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HP-41 • HP-71 • HP-75

USERS' LIBRARY

• Software • Catalog •

May • 1986

HEWLETT PACKARD

HP-41 • HP-71 • HP-75

Users' Library Software Catalog

May•1986

HEWLETT PACKARD

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Neither HP nor the contributor makes any express or implied warranty with regard to the program material offered, its merchantability or its fitness for any particular purpose. Neither HP nor the Contributor shall be liable for any incidental or consequential damages in connection with or arising out of the furnishing, use or performance of the program material. The program material is made available solely on an "AS IS" basis, and the risk as to its quality, suitability and performance is with the user.

Introduction

What is the Users' Library?

The Users' Library was established to provide a source of readily available and useful programs written for the HP-41, HP-71 and HP-75. The Library reviews, catalogs, and distributes user-contributed software. Maximize your investment--customize your Hewlett-Packard system to meet YOUR needs with software solutions listed in our Catalog!

What's in the catalog?

The Users' Library Software Catalog is your complete guide to software for the HP-41, HP-71 and the HP-75, which is currently available from the Users' Library, the Software Distribution Center, and/or your local dealer. It is a convenient source for selecting programs from a wide variety of disciplines and application areas.

Using the catalog...

For HP-41/71 or HP-75 Users' Library or Software Distribution Center Solutions:

- **Application category table**
  Locate the category number that corresponds to your area of interest.
- **Application index**
  Refer to the category number in the Application Index for a complete listing of all programs available.
- **Author index**
  A list of the authors (alphabetically), as well as the software they have written.
- **Program abstracts**
  Both pricing information and a brief description of each solution are included (numerically).

Also included is a wide variety of software available from your local dealer!

Documentation

Standard documentation varies, but usually includes: program description, sample problem, user instructions, program listings and a status page. HP-41 program documentation comes with Hewlett-Packard bar code (when available).

Pre-recorded magnetic cards, mini-data cassettes, or HP-IL 3.5″ discs are available for an additional fee.

PRICING INFORMATION...*Please read carefully*

Each program is priced for both **DOCUMENTATION ONLY** and **DOCUMENTATION WITH MAGNETIC CARDS** or **MEDIA**. Check the Program Abstract sections for individual prices.

- **Documentation only**
  Price includes photocopies of author's original documentation. Bar code is included free with HP-41 programs (when available). Customers may wish to order multiple programs recorded on disc or cassette. The cost is $19.50, plus the "documentation only" cost of each program requested.
- **Documentation with magnetic cards**
  Individual price includes complete documentation as well as pre-recorded magnetic cards.
- **Documentation with media**
  Occasionally, software MUST be sold recorded. This price INCLUDES the cost of the media. Choose either cassette, disc or magnetic cards (unlesss otherwise noted). Multiple programs CAN NOT be recorded on these selections.

Media ordered separately, cannot be discounted.

How do I order?

Complete the order form (inside front or back cover), select your payment type, and mail to the Users' Library. Please remember--checks must be in U.S. dollars and drawn on a U.S. bank. Please include any applicable state or local taxes.

Customers outside the U.S., please note:

- Software distributed through the Corvallis Users' Library is available in English only;
- Remember to attach payment (not bank receipts) to your order. Credit cards, international money orders or checks in U.S. dollars drawn on a U.S. bank are acceptable;
- Please type or print your name and address clearly;
- Include additional 10% for postage and handling outside the U.S.

Contributing To The Library

Share your programming ideas with others by documenting useful and/or entertaining software that you have developed. Contributors receive one point certificate for each program approved for distribution.* Point certificates are redeemable for a variety of HP products. For information on contributing software, contact the Users' Library.

Software Distribution Center (SDC)

The Software Distribution Center was established to provide an avenue of distribution for professionally written software for our handheld products. This software is supported by each individual author, who receives a royalty for each program sold through the SDC.

If you are a **Professional Software Writer** and wish to receive more information on developing software for the HP-71, please contact the Corvallis Software Distribution Center.

Bar Code Information

Contributors may request bar code of their HP-41 programs at the time of acceptance by the Users' Library, or, contact:

George Graphics
650 Second Street
San Francsico, CA 94107

If you wish to become a member of The Users' Library, please contact us for subscription information.

For information regarding the Users' Library contact:
HP Users' Library
Dept 39UL
1000 NE Circle Blvd
Corvallis, OR 97330

For information regarding the Software Distribution Center contact:
Software Distribution Center
1000 NE Circle Blvd
Corvallis, OR 97330

To ensure that you receive all correspondence, always keep us informed of your current address!

*Authors outside the United States may be restricted to Users' Library Software only.

What's New

The HP-94 Handheld Industrial Computer

Hewlett-Packard's new HP-94 Handheld Industrial Computer is rugged, compact and portable. It's designed for data collection, remote information processing and data communications, and is the ideal productivity tool for many applications in manufacturing and sales.

The HP-94 increases productivity by providing an alternative to manual, paper-intensive data collection methods. This battery-operated computer—which weighs less than two pounds—is designed for mobile use and can easily be carried in one hand or attached to a clipboard.

With the HP-94 to eliminate paperwork, keypunching and data verification, workers in manufacturing, distribution, sales, field service and route accounting collect data faster and more accurately. Data entry and computation errors are eliminated because mistakes are corrected as they are entered through built-in error-checking routines.

The HP-94 features a sophisticated 8-bit/16-bit 80C88-compatible processor and supports two standard programming languages—BASIC and 8088 assembly language. HP-94 programs are developed in either of these languages using the HP Vectra or IBM PC/XT/AT and a separate software development system.

The HP-94 is available with up to 256K-byte maximum memory. Several combinations of RAM, RAM and ROM or EPROM can be added to the 64K and 128K byte versions.

Data is entered into the HP-94 using the alphanumeric keyboard or with optional bar code wands*. Each wand features a durable metal case, replaceable sealed sapphire tip and high-ambient light performance for use in direct sunlight. The HP-94 reads popular bar codes including 3 of 9 Code, Interleaved 2-of-5 Code, Codabar, Code 128 and UPC/EAN/JAN.

And the HP-94 can be programmed for data communication at up to 9600 baud with its built-in serial interface.

Announcing Price Reductions For HP-41 Calculators!

Effective February 1, the prices of four Hewlett-Packard handheld calculators have been reduced by an average of 22 percent. Reduced manufacturing and material costs allow HP to pass the savings on to customers.

Reductions on the four models are: HP-11C from $75 to $56; HP-15C from $120 to $99; HP-41CV from $225 to $175 and HP-41CX from $325 to $249.

"These price reductions are consistent with our long term commitment to producing high quality, high functionality products at a lower cost. Passing cost savings on to our customers puts our products' functionality within the price range of a much larger number of people," said Ernst R. Erni, Handheld Computer and Calculator Operations Manager for Hewlett-Packard.

All four price-reduced models are popular with professionals and students in science, engineering and mathematics. All are programmable and offer a variety of high level built-in scientific functions. Among other capabilities, the HP-11C features functions for statistical calculations; the HP-15C will handle matrices and complex numbers. The HP-41CV and HP-41CX have over 200 built-in functions and I/O capability. They are expandable, highly customizable and have over 2500 prewritten programs available.

"Increased use of automation, improved assembly techniques, integrated circuit packaging improvements and reduced materials costs from vendors are some of the advances we've been able to take advantage of in our Series 10 and Series 40 calculator production lines," said Erni.

Hewlett-Packard Company is an international manufacturer of measurement and computation products and systems used in industry, business, engineering, science, medicine and education. The company employs 84,000 people worldwide and had revenue in its 1985 fiscal year of $6.5 billion.

New Service Support Agreements For HP Calculators

The Corvallis Service Center recently introduced a new Support Agreement Program for Series 10, HP-41 and HP-71 products. Qualified products are eligible for extended warranty under this program at cost-effective prices. Support Agreements are renewable on a yearly basis and are available for products currently under their original one-year factory warranty.

Under this program, all labor, parts and materials deemed necessary to maintain products covered by the Support Agreement in good operating condition are provided. Service includes diagnosis and correction of product malfunctions and failures.

Initial response to this new program has been excellent. At this time, however, the Support Agreements are available ONLY for customers in the United States. For details regarding this program, please write or call the Corvallis Service Center at (503) 757-2002.

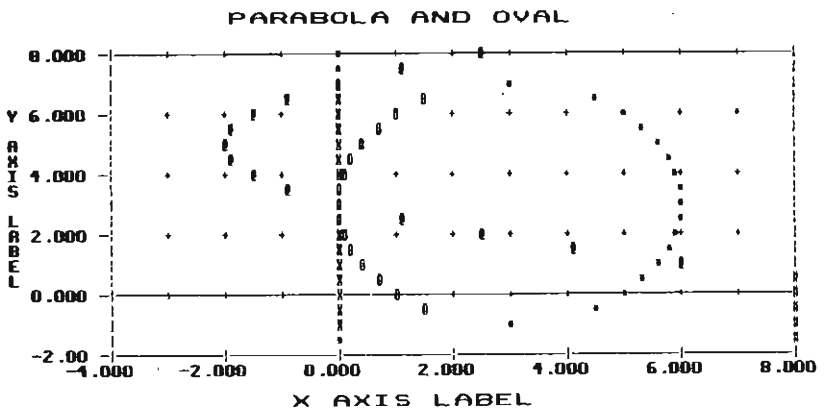
**Available in late 1986, pending final verification of compliance with applicable FCC Rules and Regulations.*

They're Here...

The HP-41 Meets The ThinkJet

At last, here's a program to plot data from the HP-41 to the HP 2225B ThinkJet printer! THINKJET PRPLOT (#03447-41-0) is the latest submittal from a frequent Users' Library contributor, William Pinnick, of State College, PA.

Providing a neatly formatted output, this program plots up to four data points per row, each with its own plot symbol. Located within the 122 character plot field are data points placed to a 1% tolerance. A user-supplied routine is used to return X values given the Y inputs. For additional information refer to the abstract.

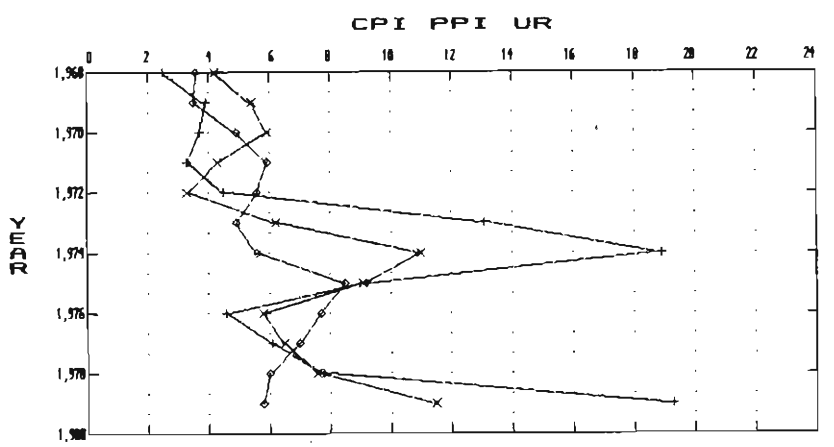


Polynomial Plots With The HP-75

William Pinnick scores again with POLYPLOT (#03436-75-5) for the HP-75. Input the order and the coefficients of any polynomial and this program will do the rest. The 6″ × 5″ plots provide a good illustration to function detail. For additional information refer to the program abstract.

The HP-71 Does It All

Paul Grimmer has put it all together in this ThinkJet plotting package! Up to 5 sets of data can be plotted with an option for interconnection of points. Function plotting is easily accommodated with user-defined subprograms. New keywords, extensive error handling, and even a routine to test the operation of your ThinkJet cartridge are just a few of the many features this package has to offer. This program didn't make the normal catalog deadline, but is available! Order part #V7546-71, send $60, and specify your choice of either mini data cassette or 3.5″ disc.



FYI

What You Should Know About The HP-41 Translator Pac

The HP82490A Translator Pac is a plug-in module for the HP-71 Handheld Computer that gives the HP-71 both calculator capability similar to that of the HP-41 and, lets it run HP-41 programs.

THE HP-41 TRANSLATOR PAC IS REQUIRED FOR THE HP-71 TO RUN HP-41 PROGRAMS. With the HP82490A module installed in any port of the HP-71, you can run approximately 90% of the HP-41 Users' Library programs and most HP-41 Solutions Books, unchanged, on the HP-71 (once translated into the HP-71 text format)..

The HP-41 Translator Pac includes the complete HP-41CV programmable function set, plus some additional register, flag, and conditional functions found in the HP-41CX. The HP-41CX timer, alarm, and extended memory functions are not supported by the HP-41 Translator Pac. However, this function set may be extended through user-defined functions.

With your order for an HP-71 translated program, you will receive HP-41 documentation and code in HP-71 text format.

How Does Your HP-41 Measure Up?

The following equations represent equivalent functional capacities:

4 Memory Modules = 1 Quad Memory Module
HP-4l-C + 1 Quad Memory Module = HP-41-CV
HP-41-CX = HP-41CV + Time Module + Extended Functions/Memory Module plus 28 new functions and modes unique to the HP-41CX.

Corrective Action For Hardware Disruptions

IMPORTANT: THE RESET PROCEDURES OUTINED BELOW WILL RESULT IN LOSS OF MEMORY (i.e. programs, data, etc.).

Have you ever had an HP-41 that, in stubborn moments, would not cooperate? Moments of "system disruption" such as these are never welcome, but there are a few simple remedies which can minimize any significant down time. The environmental nemesis to which we can attribute some degree of this disruption is static electricity.

For situations in which the HP-41 will not turn on or off: simultaneously press, then release the keys [ON] [ENTER] and backarrow. Repeat as necessary. If this does not produce results, remove the batteries and press the ON key continuously for 1-2 minutes. Release the key and reinstall the batteries. Turn the calculator on. Position the program pointer with Catalog 1 and execute CLP.

If the above procedure does not restore normal operation, remove the batteries and leave them out for 24-48 hours. Reinstall the batteries and turn the calculator on.

HP-41CX OWNERS—When difficulities occur and extra measures are required to turn the calculator on, there may also be a disturbance of the alarm settings. In this situation, execute Catalog 5 to list the alarm settings. If there are erroneous settings execute CLRALMS.

Display format alterations are common subsequent to system disruptions.

DISPLAY FORMAT—Flag 28 will transpose the commas and decimal points in the display wth the [CF] or [SF] function followed by the flag number.

Comma separators for every third digit can be enabled or disabled according to the status of flag 29.

To Tax Or Not To Tax?

Do you wonder when to include state and/or local taxes on your Users' Library orders? Because Hewlett-Packard is licensed to transact business in each of the 50 states, we are also liable to collect taxes in every state that imposes either a sales or use tax. Your ship-to address determines the amount of the tax. The exception is, of course, any organization having a tax exempt status.

Calculator Technical Support

If you are having trouble running a program from one of HP's application pacs, or are stumped trying to interface an HP-41 to a ThinkJet printer, you should be talking to one of the Technical Support Specialists at HP's Handheld Computer and Calculator Operation. Hundreds of questions covering all HP handheld computational products are answered each week by the Calculator Technical Support (CTS) department.

The CTS group handles technical questions about HP-41, HP-71 and HP-75 products; applications software pacs; HP-IL peripherals and interface converters; and general technical questions regarding the use of the HP-94 Handheld Industrial Computer. Users' Library programs are supported by Library staff.

Although the CTS group primarily provides post-sale technical support to customers, anyone needing help with a technical question about an HP handheld product may call. For the price of a phone call, get answers to your questions—in most cases the same day. ***Collect calls are not accepted.***

The number to call for Calculator Technical Support is ***(503) 757-2004***. The phone lines are open from 8:00 a.m. to 3:00 p.m. PDT, Monday through Friday. If you have questions about HP handheld computational products, call the CTS group. They'll be glad to help.

Answers to Commonly Asked HP-41 Questions

GENERAL

Q. ***How do I key in the program line that reads 1 E2 (or E2)?***

A. This is scientific notation for 100 (1 × 10^2). It is keyed in as 1 [EEX] 2 or [EEX] 2.

Q. ***How do I key in the sideways T?***

A. This is the APPEND symbol. It is keyed in (in PRGM mode) by pressing [ALPHA] [shift] [K].

Q. ***What is meant by [///] in the Solutions Book?***

A. The gold shift key is often represented by [///]. It may also be represented as [shift].

Q. ***Sometimes when I execute a program in the HP-41, the calculator says NONEXISTENT.***

A. The problem usually relates to the number of storage registers that you have allocated. Switch to program mode immediately after receiving the NONEXISTENT message. If the calculator displays a [STO] or [RCL] statement, (or any function that accesses data registers, like [CL sigma]), then you do not have enough storage registers allocated. Memory is allocated with the SIZE command.

Another possibility is that a function being called by the program does not reside in memory. Again, check to see at which line the program stopped. You may see an XROM statement in Program mode. Check the list of application pac functions to see which function is being called. Refer to the next question for information dealing with XROM.

Q. ***I copied a program out of an application module into the main memory of the HP-41, but when I execute the program (without the module), the calculator displays NONEXISTENT. When I switch to program mode, the display reads XROM xx,xx (the x's represent numbers).***

A. The XROM statements are subroutine calls to another program in the application module. To get these programs to run, you must first COPY each of the subroutines out of the application module, then change the XROM statements to the appropriate XEQ "name" instruction. You may find that the program with all the needed subroutines uses up most, if not all, of the memory. Be sure to press [GTO] [.] [.] between COPY commands. And, you may find that several subroutines reside in one program.

Q. ***When I take the sine of Pi in radians mode I get a small number (−4.1 × 10E−10) instead of zero.***

A. The value returned is correct. Although Pi is an infinite series, calculators use finite numbers and can only carry Pi to a specific number of decimal places. We use Pi to 10 digits (3.141592654). The sine of this number is −4.1 × 10E-10. To return a result of 0, Pi would have to be carried to 20 decimal places. This concept also applies to the tangent and cosine functions.

Q. ***When using the SDEV function, I sometimes get OUT OF RANGE.***

A. The statistics functions accumulate both X and Y values. If you are only doing one-variable statistics, be sure to clear the X- and Y-registers before beginning. Use CLST or 0 [ENTER].

Q. ***My calculator doesn't stop to display answers, they appear briefly and then computation resumes.***

A. Be sure to set flag 21. Programs are often written so that they run consistently with and without a printer. This requires the use of flag 21. However, if the calculator has been turned off, the status of flag 21 may have been changed.

Q. ***CATALOG 1 shows several END statements with no associated labels. How can I get rid of them?***

A. You may have deleted the global label of the program. Execute CATALOG 1, stop at the END statement, switch to Program mode, switch back to RUN mode, do [XEQ] [ALPHA] CLP then [ALPHA] [ALPHA] [ALPHA] to delete the program. The END statement will disappear from CATALOG 1. Refer to the next question for an explanation of how END statements may have been added. If you wish to save the program, add a global label, typically at the beginning of the program.

EXTENDED FUNCTIONS/MEMORY

Q. ***I have a program that uses GETSUB and PCLPS to retrieve a series of subroutines. After I run this program I have a series of END statements in program memory.***

A. The GETSUB command loads an END statement into program memory and then does a GETP. This ensures that your last program is never replaced. It also means there is an END statement before the specfied subroutine. The PCLPS function clears from line 01 of the specified program downward through CATALOG 1. One result is that the END statement that GETSUB loads into program memory is not cleared by a subsequent PCLPS instruction that specifies the same subroutine. This can be avoided by using the GETP command to load the subroutine if your last program already has an END statement.

Q. ***The XF/M manual states that GETP replaces the last program in memory, but it doesn't in my HP-41.***

A. The HP-41 considers the space between the last END statement and the "permanent" .END. the last program in memory. It is this portion of program memory that GETP will overwrite. If your last program has an END statement, then only the small blank space of memory between this END and the .END. will be overwritten.

HP-IL INTERFACE/PERIPHERALS

Q. ***I have an HP 82162A printer on the HP-IL loop and it doesn't work.***

A. Be sure that the Print Function Switch (located on the bottom of the HP-IL interface module) is set to ENABLE.

Q. ***How can I print 80 characters on a line with the HP-41 and ThinkJet?***

A. To print more than 24 characters per line, accumulate the contents of the ALPHA register into the print buffer using the ACA (accumulate ALPHA) function. When the buffer has the complete line and is ready to print, use the PRBUF (print buffer) command to print the line.

Q. ***Can I use the Plotter Module to print graphics on ThinkJet?***

A. No, the plotter module cannot be used for graphics.

Q. ***How can I print graphics?***

A. First you must be familiar with raster graphics, which is used to develop the line(s) of output. Then use escape sequences to print graphics. You must send an escape sequence before each line of print.

Q. ***Can I use the disc drive with the HP-41?***

A. Yes, although you will need an Extended I/O Module and program #09114-4I-0 from the Users' Library to fully utilize the 630K bytes of storage.

Q. ***Can an HP-41 communicate with a "Brand X" computer?***

A. The hardware required for data communication is available. You will need to write an HP-41 program to coordinate data transfer. You may also need to write a program on your "Brand X" computer.

HEWLETT-PACKARD

Calculator and Handheld Computer Products

Contact your local dealer for pricing information and product availability.

For the name of the dealer nearest you, call toll free: (800)367-4772

Product Number	Description
	Calculators and Handheld Computers*
HP-11C	Slim-Line Programmable Scientific
HP-12C	Slim-Line Programmable for Business
HP-15C	Slim-Line Programmable Scientific with Matrices
HP-16C	Slim-Line Programmable for Digital Electronics and Computer Sciences
HP-41CV	Advanced Programmable Calculator
HP-41CX	Advanced Programmable Calculator with Extended Functions
HP-71B	Handheld Computer
HP-75D	Handheld Computer
	Series 10 Accessories and Software
	HP-11C/12C/15C/16C Accessories
00011-90001	HP-11C Owner's Handbook
00011-90005	HP-11C Owner's Handbook–Spanish
00012-90001	HP-12C Owner's Handbook
00012-90005	HP-12C Owner's Handbook–Spanish
00012-90022	HP-12C Training Guide
00015-90001	HP-15C Owner's Handbook
00015-90005	HP-15C Owner's Handbook–Spanish
00016-90001	HP-16C Owner's Handbook
82174A	Vinyl Case
92169A	Leather Case-Black
92169B	Leather Case-Brown
92169C	Leather Case-Burgundy
92177S	Desktop Calculator Stand
92233F	HP-12C Quick Reference Book
NEW 92234S	An Easy Course in Using the HP-12C
92234U	HP-12C Quick Reference Book (25 per package)
NEW 92234W	An Easy Course in Programming the HP-11C and HP-15C
	HP-11C/12C/15C Application Books
00011-90009	HP-11C Solutions Handbook
00012-90009	HP-12C Solutions Handbook
00012-90015	HP-12C Real Estate Applications
00012-90021	HP-12C Leasing Applications
00015-90011	HP-15C Advanced Functions Handbook
	HP-41C/CV/CX Accessories, Peripherals, Extensions and Software
	HP-41C/CV/CX Accessories
00041-90132	Standard Applications Book–Spanish
00041-90318	HP-41C/CV Owner's Handbook–Spanish
00041-90474	HP-41CX Owner's Manual Volume 1 — Basic Operation

*All models have Continuous Memory.

	Product Number	Description
		HP-41C/CV/CX Accessories (Cont.)
	00041-90492	HP-41CX Owner's Manual Volume 2
NEW	00041-90514	HP-41CX Supplement to HP-41CV Owner's Manual – Spanish
	00041-90526	HP-41CV Owner's Manual – Basic Operation
	00041-90530	HP-41CV Owner's Manual – Spanish
	00041-90535	HP-41CV Operation in Detail – Spanish
	00041-90536	HP-41CV Quick Reference Guide
	00041-90540	HP-41CV Quick Reference Guide – Spanish
	00041-90531	HP-41CV Operation in Detail
	00097-13142	3 Program Card Holders for 82104A Card Reader
	00097-13143	Blank Program Cards for 82104A Card Reader — 120 Card Pac (No Holders)
	82045A	Thermal Printing Paper—6 rolls—Blue
	82059D	AC Adapter/Recharger—110 Vac
	82066B	AC Adapter/Recharger—Europe 220 Vac
	82111A	Vinyl Carrying Case (holds HP-41 plus 82104A Card Reader)
	82120A	Multipurpose Rechargeable Battery Pack*
	82151A	Module Holders (2)
	82152A	Overlay Kit
	82172A	50 Blank Overlays
	82175A	Thermal Printing Paper—6 rolls—Black
	82200A	HP-41 Touchpad
	82205A	Barcode Labels
NEW	92234T	Easy Course in Programming the HP-41
NEW	92235R	Using Your HP-41 Advantage – Statistics
NEW	92235S	Using Your HP-41 Advantage – Electrical Circuits
	92266A	Extended Use Battery Charger
	92266B	Rechargeable Battery Pack
	82104-90001	Card Reader Owner's Handbook
	82104-90008	Card Reader Owner's Handbook–Spanish
	82143-90001	Printer/Plotter Owner's Handbook
	82143-90007	Printer/Plotter Owner's Handbook–Spanish
	82153-90001	Optical Wand Owner's Handbook
	82153-90019	"Creating Your Own Bar Code" Manual
	82153-90020	Optical Wand Owner's Handbook–Spanish
	82160-90001	HP-IL Interface Module Owner's Handbook
	82160-90008	HP-IL Interface Module Owner's Handbook–Spanish
	82161-90002	Digital Cassette Drive Owner's Handbook
	82162-90001	Thermal Printer/Plotter Owner's Handbook
	82162-90007	Thermal Printer/Plotter Owner's Handbook–Spanish
	82180-90001	Extended Functions/Memory Module Owner's Handbook
	82180-90009	Extended Functions/Memory Module Owner's Handbook–Spanish
	82182-90001	Time Module Owner's Handbook
	82183-90001	HP-41 Extended I/O Module Owner's Handbook
	82184-90001	Plotter Module Owner's Handbook
		HP-41C/CV/CX Peripherals
	82104A	Card Reader
	82143A	Thermal Printer/Plotter
	82153A	Optical Wand
		HP-41C/CV/CX Extensions
	82160A	HP-IL Interface Module
	82180A	HP-41C/CV Extended Functions/Memory Module
	82181A	HP-41C/CV Extended Memory Module (Requires the 82180A)
	82182A	HP-41C/CV Time Module
	82183A	Extended I/O Module
	82184A	Plotter Module
		HP-41C/CV/CX Software
		Application Pacs
	00041-15042	Auto/Start Duplication ROM
	00041-15018	Aviation (For pre-flight use only)
	00041-15006	Circuit Analysis
	00041-15024	Clinical Lab & Nuclear Medicine
	00041-15004	Financial Decisions
	00041-15030	Financial Decisions – Spanish
	00041-15022	Games
	00041-15023	Home Management

*82059D AC Adapter/Recharger must be purchased separately.

Product Number	Description
	HP-41C/CV/CX Application Pacs (Cont.)
00041-15055	HP-41 Advantage
00041-15043	HP-41 HP-IL Development Module
00041-15020	Machine Design
00041-15049	Math/Stat
00041-15052	Math/Stat – Spanish
00041-15017	Navigation
00041-15039	Petroleum Fluids
00041-15016	Real Estate
00041-15026	Securities
00041-15001	Standard
00041-15027	Stress Analysis
00041-15021	Structural Analysis
00041-15005	Surveying
00041-15019	Thermal & Transport Science
	Solutions Books
00041-90093	Antennas
00041-90094	Business Statistics/Marketing/Sales
00041-90145	Calendars
00041-90100	Chemical Engineering
00041-90102	Chemistry
00041-90089	Civil Engineering
00041-90092	Control Systems
00041-90088	Electrical Engineering
00041-90139	Fluid Dynamics & Hydraulics
00041-90099	Games
00041-90443	Games II
00041-90084	Geometry
00041-90140	Heating, Ventilating & Air Conditioning
00041-90083	High-Level Math
00041-90096	Home Construction Estimating
00041-90086	Lending, Savings & Leasing
00041-90090	Mechanical Engineering
00041-90143	Optometry I (General)
00041-90144	Optometry II (Contact Lens)
00041-90142	Physics
00041-90136	Real Estate
00041-90137	Small Business
00041-90138	Solar Engineering
00041-90441	Structural Design (Cassette based)
00041-90141	Surveying
00041-90543	Taxes 1984/1985
00041-90082	Test Statistics
00041-90395	Time Module Solutions I

HP-71/75 Accessories, Extensions and Software

	HP-71/75 Accessories
00071-90001	HP-71 Owner's Manual
00071-90007	HP-71 Owner's Manual – Spanish
00071-90010	HP-71 Reference Manual
00071-90016	HP-71 Reference Manual – Spanish
00071-90019	HP-71 Quick Reference Guide
00071-90025	HP-71 Quick Reference Guide – Spanish
00071-90068	HP-71 Internal Design Specifications Vol. I
00071-90069	HP-71 Internal Design Specifications Vol. II
00071-90070	HP-71 Internal Design Specifications Vol. III
00071-90071	HP-71 Hardware Design Specifications
00075-90001	HP-75 Owner's Manual
00075-90004	HP-75 Quick Reference Manual
82001B	HP-75 Rechargeable Battery Pack
82002C	AC Adapter/Recharger—110 Vac (Required when ordering 82004A for HP-75)
82004A	HP-75 Reserve Power Pack (Requires an 82002C Recharger—110 Vac)
82059D	AC Adapter/Recharger—110 Vac
82066B	AC Adapter/Recharger—Europe 220 Vac
82401-90001	HP-71 HP-IL Interface Owner's Manual
82401-90023	HP-71 HP-IL Internal Design Specifications

Product Number	Description
	HP-71/75 Accessories, Extensions and Software (Cont.)
82462A	HP-71 Blank Overlay Kit (Qty. 5)
82463A	HP-71 Vinyl Carrying Case
82701A	HP-75 Security Cradle
82703A	HP-75 Field Case
82707A	30 Blank Magnetic Card Pac
82710A	HP-75 Overlay Kit (Qty. 5)
82715A	Notebook Card Holder (Qty. 5)
82717A	HP-75 Blank Overlay Kit (Qty. 50)
	HP-71/75 Extensions
82400A	HP-71 Card Reader
82401A	HP-71 HP-IL Interface
82420A	HP-71 4K Memory Module
82700A	HP-75 8K Memory Module
82725A	HP-75 Bar Code Reader Module
92267A	HP-75 High Resolution Digital Bar Code Wand
92267B	HP-75 Medium Resolution Digital Bar Code Wand
	HP-71 Software
	Application Pacs
82481A	AC Steady State Circuit Analysis
82484A	Curve Fitting
NEW 82479A	Data Acquisition Pac
82488A	Data Communications
82482A	Finance
82441A	FORTH/Assembler
82480A	Math
82483A	Surveying
82485A	Text Editor
82489A	AMPI™ Statistics*
82490A	HP-41/HP-71 Translator
	Solutions Books
00071-90065	Games
00071-90066	General Utilities
00071-90064	Math
82440A	Software Development Utility (Mini-Cassette)
	HP-75 Software
	Application Pacs
00075-15035	Data Communications
00075-15001	I/O ROM
00075-15015	Math
00075-15012	Surveying
00075-15019	Text Formatter
00075-15014	VisiCalc®**
	Solutions Books
00075-13008	Electronics
00075-13009	Finance
00075-13006	Games I
00075-13007	Games II
00075-13016	Graphics
00075-13013	I/O Utilities
00075-13015	Mass Media Duplication/Privacy
00075-13003	Math I
00075-13004	Math II
00075-13005	Math III
00075-13010	Real Estate
00075-13011	Statistics
00075-13012	Test Statistics

HP-IL Interfaces, Peripherals and Accessories

	HP-IL Interfaces
82164A	HP-IL/RS-232C Interface
82165A	HP-IL/GPIO Interface
82169A	HP-IL/HP-IB Interface

*AMPI™ is a U.S. registered trademark of American Micro Products, Inc.
**VisiCalc® is a registered trademark of VisiCorp.

	Product Number	Description
		HP-IL Peripherals
	82938A	HP-IL/Series 80 Interface
	92198A	HP-IL/80-Column Video Interface – U.S.†
NEW	82402A	Dual HP-IL Adapter
	82161A	Digital Cassette Drive
	82162A	HP-IL Thermal Printer/Plotter
	82168A	Acoustic Coupler (Modem)
	2225B	ThinkJet Printer
	9114B	Portable Disc Drive
		HP-IL Accessories
	82033A	Rechargeable Battery Pack for 82161A, 82162A
	82037A	Reserve Power Pack for 82161A, 82162A
	82044A	Security Cable for 82143A, 82161A, 82162A
	82045A	Thermal Printing Paper for 82143A, 82162A—6 rolls—Blue
	82059D	AC Adapter/Recharger for 2225B, 82143A, 82120A, 82161A, 82162A, 82163A, 82164A, 82165A, 82168A, 82169A, HP-71, HP-75, HP-97—110 Vac
	82066B	AC Adapter/Recharger for 2225B, 82143A, 82120A, 82161A, 82162A, 82163A, 82164A, 82165A, 82168A, 82169A, HP-71, HP-75—Euro. 220 Vac
	82167A	.5-Meter HP-IL Cable
	82167B	1-Meter HP-IL Cable
	82167D	5-Meter HP-IL Cable
	82175A	Thermal Printing Paper for 82143A, 82162A—6 rolls—Black
	82176A	Data Mini Cassettes (10 pack)
	82177A	Blank Data Mini-Cassette Labels (20 sheets = 420 labels)
	82199A	Rechargeable Battery Pack for HP 2225B
	82165-90002	HP-IL/GPIO Interface Owner's Handbook
	82166-90016	HP-IL Integrated Circuit User's Guide
	82166-90017	HP-IL Interface Specifications
	82166-90020	HP-IL Interface Kit Technical Guide
	82169-90001	HP-IL/HP-IB Interface Operator's Manual
	13269TT	Carrying Case for HP 2225B
NEW	88014B	Battery Pack for HP 9114B
	92192A	Box of 10 3½" Discs for HP 9114B
	92250V	Dust Cover for HP 2225B
	92261A	Printhead Cartridge for HP 2225B
NEW	92261D	ThinkJet Accessory Kit
	92261L	InkJet Printer Paper (1,000 fanfold sheets)
	92261M	InkJet Printer Paper (1,000 single sheets)
	92261N	InkJet Printer Paper (2500 Z-fold sheets)
	92261S	Printer Stand for HP 2225B

†Manufactured by Mountain Computer Co.

Hewlett-Packard
Handheld Computer and
Calculator Operation
1000 N.E. Circle Blvd.
Corvallis, Oregon 97330
800-FOR-HPPC

HEWLETT PACKARD

B000 APPLIED SCIENCES

B100 Agriculture
B102 Animal Science
B104 Crop Science
B106 Horticulture
B108 Soil
B200 Computer Science
B204 Base Conversions and Arithmetic
B206 Data Base Management
B208 Input/Output Applications
B209 Utilities
B300 Forestry/Forestry Engineering
B400 Hydrology
B600 Space Sciences
B800 Surveying
B802 Aerial or Photogrammatic
B804 Cadastral
B806 Control
B808 Topographical

D000 BUSINESS AND FINANCE

D050 Accounting
D052 General Accounting
D054 Payroll Accounting
D100 Cost Analysis/Estimation
D150 Forecasting/Planning
D200 General Investment Analysis
D250 Industrial Production
D300 Insurance/Retirement
D350 Inventory Control
D400 Leasing
D450 Lending/Savings
D500 Marketing Sales
D550 Personal Finance
D600 Real Estate
D650 Securities
D700 Taxes

F000 DIVERSIONS

F100 Games
F102 Board and Table Games
F104 Games of Chance
F106 Word and Number Games
F200 Hobbies
F202 Aerobics
F204 Amateur Radio
F206 Biorythms

H000 EDUCATIONAL (Programs that teach)

J000 ENGINEERING

J050 Aeronautical/Aerospace Engineering
J100 Agricultural Engineering
J150 Architectural Engineering
J200 Biomedical Engineering
J250 Chemical Engineering
J252 Design (Optimization)
J254 Process Control
J256 Stoichiometry
J300 Civil Engineering
J302 Environmental Engineering
J304 Hydraulics
J306 Soil Mechanics
J308 Structural Engineering
J310 Transportation
J312 Urban Planning
J350 Drafting/Design
J360 Electrical/Electronic Engineering
J362 Antennas
J364 Circuits
J366 Computers
J368 Dynamic Systems
J370 Fields and Waves
J372 Transmission Lines
J400 Energy Conservation and Management
J450 Engineering Physics
J500 Geotechnical Engineering
J550 Industrial Engineering
J552 Operations Research
J554 Production Control
J556 Quality Control
J558 System Analysis
J600 Mechanical Engineering
J602 Automotive Engineering
J604 Design and Analysis
J606 Dynamics of Physical Systems
J608 Energy Conversion Systems
J610 Fluid Dynamics
J612 Fuels and Lubricants
J614 Heating/Ventilating/Air Cond.
J616 Heat Transfer
J618 Metallurgy and Materials
J700 Ocean Engineering
J750 Petroleum Engineering
J752 Drilling
J754 Facilities
J756 Petrophysics
J758 Reservoir
J800 Solar Engineering

L000 MATHEMATICS

L050 Complex Variables
L100 Conversions
L150 Differential Equations
L152 Finite Differential
L154 Finite Element
L200 Extended Precision
L250 Integration
L300 Interpolation
L302 Approximation
L350 Linear Systems/Matrices
L352 Simultaneous Equations
L400 Number Theory
L450 Polynomials
L500 Series/Sequences/Progressions
L550 Special Functions
L600 Symbolic Mathematics
L602 Algebra
L650 Trigonomety/Analytic Geometry

N000 MEDICAL ARTS AND SCIENCES

N100 Anesthesia
N200 Blood Chemistry
N300 Cardiopulmonary Medicine
N400 Clinical Laboratory
N402 Radioimmune Assay
N500 Dentistry
N600 Nutrition
N700 Optometry
N800 Pharmacology
N802 Drug Dosage
N804 Toxicology
N900 Veterinary Sciences

P000 MISC. TECHNICAL APPLICATIONS

P100 Aviation
P102 Avigation
P104 Aircraft Operation
P200 Chronology
P202 Date/Calendar
P300 Marine Navigation
P302 Ship Stability
P304 Yachting
P400 Photography
P500 Special Information Applications
P502 Data Bases/Files (non-programs)
P600 Subroutine Packages

R000 PROBABILITY AND STATISTICS

R100 Analysis of Variance
R200 Curve Fit/Regression/Correlation
R300 General Statistics
R400 Non-Parametric Inference
R500 Parametric Inference
R600 Probability
R700 Probability Distribution
R800 Quality Assurance/Reliability

T000 SCIENCE

T100 Atmospheric Sciences
T200 Astronomy
T300 Biology
T320 Ecology
T340 Genetics
T360 Molecular Biology
T380 Microbiology
T400 Chemistry
T410 Acid-Base Chemistry
T420 Agricultural Chemistry
T430 Biochemistry
T440 Chromatography
T450 Crystallography
T460 Nuclear Chemistry
T470 Physical Chemistry
T472 Electrochemistry
T474 Kinetics
T476 Spectroscopy
T478 Thermodynamics
T480 Quantitative Analysis
T500 Geography
T600 Geology
T700 Geophysics
T800 Oceanography
T810 Biological
T820 Chemical
T840 Physical
T900 Physics
T910 Classical Mechanics
T920 Nuclear and Atomic Physics
T930 Optics
T940 Quantum Mechanics
T950 Relativity
T960 Thermal Physics

V000 SOCIAL SCIENCES

V100 Economics
V200 Educational
V300 Psychology

Software Distribution Center

The Software Distribution Center was established to provide an avenue of distribution for professionally written software for our handheld products. This software is supported by the individual author, who receives a royalty for each program sold through the SDC.

Developed by independent software suppliers for operation on HP products, the developer is solely responsible for the software and support services. Although distributed through the Software Distribution Center, HP has not participated in the development of such software. HP disclaims any and all liabilities for and makes no warranties, expressed or implied, with respect to SDC software. The customer is responsible for selection of software purchased.

Because of royalty agreements, these programs are excluded from any special offers and/or discounts.

APPLICATION INDEX FOR SOFTWARE DISTRIBUTION CENTER

		Available for HP-71	Available for HP-75
B000 Applied Sciences			
B208 Input/Output Applications			
RPN Calculator	V7539	✓	
B209 Utilities			
HP-71 Translator Pac Programmer's Toolkit	V7540	✓	
LINK-75	V7541		✓
NANOTEXT	V7545	✓	
RPN Calculator	V7539	✓	
D000 Business and Finance			
ACCTGCAL	V7523	✓	
NANOTEXT	V7545	✓	
Spread-71	V7524	✓	
F000 Diversions			
F100 Games			
Blackjack	V7500	✓	
J000 Engineering			
FLPROP	V7506	✓	
FLPROP	V7527		✓
GASPIPE	V7508	✓	
GASPIPE	V7529		✓
LINK-71	V7542	✓	
LIQMOD	V7512	✓	
LIQMOD	V7530		✓
LIQTHERM	V7513	✓	
LIQTHERM	V7531		✓
MULTIDIA	V7511	✓	
MULTIDIA	V7537		✓
PARLL	V7509	✓	
PARLL	V7535		✓
PIPINJ	V7510	✓	
PIPINJ	V7536		✓
PIPROP	V7516	✓	
PIPROP	V7534		✓
PRDROP	V7507	✓	
PRDROP	V7528		✓
PUMPCURV	V7514	✓	
PUMPCURV	V7532		✓
PUMPERF	V7515	✓	
PUMPERF	V7533		✓
J308 Structural Engineering			
Structural Analysis and Design	V7538	✓	
P000 Misc. Technical Applications			
DEV7571	V7521	✓	
HP-71 Data Management Pac	V7502	✓	
HPAF File Utility Pac	V7517	✓	
MASSUTIL	V7522		✓
PLOT-IT 71	V7501	✓	
QUERY71	V7518	✓	
VC75200	V7519		✓
VSOS71 and DSPLEX71	V7520	✓	
VSOS75 and DSPLEX	V7526		✓
P500 Special Information Applications			
PLOTIT-75	V7505		✓
QUERY-75	V7504		✓
VC7580	V7503		✓
P502 Data Bases/Files (non-programs)			
LINK-75	V7541		✓

		Available for HP-41
T000 Science		
T400 Chemistry		
The Chemistry Collection	V7544	
T900 Physics		
The Physics Collection	V7543	

AUTHOR INDEX FOR SOFTWARE DISTRIBUTION CENTER

Bunsen, C. V7500 V7524
Capener, C. V7539
Dinsmore, C.I. V7538
Donnelly, J. V7517 V7518 V7502
Harmon, P. V7545
MEGG Associates, INC. V7541 V7542 V7519 V7503 V7504 V7505 V7501
Paul G. Delman & Asc. V7523
SYSTEK V7534 V7506 V7528 V7511 V7527 V7537 V7531 V7516 V7532 V7510 V7536 V7512 V7513 V7508 V7509 V7533 V7535 V7530 V7507 V7514 V7515 V7529
Saul, K. V7544 V7543
VSoft Development Enterprise V7521 V7522 V7520 V7526

V7500 Blackjack

by C. Bunsen, Corvallis, OR

Casino-style Blackjack is an exciting, fast-paced addicting game program that plays up to 5 hands, while seeing all hands and the dealer's simultaneously. It allows you to double-down, split, hit, stand, and vary bets or number of players accordingly. It can use from 1-5 decks, and the playing speed and sound are adjustable. You can even program it to play your strategy for you. Have fun and practice your technique before you hit the casino! THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 5200

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7500-71-9	N/A	$40

V7501 PLOT-IT 71

by MEGG Associates, Richmond, VA

This program is a free-form graphics package for use with any HP 7470 two pen plotter. Using an HP-71 Text Editor, plots pictures in nine speeds with the arc, box, circle, and draw line commands. Rotateable text can be right, left, or center justified in nine sizes. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** HP 7470 plotter with an RS-232, HP-IB or HP-IL Interface

Steps: HP-71 Bytes: 15000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7501-71-7	N/A	$80

V7502 HP-71 Data Management Pac

by J. Donnelly, Corvallis, OR

This pac provides convenient data storage and manipulation capabilities. Use it to store and organize data from experiments or surveys, and then generate printed reports. Create, modify, and print the contents of data files conforming to the Hewlett-Packard Applications Format (HPAF) such as the HP-71 Curve Fitting ROM, Finance ROM, etc. Five programs are included. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** HP-IL interface and printer.

Steps: HP-71 Bytes: 23000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7502-71-5	N/A	$80

V7503 VC7580

by MEGG Associates, Richmond, VA

Provides two distinct operations in relation to VisiCalc by transferring both VisiCalc models and data between machines. These programs perform a very detailed analysis of a VisiCalc file in order to send a complete profile to the receiving machine. Also allows user to translate and store data in Series 80 and transmit the information when needed. Package contains three programs, approximately 4KB each. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** HP-75 and Series 80 VisiCalc; HP-75 I/O Utilities 00075-13013; 00087-15003 or 00086-15003; HP-IL Interface 82938A

Steps: HP-75 Bytes: 12000

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7503-75-4	N/A	$80

V7504 QUERY-75

by MEGG Associates, Richmond, VA

This program complements the HP-75 VisiCalc software by providing the "integrated" functionality and power of database manipulation functions. The best modeling features of HP-75 VisiCalc can be enhanced with database programming features previously available only with expensive software and larger desktop computers. Using the column header names, or field names, data can be selectively retrieved, sorted, counted, displayed, and updated. This program also provides label making capability. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** HP-75 VisiCalc Rom

Steps: HP-75 Bytes: 7000

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7504-75-2	N/A	$60

V7505 PLOTIT-75

by MEGG Associates, Richmond, VA

This program is a free form graphics package for use with any HP 7470 two pen plotter. Using HP-75 VisiCalc as the graphics editor, complex pictures can be plotted in nine speeds with the arc, box, circle, and draw line commands. Seven different line types and nine pen colors can be specified for the five drawing commands. Rotateable text can be right, left, or center justified in nine sizes. Complex symbol files can be created, then scaled and moved with a single command. Batch operations are supported from memory and/or cassette tape. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** HP-75 VisiCalc; 82700A; 00075-13013 I/O Utilities; HP 7470 with either Opt. 001, 002, or 003 and the appropriate Interface

Steps: HP-75 Bytes: 13000

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7505-75-9	N/A	$80

V7506 FLPROP

by SYSTEK, Corona, CA

Calculates properties of petroleum products. Converts specific gravity to API gravity and vice versa. Converts viscosity from SSU and SSF to centistokes and calculates viscosity of blended petroleum products. Also calculates specific gravity and viscosity at various temperatures and the bulk modulus of petroleum products at different API gravity, temperatures and pressures. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card reader or other HP-71 supported mass storage device.

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7506-71-6	N/A	$80

V7507 PRDROP

by SYSTEK, Corona, CA

Calculates velocity, Reynold's number, friction factor and pressure drop for liquid pipelines under all flow regimes for steady state, isothermal flow. Options available include Colebrook-White, Hazen-Williams, MIT and Churchill's equation. Also calculates the total pressure required, number of pump stations, and horsepower required. Both English and metric units are handled. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card Reader or Other HP-71 Supported Mass Storage

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7507-71-4	N/A	$80

V7508 GASPIPE

by SYSTEK, Corona, CA

Calculates the steady state pressure drop in a gas pipeline. Also calculates the outlet pressure and horsepower required, considering elevation difference between the ends of the pipeline. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card Reader or Other HP-71 Supported Mass Storage

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7508-71-2	N/A	$80

V7509 PARLL

by SYSTEK, Corona, CA

Calculates the steady state flow rates and pressures in a branched liquid network. Also calculates the horsepower required. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card Reader or Other HP-71 Supported Mass Storage

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7509-71-0	N/A	$80

V7510 PIPINJ

by SYSTEK, Corona, CA

Calculates the physical properties, pressures and horsepower required for a liquid pipeline with several injection and stripping points. All flow regimes are automatically accounted for. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card Reader or Other HP-71 Supported Mass Storage Device

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7510-71-8	N/A	$80

V7511 MULTIDIA

by SYSTEK, Corona, CA

Calculates the steady state pressures and horsepower required for a liquid pipeline with several different pipe sizes in series, considering elevation differences and peaks along the pipeline. All flow regimes are automatically accounted for. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card Reader or Other HP-71 Supported Mass Storage Device

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7511-71-6	N/A	$80

V7512 LIQMOD

by SYSTEK, Corona, CA

Calculates the pressures and horsepower required for a multi-pump station liquid pipeline system allowing for peaks and control points along the pipeline profile. Slack line locations are identified in the output. Automatically accounts for laminar, transition and turbulent flows. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card Reader or Other HP-71 Supported Mass Storage Device

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7512-71-4	N/A	$80

V7513 LIQTHERM

by SYSTEK, Corona, CA

Analyzes the hydraulics of a buried, heated liquid pipeline by considering the pressure drop and heat transfer between the pipe and the surrounding medium adjusting for change in fluid properties with temperature as it flows through the pipeline. Automatically accounts for laminar, transition and turbulent flows. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card Reader or Other HP-71 Supported Mass Storage Device

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7513-71-2	N/A	$80

V7514 PUMPCURV

by SYSTEK, Corona, CA

Predicts the performance of a centrifugal pump at different impeller diameters, speeds and conditions of destaging and restaging. Also calculates the performance of several pumps in series and parallel configurations. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card Reader or Other HP-71 Supported Mass Storage Device

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7514-71-0	N/A	$80

V7515 PUMPERF

by SYSTEK, Corona, CA

Predicts the performance of a centrifugal pump used on a liquid pipeline system. Calculates the flow rate, pressure, horsepower and efficiency at the operating point of intersection between the pipeline system head curve and the pump head-capacity curve. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card Reader or Other HP-71 Supported Mass Storage Device

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7515-71-7	N/A	$80

V7516 PIPROP

by SYSTEK, Corona, CA

Calculates the cross-section area, moment of inertia, weight per unit length, line fill volume, allowable internal working pressure, maximum hydrotest pressure, critical buckling load, deflection and pipe stress in pipelines and pipe columns under varying conditions of end supports. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Card Reader or Other HP-71 Supported Mass Storage Device

Steps: HP-71 Bytes: 5000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7516-71-5	N/A	$80

V7517 HPAF File Utility Pac

by J. Donnelly, Corvallis, OR

This pac also provides new tools for manipulating data files conforming to the HPAF(V7502-71, and Finance ROM, Curve Fitting ROM, etc.). Four programs are included for manipulating data files: merging, enlarging or shrinking alphanumeric fields, sorting records on multiple keys, and adding, deleting, or editing the contents of the descriptor block (all in HPAF file format). This pac is intended as a companion and extension to Data Management Pac (V7502-71). THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 19889

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7517-71-3	N/A	$80

V7518 QUERY71

by J. Donnelly, Corvallis, OR

Provides convenient data extraction capabilities for HPAF format data files. HPAF files are shared by the HP-71 Data Management Pac, and application ROMs such as Curve Fitting and Finance. QUERY71 can select records based on specific attributes, such as all records with a test value that exceeds a certain limit, or records with the name "SMITH". A calculation option will generate summary statistics across numeric fields, and will report the number of records that have been selected. A sort option may be used to sort the selected records on multiple keys. The print command may be used to generate custom report from the selected records. MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** HP-IL interface and printer

Steps: HP-71 Bytes: 9200

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7518-71-1	N/A	$50

V7519 VC75200

by MEGG Associates, Richmond, VA

Provides two distinct operations in relation to VisiCalc by transferring both VisiCalc models and data between the HP-75 and Series 200. Programs perform a very detailed analysis of VisiCalc files and send a complete profile to the receiving machine. Also allows user to translate and store data in Series 200 and transmit the information when needed. Package contains four programs, approx. 4K each. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** HP-75 and Series 200 VisiCalc, HP-75 I/O Utilities Solutions Book or I/O ROM and HP 82164A HP-IL/RS-232 Interface.

Steps: HP-75 Bytes: 12000

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7519-75-0	N/A	$80

V7520 VSOS71 and DSPLEX71

by VSoft Development Enterprise, Redondo Beach, CA

VSOS71 is an operating system overlay, written in BASIC and designed to provide the user with these executive functions: circular directory control, run/edit RAM program, load/call/purge program from mass device, change default mass device, show available RAM, exit to idle mode, password lock the HP-71. File management functions include: purge RAM file, load/save file to mass device. Also includes LEX file with 14 BASIC keywords to simplify and enhance HP-71 programming. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 1800

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7520-71-7	N/A	$50

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V7521 DEV7571

by VSoft Development Enterprise, Redondo Beach, CA

Provides the user with the ability to more easily develop and/or transfer BASIC applications and FORTH Assembler screens for/to the HP-71. Other functions include remote cataloging of the HP-71 file directory to the video display, direct execution of HP-71 commands entered through the HP-75, HP-75 RAM management, and formatting of text files per HP-71 FORTH Assembler Line Format. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** HP-75, HP-75 I/O ROM, 80 column video interface

Steps: HP-71 Bytes: 8000

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7521-71-5	N/A	$60

V7522 MASSUTIL

by VSoft Development Enterprise, Redondo Beach, CA

BASIC program that provides user with utility for copying, backing-up, selective purging, cataloging, and listing to a printer files stored on disk or cassette. Also determines unused capacity of a particular medium. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette Drive or HP-IL Disc, 80 Column Video Interface, I/O ROM, and either HP82905B or ThinkJet printer.

Steps: HP-75 Bytes: 8800

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7522-75-4	N/A	$80

V7523 ACCTGCAL

by Paul G. Delman & Asc., Ft. Lauderdale, FL

ACCTGCAL is an accounting Spreadsheet which maintains records on a cash (nonaccrual) basis. Income and expense items are accumulated in their respective columns, and reports are generated based on monthly totals. All figures are carried forward to the next month. Cash volume for this program is limited to 10 million dollars. Two versions included: Modular version requires 4K memory module; Combined version requires 27K memory modules. THIS PROGRAM MUST BE SOLD RECORDED ON 3.5 DISC OR CASSETTE ONLY. **Necessary Accessories for HP-71:** Three 4K memory modules, HP-IL Printer, -82161A Cassette Drive, -82163A Video Interface, and compatible monitor

Steps: HP-71 Bytes: 22400

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7523-71-1	N/A	$80

V7524 Spread-71

by C. Bunsen, Corvallis, OR

This compact, easy-to-use spreadsheet program fits in less than a quarter of HP-71's memory, allowing you to do "what-if" problems without writing custom programs. The program can manage up to 90 x 90 cells, limited only by available memory. Each cell can have a value, formula, or label, and can access cells from other spreadsheets. Formulae can use all the HP-71's math functions. Rows and columns may be labeled for easy identification in the display, such as "JUNE, RENT: 350.00". Spreadsheets may be output to a printer or display. Spreadsheets are accessible from other Basic programs. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** Printer useful for file copies of spreadsheets

Steps: HP-71 Bytes: 4500

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7524-71-9	N/A	$50

V7526 VSOS75 and DSPLEX

by VSoft Development Enterprise, Redondo Beach, CA

This program is an operating system overlay, written in BASIC and designed to provide the user with these executive functions: circular directory control, run/edit RAM program, load/call/purge program from mass device, show available RAM, exit to idle mode, and password lock HP-75. File management functions include: purge RAM file and load/save file to mass device. A LEXfile containing 14 BASIC keywords to enhance and simplify the programming of the HP-75 is also included. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1000

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7526-75-5	N/A	$50

V7527 FLPROP

by SYSTEK, Corona, CA

Calculates properties of petroleum products. Converts specific gravity to API gravity and vice versa. Converts viscosity from SSU and SSF to centistokes and calculates viscosity of blended petroleum products. Also calculates specific gravity and viscosity at various temperatures and the bulk modulus of petroleum products at different API gravity, temperatures, and pressures. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor is optional.

Steps: HP-75 Bytes: 003500

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7527-75-3	N/A	$80

V7528 PRDROP

by SYSTEK, Corona, CA

Calculates velocity, Reynold's number, friction factor and pressure drop for liquid pipelines under all flow regimes for steady state, isothermal flow. Options available include Colebrook-White, Hazen-Williams, MIT and Churchill's equation. Also calculates the total pressure required, number of pump stations, and horsepower required. Both English and metric units are handled. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor optional.

Steps: HP-75 Bytes: 003500

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7528-75-1	N/A	$80

V7529 GASPIPE

by SYSTEK, Corona, CA

Calculates the steady state pressure drop in a gas pipeline. Also calculates the outlet pressure and horsepower required, considering elevation difference between the ends of the pipeline. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor optional.

Steps: HP-75 Bytes: 004000

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7529-75-9	N/A	$80

V7530 LIQMOD

by SYSTEK, Corona, CA

Calculates the pressures and horsepower required for a multi-pump station liquid pipeline system allowing for peaks and control points along the pipeline profile. Slack line locations are identified in the output. Automatically accounts for laminar, transition and turbulent flows. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor optional.

Steps: HP-75 Bytes: 005500

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7530-75-7	N/A	$80

V7531 LIQTHERM

by SYSTEK, Corona, CA

Analyzes the hydraulics of a buried, heated liquid pipeline by considering the pressure drop and heat transfer between the pipe and the surrounding medium adjusting for change in fluid properties with temperature as it flows through the pipline. Automatically accounts for laminar, transition and turbulent flows. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor optional.

Steps: HP-75 Bytes: 005500

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7531-75-5	N/A	$80

V7532 PUMPCURV

by SYSTEK, Corona, CA

Predicts the performance of a centrifugal pump at different impeller diameters, speeds and conditions of destaging and restaging. Also calculates the performance of several pumps in series and parallel configurations. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor optional.

Steps: HP-75 Bytes: 004000

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7532-75-3	N/A	$80

V7533 PUMPERF

by SYSTEK, Corona, CA

predicts the performance of a centrifugal pump used on a liquid pipeline system. Calculates the flow rate, pressure, horsepower and efficiency at the operating point of intersection between the pipeline system head curve and the head-capacity curve. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor optional.

Steps: HP-75 Bytes: 007500

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7533-75-1	N/A	$80

V7534 PIPROP

by SYSTEK, Corona, CA

Calculates the cross-section area, moment of inertia, weight per unit length, line fill volume, allowable internal working pressure, maximum hydrotest pressure, critical buckling load, deflection and pipe stress in pipelines and pipe colums under varying conditions of end supports. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor optional.

Steps: HP-75 Bytes: 003500

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7534-75-9	N/A	$80

V7535 PARLL

by SYSTEK, Corona, CA

Calculates the steady state flow rates and pressures in a branched liquid network. Also calculates the horsepower required. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor optional.

Steps: HP-75 Bytes: 005000

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7535-75-6	N/A	$80

V7536 PIPINJ

by SYSTEK, Corona, CA

Calculates the physical properties, pressures and horsepower required for a liquid pipeline with several injection and stripping points. All flow regimes are automatically accounted for. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor optional.

Steps: HP-75 Bytes: 004000

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7536-75-4	N/A	$80

V7537 MULTIDIA

by SYSTEK, Corona, CA

Calculates the steady state pressures and horsepower required for a liquid pipeline with several different pipe sizes in series, considering elevation differences and peaks along the pipeline. All flow regimes are automatically accounted for. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** Cassette drive, printer. Video monitor optional.

Steps: HP-75 Bytes: 003500

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7537-75-2	N/A	$80

V7538 Structural Analysis and Design

by C.I. Dinsmore, Seattle, WA

This package of seven programs provides for the structural analysis of steel and concrete in various dimensions. Circular and reinforced beams and columns are covered as well as general beam and frame analysis. MUST BE SOLD RECORDED ON CASSETTE OR 3.5 DISC. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 36K

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7538-71-4	N/A	$80

V7539 RPN Calculator

by C. Capener, Palo Alto, CA

Convert your HP-71 into a full-featured RPN calculator. This program is written in HP-71 native machine code so that it is fast and compact. It implements 38 functions covering arithmetic, trigonometric, logarithmic, conversion, memory, stack manipulation, and display control functions. Each function is clearly marked on a multicolor keyboard overlay and is described in the instruction manual. Included is a LEX file for transferring data to and from the BASIC environment. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 001284

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7539-71-6	N/A	$30

V7540 HP-71 Translator Pac Programmer's Toolkit

by W.C. Wickes, Corvallis, OR

This Toolkit is a set of extensions to the HP 82490A HP-41 Translator Pac, that provides an enhanced HP-71 programming capability for the HP-41 and FORTH languages. With the TPPT word set, you can: 1) List (decompile) HP-41 programs and FORTH words; 2) Single-step HP-41 programs and FORTH words; 3) Set breakpoints to halt program/word execution at specified places; 4) Run HP-41 programs in "trace" mode; 5) Time program/word execution; 6 Write HP-41 programs from within the HP-41 environment, bypassing the translation stage. TPPT also includes instructions for creating new HP-41 register, conditional, and display functions, and for extending the translation program TRANS41. MUST BE SOLD RECORDED

Necessary Accessories for HP-71: HP 82490A Translator Pac

Steps: HP-71 Bytes: 10K

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7540-71-7	N/A	$60

V7541 LINK-75

by MEGG ASSOCIATES, INC., Richmond, VA

Provides bi-directional data transfer between HP-75 Visicalc and Lotus 1-2-3, VisiCalc , DBASE II, III, and other software products supporting the DIF (Data Interchange Format). Information is provided on how to transfer data between HP-75 and IBM PCs, compatibles, the HP-110, 120/125, 150 and other desktops supporting RS232. Sample listings are also provided to aid users in interfacing DIF Data File to their own application. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** HP-82164A, HP-IL RS232 Interface.

Steps: HP-75 Bytes: 18K

	Order Program No.	Documentation Only	W/Media
FOR HP-75	V7541-75-8	N/A	$80

V7542 LINK-71

by MEGG ASSOCIATES, INC., Richmond, VA

Provides bi-directional data transfer between HP-71 and desktop products like Lotus 1-2-3, VisiCalc , DBASE II, III, and other software products supporting the DIF(Data Interchange Format). HP-71 Solutions supporting the HP-AF Data Format like the STAT, CURVE FITTING, SURVEYING, and DATA MANAGEMENT PAC, can be linked to IBM PCs, compatibles, the HP- 110, 120/125, 150, and other desktops supporting RS232. Sample listings are also provided to aid users in interfacing DIF Data File to their own applications. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** HP-82164A, HP-IL RS232 Interface

Steps: HP-71 Bytes: 12K

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7542-71-3	N/A	$80

V7543 The Physics Collection

by K. Saul, Corvallis, OR

THE PHYSICS COLLECTION is a group of ten programs especially for studies in first and second-year college Physics courses. It comes with complete introductory/review material, examples, instructions, program listings, and bar code. Topics covered include Temperature Units Conversions, Thermal Resistance, Simple Harmonic Waves, Speed of Sound in Air, The Doppler Effect for Sound, Intensity of Diffracted Light Patterns, Bragg's Law, Relavistic and Newtonian Velocities, the Lorentz Transformation, and more! DOCUMENTATION ONLY (INCLUDES BAR CODE) - $25. DOCUMENTATION WITH YOUR CHOICE OF MEDIA: MAGNETIC CARDS, MINI DATA CASSETTE, OR HP-IL 3.5 DISC - $45. **Necessary Accessories for HP-41:** None.

Steps: 661 HP-41 Bytes: 001533

	Order Program No.	Documentation Only	W/Media
FOR HP-41	V7543-41-2	$25	$45

V7544 The Chemistry Collection

by K. Saul, Corvallis, OR

THE CHEMISTRY COLLECTION is a group of seven programs especially for studies in first and second-year college Chemistry courses. It comes with complete introductory/review material, examples, instructions, program listings, and bar code. Topics covered include The Rydberg Equation, Molecular Structure and Shapes of Small Molecules, Interchangeable solutions for Molarity, Moles Solute and Liters Solution, Pressure Units Conversions, Concentration Units Conversions, Activation Energy, and more! DOCUMENTATION ONLY (INCLUDES BAR CODE) - $25. DOCUMENTATION WITH YOUR CHOICE OF MEDIA: MAGNETIC CARDS, MINI DATA CASSETTE OR HP-IL 3.5 DISC - $45. **Necessary Accessories for HP-41:** None.

Steps: 576 HP-41 Bytes: 001345

	Order Program No.	Documentation Only	W/Media
FOR HP-41	V7544-41-0	$25	$45

V7545 NANOTEXT

by P. Harmon, Vancouver, WA

This program is a true screen text editor for the HP-71B, using an 80 column video interface. As such, it is a powerful tool for program and text data file editing as well as the creation of memos and small reports. Features include string search and/or replace, partial line copying, line change undo, file merge and output, (slow) paragraph formatting, and wordwrap. ThinkJet print features can be used to create smart looking printouts. The program is unsecured. NANOTEXT can also be operated in a 40 column mode. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** 80 video interface, video display, HP-IL module, TEXTUTIL (U/L Program 00006-71-7) or EDLEX file (available in FORTH, 41 TRANSLATOR, TEXT EDITOR ROMs). Recommend a disc drive (HP9114).

Steps: HP-71 Bytes: 014200

	Order Program No.	Documentation Only	W/Media
FOR HP-71	V7545-71-4	N/A	$60

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DBASE II™ and DBASE III™ are registered trademarks of Ashton Tate.

HP-41 & HP-71 Software

B000 Applied Sciences

		Available for HP-41	HP-71
Earthwork Directly From Topo or Cross Section Surveys	03065	✓	T
B100 Agriculture			
Agricultural Band and Broadcast Spraying Calculations	02061	✓	T
Calculating Daylength	02623	✓	T
Center Pivot Irrigation for Applying Pesticides and Fert	00812	✓	T
Chlorophyll Estimation From Reflectance Spectra of Potatoes	03235	✓	T
Degree Day Calculation at a Given Base Temperature	02095	✓	T
Fertilizer Least Cost Blending	01091	✓	T
Field Population and Planter Calibration	00814	✓	T
Grain Capacity	01689	✓	T
Grain Capacity for Circular Bin	01740	✓	T
Growing Degree Days: Weather Service Method	00813	✓	T
Sequential Analysis of Negative Binomial Distribution Data	02957	✓	T
B102 Animal Science			
Calculating Daylength	02623	✓	T
Small Livestock From Birth to Slaughter	03142	✓	T
B104 Crop Science			
Boom Sprayer	02865	✓	T
Calculating Daylength	02623	✓	T
Chlorophyll Estimation From Reflectance Spectra of Potatoes	03235	✓	T
B106 Horticulture			
Chemical Fertilizer Mixing	03252	✓	T
Greenhouse Heatloss	03251	✓	T
Parts Per Million	03321	✓	T
B108 Soil			
Chemical Fertilizer Mixing	03252	✓	T
Time of Concentration for Surface Water Run-Off	03361	✓	T
B200 Computer Science			
6502 Disassembler	02409	✓	T
6502 Disassembler	03166	✓	T
6502 Disassembler Mnemonic Generator	02345	✓	
6800 Disassembler	03168	✓	T
6800 Disassembler Mnemonic Generator	00821	✓	T
7 X 7 Dot Character Builder (Wand)	00883	✓	T
8080 Disassembler Mnemonic Generator	00588	✓	T
Algebraic Operating System	01067	✓	T
Alpha Barcode in Binary Format	00772	✓	T
Alpha Register Manipulation	00906	✓	T
Alphanumeric Character String Manipulations	00364	✓	T
Alphanumeric to Numeric Conversion	00581	✓	T
Arabic Roman Conversions	03137	✓	
Assembly Language Simulator	01467	✓	T
Auto Computer	01893	✓	T
Bar Code Classification and Analysis	01170	✓	
Barcodes on the 82143A Printer	01615	✓	
Base Conversions	03107	✓	
Basic 1.0 - System	02174	✓	
Bin/Dec Conversions	00953	✓	T
Binary / Hex / Decimal Conversions	01662	✓	T
Bubble Sort	01069	✓	T
Bubble Sort with Up to 42 Entries	00675	✓	T
CDC 6000 Series Disassembler	01843	✓	T
CDC Floating Point Number to Base 10 Conversion	00819	✓	T
CDC Word Conversions	00983	✓	T
B200 Computer Science-Con't			
Central Server Model of Multiprogramming	00760	✓	T
Computer Communication Network 1 - Capacity and Delay	01985	✓	T
Computer Long Division	02863	✓	T
Condensed Delta Storage	00882	✓	T
Continuous Printout of Text Files on a Tape	03351	✓	
Data Input (Store) and Review	00693	✓	T
Data Packing	00925	✓	T
Data Sort and Handling Routines for HP-41C	00606	✓	T
Data Storage, Recall and % Computation	00420	✓	T
Datablock Manipulation	00404	✓	T
Decimal to Floating Point Binary Conversion	00801	✓	T
Diminishing Increment Sort	00308	✓	T
Direct Execution Bar Code For XROM Functions	02571	✓	
First and Follow Sets	02575	✓	
Floating-Point Octal Conversion and Octal Arithmetic	01152	✓	T
Graphics Aid Program	00336	✓	
Heap Sort	01721	✓	T
Hewlett-Packard HP-41C/V Text Editor	02877	✓	T
Hex/Bin/Dec Conversion Table	01061	✓	T
Hex/Dec Conversion for 32 Bit Floating-Point or 2's Comp Int	02126	✓	T
Hexadecimal/Decimal/Binary Number Conversions (Hexdeb)	01352	✓	T
Increasing Data Storage Efficiency	01343	✓	T
Index Calculation for Busines Basic Isam Files	02032	✓	T
Insertion Sorting Routines	00990	✓	T
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Mass Flag	01789	✓	T
Microcalc	01115	✓	T
Mini Bar Code Generator	02149	✓	T
Nonlinear Least Squares	02638	✓	
Octal Register Expansion	00904	✓	T
Permutation Generator	00483	✓	T
Programmer Plus	01448	✓	T
Quick-Sort	01560	✓	T
Quicksort I	00317	✓	T
RCA 1802 Microprocessor Mnemonic Generator	01037	✓	T
Rad50	00657	✓	T
Register Sort	00614	✓	T
SC/MP II Disassembler	01941	✓	T
Scan Building Special Characters	01139	✓	T
Serial Data Compression	00681	✓	T
Table Calculations	02085	✓	
The HP-16C Emulator	02906	✓	
Time Sharing	00690	✓	T
Transitive Closure	02698	✓	
Turing Machine Simulator	02322	✓	T
Turing Machine Simulator With Extended Memory	02543	✓	
User Program Analysis and Compilation	02526	✓	
X-Register Manipulations	00884	✓	T
Z80 Disassembler	02630	✓	T
B204 Base Conversions and Arithmetic			
8085 Disassembler	02184	✓	T
Base Conversions With Complements	02541	✓	T
Base and Floating Point Conversions	02661	✓	T
Bin-Oct-Dec-Hex Conversions For Microcomputer Users	02801	✓	T
Binary Operations	01966	✓	T
Double Precision Hexadecimal Conversion	01616	✓	T
Floating Point Conversions	02554	✓	T
B204 Base Conversions and Arithmetic-Con't			
General Base Conversions Maintaining the Stack	02053	✓	T
Hex to Decimal Conversion	01809	✓	T
Num	03289	✓	T
Octal Utilities/Fractional Fixed Point Functions	02631	✓	T
B205 Data Base Management			
ASCII File Editor	02553	✓	
ASCII File Maintenance Routines For Extended Memory	02502	✓	
ASCII File Resized	01805	✓	
Alphabetic Sort	01772	✓	
Automatic Banner	01932	✓	T
Data File Statistics	02921	✓	
Fast Sorting Program	03239	✓	
File Manager	03116	✓	
Files: Rename, Change Size and Duplicate	02329	✓	
Medical Dental Service Business S Revenue Ananlysis	02162	✓	
Memo and Expense Note Pad	03319	✓	
Rolodex	03449	✓	
Sort/Merge for Extended Memory ASCII Files	02284	✓	
Text Editor For The HP-71B	03357		✓
B208 Input/Output Applications			
48 Column Word Processing Printer W/Four Character Fonts	02055	✓	
ASCII File Viewing and Editing on the 41-CX	03119	✓	
Automatic YMIN and YMAX Calculator	01704	✓	T
Banner Printer	00834	✓	
Banner Printing Special	02098	✓	
Bar Code on the HP-82143A Peripheral Printer	02087	✓	
Bar Graph	01113	✓	T
Design Special Characters	01781	✓	
Extended Mass Storage Directory	03336	✓	
Extended Memory ASCII File Management Program	02472	✓	
Fine Curve Plot with HP-82143A Peripheral Printer	01445	✓	
Formatted Register Review	01774	✓	T
Geometric Patterns	01195	✓	T
Graph Plotter	01167	✓	T
Greek Characters	01930	✓	
HP-15C Program Printer	02372	✓	T
HP-2225B Printer Mode Controls "PRINTSET"	03366		✓
HP-71 Text File Printer	03470		✓
HP41/HP75 Register Communications Programs "IN41" "OUT41"	02548	✓	
High Resolution Plot Routine (Relatively) Fast Version	00476	✓	
High Resolution Print Plot	01947	✓	
Histograms with Text	01297	✓	
Input/Output Subprograms for the HP-71	03360		✓
Inverse Characters for the HP-71	03427		✓
More Appealing Printout of an ASCII File	03283	✓	
Multi-Purpose Bar Graph	02448	✓	
Multiprinting of Matrices	02464	✓	T
PRPLOT 5	01822	✓	
Plot II	00945	✓	T
Plot of 2/3 Functions on One Graph	00732	✓	
Reading and Writing X-funct. ASCII Files to and From Cards	02552	✓	
Row Plot (High Resolution Plot)	00577	✓	
Solid Bar Graph	01879	✓	
Super-Plot	01592	✓	
TV Plotting a First Approximation	02195	✓	T
ThinkJet PRPlot-A Four Function Plotting Program	03447	✓	

APPLICATION INDEX FOR HP-41 AND HP-71

		Available for HP-41	HP-71
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Time VS Data Graph	00967	✓	T
Time vs Data Plot III - Two Data Sets	01767	✓	
Universal Table Generator Max-Min-Zero-Plot	02765	✓	T
XROM Bar Code Generator	02461	✓	
B209 Utilities			
Catalog and File Listing Utilities	03460		✓
Data Transfer: HP-71 to IBM PC	03424		✓
HP-71 Text File Printer	03470		✓
LEX File to Resize HP71 Command Stack	03428		✓
Mass Storage Utilities for the HP-71	03423		✓
B300 Forestry/Forestry Engineering			
Fire Danger	01586	✓	T
Forest Management Costs	03255	✓	T
Fuels	01163	✓	
Growth & Yield Est. for Young-Growth Conifers in N. Calif.	00992	✓	T
Growth and Yield of Alder	01589	✓	T
Growth and Yield of Douglas Fir	01457	✓	T
Interior Alaska Variable Plot & Individual Tree Cruise Calcs	01687	✓	T
Log Skidder Loading Predictions	03265	✓	T
Lumber Invoicing	00874	✓	T
Red Pine Yield Projection for Field Use	01521	✓	T
Time of Concentration for Surface Water Run-Off	03361	✓	T
West Coast Board Foot Volume	01881	✓	T
Yields for Second Growth Species of California's Coast	01536	✓	T
B400 Hydrology			
Channel Flow	00956	✓	T
Flood Estimate (10-yr., 24-hr)	03095	✓	T
Hydrology For Small Watersheds	03122	✓	
Oxygen Deficit in a Polluted Stream with Time	01806	✓	
Rainfall Intensity - Duration - Frequency Curves	03407	✓	T
SCS Runoff Equation	03069	✓	T
Steady Radial Groundwater Flow in a Finite Leaky Aquifer	01727	✓	T
Time of Concentration for Surface Water Run-Off	03361	✓	T
Well Function of U	01683	✓	T
B600 Space Sciences			
Ephemerides of Asteroids	02151	✓	T
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External Tank to Orbit Space Shuttle	00851	✓	T
Geosynchronous Satellite	01205	✓	T
Gravitational Parameters	03408	✓	T
Horizon, Drop, and Refraction	03372	✓	T
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Thermal Conduction Equation W/Radiative Boundary Conditi	00645	✓	T
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-AGD	02678	✓	T
-Ang	02869	✓	T
3W Leveling With HP-41 Used For Data Storage	02311	✓	
Archeological Electrical Resistance Survey	02841	✓	
Area Calculation From Coordinates with Distance Control	03270	✓	T
Area and Center of Gravity by Coordinate Geometry	01766	✓	T
Area of Land by Point-To-Point Traversing	00408	✓	T
Automatic Point Storage With the 41 Survey Pac	02319	✓	

		Available for HP-41	HP-71
B800 Surveying-Con't			
Balanced Horizontal Traverse by the Compass (Bowdich) Rule	00893	✓	T
Bearing Turner	01934	✓	T
Blue Top I	00711	✓	T
Calculations on the Australian Map Grid (AMG)	02562	✓	T
Calkster Cogo	03453		✓
Cogo	00790	✓	T
Cogo Plus	03136	✓	
Compute Cuts and Fills and Print Cutsheet	03327		✓
Contours	00886	✓	T
Coordinate Geometry I	01458	✓	T
Coordinate Geometry System Cgs1	01320	✓	
Coordinate Inverse Traverse	02960	✓	T
Curve Spiraled on One End Only	02424	✓	T
Cut & Fill Calculation of Earthwork X-Sections	01221	✓	T
DCOMP	02060	✓	
Earthwork Quantities	01224	✓	T
Elev on VC or Tangent in Super Transition at Pts or Interval	01127	✓	T
Equal-Tangent Vertical Curve	00892	✓	T
Field Book Data for Centerline and Curb Offset Staking	01132	✓	T
Fix Area Solution - Closing Back To Beginning Point	02287	✓	T
Ft, In, 1/16ths Right Triangle and Arithmetic	02952	✓	T
Geodesic Arc Length, Azimuth	01660	✓	T
Great Circle Distance/Bearing	03033	✓	T
Horizontal Curve Layout by PC Deflection & Short Chord Meth.	02256	✓	T
IPOS	02679	✓	T
Land Survey Measurement	01182	✓	T
Layout Program for Curves, Simple Spirals, Segment Spirals	03302	✓	T
Length of Circular Arcs	00504	✓	T
Level Reduction With Optional Adjustment	02953	✓	T
Map Check One	02446	✓	T
Offset Taping	00951	✓	T
Point on Curve	01153	✓	T
Profile - 2 Elements	02569	✓	
Radius Design	02829	✓	T
Redfern's Mercator Computation	02454	✓	T
Reduction of Measured Distances for Temp Tape Length & Slope	01504	✓	T
Reduction of Steel Band Measurements	02712	✓	T
Reduction of Steel Band Measurements (2nd Version)	03213	✓	T
Reverse Curves Between Two Parallel Lines	01679	✓	T
Road Grade Computer	02211	✓	T
SEG - Segmental Spiral	03072	✓	T
Set/Offset Curves From Centerline B.C., Direct	03291	✓	T
Simple Curve Solver	02476	✓	T
Single or Compound Curve Offsets	03132	✓	T
Slope Stakes	01409	✓	T
Slope Staking on a Var Slope	00505	✓	T
Spiralled Curve	02273	✓	T
Spirals	01706	✓	T
Stadia Reduction	00745	✓	T
Stadia Reduction	00692	✓	T
Stadia Reduction and Elevation Adjustment	02796	✓	T
Stake	00807	✓	T
Star Position Prediction	01695	✓	T
State Plane Coordinates	01406	✓	
Statics of Cables	01835	✓	
Straight Line Forced Thru Any Point	00327	✓	T
Survey Pac Supplement - Point Storage For Trav and Inter	02592	✓	

		Available for HP-41	HP-71
B800 Surveying-Con't			
Surveying Conversions	01743	✓	T
Surveyor's Star Almanac	02559	✓	
Taquimetric Survey For Compass Theodolites	02313	✓	T
Tilted Plane Curb Returns	01072	✓	T
Traverse Angle Balance Made Easy	02430	✓	T
Traverse Area Boundary Survey (Tabs)	01975	✓	T
Traverse, Inverse, Sideshots, Area and Intersections	00995	✓	T
UC-Universal Horizontal Curve Any Combination of Spirals	01945	✓	
US-Horizontal Curve With Unequal Length Spirals	02191	✓	T
Universal Table Generator Max-Min-Zero-Plot	02765	✓	T
Universal Transverse Mercator Zone to Zone Transformations	02405	✓	T
Unsymmetrical Verticle Curves	02429	✓	T
Vertical Curve Alignment	02341	✓	T
Vertical Design	03230	✓	T
Vertical Design Extended	03141	✓	
Volume By Average End Area Method	03315		✓
Volume by Average End Area Method	03104	✓	T
Volumetric Calculation for Inventory by Contour Point Survey	01513	✓	T
B806 Control			
Layout Program for Curves, Simple Spirals, Segment Spirals	03302	✓	T
SUPER CURVE: Horizontal curve with any combination of spiral	03135	✓	T
Section Breakdown	03437	✓	T
Super Curve: Horizontal Curve With Any Combination of Spiral	03279	✓	T
B808 Topographical			
Azimuth	03300	✓	T
Circular Curve Layout for Base Line or Offset Line	01701	✓	T
Clarke's Mid-Latitude Geodetic Formulae	01892	✓	T
Distance	03103	✓	T
EDM (Electronic Distance Meter)	03202	✓	T
EDM Topog Reduction	02180	✓	T
Grade Staking	01497	✓	T
Horizontal Curve - Spiraled or Simple	02417	✓	T
Intersection	02959	✓	T
Least Squares Circle Fitting	03434	✓	
Parallel Spiral Curve Offset Chain Distance Corrections	03292	✓	T
Resection	03140	✓	T
Slopestake Set and Check	01884	✓	T
Topographic Surveying	01702	✓	T

D000 Business and Finance

Automated Tally Sheet With "What If?" Capabilities	02169	✓	T
Cargo Insurance Valuation and Premium	02492	✓	T
Cash Register	02348	✓	T
Cash Register	00664	✓	T
Compound Interest Tables	01103	✓	T
Consumer Price Index	00649	✓	T
Cost Estimator	02495	✓	
Decision	01124	✓	T
Economic Analysis of Energy Conservation Investments	00907	✓	T
Gunning's Verbal Fog Index	03317	✓	T
Multicomponent System Manufacturing Cost with Tabular Output	01813	✓	T
National Economy	01609	✓	T
Open to Buy/Monthly Sales Fcst	00550	✓	
SEMITEXT	03192		✓
Shop Prices Coding	01976	✓	T
Spreadsheet/Cashflow Program	03153	✓	

D000 Business and Finance

		Available for HP-41	HP-71
D000 Business and Finance-Con't			
Standard Ad Units and Advertisement Sizes	02577	✓	T
Standard Business Functions	00835	✓	T
Statistical Budgets	02196	✓	T
Time Plan	01285	✓	T
D050 Accounting			
41C Labor Bugets/Distribution for Architects & Engineers	00978	✓	T
Account Posting & Summarizing	00396	✓	
Accounts Receivable	02307	✓	T
Accounts Receivable	01138	✓	T
Accounts Simplified for Small Organizations	03143	✓	
Budget Managing and Projecting System	02200	✓	
Cost of Sales and Inventory for Small Shop	01555	✓	T
Debtors Ageing Analysis	02935	✓	
Dollar Unit Sample Selection With Extended Sample Option	03445	✓	T
Estimation of Cost - Stochastic Model	00640	✓	T
General Ledger	02386	✓	
General Ledger	00777	✓	T
Hourly Analysis Costing	01404	✓	T
Installment Sales Method	00319	✓	T
Ledger, NPV	01399	✓	T
Standard Variances	01559	✓	T
Tabulator	00981	✓	T
Tabulator Chain Prompted Improved (Revision A)	01007	✓	T
Wage Packet Organizer	00759	✓	
D052 General Accounting			
Ledger	03035	✓	
Multiple File Bookkeeper	01907	✓	
Rounding Percentage	02656	✓	T
D054 Payroll Accounting			
Cash Payroll Denominations and Totals	03046	✓	T
Timecard Calculator	02999	✓	T
D100 Cost Analysis/Estimation			
Assignment Problem For Minimizing Costs	02812	✓	T
Cost Estimator With Electronic Spreadsheet Characteristics	02439	✓	T
Lighting Power Budget (LPB)	01520	✓	T
Spreadsheet/Cashflow Program	03153	✓	
D150 Forecasting/Planning			
Array Math (41)	01217	✓	T
Automated Spread-Sheet	01456	✓	T
Bayes's Theorem/7 Var. Interchangeable Solution for 2 Events	01765	✓	T
Bayesian Theory	01713	✓	T
Budget Managing and Projecting System	02200	✓	
Cash Flow Analysis	01868	✓	T
Critical Path Analysis	02315	✓	T
Critical Path Method	02930	✓	
Critical Path Method With Costs	03027	✓	
Critical Path Method With Progress	03026	✓	
Data Table Processing	02334	✓	
Decision Support Evaluation Parameters Weighting	01169	✓	T
Decisions Under Risk & Bayes Theorem for Business Types	01051	✓	T
Dynamic Programming to Solve a Markou Process Model	00572	✓	T
Energy Cash Flow	01925	✓	T
HP 82143A Bar Graphs	03161	✓	
Integrated Cost/Task Schedule	02114	✓	T
Lamsecon: Local Authority Maintenance and Services Economics	01119	✓	T
Learning Curve For Manufacturing	02561	✓	T
Long Term Financing	02455	✓	T

		Available for HP-41	HP-71
D150 Forecasting/Planning-Con't			
M/M/S Queue Characteristics	02185	✓	
Macro-Economic Model	01102	✓	T
Maximum Entropy Priors for Bayes' Theorem	01137	✓	T
Pavecon: Plant and Vehicle Economics	01184	✓	
Production Monitor and Record Accumulator Wk, Mth, Qtr & Yr	01364	✓	
Project Planning and Scheduling (PERT Method)	03134	✓	
Project Selection/Decision Funding Model	00915	✓	T
Queueing Models	00592	✓	T
Schedule By Constraints	02442	✓	T
Schedule by Constraints With Extended Memory	02949	✓	
Simple Linear Regression	01585	✓	T
Simplex Algorithm	00320	✓	T
Smooth Routine	02357	✓	T
Spreadsheet/Cashflow Program	03153	✓	
Sustainable Growth Rate Model	02739	✓	T
D200 General Investment Analysis			
Actual Rate of Return	02250	✓	T
Annual Growth Rate of Investments (Discounted Cash Flow)	00549	✓	T
Balance Sheet/Statement Analysis Roi-Program Label	00412	✓	
Capital Budgeting	02509	✓	T
Decision Data For Stock Investments in a Company	03149	✓	
Financial Calculations	02491	✓	T
Financial Calculations--Efficient Version	00580	✓	T
Financial Evaluation 'Fin-Eva'	00413	✓	
Financial Institutions Analysis	01857	✓	
Financial Report Analyzer	01926	✓	
Foreign and Bullion Gold Coin Analysis for Investor/Dealer	01118	✓	T
Joint Venture Financing	01894	✓	T
Life Cycle Cost Analysis	01564	✓	T
Markowitz Portfolio Selection	00411	✓	T
Net Present Value	00373	✓	T
Non Uniform Cash Flow Analysis	01378	✓	T
Payback Time	01525	✓	T
Rate of Return	01188	✓	T
Uniform Gradient Series Financial Calculations	02759	✓	T
Unknown Interest Solver and Table of Interest Factors	03320	✓	
D250 Industrial Production			
Direct Material & Labor Variance Analysis	00540	✓	T
Flowshop Scheduling: Optimize N Jobs on M Machines	01144	✓	T
Scaling-Up Equipment Costs	00857	✓	T
Work Sampling	00314	✓	T
D300 Insurance/Retirement			
Capital Need Analysis	00489	✓	T
Cargo Insurance Valuation and Premium	02492	✓	T
Cost of Paying Premiums More Frequently Than Annually	00522	✓	T
Custom Premium Calculation 2	00523	✓	T
File Management	02505	✓	T
Permanent Insurance and Term Rider Mix	00487	✓	T
Profit Sharing Allocation	02181	✓	T
Retirement Planning	02948	✓	
Retirement With Inflation	03369	✓	T
Vanishing Premium	01656	✓	
D350 Inventory Control			
Economic Production Quantity	00861	✓	T
Inventory	02253	✓	
Stock Control	01461	✓	

		Available for HP-41	HP-71
D350 Inventory Control-Con't			
The Scrap Decision	00571	✓	T
D400 Leasing			
Advance Skips and Residual	01971	✓	T
Flexible Leasing Plans Using The Ratio Method	02742	✓	T
Network Cost Analysis	01423	✓	T
D450 Lending/Savings			
Account Balance with Daily Compounding	01659	✓	T
Accumulated Interest and Remaining Balance on Loan	00493	✓	T
Amortization Schedule With Pay-Ahead Option	03127	✓	
Building Society Paid-Up Share Account Interest Calculations	01882	✓	T
Equivalent Rates	01938	✓	T
Future Value Calculations 1	00416	✓	T
HP Top Row Financial Keys With Sign Convention	02317	✓	T
Loans with Interest Free and Specified Skip Payments	00926	✓	T
Payment	02380	✓	T
Present Value Calculations 1	00418	✓	T
Prime Rate Interest Calculations	01173	✓	
Rule of 78	01350	✓	T
Simple Interest Calculator	00414	✓	T
Top-Row Financial Functions with Odd-Days Interest	00376	✓	T
D500 Marketing Sales			
Breakeven Analysis	02980	✓	T
Chlorophyll Content From Absorbtion Spectra in DMF	03043	✓	T
Chlorophyll Content From Absorption Spectra in 80% Acetone	03042	✓	T
Electric Rate Analysis I	01858	✓	
Electric Rate Analysis II	01983	✓	
Gross Profit Margin	00315	✓	T
Import Calculation	01981	✓	T
Learning Curve For Manufacturing	02561	✓	T
Mail Order Analysis	02855	✓	
Questionaire or Interview Response Tabulation 99x260x5	03229	✓	
Queueing Theory for a Small Sales Outlet	00616	✓	T
Street Consumption Research	02972	✓	T
D550 Personal Finance			
Auto	03070	✓	T
Auto Log for Gas and Maintenance	01405	✓	T
Bank Statement Validation	00551	✓	T
Budget Managing and Projecting System	02200	✓	
Budget Shopper	01128	✓	T
Cash Budget Worksheet	02277	✓	T
Checkbook - Extended Memory	02400	✓	
Checkbook Made Easy	01580	✓	
Checkbook Reconciler	01620	✓	
Checkbook Recordkeeper	01313	✓	
Checkbook Tracker - 1	01351	✓	
Consumer Price Index 1925-1983 With Quarterly Values	02616	✓	T
Credit Card - Extended Functions/Memory	01850	✓	
Easy Shopper	02283	✓	T
Electric Bill and Budget Analysis	00919	✓	T
Expense Account w/Summary	01634	✓	
Gasoline Consumption Analysis	00372	✓	
Gasuse-Heating Gas Use Rate Analyzer and Cost Projector	02354	✓	
Grocery Shopping With Cost Comparison	02465	✓	T
HOME - Household Organizer and Manager or Expenditures Prog	02413	✓	
Home Budget	03088	✓	
Individual Retirement Arrangement (IRA) Withdrawal Planning	03089	✓	T

APPLICATION INDEX FOR HP-41 AND HP-71

		Available for HP-41	HP-71
D550 Personal Finance-Con't			
Interest Checking Verification with Daily Compounding	01006	✓	T
Management of 2 Simultaneous Bank Accounts	01354	✓	
Mileage	02276	✓	T
Monthly Bill Reminder	02922	✓	
Personal Budget	01510	✓	
Personal Financial Balance Sheet	01547	✓	T
Print Checkbook Listing	00375	✓	T
Reconcile "N.O.W." Checking Account (Interest Checking)	00908	✓	T
Splitting the Bill–the Ultimate in Dining Convenience	01889	✓	T
Statistical Analysis of Automobile Use by Kalman Filter	02560	✓	
Telephone Bill	00987	✓	T
The Gas Card	02294	✓	
Verify Your Interest Checking Statement	02347	✓	
D600 Real Estate			
Building Area Conversion, Net to Gross	00370	✓	T
Contract Payment Schedule Print-Out	02156	✓	T
Depreciation Present Value (PV) Factor	00672	✓	T
Installment Sale of Property Tax Differential	01631	✓	T
Internal Rate of Return	01630	✓	T
Monthly Payment Amortization (Monpay) (Max Loan)	01515	✓	T
Mortgage Analysis	01958	✓	
Mortgage Loan Service	02647	✓	
Real Estate Agent's Finance Advisor for Purchasers	01480	✓	T
Real Estate Investment Analysis After-Tax Cash Flows & IRR%	01126	✓	T
Subdivision Evaluation	02508	✓	T
Warehouse Rent/Sale Arithmetic	01202	✓	T
D650 Securities			
Bond	01563	✓	T
Buy and Sell Stock Market Timing	00449	✓	T
Call Option Value	00643	✓	T
Commercial Bills	02901	✓	T
Data Correlation	01460	✓	
Earnings Per Share	02954	✓	T
Extended Stock	02395	✓	
Fixed Interest Valuation	02900	✓	T
IORISK	03130	✓	T
OBV (On Balance Volume)	01718	✓	T
Option Straddle Calculation	01987	✓	T
Option Write - Cash	02027	✓	T
Point and Figure Charting Aid	00456	✓	T
Profit Sharing Stock File and Transaction Record	01666	✓	
Real Interest of Bonds	03268	✓	T
Recordkeeping and Analysis System for Investments	01134	✓	T
Rights Issue Calculations	02923	✓	T
Stock Plot	01720	✓	
Stock Portfolio	00417	✓	T
Stocks	00800	✓	T
Stocks File and Evaluation	02013	✓	
T Bills	01688	✓	T
D700 Taxes			
1040C Business Expenses	01251	✓	
Accelerated Cost Recovery System	01937	✓	T
Economic Recovery Act of 1981 Accelerated Depreciation Table	01502	✓	T
Federal Corporate Income Taxes 1981 to 1983	01183	✓	T
IRS Interest Computation	02131	✓	T
Maximum 50% Tax Test for Personal Service Income	00817	✓	T
D700 Taxes-Con't			
Payroll with Federal and Illinois State Tax	00541	✓	T
Withholding Tax Federal + New York State	00569	✓	T

F000 Diversions

Adventure	02557	✓	
Array1 Array2	00371	✓	T
Demo of Unique HP-41C Features	03071	✓	T
Gross Printing	02367	✓	
Highways	02382	✓	T
Poor Edward's Barcode Maker Type 6 Numeric Data	00966	✓	T
Poor Edward's Barcode Maker for Type 7 Barcode	00887	✓	T
Travel Computer	02903	✓	
Trip Record	03109	✓	
Vacation Trip Planner	01070	✓	T
Value Comparison	00498	✓	T
X Function Star Trek	02762	✓	
F100 Games			
Advanced Star Trek	01321	✓	T
Alpha Rotate	01395	✓	
Axman	01969	✓	T
Badmen at Crooked Tree	02271	✓	T
Baseball Fever	01977	✓	T
Baseball Simulation	02747	✓	
Bingo Generator	00715	✓	T
Bowl: A Football Game For the HP-41	02235	✓	T
Bowling Scorekeeper	02908	✓	T
Camel	01472	✓	T
Cannibals and Missionaries	00497	✓	T
Civil War Simulation	00965	✓	T
Clay Pigeon Shooting	02074	✓	T
Contract Bridge Scorer	00332	✓	
Crack the Vault	00311	✓	T
Darts: 301 Opponent Simulator	01159	✓	T
Driver	02895	✓	T
Escape	03147	✓	
Extended Star Trek	02970	✓	
Flight	02886	✓	T
Football	01088	✓	T
Full Poker--5 Card Draw	01318	✓	
Game of Life	03171	✓	T
Game of Rhythms	01642	✓	T
Gin Rummy Scorekeeper	02528	✓	T
Gnort	02104	✓	T
Golf	00758	✓	
Golf	00714	✓	T
Hearts Scorekeeper (With Output Labeling)	00384	✓	T
Hobbit	02888	✓	T
Hobbit Adventure	02389	✓	T
Hot-Air Balloon	00597	✓	T
Hunt the Wumpus	00547	✓	T
Hunt the Wumpus - II	00783	✓	T
Invaders	00633	✓	T
Invaders 2	02165	✓	T
Invisible Enemy	02102	✓	T
Kingdom	02092	✓	T
LJ Adventure	01076	✓	T
Labyrinth	01551	✓	
Labyrinth-Adventure	00971	✓	T
Laser Battle	02890	✓	
Laser Blast	02370	✓	T
Microtrek II	02296	✓	T
Mine Field	02608	✓	
F100 Games-Con't			
Moon Orbiter	00496	✓	T
Music Record and Playback on the HP-71B	03358		✓
Music and Memory	00733	✓	T
Musical Reverse	00309	✓	T
Mystery	03418	✓	
Nicomachus	01229	✓	T
Numeric Mastermind	02146	✓	T
Orbital Lander - HP Solution with Printer and Modified End	00495	✓	T
Pac Man	02609	✓	
Petals Around the Rose	00479	✓	T
Psycho Logic	03404	✓	
Pyramid of Thirteen	02716	✓	
Rally	01346	✓	T
Random Card Generator	02894	✓	T
Redpawl Thacket- a Problem in Logic-41C Version	00402	✓	T
Rubber Bridge Scorekeeper	01481	✓	T
Rubik's Cube Solver	01227	✓	T
Scorekeeper	00924	✓	T
Scorekeeper With Player Ranking	02879	✓	T
Senso	03172	✓	T
Shiphunting	02396	✓	T
Shoot-out at the OK Corral	02447	✓	
Skier	02891	✓	
Solitaire	02572	✓	T
Space	01514	✓	T
Space War	01022	✓	T
Starbattles	01310	✓	T
Starwars	02153	✓	T
Stock Market Tycoon	01739	✓	T
Super Detective	03401	✓	T
Super Reverse and XOR	03402	✓	T
Tank Battle	02540	✓	
Tank-Hunting 2	03269	✓	T
Tennis	00797	✓	T
The Caves	00900	✓	T
The Count of Derg	01247	✓	T
The Skeet Shooter	03078	✓	
Tic-Tac-Toe	02963	✓	T
Treasure Island	02435	✓	T
Treasure Quest	01784	✓	T
Treasure Search	03015	✓	
Trivia Quiz	03472		✓
F102 Board and Table Games			
10x10 Life	00820	✓	T
3 Dim Tic Tac Toe	02603	✓	T
Ancient Sumeria	00685	✓	T
Arena of Death	02664	✓	T
Armchair Admiral	03217		✓
Attack	01980	✓	
BOGA	02595	✓	T
Battleships	02433	✓	T
Bell Fruit 41	00594	✓	
Black Box	00582	✓	T
Challenge Tic-Tac-Toe	02488	✓	T
Checkers	01349	✓	T
Checkers	01654	✓	
Chess 5x5	00929	✓	T
Cribbage Board	02038	✓	T
Deluxe Battleship	00949	✓	T
Domino	02327	✓	T
Electronic Dice Plus	03052	✓	T
F1 Race (or 'Formula One Grand Prix')	03037	✓	
Football Simulation	02743	✓	T
Football Super III	00803	✓	T

F000 Diversions

		Available for HP-41	Available for HP-71	
F102 Board and Table Games-Con't				
Game of the Generals	00485	✓		
Game of the Generals (Advanced Version)	00629	✓		
Gold Rush	02892	✓		T
Graph Chess	03280	✓		
King of Sumer	01994	✓		T
Life (15 x 15)	02824	✓		T
Life:A	03179		✓	
Magic Card	03308	✓		T
Mastermind	00735	✓		T
Maze: Construction and Play	00663	✓		T
Monopoly	00570	✓		
Orbital Rendezvous with Lunar Commend Module	00785	✓		T
Othello for Two Players	00854	✓		
Panzerblitz Attack Results System (PARS)	02532	✓		
Pathfinder	00515	✓		
Pole Position	02615	✓		T
Polyhedral Dice	02536	✓		T
Queen	02710	✓		T
Queen	03173	✓		T
RAT-An Adventure Game For the HP-41C Calculator	02718	✓		T
Reversi	00903	✓		T
Rubik Cube Solution	01342	✓		
Search & Dastroy (W/Out Wand)	00539	✓		T
Simulation of Rubik's Magic Cube Inc a Complete Soltn Algor.	01228	✓		T
Sniper	02167	✓		T
Space Cleaner	01617	✓		T
Space Hunt	00877	✓		T
Space War-Interactive	00855	✓		T
Star Gate	00808	✓		T
Submarine Hunt	02864	✓		T
Sumer	00740	✓		T
Swords and Sorcery	01763	✓		T
The Caves (Revisited...)	03146	✓		T
The Dungeon Master	02478	✓		T
The Game of Isola	03216	✓		T
The Step Game	00363	✓		T
Think a Dot	02955	✓		
Torpedo	00403	✓		
Towers of Hanoi	00694	✓		T
Travellar Character/Planet Generator W/Trade Classifications	03051	✓		T
Trua Battleship	00796	✓		T
True Battleship Challenger	02378	✓		
Wars - A Version of Startrek	01220	✓		T
Wizard of Pinball	00361	✓		
F104 Games of Chance				
"4-5-6" (Dice Game)	00965	✓		T
1 to 10 Spot Keno	01716	✓		T
7 Card Stud	02845	✓		T
Advanced Las Vegas Blackjack, With Rules of Play Options	02416	✓		T
Axman Video	02045	✓		T
Blackjack	01462	✓		T
Blackjack Competitor	00665	✓		T
Blackjack Test Strategy 2 (With Output Labeling)	00385	✓		T
Bug end Spiders	03170	✓		T
Cards	03160	✓		
Casino Blackjack	03038	✓		T
Complete Blackjeck	01519	✓		T
Craps	00478	✓		T
D and D (TM) Attack Matrices	02727	✓		T
D and D (TM) Dice and Character Generator	02726	✓		T
D&D/Traveller Referee's Aid	00553	✓		T
F104 Games of Chance-Con't				
Derby	02069	✓		T
Draw Poker	02646	✓		
Gin Poker	02647	✓		
Jaws, The Electronic Shark	02046	✓		T
Labyrinth-Adventure Deluxe	02099	✓		T
Landmine-Forth	03464		✓	
Lotto Number Generator	03286	✓		
Mini Slot Machine	02745	✓		T
Poker–5 Card Draw with Alpha Presentation of Suit	02008	✓		
Seven Card Stud/Baseball Poker	03014	✓		
Slot Mechine	00484	✓		
Slot Machine Simulator	02800	✓		T
Super-Yahtzee	02097	✓		
Swap Poker	02610	✓		
Wall Street - 1929	03290	✓		T
Yahtzee	02100	✓		T
F106 Word and Number Games				
30 Chips	03174	✓		T
A Scorekeeper for the Game 'Screbble'*	00405	✓		T
Advance Mastermind	02601	✓		
Alpha Count	03056	✓		
Amina's Panel	02594	✓		T
Cannon	02943	✓		T
Code Uncoder	02614	✓		T
Cryptograms	01858	✓		
Cryptography on the HP-41C/CV	02155	✓		T
Domino Grid Puzzle	02942	✓		T
Eliminator	02896	✓		T
Encode: Calculator Cryptography Made Easy	02646	✓		T
Formula 999999	02606	✓		T
Grand Master Mind	03175	✓		T
Hangman	02757	✓		
Hangman (SP)	02672	✓		T
Hangman (XF)	02774	✓		T
Jargon	00912	✓		T
Jumble Electronic Scrachpad	03054	✓		
Jumble Scrambler	03053	✓		
Jumper	02607	✓		
Master Mind and Rubik's Cube in One	01355	✓		T
Mastermind	00514	✓		T
Mastermind - An Exact Simulation	02844	✓		
Mastermind-Short Version	01013	✓		T
Math Baseball	01491	✓		T
Memory Tester Geme	02744	✓		
Noah's Ark	02365	✓		
Number Guessing Game	02962	✓		T
Number Hunt	02746	✓		T
Number Song	01059	✓		T
Safe Cracker	02535	✓		T
Scorakeeper for Scrabble	00897	✓		T
Simon	00818	✓		T
Staircase	02711	✓		T
The Lost Word	02298	✓		
The Square Challenger	03339	✓		
The Tower of Brahma	02458	✓		T
Undercut	02793	✓		T
Undercut	02940	✓		T
Word Search Puzzle Generator	00994	✓		T
F200 Hobbies				
41CV-Decorative Patterns end Letter Benner Printing	01324	✓		T
Alpha Aspects	02473	✓		
Arabic Alphabet	02507	✓		
Audio Tape Counter/Timer Conversions	02418	✓		T
F200 Hobbies-Con't				
Auto-Banner	01691	✓		
Bowling Scoring For The Team Captain	02802	✓		
Calloway Golf Handicap System	03413	✓		
Citizens Band 40 Channel Frequency Conversion and List	01848	✓		T
Conversion From Upper Case to Lower Case Latters	03018	✓		T
Enduro	01300	✓		T
Enigma	02094	✓		T
Fret and Holiday Patterns	01989	✓		T
Gears	01816	✓		T
Gears	01540	✓		T
Giant Pattern	01552	✓		
High School Debete Timer	02798	✓		
Improve Your Tapecounter	01861	✓		T
League Bowling Statistics and Set Up	01588	✓		
Marathon Pace Calculation	01512	✓		T
Model Rocket Altitude Prediction	00568	✓		T
Model Rocket Altitude Tracking Data Reduction	01554	✓		T
Model Rocket Altitude and Speed Tracking (MRAST)	01508	✓		T
Morse Code, XFN/XMEM Module Trainer	01901	✓		
Musical Transposition	01638	✓		T
One Down Automatic Golf Presses	01469	✓		T
Picture Framing	00400	✓		T
Rallye Navigation	00940	✓		T
Randomized Gem Rolling for Dungeons and Dragons	02044	✓		T
Running	01117	✓		T
Signs - A Fast and Versatile Banner Program	02210	✓		T
Single-Line Spectroscopic Binery	03041	✓		T
Tape Deck Counter to Time Converter	01668	✓		T
The Complete Bowling League Secretary Card Based Data System	02687	✓		
Time Recorder for Dungeons and Dragons	02043	✓		T
VCR Playing Time Calculator	01922	✓		T
F202 Aerobics				
Aerobics Point Counter	03113	✓		
Ten Kilometer Runner's Tally	03025	✓		
USMC Male/Female Physical Fitness Test	02025	✓		T
F204 Amateur Radio				
Amateur Satellite Tracking	02700	✓		
Code Oscillator	03177		✓	
Morse Code (Compiled Transmit, Single Character or Practice)	01624	✓		T
Morse Code Transmission at Variable Speeds	02946	✓		
Short Path Beam Heading	02665	✓		T
Synthetic Speed Morse Code	02836	✓		
F206 Biorythms				
Advanced Bio-Pac	02792	✓		T
Bio	00408	✓		
Bio-Compatibility	00952	✓		T
Bioplot	02096	✓		
Bioplotter	01131	✓		T
Biorhythm Plot/Print	02246	✓		
Biorhythm Plotting Routine	01371	✓		
Biorhythms & Competibility for You or People in History	01891	✓		
Biorhythms and Coincidences	02037	✓		T
Biorhythms with Prompts	00310	✓		T
Byor	02904	✓		T
Calculations of Biorythms	02761	✓		T
Precision Biorhythm Plot	00795	✓		

H000 Educational (Programs that teach)

H000 Educational (Programs that teach)-Con't

H000 Educational (Programs that teach)

		Available for HP-41	Available for HP-71
Act Financial Analysis : Independent Student	00888	✓	T
Act Financial Needs Analysis: for Dependent Students	00769	✓	T
Arithmetic Teacher 2	02108	✓	T
Cal-Scientific Notation	02628	✓	T
Coord Transformation: Drill/Practice or Test Questions	01788	✓	T
Grade Point Averager Plus	00369	✓	T
Hangmath 1.0	02318	✓	
Logic Through a Looking Glass	00381	✓	T
Math Flashcard - For Children and Adults	02466	✓	T
Math-1 Elementary Arithmetic Teacher	00573	✓	T
Morse Simulator (Learning Routines)	03154	✓	
Num	03289	✓	T
Scientific Notation Problems	02105	✓	
Trivia Quiz	03472		✓
Two Language Dictionary	01014	✓	T
Typing Tutor	01783	✓	

J000 Engineering

Analysis of Laboratory Strength Test Data	01034	✓	T
Automatic Design of Stairs	01166	✓	T
Coal Quality Weighted Averages	01880	✓	T
Continuous Miner Productivity	02217	✓	T
Conveyor Calculations	02152	✓	T
Cooling Load Calculations	01403	✓	T
Discontinuity Stress in Cylinders With Spherical Heads	03151	✓	T
Drive Belt Calculations	03293	✓	
Duct Pressure Drop	03426		✓
Frequency Dependent Rejection Plused 'FDRP'	03099	✓	T
Geometric Solution to Bent Plate Framing Connections	02827	✓	T
Helical Torsion Spring Design	02813	✓	T
Insulation Characteristics	01338	✓	T
Isotropic Plate Bending Analysis	03214	✓	T
Laser Beam Variable Attenuator	01799	✓	T
Manhole Invert Calculations	03093	✓	T
Mine Production Rate	01801	✓	T
Mining Calculation	01601	✓	T
Pitot Tube Velocity and Volume Conversion from Traverse	01025	✓	T
Plane Frame Analysis	00199		✓
Pressure Vessel Design	01697	✓	T
Project Status and Report	00867	✓	
Radar Displayed Pulse Count 'RDPC'	03139	✓	T
Radar Range Equation (RRE)	03106	✓	T
Rectangular Mode Program	01696	✓	T
Reverberation Time	01936	✓	T
Root Locus Generation	01439	✓	T
Simple Janbu Analysis for Mohr Coulomb Material	00938	✓	T
Simplified Bishop Analysis for Mohr Coulomb Material	01035	✓	T
Sound System Performance Predictions	01015	✓	T
Structural Frame Analysis	02971	✓	
Transistor Parameter Conversion	02640	✓	T
Truck Weight Distribution	01110	✓	T
Vented Loudspeaker Box Tunings	01451	✓	
Verify Cable TV System Design	00725	✓	T
Weight and Moment Calculations	02976	✓	T

J050 Aeronautical/Aerospace Engineering

2-D Shock Angles With Variable Specific Heats	02911	✓	T
Aero	02145	✓	T
Aerodynamic Properties of a Finite Wing (Prandtl)	00506	✓	
Aeronautical Calculations with a Tabular Polar	02049	✓	T
Aeronautical Engineering Subroutines	02278	✓	T
Aircraft Drag-Estimation	02902	✓	T
Airfoil Calculations	01193	✓	T
Airfoil Coordinate Data Generation	02257	✓	T
Airfoil Coordinate Interpolation	01056	✓	T
Airplane Takeoff Field Length	01452	✓	T
Atmospheric Conditions	02193	✓	T
Atmospheric Properties	01874	✓	T
Atmospheric Properties/Velocities/Aerodynamic Calc.	01191	✓	T
Bulk Density for Two Propellants	00997	✓	T
Compressible Flow Functions	00787	✓	T
Compressible Flow Functions for Air	00830	✓	T
Direction Cosine Matrix	00382	✓	T
Euler Angles from Direction Cosines	00380	✓	T
Flow Parameters for a Given Mach Number	00773	✓	T
Lift and Drag Coefficients for a Supersonic Rhombic Airfoil	01234	✓	
Mass Properties Summation	01625	✓	T
Minimum Time or Fuel Paths to Climb	02063	✓	T
Model Airplane Design - Radio Control Competition Patter	00707	✓	T
Multi-Stage Boost Trajectory	00617	✓	T
Oblique Shock Properties	03295	✓	T
Potential Flow - Plane Source Quadrilateral (PSQ)	00737	✓	T
Potential Flow-Linear Source Filament (lsf1)	00576	✓	T
Rotor Basic Analysis "RCFT"	02602	✓	T
Shock Flow	00738	✓	T
Solutions to Some Common Aeronautical Problems	02000	✓	T
Windmill Design	01719	✓	T

J100 Agricultural Engineering

Manifold Multiple Pipe Sizing	02221	✓	

J150 Architectural Engineering

Haul Truck Simulation	01258	✓	T
Marginal-Naval Architecture	02754	✓	T
Preliminary Design Conditions Program	01532	✓	T
Simpson's Naval Architecture	02753	✓	T
Solar Angles, Solar Time, and Clear Day Solar Radiation	03159	✓	
TKV$C-Naval Architecture	02752	✓	

J250 Chemical Engineering

41C Settling Velocities	00461	✓	T
ASTM-TBP Distillation	01101	✓	T
Absorption and Leaching 1	00562	✓	T
Absorption and Leaching 2	00561	✓	T
Absorption and Leaching 3	00560	✓	T
Absorption and Leaching 4	00559	✓	T
Airstream Energy Balances	02444	✓	T
Analysis of Sieving Results	01493	✓	T
Approximate Method of Real to Ideal Gas Conversion	02338	✓	T
Benedict-Webb-Brubin Equation of State	02645	✓	T
Benedict-Webb-Rubin Equation of State For Mixtures	02643	✓	T
Bubble and Dew Point Calculations	03199	✓	T
Bubble and Dew Point Temperature of an N Component Mixture	02611	✓	T
Carbon Adsorber Design	00378	✓	T
Chemical Phasical Property Data Bank	02143	✓	

J250 Chemical Engineering-Con't

Clausius-Clapeyron Equation	00972	✓	T
Combinatorial Calculations on Separation Sequences	02586	✓	T
Combustion Calculations	01099	✓	T
Combustor Flame Temperature	01674	✓	T
Comparison of Three Equations of State	01570	✓	T
Computing Ryznar and Langelier Indexes	02862	✓	T
Conversion From Wt. Fraction to Mole Fraction and Vice Versa	02073	✓	T
Cooling Tower	02685	✓	T
Cooling Tower Estimates by Correlations Based on Real Data	01672	✓	T
Corr. of Tie Line Data For Ternary Systems by Hand's Method	02352	✓	T
Cost Estimation For Heat-Transfer Equipment	02587	✓	T
Cyclone Efficiency	01294	✓	
Design & Rating of Absorbers, Including Packed-Column Design	01180	✓	T
Design and Rating of Packed Columns	01962	✓	T
Diameter Estimation of Vapor-Liquid Contacting Trays	02474	✓	T
Discounted Cash Flow	02849	✓	T
Dzip-Shortcut Multicomponent Distillation	01045	✓	T
Economic Pipe Diameter for Turbulent Flow	01112	✓	T
Equation of State: Beattie-Bridgeman	02524	✓	T
Equilib. Flash-Using Antoines Eq. to Calc. Equil. and Heat	01028	✓	T
Equilibrium Constant, Rate Coefficient, Vapor Pressure	03091	✓	T
Equilibrium Constant/Vapor Pressure Evaluation	03294	✓	T
Equilibrium Constants for Gas Reactions	01334	✓	
Equilibrium Flash	01569	✓	T
Equilibrium K-Values	01724	✓	T
Estimation of Plate Efficiency	02699	✓	T
Exchanger Film Coefficient	01824	✓	T
Filtration N1	00450	✓	T
Fin Temperature and Heat Transfer Rate	01715	✓	T
Fitting Vapor Pressure Data to Antoine Equation/3 Constants	02649	✓	T
Flash Composition Calculations	02510	✓	T
Flowpast Immersed Bodies	01041	✓	T
Fluid Properties	01323	✓	T
Formulation Analysis	03461		✓
Gas Property Using Redlick Kwong Equation of State	02820	✓	
Gasmix	02947	✓	T
Gaussian Error Function/Probability Integral: erf(Z)	02881	✓	T
General Material Balances Involving Binary Systems	02590	✓	T
Heat Exchanger Calculations	01244	✓	T
Heat Exchanger Optimization I	00453	✓	T
Heat Exchanger Rating	02042	✓	T
Heat Loss or Gain by Insulated Pipe	01682	✓	T
Heat Tracing Requirements For Pipelines	02353	✓	T
Heat-Transfer Time in Jacketed Vessels: Isothermal Medium	02589	✓	T
Heating Rate Calculator	03063	✓	T
Heating Values	01307	✓	T
Horizontal Vessel Volume	01627	✓	T
Hydrocyclone Efficiency	01923	✓	T
Intelligent Problem-Solving of Heat Exchangers Calculations	01545	✓	T
Ion Exchange Breakthrough Curves	02736	✓	T
K-Value Prediction	00517	✓	
Low Pressure Gas Pipe Sizing	00710	✓	T
Mathematical Modeling of a Catalytic Reformer of Methane	02585	✓	T
Metallurgical Balance	02715	✓	
Mole Fraction for N Components	01846	✓	T
Organic Pollution Loads on Streams	00621	✓	T

J000 Engineering

J250 Chemical Engineering-Con't

		Available for HP-41	HP-71
PVT Calculations Using Soave-Redlich-Kwong Equation of State	02584	✓	T
PVT Data For Ideal and Real Multicomponent Mixtures	03198	✓	T
Packed Tower Hydraulic Design	02356	✓	T
Peng-Robinson Eqn of State Pvt and Fugacity Data for Bin	00688	✓	T
Physical Property Estimation	01207	✓	T
Pipe Heat Loss and Economics	01511	✓	T
Pipe-Sizing for Compressible Flow	01859	✓	
Pitzer and Redlich-Kwong Equations For a Real Gas	02339	✓	T
Pressure Vessel Nozzle Losses for Gases	00847	✓	T
Properties of Hydrocarbons	01012	✓	T
Residence Time Distribution	00377	✓	T
Riedel-Plank-Miller Correlation for Vapor Pressures	02134	✓	T
Saturated Steam Pipe Design	01673	✓	T
Saturation on pH - Calculation of Langelier & Ryzner Indices	02578	✓	T
Sedimentation Rates	00357	✓	T
Simple Batch Distillation for Two Components	01544	✓	T
Sizing Calculations For Condensate-Return Lines	02522	✓	T
Slurry Calculation Chart	01198	✓	T
Slurry Calculations	02730	✓	T
Specific Heats of Gases at One Atmosphere	01053	✓	T
Superheated Steam Pipe Design	01853	✓	T
Surface Tensions of Aqueous Organic Solutions	02449	✓	T
Tank Volumes in Partly Filled Tanks	01990	✓	T
Temperature Profile	03364	✓	
Thermal Conductivities of Low Pressure Gas Mixtures	02050	✓	T
Thermal RC Calculator—Temp. of Mass Heated Thru a Conductor	03148	✓	T
Thermocouple Correction	03201	✓	T
Thermodynamic Properties of Gas Mixtures	00519	✓	T
Thermodynamic Properties of Saturated & Superheated Steam	01693	✓	T
Thermodynamic Properties of a Substance from Critical Data	01011	✓	T
Thermosiphon Reboiler - Heat Exchanger Rating	00842	✓	T
Vapor Pressure	00891	✓	T
Viscosities of Gas Mixtures at Low Pressures	02052	✓	T
Viscosity	01089	✓	T
Viscosity of Gas Mixture at Low Density	01600	✓	T
Vol Change in Horizontal, Vertical, Cyl., Spherical Vessel	02773	✓	T
Wilson Equation: Activity Coefficients For Binary Solutions	02817	✓	T
Z-Transformation	02644	✓	T

J252 Design (Optimization)

		Available for HP-41	HP-71
Calculation for Cryogenic Processing	02144	✓	
Chemical Process Equipment Cost Estimation	01838	✓	
Determination of Antoine Constants	02832	✓	
Determination of Antoine's Constants I	02831	✓	
Friction Loss in Pipes	02617	✓	T
Linear Optimization	03077	✓	
Multicomponent Distillation Calculations	03262	✓	
Multicomponent Distillation Column Design	02083	✓	T
Multivariable Nonlinear Function Maximum Finder	02905	✓	T
Optimum Path Finder	03105	✓	
Runaway Criteria For a Fixed Bed Tubular Reactor	03074	✓	T
Shortcut Multicomponent Distillation Design	01778	✓	T
Single Variable Max, or Min Finder	02551	✓	T
Size Packed Columns	01794	✓	T
Univariate Search Function Maximum Finder	02815	✓	T

J252 Design (Optimization)-Con't

J254 Process Control

		Available for HP-41	HP-71
13T and E13T Foxboro Target Flowmeters	03429		✓
Acid Gas Dewpoint	02007	✓	T
Activated Sludge Process Control Calculations	02113	✓	T
Control System State Controllability and Observability	02021	✓	T
Control Valve Sizing Liquid, Gas and Steam	03118	✓	T
Flow Measurements With Pipe Elbow Taps	03057	✓	T
Independent Equations From Complex Reaction Equations	02337	✓	T
Simultaneous Nonlinear Equations	02767	✓	T
State Controllable From Dynamic Equations	02267	✓	T
State Observability of a Digital System	01840	✓	T

J256 Stoichiometry

		Available for HP-41	HP-71
Stoichiometry of a Chemical Equation	02115	✓	T

J300 Civil Engineering

		Available for HP-41	HP-71
"Axbend" Steel Axial-Bending Interaction Equations	02340	✓	T
"Conbeam" (Flex. Strength of R.C. and Bonded P.S.C. Beams)	01496	✓	T
"Geoprop" Sections In Forth	03452		✓
"Tiltup" Tilt-Up Wall Design	00575	✓	T
2Axcon Concrete Column/Biaxial Bending	02751	✓	T
3-Axis Weight, Cg, and Inertia	01161	✓	T
36 Beams	00782	✓	T
41C Rectangular Corner Walls Calculations	00460	✓	T
A.A.S.H.T.O. Simple Beam Live Load Analysis	03115	✓	T
AASHTO Tee Pier Analysis	02936	✓	T
Analysis of Inverted V Bracings	03410	✓	T
Analysis of Pin-Jointed 2-D Frames	02090	✓	T
Barometric Levelling	01376	✓	T
Bases	01295	✓	T
Beam Design	02248	✓	T
Beam Program with Stirrup Design-Simple 2	01538	✓	T
Beam on Elastic Continuous Support	01232	✓	T
Beam with Varying Moment of Inertia. Stiffness, Fem, Cof	01009	✓	T
Beam/Column Design	01416	✓	T
Beams: Simply Supported, Cantilever and Fixed at Both Ends	01455	✓	
Bearing Pile	00878	✓	T
Bending Moment Plotting	00914	✓	T
Benkelman Beam Rebound Analysis	02621	✓	
Bishop Slope Stability Analysis	01468	✓	T
Bolt Prying Action in Steel Connections	02470	✓	T
Buttress Design	01174	✓	T
CPM - An HP-41CV Implementation	01712	✓	T
Cable	00468	✓	T
Cantilevered Retaining Walls	00603	✓	T
Center of Gravity and Moment of Inertia for Rotated Members	03240	✓	T
Circon/Circular Concrete Column Biaxial Bending	00454	✓	T
Column Loads - S.I. and Imperial Units	01122	✓	T
Column Solver	02740	✓	T
Compleat Composite Beam	03220	✓	
Complexly Loaded Reinforced Concrete Retaining Wall Design	02300	✓	T
Composite Section Properties	00589	✓	T
Compute Cuts and Fills and Print Cutsheet	03327		✓
Concrete Beam Design & Analysis Rectangular	01248	✓	T
Concrete Foundation Bolt Design	02758	✓	T

J300 Civil Engineering-Con't

		Available for HP-41	HP-71
Constant Head Permeability	00652	✓	T
Continuous Beam - Support Moments, Reactions & Int. Moments	01541	✓	
Continuous Beams Through Fixed Points	00902	✓	T
Cost of Pumping	00933	✓	T
Counter Weight Calculation for Luffing Machines	03411	✓	T
Crane/Outrigger Reactions and Stability	01952	✓	T
Critical Path Method for Project Planning & Scheduling	01309	✓	T
Curb Return Design	02919	✓	T
Curved Beam Loaded Normal to the Plane of Curvature	01339	✓	T
Deflection of Beam with Variable Section	00704	✓	
Deflections by Area Moment	00678	✓	T
Design of Commonly Used Beams	02674	✓	T
Design of Concrete Foundation Blocks	02918	✓	T
Design of Fillet Welds	02081	✓	T
Determination of Reactions in a Continuous Beam	00789	✓	T
Distribution Factor Calculation	01495	✓	T
Drilled in Concrete Piers-Sands	00466	✓	T
Earth Dams and Cut Slopes Stability and Safety	01361	✓	T
Earthwork	03121	✓	T
Earthwork and Paving Estimations	00516	✓	T
Eccentrically Loaded Column Base Plate	03048	✓	T
Effective Orifice Area for Pressure Relief Device	00931	✓	T
End Supported Beams	02910	✓	T
Finite Length Beam on Elastic Foundation-Concentrated Loads	02279	✓	T
Fixed Beam Plot of Shear and Bending Moment Diagrams	01315	✓	
Floating Floor Calculations	02912	✓	T
Foundation Design	02335	✓	T
Frame Analysis	01417	✓	
Frame Analysis 3-6 Bays 2 Story	01367	✓	
Grade Computer	01738	✓	
Grade Computer II	02898	✓	
Hydro	02854	✓	T
LCN for Flexible Pavements	01414	✓	T
LSD Steel Beams S.I. and Imperial	01123	✓	T
Loads on Pipe in Trench	03203	✓	T
Long Continuous Beam (Up to 18 Spans)	02878	✓	T
Masonry Lintel Design (Lintel)	03120	✓	
Modified Berggren Equation: Dept HS of Freeze or Thaw	01242	✓	T
Moment Distribution Around a Box Frame	02247	✓	T
Moment Resistant Column Anchor Bolt Tension	01690	✓	T
Moments and Shears For Simple Spans With AASHTO Live Loads	02320	✓	
Monorail Moments Under Moving Load	00837	✓	T
Mound	01565	✓	T
Moving Wheel Loads	01308	✓	T
Mwall/Masonry Shear Wall Design	00451	✓	T
One Way Slabs in Reinforced Concrete	02262	✓	T
Percent Passing for Aggregate Production Control	00781	✓	T
Percent Rehandle	01817	✓	T
Piles Under Rigid Block	01081	✓	T
Practical Signal Timing	00937	✓	T
Prestressed Beam "PREBM"	02741	✓	T
Principal Stresses at a Point (Three Dimensional Case)	00831	✓	T
Pull Chart	03385	✓	T
Rectangular Tied Concrete Column Interaction Curve Data	02272	✓	T
Reinforced Square Footing	01358	✓	T
Retaining Wall Loads	01154	✓	T
Roadway Illumination Design	01700	✓	T

APPLICATION INDEX FOR HP-41 AND HP-71

		Available for HP-41	HP-71
J300 Civil Engineering-Con't			
Rock Permeability by Constant/Falling Head Tests	01732	✓	T
Section Properties of Structural Members	00950	✓	T
Septic Tank Volume and Absorption Field	01348	✓	T
Sieve Analysis and Soil Moisture Content	00674	✓	T
Simply Supported and Cantilevered Steel Beams	02452	✓	T
Slope Stability Analysis	01168	✓	T
Stability and Analysis of Retaining Walls	02171	✓	T
Standard Beams, Axially Loaded Beams, Beams on Elastic Found	01278	✓	T
Standard Penetration Test Adjustment for Soil Overburden	01263	✓	T
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Steel Baseplate Design Program-Columns w/or w/o Base Moments	00939	✓	T
Strains and the Ellipse of Elasticity	01748	✓	T
Structural Excavation and Comp-Active Backfill for Pipes	00746	✓	T
Strum1/Structural Miscellaneous Programs/One	01029	✓	T
Superbeam	01044	✓	T
Superelevated Roadway Design with Elevations	01768	✓	T
Timber Design - 1977 NDS (WD7 7)	01509	✓	T
Truss Joint Stresses	01047	✓	T
Tube Column Design	02671	✓	T
U.B.C. Embedment Depth For Poles	02432	✓	T
Ultimate Bearing Capacity of a Pile From SPT	02668	✓	T
Ultimate Strength Beam	02014	✓	T
Unified Soil Classification	01657	✓	T
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Welded WF Section Properties	01411	✓	T
Wood Design	01130	✓	T
J302 Environmental Engineering			
Coal Fired Boiler Efficiency	03400	✓	T
Conduit Outlet Protection (Rip Rap)	02988	✓	T
Horizontal and Vertical Displacements of Movement Markers	02734	✓	T
Land Application of Municipal Sludge	02783	✓	T
Newton's Method in up to 11 Variables	01604	✓	
Residential Hot Air Furnace Selection	02882	✓	T
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J304 Hydraulics			
Backwater Profile for Rect Trap or Triangular Channels	00697	✓	T
Box Culvert Headwater	03469	✓	
Bridge Backwater Yarnell Equation	00613	✓	T
Calculation For Head Loss and Centrifugal Pump	02201	✓	
Channel Slide Rule (CSR)	01314	✓	T
Circular Pipe Friction Losses	01775	✓	T
Circular and Trapezoidal Channel Water Surface Profile Comps	03087	✓	T
Conjugate Depth for Hydraulic Jump	00696	✓	T
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Critical Depth of Rect Trap or Triangular Channels	00698	✓	T
Differential Pressure by Two-K Method	02545	✓	T
Field Packer Permeability Test Calculations	00793	✓	T
Flow Computations for Various Open Channel Configurations	01957	✓	
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Gas Pipeline Hydraulics	03425		✓
Generalized Manning Equation for Open Channel Flow	01396	✓	T
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Hardy Cross (HDY +)	01397	✓	T
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Open Channel Junction Structure Analysis	02837	✓	T
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Pipe Spillway Rating	01111	✓	T
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Storm Water Detention Pond Design	01550	✓	T
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Maximum Moment Under 18 Moving Loads	02118	✓	T
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J310 Transportation			
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Perspective Made Simple	02288	✓	T
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Sortcon	02215	✓	T
Spiral	01107	✓	T
Spiral Offsets and Deflections	02179	✓	T
Spur Gear Dimensions and Cutting Data	01887	✓	T
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Circular Plate with Hole - Plate 1	01211	✓	T
Circular Plate with Hole - Plate 2	01212	✓	T
Circular Plate with Hole - Plate 3	01382	✓	T
Circular Segments and Sectors	01027	✓	T
Compression Spring Check	01219	✓	T
Compression Spring Design	01312	✓	T
Cone-Stress	02984	✓	T
Critical Shaft Speed	02384	✓	T
Cylindrical Tank Volumes (Horiz or Vert)	02066	✓	T
Diesel Fuel Spray Penetration	01443	✓	T
Drive Belt Calculations	03293	✓	
Duct Pressure Drop	03426		✓
Duct Sizing - Static Regain	00936	✓	T
Duhamel's Integral for a Vibrating System	00944	✓	T
Elliptical-Stress	02982	✓	T
Expansion Stresses in Plane Piping Configurations	01959	✓	T
Expansion Tank Selection	01647	✓	T
Factor of Safety	02956	✓	T
Finite Element Heat Transfer	00954	✓	T
Frequencies and Mode Shapes for a General 3-DOF System	01621	✓	T
Ft, In, 1/16ths Right Triangle and Arithmetic	02952	✓	T
Gage Calculations	01239	✓	T
Gear Frequencies	00702	✓	T
Gear Measurement	01484	✓	T
General CAM Program	01424	✓	T
HVAC Duct Weight Calculator	01471	✓	T
Heat Transfer Rate	02714	✓	T
Heat Transfer in Air	01290	✓	T
High Pressure Gas Piping	01436	✓	T

		Available for HP-41	HP-71
J600 Mechanical Engineering-Con't			
Hole-Stress	02983	✓	T
Lateral Acceleration & Aerodynamic Forces & Road Load Req	02020	✓	T
Layout	01388	✓	T
Length of Paper in a Roll	00855	✓	T
Machining Time	01296	✓	
Mass	01828	✓	T
Mass, Polar and Moments of Inertia - Common Geometric Shapes	01954	✓	T
Metering Orifice Program for Flange Tap Square-Edged Orifice	02004	✓	T
Momentumline Plotting	01316	✓	T
Natural Frequencies of Uniform Beams	00894	✓	T
Natural Gas Pipeline: Pressure and Temperature vs Length	02979	✓	
Nozzle Reinforcements Per ASME Sect. VIII	02295	✓	T
Perforated Metals	03129	✓	T
Pipe Sizing (Hazen Williams)	01641	✓	T
Pipe Stress	01171	✓	T
Pipe Template	02852	✓	T
Piping Losses Including Fittings and Values	02655	✓	
Pressure Vessel Cost/Weight Estimate (PVCW)	02673	✓	T
Pressure Vessel Shell & Head Design Per ASME Sect VIII, Div1	02366	✓	T
Properties For Solids of Revolution	02477	✓	T
Prssl Computes Stress in Cylindrical Pressure Vessel	00518	✓	T
Random Vibration	02228	✓	T
Reflected Inertia and Flywheels	01422	✓	T
Relief Valve Sizing - Gases & Vapors	02713	✓	T
Residential Hot Air Furnace Selection	02882	✓	T
Rigid Body Inertial Properties	02653	✓	T
Rope Drum Capacity	00431	✓	T
Rotor Total Mass and Moments of Inertia (S.I. Units)	02938	✓	T
SDOF	03110	✓	T
Safety Valve Nozzle Stress	01259	✓	T
Safety Valve Vent Stack	01675	✓	T
Safety-Valve Steam-Flow Capacity	01114	✓	T
Section Properties - Single Axis	01394	✓	T
Shearing Force in Fixation Pieces (Screw revits pins etc)	02570	✓	T
Single Stage Reciprocating Compressor Operating Curves	03379	✓	
Sinusoidal Motion	00898	✓	T
Stress Concentration	01311	✓	T
Sum and Difference Frequencies	02654	✓	T
Supply Grilles Selection for H Vac Systems	01366	✓	T
Swirl Velocity	01019	✓	T
Symmetrical and Unsymmetrical Leaf Spring Properties	02018	✓	T
Tank Volume, Spherical/Horizon Tl Cylind Tanks Given Liq Dep	03123	✓	
Thermal Expansion of Parts	02641	✓	T
Thermowell Design	02776	✓	T
Torsion Bar Analysis and Auto Clutch Calculations	02019	✓	T
Transmitted Force	01736	✓	T
Turbomachinery Calculations	00921	✓	T
Two Phase Frictional Pressure Drop	02876	✓	T
Vibrating Body Supports	03158	✓	
Vibration Conversions and Guidelines	01758	✓	T
Viscosity Corrections for Centrifugal Pumps	01649	✓	T
Volumes and Areas of Common Shapes	01953	✓	T
Wear Equation	02932	✓	T
Wire Rope Incipient Scrub	03333	✓	T

		Available for HP-41	HP-71
J602 Automotive Engineering			
Exhaust Design Criteria For Four Stroke Engines	02574	✓	T
Internal Combustion Engine Cycle Otto	01821	✓	T
Internal Combustion Engine Performance Calculations	01623	✓	T
J604 Design and Analysis			
Centrifugal Pump Model	03155	✓	
Failure Theories (Brittle and Ductile)	03416	✓	T
Gasscrubber Design Calculation	02867	✓	T
Leaf Spring Design Calculations	02072	✓	T
Pipe Branch Reinforcement Calculation	01847	✓	T
Power Screw Calculations	02814	✓	T
Press Fit of Thick-Walled Cylinders	02731	✓	T
Servometer Bellows Design	02924	✓	T
Shaft	02853	✓	T
Short Cylinder Analysis - Cylinder 3	02051	✓	
J606 Dynamics of Physical Systems			
Dynamic Analysis Subsidies	02375	✓	T
Two-Plane Balancing	02582	✓	T
J608 Energy Conversion Systems			
GTHML	02484	✓	T
Power Plant Condenser Hydraulic Horsepower Calculation	03375	✓	T
U Value	01890	✓	T
J610 Fluid Dynamics			
13T and E13T Foxboro Target Flowmeters	03429		✓
Critical Steam Flow	01991	✓	T
Differential Pressure by Two-K Method	02545	✓	T
Dimensional Analysis	03374	✓	
Flange Tap Orifice Calculations for Natural Gas	03422		✓
Flow Rate as a Function of Pressure Drop	02986	✓	T
Gas Pipeline Hydraulics	03425		✓
Head Loss in Turbulent Flow	02987	✓	T
Orifice Calculations For Flow Measurements	02546	✓	T
Pipe Friction Loss	02558	✓	T
Pressure Drop With Fully-Developed Flow	02985	✓	T
System Curve (SYSCRV)	02756	✓	
Tank Drainage Time	01862	✓	T
J612 Fuels and Lubricants			
Fluid Flow through Square-Edge Orifice	01787	✓	
Internal Combustion Engine Fuels	01996	✓	T
Orifice Calculations For Flow Measurements	02546	✓	T
Tank Volume, Spherical/Horizon Tl Cylind Tanks Given Liq Dep	03123	✓	
J614 Heating/Ventilating/Air Cond.			
Altitude Correction	02856	✓	T
Building Heat Loss Calculation	01773	✓	T
Ceiling Plenum Temperature	02394	✓	T
Duct Pressure Drop	03426		✓
Heat Loss From Insulated Pipelines	02244	✓	T
Plenum Temperature Calculation	01811	✓	T
Psychrometric Chart	03245	✓	T
Thermal Insulation Effectiveness	02861	✓	T
J616 Heat Transfer			
CLMTD For Heat Exchangers In Series	02926	✓	T
Coldplate Heat Exchanger Performance	02137	✓	T
Effectiveness of Heat Exchangers	02991	✓	T
Exchanger Film Coefficient	01824	✓	T
Finite Difference Heat Transfer Two Dimensional	01622	✓	T

		Available for HP-41	HP-71
J616 Heat Transfer-Con't			
Finite-Difference Heat Transfer For Internal Turbulent Flow	03111	✓	T
Finned Heat Sink Thermal Resistance	02219	✓	T
Heat Conduction by Fourier's Law	02804	✓	T
Heat Loss: Radiation vs. Convection	02787	✓	T
Heating Rate Calculator	03063	✓	T
Heatsink Selection and Performance Evaluation	03145	✓	
Thermal RC Calculator--Temp. of Mass Heated Thru a Conductor	03148	✓	T
Thermodynamics Assistant: Calculations Based on Steam Tables	03368	✓	T
Transient Conduction (Lumped Capacitance Method)	02666	✓	T
J618 Metallurgy and Materials			
Data Analysis of Three Element Strain Gage Rosettes	01603	✓	T
Fillet Weld Effective Throat (TE)	02695	✓	T
Gaussian Error Function/Probability Integral: erf(Z)	02881	✓	T
Pipe Properties	02931	✓	T
Welding Bevel Calculations For Steel Plate and Pipe	03114	✓	T
J750 Petroleum Engineering			
Air-Free Natural Gas Analysis from Composition	02128	✓	T
Buildup	02142	✓	T
Complete Exponential Decline Curve Analysis	02728	✓	T
Constant Percent Decline Analysis	01506	✓	T
Decline Curve Analysis	01444	✓	T
Determination of Pressure Buildup from Injection	01106	✓	T
Drilling Fluid Volume	01165	✓	T
Gulf Coast Seismic Time-Depth Correlation	03458		✓
Natural Gas Measurement Via Orfice Meter	02407	✓	
Natural Gas Properties From Petroleum Fluids Pac	02622	✓	
Natural Gas Properties from Specific Gravity	02125	✓	T
Natural Gas Well Testing Programs	03386	✓	
PEPL	01602	✓	T
Pipe-Sizing for Compressible Flow	01859	✓	
Plug	03444	✓	T
Properties of Petroleum Fluids	03359		✓
Shaly Sand Analysis	01651	✓	T
Tubing Erosional Velocity Calculations	03356		✓
Viscosity Conversions	00356	✓	T
Viscosity of Suspensions	00856	✓	T
J752 Drilling			
Calculating the Driller's Angles	01815	✓	T
Directional Well Survey - Radius of Curvature Method	02724	✓	T
Tubing Erosional Velocity Calculations	03356		✓
J754 Facilities			
Gas Pipeline Hydraulics	03425		✓
Tubing Erosional Velocity Calculations	03356		✓
J758 Reservoir			
Properties of Petroleum Fluids	03359		✓
J800 Solar Engineering			
Complete Fanning (or Moody) Friction Factor Chart	02140	✓	T
Heat Loss Calculations	01238	✓	T
Life Cycle Cost	02737	✓	T
Photovoltaic System: Panel Peak Power and Battery Size	01546	✓	T
Solar Angles, Solar Time, and Clear Day Solar Radiation	03159	✓	
Solar Heating Savings Analysis	01503	✓	
Solar Shading	01162	✓	T

		Available for HP-41	HP-71
J800 Solar Engineering-Con't			
Solar Time To/From Local Time	02192	✓	T
Sun Shade	01692	✓	
Sunpath Diagrams	01524	✓	T

L000 Mathematics

82905B Word Processor	02077	✓	
Area of n Sided Polygon	03029	✓	
Babbage Difference Engine	02325	✓	T
Bernoulli and Euler Numbers and Polynomials	03259	✓	T
CIN	01438	✓	T
Calculation of Limits	02006	✓	T
Complex Quadratic Equation	02969	✓	
Cone, Cylinder, and Sphere Computations	02350	✓	T
Converter	03309		✓
Fast and Sure Root Finder	02460	✓	T
Foot-Inch Pound-Ounce Arithmetic	02324	✓	T
Fractional Arithmetic	01911	✓	T
Fractions	00387	✓	T
Function Scanner	00564	✓	T
Function Table Printer	01529	✓	T
Function Tabulator	01413	✓	
Gram-Schmidt Orthogonalization	02503	✓	T
Ingredients for a Batch	01427	✓	T
Inverse Gamma Function	02966	✓	T
Missing Number Addition	00340	✓	T
Missing Number Division	00337	✓	T
Missing Number Multiplication	00339	✓	T
Missing Number Subtraction	00338	✓	T
Monitored Solution to F(X)=0 on an Interval	01412	✓	T
N-Dimensional Vector Operation	02504	✓	T
Network of Minimal Length	01303	✓	T
Newton-Raphson Solution to F(x)=0; Newton's Method	02346	✓	T
Non-Linear Multiple-Variable Newton-Raphson Technique	01374	✓	T
Normal and Log-Normal Distributions	02683	✓	T
Prime	02794	✓	T
Prime Factorization	01020	✓	T
Printerless Plotting Routine	01744	✓	T
Quartic, Cubic, and Quadratic Equations	02321	✓	T
Right Triangles and Bevels	03047	✓	T
Root Finding by Richmond's Method	00566	✓	T
Solution to All Roots of an Equation Over an Interval	00642	✓	T
Solutions For a System of Two Non-Linear Equations	02843	✓	T
Special Root Finder 1	00565	✓	
Systems of Nonlinear Equations	01306	✓	T
Tanscendental Equation Solver	02286	✓	T
Test-Figure-Program	03082	✓	T
Transitive Closure	02698	✓	
Variable Root Finder (VRF)	01410	✓	T
Vector Calculator	03084	✓	
L050 Complex Variables			
13 Complex Number Operations	02619	✓	T
Advanced Complex Operations	02369	✓	
An RPN Language for Complex Variable Problems	01325	✓	T
Complex 41	02997	✓	T
Complex Matrix	02920	✓	
Complex RPN	00695	✓	T
Complex RPN for Complex Number Treatment	01360	✓	T
Complex Root Finder with Deflation	01539	✓	T
N-Complex Simultaneous Linear Equations	01231	✓	
Numerical Complex Functions	02323	✓	T
L050 Complex Variables-Con't			
Root N and Complex Root of a Complex Number	02239	✓	T
Simultaneous Equations and Math for Complex Numbers	01898	✓	T
Solution to Simultaneous Equations with Complex Variable	01098	✓	T
The Complex Quartic Equation	02917	✓	T
L100 Conversions			
108 Weights & Measures	01671	✓	T
Base Conversions	02010	✓	T
Base Conversions Extended	03329	✓	
Base Conversions To and From Base 10 to 2 Through 37	02583	✓	T
Conv of Number Including Fraction of Any Base to Decimal	02732	✓	T
Conversions: Metric/English Plus Temperature and More	02490	✓	T
Converter	03309		✓
Decimal to Vulgar Fraction Converter	01478	✓	T
Decimals to Fractional Inches	01845	✓	T
Dimension Addition	01626	✓	T
Exponential Conversion	03208	✓	T
Extended Unit Management	01064	✓	T
Five Way Temperature Conversions	01929	✓	T
Foreign Currency Converter	00432	✓	T
Hex/Dec Conversion	00896	✓	T
Length Conversions	00750	✓	T
Mass, Weight and Force Conversions	00752	✓	T
Metric	00721	✓	T
Metric Conversion	00809	✓	T
Metric Unit Conversions	03085	✓	T
Metric/English Conversions	00935	✓	T
Nails Per Pound/Kilogram	01302	✓	T
Printed Conversion Tables Temp. Vol. Dist. Wt, Etc.	01245	✓	
Quantity of Tiles Per Square Foot of Floor Space	01301	✓	T
Roman & Arabic Numeral Conversions	00647	✓	T
Roman Numerals to Hindu-Arabic Numbers	00467	✓	T
Speed Conversions	01650	✓	T
Temperature Conversions	01986	✓	T
Textile Count Conversions	00823	✓	T
Transpose Music	01002	✓	T
U.S. British Metric Conversions	01336	✓	T
Volume Conversions	00751	✓	T
Wind Chill Warnings	01121	✓	T
L150 Differential Equations			
4th Order Runge-Kutta For O.D.E.	03188		✓
4th Order Runge-Kutta for N-O.D.E.'s	03190		✓
Adams-Moulton Method	01522	✓	T
An Efficient Ode Solver	01240	✓	T
Derivative	00843	✓	T
Derivative Calculations	03406	✓	T
Differential Equation Systems	00391	✓	T
Differential Equations 1 Order: Euler, R-k 2, Taylor 2nd Ord	02316	✓	T
Four-Variable Dynamic Linear Model of US Economy	02269	✓	T
Fourth Order Runge-Kutta For 1-99 Simultaneous O.D.E.'s	03377		✓
N Simultaneous Ode	00554	✓	T
Numerical Solutions to Initial and Boundary Value Problems	03210	✓	T
Runge-Kutta Integrator for One to Six First Order Equations	00422	✓	T
Runge-Kutta Method of 4th Order to Solve Diff. Eq. First Ord	02138	✓	T
Simultaneous 1st Order Difeq	02197	✓	T
Solving Ode by Runge-Kutta-Gill Method	00444	✓	T
L200 Extended Precision			
20-Digit RPN	02103	✓	T
Correlation Matrix	02121	✓	T
Extended Precision Multiplication	02604	✓	T
Extended Range Arithmetic	00850	✓	T
Ridiculously Compleat Factorial	00901	✓	T
L250 Integration			
96 Point Gauss-Legendre Integration	00360	✓	T
Adaptive Quadrature	01960	✓	T
Direct Integration of Polynomials	02648	✓	T
Double Integration by Gaussian Quadrature	00610	✓	T
Double Lobatto Quadrature	01305	✓	T
Double Riemann Sum	00445	✓	T
Fourth-Order Newton-Cotes Integration	03032	✓	T
Gauss Quadrature	02998	✓	
Integration by Simpson's Rule/Plot of Function	00443	✓	T
Integration of Functions	03189		✓
Integration to Infinite	01237	✓	T
Integration: Gaussian, Laguerre, and Hermite	00611	✓	T
Maths	03448	✓	
Min	01291	✓	T
Modified Trapezoidal Integration	00507	✓	T
Numerical Integration	01733	✓	T
Numerical Integration - Polar and Rectangular	02349	✓	T
Numerical Quadrature of Unequally Spaced Ordinates W/SMO	00756	✓	T
Romberg Integration	01065	✓	T
Single, Double and Triple Simpson/Trapezoidal Integration	03101	✓	T
L300 Interpolation			
1, 2, 3 Dimensions - Integration (Basic)	02363	✓	T
1, 2, 3 Dimensions - Inter/Integ (Quadratic)	02362	✓	T
1, 2, 3 Dimensions - Interpolation (Basic)	02364	✓	T
1D and 2D Table Lookup	01408	✓	T
Aitken's Method of Interpolation	01669	✓	T
Area Under Curve	00351	✓	T
Birkhoff Interpolation Using Function and Derivatives	00590	✓	T
Bridge Deck Elevations I	02079	✓	
Cubic Spline Interpolation	01530	✓	T
Interpolation With Cubic Splines	03387		✓
Interpolation and Extrapolation	01442	✓	T
Interpolation and Numerical Integration by Akima's Local	00679	✓	T
Inverse Interpolation by Salzer's Method	01587	✓	T
Least Squares Polynomial Regression	03012	✓	
Osculating Inverse Interpolation	01454	✓	T
Polynomial Interpolation I - Progressive Method	02255	✓	T
Polynomial Interpolation II - Explicit Form & Derivative	02332	✓	
Shovelton & Karup-King Interpolation Formulae	00631	✓	T
Spline - Interpolation - Package	01435	✓	T
Spline Interpolation for Discrete Data	01365	✓	
Table Look-Up Using the Lagrange Interpolating Polynomial	01433	✓	T
Table Look-up Using Lagranian Interpolating Polynomial	00367	✓	T
XYZ Tabular Data Entry and Linear Interpolation System	01317	✓	
L302 Approximation			
Brent's Minimum Finder Algorithm	02596	✓	T
Horn	03253	✓	T

L000 Mathematics

		Available for HP-41	Available for HP-71
L302 Approximation-Con't			
Horner	03254	✓	T
POLFIT: Least Squares Polynomial Fit	03466		✓
ROM	03024	✓	T
L350 Linear Systems/Matrices			
2 X 2 Complex Matrix	01619	✓	T
3 D Vector Calculations	01277	✓	T
Anke-Simultaneous Equation System	03257	✓	
Banded Matrix Solution	01375	✓	T
Best Way to Solve Simultaneous Equation up to 3 Unknowns	01566	✓	T
Characteristic Polynomial of a Square Matrix	00407	✓	T
Cholesky Decomposition Subroutine	00724	✓	T
Complex Determinant and Simultaneous 3x3 Equations	02851	✓	T
Complex Matrix Calculations	02576	✓	T
Conjugate Gradient Method Subroutine for Symm Matrices	00754	✓	T
Cramer's Rule	00599	✓	T
Crout Reduction Subroutine	00984	✓	T
Determinant of a N by N Matrix	00598	✓	T
Echelon Form of a Matrix	00720	✓	T
Eigenvalue/Vectors for Nth Order Systems.	01814	✓	
Extended Memory Matrix Operations	02676	✓	
General Linear Programme, with Reduced Costs	01105	✓	T
Gram-Schmidt Orthogonalization of Matrices	03341		✓
Iterative Multiplication of Matrices	01488	✓	T
Lin Alg With the Subroutines Sys Inv/Adj, and Out1, 2	02807	✓	T
Linear Multiple Regression Analysis	01446	✓	
Linear Programming	02521	✓	T
Linear Systems (Subroutine Lin)	00343	✓	T
Matdiag	00747	✓	T
Matrix Arithmetic	03384	✓	
Matrix Inversion Subroutine with Complete Pivoting Optio	00723	✓	T
Matrix Mathematics	03343		✓
Matrix Multiplication	02658	✓	T
Matrix Multiplication (A - super n - B)	02355	✓	T
Matrix Operations	02443	✓	T
Matrix Operations On Fractions	03376	✓	T
Matrix Operations, Addition, Subtraction and Multiplication	00718	✓	T
N Simultaneous Equations in N Unknowns	00608	✓	T
NxN Matrix Multiplication	01142	✓	T
Over- determined System of Linear Equations	02975	✓	
Power "N" of a 2x2 Matrix	00899	✓	T
Product of Two General Matrices	00703	✓	T
Programmed Equations	01201	✓	T
Real/Complex Matrix Multiplication	02883	✓	T
Sequential Multiplication of Real/Complex Matrices	03205	✓	T
Simplex Method	03282	✓	T
Simplex Method For Linear Programming	03150	✓	T
Simultaneous Equations (MXM) Variable Size	02112	✓	T
Solution To System of Up to 16 Equations Simultaneously	02501	✓	T
Solution of Complex Equations	02916	✓	T
Solution of Tridiagonal Matrices by Thomas Algorithm	01370	✓	T
Solution of Tridiagonal Systems	01082	✓	T
Solutions For Linear Systems of Equations With 2&3 Unknowns	02549	✓	T
Solutions For Linear Systems of Equations With 4 Unknowns	02670	✓	T
Solutions of a Second Degree Matrix Equation	02579	✓	T
Symmetric Matrix Solution - Cholesky Modified Method	02826	✓	T
L350 Linear Systems/Matrices-Con't			
Symmetrical Linear Equations	00342	✓	T
System of Equations: Version 1 (Maximum Accuracy)	01379	✓	T
System of Equations: Version 2 (Maximum Size)	01380	✓	T
Thomas Algorithm: Solution of A Tridiagonal Matrix	02620	✓	T
Vector Operations	02790	✓	T
Warshalls Algorithm	01967	✓	T
L352 Simultaneous Equations			
Almost Linear System of Equations	03209	✓	T
Cram3L: Cramers Rule Calculations of Third Level Equations	01798	✓	T
Matrix Mathematics	03343		✓
Overdetermined Systems	03058	✓	
Simultaneous Non-Linear Equations (Newton-Raphson)	03344		✓
System of N Linear Equations with Complex Coefficients	01746	✓	T
System of Simultaneous Equations	02642	✓	T
Three Simultaneous Linear Equations	01598	✓	T
n Complex Simultaneous Equations	02414	✓	T
L400 Number Theory			
Base Conversion	01935	✓	T
Base Conversions	01087	✓	T
Base Transformation and Arithmetic	01613	✓	T
Bigger Base Conversion	01663	✓	T
Chinese Remainder Theorem	00601	✓	T
Decimal / Binary / Hexadecimal Conversions	01678	✓	T
Decimal to Fraction	02441	✓	T
Diophantine Equations Ax+by=c	00366	✓	T
Increasing Decreasing Sort	02703	✓	T
Index	01178	✓	T
Intercalculation of 2 Blocks of N Registers (Increas.)	02704	✓	T
Interelation of 2 Blocks in Decreasing Order	02702	✓	T
Multinumber Generator	00388	✓	T
Number Generator Pack	02539	✓	T
Numerical Differentiation by Three-Point and Five-Point Form	02360	✓	T
PR?	03022	✓	T
Perfect Number Research	00729	✓	T
Permutations of Symbolic Set to 12 Members	00470	✓	T
Prime Factor Analyses	02797	✓	T
Prime Factorization	01021	✓	T
Rational Number Operations	00383	✓	T
Ro-Diagram-Pollards Method	02581	✓	T
Symbol Selection and/or Permutation	01753	✓	T
Ultimate Base Conversions	02499	✓	
L450 Polynomials			
Bernoulli and Euler Numbers and Polynomials	03259	✓	T
Bessel Polynomials	02258	✓	T
Binomial Expansion	02301	✓	T
Binomial Expansion	01086	✓	T
Binomial Expansions	02093	✓	T
Calculating a Quadratic Equation Given Three Points	00749	✓	T
Calculation of Polynomials	01842	✓	
Chebyshev Polynomial Evaluation and Coefficients	02675	✓	T
Complex Polynomial Evaluation	02914	✓	T
Complex Roots of Polynomials	01667	✓	T
Cubic	01393	✓	T
Cubic Equation	02002	✓	T
Cubic and Quartic Solution	01755	✓	T
Differentiation	02771	✓	T
Disequation Evaluation	02496	✓	
L450 Polynomials-Con't			
Division of Polynomials	01549	✓	T
Equation of Curve Going Through Two, Three, or Four Points	01058	✓	T
Factorization of Polynomials	03061	✓	T
Fast Division of Polynomials	03207	✓	T
Fast Polynomial Multiplication	03005	✓	T
Lagrange Polynomial Equation Fitting	02780	✓	T
Laguerre's Polynomial Root Finder	01534	✓	T
Large Numbers: Factorials, Combinations, and Binomials	03392	✓	T
Lin	03100	✓	
Multiplication of Binomials/Polynomials	02071	✓	T
Newton	03019	✓	T
Newton Interpolation Polynomial	02106	✓	T
POLFIT: Least Squares Polynomial Fit	03466		✓
Partial Fraction	01665	✓	T
Partial Fraction Expansion	00869	✓	T
Polynomial Arithmetic and Derivation	02928	✓	T
Polynomial Curve Fitting	03003	✓	
Polynomial Curve Fitting, 2nd thru 9th Order	01415	✓	T
Polynomial Derivatives	01449	✓	T
Polynomial Division	03009	✓	
Polynomial Equation Graph	02485	✓	T
Polynomial Evaluation Utilizing the Math Pac	01946	✓	T
Polynomial Factorization	01016	✓	T
Polynomial Fitting	02026	✓	T
Polynomial Products	03008	✓	
Polynomial Roots by Maechly's Method	00660	✓	T
Polynomials Modific., Newton Form and Shifted Power Form	02434	✓	T
Product of Polynomials	01507	✓	T
Proot	02657	✓	T
Quadratic Equation	00863	✓	T
Quartic Equation	02070	✓	T
Race II	03076	✓	T
Real Factors to Polynomials	03446	✓	T
Real Roots of a Real Coefficient Polynomial-Up to degree 249	01973	✓	T
Roots of Cubic Equations	03394	✓	T
Roots of Polynomials	00390	✓	T
Simplification of Algebraic Expressions	01494	✓	T
Sol of Quadratic Equation Complex Form	02634	✓	T
Solving 2nd, 3rd and 4th degree equations by algorithm	02785	✓	T
Synthetic Division	01886	✓	T
Synthetic Substitution	00525	✓	T
Unique Nth Degree Polynomial through N+1 Points	01839	✓	T
Vieta	03020	✓	T
L500 Series/Sequences/Progressions			
Accelerated Convergence of Series	00805	✓	T
Algebraic Manipulation of Series and Polynomials	01298	✓	T
Alphabetical Sort	01737	✓	T
Arithmetic and Geometric Sequences	01661	✓	T
Arithmetic, Geometric, Harmonic Progressions	02282	✓	T
Auto or Crosscorrelation of Large Data Files in Ext-Memory	02717	✓	
Binomial Expansion	00474	✓	T
Chebyshev Series-304 Samples	01800	✓	T
Fast Fourier Transform I	00868	✓	T
Fast Fourier Transform II	01357	✓	
Fast Walsh Transform	01676	✓	T
Fourier Series	00833	✓	T
Fourier Series-300 Samples	01818	✓	T
Full Evaluation of Arithmetic Progressions	03011	✓	T

APPLICATION INDEX FOR HP-41 AND HP-71

		Available for HP-41	HP-71
L500 Series/Sequences/Progressions-Con't			
Full Evaluation of Geometric Progressions	03010	✓	T
Geometric Progression	00426	✓	T
Geometric Progressions	01004	✓	T
Harm (Harmonic Analysis of a Periodic Function)	01359	✓	T
Magic Squares	02748	✓	T
Sequencer	00593	✓	T
Sequences and Series	02823	✓	T
Taylor Series	02515	✓	T
L550 Special Functions			
41C Hyperbolics	00976	✓	T
Bessel Function Arbitrary Order	01326	✓	T
Bessel Functions J & Y	02534	✓	T
Bessel Functions of Integer Order	01725	✓	T
Bessel Functions of Integer Order	02403	✓	T
Complex Error Function	01462	✓	T
Complex Exponential Integral by Continued Fractions	02274	✓	T
Complex Gamma Function	00815	✓	T
Computer Slope Staking	00875	✓	T
Confluent Hypergeometric Function	02483	✓	T
Dawson's Integral	00648	✓	T
Elli·	03287	✓	T
Euler Phi Function	00641	✓	T
FAC	03023	✓	T
Fast Hyperbolics	03264	✓	T
Fractions Calculator	01595	✓	T
Gam	03288	✓	T
Gamma Fn Also Near Integers <=0	01157	✓	T
Gamma Function; Fraction and Negative Values	00829	✓	T
Gaussian Error Function/Probability Integral: erf(Z)	02881	✓	T
Hyperbolic Functions For Complex Variables	02884	✓	T
Legendre Functions	02359	✓	T
Ln of Gamma Fn or of Factorial	01158	✓	T
Polynomial Approximations to Four Common Functions	00359	✓	T
Properties of Logarithmic Spiral Segments	02385	✓	T
Quantum Mechanical Addition of Angular Momenta	03126	✓	T
Special Functions	02516	✓	T
Symbolic Differentiation	01523	✓	T
The Gamma Function and Related Functions	02475	✓	T
Theta Function	00637	✓	T
Vector Operations (Dot and Cross Products)	00876	✓	T
Vector Products and Magnitudes	01751	✓	T
L600 Symbolic Mathematics			
Huffmans Code	02637	✓	
L602 Algebra			
Differentiation	02771	✓	T
L650 Trigonometry/Analytic Geometry			
3 "D"	01257	✓	T
ANG-Line Orientations in an Orthogonal System	01754	✓	T
Analysis of Conics with Invariants	00706	✓	
Analytical Geometry of Circles	02809	✓	
Angle Between Two Planes	01558	✓	T
Areas of Polygons, Triangles, Trapezoids, Rhombi & Circle	01810	✓	T
Case VI Oblique Spherical Triangles -- 6 Variations	01852	✓	T
Chord from Arc Height & Length	00670	✓	T
Circle Calculations	00947	✓	T
Circle Computations	01993	✓	T

		Available for HP-41	HP-71
L650 Trigonometry/Analytic Geometry-Con't			
Circle Interchangeable Solutions	03330	✓	T
Circle and Pie Graph Chart Calculations	03260	✓	T
Circle-Line Intersection	02514	✓	T
Circles and Polygons	00775	✓	T
Complex Quadratic Equation	02969	✓	
Conic Sections	01832	✓	T
Conic Sections with Rotation	01833	✓	T
Conics	01266	✓	T
Coordinate Transformations (Improved)	02343	✓	T
Cubic Spline	00879	✓	T
Cylinders & Cones	01104	✓	T
Intersections of Lines, Circles, and Conics; and Distances	03162	✓	T
Intersections of Two Circles	01723	✓	T
Line Coordinate Calculations	01368	✓	T
Line Through a Point and Tangent to a Circle	01807	✓	T
Oblique Spherical Triangles - Case I thru V	01873	✓	T
Parabolic Intersections	03059	✓	T
Partial Cylinder Volume	03096	✓	T
Plane & Solid Analytic Geomt Pts, Distance, Slopes, Angles	02709	✓	
Plane Analytic Geometry Straight Lines	02482	✓	
Plane Geometry of Regular Polygons	01734	✓	T
Points on an Ellipse and Line Parallel to the Ellipse	02001	✓	
Polygon Solutions	02859	✓	T
Polyhedra	00776	✓	T
Polyhedrons & Prismatoids	01075	✓	T
Properties of the Circle	02806	✓	T
Quadrics Reduction Classification (by Variants)	02760	✓	T
Quick and Easy Triangle Solver	03355		✓
Right Angle Triangle Solutions-- Automatic	01235	✓	T
Right Circular Cones	02158	✓	T
Right Cylinders	02160	✓	T
SINR	01684	✓	T
SUPER CURVE: Horizontal curve with any combination of spiral	03135	✓	T
Segmental Curve Fitting	02059	✓	T
Solving Four Cases of Oblique Triangles	03354		✓
Sphere	00774	✓	T
Spheres, Spherical Angles & triangles, Barrels, Ellipsoids	01304	✓	T
Spherical Right, Quadrantal and Isosceles Triangles	02175	✓	
Spherical Trig Solutions	02150	✓	T
Straight Lines and Points	03237	✓	T
Super Curve: Horizontal Curve With Any Combination of Spiral	03279	✓	T
The Cube by Three Points	02913	✓	T
The Sphere by Four Points	03050	✓	T
Three Points Circle	03060	✓	T
Triangle Computation Coordinates	02310	✓	T
Triangle Computations Sides and Angles	02309	✓	T
Triangle Solution-Automated	00392	✓	T
Triangle Solutions	00334	✓	T
Triangles Solutions-All Cases	02555	✓	T
Trigonometric Complex Functions	02544	✓	T
Vector Operations	01050	✓	T
Vector Operations	03169	✓	T
Vectorial Algebra Utilities--Point -- Line - - Plane	01961	✓	T

N000 Medical Arts and Sciences

		Available for HP-41	HP-71
Acid-Base Factors for Blood and Brain Interstitial Fluid	01030	✓	T
Aqueous Flow Simulation	01288	✓	
Blood-Type Matching	02639	✓	T

		Available for HP-41	HP-71
N000 Medical Arts and Sciences-Con't			
Conditional Probabilities By Baye's Rule	03332		✓
Framingham Risk Equation	02035	✓	T
Hearing Loss Rating	02537	✓	T
Heights vs Desirable Weights for Adult Males and Females	01194	✓	T
Human Heat Stress	00755	✓	T
Menstruation Calendar	03258	✓	
Obstetrical Ultrasound	00662	✓	T
Physical Growth Percentiles	02163	✓	T
Renal Function Tests	00909	✓	T
Respiration	00578	✓	T
Resting Membrane Potentials	02148	✓	T
Tissue Blood Flow	00421	✓	T
U.S. Air Force & Marine Corps Percent Body Fat	01997	✓	T
N100 Anesthesia			
Cardiac Anesthesia Utility	01036	✓	T
Human Heat Stress II	03390	✓	T
N200 Blood Chemistry			
Acidity and Oxygen Contents of Blood	02040	✓	T
Determination of Whole Serum Complement Activity (CH50)	00999	✓	T
N300 Cardiopulmonary Medicine			
Bedside Hemodynamic Data	00350	✓	T
Clinical Cardiopulmonary Calculations for Critical Care	01401	✓	T
Comprehensive Acid-Base Analysis "AB"	02973	✓	T
Routine ECG Determinations "ECG"	02117	✓	T
Scalar EKG "EKG"	02763	✓	T
N400 Clinical Laboratory			
Aqueous Facility Tonography	01583	✓	T
Conditional Probabilities By Baye's Rule	03332		✓
The Workload of the Anatomic Pathologists	01779	✓	T
N402 Radioimmune Assay			
Four-Parameter Logistic Curve Fitting and Description	02147	✓	T
Radioimmunoassay	02344	✓	T
Weighted Logit-Logria Method	02513	✓	T
N500 Dentistry			
Moyer's Space Analysis 75%	01200	✓	T
N600 Nutrition			
Diet Control for -	00494	✓	T
Diet Planning (With Output Labeling)	00316	✓	T
Weight Control and Calorie Calculations	03092	✓	
N700 Optometry			
Depth of Field RR #1	03263	✓	T
Intraocular-Implant Lens-Power	01605	✓	
N800 Pharmacology			
I.V. Label-Generating Programs	03144	✓	
N802 Drug Dosage			
Conversion of Drug Infusion	01633	✓	T
Infusion Drug Dosage Table	01902	✓	T
Pediatric Emergency Drug List	02075	✓	T
Pharmacokinetic Parameters from Serum Drug Concentrations	01878	✓	
N900 Veterinary Sciences			
Dairy Ration to Meet Energy, Protein and Mineral Needs	03152	✓	T

P000 Misc. Technical Applications

P000 Misc. Technical Applications

		Available for HP-41	HP-71
P000 Misc. Technical Applications-Con't			
"Shackle" Encode/Decode	02860	✓	
Aerobic Points and Caloric Requirements for Runnihg	01185	✓	T
Aeronautical Radionavigation Frequencies (ARF)	03081	✓	T
Astrological Chart Printer	01210	✓	
Athletic Endurance Equation	01023	✓	T
Banner	00530	✓	
Bar Graphs With the HP 82905B Printer	03138	✓	
Bicycle Commuter Computer	01017	✓	T
Blind Numerical Operations *1	00499	✓	T
Blow Your Stack: a Ten-Fold Stack for 41C	00768	✓	T
D=RT Calculations	00744	✓	T
Display Format Restore	00607	✓	T
Dive Tables	02990	✓	
Fit	01255	✓	T
Frequencies of Musical Pitch–Equal-Tempered Scale	00958	✓	T
Greek Alphabet	00804	✓	
HP-41 TO HP 9114A Utility	09114	✓	
Hebrew Typewriter	01233	✓	
High Resolution Plotter	00763	✓	
Label Storage	01093	✓	T
League Table	00595	✓	
Long Distahce Phone Call Timer	01369	✓	T
Musical Composer (complete)	00312	✓	T
Musical Scales–Frequencies	00911	✓	T
Pitch to Frequency	01077	✓	T
Pseudo-Talk for the Speech Handicapped	01074	✓	T
Radio Direction Finding Accuracy	01498	✓	T
Script Letters	02749	✓	
Sorting Program	03102	✓	T
Step Test of Aerobic Capacity: U.S. Forest Service Method	01024	✓	T
Tones and Semi-Tones	01052	✓	T
Triads, Chords of the Seventh and Chords of the Ninth	00708	✓	T
P100 Aviation			
Aerial Photography, Mapping Percent of Overlap, Frame	02750	✓	T
Aircraft Position	00584	✓	T
Altitude Versus DME Reading For Instrument Approaches	02677	✓	T
Cruise Optimization	00836	✓	T
Flight Computer System	01527	✓	
Flight Planning and Management	00701	✓	
Flying	01319	✓	T
Flying IV Conversions	00667	✓	T
Load Capacity of Hot-Air Balloons	00968	✓	T
Navigation Computations	03197	✓	T
Time, Fuel, and Distance to Climb	02381	✓	
Wind Triangle	00521	✓	
Wind Triangle	02707	✓	T
Wind Triangle	01046	✓	T
P102 Avigation			
Aeronautical Radionavigation Frequencies (ARF)	03081	✓	T
Critical Field Length for Jet Aircraft	01978	✓	T
DME With Approach Timer and Wind Triangle	02427	✓	
Density Altitude	00673	✓	T
Distance and Direction	01745	✓	T
Enroute RNAV Great Circle Navigation	00352	✓	T
FAA AC 90-45A Computation of Geodesic Information	01864	✓	T
Interactive Flight Information Manager	01804	✓	T
Lat/Lon to or from Bearing/Distance	01834	✓	T
Low Level Flight Planning	03094	✓	
Magnetic Variation in Australia	03017	✓	T

		Available for HP-41	HP-71
P102 Avigation-Con't			
Preflight Planning	01710	✓	T
Pressure Navigation	02659	✓	T
RNAV	01353	✓	
Tacan Point to Point Navigation	03393	✓	T
Tacan Point to Point With in Flight Wind Calculations	02213	✓	
Vortac/Tacan Point to Point Navigation	01829	✓	T
P104 Aircraft Operation			
Aeronautical Radionavigation Frequencies (ARF)	03081	✓	T
Aircraft Range	00832	✓	T
Engine Trend Monitoring Program for PT6A-11/21/25/27/28	02011	✓	T
General Aircraft Weight and Balance	00719	✓	T
P200 Chronology			
Calendar Events by Month (Events)	02249	✓	
Tropical Year Calculations	02419	✓	T
P202 Date/Calendar			
'Friday'; An Appointment Reminder	03223		✓
Calculation of Easter Sunday	02680	✓	T
Calendar	00437	✓	T
Calendar Functions	00321	✓	T
Calendar Functions: Numeric	03221		✓
Calendar Printer, for any month of any year	02462	✓	T
Calendar Printout Using 82905B Impact Printer	02506	✓	
Calendars	01872	✓	T
Complete Christian-Era Calendar	01347	✓	T
Complete Holidays	01031	✓	T
DOY and M-D	02768	✓	
Date Calculator	02625	✓	
Date: Counting by Weekdays	02259	✓	T
Days Between Dates	03435	✓	T
Epact & Golden Number	03034	✓	T
Holidays	00439	✓	T
Islamic Calendar	00764	✓	T
Jewish Holidays	00323	✓	T
Jewish-Common Era Calendar Conversions	02222	✓	
New Moon and Full Moon Day of Month (Improved)	02089	✓	T
Select Calendar Number from Gregorian or Julian Input Year	01844	✓	T
Supercalendar: Seven Million Days - Past, Present & Future	02299	✓	T
The Ultimate Calendar - A.D. & B.C.	01593	✓	T
Working Days Between Dates	01963	✓	
Working Days Calendar Functions	02529	✓	
Worldwide Calendar and Time	02531	✓	T
P204 Time			
Analemmic Sundial Design	01865	✓	T
Appointment Calendar	01269	✓	
Four-Channel Controller	01273	✓	
Lawn Watering Timer	02141	✓	T
Logbook	01274	✓	
Long Distance Time and Charges	01943	✓	
Mass Storage Time and Date	03335	✓	
Playback Programmable Timer	01276	✓	
Sundial	00579	✓	T
Sunrise, Sunset and Twilight from 1900	00508	✓	T
Telephone Call Monitor for the United Kingdom	02782	✓	
Time Counter	02893	✓	T
Time Zone Convertor	01537	✓	T
Timetable	00482	✓	T
Travel Time Measurement and Analysis	02838	✓	
Trip Computer	02929	✓	
Tropical Year Calculations	02419	✓	T

		Available for HP-41	HP-71
P204 Time-Con't			
World Time Converter	00481	✓	T
P300 Marine Navigation			
Automatic Selection Fix	01709	✓	T
Celestial Fix or Running Fix	01384	✓	T
Celestial Sight Reduction	00638	✓	T
Continuous Sun Azimuth	02696	✓	
Coriolis Force on ULCC's	03277	✓	T
Distance off Great Circle Track	02243	✓	T
Fix From Two Sextant Readings	01432	✓	T
Fix from Two Objects	02204	✓	T
Grand Traverse or Round 'Square' Robin	02208	✓	T
Great Circle Direction Converted To Mercator Direction	02361	✓	T
Great Circle Sailing	02266	✓	T
Lan Error Minimization	00347	✓	T
Lat/Lon from Sun Rise/Set Times without Sextant or Almanac	01760	✓	T
Latitude by Meridian Altitude	02907	✓	
Lines of Position	01148	✓	T
Local Apparent Noon	01146	✓	
Local Apparent Noon	02651	✓	
Longitude Solution	02265	✓	T
Man. Radiogoniometer Position Calculations w/3 Measurements	01910	✓	T
Mercator Sailing	02206	✓	T
Monthly Tide Predictions	01877	✓	
Most Probable Position using the 'Least Square Method'	03131	✓	
Navigation Package	00511	✓	T
Navpac for Yachtsmen	00982	✓	
Off Shore Navigation For Sail Racer/Cruisers	02479	✓	T
Radar Plotting with Timer	01908	✓	
Ragman	01372	✓	T
Rhumb Line Sailing	02209	✓	T
Sea Passage - Printing Option	02786	✓	
Sight Reduction and Automatic Selection Fix	01939	✓	T
Sight Reduction and Most Probable Position	01284	✓	T
Solar Coordinates	02961	✓	T
Star Identifier and Celestial Body Locator	01145	✓	
Sumner Line of Position	02205	✓	T
Sunrise and Sunset	02697	✓	
Sunrise, Sunset and Civil, Nautical & Astronomical Twilight	01950	✓	T
The Sailings	01373	✓	T
Tidal Current Plotting	02939	✓	
Tidal Prediction Curve	03276	✓	
Tide Calculations	01437	✓	
Tide Predictions	01419	✓	T
Time Solution	02550	✓	T
Time and Altitude on Prime Vertical	02302	✓	T
Traverse Sailing	03345	✓	T
USPS Navigation Course Checker	02635	✓	T
Voyage Planner	01147	✓	T
P302 Ship Stability			
'Respla' Planning Regime	01254	✓	T
Displacement, Trim and Righting Arm Curve for Deck Barge	00748	✓	
Nevins's Scantling Rules For Wooden Yachts	02934	✓	
Planning Boat Power Prediction	01164	✓	T
Plot of Cargo Stress on Ship	00535	✓	T
Ship's Stability Calculation	03250	✓	T
Tanker Drafts	00536	✓	T
Tanker Loading	00534	✓	T
Tidal Prediction Curve	03276	✓	

P000 Misc. Technical Applications

		Available for HP-41	HP-71
P302 Ship Stability-Con't			
Twin Rudder Settings - Ackermann Principal	01920	✓	T
Vessel Stability Calculation	03090	✓	T
Wind Capsize Point for Multihulls	02015	✓	T
P304 Yachting			
Coastal Navigation by Two Bearings	01430	✓	T
Herreshoff's Rules for Wooden Yachts	02944	✓	
PHRF Race Results	02251	✓	
Sailing-Force Plot	01606	✓	
Tide Calculations Heights, Time & Depth of Water to Low Tide	02232	✓	T
P400 Photography			
B&W Reciprocity Curve Data	01392	✓	T
Camera Lens Focus	02819	✓	T
Close Up and Depth of Field Solutions	02214	✓	T
Development Calculator For Black and White Films	02224	✓	T
Enlarger Settings	01286	✓	T
FDT - Film Developing Timer	02067	✓	T
Find Focal Length & Sets Camera Settings for Fixed Image	01042	✓	T
Find Focal Length & Sets Camera Settings for Fixed Object Pl	00970	✓	T
INCR	03018	✓	T
Manual Electronic Flash Calculator	02203	✓	T
Photographer's Log	01866	✓	
Print Time for Enlargements or Paper Speed Change	01780	✓	T
Slide Performance Rating and Sorting	01172	✓	
Solar System Exposures for Astro-Photography	01283	✓	T
Temperature Correction Filters	02194	✓	T
Tungsten Lamp Characteristics	02082	✓	T
Vivitar 283 Flash Guide Number & F-Stop Computations	00918	✓	T
P500 Special Information Applications			
ASCII File Viewing and Editing on the 41-CX	03119	✓	
Address Book	01599	✓	
Banner	03180		✓
Bar Code Generator	01644	✓	
Calculation for Cryogenic Processing	02144	✓	
Character Set LEX File Generator	03183		✓
Circle and Pie Graph Chart Calculations	03260	✓	T
Customization Utilities (CUSTUTIL)	03184		✓
Diary	03459		✓
Dictionary/Data Base	03125	✓	
Direct Execution of HP-41 Mass Storage Files By The HP-71	03471		✓
Editex	02154	✓	T
Encode: Calculator Cryptography Made Easy	02646	✓	T
Extended Showport	03185		✓
Greek Alphabet	01553	✓	
Grinding Mill Power Draw	02835	✓	T
Gunning's Verbal Fog Index	03317	✓	T
HP-41 to HP-71 Mass Storage Program Conversion	03193		✓
HP-41/HP-2225B Program Bar Code	03246	✓	
I.V. Label-Generating Programs	03144	✓	
Inverse Characters for the HP-71	03427		✓
Japanese Katakana	01571	✓	
K-Means Algorithm	03256	✓	
Key Assignments	02127	✓	T
Keyboard Is	03194		✓
LEX File Utilities Pac	03191		✓
Multi Width ASCII File Printout on HP 82143A and HP 82162A	03314	✓	
Numeric Barcode For the 82162A Printer	02264	✓	
Phone Book/Area Codes	02039	✓	

		Available for HP-41	HP-71
P500 Special Information Applications-Con't			
Phone Directory II	01921	✓	
Printing HP-41 Program Bar Code With HP 82905B Printer	02772	✓	
Questionaire or Interview Response Tabulation 99x260x5	03229	✓	
ROMAN 8 Character Set Lexfile	03187		✓
ROWCOL	03178		✓
Running Clock Display	03181		✓
Simple and Enhanced Key Redefinition	03186		✓
Synthetic Programmer	03079	✓	
Telephone Directory	03249	✓	
Telephone Directory	03409	✓	
Telephone List	01479	✓	T
Text File Utilities (TEXTUTIL)	03182		✓
Video-Calc	02431	✓	
P502 Data Bases/Files (non-programs)			
Column Operations and Data Retrieve	03297	✓	T
P600 Subroutine Packages			
Alphabetic Sort	01772	✓	
Device Independent "Format" Commands	03075	✓	
Extended Functions Extended	02176	✓	
HP-2225B Printer Mode Controls "PRINTSET"	03366		✓
Save and Restore Machine State	02518	✓	T
Signal Processing - Fast Fourier Transform	01500	✓	T
Storage Register Manager	02803	✓	T
Video Bar Graph	02168	✓	
Video Cursor Control and Text-Writing Routines	02229	✓	
Video Output Routines: Text-Writing and Special Effects	02795	✓	

R000 Probability and Statistics

Analysis of Variance With Factorial and Transforming Options	03045	✓	T
Combinational and Variational Calculations	03062	✓	T
Conditional Probabilities By Baye's Rule	03332		✓
Duncan's Multiple Range Test For Equal/Unequal Replications	02306	✓	T
Error Calculations	02305	✓	T
Error Propagation (4-Function)	00644	✓	T
Exponencial Curve Fit	02967	✓	T
K LSD Test For Significant Difference Comparisons of Means	03044	✓	T
LIN6R	03080	✓	T
Linear Regression	02968	✓	T
Logarithmic Curve Fit	03028	✓	T
Mann-Whitney Statistic	01116	✓	T
Markov Chain, Discrete Time	01582	✓	T
Mean, Standard Deviation, T-Statistics and T-Distribution	00651	✓	T
Multi-Channel Queues	00682	✓	T
Permutations and Combinations with Extended Limits	01968	✓	T
R100 Analysis of Variance			
1, 2,3 Way ANOVA with Multiple Range Test (Scheffe)	01473	✓	T
2-Way Anova No Reps With Row and Col Stx (Avg, S, Min, ...	02994	✓	
ANOVA: Split-Plot and Split-Split-Plot Designs	03450	✓	T
Analysis of Variance of 2**n Full Factorial Designs	01176	✓	T
Analysis of the Latin Square Design	03415	✓	T
Anova and All Significance Tests of Simple Regression	00780	✓	T
One and Two Way Analysis of Variance	02632	✓	T
Treatment Component Sum of Squares	03397	✓	T

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R100 Analysis of Variance-Con't			
Two Way Analysis of Variance with Interactions	00960	✓	T
Two Way Analysis of Variance with Replicates	01557	✓	T
R200 Curve Fit/Regression/Correlation			
2D Curve Fitting	03098	✓	T
Auto Regressive Power Spectra, Yule-Walker Method	02270	✓	
Chebyshev Polynomial Curve Fit	01084	✓	T
Correlation Coefficient Statistics	00822	✓	T
Correlation Matrix Storage	02120	✓	T
Curve Fit & Automatic Plot Best Fit for Polynomials to 1	01400	✓	
Curve Fit and Plot-Best Fit-Up to 4th Degree Polynomial	01032	✓	T
Curve Fit for 12 Different Functions	02132	✓	T
Curve Fit-Best Fit-Nine Curves	00943	✓	
Curve Fitting – with Automatic Type Selection	00477	✓	T
Curve Fitting With Confidence Intervals	03334	✓	
Curve Fitting with Predictions for X and Y	01974	✓	T
Finding Best Curve Fit Among Twelve Equations	01637	✓	T
Fitting Polynomials of Degree M to Data	00609	✓	T
Gram-Schmidt Orthogonalization of Matrices	03341		✓
Kendall's Independence Test	03440	✓	T
Least Squares Circle Fitting	03434	✓	
Least Squares Polynomial Curve Fit	00860	✓	
Linear Least Square Fit With Confidence Limits Plot	03337	✓	
Linear Regression Confidence Intervals	00917	✓	T
Linear Regression Package 1	00438	✓	
Linear Regression Package 2	00473	✓	T
Linear Regression Package 3	00567	✓	T
Linear Regression Package 5	00622	✓	T
Linear Regression Package 6	00623	✓	T
Linear Regression Through a Single Point	02933	✓	T
Linear Regression Y=MX+B With Standard Errors	01203	✓	T
Linear Regression with Standard Deviations	02393	✓	T
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Matrix Least Squares for Linear Models	02078	✓	
Modified Crescant Curve Fitting	00341	✓	T
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Multiple Linear Regression	00555	✓	
Multiple Regression 1	00741	✓	T
Multiple and Polynomial Regression	01398	✓	
Non-Linear Curve Fit Using Function Minimization	01333	✓	T
Non-Linear Error For Curve Fit	02438	✓	T
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P.D.F. Fitting 2	00624	✓	
PBEGA	03455	✓	T
PNLN	03451	✓	T
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Piloted Linear Regression	00397	✓	T
Polynomial Curve Fitting	00398	✓	T
Polynomial Curve Fitting	01782	✓	
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Quadratic Curve Fit	01575	✓	T
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R000 Probability and Statistics

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R200 Curve Fit/Regression/Correlation-Con't			
STATS	03456	✓	
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Spearmans Rank Correlation Coefficient	02650	✓	T
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Surface Regression 2	01208	✓	
Two-Independent : One-Dependent Variable Linear Regression	03342	✓	
Two-Variable Multi-Regression	00389	✓	
Universal Curve Fit	02136	✓	T
Universal Table Generator Max-Min-Zero-Plot	02765	✓	T
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Y=CX**A+DX**B Least Squares Regression	00471	✓	T
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Exam Score Distribution	01250	✓	
Geometric Mean With Standard Error	02799	✓	T
Gini Coefficient of Concentration	01249	✓	T
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PANSOC-Package for Analysis of Statistics on Calculators	02130	✓	
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Random Number Generator Test	02580	✓	T
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Spread Sheet	02613	✓	T
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Statistics For One or Two Variables	03331	✓	T
Statistics For Two Variables	03083	✓	T
Statistics for One Variable	03036	✓	T
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Survival Analysis by the Actuarial Life-Table Method	02242	✓	T
Tally Opinionaires and Report Writer	03013	✓	
Ten Bin Histogram with Alphanumeric Labeling	00669	✓	T
Ten Class Histogram with Distribution Fit and Plotting	01711	✓	
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Youden Paired Sample Analysis	00794	✓	T
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Assessing Significance in a Fourfold Table "2x2"	03296	✓	T
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R400 Non-Parametric Inference-Con't			
Kendall's Independence Test	03440	✓	T
Kolmogorov-Smirnov Two-Sample Test	03323	✓	
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Binomial Distribution	00626	✓	T
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T000 Science

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V300 Psychology			
ESP Tester and Trainer	01826	✓	T
Questionaire or Interview Response Tabulation 99x260x5	03229	✓	
Street Consumption Research	02972	✓	T

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02378 01476 02379 02196
Veenstra, K. 01551
Velez, M.P. 01182
Velez-D, G.A. 01821
Veverka, M. 01968
Vianna, B.R. 01407 01582
01249 00640
Vivequin, P. 02548
Vo, P.N. 03198 03199
Vollberg, S.R. 00785
Volny, N.J. 01503
Volpe, P.J. 03137 03280
Voltz, D.A. 01504
Vranjes, P. 03403
Vyvadil, P.J. 01181
Wagner, M.P. 02510
Walen, J. 00637 01178
00815
Walker, K.F.D. 00647 00635
Wallace, K.J. 02380
Walsh, M. 02362 01875
02364 00782 02363
Walters, J.A. 01408
Walton, D.D. 02738 00334
02735 00715 00714
Walton Jr, T. 01581
Wandzura, S. 00383
Warner, M.J. 02515 02970
02516 02638 01439
Warren, R.E. 02487 02486
01828 02837
Watson, A. 02433 02624
Way, S.E. 02827
Wearn, P.R. 02203
Wease, W.H. 00427
Webb, I.A. 01480 00470
Webb Phd, B.C. 01440
Weber, G.C. 01151
Wehnau, R.A. 00748
Weikel, D.A. 00749 01117
Welker, B. 02733
Welzel, R. J. 03393 03094
Wentworth, C.B. 01793
Wesseler, D. 02646
West, J.D. 00716 01602
Westacott, D.J.C. 00893 00892
Westcott, D.B. 01481 00508
Wheeler, P.N. 00405 00783
00717

White, S.J. 02882 01277 02128 01409 01176 02569 01224
Whitesell, G.L. 01045
Wickenberg, J. 01093 03314
Wickes, W.C. 03193
Wieczorek, D.H. 01687
Wight, C. 00638 00332 00417 00433
Wile, D. 01410
Wiley, J.E. 01025
Wilke, J.A. 00718 00720
Willers, C.J. 02387
Williams, R.C. 01989 01324 02114 02009 01932 01603
Wilson, R.G. 03157 00719 03121 03122 01864
Windhorn, A. 00546
Winkel, V. 02971 01604 02828
Winters, L.R. 00861
Witkowski, A.U. 02043 02940 02044 02999
Wittmann, J.C. 01688
Wlaschin, P.D. 01698
Woelper, H. 02138 02132 01592 02106
Woicik, S. 01482
Woldering, J.F. 01848 02046 01943 02032 01728
Wolf, M.A. 01152 01026
Wolfe, J.R. 00876
Wolfer, J. 01809
Wong, O. 02896 02609 02846 02908 02894 02607 03014 02847 03339 02891 02895 02606 02890 02942 02943 03016 02608 02893 03015 02610 03147 02845 02892 03283 02874
Woo, I. 01027
Wood, S. 00750 00752 00751 01153 00639 00956
Woodhouse, D.F. 01583 01288 01606 01605
Woodruff, M.R. 01317 02278 02063 02381 02049
Wooley, R.J. 02611 02083 01207 00842 01693 02143 01180 01962 01028 02073
Woolston, B. 02931
Wright, W.E. 02829 02529 01313 02200 01441
Wurst, W.C. 02126
Wurstner, J.A. 00895
Wyckoff, R.C. 03372 03408
Wyles, H.E. 01607 01267 00753
Wymer, J.R. 01268
Yada, Q.L. 01689 01740 01411 01690
Yamada, R.T. 01505
Yannone, P.J. 01889
Yarid, A.D. 00406
Yat, D.L.T. 02565
Yates, R.A. 01520
Yeh, V. 00979
Yoshimura, M.T. 02429
Young, E. 03449
Zawadzki, A. 01686 01061
Zeichick, A.L. 01850
Ziff, R.M. 01298
Zimmerman, R.L. 01584
Ziran, G.K. 02097 02409 01941 02455 01835 02184 01981
Zisman, E.D. 03066
Zonneveld, E. 03119 03416
Zuckor, J. 01739
Zuiker, R. 02994 02830 02547
Zullo, R. 03306
de Lacroix, G.L. 03158
du Pont, W.C. 03159
van Rooyen, L. 01601
van Santbrink, F.F. 01678
van der Heijde, P.K.M. 01727

00199 Plane Frame Analysis
by R.L. Mayo, Dixon, MO

This program will compute joint displacements, support reactions and member-end actions for place frames with joint and/or member loads. The output can either be displayed to the HP-71B or printed on an HP Think Jet Printer or the HP 82905B Printer. The input for the program is: No. of members, joints, restrained joints; joint coordinates, member properties, support restraints, joint and member loads. **Necessary Accessories for HP-71:** 9114A Disc Drive; card reader.

Steps: HP-71 Bytes: 009366

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	00199-71-7	N/A	$20

00308 Diminishing Increment Sort
by M. Hale, Ames, OH

Sorts from 3 to 46 numbers using the sort method (diminishing increment) due to D.L. Shell. Illustrates the indirect addressing capability of the stack to save space and speed sort. Larger sets may be sorted with Memory Modules. Increments are of the form 2**k-1. Quite fast. **Necessary Accessories for HP-41:** None

Steps: 99 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00308-41-7	$10	$11
FOR HP-71*	00308-71-4	N/A	$12

00309 Musical Reverse
by D.E. Farmer, Houston, TX

"Musical Reverse" is a game program. The object is to order a random sequence starting from the left. The tone function of the 41C provides the "music" as the digits are sorted. **Necessary Accessories for HP-41:** None

Steps: 97 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00309-41-5	$10	$11
FOR HP-71*	00309-71-2	N/A	$12

00310 Biorhythms with Prompts
by C.R. Ammerman, Falls Church, VA

Written with prompts on HP-41C makes program much easier to use. Calculates point on cycle for physical (23), emotional (28), and intellectual (33-day) cycles for any date given birthdate. Easy to step ahead 1 day. Can handle fractional days. Display review key. **Necessary Accessories for HP-41:** None

Steps: 89 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00310-41-3	$10	$11
FOR HP-71*	00310-71-0	N/A	$12

00311 Crack the Vault
by R.S. Altman, Clearlake, CA

A bank vault, containing millions of dollars, has been accidentally locked. You must open it quickly or lose your job. Can you do it? **Necessary Accessories for HP-41:** None

Steps: 154 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00311-41-1	$10	$12
FOR HP-71*	00311-71-8	N/A	$14

00312 Musical Composer (complete)
by R.S. Altman, Clearlake, CA

With this program, your calculator can compose music! The program selects an appropriate tempo and then calculates the pitch and duration for each note or rest, which is then displayed using the alphanumeric capabilities of the HP-41C. You may select any number of beats per measure and vary the length of a note by using the "add-abeat" feature. **Necessary Accessories for HP-41:** None

Steps: 203 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00312-41-9	$10	$12
FOR HP-71*	00312-71-6	N/A	$14

00314 Work Sampling
by R.A. Schwartz, Arcadia, CA

Measures the proportion of a worker's time spent in up to ten activities by means of a randomly timed beep. Provides an estimate of the accuracy of the results. **Necessary Accessories for HP-41:** None

Steps: 74 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00314-41-5	$10	$11
FOR HP-71*	00314-71-2	N/A	$12

00315 Gross Profit Margin
by Curry Bob, Austin, TX

This program computes gross profit margin, selling price or cost, according to the formula: GPM (%)=100(S.P. Cost)/S.P. **Necessary Accessories for HP-41:** None

Steps: 65 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00315-41-2	$10	$11
FOR HP-71*	00315-71-9	N/A	$12

00316 Diet Planning (With Output Labeling)
by R.S. Altman, Clearlake, CA

Most diet plans only count calories for a fixed-calorie input, regardless of an individual's caloric requirements. This program estimates an individual's basal metabolism from height, weight, age and sex. Then required calories/day for maintaining (or changing) weight are estimated using hours/day spent at each of five activity levels. This program is based on HP-97 program #01074D. **Necessary Accessories for HP-41:** None

Steps: 171 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00316-41-0	$10	$12
FOR HP-71*	00316-71-7	N/A	$14

00317 Quicksort I
by M. Hale, Ames, OH

Numbers are sorted in ascending order by this implementation of the quicksort algorithm due to C.A.R. Hoare. Data is partitioned into smaller sets which are more easily sorted by the straight insertion sort subroutine (included). For larger randomly ordered sets, run time is exceptionally fast. E.g., 192 numbers takes about 10 minutes or so. **Necessary Accessories for HP-41:** Memory Modules necessary for sets larger than about 23.

Steps: 137 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00317-41-8	$10	$12
FOR HP-71*	00317-71-5	N/A	$14

00319 Installment Sales Method
by Curry Bob, Austin, TX

One way to account for payments due at some future time when it isn't certain that the payments will be received is the installment sales method. This program yields the information necessary for a small business to account for uncertain future payments. **Necessary Accessories for HP-41:** Printer

Steps: 106 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00319-41-4	$10	$12
FOR HP-71*	00319-71-1	N/A	$14

00320 Simplex Algorithm
by L.A. Esterhuizen, Johannesburg, South Africa

Solves classical linear programmes using the simplex 2-phase method for maximize and minimize cases. User formulates the problem according to inequality constraints and on objective function for which rules are given. Program does the rest. Can handle up to 10 constraints and/or 10 variables. Program performs pivotal transformations and outputs optimum solution (if it exists), max/min z valve, shadow prices. Options include printout of matrix each iteration, editing capability, auto size check, fast execution. **Necessary Accessories for HP-41:** Two Memory Modules Minimum, Printer optional.

Steps: 401 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00320-41-2	$10	$14
FOR HP-71*	00320-71-9	N/A	$16

00321 Calendar Functions
by C.A. Pearce, Berwyn, IL

Given a date, this program will find the Julian day number (JD #), the day of the week (DOW) and/or the phase of the Moon (Moon) for any date from Jan. 1, 4713 BC to Dec. 31, 9999 AD. The program uses the 41C's alpha-capabilities, is adjustable for the Julian (old) or Gregorian (current) style of calendars, allows the user to select Printer on/off (using the 82143A printer) and error traps any "Feb. 29th" inputs for non-leap years. **Necessary Accessories for HP-41:** One Memory Module. Optional: Printer and Card Reader

Steps: 201 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00321-41-0	$10	$12
FOR HP-71*	00321-71-7	N/A	$14

00323 Jewish Holidays
by R.S. Altman, Clearlake, CA

The calculation of the Gregorian dates for the main Jewish holidays are precisely performed for any year from 1900 to 2099. Dates are given for Rosh Kashanah (Jewish New Year), Yom Kippur, (Day of Atonement), Passover, Chanvkah, Purim, Sukkot, Simchat Torah, and Shavuot. No knowledge of the Jewish calendar is required. **Necessary Accessories for HP-41:** One Memory Module

Steps: 309 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00323-41-6	$10	$13
FOR HP-71*	00323-71-3	N/A	$14

00324 Acid Dissociation at Given PH
by G.R. Miller, Cincinnati, OH

Given the acid dissociation constants for a polyprotic acid (one to nine equilibria) program calculates the fraction of each species present in solution at a given pH. **Necessary Accessories for HP-41:** None

Steps: 104 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00324-41-4	$10	$11
FOR HP-71*	00324-71-1	N/A	$12

00325 Amplifier Bode Plot and Solve
by R. Feigal, Seattle, WA

Given the midband open loop gain and the high and low frequency poles of an amplifier, this program will output the open loop gain and phase for any desired frequency. The program will also indicate stability directly by solving for the unit gain cross over frequency and displaying the phase at that frequency. **Necessary Accessories for HP-41:** None

Steps: 151 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00325-41-1	$10	$12
FOR HP-71*	00325-71-8	N/A	$14

00326 Molecular Weight Calculator
by D. Conklin, Corvallis, OR

Calculates molecular weight from chemical formula. Also can look up atomic number given the chemical symbol for an element, and can look up atomic weight given atomic number. **Necessary Accessories for HP-41:** None

Steps: 160 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00326-41-9	$10	$15
FOR HP-71*	00326-71-6	N/A	$18

00327 Straight Line Forced Thru Any Point
by F.C. Blachly, Hyattsville, MD

This program calculates the bearing of a least squares fit straight line forced through any given point. Predictions of new e**8 and n**8 on that line may be made from values of n and e. Coordinate pairs (n, e) may be added or deleted at any time. **Necessary Accessories for HP-41:** None

Steps: 86 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00327-41-7	$10	$11
FOR HP-71*	00327-71-4	N/A	$12

00332 Contract Bridge Scorer

by C. Wight, Brookline, MA

The program shows the score above and below the line for each side in a rubber of bridge. Totals for each side are also displayed. **Necessary Accessories for HP-41:** Two Memory Modules, Card Reader and Printer.

Steps: 432 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00332-41-7	$10	$15
FOR HP-71	NOT AVAIL		

00334 Triangle Solutions

by D.D. Walton, Cincinnati, OH

Improved triangle solver for all cases which will give standard angle configuration (ab+c) and also standard side configuration (lower case: (ab+c). **Necessary Accessories for HP-41:** One Memory Module

Steps: 253 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00334-41-3	$10	$12
FOR HP-71*	00334-71-0	N/A	$14

00336 Graphics Aid Program

by P.E. Pozel, Minneapolis, MN

This program helps users generate special graphics for the HP82143A printer. Utilizing a single visually formatted input number, the user can produce dot matrices row by row, compute column print numbers, build special characters, edit his results, or create negative images. **Necessary Accessories for HP-41:** Printer

Steps: 73 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00336-41-8	$10	$11
FOR HP-71	NOT AVAIL		

00337 Missing Number Division

by R.S. Altman, Clearlake, CA

This program helps the user improve his/her division. Problems are displayed in one of three formats: 1) z/y=?, 2) z/?=x, 3) ?/y=x. You can change the level of difficulty by changing the maximum number (of x, y). This program also offers: recording your scores; display high, low, average scores; full use of HP-41C alpha-numeric capabilities. **Necessary Accessories for HP-41:** None

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00337-41-6	$10	$12
FOR HP-71*	00337-71-3	N/A	$14

00338 Missing Number Subtraction

by R.S. Altman, Clearlake, CA

This program helps the user improve his/her subtraction. Problems are displayed in one of three formats: 1) z-y=?, 2) z-?=x, 3) ?-y=z. You can change the level of difficulty by changing the maximum number (of x, y). this program also offers: recording your scores; display high, low, average scores; full use of HP-41C alpha-numeric capabilities. **Necessary Accessories for HP-41:** None

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00338-41-4	$10	$12
FOR HP-71*	00338-71-1	N/A	$14

00339 Missing Number Multiplication

by R.S. Altman, Clearlake, CA

This program helps the user improve his/her multiplication. Problems are displayed in one of three formats: 1) x*y=?, 2) x*?=z, 3) ?*y=z. You can change the level of difficulty by changing the maximum number (of x, y). this program also offers: recording your scores; display high, low, average scores; full use of HP-41C alpha-numeric capabilities. **Necessary Accessories for HP-41:** None

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00339-41-2	$10	$12
FOR HP-71*	00339-71-9	N/A	$14

00340 Missing Number Addition

by R.S. Altman, Clearlake, CA

This program helps the user improve his/her addition. Problems are displayed in one of three formats: 1) x+y=?, 2) x+?=z, and 3) ?+y=z. You can change the level of difficulty by changing the maximum number (of x, y). This program also offers: recording your scores; display high, low, average scores; full use of HP-41C alpha-numeric capabilities. **Necessary Accessories for HP-41:** None

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00340-41-0	$10	$12
FOR HP-71*	00340-71-7	N/A	$14

00341 Modified Crescent Curve Fitting

by N.C. Shammas, Richmond, VA

Program fits y=a+b exp(-/c x), given scattered sets of (x, y) pairs. Uses an iterative procedure. **Necessary Accessories for HP-41:** Two Memory Modules and Card Reader

Steps: 193 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00341-41-8	$10	$12
FOR HP-71*	00341-71-5	N/A	$14

00342 Symmetrical Linear Equations

by B.W. Clare, Coolbellup, Western Australia

Subroutine Symlin. A subroutine to solve linear systems with a symmetric matrix by Gaussian elimination. Symmetry allows compact storage, and minimizes the number of operations. Systems of size 2x2 to 5x5 (no Memory Modules) or 22x22 (four Memory Modules) can be solved. The subroutine is useful for problems arising from regression analysis. No Memory Modules required for example. **Necessary Accessories for HP-41:** Memory Modules according to the size of system.

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00342-41-6	$10	$12
FOR HP-71*	00342-71-3	N/A	$14

00343 Linear Systems (Subroutine Lin)

by B.W. Clare, Coolbellup, Western Australia

Subroutine Lin. Solves systems of linear equations by Gaussian elimination without pivoting. Systems of size 2x2 to 4x4 (no Memory Modules) or 15x15 (four Memory Modules) may be solved. No Memory Modules required for example. **Necessary Accessories for HP-41:** Memory Module according to size of system.

Steps: 174 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00343-41-4	$10	$12
FOR HP-71*	00343-71-1	N/A	$14

00347 Lan Error Minimization

by C.G. Adams, Sun Valley, ID

Given a sequence of sun shots made before, during and after local apparent Noon, the program determines the most likely time of Lan and the sextant altitude at Lan by fitting a parabola to the data with the mean square error minimized and the slope of the directrix constrained to be infinite. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 180 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00347-41-5	$10	$12
FOR HP-71*	00347-71-2	N/A	$14

00348 Monostable Multivibrators

by R.W. Keil, Pacifica, CA

This program calculates the parameters of IC's 74121, 74122, 74123, 9600, 9601 and 555 in the monostable mode and of IC 555 in the astable mode. Given any two of the following parameters; r, c, and t, it calculates the third variable, signalling if it is beyond the operating range of the specific IC. For the astable mode it calculates the 4th variable given 3 of the following ra, rb, c and f. **Necessary Accessories for HP-41:** None

Steps: 273 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00348-41-3	$10	$13
FOR HP-71*	00348-71-0	N/A	$14

00349 Radar Range Multipath Calculations

by W. Dixon, Glen Burnie, MD

This program solves for the effects of multipath between a radar source and target. Calculations include the time delay between the direct and reflected paths of the radar signal. **Necessary Accessories for HP-41:** None

Steps: 159 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00349-41-1	$10	$12
FOR HP-71*	00349-71-8	N/A	$14

00350 Bedside Hemodynamic Data

by J.K. Garman, Stanford, CA

This is an interactive program which asks the user for basic patient data from arterial, central venous, and pulmonary artery catheters. It then provides a list of derived values including cardiac index, stroke index, stroke work indices, vascular resistances, and body surface area. **Necessary Accessories for HP-41:** One Memory Module

Steps: 204 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00350-41-9	$10	$13
FOR HP-71*	00350-71-6	N/A	$14

00351 Area Under Curve

by N.C. Shammas, Richmond, VA

If you are tired of not being able to use Simpson's Rule for numerical integration, because your data does not lie on equal interval, then this program is just for you! It uses Lagranglan Interpolation to yield an easily integrated equation. With simple changes, you can also use it as a subroutine or merge it with another program. **Necessary Accessories for HP-41:** Card Reader

Steps: 99 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00351-41-7	$10	$11
FOR HP-71*	00351-71-4	N/A	$12

00352 Enroute RNAV Great Circle Navigation

by J.M. Krasno, Elk Grove Village, IL

This program calculates great circle distance and initial magnetic course from present position to destination. It also calculates distance off course. It uses VOR radial and DME information to compute present position or destination waypoint. Can update departure point to present position. **Necessary Accessories for HP-41:** One Memory Module

Steps: 198 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00352-41-5	$10	$12
FOR HP-71*	00352-71-2	N/A	$14

00353 Radar Receiver Matched Filter Design-Dolph Chebyshev

by W. Dixon, Glen Burnie, MD

This program provides a basis for designing a radar FM pulse-compression receiver. Utilizing the Dolph-Chebyshev distribution function minimum values for target range resolution, spectrum bandwidth, and time sidelobes can be calculated to be used as standards in designing the linear FM radar receiver. **Necessary Accessories for HP-41:** None

Steps: 201 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00353-41-3	$10	$12
FOR HP-71*	00353-71-0	N/A	$14

00356 Viscosity Conversions

by A.C. Attwell, Durban, South Africa

This program will convert between any two of the following viscosity units in either direction: a) Kinematic Centistokes (CST), b) Saybolt Seconds Universal (SSU) at any user-defined temperature, c) Redwood No. 1 seconds at 60 deg C (140 deg F), d) Redwood No. 2 Seconds, e) Saybolt Seconds Furol (SSF) at 50 deg C (122 deg F), f) Saybolt Seconds Furol (SSF) at 98. deg C (210 deg F), g) Engler Degrees (deg E). 1 main routine and 6 subroutines load any or all-one for each unit. Fully prompted inputs and labelled outputs. **Necessary Accessories for HP-41:** Card Reader

Steps: 320 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00356-41-6	$10	$15
FOR HP-71*	00356-71-3	N/A	$18

00357 Sedimentation Rates

by H.Y. Rhyu, Seal Beach, CA

A particle falling in fluid under gravity accelerates until drag force balances gravitational force, after which it continues to fall at a constant velocity known as the terminal velocity. This program solves for any one unknown, interchangeably, given the other five variables in Stoke's formula. **Necessary Accessories for HP-41:** None

Steps: 101 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00357-41-4	$10	$12
FOR HP-71*	00357-71-1	N/A	$14

00359 Polynomial Approximations to Four Common Functions

by M. Potter, Saratoga, CA

Contains four subroutines which calculate the gamma function, error function, normal and inverse normal distributions. The subroutines use polynomial approximation to obtain fast and accurate answers. **Necessary Accessories for HP-41:** None

Steps: 176 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00359-41-0	$10	$12
FOR HP-71*	00359-71-7	N/A	$14

00360 96 Point Gauss-Legendre Integration

by J. Dowson, Ottawa Ontario, Canada

This program will compute approximations for integrals over finite or infinite intervals by the 96 point Gauss-Lengendre Quadrature method. (The programs are able to be called as subroutines as well) the function must be explicitly known. (typical accuracy: 8-9 figures.) **Necessary Accessories for HP-41:** Card Reader and two Memory Modules.

Steps: 132 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00360-41-8	$10	$15
FOR HP-71*	00360-71-5	N/A	$18

00361 Wizard of Pinball

by C.A. Pearce, Berwyn, IL

This program simulates the play of some of the new electronic games, including 2x, 3x and 5x outbonus, point advancing kickout holes, thumper bumpers, spinner gate, star rollovers, lane rollovers, alpha-targets, drop targets, free ball, one to four players, 5 ball games, hi-score bonus, 3 free game thresholds, full alpha-display on scoring and sounds. 'Bookkeeping' routine keeps track of cash spent on games ("25 cents" per game). Flippers included. **Necessary Accessories for HP-41:** Minimum of 3 Memory Modules. Card Reader would aid in reloading program.

Steps: 534 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00361-41-6	$10	$18
FOR HP-71	NOT AVAIL		

00363 The Step Game

by G.G. Sandoval, Metro Manila, Philippines

You and the HP engage in a strategic blocking battle. The one who can't move loses. As the challenger, you move first. This game may look like child's play but look out– the HP thinks several steps ahead. Your display becomes a TV screen to monitor your movements. **Necessary Accessories for HP-41:** One Memory Module

Steps: 145 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00363-41-2	$10	$13
FOR HP-71*	00363-71-9	N/A	$14

00364 Alphanumeric Character String Manipulations

by P.C. Jensen, Newport, RI

This program consists of several subroutines to manipulate alphanumeric character strings in the alpha-register. The entire string may be reversed, or shifted left or right any number of desired spaces. These routines easily interact with other programs by preserving the contents of the stack and require only eight data registers. **Necessary Accessories for HP-41:** None

Steps: 138 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00364-41-0	$10	$12
FOR HP-71*	00364-71-7	N/A	$14

00366 Diophantine Equations Ax+by=c

by G. Goodman, Stamford, CT

This program finds the integer solutions to the equation $ax+by=c$. The parametric forms of the solutions, $x=m+ut$ and $y=n+vt$ are displayed directly, and the coefficients m, u, n and v can be used in further studies. **Necessary Accessories for HP-41:** None

Steps: 81 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00366-41-5	$10	$11
FOR HP-71*	00366-71-2	N/A	$12

00367 Table Look-up Using Lagranian Interpolating Polynomial

by R.L. Robinson, WPAFB, OH

This program is designed for use as a subroutine to interpolate in tables of x-y pairs. The degree of the interpolating polynomial (n) can vary from zero to one less than the number of x-y pairs. This allows use in tables of a step function, such as inflation factor versus year, or tables of a continuous function, such as drag coefficient versus mach number. More than one table can be addressed by the routine, and a different value of "n" can be used for each table look up. **Necessary Accessories for HP-41:** Additional Memory Modules are required to store more than 18 X-Y pairs.

Steps: 115 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00367-41-3	$10	$11
FOR HP-71*	00367-71-0	N/A	$12

00368 Logic I:800 Lean, Digital Circuit

by E.M. Keefe, Ankeny, IA

This version of a digital circuit analyzer can handle (simulate) circuits with up to nine (inputs) (possibly more with extended memory). The program is unique in that it will also do symbolic logic (even multi-valued valued logic provided "and" = min(x, y); "or" = max(x, y)). It can thus be used to test the validity of logical arguments. The program is written so that the user may write, and key in, the simulation routine in an almost direct fashion. **Necessary Accessories for HP-41:** One Memory Module. Card Reader optional.

Steps: 112 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00368-41-1	$10	$12
FOR HP-71*	00368-71-8	N/A	$14

00369 Grade Point Averager Plus

by E.M. Keefe, Ankeny, IA

A two part program: with the first part being a standard program to figure gpa on a 4 point grading system. The second part is unique. It can use the results of the first part, or operate independently. It prompts for "GPA now", "hours earned up to now", "how many hours do you have left in a typical degree program?", "What GPA do you want to have at the end (in order to graduate Cum Laude, etc)?" It computes the GPA you must earn between now and then and then tells you how many hours of A, B, C, D grades you must acheive to get this GPA. Card Reader optional. **Necessary Accessories for HP-41:** Card Reader optional.

Steps: 147 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00369-41-9	$10	$12
FOR HP-71*	00369-71-6	N/A	$14

00370 Building Area Conversion, Net to Gross

by C. Close, Alexandria, VA

This program converts individual net areas to individual gross areas proportionally based on the net area percentage of the total net area. Program prompts for all required input. Maximum number of spaces which can be analyzed 252 (4 Memory Modules). 60 spaces possible with one Memory Module. **Necessary Accessories for HP-41:** One Memory Module

Steps: 184 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00370-41-7	$10	$13
FOR HP-71*	00370-71-4	N/A	$14

00371 Array1 Array2

by E.M. Keefe, Ankeny, IA

Array 1: given the number of rows or cols in a 2-d array, and a specific row and column designation representation, the 41C will return a single offset number for a one-dimensional array. Array 2: given the number of rows or columns in a 2-d array, and an offset number in a corresponding one-dim array, the 41C will give the row and col. Designation for the 2-d array. Card Reader optional. **Necessary Accessories for HP-41:** Card Reader optional.

Steps: 94 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00371-41-5	$10	$12
FOR HP-71*	00371-71-2	N/A	$14

00372 Gasoline Consumption Analysis

by A.C. Attwell, Durban, South Africa

This program enables a vehicle operator to keep a tank-by tank record of gasoline consumption and cost. A record is kept on magnetic data card and updated each tankful. A summary program will display/print totals to date of volume, distance and cash. It also displays/prints averages over the period concerned of consumption, cost per unit volume and cost per unit distance. Duplicate routines - metric/English. Automatic print routine. Fully prompted inputs and labelled outputs. **Necessary Accessories for HP-41:** Card Reader. Printer optional.

Steps: 340 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00372-41-3	$10	$15
FOR HP-71	NOT AVAIL		

00373 Net Present Value

by G.G. Sandoval, Metro Manila, Philippines

Given the periodic cash flows an investment generates, this program computes the NPV of the investment's cash flows. Last cash flow entered is saved for easy error correction. Program gives prompts for next step and positive NPV, and is largely self-instructing. **Necessary Accessories for HP-41:** None

Steps: 91 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00373-41-1	$10	$11
FOR HP-71*	00373-71-8	N/A	$12

00374 Standard Curve Test Analysis

by L.J. Burger, Camarillo, CA

This program produces a test analysis using a standard distribution curve. Given the mean score, the standard deviation and the maximum possible number of points on a test, the program determines the lower limits for letter grades of A, B, C and D. The program also determines the lowest possible percentage for each letter grade and the average percentage test score. Printer optional. **Necessary Accessories for HP-41:** Printer optional.

Steps: 136 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00374-41-9	$10	$12
FOR HP-71*	00374-71-6	N/A	$14

00375 Print Checkbook Listing

by Curry Bob, Austin, TX

Tabulates and prints checkbook balances and items (checks or deposits) from checkbook listing or bank reconciliation statement. Arranges by column and prints check number, deposit date, "c" or "d" as appropriate, amount of check or deposit, and balance (positive or negative). **Necessary Accessories for HP-41:** Printer

Steps: 142 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00375-41-6	$10	$12
FOR HP-71*	00375-71-3	N/A	$14

00376 Top-Row Financial Functions with Odd-Days Interest

by N. Meyers, Corvallis, OR

Performs n, i, pv, pmt, and fv calculations with a partial ("odd") period at the beginning. Allows beginning/end-of-month payments and simple/compound partial first period. **Necessary Accessories for HP-41:** One Plug-in RAM Module.

Steps: 409 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00376-41-4	$10	$14
FOR HP-71*	00376-71-1	N/A	$16

00377 Residence Time Distribution

by N.C. Shammas, Richmond, VA

This program package helps you to know how close your reactor is to the ideal PFTR or CSTR, follows the method of RTD calculations as presented by Levenspiel's "Chemical Reaction Engineering", a popular reference. **Necessary Accessories for HP-41:** Card Reader, Printer, two Memory Modules.

Steps: 233 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00377-41-2	$10	$12
FOR HP-71*	00377-71-9	N/A	$14

00378 Carbon Adsorber Design

by N.C. Shammas, Richmond, VA

Based on the surface reaction model for adsorption, the user can enter two types of breakthrough data and obtain the initial adsorptive capacity and reaction rate constant. In addition, the user can afterwards calculate any of the breakthrough concentration, time and bed height, given the other two. **Necessary Accessories for HP-41:** Card Reader

Steps: 195 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00378-41-0	$10	$12
FOR HP-71*	00378-71-7	N/A	$14

00380 Euler Angles from Direction Cosines

by K.L. Remmler, Palmdale, CA

Calculates Euler angles from direction cosines for three sets of most commonly used order of rotations. This program is compatible with and can be used in conjunction with program 00382C 'Direction Cosine Matrix'. **Necessary Accessories for HP-41:** One Memory Module

Steps: 234 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00380-41-6	$10	$12
FOR HP-71*	00380-71-3	N/A	$14

00381 Logic Through a Looking Glass

by E.M. Keefe, Ankeny, IA

New version of "Logic 2". This version follows the same logic (flowchart) as the earlier version, but has been revised to incorporate the optional use of a printer and to embody more efficient RPN coding (especially in the use of labels). The program is designed to aid the student of classical logic in the solution of syllogisms. Of interest to the logician, will be the use of a 3-valued logic system which 'solves' the syllogisms. **Necessary Accessories for HP-41:** One Memory Module

Steps: 281 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00381-41-4	$10	$14
FOR HP-71*	00381-71-1	N/A	$16

00382 Direction Cosine Matrix

by K.L. Remmler, Palmdale, CA

Calculates the direction cosine matrix for the most commonly used three sets of Euler angle rotations. This program is compatible with and can be used in conjunction with program 00380C 'Euler angles from direction cosines'. **Necessary Accessories for HP-41:** One Memory Module

Steps: 282 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00382-41-2	$10	$13
FOR HP-71*	00382-71-9	N/A	$14

00383 Rational Number Operations

by S. Wandzura, Malibu, CA

Turns HP-41C into a rational number (fraction) calculator. Features an automatic four level stack with last x register. Operations are: enter, clear x, change sign, enter integer, x<>y, roll up, roll down, last x, +, -, /, *, 1/x, x**2. Optional store and recall are included for users with a Memory Module. **Necessary Accessories for HP-41:** None

Steps: 208 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00383-41-0	$10	$12
FOR HP-71*	00383-71-7	N/A	$14

00384 Hearts Scorekeeper (With Output Labeling)

by R.S. Altman, Clearlake, CA

This program allows you to maintain the scores of up to six players, individually or with partners. After the scoring for each hand is completed, the display tells you whether to pass the cards to the right, left, across, or not at all. **Necessary Accessories for HP-41:** One Memory Module

Steps: 169 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00384-41-8	$10	$12
FOR HP-71*	00384-71-5	N/A	$14

00385 Blackjack Test Strategy 2 (With Output Labeling)

by R.S. Altman, Clearlake, CA

Empirically test your favorite Blackjack playing strategy using casino rules, number of decks of your choice, and desired bet. Rules, number of decks of your choice, and desired bet. Input each win, loss, push, blackjack, or double win/loss as you play. The HP-41C will display the following summary (labeled) at the end: number of wins/losses, etc. longest string of wins, losses, total number of hands, total $, percent won. Also: optional betting feature. **Necessary Accessories for HP-41:** One Memory Module

Steps: 250 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00385-41-5	$10	$13
FOR HP-71*	00385-71-2	N/A	$14

00386 Electrolytic Conductance (Fuoss 1975 Equation)

by B.W. Clare, Coolbellup, Western Australia

Fits concentration-conductance data to the Fuoss (1975) Equation ('F75'). An HP-41C version of part number 04713D. It is about three times faster than the HP-97 program, and much more convenient to use, as the iterating routine and experimental points are contained within the machine. After keying in the points, no further attention is necessary. **Necessary Accessories for HP-41:** Three Memory Module and Card Reader. Printer optional.

Steps: 867 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00386-41-3	$10	$19
FOR HP-71*	00386-71-0	N/A	$22

00387 Fractions

by R.J. Vaughan, Spring, TX

This program will add, subtract, multiply, and reduce fractions or convert them to mixed numbers. It will also compute the greatest common divisor or the least common multiple or convert any decimal number to a reduced fraction. **Necessary Accessories for HP-41:** None

Steps: 126 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00387-41-1	$10	$11
FOR HP-71*	00387-71-8	N/A	$12

00388 Multinumber Generator

by G.G. Sandoval, Metro Manila, Philippines

Several programs in one. One program generates successive primes starting with 1 or a user-supplied odd integer n. Another program computes the coefficients of the expansion of (x+1)**n, otherwise known as Pascal's triangle for values less than or equal to 69. A third generates Fibonacci numbers. A fourth computes log x! **Necessary Accessories for HP-41:** None

Steps: 125 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00388-41-9	$10	$11
FOR HP-71*	00388-71-6	N/A	$12

00389 Two-Variable Multi-Regression

by N.C. Shammas, Richmond, VA

This may be a program you long awaited. It deals with 2 variables b=f(a) related with 3 coefficients. You can fit them as z=a+bx+cy, you decide if z, x, y are functions of a or b, in addition to the type of transformation (ln, sqrt, 1/x...etc). It is equivalent to many programs that consider one case. **Necessary Accessories for HP-41:** Card Reader, two Memory Modules.

Steps: 330 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00389-41-7	$10	$13
FOR HP-71	NOT AVAIL		

00390 Roots of Polynomials

by N.K. Sinha, Hamilton, Canada

Real and complex roots of Polynomials of order up to 20 are evaluated using Laguerre's method having a much faster rate of convergence than the Newton-Raphson method. Global convergence to real roots is guaranteed. The polynomial is reduced using synthetic division and the process continued until all roots are determined. **Necessary Accessories for HP-41:** One Memory Module

Steps: 300 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00390-41-5	$10	$13
FOR HP-71*	00390-71-2	N/A	$14

00391 Differential Equation Systems

by B.W. Clare, Coolbellup, Western Australia

Solves systems of differential equations by memory fourth order Runge Kutta method. Requires at least one Memory Module. The maximum size of the system depends on the equations, but with simple equations and four modules would be about 40. **Necessary Accessories for HP-41:** One Memory Module

Steps: 281 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00391-41-3	$10	$13
FOR HP-71*	00391-71-0	N/A	$14

00392 Triangle Solution-Automated

by K. Jarett, Manhattan Beach, CA

This program finds the unknown parts of a triangle. You enter the known parts in arbitrary order; the program chooses the proper algorithm and generates the solution. Then you request output in any order. After key assignments are cleared this program will run on an HP-41C without Memory Modules. **Necessary Accessories for HP-41:** None

Steps: 230 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00392-41-1	$10	$12
FOR HP-71*	00392-71-8	N/A	$14

00396 Account Posting & Summarizing

by W.B. Kohlmoos, Reno, NV

This program can be used either monthly or at year-end to post accounts, total accounts, and prepare a summary for income and expense accounts. It is designed for an individual or small business as an aid in the preparation of itemized deductions for income tax purposes. **Necessary Accessories for HP-41:** Two Memory Modules, Card Reader and Printer.

Steps: 356 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00396-41-2	$10	$15
FOR HP-71	NOT AVAIL		

00397 Piloted Linear Regression

by N.C. Shammas, Richmond, VA

If you are looking for a versatile linear regression package that allows you to choose up to nine types of equations to fit your data (x, y) that you enter once, then you have the correct address! Yes, you can select to fit with only the equations that interest you and discard the rest. Projections are available for each type of curve. **Necessary Accessories for HP-41:** Card Reader and three Memory Modules.

Steps: 469 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00397-41-0	$10	$15
FOR HP-71*	00397-71-7	N/A	$18

00398 Polynomial Curve Fitting

by C. Butler, San Rafael, CA

This program fits data to second, third and fourth degree equations. Equally space points are required. Program prompts for all inputs are included making this program easy to use. One Memory Module required. **Necessary Accessories for HP-41:** One Memory Module

Steps: 414 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00398-41-8	$10	$13
FOR HP-71*	00398-71-5	N/A	$14

00399 Two-Tailed Student T-Distribution

by N.C. Shammas, Richmond, VA

Involved in statistical tests and tired of using tables for t-distribution? Let the powerful HP-41C do the job for you! The first program sets up the equation for a specific probability of error, while the second prompts for the D.F. To give you T. The latter can be merged or used with another program. **Necessary Accessories for HP-41:** Card Reader

Steps: 121 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00399-41-6	$10	$12
FOR HP-71*	00399-71-3	N/A	$14

00400 Picture Framing

by J.B. Massey, Columbus, OH

Given the dimensions of a picture, and the width of the framing material, program will compute the dimensions of the framed picture (allowing for width of blade cuts and dadoing on back side of frame to hold picture in) as well as the length of framing material to do the job. By trial and error, can be used to determine max frame from given length. **Necessary Accessories for HP-41:** Printer

Steps: 47 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00400-41-2	$10	$12
FOR HP-71*	00400-71-9	N/A	$14

00402 Redpawl Thacket- a Problem in Logic- 41C Version

by R.S. Altman, Clearlake, CA

Redpawl Thacket is a town where the inhabitants tell the truth, lie, answer by alternately lying or telling the truth, or just answer randomly. Your task is to determine from the answers you receive who is who! Information will either be supplied randomly or you may set the questions and decide whom to ask. This program is based on #02580D and #04059D, but uses all of the 41C advanced capabilities. **Necessary Accessories for HP-41:** One Memory Module

Steps: 316 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00402-41-8	$10	$13
FOR HP-71*	00402-71-5	N/A	$14

00403 Torpedo

by G.G. Sandoval, Metro Manila, Philippines

This game simulates an enemy torpedo attack on your ship. Complete with sounds and HP graphics. Defend yourself by blasting mines you have in the torpedo's path. Just like those electronic arcade games with game over indicator and scorekeeper built in. Variable levels of difficulty. **Necessary Accessories for HP-41:** Card Reader and additional Memory Module.

Steps: 136 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00403-41-6	$10	$13
FOR HP-71	NOT AVAIL		

00404 Datablock Manipulation

by N.C. Shammas, Richmond, VA

If you are looking for a minipackage of programs to exchange, copy, clear, roll-up and roll-down your data (considered as a block) without using a single memory, then you cannot be in better hands! Program even allows you to triple your data block. Can be used in parts of other programs. **Necessary Accessories for HP-41:** Card Reader

Steps: 109 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00404-41-4	$10	$11
FOR HP-71*	00404-71-1	N/A	$12

00405 A Scorekeeper for the Game 'Scrabble'*

by B.F. Wheeler, Haddonfield, NJ

This program scores the crossword game "Scrabble" for one to four players. Word value is accumulated as letters are input using assigned alpha keys. Keys also assigned to score premium words and end each players turn. At the end of each round, cumulative scores are printed if a printer is connected. *Registered trademark of Selchow & Righter Co. **Necessary Accessories for HP-41:** One Memory Module. Printer optional to print out scores.

Steps: 347 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00405-41-1	$10	$14
FOR HP-71*	00405-71-8	N/A	$16

00406 Bio

by A.D. Yarid, Washington, DC

For any number of selectable days or months, this program calculates and simultaneously prints out the three plot points (p=physical, e=emotional, i=intellectual) along with the corresponding day of the month. **Necessary Accessories for HP-41:** One Memory Module and Printer. Card Reader desirable.

Steps: 746 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00406-41-9	$10	$14
FOR HP-71	NOT AVAIL		

00407 Characteristic Polynomial of a Square Matrix

by N.K. Sinha, Hamilton, Canada

This program determines the characteristic polynomial of a 14x14 matrix. Danilevsky's method is used for transforming the matrix to the Frobenius Canonical form, yielding the coefficients of the polynomial. These coefficients are then displayed. **Necessary Accessories for HP-41:** One Memory Module for up to a 5x5 matrix and four Memory Modules for a 14x14 matrix.

Steps: 348 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00407-41-7	$10	$13
FOR HP-71*	00407-71-4	N/A	$14

00408 Area of Land by Point-To-Point Traversing

by G. Goodman, Stamford, CT

This program computes the area of land by point-to-point traversing, given the bearing, distance, and radius of curvature of each side. The error in closure is displayed as well as the area in square feet and acres. Bearings and quadrants are previewed and may be changed. **Necessary Accessories for HP-41:** Printer optional.

Steps: 147 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00408-41-5	$10	$12
FOR HP-71*	00408-71-2	N/A	$14

00409 Siderial Time & Polaris Position

by D.I. Kosowsky, Needham Hts., MA

This program accurately computes local siderial time and determines the position of polaris in terms of astronomical coordinates and angular relationship to celestial north pole. Also yields universal time and Julian date. Inputs are local longitude, time, and date. Use of alpha mode simplifies operation and clarifies display. **Necessary Accessories for HP-41:** None

Steps: 161 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00409-41-3	$10	$12
FOR HP-71*	00409-71-0	N/A	$14

00410 Zener Supply Design

by J.B. Ferrer, Belo Horizonte MG, Brasil

This program calculates components values and power rating of a zener supply, in a 41C alphanumerical language. It saves time better than the current available programs. **Necessary Accessories for HP-41:** None

Steps: 45 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00410-41-1	$10	$11
FOR HP-71*	00410-71-8	N/A	$12

00411 Markowitz Portfolio Selection

by D. Hickingbotham, Hillsborough, CA

Given the expected return and proportion of each stock within a portfolio, and the covariances of returns among the stocks, this program calculates the portfolio's expected return and standard deviation of returns using a Markowitz algorithm. Great for graduate level business courses in investments where this kind of data is available. **Necessary Accessories for HP-41:** Minimum of one Memory Module. More modules needed for larger problems.

Steps: 265 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00411-41-9	$10	$13
FOR HP-71*	00411-71-6	N/A	$14

00412 Balance Sheet/Statement Analysis Roi-Program Label

by A.M. Danny, Vernon, Canada

Using financial statement information this program prints out balance sheet & income statement to confirm information then calculates 2 score (Altman Formula) to predict, within 80% probability if the firm will be in business 2 years from statement date, liquidation value, cash flow to debt ratio, return on both investment and assets employed. **Necessary Accessories for HP-41:** Card Reader, Printer and two Memory Modules.

Steps: 392 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00412-41-7	$10	$16
FOR HP-71	NOT AVAIL		

00413 Financial Evaluation 'Fin-Eva'

by A.M. Danny, Vernon, Canada

Utilizing information from balance sheet/statement analysis various ratio's are calculated for indication of short term solvency (ie current ratio, acid test, absolute liquidity, W.C. To total assets and cash flow and cash flow to debt), long term solvency (ie debt to equity, earnings before interest, taxes and special management bonuses to interest, taxes and management bonuses), and various profitability add efficiency (turnover) ratios. **Necessary Accessories for HP-41:** Card Reader, Printer and two Memory Modules.

Steps: 230 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00413-41-5	$10	$14
FOR HP-71	NOT AVAIL		

00414 Simple Interest Calculator

by G.G. Sandoval, Metro Manila, Philippines

This program computes for the 4th variable (PV, I, Days, Int, FV) in a simple interest problem given 3 of the others. Program is for 360 days but very easily can be modified to 365. May be used with Calendar Program in 41C Standard Applications. Display indicates whether data has been input or computed. **Necessary Accessories for HP-41:** None

Steps: 124 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00414-41-3	$10	$12
FOR HP-71*	00414-71-0	N/A	$14

00415 Pi and T-network Calculator with Plot Option

by J.S. Sutton, Tucson, AZ

Calculates normalized reactances for pi- and t-networks. Inputs are source and load normalized impedances (either series or parallel). Outputs are series/parallel equivalents of source and load; values of jx2, jx3, jx4, jx5 for selected network; relative power response of network, with plot option. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 334 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00415-41-0	$10	$14
FOR HP-71*	00415-71-7	N/A	$16

00416 Future Value Calculations 1

by R. Phillips, New York, NY

Program calculates future value of payments stream at one, two or three interest rates. **Necessary Accessories for HP-41:** Printer

Steps: 87 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00416-41-8	$10	$11
FOR HP-71*	00416-71-5	N/A	$12

00417 Stock Portfolio

by C. Wight, Brookline, MA

This program lists the symbol or six letter abbreviation of up to 64 different securities together with the number of shares and the dollar price. The sub-totals and grand total are also displayed. Inserting annual dividends instead of prices gives sub-totals and grand totals of dividends. **Necessary Accessories for HP-41:** Card Reader, Printer and two Memory Modules.

Steps: 180 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00417-41-6	$10	$12
FOR HP-71*	00417-71-3	N/A	$14

00418 Present Value Calculations 1

by R. Phillips, New York, NY

Program calculates present value of a stream of payments at one, two or three interest rates. **Necessary Accessories for HP-41:** Printer

Steps: 106 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00418-41-4	$10	$11
FOR HP-71*	00418-71-1	N/A	$12

00420 Data Storage, Recall and % Computation

by H.Y. Rhyu, Seal Beach, CA

As a set of data is entered, each element of the set is stored and the subtotal displayed along with the item number. The stored data, either as entered or in %, may be recalled and displayed with the item number, one at a time in the order of original entry. **Necessary Accessories for HP-41:** None

Steps: 82 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00420-41-0	$10	$11
FOR HP-71*	00420-71-7	N/A	$12

00421 Tissue Blood Flow

by T. Adams, East Lansing, MI

This program solves equations associated with a thermodynamic technique for measuring regional tissue blood flow and heat transfer characteristics. **Necessary Accessories for HP-41:** One Memory Module

Steps: 238 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00421-41-8	$10	$13
FOR HP-71*	00421-71-5	N/A	$14

00422 Runge-Kutta Integrator for One to Six First Order Equations

by K.L. Remmler, Palmdale, CA

A general purpose integrator for solving a system of first order differential equations with initial boundary values. Code automatically sizes program, input prompting, and output for one to six simultaneous differential equations. The integrator uses a 4th order Runge-Kutta formula. **Necessary Accessories for HP-41:** One Memory Module and Printer.

Steps: 191 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00422-41-6	$10	$12
FOR HP-71*	00422-71-3	N/A	$14

00423 Simple Linear Regression and Correlation

by C. Butler, San Rafael, CA

This program is designed for the person who uses regression and correlation frequently. It is short enough to remain in program memory at all times. Outputs are the regression equation, x & y predictions and the correlation coefficient. **Necessary Accessories for HP-41:** None

Steps: 88 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00423-41-4	$10	$11
FOR HP-71*	00423-71-1	N/A	$12

00424 Moving Range

by G.G. Sandoval, Metro Manila, Philippines

Given the number of points in the moving range (n), and the data points, this program computes an n-point moving range. The number of points (n) is variable even after it has been entered. **Necessary Accessories for HP-41:** None

Steps: 103 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00424-41-2	$10	$12
FOR HP-71*	00424-71-9	N/A	$14

00425 Survey Tabulation Aid

by G.G. Sandoval, Metro Manila, Philippines

Given a survey questionnaire with #q questions and up to 4 alternative responses per question, this program tabulates up to 99 responses per alternative. Last response is stored for instant error correction. Convenient review and data analysis features. **Necessary Accessories for HP-41:** One Memory Module

Steps: 216 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00425-41-9	$10	$12
FOR HP-71*	00425-71-6	N/A	$14

00426 Geometric Progression

by R.S. Altman, Clearlake, CA

This program calculates and outputs (with output labeling) the ratio and series for a geometric progression. **Necessary Accessories for HP-41:** None

Steps: 76 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00426-41-7	$10	$11
FOR HP-71*	00426-71-4	N/A	$12

00427 Zonal Cavity Method Lighting Two to Four Lamp Flourescent

by W.H. Wease, Charleston, SC

Program calculates the number of flourescent fixtures required in any size room using derived photometrics for medium quality flourescent troffers using the zonal cavity method. Printer may be used for documentation. **Necessary Accessories for HP-41:** None

Steps: 152 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00427-41-5	$10	$13
FOR HP-71*	00427-71-2	N/A	$14

00431 Rope Drum Capacity

by E. McGehee, Jackson, MS

This program calculates the length of cable that can be spooled onto a drum or reel. The program is valid for any size wire rope from 1/8" to 2.5". **Necessary Accessories for HP-41:** Printer

Steps: 82 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00431-41-7	$10	$11
FOR HP-71*	00431-71-4	N/A	$12

00432 Foreign Currency Converter

by G.G. Sandoval, Metro Manila, Philippines

This program consists of 2 related routines that enable a) conversions between any 2 of 52 stored currencies; b) conversion from 1 to all 51 other currencies; and also c) interconversion between any foreign currency and your home currency. Features convenient entry and error recovery. **Necessary Accessories for HP-41:** Two Memory Modules (3 preferable). Card Reader optional.

Steps: 223 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00432-41-5	$10	$17
FOR HP-71*	00432-71-2	N/A	$20

00433 Star Identification

by C. Wight, Brookline, MA

This program determines the sidereal hour angle and declination of a star. It also prints out the name of the star. If a planet is observed, the Greenwich Hour Angle and the declination will be displayed. **Necessary Accessories for HP-41:** Card Reader, Printer and two Memory Modules

Steps: 372 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00433-41-3	$10	$16
FOR HP-71*	00433-71-0	N/A	$18

00434 Ohms Law with Dbm

by O.R. Beaver, Riverside, CA

Program will display labeled output of any of the four basic units, ie: volts, amps, ohms or watts, given any two values. It also converts watts to DBM, and DBM to watts. Converting DBM to watts automatically stores 50 ohms for voltage calculation. 82104A Card Reader is useful, but is not necessary. **Necessary Accessories for HP-41:** Card Reader useful but not necessary.

Steps: 192 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00434-41-1	$10	$12
FOR HP-71*	00434-71-8	N/A	$14

00435 Optical Calculations for Imaging Systems

by P.G. Baker, Cupertino, CA

Determines any two of object distance, image distance, focal length and magnification given the other two. **Necessary Accessories for HP-41:** None

Steps: 146 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00435-41-8	$10	$11
FOR HP-71*	00435-71-5	N/A	$12

00437 Calendar

by O. Collins, Washington, DC

This program prints a calendar for any month between 1 A.D. And 9999 A.D. It uses a special output formatting technique which allows it to print the entire calendar in less than 22 seconds, while still consuming only 310 bytes of memory. **Necessary Accessories for HP-41:** Printer

Steps: 174 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00437-41-4	$10	$12
FOR HP-71*	00437-71-1	N/A	$14

00438 Linear Regression Package 1

by N.C. Shammas, Richmond, VA

This program uses the large memory of the HP-41C as well as alphanumeric capabilities to enable you to store the original data (up to 45 points) then decide if and what the transformation for x and/or y will be. Projections are available. Prints of a table for y, y(hat) and their difference. Also calculate sum of the deviations squared, standard errors of the slope, intercept and coefficient of determination. **Necessary Accessories for HP-41:** Card Reader, Printer and two Memory Modules.

Steps: 279 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00438-41-2	$10	$13
FOR HP-71	NOT AVAIL		

00439 Holidays

by R.A. Somrak, Paonia, CO

This program is designed for use with a Calendar Printout Program and adds to it the ability to print out holidays. In addition to the standard holidays incorporated in the program, it can be configured by the user for birthdays, anniversaries, etc. Printer and program "Calendar" by Oliver Collins needed. **Necessary Accessories for HP-41:** Printer and Program "Calendar" by Oliver Collins.

Steps: 93 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00439-41-0	$10	$12
FOR HP-71*	00439-71-7	N/A	$14

00440 Radioactive Decay

by O. Collins, Washington, DC

This program computes the fourth given three of the following parameters: time, half life, initial mass, and final mass for radioactive decay (or, with a little ingenuity for a first order chemical reaction). **Necessary Accessories for HP-41:** None

Steps: 72 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00440-41-8	$10	$11
FOR HP-71*	00440-71-5	N/A	$12

00443 Integration by Simpson's Rule/Plot of Function

by S. Hagman, Lafayette, CA

This program will perform integration by Simpson's rule for any explicitly known function or set of discrete points. The program allows for easy changes in: integration limits, number of iterations and collects all of the data required to produce a one "keystroke" plot of the function. **Necessary Accessories for HP-41:** Printer for plotting.

Steps: 131 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00443-41-2	$10	$12
FOR HP-71*	00443-71-9	N/A	$14

00444 Solving Ode by Runge-Kutta-Gill Method

by N.C. Shammas, Richmond, VA

Tired of growing errors during the solution of a first order ode? Maybe the Runge-Kutta-Gill method will help you to march with more confidence! Selective periodic printing is also available, to obtain a list of fewer, less confusing, results. **Necessary Accessories for HP-41:** Card Reader

Steps: 133 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00444-41-0	$10	$11
FOR HP-71*	00444-71-7	N/A	$12

00445 Double Riemann Sum

by D. Comenetz, Belmont, MA

The program computes double riemann sums over bounded domains; developed for classroom instructional use. A boundary consists of the zeros of some user-specified functions, which may be given in polar form. Tones are employed so that one can "hear" the shape of the domain. **Necessary Accessories for HP-41:** One Memory Module

Steps: 127 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00445-41-7	$10	$12
FOR HP-71*	00445-71-4	N/A	$14

00448 Single Reactant Kinetics

by N.C. Shammas, Richmond, VA

Having problems with the kinetics of a single reactant with non-integer order of reaction? Then this program is tailored for you! Yes, you don't have to keep guessing a dozen values of reaction order. Relax, and let the HP-41C do the search of the order and reaction rate constant. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 151 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00448-41-1	$10	$12
FOR HP-71*	00448-71-8	N/A	$14

00449 Buy and Sell Stock Market Timing

by N.J. Gordon, Mountain View, CA

Anticipates Bull and Bear markets using readily available (Wall Street Journal) short sales information of "insiders" activities. This is not a "hot tip" approach but one used by canny investors who have achieved remarkable success at predicting shifts of 10% or more in stock prices. Printer optional. **Necessary Accessories for HP-41:** Printer optional

Steps: 78 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00449-41-9	$10	$12
FOR HP-71*	00449-71-6	N/A	$14

00450 Filtration N1

by N.C. Shammas, Richmond, VA

Here is a versatile program about Sand Filter beds. It calculates head loss of clean beds, during operation, during backwashing and a regression for a quadratic fitted model for head loss and time. **Necessary Accessories for HP-41:** None

Steps: 395 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00450-41-7	$10	$13
FOR HP-71*	00450-71-4	N/A	$14

00451 Mwall/Masonry Shear Wall Design

by C.I. Dinsmore, Seattle, WA

This program uses evaluation based on static equilibrium of sum(fv)=0, sum(m)=0 to analyze a reinforced masonry shear wall. All data is input by indirect control and the proper alpha prompts. The solution is automatically printed, if the printer is attached. **Necessary Accessories for HP-41:** Printer optional

Steps: 212 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00451-41-5	$10	$12
FOR HP-71*	00451-71-2	N/A	$14

00452 Hazen-William's Equation for Flows, Head and Diameter

by C.S. Hodge, El Toro, CA

For a pipe of given length and friction factor "C", this program, using Hazen-William's Formula, will compute either flow, head or diameter--flow from head and diameter, head from flow and diameter, diameter from flow and head. Flow units can be CFS, MGD or GPM. **Necessary Accessories for HP-41:** None

Steps: 95 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00452-41-3	$10	$11
FOR HP-71*	00452-71-0	N/A	$12

00453 Heat Exchanger Optimization I

by N.C. Shammas, Richmond, VA

This program determines the optimum cooling water flow rate in a condenser. The annual operative cost is also calculated. **Necessary Accessories for HP-41:** None

Steps: 147 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00453-41-1	$10	$12
FOR HP-71*	00453-71-8	N/A	$14

00454 Circon/Circular Concrete Column Biaxial Bending

by C.I. Dinsmore, Seattle, WA

"Circon" computes the ultimate capacity for a circular concrete section subject to a given moment about two perpendicular axes, and given axial load. The section may have up to 62 reinforcing bars placed in either a circular or square pattern. The method of analysis is based on ultimate strength design following A.C.I. 318-77. **Necessary Accessories for HP-41:** None

Steps: 599 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00454-41-9	$10	$16
FOR HP-71*	00454-71-6	N/A	$18

00456 Point and Figure Charting Aid

by K.L. Remmler, Palmdale, CA

Evaluates price action of stock, providing printer output of up/down column chart entries, including buy and sell signals. **Necessary Accessories for HP-41:** None

Steps: 307 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00456-41-4	$10	$13
FOR HP-71*	00456-71-1	N/A	$14

00457 Weibull Distribution

by G.G. Sandoval, Metro Manila, Philippines

This program solves f(x), q(x) and x (for a given q, $0<Q<1$) in the Weibull distribution. It is an adaptation of HP-65 Program Stat 1-17A. **Necessary Accessories for HP-41:** None

Steps: 72 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00457-41-2	$10	$11
FOR HP-71*	00457-71-9	N/A	$12

00459 Electrical Transmission Line Calculations

by J.J. Gafford, Waco, TX

Given sending voltage and sending end volt-amperes this program calculates receiving end voltage, receiving end volt-amperes, and line losses. As an option, given sending end voltage and receiving end volt amperes, it calculates receiving end voltage, sending end volt-amperes, and line losses. The program uses the medium length line model. Full vector mathematics are used in the calculations. The medium length line model usually provides satisfactory results for lines of up to about 150 miles in length. **Necessary Accessories for HP-41:** One Memory Module. Printer desirable.

Steps: 218 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00459-41-8	$10	$12
FOR HP-71*	00459-71-5	N/A	$14

00460 41C Rectangular Corner Walls Calculations

by P.d.S. Mourao, Belo Horizonte, Brasil

Performs structural calculations on rectangular reservoir walls near corners. This program splits vertical and horizontal loads previously determined by calculating elastic deflections in both directions, and processes them in order to get reactions and bending moments using any consistent system of units. **Necessary Accessories for HP-41:** One Memory Module

Steps: 289 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00460-41-6	$10	$13
FOR HP-71*	00460-71-3	N/A	$14

00461 41C Settling Velocities

by N.C. Shammas, Richmond, VA

This program mainly gives the settling velocities of particles in liquids, as in sedimentation or fluidization. Particle diameter or solid volume fraction can be alternatively solved for. **Necessary Accessories for HP-41:** None

Steps: 153 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00461-41-4	$10	$12
FOR HP-71*	00461-71-1	N/A	$14

00466 Drilled in Concrete Piers-Sands

by R.K. Lloyd, Albuquerque, NM

Program computes estimated drilled-in concrete pier capacity in predominantly sand type soils. Labeled output includes shaft and base resistance, ultimate and allowable pier load for diameters of 12 through 42 inch varying by 6 inch increments. One, two or three varying soil stratas are considered. **Necessary Accessories for HP-41:** Printer

Steps: 233 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00466-41-3	$10	$12
FOR HP-71*	00466-71-0	N/A	$14

00467 Roman Numerals to Hindu-Arabic Numbers

by R.S. Altman, Clearlake, CA

This program converts Roman Numerals to Hindu-Arabic Numbers. Full use is made of the HP-41c's alpha-numeric capabilities. **Necessary Accessories for HP-41:** None

Steps: 93 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00467-41-1	$10	$11
FOR HP-71*	00467-71-8	N/A	$12

00468 Cable

by P.J. Muccino, Massapequa, NY

This program solves a variety of problems involving cables suspended between two points at the same elevation. Solutions are based on the assumption of uniform load per unit of horizontal projection; leading to the parabolic form of cable so often substituted for the true catenary form. **Necessary Accessories for HP-41:** None

Steps: 157 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00468-41-9	$10	$12
FOR HP-71*	00468-71-6	N/A	$14

00469 Logarithmic Normal Distribution

by G.G. Sandoval, Metro Marilla, Philippines

Given a random variable x whose logarithm is normally distributed with mean and variance supplied, this program computes the density function f(x) and the ff statistics: mean, median, mode and variance. **Necessary Accessories for HP-41:** None

Steps: 87 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00469-41-7	$10	$11
FOR HP-71*	00469-71-4	N/A	$12

00470 Permutations of Symbolic Set to 12 Members

by I.A. Webb, Saratoga, CA

Systematically generates all permutations of symbolic sets with 1 to 12 members. Members may consist of 0 to 6 alpha characters and may be of different lengths. The limiting factor is the 24 character display. Program provides non-prompting entry points for use as a subroutine. **Necessary Accessories for HP-41:** None

Steps: 76 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00470-41-5	$10	$11
FOR HP-71*	00470-71-2	N/A	$12

00471 Y=CX**A+DX**B Least Squares Regression

by G.G. Sandoval, Metro Manila, Philippines

This program determines the coefficients of the equation y=cx**a+dx**b for a set of data points (x, y) where a, b are any user-suppled real numbers. X(i) should be greater than zero. **Necessary Accessories for HP-41:** None

Steps: 107 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00471-41-3	$10	$11
FOR HP-71*	00471-71-0	N/A	$12

00472 Bivariate Normal Distribution

by G.G. Sandoval, Metro Manila, Philippines

This program computes the values of the bivariate normal distribution of x and y given the means and standard deviations of their populations. **Necessary Accessories for HP-41:**

Steps: 93 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00472-41-1	$10	$11
FOR HP-71*	00472-71-8	N/A	$12

00473 Linear Regression Package 2

by N.C. Shammas, Richmond, VA

This program enables you to store several variables, then select any two for a linearized regression. User has flexible capbilities to transform the variables involved in regression. Projections are available. Memory mapping is provided by the program. **Necessary Accessories for HP-41:** None

Steps: 333 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00473-41-9	$10	$14
FOR HP-71*	00473-71-6	N/A	$16

00474 Binomial Expansion

by O. Collins, Washington, DC

This program performs binomial expansion, and, given the coefficients of the two terms and the exponent, will output all the terms of the series. **Necessary Accessories for HP-41:** None

Steps: 100 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00474-41-7	$10	$11
FOR HP-71*	00474-71-4	N/A	$12

00476 High Resolution Plot Routine (Relatively) Fast Version

by K. Jarett, Manhattan Beach, CA

Using the 41C special graphics capabilities, this program plots 7 values of a user supplied function per line of printer output, providing much higher resolution than the standard plot routine. Execution time is 37 seconds per line for a simple f(x). **Necessary Accessories for HP-41:** Printer, Card Reader and One Memory Module

Steps: 158 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00476-41-2	$10	$12
FOR HP-71	NOT AVAIL		

00477 Curve Fitting -- with Automatic Type Selection

by K. Jarett, Manhattan Beach, CA

This program will determine the type of curve (linear, exponential, logarithmic, or power curve) which best fits given data. It then determines the parameters of that curve or of a user-selected curve type, all without any re-entry of data. **Necessary Accessories for HP-41:** None

Steps: 181 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00477-41-0	$10	$12
FOR HP-71*	00477-71-7	N/A	$14

00478 Craps

by N. Nathanson, Franklin, MI

Program simulates the popular Dice game. Player is provided an initial sum of money. Successful bettors can break the bank while losers go broke! Calculator rolls dice; 7 or 11 win; 2, 3 or 12 lose. Other numbers (players point) must be rolled before a seven to win. **Necessary Accessories for HP-41:** None

Steps: 123 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00478-41-8	$10	$12
FOR HP-71*	00478-71-5	N/A	$14

00479 Petals Around the Rose

by E.M. Keefe, Ankeny, IA

The 41C "rolls" 5 dice (watch'em dance across the display!). You are to guess the number of "Petals Around the Rose". The 41C will tell you if your guess is right or wrong. It will give one hint, after 10 incorrect guesses. And, after 3 correct guesses in a row, it will dub you a "Knight or Lady" of the Rose. **Necessary Accessories for HP-41:** None

Steps: 145 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00479-41-6	$10	$13
FOR HP-71*	00479-71-3	N/A	$14

00481 World Time Converter

by G.G. Sandoval, Metro Manila, Philippines

This program computes time in 22 other time zones of the world given time and a particular time zone. It also gives keys to the time in 29 other cities besides those 22 the HP flashes. Output is given in hours and minutes with AM/PM indicator and date. The program has been designed for convenience. Once a known time and a known city/time zone are entered, time in the 22 other zones can be determined without the need to repeatedly key in variables. **Necessary Accessories for HP-41:** One Memory Module

Steps: 190 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00481-41-2	$10	$13
FOR HP-71*	00481-71-9	N/A	$14

00482 Timetable

by D. Milanovic, New York, NY

This program sorts, tests and displays the input data according to the beginning and duration times. Events are displayed in timetable form in ascending order, with each day displayed separately, signaling if two events overlap. This program is an excellent aid for making college timetables, train schedules, travel plans, or any other time-dependent schedules. **Necessary Accessories for HP-41:** One Memory Module

Steps: 231 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00482-41-0	$10	$12
FOR HP-71*	00482-71-7	N/A	$14

00483 Permutation Generator

by G.G. Sandoval, Metro Manila, Philippines

Given a prime integer n of the form (8n + 3) or (8n + 5), (n is any positive integer), this program will display all integers x, 0 less than x less than n, in scrambled order once before repeating the numbers. Applications are in situations where a definite sequence of numbers is desired but repetitions not wanted until all numbers in that sequence have appeared. **Necessary Accessories for HP-41:** None

Steps: 50 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00483-41-8	$10	$11
FOR HP-71*	00483-71-5	N/A	$12

00484 Slot Machine

by S. Hagman, Lafayette, CA

This program is an upgraded version of the HP-67 program "Bell-Fruit" Slot Machine (#00218D). The program has been modified for use on the 41C and incorporates more features, such as: a permanent bank, continuous record of the number of plays and payoff/jackpot notification on winning plays. **Necessary Accessories for HP-41:** Card Reader

Steps: 144 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00484-41-6	$10	$13
FOR HP-71	NOT AVAIL		

00485 Game of the Generals

by G.G. Sandoval, Metro Manila, Philippines

This program simulates a strategic army game in which the object is to capture the opponent's flag. You and the HP command armies of seven officers, a flag and a spy. You arrange your forces before the encounter. higher rank defeats lower rank. The spy can kill all other ranks except the private, who kills the spy. Any other piece can capture the opponent's flag, but a flag against a flag is a draw. **Necessary Accessories for HP-41:** One Memory Module

Steps: 235 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00485-41-3	$10	$14
FOR HP-71	NOT AVAIL		

00487 Permanent Insurance and Term Rider Mix

by G.V. Parker, Oakland, CA

Given face amount of insurance required, for purchase by given total annual premium, this program will compute respective face amounts and premiums of permanent insurance and of term rider in required mix. Will show all permanent insurance if premium is sufficient, or, conversely, all term if premium insufficient for mix. Printer useful, but not necessary. **Necessary Accessories for HP-41:** Printer useful.

Steps: 102 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00487-41-9	$10	$12
FOR HP-71*	00487-71-6	N/A	$14

00489 Capital Need Analysis

by G.V. Parker, Oakland, CA

Automatically computes all information reqired for income analysis and total income analysis pages of standard capital need analysis worksheets used by most insurance companies. Allows user to choose any interest assumption and any income objective. **Necessary Accessories for HP-41:** One Memory Module

Steps: 205 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00489-41-5	$10	$12
FOR HP-71*	00489-71-2	N/A	$14

00493 Accumulated Interest and Remaining Balance on Loan

by N.J. Gordon, Mountain View, CA

Interest payments for tax deductions (and other purposes) for any period or block of periods can be obtained immediately, without iteration on any loan or mortgage. Input is prompted in logical order and the printout is equally clear. User has choice of detailed schedule for each payment after printout of period summary. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 203 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00493-41-7	$10	$13
FOR HP-71*	00493-71-4	N/A	$14

00494 Diet Control for -

by N.J. Gordon, Mountain View, CA

A personalized (hyphen in title replaced by name) printout of a diet's caloric requirements for weight maintenance, gain or loss according to sex, height, weight, age: in metric or english units considering persons' daily activities. Great for social gatherings: fund raising booths, health clinics, ice breaker (social). **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 307 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00494-41-5	$10	$14
FOR HP-71*	00494-71-2	N/A	$16

00495 Orbital Lander - HP Solution with Printer and Modified End

by M.H. Kaericher, Plymouth, MI

Program logic is from HP Games Solutions Book (Program 00216C), but is modified to run faster and with less stops and less paper when used with the printer. The feedback after impact is also more friendly. **Necessary Accessories for HP-41:** Printer, one Memory Module.

Steps: 332 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00495-41-2	$10	$13
FOR HP-71*	00495-71-9	N/A	$14

00496 Moon Orbiter

by N.J. Gordon, Mountain View, CA

You, as pilot of a Moon Orbiter, have your chances for surviving a lunar landing greatly increased by being able to examine a printout of your simulated trials. You can then try to correct your mistakes. A safe landing is still extremely challenging. Can be used for parties as icebreaker! **Necessary Accessories for HP-41:** One Memory Module

Steps: 294 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00496-41-0	$10	$13
FOR HP-71*	00496-71-7	N/A	$14

00497 Cannibals and Missionaries

by E.M. Keefe, Ankeny, IA

An adaptation of a classic puzzle from the HP-29C Games Book: 3 Missionaries and 3 All-Consuming Cannibals. Get them all across the river without mishap. The 41C's alpha display is used to help keep track of how many C's and M's make it successfully to the opposite bank of a river and to inform the user when a goof is made. **Necessary Accessories for HP-41:** None

Steps: 111 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00497-41-8	$10	$12
FOR HP-71*	00497-71-5	N/A	$14

00498 Value Comparison

by N.J. Gordon, Mountain View, CA

The best value can be selected from a large number of offerings (in supermarkets or other situations) on the basis of varying prices for varying quantities (weight, number, size etc). Then in case the best value is no longer available, the second best value can be called up immediately and reliably. **Necessary Accessories for HP-41:** None

Steps: 85 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00498-41-6	$10	$11
FOR HP-71*	00498-71-3	N/A	$12

00499 Blind Numerical Operations *1

by M. O'Regan, Nottingham, England

Program is to enable blind people to "read" the numerical display, by the correct number of audio tones for each digit. Special audio signals indicate decimal and/or minus numbers. Orginal number is returned unaltered to display (except SCI and ENG displays, which are only returned unaltered when they will not fit the normal fix display). **Necessary Accessories for HP-41:** None

Steps: 84 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00499-41-4	$10	$11
FOR HP-71*	00499-71-1	N/A	$12

00501 The Draftsman's Friend

by J.T.J. Potts, Boulder, CO

Performs dimension arithmetic, working in feet, inches, 16ths of inches. Operations are add, repeat add, subtract, repeat subtract, multiply and divide by scalar or dimension. Also computes bevel dimensions: base rise and slope lengths, all in feet, inches, and 16ths of inches. These routines are especially useful for detailing of structural steel where bevel dimensions are used. **Necessary Accessories for HP-41:** One Memory Module

Steps: 175 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00501-41-7	$10	$12
FOR HP-71*	00501-71-4	N/A	$14

00502 Orbital Parameters

by J. Porras, San Diego, CA

The parameters of an orbit are calculated by this program given the position and velocity vectors of the body in geocentric-equatorial coordinates. The parameters are displayed and printed but if a printer is not attached, any desired parameter can be individually displayed by pressing a local label key. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 375 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00502-41-5	$10	$13
FOR HP-71*	00502-71-2	N/A	$14

00504 Length of Circular Arcs

by H.C. Ferber, Vero Beach, FL

By the use of this program the length of any arc may be found if the length of the radius and the angle of the segment are known. Given two concentric arcs and a given angle the program also solves for the area of the configuration. **Necessary Accessories for HP-41:** Printer, Card Reader

Steps: 51 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00504-41-1	$10	$11
FOR HP-71*	00504-71-8	N/A	$12

00505 Slope Staking on a Var Slope

by L.D. Thomas, Pocatello, ID

This program computes the appropriate cut or fill and its corresponding sideslope, for sections on a variable slope. **Necessary Accessories for HP-41:** None

Steps: 85 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00505-41-8	$10	$12
FOR HP-71*	00505-71-5	N/A	$14

00506 Aerodynamic Properties of a Finite Wing (Prandtl)

by J. Orosa, Gainesville, FL

This program calculates the spanwise load distribution and associated aerodynamic coefficients for high-aspect ratio wings. A ten control-point, horseshoe-vortex approximation to Prandtl's lifting line theory is used. The program is restricted to symmetrically loaded unswept wings with linear taper and twist and to incompressible flow fields. **Necessary Accessories for HP-41:** Three Memory Module and One Math Module.

Steps: 366 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00506-41-6	$10	$14
FOR HP-71	NOT AVAIL		

00507 Modified Trapezoidal Integration

by J.T. Rickard, La Jolla, CA

This program evaluates integrals of analytic functions using a sequence of changes of variable of integration, followed by trapezoidal integration. A desired accuracy can be achieved with significantly fewer integrand evaluations than with other integration techniques. Thus, the program is particularly useful for integrands whose evaluation is time-consuming. **Necessary Accessories for HP-41:** None

Steps: 57 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00507-41-4	$10	$11
FOR HP-71*	00507-71-1	N/A	$12

00508 Sunrise, Sunset and Twilight from 1900

by D.B. Westcott, Islington, Canada

Sunrise, sunset, local apparent noon and astronomical, nautical and civil twilight times are calculated from the geocentric orbital data for the sun for standard time zones automatically in either standard or daylight-saving time. In the "exact" mode all times agree with the ephemeris to within one minute. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 400 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00508-41-2	$10	$15
FOR HP-71*	00508-71-9	N/A	$18

00509 Mannings Equation for Flow, Diameter, Slope and Depth

by C.S. Hodge, El Toro, CA

For a pipe with friction factor of "n", this program's Mannings's formula application will compute either flow, slope, diameter or depth ratio – any one from the other three. Flow units can be cfs or mgd. **Necessary Accessories for HP-41:** None

Steps: 171 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00509-41-0	$10	$12
FOR HP-71*	00509-71-7	N/A	$14

00511 Navigation Package

by W.B. Kohlmoos, Reno, NV

Program solves celestial sight of any heavenly body and gives line of position. Contains almanac for sun and stars. Nautical almanac required for moon and planets. Solves great circle problem and dead reckoning sailings. Uses 722 steps, and only eight storage registers. Easy to operate with prompting and automatic execution. **Necessary Accessories for HP-41:** Two Memory Modules. Printer and Card Reader optional.

Steps: 722 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00511-41-6	$10	$20
FOR HP-71*	00511-71-3	N/A	$24

00514 Mastermind

by D. Hayden, Rocky Hill, NJ

Break the hidden code! User specifies code length of up to seven digits, and calculator picks a number of that length. Any digits may be used and repeated. Complete with audio-visual feedback. Lots of fun! **Necessary Accessories for HP-41:** None

Steps: 148 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00514-41-0	$10	$12
FOR HP-71*	00514-71-7	N/A	$14

00515 Pathfinder

by G.G. Sandoval, Metro Manila, Philippines

This program consists of finding a hidden path from a known starting point to a known ending point in a 5 x 5 grid. The object is to trace the secret path in the minimum number of excess (penalty) steps beyond the path length. Clues may be bought for the price of a number of penalty steps. The pathfinder may not make the minimum number of steps but he proves he is a shrewd buyer and user of information. **Necessary Accessories for HP-41:** At Least One Memory Module

Steps: 202 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00515-41-7	$10	$15
FOR HP-71	NOT AVAIL		

00516 Earthwork and Paving Estimations

by B.D. Heinrich, Fresno, CA

This program calculates import and export earth and keeps a running total of cubic yards along with asphalt and aggregate base rock tonnages. Calculates amounts of sand, baserock, asphalt and earth needed. Three construction options are included: paving areas, building pads and landscaped or dirt areas. **Necessary Accessories for HP-41:** One Memory Module

Steps: 290 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00516-41-5	$10	$14
FOR HP-71*	00516-71-2	N/A	$16

00517 K-Value Prediction

by V. Rice, Stillwater, OK

This program will predict the equilibrium k-values at a specific temperature and pressure for a pur component. The required pur component data are the critical temperature, critical pressure, and the accentric factor. The algorithm assumes both phases are ideal solutions but pure component non-idealities are accounted for. **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 223 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00517-41-3	$10	$18
FOR HP-71	NOT AVAIL		

00518 Prssl Computes Stress in Cylindrical Pressure Vessel

by M. Balmert, Columbus, OH

Program solves Roark, Table xiii, Case 30: cylinder with flat head, uniform pressure. Calculation includes stresses at any location along cylinder due to pressure, moment, and joint shear. Maximum stress at centerline calculated in head due to pressure, moment, and joint shear. **Necessary Accessories for HP-41:** One Memory Module

Steps: 308 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00518-41-1	$10	$12
FOR HP-71*	00518-71-8	N/A	$14

00519 Thermodynamic Properties of Gas Mixtures

by V. Rice, Stillwater, OK

This program utilizes the Redlich-Kwong equation of state to calculate the following thermodynamic properties of a gas mixture: compressibility factor, enthalpy departure, entropy departure, fugacity coefficient of the mixture, fugacity coefficients of the mixture components, and the fugacity coefficients of the pure components at the temperature and pressure of the mix. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 440 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00519-41-9	$10	$13
FOR HP-71*	00519-71-6	N/A	$14

00521 Wind Triangle

by T.D. Boldt, Thousand Oaks, CA

Program solves wind triangle. **Necessary Accessories for HP-41:** Aviation X Pac

Steps: 152 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00521-41-5	$10	$12
FOR HP-71	NOT AVAIL		

00522 Cost of Paying Premiums More Frequently Than Annually

by G.V. Parker, Oakland, CA

This program is a very powerful tool for soliciting annual payment of insurance premiums. Requiring only two inputs, the annual premium and the fractional premium, (semi-annual, quarterly, or monthly), the program solves for the annual percentage rate, (A.P.R.) and the effective annual interest. Printer very useful but not necessary. **Necessary Accessories for HP-41:** Printer useful.

Steps: 108 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00522-41-3	$10	$11
FOR HP-71*	00522-71-0	N/A	$12

00523 Custom Premium Calculation 2

by G.V. Parker, Oakland, CA

One keystroke computes premium in all modes from face amount, or face amount from premium; also computes cash value and monthly income @ 65. Agent may "customize" for any company that calculates fractional premiums as multiples of annual premium without policy fee, and then adds fractional premium policy fee. **Necessary Accessories for HP-41:** One Memory Module

Steps: 213 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00523-41-1	$10	$12
FOR HP-71*	00523-71-8	N/A	$14

00525 Synthetic Substitution

by M. Marion, Villanora, PA

This program performs synthetic substitution involving polynomials. It can be used to locate zeros, factors of f(x), and can help when using derivations of f(x) to find the slope of a point on the curve. **Necessary Accessories for HP-41:** None

Steps: 97 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00525-41-6	$10	$11
FOR HP-71*	00525-71-3	N/A	$12

00526 Reactance Chart Nine Equations

by H.P. Meisinger, Washington, DC

The reactance chart provides a means of determining the missing values when any two values are known in any of nine resonance related equations. Frequency, inductance, capacitance, inductive reactance and capacitive reactance are used for output as well as input terms. Automatic selection of the proper equation is provided. When a computation is made, data is automatically stored so that subsequent computations can be made without reentry. Input and output data are alpha labeled. **Necessary Accessories for HP-41:** None

Steps: 233 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00526-41-4	$10	$12
FOR HP-71*	00526-71-1	N/A	$14

00528 Hydraulic Properties for Irregular River Cross Sections

by L.E. Peterson, Nashville, TN

Program provides data needed for profile analysis or bridge backwater study. Divided flow permitted, n-1 subareas with unique roughness allowed, where n is the number of cross sections points, points are preserved properties may be computed at any number of elevations, output (by subarea) conveyance, a, p,r, t - alpha computed. **Necessary Accessories for HP-41:** One Memory Module

Steps: 317 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00528-41-0	$10	$13
FOR HP-71*	00528-71-7	N/A	$14

00530 Banner

by D. Hayden, Rocky Hill, NJ

Program prints user defined characters at normal size or vertically along paper as giant banners with each column being printed as one line. Banner size characters make editing with the program's several editing features a snap. **Necessary Accessories for HP-41:** One Memory Module and Printer.

Steps: 214 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00530-41-6	$10	$12
FOR HP-71	NOT AVAIL		

00531 Steady State Flow in a Prismatic Channel

by C.S. Hodge, El Toro, CA

For a given rectangular or tradezoidal channel section, this program, using Manning's formula, will compute either flow, slope or depth -any one from the other two. Flow units be either cubic-feet per second or acre-feet per day. **Necessary Accessories for HP-41:** One Memory Module

Steps: 179 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00531-41-4	$10	$12
FOR HP-71*	00531-71-1	N/A	$14

00532 Earthquake Energy

by R.G. Hartmann, Los Altos, CA

Prompts for and accepts magnitude of earthquake on richter scale. Outputs earthquake radiated energy in joules and then in equivalent tons of tnt. **Necessary Accessories for HP-41:** None

Steps: 32 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00532-41-2	$10	$11
FOR HP-71*	00532-71-9	N/A	$12

00534 Tanker Loading

by M. Grattan, Tavermier, FL

This program will load a bulk liquid tanker. User enters the tons of cargo to be loaded or unloaded (a negative number), in what tank the cargo is to go, and the factor for that tank. Program will output the total displacement, trim numeral, whether the ship is hogging or sagging and by what factor. **Necessary Accessories for HP-41:**

Steps: 79 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00534-41-8	$10	$11
FOR HP-71*	00534-71-5	N/A	$12

00535 Plot of Cargo Stress on Ship

by M. Grattan, Tavermier, FL

This program is dependent on program 00534C. It will plot a curve of the stress placed on the ship by the cargo loaded. It will also indicate whether the ship is down by the bow or stern. **Necessary Accessories for HP-41:**

Steps: 45 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00535-41-5	$10	$11
FOR HP-71*	00535-71-2	N/A	$12

00536 Tanker Drafts

by M. Grattan, Tavermier, FL

This program is dependent on program #00534C. The user enters the forward and after factors for each tank and loads the bunkers and their factors also. The program displays the forward and after draft of the ship in decimal feet. **Necessary Accessories for HP-41:**

Steps: 73 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00536-41-3	$10	$11
FOR HP-71*	00536-71-0	N/A	$12

00540 Direct Material & Labor Variance Analysis

by E.W. Brasch, Marietta, GA

This program computes the following four variances used particularly in a standard cost accounting situation: 1. Material price variance. 2. Material usage variance. 3. Labor rate variance. 4. Labor efficiency variance. **Necessary Accessories for HP-41:** None

Steps: 80 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00540-41-5	$10	$12
FOR HP-71*	00540-71-2	N/A	$14

00541 Payroll with Federal and Illinois State Tax

by P.J. Rzeminski, Blue Island, IL

Computes biweekly payroll deductions for income tax (state and federal), social security, pension, tax shelter annuity (or IRA), savings and misc. under October, 1981 tax reform act. Pension can be eliminated by selecting certain labels. There is no need for separate programs for married or singles. It's all in this one program. Added advantage - by using enclosed tax table, user can change program from bi-weekly to weekly, semi-monthly or monthly. Program can be updated by changing social security % or tax tables as needed, or by using local state % instead of Illinois %. **Necessary Accessories for HP-41:** One Memory Module

Steps: 349 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00541-41-3	$10	$14
FOR HP-71*	00541-71-0	N/A	$16

00543 Root Locus Plot Construction

by R. Gaston, Torrance, CA

This program constructs the root loci of a transfer function with any combination of up to 21 poles and zeroes, real or complex. Program yields loci asymptotes and centroid, departure/arrival angles for all poles/zeroes, breakaway points for real axis loci, and intermediate locus points with corresponding k values. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 496 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00543-41-9	$10	$15
FOR HP-71*	00543-71-6	N/A	$18

00544 Poly:Computation of Acid-base Species Distribution

by S.L. Morgan, Columbia, SC

This program will determine the distribution, as a function of ph or (h+), of the several possible forms of an acid or base in aqueous solution. The program can also calculate the fractional amounts of all species in a complex ion equilibrium given the ligand concentration. **Necessary Accessories for HP-41:** None

Steps: 125 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00544-41-7	$10	$11
FOR HP-71*	00544-71-4	N/A	$12

00545 555 Timer Astable

by J.B. Ferrer, Belo Horizonte MG, Brasil

The pulse widths, frequency, duty cycle, timing resistors or timing capacitor may be calculated for the 555 timer, in 41C alphanumerical language (save time). **Necessary Accessories for HP-41:** None

Steps: 118 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00545-41-4	$10	$11
FOR HP-71*	00545-71-1	N/A	$12

00546 Coil Design Program

by A. Windhorn, Kasota, U.S.A.

Calculates build, mean length of turn, wire length, weight, and resistance for multiple windings on a random-wound bobbin. Calculates wire table data for standard AWG 10 through 50 with single or heavy film insulation. **Necessary Accessories for HP-41:** None

Steps: 145 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00546-41-2	$10	$13
FOR HP-71*	00546-71-9	N/A	$14

00549 Annual Growth Rate of Investments (Discounted Cash Flow)

by N.J. Gordon, Mountain View, CA

Data is entered once only, as prompted, to determine with 99.99% accuracy, the annual growth rate (discounted cash flow rate of return) of any investment--stocks, bonds, other tangibles etc. and combinations--or unlimited cash flow stream. This is a fully automatic version of 00817D-67, requiring only data and R/S entry. One memory module minimum. 2nd module necessary only if large amount of data is to be processed. See page 10. **Necessary Accessories for HP-41:** One Memory Module minimum - 2 Memory Modules if large amount of data is to be processed.

Steps: 314 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00549-41-6	$10	$14
FOR HP-71*	00549-71-3	N/A	$16

00550 Open to Buy/Monthly Sales Fcst

by A.M. Danny, Vernon, Canada

The average retailers activity of sales and purchases for annual period is built from any one of: (1) annual sales, (2) total net purchases @ LCD or (3) by product area, with or without % of total purchases in that product area, for the brand known. Output in terms of: total sales, laid down cost of goods sold in total & by product area, resulting gross profit, forecast sales and open to buy (monthly based on industry/known average). **Necessary Accessories for HP-41:** Card Reader, Printer and Two Memory Modules.

Steps: 358 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00550-41-4	$10	$17
FOR HP-71	NOT AVAIL		

00551 Bank Statement Validation

by R. Benn, Del Mar, CA

Validates monthly bank statement with check book entries. Simplified input thru printer/display prompting. Identifies each transaction, whether on bank statement or in check book, and prints all data on each deposit, canceled check, voided check, check service charge, miscellaneous charge and interest paid. Recaps all transactions to show what bank balance should be and what current check book balance is. Can be used for recapitulation of any financial records using serialized vouchers or receipts. **Necessary Accessories for HP-41:** Two Memory Modules and a Printer.

Steps: 351 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00551-41-2	$10	$15
FOR HP-71*	00551-71-9	N/A	$18

00554 N Simultaneous Ode

by N.C. Shammas, Richmond, VA

Involved in a simulation? Make this program your loyal companion. This program can handle up to 10 simult. Ode. The latter is keyed by user. **Necessary Accessories for HP-41:** Card Reader, Printer and One Memory Module.

Steps: 140 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00554-41-6	$10	$12
FOR HP-71*	00554-71-3	N/A	$14

00555 Multiple Linear Regression

by N.C. Shammas, Richmond, VA

This program will convince you that your calculator is a serious rival to the fancy computer, since you can, using Math 1 module, carry out a multiple linear regression of up to nine variables (independent). Projections are also available. **Necessary Accessories for HP-41:** Card Reader, Math 1 and Memory Modules.

Steps: 156 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00555-41-3	$10	$12
FOR HP-71	NOT AVAIL		

00559 Absorption and Leaching 4

by N.C. Shammas, Richmond, VA

This program deals with counter-current absorption or leaching for unsaturated feed (or partially miscible solvents), and solute present in extract. You can calculate the number of stages, or stripping factor, or a list of component flowrates at each stage. **Necessary Accessories for HP-41:** None

Steps: 249 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00559-41-5	$10	$12
FOR HP-71*	00559-71-2	N/A	$14

00560 Absorption and Leaching 3

by N.C. Shammas, Richmond, VA

Let this program help you in dealing with counter-current absorption or leaching for unsaturated feed (or partially miscible solvent) and pure extract. You can calculate the number of stages, or stripping factor, or a list of component flowrate for each stage. **Necessary Accessories for HP-41:** None

Steps: 214 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00560-41-3	$10	$12
FOR HP-71*	00560-71-0	N/A	$14

00561 Absorption and Leaching 2

by N.C. Shammas, Richmond, VA

Let this program help you in counter-current absorption and leaching calculations for a saturated feed and solute present in extract. You can calculate the number of stages, or stripping factor, or a list of component flowrates for each stage. **Necessary Accessories for HP-41:** None

Steps: 204 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00561-41-1	$10	$12
FOR HP-71*	00561-71-8	N/A	$14

00562 Absorption and Leaching 1

by N.C. Shammas, Richmond, VA

Let this program handle your calculations in counter-current absorption and leaching for saturated feed and pure extract. You can calculate the number of stages needed, or stripping factor, or a list of the component flowrates for each stage. **Necessary Accessories for HP-41:** None

Steps: 169 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00562-41-9	$10	$12
FOR HP-71*	00562-71-6	N/A	$14

00564 Function Scanner

by N.C. Shammas, Richmond, VA

Curious about the maxima, minima and roots of a function? then you are in good company, because this program helps you to scan for the above in a region designated by user. For each class of loci either rough guesses or more accurate values can be obtained. **Necessary Accessories for HP-41:** One Memory Module

Steps: 202 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00564-41-5	$10	$12
FOR HP-71*	00564-71-2	N/A	$14

00565 Special Root Finder 1

by D.H. Bradstreet, St. Davids, PA

Tired of trying to obtain roots of s-shaped and other nonsmooth functions, and ending up in a wild goose chase? This program will make it easy on you. You can plot your function and choose two guesses that define your region of interest. The algorithms involved will monitor divergence and make corrective action. Printer enables function plotting. **Necessary Accessories for HP-41:** None

Steps: 122 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00565-41-2	$10	$11
FOR HP-71	NOT AVAIL		

00566 Root Finding by Richmond's Method

by N.C. Shammas, Richmond, VA

Looking for a fast root finder? Try the Richmond algorithm, superior to Newton's method. You will save in the number of iterations. With some changes you can use it as a subroutine. First and second derivatives, used in algorithm, are evaluated by divided difference. **Necessary Accessories for HP-41:** None

Steps: 70 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00566-41-0	$10	$11
FOR HP-71*	00566-71-7	N/A	$12

00567 Linear Regression Package 3

by N.C. Shammas, Richmond, VA

This is the poor man's regression package, with no memory modules. The user fits a linearized regression in which each of the variables involved can undergo several sequences of transformations. Projections are available. Versatile in fitting rather unusual forms. **Necessary Accessories for HP-41:** None

Steps: 216 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00567-41-8	$10	$12
FOR HP-71*	00567-71-5	N/A	$14

00568 Model Rocket Altitude Prediction

by S. Douglas, Bellaire, TX

This program calculates the burnout altitude, burnout velocity, distance coasted, maximum altitude and coasting time for single stage model rockets. the inputs required are rocket weight, drag coefficient, maximum diameter, engine weight, propellant weight, thrust duration and average thrust. Estes engine data is supplied. Ten engines are preprogrammable. **Necessary Accessories for HP-41:** None

Steps: 206 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00568-41-6	$10	$12
FOR HP-71*	00568-71-3	N/A	$14

00569 Withholding Tax Federal + New York State

by J.H. Abrams, Corvallis, OR

Given gross pay calculates amount of federal withholding tax, FICA and New York state withholding taxes. Provides net pay and total deductions. Also disability (NY). Works on weekly payroll. **Necessary Accessories for HP-41:** One Memory Module

Steps: 266 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00569-41-4	$10	$13
FOR HP-71*	00569-71-1	N/A	$14

00570 Monopoly

by E.W. Brasch, Marietta, GA

This program is an adaptation for the HP-41C of program #01816D by Bruce G. Hansen. With this program, it makes the game more fun and efficient since you don't have to keep loading the cards as per his instructions. The HP-41C is a great banker and board position-keeper. The program does not follow all the standard rules of "Monopoly" - there are approximately ten differences. **Necessary Accessories for HP-41:** Two Memory Modules and Card Reader.

Steps: 420 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00570-41-2	$10	$14
FOR HP-71	NOT AVAIL		

00571 The Scrap Decision

by E.W. Brasch, Marietta, GA

If you have an inventory of scrap items or surplus items in your inventory, this program can help you decide when it is time to sell it. You will get the message "hold" or "sell" depending on the factors. **Necessary Accessories for HP-41:** None

Steps: 41 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00571-41-0	$10	$11
FOR HP-71*	00571-71-7	N/A	$12

00572 Dynamic Programming to Solve a Markou Process Model

by E.W. Brasch, Marietta, GA

It is possible to use the technique of dynamic programming to study the short run, transient behavior of a Markou process. The solution depends on the initial state. If a machine is in state 1 (in adjustment) on day 1, a person may wish to know the expected profit. **Necessary Accessories for HP-41:** None

Steps: 86 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00572-41-8	$10	$12
FOR HP-71*	00572-71-5	N/A	$14

00573 Math-1 Elementary Arithmetic Teacher

by L.C. Brown, San Diego, CA

Math teacher for children K-2nd. Presents addition and subtraction problem of 1 to 4 digits in which carrying and borrowing are not required. Key inputs simplified for use by children. Tones reward correct answer. Problem resubmitted for partial credit if missed on first try, if second incorrect correct answer given. **Necessary Accessories for HP-41:** None

Steps: 143 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00573-41-6	$10	$12
FOR HP-71*	00573-71-3	N/A	$14

00575 "Tiltup" Tilt-Up Wall Design

by C.I. Dinsmore, Seattle, WA

A program for the design of tilt-up concrete walls using the strength design method, with tilt-up walls the presence of lateral loads and high eccentricities, together with the influence of variable inertia, and effects of deflections, presents a complex problem. By the use of numerical methods and the HP-41C this program provides a ready solution. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 281 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00575-41-1	$10	$13
FOR HP-71*	00575-71-8	N/A	$14

00576 Potential Flow-Linear Source Filament (lsf1)

by R.L. Fearn, Gainesville, FL

This is one of a series of programs on line and surface singularities in potential flow (lap 0=0, where 0 is a scalar). This program calculates the velocity induced at a point by a finite straight source filament of constant strength. **Necessary Accessories for HP-41:** One Memory Module

Steps: 277 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00576-41-9	$10	$14
FOR HP-71*	00576-71-6	N/A	$16

00577 Row Plot (High Resolution Plot)

by T.D. Boldt, Thousand Oaks, CA

Plot of single-valued function, y=f(x), plotting one point per row of printer output. Program to be compatible with printer plotting programs. Plotting program PRPLOT <--> PLOTHR, PRPLOTP <-> PLOTHP, REGPLOT <--> REGHP are same to use except for memory requirements. PLOTHR and PLOTHP use additional registers R12 to R19, in addition for REGPLOT plot points stored in R12 to R18 inclusive. **Necessary Accessories for HP-41:** None

Steps: 292 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00577-41-7	$10	$13
FOR HP-71	NOT AVAIL		

00578 Respiration

by T. Adams, East Lansing, MI

This program is designed to provide the calculations and unit conversions used in respiratory physiology. In using different equations, only data which have not already been entered will be requested. For a single day and/or experiment, some values will remain constant and only new values for gas volumes, ventilations, V02's, VC02's R's and gas partial pressures are needed. Equations solved by this program are commonly used in medical teaching and respiratory research. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 577 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00578-41-5	$10	$16
FOR HP-71*	00578-71-2	N/A	$18

00579 Sundial

by J.L. Bigorra, Caracus, Venzuela

This program computes the time of day (accurate to better than a minute of time) from either the altitude or azimuth of the sun. A routine is included to correct for atmospheric refraction. **Necessary Accessories for HP-41:** One Memory Module

Steps: 258 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00579-41-3	$10	$12
FOR HP-71*	00579-71-0	N/A	$14

00580 Financial Calculations--Efficient Version

by K. Jarett, Manhattan Beach, CA

This program solves for an unknown component of an even cash flow. Payments are made at the end of each compounding period. This program is essentially identical in operation to the Standard Pac Financial Calculations Program. It cuts the memory requirement by 6 registers through heavy use of the stack. **Necessary Accessories for HP-41:** None

Steps: 190 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00580-41-1	$10	$12
FOR HP-71*	00580-71-8	N/A	$14

00581 Alphanumeric to Numeric Conversion

by P.C. Jensen, Newport, RI

This program will convert any valid alphanumeric string located in the alpha register to a number which will be pushed on the stack. Examples of use are converting character strings entered by user and reconverting numbers that have been "ARCL'ed" into the alpha register. **Necessary Accessories for HP-41:** None

Steps: 211 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00581-41-9	$10	$12
FOR HP-71*	00581-71-6	N/A	$14

00582 Black Box

by R.S. Altman, Clearlake, CA

This program is based on the game of "Black Box" (Parker Bros). Five marbles are hidden inside the black box by one of the players or by the HP-41C. A player sends "rays" into the box from various points. These rays may hit a marble or change direction if it comes close. Alphanumeric clues are displayed. From these clues you try to find the hidden marbles. The game is for one or two players. **Necessary Accessories for HP-41:** One Memory Module and Card Reader.

Steps: 359 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00582-41-7	$10	$13
FOR HP-71*	00582-71-4	N/A	$14

00584 Aircraft Position

by T.D. Boldt, Thousand Oaks, CA

Program designed to work in conjunction with Aviation X Pac program "Plan" to provide course/distance information from latitudes/longitudes. **Necessary Accessories for HP-41:** One Memory Module

Steps: 269 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00584-41-3	$10	$13
FOR HP-71*	00584-71-0	N/A	$14

00586 Strong Acid-Base Titration Calculations

by L.J. Burger, Camarillo, CA

This program calculates the hydrogen ion concentration, hydroxide ion concentration, the ph and poh of a strong acid-base titration. The total volume, the volume of the acid, the volume of the base, the original strong acid concentration, and the original strong base concentration are inputs. **Necessary Accessories for HP-41:** None

Steps: 155 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00586-41-8	$10	$12
FOR HP-71*	00586-71-5	N/A	$14

00587 Bode Plots

by G.R. Carroll, Columbus, OH

This program solves for the data needed to plot the frequency response (bode plot) of a given linear transfer function (magnitude ratio in decibels, and phase shift in degrees for each automatically indexed frequency-rad/sec). Transfer functions beyond eleventh order as well as nonminimum phase factors can be accomodated. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 240 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00587-41-6	$10	$12
FOR HP-71*	00587-71-3	N/A	$14

00588 8080 Disassembler Mnemonic Generator

by R.D. Cooper, Houston, TX

Program generates 8080 microprocessor mnemonics for a given machine code input in decimal or octal format. **Necessary Accessories for HP-41:** One Memory Module

Steps: 362 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00588-41-4	$10	$14
FOR HP-71*	00588-71-1	N/A	$16

00589 Composite Section Properties

by R.L. Danley, Rancocas, NJ

Computes location of neutral axis, moment of inertia, radius of gyration and cross section area for any section comprised of an unlimited number of the following shapes: cylinders (hollow or solid), rectangles (parallel to reference datum) and shapes, which are shapes about which area, moment of inertia and location of centroid are known (e.g. Structural shapes). **Necessary Accessories for HP-41:** None

Steps: 129 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00589-41-2	$10	$11
FOR HP-71*	00589-71-9	N/A	$12

00590 Birkhoff Interpolation Using Function and Derivatives

by J.F.G. Darby, Parkville, Australia

Finds and stores the generalized divided differences of a set of arbitrarily spaced ordinates and any derivatives known at any of them, so that the corresponding interpolation polynomial may be evaluated for any x. The degree of the polynomial can be increased by adding more points or derivatives, while retaining earlier results, and the resulting convergence of successive interpolates watched. **Necessary Accessories for HP-41:** None

Steps: 99 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00590-41-0	$10	$11
FOR HP-71*	00590-71-7	N/A	$12

00592 Queueing Models

by L.A. Esterhuizen, Johannesburg, South Africa

For simple queueing models (multi or single-server) this program computes mean queue and system length, mean queue and system wait. Also computes the following probabilities: all servers idle, one server idle, system busy. In addition to above, for finite queue lengths effective lambda is computed. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 321 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00592-41-6	$10	$11
FOR HP-71*	00592-71-3	N/A	$12

00593 Sequencer

by J.D. Flegenheimer, Necochea, Argentina

Without extra memory modules, this program sorts up to 35 numbers in a given series from the smallest to the greatest. The numbers can be reviewed before and after ordering. **Necessary Accessories for HP-41:** None

Steps: 95 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00593-41-4	$10	$11
FOR HP-71*	00593-71-1	N/A	$12

00594 Bell Fruit 41

by J.L. Gilby, Vancouver, Canada

This program simulates a Mills brand slot machine in payoffs and duplicates the same odds that any combination will occur. The display gives different alpha characters and audible tones for each fruit. Winnings are shown in display with fanfare. The pot can be reviewed and seed changed at any time. **Necessary Accessories for HP-41:** Card Reader

Steps: 146 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00594-41-2	$10	$12
FOR HP-71	NOT AVAIL		

00595 League Table

by J.L. Gilby, Vancouver, Canada

This program compiles results and prints the league table for any sport with low scoring matches. The program was designed to be used for association football results for up to 24 teams in the league. It uses a subroutine for team names and one store per team for data. This is fun to run particularly for the British football enthusiast every Saturday evening. It is a useful program for organizers of leagues. **Necessary Accessories for HP-41:** One or Two Memory Modules, Card Reader and Printer.

Steps: 257 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00595-41-9	$10	$16
FOR HP-71	NOT AVAIL		

00596 "ANAP" Active Network Analysis Program

by S. Hageman, Vallejo, CA

This program will calculate the transfer function, pole-zero locations, q(n) and f(n) of a six element op-amp feedback network. The network can consist of r's or c's and takes into account the non-ideal nature of the op-amp. The program allows for easy modification of op-amp or feedback parameters. Two memory modules necessary, printer optional. **Necessary Accessories for HP-41:** Two Memory Modules. Printer optional.

Steps: 475 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00596-41-7	$10	$15
FOR HP-71*	00596-71-4	N/A	$18

00597 Hot-Air Balloon

by J.D. Hanks, Bozeman, MT

The object of the game is to safely land the hot-air balloon near the center of a small clearing surrounded by trees. The direction of the wind changes with altitude, and thus the horizontal position of the balloon is controlled by varying its altitude, by adjusting the amount of hot air it contains. There is only a limited amount of fuel for heating the air, but sandbags can be dropped for emergency ascent. **Necessary Accessories for HP-41:** None

Steps: 167 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00597-41-5	$10	$12
FOR HP-71*	00597-71-2	N/A	$14

00598 Determinant of a N by N Matrix

by L.K. Johnson, Kennewick, WA

This program given U**2+5 registers of data memory will solve any N by N matrix. The way the program is designed if you had 00**2+5 registers you would be able to solve an infinity by infinity matrix. The program prompts for all data input. **Necessary Accessories for HP-41:** None

Steps: 146 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00598-41-3	$10	$11
FOR HP-71*	00598-71-0	N/A	$12

00599 Cramer's Rule

by C. Jones, Grass Valley, CA

Cramer's rule is a short cut in solving 3 equations with 3 unknowns. This is done very quickly on the 41c due to its "key assignment" power. The matrix of coefficients in the equations are punched in an "assigned keyboard matrix". **Necessary Accessories for HP-41:** None

Steps: 149 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00599-41-1	$10	$11
FOR HP-71*	00599-71-8	N/A	$12

00601 Chinese Remainder Theorem

by E.M. Keefe, Ankeny, IA

Given any number of relations of the form "x is congruent to ai modulo mi" (where a and m are integers). The "CH" program will solve for an x that satisfies all n equations. (the RPN coding shows how some basic language statements may be transposed to run on the 41C). **Necessary Accessories for HP-41:** None

Steps: 72 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00601-41-5	$10	$11
FOR HP-71*	00601-71-2	N/A	$12

00602 Data Transformation

by A. Leyenberger, Whippany, NJ

This program performs 4 types of data transformation: logarithmic; arcsin; reciprocal; and square-root. Special cases of the logarithmic, square-root and reciprocal tranformations are included. **Necessary Accessories for HP-41:** None

Steps: 116 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00602-41-3	$10	$12
FOR HP-71*	00602-71-0	N/A	$14

00603 Cantilevered Retaining Walls

by J.R. Loftfield, Las Vegas, NV

This program finds the required footing width and key depth to satisfy the soil bearing requirements for a given wall height and soil data. It then calculates factored moments and shears at three places on the wall, and at four places on the footing. **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 750 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00603-41-1	$10	$16
FOR HP-71*	00603-71-8	N/A	$18

00606 Data Sort and Handling Routines for HP-41C

by D. Milanovic, New York, NY

This program will rapidly sort any number of inputs in ascending order and display them in either ascending or descending order. New data may be inserted and resorted. In addition, any value may be reviewed, changed or deleted. The sort routine is short, only 35 steps long, and relatively fast. It takes about 15 seconds to sort 10 values, and progressively more for additional inputs. **Necessary Accessories for HP-41:** One Memory Module if more than 8 inputs are used.

Steps: 165 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00606-41-4	$10	$12
FOR HP-71*	00606-71-1	N/A	$14

00607 Display Format Restore

by E.D. Moore, Anaheim, CA

After running a program that temporarily changes the display format, the user often finds it necessary to return to the original format manually. This subroutine can be used to automatically restore the previous display format when the program is finished. This subroutine does not alter the stack. **Necessary Accessories for HP-41:** None

Steps: 33 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00607-41-2	$10	$11
FOR HP-71*	00607-71-9	N/A	$12

00608 N Simultaneous Equations in N Unknowns

by R. Monroe, Derby, KS

This program will solve up to 13 equations in 13 unknowns with 3 additional memory modules. This program was designed to access coefficients as a one dimensional array allowing more efficient execution. Resides on three program cards. **Necessary Accessories for HP-41:** Card Reader. Memory Modules as desired.

Steps: 259 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00608-41-0	$10	$13
FOR HP-71*	00608-71-7	N/A	$14

00609 Fitting Polynomials of Degree M to Data

by G.L. Olson, Boulder, CO

Polynomials are fitted in the least squares sense to input data using orthogonal polynomials rather than matrix methods. This is more accurate and efficient for large M. Spacing of data points may be arbitrary. For N data points the number of memory modules required is 1 +INT ((38+3m+2n)/64). **Necessary Accessories for HP-41:** Memory Modules

Steps: 361 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00609-41-8	$10	$13
FOR HP-71*	00609-71-5	N/A	$14

00610 Double Integration by Gaussian Quadrature

by G.L. Olson, Boulder, CO

Approximations to double integrals are found using Gaussian quadrature methods. The limits of the inner integral may be constants or functions. The number of grid points, N, is chosen by the user. The required number of memory modules is INT ((39+2N)/64). **Necessary Accessories for HP-41:** Memory Modules. Card Reader useful.

Steps: 122 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00610-41-6	$10	$11
FOR HP-71*	00610-71-3	N/A	$12

00611 Integration: Gaussian, Laguerre, and Hermite

by G.L. Olson, Boulder, CO

Approximations to integrals over finite or infinite intervals are found using Gaussian quadrature methods. Integrals of the Laguerre and Hermite types are also approximated using appropriate weighting factors. The number of grid points, n, is arbitrary. The required number of memory modules is INT((45+2n)/64). **Necessary Accessories for HP-41:** Memory Modules. Card Reader useful.

Steps: 161 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00611-41-4	$10	$12
FOR HP-71*	00611-71-1	N/A	$14

00612 High Head Flow in Hydraulically Short Culverts

by L.E. Peterson, Nashville, TN

Computer discharge for pipe culverts in high head, hydraulically short conditions, type 5 of the U.S. Geological Survey classification. Input is diameter, head and degree of beveling or rounding of entrance. Coefficient may be computed internally, entered directly or adjusted by a factor. **Necessary Accessories for HP-41:** One Memory Module

Steps: 191 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00612-41-2	$10	$12
FOR HP-71*	00612-71-9	N/A	$14

00613 Bridge Backwater Yarnell Equation

by J.T.J. Potts, Boulder, CO

The Yarnell equation is an empirical formula which predicts bridge backwater as a function of bridge geometry, and downstream Froude number. It is applicable to subcritical flow through bridges and is used in the Corps of Engineers HEC-2 water surface profiles program. This program applies the equation and tests for applicability. **Necessary Accessories for HP-41:** None

Steps: 95 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00613-41-0	$10	$11
FOR HP-71*	00613-71-7	N/A	$12

00614 Register Sort

by J. Porras, San Diego, CA

This program sorts registers roo-rnnn (rnnn, the last register, does not need to be known) in ascending order without using any storage registers itself. It can be modified to sort in descending order or to start at any storage register. It is very useful as a subroutine. **Necessary Accessories for HP-41:** None

Steps: 26 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00614-41-8	$10	$11
FOR HP-71*	00614-71-5	N/A	$12

00616 Queueing Theory for a Small Sales Outlet

by M.A. Pickup, Ithaca, NY

Input the number of customers expected per hour, the number one salesperson can serve in an hour, and the number of salespeople. Then the program predicts the queue length, time in queue, number of customers present, and total time spent waiting and being served. **Necessary Accessories for HP-41:** None

Steps: 124 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00616-41-3	$10	$12
FOR HP-71*	00616-71-0	N/A	$14

00617 Multi-Stage Boost Trajectory

by K.L. Remmler, Palmdale, CA

Calculates trajectory state parameters as a function of time. Includes thrust vectoring and atmosphere model for drag and thrust. The drag coefficient is modeled as a five point, mach number table interpolation. The system of differential equations is integrated using a modified Euler algorithm. **Necessary Accessories for HP-41:** Two Memory Modules, Card Reader and Printer.

Steps: 498 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00617-41-1	$10	$16
FOR HP-71*	00617-71-8	N/A	$18

00619 Electrolysis and Faraday's Law

by H.V. Saad, Cofrailly Caracus, Venezuela

This program uses Faraday's law to solve problems of electrolysis to the following variables: time of electrolysis, current of electrolysis and grams of: element (metal or not metal), acid, salt, or basis. **Necessary Accessories for HP-41:** None

Steps: 152 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00619-41-7	$10	$12
FOR HP-71*	00619-71-4	N/A	$14

00621 Organic Pollution Loads on Streams

by N.C. Shammas, Richmond, VA

Allow yourself to relax while this program handles calculations of oxygen deficit in a polluted stream. Available is the oxygen deficit after a certain desired period, also the coefficients of deoxygenation and re-aeration from the maximum deficit data. **Necessary Accessories for HP-41:** None

Steps: 195 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00621-41-3	$10	$12
FOR HP-71*	00621-71-0	N/A	$14

00622 Linear Regression Package 5

by N.C. Shammas, Richmond, VA

Three programs in one? Yes, this program stores (x, y) data and allows you to perform (1) linearized regression $g(y)=a+bf(x)$, (2) multiple regression $g(y)=a+bf(x)+ch(x)$, (3)shift from case (1) to (2) by inserting h(x) (done by program), no data re-entry needed. You can cover a wide variety of equations. Projections are available. **Necessary Accessories for HP-41:** One or Two Memory Modules

Steps: 348 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00622-41-1	$10	$13
FOR HP-71*	00622-71-8	N/A	$14

00623 Linear Regression Package 6

by N.C. Shammas, Richmond, VA

If you have ever tried to calculate trends on weekly, monthly, annual or any periods, then you know the frustration involved. Let this program help you enter your data once and build up from lower periods to higher, while you can obtain regression results at any moment. Also used for multi-trend data. Transformations are possible. At least one memory module necessary, printer (option). **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 253 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00623-41-9	$10	$12
FOR HP-71*	00623-71-6	N/A	$14

00624 P.D.F. Fitting 2

by N.C. Shammas, Richmond, VA

Having doubts about which probability distribution function best fits your data? This program deals with normal, log-normal, beta, gamma, Cauchy and Erlang PDF, and tells you the best function. **Necessary Accessories for HP-41:** Two Memory Modules and Card Reader.

Steps: 326 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00624-41-7	$10	$13
FOR HP-71	NOT AVAIL		

00626 Binomial Distribution

by G.G. Sandoval, Metro Manila, Philippines

This program evaluates the binomial density function for a given p and n. It also gives the mean and variance. The program is an adaptation of HP-65 program Stat 1-18A. **Necessary Accessories for HP-41:** None

Steps: 126 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00626-41-2	$10	$11
FOR HP-71*	00626-71-9	N/A	$12

00627 Negative Binomial Distribution

by G.G. Sandoval, Metro Manila, Philippines

This program evaluates the negative binomial density function for given p and r. It also gives the mean and variance. The program is an adaptation of HP-65 program Stat 1-19A. **Necessary Accessories for HP-41:** None

Steps: 118 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00627-41-0	$10	$11
FOR HP-71*	00627-71-7	N/A	$12

00628 Mann-Whitney Statistic

by G.G. Sandoval, Metro Manila, Philippines

This program computes the Mann-Whitney test statistic on two independent samples of equal or unequal sizes. This test is designed for testing the null hypothesis of no difference between 2 populations. The program is an adaptation of HP-65 program Stat 1-35A. **Necessary Accessories for HP-41:** None

Steps: 84 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00628-41-8	$10	$11
FOR HP-71*	00628-71-5	N/A	$12

00629 Game of the Generals (Advanced Version)

by G.G. Sandoval, Metro Manila, Philippines

For the more advanced GG player. Has a secret play option, so you don't know what killed you. Doesn't permit illegal reentries of previously eliminated ranks. Ranks eliminated feature, so you can replay. Card reader, two memory modules necessary. **Necessary Accessories for HP-41:** Two Memory Modules and Card Reader.

Steps: 339 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00629-41-6	$10	$15
FOR HP-71	NOT AVAIL		

00631 Shovelton & Karup-King Interpolation Formulae

by W.W. Steffen, Indianapolis, IN

Interpolates by either Shovelton's osculatory six-point formula or Karup-King's osculatory four-point formula. The values are printed and are stored for computation, printing and review of the first through fourth difference. **Necessary Accessories for HP-41:** Printer, three Memory Modules.

Steps: 572 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00631-41-2	$10	$15
FOR HP-71*	00631-71-9	N/A	$18

00632 Distance on Earth's Surface Per FCC Rules

by P.N. Steinmetz, Minneapolis, MN

This program calculates the distance between two points on the earth's surface per FCC rules. Optional input prompting. Flag controllable decimal degree or d. MSS input format. Extremely useful for determining the distance to possible interfering broadcasting stations. **Necessary Accessories for HP-41:** None

Steps: 77 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00632-41-0	$10	$11
FOR HP-71*	00632-71-7	N/A	$12

00633 Invaders

by J.C. Stevens, Orem, UT

This is a calculator game similar to the popular space invaders game at arcades. An "enemy" will flash at a random place on the display. The object is to accurately estimate the number of blank spaces before the "enemy" (between 0 and 9). If the "enemy" is hit he will blow up. If missed, he has a 50/50 chance of blowing up 1 of your 3 bases. **Necessary Accessories for HP-41:** None

Steps: 127 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00633-41-8	$10	$12
FOR HP-71*	00633-71-5	N/A	$14

00635 Fisher Exact Test with Tochars Modification

by K.F.D. Walker, Adelaide, South Australia

The Fisher test determines whether subjects in two independent groups differ in their proportional representation of two mutually exclusive categories. Tocher's modification increases the power of the test, and provides an effective one-tailed test for data in a 2 x 2 table. This program computes the Fisher probability and, if applicable, the Tocher ratio. The ratio is tested for significance at a given alpha. **Necessary Accessories for HP-41:** One Memory Module

Steps: 205 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00635-41-3	$10	$12
FOR HP-71*	00635-71-0	N/A	$14

00636 Von Bertalanffy Growth Curve

by F.C. Harmon, Corvallis, OR

The Von Bertalanffy equation is an asymptotic growth model commonly used by fishery biologists. This program uses Rafail's method to determine the three constants and goodness of fit, given annual measurements for up to 25 years. It provides for estimation of age given length, and vice versa. An optional printing routine (56 steps) is also provided. **Necessary Accessories for HP-41:** None

Steps: 206 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00636-41-1	$10	$13
FOR HP-71*	00636-71-8	N/A	$14

00637 Theta Function

by J. Walen, Fasanstigen 2, Sweden

Computes the sum of EXP (-PI*Z^N*N) over all integers N, using the properties of Dedekinds ETA function, which also is determined. The logarithms of these functions are determined for complex arguments. **Necessary Accessories for HP-41:** None

Steps: 174 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00637-41-9	$10	$12
FOR HP-71*	00637-71-6	N/A	$14

00638 Celestial Sight Reduction

by C. Wight, Brookline, MA

This program determines the computed altitude and azimuth for each of two celestial bodies then solves for and prints out the latitude and longitude of the fix. Provision is made not only for insertion of H0 instead of H3 but also for correction of movement of observer between observations. **Necessary Accessories for HP-41:** Two Memory Modules and Printer.

Steps: 374 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00638-41-7	$10	$15
FOR HP-71*	00638-71-4	N/A	$18

00639 Mtbf Calculation from Test Data

by R.H. Wood, Orinda, CA

This program calculates mean time between failures at upper and lower confidence limits, given the total test hours or cycles, number of observed failures, and confidence interval wanted. Allowed confidence intervals are 90, 80, 60, and 50 percent. Included instructions allow modification for other confidence intervals. **Necessary Accessories for HP-41:** None

Steps: 89 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00639-41-5	$10	$11
FOR HP-71*	00639-71-2	N/A	$12

00640 Estimation of Cost - Stochastic Model

by B.R. Vianna, Belo Horizonte, Brazil

This program estimates the whole cost of a job, using the unit cost of the activities as a random variable. To calculate the expected value, three estimates of the unit cost of each activity will be made; the minimum unit cost, the more probable unit cost, and the maximum unit cost. Optionally, the confidence interval and several probability values can be calculated. **Necessary Accessories for HP-41:** None

Steps: 372 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00640-41-3	$10	$14
FOR HP-71*	00640-71-0	N/A	$16

00641 Euler Phi Function

by S.J. Thomas, Hollywood, FL

This enhanced program rapidly computes the Euler phi value of a positive integer n -- that is, the number of positive integers less than n which are relatively prime to n. It takes advantage of the HP-41C's alphnumerics and also preserves the stack; thus it may be used in chain calculations. **Necessary Accessories for HP-41:** None

Steps: 116 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00641-41-1	$10	$12
FOR HP-71*	00641-71-8	N/A	$14

00642 Solution to All Roots of an Equation Over an Interval

by S. Hageman, Vallejo, CA

This program will solve for all roots of an equation over a given interval, the program when connected to a printer can be left unattended and will generate error messages as required, then continue on to the next root. Will also work without a printer by displaying the error messages. Will work with or without a printer. **Necessary Accessories for HP-41:** None

Steps: 124 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00642-41-9	$10	$12
FOR HP-71*	00642-71-6	N/A	$14

00643 Call Option Value

by Curry Bob, Austin, TX

The value of a call option is calculated using the Black-Scholes model, and the calculated value is compared with the option premium. While the Black-Scholes model has been implemented in several programmable calculators this program is tailored to the HP-41C, and uses many of the 41C unique features. Simple program modification is required to use after May, 1981. Program calculates time to option expiration using only the present date. Other required inputs are: (1) underlying stock price, (2) underlying stock rate of return, (3) market risk-free rate, and (4) option exercise price. **Necessary Accessories for HP-41:** Two Memory Modules and 82143A Printer

Steps: 352 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00643-41-7	$10	$14
FOR HP-71*	00643-71-4	N/A	$16

00644 Error Propagation (4-Function)

by E.W. Stoub, Des Plaines, IL

This program propagates errors through the four basic arithmetic functions (+, -,*, /). **Necessary Accessories for HP-41:** None

Steps: 118 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00644-41-5	$10	$12
FOR HP-71*	00644-71-2	N/A	$14

00645 Thermal Conduction Equation W/Radiative Boundary Conditi

by W.M. Sinton, Honolulu, HI

This program solves the thermal conduction equation in a semi-infinite plane surface with radiative boundary condition for periodic and non-periodic variation of incident radiative flux. The program is intended for the calculation of the temperature variation of planetary surfaces such as the moon during a "day" or an eclipse. **Necessary Accessories for HP-41:** One Memory Module. Printer desirable.

Steps: 172 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00645-41-2	$10	$12
FOR HP-71*	00645-71-9	N/A	$14

00647 Roman & Arabic Numeral Conversions

by K.F.D. Walker, Adelaide, South Australia

This program converts conventional numbers to their equivalent in Roman numerals. The year 1981, for example, is represented as MCMIXXXI. It also converts Roman numerals to Arabic. **Necessary Accessories for HP-41:** None

Steps: 100 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00647-41-8	$10	$12
FOR HP-71*	00647-71-5	N/A	$14

00648 Dawson's Integral

by K. Akima, Boulder, CO

For x real, this program will calculate the value of Dawson's integral, d=EXP(-x*x)*Integral from zero to x of EXP(t*t) dt. Power series expansion is used, producing an error of at most 10**-9. A print/no print option is provided. **Necessary Accessories for HP-41:** None

Steps: 35 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00648-41-6	$10	$11
FOR HP-71*	00648-71-3	N/A	$12

00649 Consumer Price Index

by K. Akima, Boulder, CO

This program can be used to compute the consumer price index. The Laspeyres, Paasche, Marshall-Edgeworth, and Fisher's ideal indices are provided. These indices can be used to infer whether increases or decreases have occurred in consumer welfare. The number of items in the market-basket is not limited. **Necessary Accessories for HP-41:** None

Steps: 75 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00649-41-4	$10	$11
FOR HP-71*	00649-71-1	N/A	$12

00650 T for Three (Three-Way T Statistics)

by K. Akima, Boulder, CO

This program will calculate the t statistic for three (3) cases: 1) the paired t statistic; 2) the t statistic for two means with equal variances; and 3) the t statistic for two means with unequal variances. **Necessary Accessories for HP-41:** None

Steps: 171 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00650-41-2	$10	$12
FOR HP-71*	00650-71-9	N/A	$14

00651 Mean, Standard Deviation, T-Statistics and T-Distribution

by H.Y. Rhyu, Seal Beach, CA

This is a master program capable of handling mean, standard deviation, t-statistics and t-distribution. Subroutines may be used individually or together. Fully utilizing the alpha-prompting features of the 41C one need not bother with many cards or understand the mnemonics. **Necessary Accessories for HP-41:** One Memory Module

Steps: 276 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00651-41-0	$10	$12
FOR HP-71*	00651-71-7	N/A	$14

00652 Constant Head Permeability

by J.L. Gilby, Vancouver, Canada

This program calculates the permeability from a constant head permeability test. The variables in the formula are shown automatically, these may be input by pressing the value then the corresponding key. Q must be entered last as this computes the permeability. To review values press corresponding top row key. **Necessary Accessories for HP-41:** None

Steps: 100 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00652-41-8	$10	$11
FOR HP-71*	00652-71-5	N/A	$12

00653 Inorganic Carbon Calculations

by R.H. Cohen, Reston, VA

This program calculates the concentrations of carbon dioxide bicarbonate, carbonate and total inorganic carbon in aquatic systems using values of alkalinity, temperature and ph(ionic strength is optional). It uses the alphanumeric capacity of the HP41C to request inputs. **Necessary Accessories for HP-41:** One Memory Module

Steps: 163 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00653-41-6	$10	$13
FOR HP-71*	00653-71-3	N/A	$14

00654 Othello for Two Players

by L.W. Jordan, Lake Charles, LA

This program allows two people to play Othello on the 41C, with the calculator keeping track of the board and score. A formatted board is printed after every move along with the score and prompting for the next move. **Necessary Accessories for HP-41:** Two Memory Modules and Printer.

Steps: 338 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00654-41-4	$10	$14
FOR HP-71	NOT AVAIL		

00655 Space War-Interactive

by R.M. Stenerson, Albany, OR

You are the captain of a spacecraft in the far reaches of the universe. Your mission is to destroy as many of the enemy as possible, without being destroyed yourself. To accomplish this, you shoot at the enemy spacecraft (fighters, battleships, and freighters) as they move rapidly across the display. **Necessary Accessories for HP-41:** One Memory Module

Steps: 213 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00655-41-1	$10	$13
FOR HP-71*	00655-71-8	N/A	$14

00657 Rad50

by M.E. Johnson, Bataria, IL

Converts 3 character alpha text to PDP-11 rad 50 number or a rad 50 number to alpha text. **Necessary Accessories for HP-41:** One Memory Module

Steps: 170 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00657-41-7	$10	$12
FOR HP-71*	00657-71-4	N/A	$14

00659 Chi Squared Corrected for Continuity

by R.W. Fitzgerald, Queanbeyan, Australia

For a 2 x 2 contingency table, gives chi squared corrected for continuity with it's significance level. Marginal totals output. Checks both the n and expected frequencies and advises if chi squared is invalid. **Necessary Accessories for HP-41:** None

Steps: 187 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00659-41-3	$10	$12
FOR HP-71*	00659-71-0	N/A	$14

00660 Polynomial Roots by Maechly's Method

by K. Akima, Boulder, CO

This program finds the real roots of a polynomial with real coefficients by using Maechly's method, a modification of Newton's. The basic 41C will handle a tenth degree polynomial, and 32 degrees can be added for each memory module. The program will also calculate p(x) and p-prime(x) given x. **Necessary Accessories for HP-41:** None

Steps: 131 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00660-41-1	$10	$12
FOR HP-71*	00660-71-8	N/A	$14

00661 Power Factor/Load Design

by R.D. Shankle, Kansas City, MO

This program is used to calculate required load resistances and required inductance or capacitance values to obtain a specific power factor in AC power distribution systems. **Necessary Accessories for HP-41:** None

Steps: 99 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00661-41-9	$10	$12
FOR HP-71*	00661-71-6	N/A	$14

00662 Obstetrical Ultrasound

by M.C. McGoodwin, Seattle, WA

This program performs a variety of calculations which arise in diagnostic ultrasound evaluation of pregnant patients. These include prediction of delivery date based on last menses or fetal biparital diameter, current gestational age, evaluation of fetal head growth between examinations, and detection of intrauterine growth retardation by assessment of total intrauterine volume. **Necessary Accessories for HP-41:** Three Memory Modules. Card Reader and Printer optional.

Steps: 600 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00662-41-7	$10	$17
FOR HP-71*	00662-71-4	N/A	$20

00663 Maze: Construction and Play

by L.K. Johnson, Kennewick, WA

This program produces a random maze ten by ten squares. The program first makes a path through the maze, then the program completes the maze. The second part of the program interprets the data and allows the player to try to make their way through the maze. You can only see one square at a time. **Necessary Accessories for HP-41:** One Memory Module.

Steps: 359 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00663-41-5	$10	$13
FOR HP-71*	00663-71-2	N/A	$14

00664 Cash Register

by T. Carlyle, Pampa, TX

Converts 41C into a personalized electronic cash register which prints store name, location, and sales-person's name (up to four salespersons). Other functions include: error, overring, and reading operations. Numerous tests minimize operator error. Unique single button operation frees operator's hands, computes tax automatically. **Necessary Accessories for HP-41:** One Memory Module

Steps: 221 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00664-41-3	$10	$14
FOR HP-71*	00664-71-0	N/A	$16

00665 Blackjack Competitor

by P. Moran, Ventura, CA

Blackjack competitor challenges the user to a realistic game of blackjack, comparable to that played in professional casinos. Player options include pair splitting, doubling down, and insuring. The program simulates a pair of real decks. Displays are meaningful but not wordy. **Necessary Accessories for HP-41:** One Memory Module

Steps: 359 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00665-41-0	$10	$15
FOR HP-71*	00665-71-7	N/A	$18

00667 Flying IV Conversions

by Users' Library, , Corvallis, OR

Converts the following values: NM to/from SM, NM to/from KM, SM to/from KM, IMP gal to/from US gal, IMP gal to/from liters, US gal to/from liters, kg to/from lbs, feet to/from meters, deg c to/from deg f, reciprocal headings for use with "flying I preflight and inflight calculations", or may be used independently. This program also available in special program #01319C. (Recommend additional memory module if used with "flying I" program). **Necessary Accessories for HP-41:** Recommend Additional Memory Module if used with "Flying I" program.

Steps: 141 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00667-41-6	$10	$12
FOR HP-71*	00667-71-3	N/A	$14

00669 Ten Bin Histogram with Alphanumeric Labeling

by R.S. Altman, Clearlake, CA

This program will sort data into up-to ten equal width bins between user-specified upper and lower units. It will then display or print the output using the HP-41C's alphanumeric capabilities. Output will be: b#=ll/uu f=n, where ll and uu are lower/upper width of bin, f is frequency. if printer is attached (optional), "bar chart" will be neatly displayed. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 287 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00669-41-2	$10	$13
FOR HP-71*	00669-71-9	N/A	$14

00670 Chord from Arc Height & Length

by C. Barry, Toronto Islands, CANADA

Iterative solution for the algebraically inseparable problem gives the chord length to 9 significant figures between the limits of the straight line and semicircle conditions. Applications include the approximate degree of pullout from a frame for a uniformly pressure loaded flat plate supported on two opposite edges. **Necessary Accessories for HP-41:** None

Steps: 84 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00670-41-0	$10	$11
FOR HP-71*	00670-71-7	N/A	$12

00672 Depreciation Present Value (PV) Factor

by T.D. Boldt, Thousand Oaks, CA

Program calculates present value (pv) factor of depreciation for declining balance (200%, 150%, 125%), straight line and sum-of-the-year digits methods. Pv factor may then be utilized for computing present value of depreciation. **Necessary Accessories for HP-41:** None

Steps: 98 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00672-41-6	$10	$11
FOR HP-71*	00672-71-3	N/A	$12

00673 Density Altitude

by T.D. Boldt, Thousand Oaks, CA

Given the altimeter setting & indicated altitude, computes pressure altitude. Given any two of the three quantities 1) pressure altitude, 2) density altitude, 3) temperature (degrees centigrade), program computes third. **Necessary Accessories for HP-41:** None

Steps: 77 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00673-41-4	$10	$12
FOR HP-71*	00673-71-1	N/A	$14

00674 Sieve Analysis and Soil Moisture Content

by M.E. Brazie, Golden, CO

This program calculates cumulative percent retained, percent finer, and sample loss given total sample weight and weight retained on each screen. It also calculates weight of water, weight of dry soil, and percent moisture given wet and dry sample weights and dish weight. **Necessary Accessories for HP-41:** None

Steps: 120 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00674-41-2	$10	$12
FOR HP-71*	00674-71-9	N/A	$14

00675 Bubble Sort with Up to 42 Entries

by M. Carlton, Covina, CA

This program will sort up to 42 numbers in a file, into ascending or descending sequence, using a bubble sort. A merge function allows you to add to the file, and a view function allows you to view the file. Each memory module increases the maximum number of entries by 64. **Necessary Accessories for HP-41:** None

Steps: 64 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00675-41-9	$10	$11
FOR HP-71*	00675-71-6	N/A	$12

00678 Deflections by Area Moment

by J.R. Cook, West Palm Beach, FL

Using previously established moments and their respective locations along a beam this program will calculate the deflection and slope of user controllable points to the elastic curve of the given beam. For beams with less than 21 points of input no modules are required. **Necessary Accessories for HP-41:** None

Steps: 158 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00678-41-3	$10	$12
FOR HP-71*	00678-71-0	N/A	$14

00679 Interpolation and Numerical Integration by Akima's Local

by J.F.G. Darby, Parkville, Australia

Applies Akima's process to finding a set of local interpolating polynomials that best fit the curve that would be drawn through a set of arbitrarily spaced points by eye, and also integrates the result. Introduces no false extremes or inflections. **Necessary Accessories for HP-41:** None

Steps: 162 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00679-41-1	$10	$12
FOR HP-71*	00679-71-8	N/A	$14

00680 Thermal Conductivity with Carbon Resistors

by R.L. Fagaly, San Diego, CA

Calculates the thermal conductivity (k) of a sample at low temperatures by a one heater-two thermometer technique. The thermometers are carbon resistors and are characterized by a quadratic equation in ln r and ln t. K is determined to second order. Also calculated are dr/dt, d2r/dt2, <>t and t-ave. Also supplied are HP-67/97 keystrokes. **Necessary Accessories for HP-41:** None

Steps: 218 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00680-41-9	$10	$12
FOR HP-71*	00680-71-6	N/A	$14

00681 Serial Data Compression
by R.W. Fitzgerald, Queanbeyan, Australia

This is a very versatile data compression routine which stores 2 data pts per register (data pts must be => 1000; a correction and easy data review routine for confirming data entry, and basic statistics. 128 data pts after the first 74 pts. **Necessary Accessories for HP-41:** One Memory Module

Steps: 127 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00681-41-7	$10	$11
FOR HP-71*	00681-71-4	N/A	$12

00682 Multi-Channel Queues
by R.J. Frey, Mt. Sinai, NY

This program computes the mean waiting times and queue lengths for gi/g/c infinite capacity queues when the first two moments of the inter arrival and service times are known. For certain cases the solutions are approximate but are generally more representative of general systems than m/m/c models. **Necessary Accessories for HP-41:** Printer useful.

Steps: 182 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00682-41-5	$10	$12
FOR HP-71*	00682-71-2	N/A	$14

00683 Schmitt Trigger Design
by A. Gerbens, Mesa, AZ

Assists in design of two transistor Schmitt trigger circuit. Inputs are voltage thresholds, supply voltage, transistor type and load resistance. outputs resistance values and power dissipated by the load. All inputs are prompted and all outputs are labeled. Output valves loop continuously until interrupted. **Necessary Accessories for HP-41:** One Memory Module

Steps: 118 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00683-41-3	$10	$12
FOR HP-71*	00683-71-0	N/A	$14

00684 Graph Prep II
by C.H. Gottwald, San Diego, CA

Graph prep facilitates graph preparation. Graph size is arbitrary; scales are linear or logarithmic. Uses an arbitrary measurement scale or linear graph paper for layout. Computed measurements are arbitrarily rounded to correspond to marks or special points on the measurement scale for easy, quick plotting. **Necessary Accessories for HP-41:** One Memory Module

Steps: 391 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00684-41-1	$10	$14
FOR HP-71*	00684-71-8	N/A	$16

00685 Ancient Sumeria
by R.C. Gration, Victoria, Australia

As the despot ruling ancient Summeria, you must buy or sell land, feed the population, and plant sufficient crops each year without being impeached. Program includes full alphanumeric prompting, labelled output and a scoring routine to rate your reign. **Necessary Accessories for HP-41:** One Memory Module

Steps: 314 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00685-41-8	$10	$14
FOR HP-71*	00685-71-5	N/A	$16

00686 Combined Ohms & Power Laws, Parallels, Resistance & Resistor
by F. Hali, Hillarys, West Australia

Given any two of the four variables (p, v,i, r) remaining two values are displayed. Program also calculates the parallel resistance required given the total resistance and available resistance or two // resistances. Will also calculate max. and min. values of a given resistance with the tolerance given as either a colour or a number. All routines use clear prompts and labels with error display and auto RTN. **Necessary Accessories for HP-41:** One Memory Module

Steps: 328 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00686-41-6	$10	$13
FOR HP-71*	00686-71-3	N/A	$14

00687 Equation of Position, Speed, Gravity, and Time
by B. Henry, Napa, CA

Program calculates the unknown gravity in the equation: 0=1/2GT 2+ VOT+SO. Program prompts for inputs. After providing three knowns the calculator will calculate the unknown quantity and store it for future use. **Necessary Accessories for HP-41:** None

Steps: 163 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00687-41-4	$10	$12
FOR HP-71*	00687-71-1	N/A	$14

00688 Peng-Robinson Eqn of State Pvt and Fugacity Data for Bin
by E.C.I. Hume, Cambridge, MA

Given critical constants for a single component or a binary mixture, this program calculates pressure, volume, temperature, compressibility, and fugacity relationships based on the Peng-Robinson equation of state. Both vapor and liquid properties can be obtained. Two memory modules necessary. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 574 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00688-41-2	$10	$15
FOR HP-71*	00688-71-9	N/A	$18

00689 Work Points
by R.J. Hunnicutt, New Orleans, LA

Finds location of the top and bottom work points of a diagonal brace. **Necessary Accessories for HP-41:** Card Reader and Printer helpful.

Steps: 120 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00689-41-0	$10	$11
FOR HP-71*	00689-71-7	N/A	$12

00690 Time Sharing
by N.H. Blair, Bangkok 16, Thailand

Up to 4 people can use the calculator without interfering with each others calculations...businessmen in conference or students doing homework. The stack and R01-R03 are available for each user. Other functions as normal. Listing also provided for 2 shorter routines which save a bit less. **Necessary Accessories for HP-41:** None

Steps: 130 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00690-41-8	$10	$11
FOR HP-71*	00690-71-5	N/A	$12

00692 Stadia Reduction
by J.A. Hutchinson, Launceston, Australia

This program solves reduction of stadia observations to distance and elevation by height of instrument. **Necessary Accessories for HP-41:** Printer optional.

Steps: 41 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00692-41-4	$10	$11
FOR HP-71*	00692-71-1	N/A	$12

00693 Data Input (Store) and Review
by B.G. Lawrence, Miami, FL

Numeric and/or alphanumeric data may be stored in a user-specified series of data registers (error correction available for value just input). Register numbers are provided in a "prompt" message. Any or all data registers may be reviewed, by register number and contents, without a printer. User specifies data display format. Also, included, routine performing same function, but saving 9 registers (at the expense of some prompts). **Necessary Accessories for HP-41:** None

Steps: 70 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00693-41-2	$10	$12
FOR HP-71*	00693-71-9	N/A	$14

00694 Towers of Hanoi
by G.N. Leith, Melbourne, Australia

You must move up to nine disks of increasing size from the far left tower to the far right tower with the aid of only one intermediate tower. Be careful not to place a large disk on a smaller one. This game is about 2000 years old but it can still infuriate the player in its complexity of strategy. **Necessary Accessories for HP-41:** None

Steps: 104 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00694-41-0	$10	$11
FOR HP-71*	00694-71-7	N/A	$12

00695 Complex RPN
by P.A. Lind, Seattle, WA

Allows complex number manipulation in either polar or rect. form using standard RPN with a 4-register stack. Functions include enter, +, -,*, /, x<>y, RDN, RUP, LAST X, CLX, CLST, CLRG, 1/X, X**2, and STO and RCL (5 registers). Internal routines control stack lift and drop allowing easy interface to a complex operations program (E**z, SIN Z, etc). **Necessary Accessories for HP-41:** One Memory Module

Steps: 336 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00695-41-7	$10	$13
FOR HP-71*	00695-71-4	N/A	$14

00696 Conjugate Depth for Hydraulic Jump
by R.R. Manahan, Wichita Falls, TX

Program solves for conjugate depth of hydraulic jump in rectangular, trapezoidal, or triangular channels. **Necessary Accessories for HP-41:** One Memory Module

Steps: 92 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00696-41-5	$10	$12
FOR HP-71*	00696-71-2	N/A	$14

00697 Backwater Profile for Rect Trap or Triangular Channels
by R.R. Manahan, Wichita Falls, TX

Solves for backwater curve for prismatic channels. **Necessary Accessories for HP-41:** One Memory Module

Steps: 147 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00697-41-3	$10	$12
FOR HP-71*	00697-71-0	N/A	$14

00698 Critical Depth of Rect Trap or Triangular Channels
by R.R. Manahan, Wichita Falls, TX

Solves for critical depth of prismatic channels by use of root finder. "NEWT" program (included) or other root finder necessary. **Necessary Accessories for HP-41:** None

Steps: 47 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00698-41-1	$10	$12
FOR HP-71*	00698-71-8	N/A	$14

00699 Open Channel Flow Triangular Rectangular Trapezoidal Channel
by R.R. Manahan, Wichita Falls, TX

Solves for flow, depth, or slope given two of three values. Critical slope is also computed. Manning n, base width, and side slope required. Uses unique question - answer ability of HP41 so that user need not be concerned where data or answers are stored. Root finder "NEWT" included. **Necessary Accessories for HP-41:** One Memory Module

Steps: 264 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00699-41-9	$10	$14
FOR HP-71*	00699-71-6	N/A	$16

00700 Potentiometric Titration of Weak Acid-Strong Base Simulated

by J.M. Merino, Valladolid, Spain
A.d.D. Beade, Valladolid, Spain

This program calculates the whole curve ph vs. volume for the potentiometric titration of a weak acid and a strong base, both in aqueous solution. **Necessary Accessories for HP-41:** None

Steps: 128 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00700-41-5	$10	$11
FOR HP-71*	00700-71-2	N/A	$12

00701 Flight Planning and Management

by J. Meyer, Trondheim, Norway

The program is designed to perform all preflight preplanning tasks. Navigational data may be input from prepared data-cards, or manually. It will handle crossing of checkpoints in climb segment and contains a method of modelling atmospheric conditions. Aircraft climb characteristics are modelled in a separate program appended to the main one. **Necessary Accessories for HP-41:** Three Memory Modules. Card Reader optional.

Steps: 529 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00701-41-3	$10	$16
FOR HP-71	NOT AVAIL		

00702 Gear Frequencies

by J.C.I. Morehead, Ambridge, PA

This program calculates the mechanical vibration frequencies typically generated by a pair of gears. It is valid for spur, helical, and straight bevel gears and has been used occasionally for spiral bevels. Not all frequencies calculated are observed in every vibration signature. **Necessary Accessories for HP-41:** Printer

Steps: 144 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00702-41-1	$10	$12
FOR HP-71*	00702-71-8	N/A	$14

00703 Product of Two General Matrices

by M. Nhuch, Rio De Janeiro, Brazil

This program solves for the product of two general matrices A and B. **Necessary Accessories for HP-41:** At least one Memory Module.

Steps: 176 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00703-41-9	$10	$12
FOR HP-71*	00703-71-6	N/A	$14

00704 Deflection of Beam with Variable Section

by J.H. Obermeyer, Crown Point, IN

This program finds and plots the deflection of a beam of varying cross section by two successive graphical integrations of the M/EI diagram. The beam must be supported at two points, but may overhang both or either support. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 233 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00704-41-7	$10	$12
FOR HP-71	NOT AVAIL		

00705 High Head Flow in Hydraulically Long Culverts-Pipes

by L.E. Peterson, Nashville, TN

A culvert may flow full without the outlet being submerged. (type 6 flow - USGS classification, type 2 - chow's) the piezometric head at the outlet varies with discharge (q). Input to this program is the head, culvert geometry and if the outflowing jet is supported or unsupported, output is the discharge. Loss coefficients are computed internally or may be input. the program also computes q if the outlet is submerged. (type 4 - USGS). **Necessary Accessories for HP-41:** One Memory Module

Steps: 225 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00705-41-4	$10	$12
FOR HP-71*	00705-71-1	N/A	$14

00706 Analysis of Conics with Invariants

by G.D. Presman, Capital Federal, Argentina

This program determines the type of conic represented by a second order equation (parabola, hyperbola, ellipse and degenerate forms). After a classification, the program calculates the coefficients of the conical form with a rotation. **Necessary Accessories for HP-41:** One Memory Module and Math Pac

Steps: 155 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00706-41-2	$10	$12
FOR HP-71	NOT AVAIL		

00707 Model Airplane Design - Radio Control Competition Patter

by K.L. Remmler, Palmdale, CA

Thirty-five design parameters are calculated from empirically derived data coefficients and analytical relationships. The program is organized so that data coefficients for different types of model airplanes, e.g. Pylon racers, sport trainers, etc. may be maintained on separate data cards. **Necessary Accessories for HP-41:** Two Memory Modules, Card Reader and Printer.

Steps: 394 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00707-41-0	$10	$15
FOR HP-71*	00707-71-7	N/A	$18

00708 Triads, Chords of the Seventh and Chords of the Ninth

by H.Y. Rhyu, Seal Beach, CA

Given the key (tonality), chord (in arabic numeral), and mode (major or minor), the program outputs the triad, chord of the seventh or chord of the ninth. Given a triad, it provides a complete list of the appropriate keys, chords and modes. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 419 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00708-41-8	$10	$14
FOR HP-71*	00708-71-5	N/A	$16

00709 Concentrations and Disolutions Chemistry

by H.V. Saad, Cofraily Caracus, Venezuela

This program solves problems in chemistry of solutions and concentrations using the following variables: grams of solutions, solute, and solvent; density, volume, mole fraction of solute and solvent; percent concentration, molarity normality, molality, valence, number of moles, molecular weight, equivalent weight and number of equivalents. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 772 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00709-41-6	$10	$17
FOR HP-71*	00709-71-3	N/A	$20

00710 Low Pressure Gas Pipe Sizing

by M.F. Schluender, Gladstone, MS

This program calculates pipe sizes for a gas under 1 PSIG with a .5 inch of water or less system pressure loss. **Necessary Accessories for HP-41:** None

Steps: 125 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00710-41-4	$10	$12
FOR HP-71*	00710-71-1	N/A	$14

00711 Blue Top I

by L.D. Thomas, Pocatello, ID

This program computes center-line and shoulder grades for symetrical sections. The grades calculated may be for any of the following: finished grades, base grades, sub-base grades, and subgrade. This program will compute the above grades on any predetermined interval automatically. Top back sidewalk, top back of curb and the elevation for a given distance from centerline may also be computed. **Necessary Accessories for HP-41:** Three or more Memory Modules

Steps: 471 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00711-41-2	$10	$17
FOR HP-71*	00711-71-9	N/A	$20

00712 Timestudy - Machining

by T.F. Thompson, Windsor, CT

This program calculates machining time for manual and N/C lathes and milling machines, constant surface speed is utilized with maximum (input) rpm not exceeded. Horsepower is calculated as is diameter, sfpm, and rpm. Rapid traverse times are computed, index time is compiled. **Necessary Accessories for HP-41:** None

Steps: 324 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00712-41-0	$10	$13
FOR HP-71*	00712-71-7	N/A	$14

00713 Standard Step Backwater for Natural Channels from Card D

by J.S. Ulrick, Berkeley, CA

This program reads geometric data from cards, computes the geometric elements of the cross section and converges to a solution of the backwater calculation by Newton's method. Multiple water surface profiles may be calculated from one set of geometric data on cards. **Necessary Accessories for HP-41:** One Memory Module

Steps: 276 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00713-41-8	$10	$13
FOR HP-71	NOT AVAIL		

00714 Golf

by D.D. Walton, Cincinnati, OH

In this game of golf, you choose your own handicap, design your course, select and swing your club, and hope your ball escapes the woods. Hole number, yardage, par, and distance to the woods are output for one to four golfers. **Necessary Accessories for HP-41:** Three Memory Modules and Printer

Steps: 612 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00714-41-6	$10	$17
FOR HP-71*	00714-71-3	N/A	$20

00715 Bingo Generator

by D.D. Walton, Cincinnati, OH

41C bingo generator will give bingo calls randomly without repetition either singly or in a series of calls. Output per example I22, G53, B12, N45 etc. Also able to give a complete review of all numbers called. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 204 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00715-41-3	$10	$12
FOR HP-71*	00715-71-0	N/A	$14

00716 Symmetrical Components-Phasors Conversions

by C.B. West, Bellevue, WA

This program provides a simple and convenient means to convert between unsymmetrical (unbalanced) phasors and symmetrical components, thus removing some of the tedium related to 3-phase circuit calculations of unbalanced loading and fault analysis. Conversions can be made both ways. Output values are identified to reduce errors. **Necessary Accessories for HP-41:** None

Steps: 173 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00716-41-1	$10	$12
FOR HP-71*	00716-71-8	N/A	$14

00717 Rates of Effusion of Gases - Graham's Law

by P.N. Wheeler, Charlottesville, VA

Determines unknown quantity when given 3 of 4 quantites: GMW gas a, GMW gas b, rate of effusion gas a, rate of effusion gas b; or 3 of 4 quantities: GMW gas a, GMW gas b, time of effusion gas a, time of effusion gas b. **Necessary Accessories for HP-41:** Card Reader optional.

Steps: 82 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00717-41-9	$10	$11
FOR HP-71*	00717-71-6	N/A	$12

00718 Matrix Operations, Addition, Subtraction and Multiplication

by J.A. Wilke, Seattle, WA

This program will multiply, add, or subtract two matrices. The matrices may be rectangular or square and their size depends upon the total available space for data storage. **Necessary Accessories for HP-41:** One Memory Module

Steps: 234 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00718-41-7	$10	$12
FOR HP-71*	00718-71-4	N/A	$14

00719 General Aircraft Weight and Balance

by C.B. Wilson, Albuquerque, NM

Program calculates center of gravity, gross weight and gross moment. Used to determine if an aircraft is loaded within the weight and balance envelope. Inputs are weight and respective arm or moment. Program easily allows for changes to final weight and balance output to accomodate shifts or changes to aircraft loading. **Necessary Accessories for HP-41:** None

Steps: 49 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00719-41-5	$10	$11
FOR HP-71*	00719-71-2	N/A	$12

00720 Echelon Form of a Matrix

by J.A. Wilke, Seattle, WA

This program solves for the echelon form of a matrix - either square or rectangular - where the maximum matrix size is determined only by the maximum number of available storage registers, minus 70 registers for program memory, and working space for the program. **Necessary Accessories for HP-41:** One Memory Module

Steps: 254 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00720-41-3	$10	$12
FOR HP-71*	00720-71-0	N/A	$14

00721 Metric

by P.D. Roth, San Rafael, CA

Converts metric to english units, or english to metric units, for fifteen different measures. Includes mass, length, area, volume, fluid measure, and temperature. **Necessary Accessories for HP-41:** One Memory Module

Steps: 133 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00721-41-1	$10	$14
FOR HP-71*	00721-71-8	N/A	$16

00723 Matrix Inversion Subroutine with Complete Pivoting Optio

by H.J. Albert, Bettendorf, IA

This subroutine can be used to compute the inverse of an nxn matrix using the Gauss-Jordan exchange algorithm, complete pivoting is used to improve accuracy. The size of the problem that can be solved is limited by the number of memory modules in use. **Necessary Accessories for HP-41:** One Memory Module

Steps: 243 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00723-41-7	$10	$12
FOR HP-71*	00723-71-4	N/A	$14

00724 Cholesky Decomposition Subroutine

by H.J. Albert, Bettendorf, IA

This subroutine can be used to solve the problem ax=b for symmetric positive-definite matrices. The size of the problem that can be solved is limited by the number of memory modules in use. One memory module necessary to handle problems larger than 3x3. **Necessary Accessories for HP-41:** One Memory Module necessary to handle problems larger than 3 by 3.

Steps: 222 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00724-41-5	$10	$12
FOR HP-71*	00724-71-2	N/A	$14

00725 Verify Cable TV System Design

by M. Bowers, Atlanta, IA

User may verify equipment locations in an existing cable tv system, cable and equipment specs are input. The user then inputs equipment locations and the program computes operating levels at that point. Program is compatible with different brands of equipment using data cards or loading manually. Works on trunk or distribution. **Necessary Accessories for HP-41:** One Memory Module. Printer and Card Reader optional.

Steps: 246 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00725-41-2	$10	$14
FOR HP-71*	00725-71-9	N/A	$16

00727 Heterogeneous Kinetics 2

by B.W. Clare, Coolbellup, Western Australia

Program prints out a table of fraction reacted vs. time for the shrinking unreacted core model of heterogeneous kinetics, given reaction times for chemical control alone, and for diffusion control alone. Useful for plotting a fitted curve for comparison with the experimental points treated by "Heterogeneous Kinetics 1". **Necessary Accessories for HP-41:** Printer

Steps: 87 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00727-41-8	$10	$11
FOR HP-71*	00727-71-5	N/A	$12

00728 Heterogeneous Kinetics 1

by B.W. Clare, Coolbellup, Western Australia

Program fits fraction reacted/time data to the shrinking unreacted core model of uniform spheres reacting with a gas or solution. Reaction rate is considered to be limited by chemical reaction at the surface of the core, and by diffusion of reactant through the product layer. Output is r**2 for the regression, the time constants for chemical and for diffusion control, and the parameters of a confidence ellipse. **Necessary Accessories for HP-41:** One Memory Module

Steps: 280 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00728-41-6	$10	$12
FOR HP-71*	00728-71-3	N/A	$14

00729 Perfect Number Research

by P.d.S. Mourao, Belo Horizonte, Brasil

To detect perfect number occurrence in interval beginning with choice number. **Necessary Accessories for HP-41:** None

Steps: 49 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00729-41-4	$10	$11
FOR HP-71*	00729-71-1	N/A	$12

00730 Dose Commitment Factor Inhale

by J.W. Ferman, Minneapolis, MN

Organ radiological dose commitments are computed for inhalation of insoluble radionuclides. Dcf values accumulated for 1, 5, 10, 20, and 50 year intervals. Uptakes are net to lung for up to one year. USNRC age groups for organ masses and single compartment retention theory are used. Program prompts for input data. **Necessary Accessories for HP-41:** One Memory Module

Steps: 271 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00730-41-2	$10	$13
FOR HP-71*	00730-71-9	N/A	$14

00732 Plot of 2/3 Functions on One Graph

by J.L. Gilby, Vancouver, Canada

This program extends the capability of plotting on the 82143A printer enabling up to three functions of x to be plotted on one graph. The program works in a similar way as the PRPLOT function of the printer prompting for function name and limits of x and y axes. **Necessary Accessories for HP-41:** One Memory Module

Steps: 183 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00732-41-8	$10	$12
FOR HP-71	NOT AVAIL		

00733 Music and Memory

by D.M. Green, Oak Park, IL

This program tests your musical ear and your memory! The calculator plays a tone. Guess it right, and the old tone, as well as the new one, will be played. Special features include: scoring, help routine, and ==three== skill levels! **Necessary Accessories for HP-41:** None

Steps: 121 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00733-41-6	$10	$12
FOR HP-71*	00733-71-3	N/A	$14

00735 Mastermind

by C. Jones, Grass Valley, CA

This program allows you to play mastermind on the calculator alone, without the aide of scratch paper or a board! you can "scroll" through your past guesses at anytime during the game. Completely portable - goes anywhere. more challenging than playing this game on a board. Six colors; four digits (expandable). One memory module. (two if you wish to expand colors and digits). **Necessary Accessories for HP-41:** One Memory Module

Steps: 262 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00735-41-1	$10	$13
FOR HP-71*	00735-71-8	N/A	$14

00737 Potential Flow - Plane Source Quadrilateral (PSQ)

by J. Orosa, Gainesville, FL

This program calculates the influence coefficients at a field point due to a plane source quadrilateral defined by four coplanar-points. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 813 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00737-41-7	$10	$16
FOR HP-71*	00737-71-4	N/A	$18

00738 Shock Flow

by J. Porras, San Diego, CA

This program calculates the static pressure, density, temperature and speed of sound ratios across a normal shock. It also calculates the stagnation pressure ratio across a shock and the mach number downstream of the shock. This program does not require the use of any storage registers. **Necessary Accessories for HP-41:** None

Steps: 113 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00738-41-5	$10	$11
FOR HP-71*	00738-71-2	N/A	$12

00740 Sumer

by G.L. Rowell, Balaclava Victoria, Australia

You reign over the country of Sumer. In your 10 year term, you must deal in land, facing the problems of famine and population growth. Your future decisions will depend on the decisions of the present. This program uses some of the 41C advanced features, and includes full alpha prompting. **Necessary Accessories for HP-41:** Two Memory Modules. Card Reader suggested. Works reasonably on Printer.

Steps: 501 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00740-41-1	$10	$15
FOR HP-71*	00740-71-8	N/A	$18

00741 Multiple Regression 1

by N.C. Shammas, Richmond, VA

Based on the simplest case of multiple regression, the user can fit 2 or 3 variables with 3 coefficients. Efficient transformations, ability to rename the variables, calculations of various confidence intervals, performing student t-test on coefficients and projections with confidence intervals are the main program features. Program can evaluate student t, no prompting for t is needed. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 490 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00741-41-9	$10	$14
FOR HP-71*	00741-71-6	N/A	$16

00742 Audio Pads

by W.K. Small, Manchester, NH

This program will compute resistor values for audio pads of types h, t, o, and pi. The program will work for any impedence including unequal input and output values. **Necessary Accessories for HP-41:** None

Steps: 144 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00742-41-7	$10	$11
FOR HP-71*	00742-71-4	N/A	$12

00743 Poisson Distribution: Large Values of Mean

by R.B. Standler, Webster, NY

Given only the mean value, this program computes the probabilities that: (1) a certain integer, n, (2) any integer =< n, and (3) any integer > n will be observed. Only results for integers, n, between user-specified upper and lower bounds are printed. This program was designed to accept values of the mean greater than 230. **Necessary Accessories for HP-41:** Printer

Steps: 93 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00743-41-5	$10	$11
FOR HP-71*	00743-71-2	N/A	$12

00744 D=RT Calculations

by S.E. Taylor, Ames, IO

This program solves a variety of problems involving distance, time and speed. Time is entered as hours, min, seconds and hundredths of seconds. distance in miles or km and speed in min/mile, min/km, or km/hr. It is particularly useful for orienteering, jogging, cycling, and racing, as well as any general d=rt problems. **Necessary Accessories for HP-41:** Printer optional.

Steps: 145 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00744-41-3	$10	$12
FOR HP-71*	00744-71-0	N/A	$14

00745 Stadia Reduction

by L.D. Thomas, Pocatello, ID

This program reduces stadia directly from the hair readings. All prompts and outputs are alpha labeled for ease of use. This program is similar to program #00223C, however for this program, the user is not required to compute a rod interval or angle from line of sight, this is done by the program to simplify user input. **Necessary Accessories for HP-41:** None

Steps: 97 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00745-41-0	$10	$11
FOR HP-71*	00745-71-7	N/A	$12

00746 Structural Excavation and Comp-Active Backfill for Pipes

by L.D. Thomas, Pocatello, ID

This program computes quantities for structual excavation and compactive backfill for cross drains or side drains according to Idaho specifications as shown on standard drawing D12. User is allowed to choose trench widths or specify defined maximums. **Necessary Accessories for HP-41:** One Memory Module

Steps: 204 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00746-41-8	$10	$12
FOR HP-71*	00746-71-5	N/A	$14

00747 Matdiag

by E.L. Tomusiak, Los Alamos, NM

This program finds the Eigenvalues and normalized Eigenvectors of real, symmetric nxn matrices. Jacobi's algorithm for matrix diagonalization is used. With two memory modules 3=<n=<5 while with three memory modules 3=<n=<8. With four memory modules 3=<n=<9. **Necessary Accessories for HP-41:** Two Memory Modules minimum

Steps: 460 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00747-41-6	$10	$14
FOR HP-71*	00747-71-3	N/A	$16

00748 Displacement, Trim and Righting Arm Curve for Deck Barge

by R.A. Wehnau, San Francisco, CA

Given measurable characteristics of any barge and factors for components of load, program computes displacement, draft, trim g m, vcgc and righting arm for various degrees of heel. Righting arm curve is printed. **Necessary Accessories for HP-41:** Three Memory Modules and Printer

Steps: 668 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00748-41-4	$10	$16
FOR HP-71	NOT AVAIL		

00749 Calculating a Quadratic Equation Given Three Points

by D.A. Weikel, San Meteo, CA

This program given three points in cartesian co-ordinate form will calculate a quadratic equation representing these points. Once in quadratic form a subroutine will determine the roots provided they are not complex. **Necessary Accessories for HP-41:** None

Steps: 134 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00749-41-2	$10	$12
FOR HP-71*	00749-71-9	N/A	$14

00750 Length Conversions

by R.H. Wood, Orinda, CA

This program is a rewrite for the HP41C of an HP67 program written by D. Kemper. The original was published in 65 Notes, V3 N9 P28. The program converts between 28 units of length measurement in the Anglo-American, metric and astronomical systems of measurement. The rewrite eases 41C operation. **Necessary Accessories for HP-41:** None

Steps: 163 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00750-41-0	$10	$12
FOR HP-71*	00750-71-7	N/A	$14

00751 Volume Conversions

by R.H. Wood, Orinda, CA

This program is a rewrite for the HP 41C of an HP 67 program written by D. Kemper. The original was published in 65 Notes, V3N10P20. The program converts between 28 units of measurement in the English, American and metric systems. The rewrite eases 41C operation. **Necessary Accessories for HP-41:** None

Steps: 143 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00751-41-8	$10	$12
FOR HP-71*	00751-71-5	N/A	$14

00752 Mass, Weight and Force Conversions

by R.H. Wood, Orinda, CA

This program is a rewrite for the HP41C of an HP67 program by D. Kemper, the original was published in 65 Notes, V3 N9 P25. The program converts between 28 units of weight, mass and force in the english, metric, troy and s.i. systems. The rewrite eases operation on the 41C compared to the original. **Necessary Accessories for HP-41:** None

Steps: 142 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00752-41-6	$10	$12
FOR HP-71*	00752-71-3	N/A	$14

00753 Electro-Magnetic Wavelength Calculations

by H.E. Wyles, Fairfax, VA

Program calculates the wavelength of a frequency or the frequency of a wavelength. Inputs and outputs are expressed directly in: hz., khz., mhz., ghz., inches, feet, mm, cm, or meters. Program will also do metric length conversions using a 9 digit conversion factor. **Necessary Accessories for HP-41:** One Memory Module. Printer and Card Reader optional.

Steps: 264 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00753-41-4	$10	$13
FOR HP-71*	00753-71-1	N/A	$14

00754 Conjugate Gradient Method Subroutine for Symm Matrices

by H.J. Albert, Bettendorf, IA

This subroutine can be used to solve the problem ax=b for symmetric matrices. The coefficient matrix, a, remains unchanged during the computation. The size of the problem that can be solved is limited by the number of memory modules in use. **Necessary Accessories for HP-41:** One Memory Module minimum

Steps: 216 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00754-41-2	$10	$12
FOR HP-71*	00754-71-9	N/A	$14

00755 Human Heat Stress

by T. Adams, East Lansing, MI

This program calculates a "heat stress index" a nominal exposure time and ambient relative humidity as well as total and percent heat loads due to thermal convection, radiation and metabolism, based on dry bulb, wet bulb and globe temperatures, air velocity and work rate values for either metric or english units. Although human comfort and safety in acute heat stress depend on many other factors also, these calculations are useful guidelines for developing effective countermeasures against heat strain. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 349 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00755-41-9	$10	$14
FOR HP-71*	00755-71-6	N/A	$16

00756 Numerical Quadrature of Unequally Spaced Ordinates W/SMO

by J.F.G. Darby, Parkville, Australia

Program averages the integrals, between a pair of adjacent ordinates, found by Simpson's rule modified for non-uniform spacing, of the quadratic curves through the pair and alternately the preceding and succeeding point, and sums the average. **Necessary Accessories for HP-41:** None

Steps: 87 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00756-41-7	$10	$11
FOR HP-71*	00756-71-4	N/A	$12

00757 Dose Commitment Factor Ingest

by J.W. Ferman, Minneapolis, MN

Organ radiological dose commitments are computed for ingestion of soluble/insoluble radionuclides and inhalation of soluble nuclides. Dcf values are obtained for 1, 5,10, 20, and 50 year intervals. Uptakes are net to organ. USNRC age groupings and single compartment retention are used. program prompts for input data. **Necessary Accessories for HP-41:** One Memory Module

Steps: 248 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00757-41-5	$10	$13
FOR HP-71*	00757-71-2	N/A	$14

00758 Golf

by J.L. Gilby, Vancouver, Canada

This program allows for 1 or 2 players, you choose your handicaps, the club you want to use and the swing. Your HP-41C designs the course by a random number generator. Shot distance and distance to hole, and whether you have hit into the rough or not are displayed. After each hole your score and after 18 holes the totals for the round are displayed. **Necessary Accessories for HP-41:** One Memory Module and Printer. Card Reader optional.

Steps: 321 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00758-41-3	$10	$13
FOR HP-71	NOT AVAIL		

00759 Wage Packet Organizer

by L.A. Esterhuizen, Johannesburg, South Africa

For small businesses that pay weekly or monthly cash wage packets, this program will split the wage bill (by employee) into various user specified denominations, then print out a summary (i.e. No of $10 bills, no of 1 cent pieces, etc). Also gives a balancing figure suitable for any currency operating on a decimal basis. **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 178 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00759-41-1	$10	$12
FOR HP-71	NOT AVAIL		

00760 Central Server Model of Multiprogramming

by R.J. Frey, Mt. Sinai, NY

Given the service rates, branching probabilities, and multiprogramming level for a closed central server queueing network, this program computes the device utilizations, queue lengths, and system throughput for each multiprogramming level from 2 to the level specified. It features streamlined data entry and editing options and a storage efficient algorithm allowing the analysis of large models. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 367 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00760-41-9	$10	$13
FOR HP-71*	00760-71-6	N/A	$14

00761 "Trap" Transient Response Analysis Program

by S. Hageman, Vallejo, CA

Using the bilinear transform this program will solve for the time-domain response of any transfer function of the form g(s=n(s)/ d(s) with up to fifth order numerator and denominator. Inputs can be a step, ramp or pulse and outputs consist of time, E(in) and E(out), can be used with #596C. **Necessary Accessories for HP-41:** Two Memory Modules. Printer optional.

Steps: 557 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00761-41-7	$10	$15
FOR HP-71*	00761-71-4	N/A	$18

00763 High Resolution Plotter

by D. Hayden, Rocky Hill, NJ

This program was derived from the PRPLOT program included with the printer. instead of using the same printing character for each line printed, HIPLOT makes a new special character each time a line of the plot is printed. This special character matches the graph as closely as possible within the 7x7 dot matrix. The result is high resolution plots at a slower speed than PRPLOT. **Necessary Accessories for HP-41:** One Memory Module and Printer.

Steps: 227 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00763-41-3	$10	$12
FOR HP-71	NOT AVAIL		

00764 Islamic Calendar

by M.L. Jamaldeen, Jeddah, Saudia Arabia

This program converts any civil date (Anno Dei) to its corresponding Islamic date (after hegira) and also displays the day of week (dow). The Islamic date is displayed numerically or with the month named as an option. This program is an adaptation of program 60124 (UPLE) written for HP 67/97 and includes the 400 year correction. **Necessary Accessories for HP-41:** One Memory Module. Printer and Card Reader optional.

Steps: 336 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00764-41-1	$10	$13
FOR HP-71*	00764-71-8	N/A	$14

00767 Motion

by M. Ferris, Los Angeles, CA

This program is a tremendous time-saver for all who use the motion equations of physics. Given at least three of the five variables, acceleration, time, original velocity, final velocity, and distance, the program will solve for the other two, deciding which equations to use. **Necessary Accessories for HP-41:** None

Steps: 223 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00767-41-4	$10	$12
FOR HP-71*	00767-71-1	N/A	$14

00768 Blow Your Stack: a Ten-Fold Stack for 41C

by E.M. Keefe, Ankeny, IA

At the expense of one (or two) extra key strokes per data entry, and a couple extra milliseconds "XEQ" shun time you can have a 41C with a ten fold stack: - deeper, if your heart desires, and your mind can master the modifications. All the usual functions of the 41C function as usual (or so it appears). **Necessary Accessories for HP-41:** None

Steps: 93 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00768-41-2	$10	$11
FOR HP-71*	00768-71-9	N/A	$12

00769 Act Financial Needs Analysis: for Dependent Students

by E.M. Keefe, Ankeny, IA

May enter whole dollar amounts as prompted for, and receive an almost immediate analysis of student's financial need. Program illustrates one way that the HP-41C can be programmed to handle information from lengthy forms. **Necessary Accessories for HP-41:** One Memory Module

Steps: 390 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00769-41-0	$10	$14
FOR HP-71*	00769-71-7	N/A	$16

00771 Lunar Day Converter/Astrophotography Exposure Guide

by J.P. Patterson, Cambridge Bay NWT, Canada

Combines HP97 programs of same but separate titles. Automatically prompts for required data. Will print if printer used. Exposure guide prompts for all necessary data plus filter factor & automatically displays/prints exposure times along with complete bracketing. Lunar converter uses days & hours giving brightness & stellar magnitude. Field conversion for when lunar diameter larger than camera field. Exposure guide uses elevation angle, stellar magnitude, telecamera f/no., film asa, and filter factor. Computes atmospheric absorption if significant, & corrects magnitude, computing brightness, uncorrected exposure time, & corrected for reciprocity. **Necessary Accessories for HP-41:** Three Memory Modules. Printer optional.

Steps: 443 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00771-41-6	$10	$17
FOR HP-71*	00771-71-3	N/A	$20

00772 Alpha Barcode in Binary Format

by J. Pilcher, Denver, CO

HP-41C programmers can create their own alpha-replace and alpha-append (types 7 and 8) barcodes using the output of this program. Computer generated and hand drawn bars are easily handled with the binary and decimal numbers created by this program. Only numbers are created by the program, not 82153A wand-readable bars. **Necessary Accessories for HP-41:** Printer Optional.

Steps: 129 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00772-41-4	$10	$12
FOR HP-71*	00772-71-1	N/A	$14

00773 Flow Parameters for a Given Mach Number

by J. Porras, San Diego, CA

Given a mach number, this program will calculate po/p, to/t, do/d, ao/a, and a*/a for isentropic flow through air. The program does not use any storage registers. **Necessary Accessories for HP-41:** None

Steps: 52 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00773-41-2	$10	$11
FOR HP-71*	00773-71-9	N/A	$12

00774 Sphere

by H.Y. Rhyu, Seal Beach, CA

This program provides interchangeable solutions for radius, surface area & volume, segment area & volume, lune area & angle, segment height and segment area & volume. It fully utilizes the alphanumeric capability of the 41C and instructions are part of the program; therefore, written instructions or mnemonics are not necessary to use the program. **Necessary Accessories for HP-41:** One Memory Module

Steps: 239 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00774-41-0	$10	$12
FOR HP-71*	00774-71-7	N/A	$14

00775 Circles and Polygons

by H.Y. Rhyu, Seal Beach, CA

Given a regular polygon (side number & length), the program outputs area, radii of inscribed & circumscribed circles, central & outer angles. It calculates area and circumference given a circle (radius), generates the various angle-subtended parameters given central angle and describes the inscribed & circumscribed polygons for given polygon (side number). It outputs inscribed & circumscribed circles given a triangle (three sides). **Necessary Accessories for HP-41:** One Memory Module

Steps: 230 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00775-41-7	$10	$13
FOR HP-71*	00775-71-4	N/A	$14

00776 Polyhedra

by H.Y. Rhyu, Seal Beach, CA

This program lists five different types of regular polyhedra, allowing the user to select one of interest. Once a polyhedron is selected, this program describes the type of surface and provides interchangeable solutions for edge length, surface area and volume. **Necessary Accessories for HP-41:** None

Steps: 150 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00776-41-5	$10	$12
FOR HP-71*	00776-71-2	N/A	$14

00777 General Ledger

by K. Sharp, Galax, VA

This program prints a list of all debit and credit journal entries for the month giving not only the amount but also the account name. After all entries have been made, a detailed income statement and balance sheet may be printed with net income (net loss) calculated and printed. **Necessary Accessories for HP-41:** One Memory Module, Printer and Card Reader

Steps: 224 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00777-41-3	$10	$13
FOR HP-71*	00777-71-0	N/A	$14

00778 LM381 Optimized Low Noise Preamp Design

by J.W. Stienman, Falls Church, VA

This program allows lM381 dual preamplifier designs to be optimized for low noise. Input current density and high frequency roll-off are optimized. All inputs are prompted, all outputs are labelled and one or more parameters may be changed without re-entering all data. **Necessary Accessories for HP-41:** None

Steps: 173 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00778-41-1	$10	$12
FOR HP-71*	00778-71-8	N/A	$14

00780 Anova and All Significance Tests of Simple Regression

by M.S. Tawfik, State College, PA

This program calculates simple regression parameters, correlation coefficient, all entries of analysis of variance table (anova), coefficient of determination, unbiased standard error of the estimate and t value of significance tests for regression parameters and correlation coefficient. the program is important for judging the precision of the fitted model to the sample data. **Necessary Accessories for HP-41:** None

Steps: 185 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00780-41-7	$10	$12
FOR HP-71*	00780-71-4	N/A	$14

00781 Percent Passing for Aggregate Production Control

by L.D. Thomas, Pocatello, ID

This program solves for the percent of aggregate passing the following screen sizes: 1 in., 3/4 in, 1/2 in, 3/8 in, no. 4, no. 8, no. 16, no. 30, no. 40, no. 50, no. 100 and no. 200. The above are both fine and coarse screen sizes that are commonly used by various highway departments to control aggregate production. Required input, are wet and dry sample weights and the accum. Weight on the desired screens. **Necessary Accessories for HP-41:** One Memory Module

Steps: 168 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00781-41-5	$10	$12
FOR HP-71*	00781-71-2	N/A	$14

00782 36 Beams

by M. Walsh, De Portneuf, Canada

Six loading cases (concentrated load, moment, externally created angular or transverse deformation, partially uniform or triangular load) and six ends restrain (t for theta, y for deflection, m and v, moment and shear; a and b the ends, restrain are (listed are zero): (ta, tb, ya, yb); (ya, ma, yb, tb); (ya, yb, ma, mb); (ma, va, yb, tb); (ta, va, tb, yb); (ta, va, yb, mb) for constant beam. Memory module may be necessary for complex cases. **Necessary Accessories for HP-41:** Memory Modules may be necessary for complex cases.

Steps: 515 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00782-41-3	$10	$14
FOR HP-71*	00782-71-0	N/A	$16

00783 Hunt the Wumpus - II

by B.F. Wheeler, Haddonfield, NJ

Somewhere in 20 interconnected caves is a cave with a wumpus, two caves with pits, and two with super-bats. Hunter must search caves, alert for danger warnings, find and shoot the wumpus. This is an enhanced version of 00213C which is easier to play (illegal moves not possible), adds sound effects, keeps score, permits replay of preceding game, and when used with printer will keep a log of the hunters travels. One memory module necessary. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 320 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00783-41-1	$10	$13
FOR HP-71*	00783-71-8	N/A	$14

00785 Orbital Rendezvous with Lunar Command Module

by S.R. Vollberg, Ann Arbor, MI

You are in control of the lunar module and must dock with the command module orbiting above. Sound easy? Your IM horizontal thrusters are crippled, forcing you to control orbital speed by changing only your altitude above the moon. **Necessary Accessories for HP-41:** One Memory Module (None with alterations noted).

Steps: 197 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00785-41-6	$10	$13
FOR HP-71*	00785-71-3	N/A	$14

00787 Compressible Flow Functions

by R. Cimmino, Naples, Italy

This program calculates several mach functions for one-dimensional, isentropic compressible flow providing the mach number and the constant specific heat ratio. **Necessary Accessories for HP-41:** None

Steps: 79 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00787-41-2	$10	$11
FOR HP-71*	00787-71-9	N/A	$12

00788 Equations of Particle Dynamics

by D. Hayden, Rocky Hill, NJ

Given any three of the following, this program will solve the other 2 with the press of a single key: distance, time, initial velocity, final velocity, acceleration. **Necessary Accessories for HP-41:** None

Steps: 161 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00788-41-0	$10	$11
FOR HP-71*	00788-71-7	N/A	$12

00789 Determination of Reactions in a Continuous Beam

by M.L. Jamaldeen, Jeddah, Saudia Arabia

This program calculates the reactions in a continuous beam with point/s (single or multiple) or uniform (partial or full) loads or a combination of these loadings. There is no limit to the number of spans. Only six data registers are used for storage. **Necessary Accessories for HP-41:** None

Steps: 150 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00789-41-8	$10	$12
FOR HP-71*	00789-71-5	N/A	$14

00790 Cogo

by G.H. Pesman, Boulder, CO

The program is ideal for the practicing surveyor in the field. The program offers 5 separate subroutines: 1) recall pt. #, 2) traverse, 3) inverse, 4) sideshot, 5) enter & assign, for coordinate calculation and inverse capability between 38 stored coordinate pairs. **Necessary Accessories for HP-41:** Two Memory Modules and Card Reader

Steps: 376 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00790-41-6	$10	$14
FOR HP-71*	00790-71-3	N/A	$16

00792 Parabolic Curve Fit

by G.L. Bass, Orange Park, FL

This program computes the constants of a generalized parabola opening in the positive x direction which is displaced from the x and y axis given 3 sets of data points on the curve. This program can be used to compute other values of x and y once the equation for the parabola has been determined. **Necessary Accessories for HP-41:** Printer optional.

Steps: 212 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00792-41-2	$10	$12
FOR HP-71*	00792-71-9	N/A	$14

00793 Field Packer Permeability Test Calculations

by M.E. Brazie, Golden, CO

This program calculates field permeability from borehole packer test data. **Necessary Accessories for HP-41:** None

Steps: 115 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00793-41-0	$10	$12
FOR HP-71*	00793-71-7	N/A	$14

00794 Youden Paired Sample Analysis

by S.W. Butler, Alexandria, VA

The Youden paired sample analysis is used for analysis of data from collaborative studies where the information contributed by replicates is obtained from pairs of closely similar samples. Sums of squares are computed by the most efficient single pass method. **Necessary Accessories for HP-41:** None

Steps: 103 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00794-41-8	$10	$11
FOR HP-71*	00794-71-5	N/A	$12

00795 Precision Biorhythm Plot

by F.M. Fujimoto, Stanford, CA

This program uses the printer's SKPCOL to plot biorhythms with smooth curves. The date is printed along with the day of the week, all on one line per day. Also includes a modified calendar functions from the 41C standard applications, and numerical evaluations for biorhythm cycles on particular days. **Necessary Accessories for HP-41:** Two Memory Modules and Printer

Steps: 548 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00795-41-5	$10	$15
FOR HP-71	NOT AVAIL		

00796 True Battleship

by L. Gasperini, Montevideo, Uruguay

This program replaces one player in the original battleship game in two seas of 10 * 10 with (4, 3,2, 1) ship(s) (1, 2,3, 4) square(s) big. It places its ships and plays against you. Works faster with card reader. **Necessary Accessories for HP-41:** Three Memory Modules. Card Reader optional.

Steps: 719 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00796-41-3	$10	$17
FOR HP-71*	00796-71-0	N/A	$20

00797 Tennis

by M.G. Green, Salisbury, Zimbabwe

Play tennis against your 41C where you can vary your position and have two types of shots. **Necessary Accessories for HP-41:** Three Memory Modules (if part of wording cut out only two Modules). Printer optional.

Steps: 510 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00797-41-1	$10	$17
FOR HP-71*	00797-71-8	N/A	$20

00798 "NBW" Filter Function Noise Bandwidth Analysis

by S. Hageman, Vallejo, CA

This program greatly eases the analysis of filter noise performance. It offers design flexibility by providing exact values for the effective noise bandwidth for first through fourth order polynomials of the form $g(s)=n(s)/d(s)$. After NWB is calculated the output noise level can be calculated by supplying the input broadband noise level. **Necessary Accessories for HP-41:** None

Steps: 189 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00798-41-9	$10	$12
FOR HP-71*	00798-71-6	N/A	$14

00799 "Bode" Plot of Second Order Over 3rd Order Transfer Function

by S. Hageman, Vallejo, CA

This program will plot the gain and phase of a second order over third order transfer function. The program is unique in that both gain and phase are plotted simultaneously by the printer (by use of a two variable plotting routine). Can be used with 41-00596-4. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 260 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00799-41-7	$10	$13
FOR HP-71	NOT AVAIL		

00800 Stocks

by S.B. Jeffries, Chicago, IL

This program is designed to be used as an organizational tool when tabulating stock portfolios. The program prompts for all necessary inputs and prints (on the HP-41C printer) a complex list of each stock, any free cash holdings, the total income from all stocks, and the total current market value of stocks. **Necessary Accessories for HP-41:** Printer

Steps: 154 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00800-41-3	$10	$13
FOR HP-71*	00800-71-0	N/A	$14

00801 Decimal to Floating Point Binary Conversion

by D. Mabry, Royal Oak, MI

Converts a decimal number in the x register to a binary floating point format similar to that used by microcomputers both in software and hardware floating point arithmetic. Mantissa is calculated to 25 bits of precision but can easily be modified for any amount of precision desired. **Necessary Accessories for HP-41:** None

Steps: 74 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00801-41-1	$10	$11
FOR HP-71*	00801-71-8	N/A	$12

00802 Trapezoidal Channel Design

by L.E. Peterson, Nashville, TN

Critical and normal depth; or normal width solved by iterative procedure. Also solves for critical and normal discharge, critical slope, Froude number, velocity, area and top width. Variables conveniently entered, viewed, or computed by using top ten keys. Programmed for the design engineer. For trapezoidal, rectangular, and triangular shapes. **Necessary Accessories for HP-41:** One Memory Module

Steps: 261 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00802-41-9	$10	$12
FOR HP-71*	00802-71-6	N/A	$14

00803 Football Super III

by J.S. Dublirer, Sacramento, CA

Most advanced, complete football program ever. Play 3 ways: against another player, against the HP-41C, or the HP-41C plays against itself. Several run, pass, kick, and defensive plays. Down, yardline, etc., shown automatically in very convenient display. Halftime and "sudden-death" overtime. Occasional spectacular runbacks. "Two-minute" warning. Improved play-odds. "fantastic" **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 710 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00803-41-7	$10	$19
FOR HP-71*	00803-71-4	N/A	$22

00804 Greek Alphabet

by J.L. Gilby, Vancouver, Canada

This program will print out all Greek letters using the graphics of the 82143A printer or standard characters. It can be used as a reference and will print the complete alphabet or single letters in upper and/or lower case. If a letter is required for a formula the graphics are documented for ease of extraction to your own programming needs. **Necessary Accessories for HP-41:** Two Memory Modules, Card Reader and Printer

Steps: 572 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00804-41-5	$10	$16
FOR HP-71	NOT AVAIL		

00805 Accelerated Convergence of Series

by E.C.I. Hume, Cambridge, MA

This program includes 3 techniques that are used to predict the sum of an infinite series. For slowly converging series the accuracy obtained by these methods may surpass the direct summation of hundreds or thousands of terms. The included techniques are repeated averaging, Shank's transformation, and Richardson's extrapolation. **Necessary Accessories for HP-41:** One Memory Module

Steps: 231 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00805-41-2	$10	$13
FOR HP-71*	00805-71-9	N/A	$14

00806 Multiform Random Number Series Generator

by K.S. Hunziker, Yakima, WA

This program calculates uniformly, normally, or exponentially distributed numbers as well as random integers. Starting points may be defined by a user supplied "seed", making this program useful for games and many other purposes. The mean, standard deviation, and count of the numbers generated are kept automatically. **Necessary Accessories for HP-41:** None

Steps: 175 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00806-41-0	$10	$12
FOR HP-71*	00806-71-7	N/A	$14

00807 Stake

by J.N. Junker, Oklahoma City, OK

This program is designed to assist the field surveyor in setting control points (i.e. property corners, sewer line, water line, etc) from known points. Coordinates of backsight point, occupied point, and points to be set are input. Final output is azimuth, field angle, and distance to point to be set. Program may also be used to calculate field angles for field checking traverse, and sideshots. **Necessary Accessories for HP-41:** None

Steps: 95 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00807-41-8	$10	$12
FOR HP-71*	00807-71-5	N/A	$14

00808 Star Gate

by T. Langland, Phoenix, AZ

You are the pilot of an interplanetary spaceship and must make it thru the star gate. To aid you in your flight are funnelling anti-gravity boundaries. However, there are three deadly black holes you must stay away from. Has time warp consequence for going too fast, and adjustable difficulty. **Necessary Accessories for HP-41:** One Memory Module

Steps: 347 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00808-41-6	$10	$14
FOR HP-71*	00808-71-3	N/A	$16

00809 Metric Conversion

by K. Sharp, Galax, VA

This application will convert any number entered to its metric equivalent. It will also convert almost any unit of measurement into equivalent units of common measurement. This program can be used by anyone dealing with both common American units and metric numbers. **Necessary Accessories for HP-41:** One Memory Module

Steps: 760 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00809-41-4	$10	$13
FOR HP-71*	00809-71-1	N/A	$14

00810 Poisson Distribution

by R.B. Standler, Webster, NY

Given only the mean value, this program computes the probabilities that: (1) a certain integer, n, (2) any integer =< n, & (3) any integer > n will be observed. Only results for integers, n, between user-specified upper and lower bounds are printed. **Necessary Accessories for HP-41:** Printer

Steps: 93 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00810-41-2	$10	$11
FOR HP-71*	00810-71-9	N/A	$12

00812 Center Pivot Irrigation for Applying Pesticides and Fert

by S.E. Taylor, Ames, IO

This program provides for field calibration of chemical injection equipment for application of pesticides and fertilizers with center pivot irrigation systems. Also provided are calculations for acres covered by the system, inches of water applied to the crop, and the total amount of chemical needed to treat the field. **Necessary Accessories for HP-41:** None

Steps: 101 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00812-41-8	$10	$12
FOR HP-71*	00812-71-5	N/A	$14

00813 Growing Degree Days: Weather Service Method

by S.E. Taylor, Ames, IO

The development of many crops, weeds, insects, and plant diseases is well correlated with degree day accumulations. This program uses daily maximum and minimum temperatures to calculate and accumulate growing degree days according to the National Weather Service method. **Necessary Accessories for HP-41:** None

Steps: 67 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00813-41-6	$10	$11
FOR HP-71*	00813-71-3	N/A	$12

00814 Field Population and Planter Calibration

by S.E. Taylor, Ames, IO

Calibrate planter according to number of seeds to be dropped in 10 feet to achieve desired planting density for specified row spacing. Calculate actual field populating (plants per acre) according to number of plants sampled in any measured length of row for specified row spacings. **Necessary Accessories for HP-41:** Printer optional

Steps: 52 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00814-41-4	$10	$11
FOR HP-71*	00814-71-1	N/A	$12

00815 Complex Gamma Function

by J. Waten, Fasanstigen 2, Sweden

Computes LN(gamma) for all complex values except negative and real. **Necessary Accessories for HP-41:** None

Steps: 193 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00815-41-1	$10	$12
FOR HP-71*	00815-71-8	N/A	$14

00816 Conductivity by Electromagnetic Induction

by B.W. Bevan, Pitman, NJ

This geophysical analysis calculates the apparent conductivity of a multi-layered earth to model the response of an electromagnetic induction meter. Horizontal stratification is assumed; transmitter and receiver dipoles are vertical, above the earth, and have a spacing much less than the skin depth in any stratum. **Necessary Accessories for HP-41:** None

Steps: 76 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00816-41-9	$10	$11
FOR HP-71*	00816-71-6	N/A	$12

00817 Maximum 50% Tax Test for Personal Service Income

by E.W. Brasch, Marietta, GA

This program allows the user to promptly determine if the benefits of form 4726 can be utilized. Form 4726 is the maximum tax on personal service income and may result in a lower tax than regularly computed. Income averaging may need to be checked, also, since you can only use one that gives greatest savings. **Necessary Accessories for HP-41:** None

Steps: 87 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00817-41-7	$10	$12
FOR HP-71*	00817-71-4	N/A	$14

00818 Simon

by L.G.C. Brey, Buenos Aires, Argentina

You must repeat the ever increasing sequence of numbers and tones. A fanfare sounds when you complete sequences whose lengths are multiple of the level entered. When you make a mistake or you don't answer the play ends with a march, then you can obtain the last and longest sequences. **Necessary Accessories for HP-41:** One Memory Module

Steps: 206 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00818-41-5	$10	$12
FOR HP-71*	00818-71-2	N/A	$14

00819 CDC Floating Point Number to Base 10 Conversion

by J. Brownlow, Lancaster, CA

This program takes a CDC floating point number (octal) and converts it to the equivalent base 10 value. **Necessary Accessories for HP-41:** None

Steps: 66 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00819-41-3	$10	$11
FOR HP-71*	00819-71-0	N/A	$12

00820 10x10 Life

by M. Carlton, Covina, CA

In this game, organisms exist as cells in a 10 x 10 grid and survive, die, or reproduce according to a simple set of genetic rules. Each generation is calculated in an average of 1 1/2 minutes, with a 3 1/2 minute maximum. Program can move organism to prevent it growing off edges. The program can be run without a memory module by deleting the editing functions. **Necessary Accessories for HP-41:** One Memory Module

Steps: 198 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00820-41-1	$10	$12
FOR HP-71*	00820-71-8	N/A	$14

00821 6800 Disassembler Mnemonic Generator

by R.D. Cooper, Houston, TX

Program generates 6800 microprocessor mnemonics for a given machine code input in decimal. **Necessary Accessories for HP-41:** One Memory Module

Steps: 364 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	00821-41-9	$10	$14
FOR HP-71*	00821-71-6	N/A	$16

00822 Correlation Coefficient Statistics

by T.S. Cox, Easley, SC

Given correlation coefficient (r) and sample size (n) calculates 95% confidence interval for (r). Given two correlation coefficients and their respective sample sizes, determines if the coefficients are different at 0.05 level. **Necessary Accessories for HP-41:** None

Steps: 142 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00822-41-7	$10	$12
FOR HP-71*	00822-71-4	N/A	$14

00823 Textile Count Conversions

by T.S. Cox, Easley, SC

Provides any of the twenty (20) possible conversions between the following textile count or size numbering systems. 1) Cotton count which is based on 840 yards for one pound for cotton count=1.00. 2) Worsted count is based on 560 yards for one pound for worsted count = 1.00. 3) Tex count is based on 1 kilometer for one gram for tex count = 1.00. 4) Denier is based on 9 kilometers for one gram for denier = 1.00. 5) Metric count is based on one gram per meter for metric count = 1.00. **Necessary Accessories for HP-41:** One Memory Module

Steps: 279 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00823-41-5	$10	$12
FOR HP-71*	00823-71-2	N/A	$14

00825 Hypergeometric Distribution Sampling Probability

by T.S. Cox, Easley, SC

Given 1) lot size, 2) sample size, 3) lot defects, and 4) sample defects calculates probability of exactly p or p or less sample defects. Lot size must be less than 70. **Necessary Accessories for HP-41:** Card Reader and Printer optional

Steps: 141 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00825-41-0	$10	$12
FOR HP-71*	00825-71-7	N/A	$14

00826 Stat-Pac Data Libraries

by R.J. Frey, Mt. Sinai, NY

Using the card reader one can store, recall, add, and subtract entire groups of data for the 41C Stat-Pac's multiple-polynomial regression program. There is also a routine to recompute the information matrix after the regression parameters have been computed so that additional data points can be entered in the model. **Necessary Accessories for HP-41:** Memory Module, Card Reader and Stat Pac ROM

Steps: 87 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00826-41-8	$10	$11
FOR HP-71	NOT AVAIL		

00829 Gamma Function; Fraction and Negative Values

by E.M. Keefe, Ankeny, IA

Two different algorithms to calculate the gamma function algi uses an expanded Stirling approximation - can calculate gamma of 10**98 algor ii gives more precise results for gamma of z when 1<=z<=2. This algorithm calculates gamma of z with z between the limits of positive and negative 70.957. **Necessary Accessories for HP-41:** None

Steps: 161 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00829-41-2	$10	$11
FOR HP-71*	00829-71-9	N/A	$12

00830 Compressible Flow Functions for Air

by J.G. Kocsis, Mojave, CA

From given pressure-pair, the program computes the mach-number, area-ratio, temperature-ratio and density-ratio, thus eliminates the need of using handbooks, tables, and interpolation. If the temperature is known any locality, the local speed of sound, velocity (fps), and massflow rate per unit-area are also calculated. **Necessary Accessories for HP-41:** None

Steps: 120 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00830-41-0	$10	$12
FOR HP-71*	00830-71-7	N/A	$14

00831 Principal Stresses at a Point (Three Dimensional Case)

by P. Kiss, Kenmore, NY

This program finds the normal and shearing principal stresses at a point given the stress tensor components at that point. The method of solution is explicit in form, thereby eliminating excessive execution time required for the solution of the invarient cubic equation. **Necessary Accessories for HP-41:** None

Steps: 198 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00831-41-8	$10	$12
FOR HP-71*	00831-71-5	N/A	$14

00832 Aircraft Range

by J.G. Kocsis, Mojave, CA

The program ("range") calculates remaining cruise-distance for aircraft from inputs, which are either known, or instrument-readable to the pilot. It uses the classical Breguet-equation, which is presented in forms for propeller and jet-driven airplanes. Can be used for pre-flight and in-flight computations. Program returns to start, and ready for new inputs, if the answer to the question "landing?" is other than yes "y". **Necessary Accessories for HP-41:** One Memory Module

Steps: 181 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00832-41-6	$10	$12
FOR HP-71*	00832-71-3	N/A	$14

00833 Fourier Series

by J. LeMay, Houston, TX

This program produces the same results as 00026D for Fourier series. In addition, it will allow up to 134 frequencies with memory modules in all three angle modes and can delete data errors. Designed for use with Fourier power series program (included). The power series is designed to convert the coefficients on the 41C Fourier series program to a trig power series that produces identical results but in 65% less time or better. **Necessary Accessories for HP-41:** None

Steps: 179 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00833-41-4	$10	$14
FOR HP-71*	00833-71-1	N/A	$16

00834 Banner Printer

by D. Luttropp, Ft Collins, CO

Letters 1 1/2" high are printed sideways on the 41C printer. This program features maximum contrast block letters. Using an 8 wide by 12 high matrix concept, characters are generated from the stored data. Other characters can be generated in addition to the 40 supplied. **Necessary Accessories for HP-41:** Two Memory Modules, Card Reader and Printer

Steps: 141 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00834-41-2	$10	$16
FOR HP-71	NOT AVAIL		

00835 Standard Business Functions

by E. McGehee, Jackson, MS

This program provides one-button addition with item count, automatic repeat, and prints all entries double wide. This program also provides for constant multiplication, and calculates per-cent of totals like the HP-38C. Another routine calculates the unknown if any two of cost, selling price, or % margin are entered. **Necessary Accessories for HP-41:** Printer

Steps: 112 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00835-41-9	$10	$12
FOR HP-71*	00835-71-6	N/A	$14

00836 Cruise Optimization

by J. Meyer, Trondheim, Norway

The program will calculate minimum time and minimum fuel required and display the altitudes at which this occurs. Inputs to the program are winds aloft, temperatures aloft, aircraft weight and power setting. The program is general in that the aircraft characteristics are modelled in a program appended to the main one. **Necessary Accessories for HP-41:** Three Memory Module. Card Reader optional.

Steps: 505 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00836-41-7	$10	$18
FOR HP-71*	00836-71-4	N/A	$22

00837 Monorail Moments Under Moving Load

by P.d.S. Mourao, Belo Horizonte, Brasil

A continuous beam, up to 7 spans, is run by a moving load. It gives, beginning with first span, and progressing automatically to remainder spans, the left support moment (l.m.), the right support moment (r.m.), and the positive moment under the load, at each point, according to pre-set interval. **Necessary Accessories for HP-41:** One Memory Module

Steps: 262 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00837-41-5	$10	$13
FOR HP-71*	00837-71-2	N/A	$14

00840 Path Plot & Reflection Point

by J.L. Roth, Newbury Park, CA

The path plot program (PP) plots the propagation path and Fresnel curve for a smooth earth condition or for conditions of uniform roughness. With a slight modification, the program can be used with diffraction paths. The reflection point program (r) determines the point of reflection as well as the incident and reflection angles for smooth earth conditions. This program utilized an indirect address routine and is 70 steps shorter than previously published programs. (see "Path Profiling with a Programmable Calculator" Lenkurt Demodulator, March/April, 1979). Linear graph paper necessary. **Necessary Accessories for HP-41:** Linear Graph paper necessary

Steps: 150 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00840-41-9	$10	$12
FOR HP-71*	00840-71-6	N/A	$14

00841 Grey Body Color Temperature & Emissivity

by W.M. Sinton, Honolulu, HI

Given the radiances at two wavelengths, the grey-body color temperature is calculated. If the radiances are in absolute units, the emissivity is also obtained. Also calculates blackbody radiance given the temperature and wavelength. Re-iterative parameter entry, which saves time on repeat problems, is used. 41C math applications pac optional. **Necessary Accessories for HP-41:** 41C Math Applications Pac optional.

Steps: 173 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00841-41-7	$10	$12
FOR HP-71*	00841-71-4	N/A	$14

00842 Thermosiphon Reboiler - Heat Exchanger Rating

by R.J. Wooley, Midland, MI

Given, geometry of the thermosiphon reboiler and physical properties of the fluids; the circulation rate, inside, outside and overall (uc) heat transfer coefficients are calculated. Uc and ud (ud= q/a*lmtd) are used to calculate rd (dirt factor). Based on rd the program can be rerun changing only the exchanger geometry. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 425 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00842-41-5	$10	$14
FOR HP-71*	00842-71-2	N/A	$16

00843 Derivative

by D.E. Abad, Bremerton, WA

This program determines the first and second derivative of a given function. **Necessary Accessories for HP-41:** None

Steps: 59 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00843-41-3	$10	$11
FOR HP-71*	00843-71-0	N/A	$12

00847 Pressure Vessel Nozzle Losses for Gases

by K. Fewel, Dallas, TX

Program takes flow conditions of gas transmission applications and computes the density and actual flowrate, displays them and then takes vessel diameter and nozzle diameter and computes and displays flow velocities, rho v**2, expansion and contraction pressure losses in inches water. For losses <10% of line pressure. K factors based on experimental results. **Necessary Accessories for HP-41:** One Memory Module

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00847-41-4	$10	$12
FOR HP-71*	00847-71-1	N/A	$14

00849 "Order" Butterworth and Chebyshev Filter Design

by S. Hageman, Vallejo, CA

This program, given a set of four parameters will calculate the required filter order and calculate the required pole locations. Will handle high-pass and low-pass filters. Filter types can be Butterworth or Chebyshev. The input parameters are, passband and stopband attenuation and passband and stopband frequencies. **Necessary Accessories for HP-41:** One Memory Module

Steps: 269 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00849-41-0	$10	$12
FOR HP-71*	00849-71-7	N/A	$14

00850 Extended Range Arithmetic

by E.M. Keefe, Ankeny, IA

For those problems that typically give "out of range" the 41C now can crunch away. The following functions are operable: 1/x, y**x, sqrt, x**2, log, ln, 10**x, e**x, +, -, *, /, x<>y, CLX, RDN, CLST, LAST X, ENTER. The functions may be assigned to appropriate keys, so that the 41C will function almost as it normally does. **Necessary Accessories for HP-41:** One Memory Module

Steps: 248 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00850-41-8	$10	$12
FOR HP-71*	00850-71-5	N/A	$14

00851 External Tank to Orbit Space Shuttle

by J.G. Kocsis, Mojave, CA

Computes additional fuel required in the tank to accelerate the orbiter+tank assembly to orbital velocity, with variable loads carried in the payload-bay. Grossweight of orbiter (incl. Payload). The empty weight of the tank, fuel consumption at full power and delta velocity to be inputs, the acceleration of the assembly is limited to 3g-s. The orbital maneuvering thrusters ignite at unchanged (suborbital) speed, to supplement thrust. **Necessary Accessories for HP-41:** One Memory Module

Steps: 105 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00851-41-6	$10	$12
FOR HP-71*	00851-71-3	N/A	$14

00852 Escape Velocity from Planets

by J.G. Kocsis, Mojave, CA

The program simply computes a required velocity to achieve escape-trajectory from a planet, as a function of the radius of the planet and - the gravitational acceleration - from any altitude above the surface of the planet. The needed inputs are the altitude above the planet and the name of the planet, within our solar-system. **Necessary Accessories for HP-41:** None

Steps: 101 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00852-41-4	$10	$12
FOR HP-71*	00852-71-1	N/A	$14

00854 Closed Loop Power Supply

by G.D. Presman, Capital Federal, Argentina

This program calculates the passive components of a closed loop power supply. In case of impossibility (initial conditions bad) the machine announces this with its alphanumeric capability. **Necessary Accessories for HP-41:** One Memory Module

Steps: 210 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00854-41-0	$10	$13
FOR HP-71*	00854-71-7	N/A	$14

00855 Length of Paper in a Roll

by H.Y. Rhyu, Seal Beach, CA

Given any three of the length of paper in a roll, paper thickness, core diameter, and roll diameter, this program interchangeably solves for the unknown. Xeq "ROLL" begins to prompt for the variables. The known variables are keyed in, followed by (R/S). Prompt for the unknown is answered by (R/S), which the program solves for. **Necessary Accessories for HP-41:** None

Steps: 89 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00855-41-7	$10	$11
FOR HP-71*	00855-71-4	N/A	$12

00856 Viscosity of Suspensions

by H.Y. Rhyu, Seal Beach, CA

For estimating the viscosity of a suspension of solids in a liquid for use in fluid-flow and heat-transfer calculation, Einstein's or Hatschek's equation may be used which relates the suspension viscosity to liquid viscosity and volume fraction of solids in suspension. With the alphanumeric capabilities of the 41C fully utilized, one only needs to input the variables prompted for to obtain interchangeable solutions for the three variables. **Necessary Accessories for HP-41:** None

Steps: 135 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00856-41-5	$10	$12
FOR HP-71*	00856-71-2	N/A	$14

00857 Scaling-Up Equipment Costs

by H.Y. Rhyu, Seal Beach, CA

Cost of scaled-up chemical equipments and plants may be estimated if cost data at some other capacity levels are available. Scale-up factors for some typical equipments are built into the program, but user may use his own if available. Program provides interchangeable solutions for cost of a, capacity of a, cost of b, capacity of b and scale-up factor. **Necessary Accessories for HP-41:** None

Steps: 140 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00857-41-3	$10	$12
FOR HP-71*	00857-71-0	N/A	$14

00858 The Random Division of an Interval or a Circle

by H.Y. Rhyu, Seal Beach, CA

If a straight line of length l is divided into n subintervals by (n-1) points chosen at random on the straight line or if a circle of circumference l is divided into n subintervals by n points chosen at random on the circle, then the probability pk that exactly k of the subintervals will exceed d in length can be calculated by the formula described in this program. The program uses the prompting features, not the local labels. **Necessary Accessories for HP-41:** None

Steps: 91 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00858-41-1	$10	$11
FOR HP-71*	00858-71-8	N/A	$12

00859 Frequency of Vibrating Strings

by H.Y. Rhyu, Seal Beach, CA

This program provides for interchangeable solutions for frequency, radius, length, tension and density. The alpha-prompting features of the 41C fully utilized, instructions are part of the program and no local labels are used. In repeat cases, the variables remaining the same need not be re-entered. **Necessary Accessories for HP-41:** None

Steps: 112 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00859-41-9	$10	$11
FOR HP-71*	00859-71-6	N/A	$12

00860 Least Squares Polynomial Curve Fit

by E.E. Stoner, St. Charles, MO

Will fit a polynomial of any degree to data points giving the best fit in the least squares sense. By using the PVT subroutine in the Math Module this program requires only 125 lines. Projections computed. **Necessary Accessories for HP-41:** Math Module and Memory Modules as required

Steps: 125 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00860-41-7	$10	$11
FOR HP-71	NOT AVAIL		

00861 Economic Production Quantity

by L.R. Winters, Santa Clara, CA

This program outputs 8 variables relating to production quantities, batch sizes, inventory levels, production run times, etc. as they relate to costs. **Necessary Accessories for HP-41:** None

Steps: 122 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00861-41-5	$10	$11
FOR HP-71*	00861-71-2	N/A	$12

00863 Quadratic Equation

by G. Routh, Castro Valley, CA

Finds the two roots of the equation AX**2 + BX + C=0, whether the roots are real or complex, by using the quadratic equation : (-B + or -(B**2-4*A*C)**1/2)/2*A). This program uses no memories! **Necessary Accessories for HP-41:** None

Steps: 83 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00863-41-1	$10	$11
FOR HP-71*	00863-71-8	N/A	$12

00865 Almanac for Computers: Power Series and Chebyshev Expansions

by J.A. Folkers, Flagstaff, AZ

Program evaluates power series and Chebyshev expansions using any number of terms as published in "Almanac for Computers" to facilitate the computation of navigational and astronomical functions such as lunar, solar and planetary coordinates, sidereal time, equation of equinoxes, nutation, GHA and declination of sun, moon, navigational planets, etc. **Necessary Accessories for HP-41:** One Memory Module

Steps: 249 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00865-41-6	$10	$12
FOR HP-71*	00865-71-3	N/A	$14

00867 Project Status and Report

by G.M. Majors, Beaumont, TX

Program stores project cost data on cards, provides for update, and prints a project status report. **Necessary Accessories for HP-41:** Card Reader, Printer and Two Memory Modules

Steps: 300 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00867-41-2	$10	$14
FOR HP-71	NOT AVAIL		

00868 Fast Fourier Transform I

by N. Kim, Seattle, WA

This program computes the FFT or IFFT of a complex sequence up to 128-point, using the well-known decimation-in-time algorithm with radix 2. Necessary accessories: additional memory modules according to the total registers given by tot. Eg=62+2n, where n is the number of points. **Necessary Accessories for HP-41:** None

Steps: 220 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00868-41-0	$10	$12
FOR HP-71*	00868-71-7	N/A	$14

00869 Partial Fraction Expansion

by N. Kim, Seattle, WA

The purpose of this program is to evaluate the coefficients of the partial fraction expansion of a rational function with the poles of multiplicity up to 4, where the degree of numerator is less than that of the denominator for the rational function. Necessary accessories: memory modules according to the following formula: int(110+4p+n/64), where p & n are the number of poles & the order of denominator. **Necessary Accessories for HP-41:** None

Steps: 340 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00869-41-8	$10	$13
FOR HP-71*	00869-71-5	N/A	$14

00870 Experimental Simulated Study of a Gas

by J.M. Merino, Valladolid, Spain

This program supplies fifteen values to plot the pressure-volume curve of a gas for all temperatures with great accuracy in respect to the experimental curve. It is very helpful to chemistry and physics students. **Necessary Accessories for HP-41:** None

Steps: 80 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00870-41-6	$10	$11
FOR HP-71*	00870-71-3	N/A	$12

00871 Reaction Kinetics Simulated

by J.M. Merino, Valladolid, Spain

This program allows the study of the reaction kinetics of the order 0, 1 and 2 (2a==>b or a + b ==> c) in one step, at any temperature. It is intended for students of chemistry. **Necessary Accessories for HP-41:** None

Steps: 134 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00871-41-4	$10	$12
FOR HP-71*	00871-71-1	N/A	$14

00872 Non-Standard Enthalpy and Free Energy of a Chemical Reac

by J.A. Pita, Quito, Ecuador

Known the heat capacities of reactants and products for a reaction in the form of equations based on temperatures, this program calculates the enthalpy and free energy of the reaction at any given temperature. A reference or standard state must be defined with known enthalpy and free energy (usually 25 deg c). **Necessary Accessories for HP-41:** One Memory Module

Steps: 205 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00872-41-2	$10	$12
FOR HP-71*	00872-71-9	N/A	$14

00873 Tropospheric Scatter

by J.L. Roth, Newbury Park, CA

The tropo program predicts the propagation loss of a radio wave in the tropospheric scatter mode. The program evaluates losses (or gains) due to elevation angles, determines antenna gain and beamwidth, and then calculates basic tropo loss and the aperture-to-coupling loss, based on beamwidth and effective distance. Topographic maps necessary. **Necessary Accessories for HP-41:** None

Steps: 132 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00873-41-0	$10	$12
FOR HP-71*	00873-71-7	N/A	$14

00874 Lumber Invoicing

by K. Sharp, Galax, VA

This program automatically calculates board feet of a quantity of lumber and extends these amounts based on a price per thousand or per hundred. Both board footage and extensions are accumulated eliminating the need to calculate twice. Input is in the form feet, inches, and 1/16 inches--no conversion necessary. **Necessary Accessories for HP-41:** None

Steps: 88 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00874-41-8	$10	$11
FOR HP-71*	00874-71-5	N/A	$12

00875 Computer Slope Staking

by D. Terry, Anderson, CA

This completely automated grade staking program quickly computes catch point or daylight point from user input sideslope angle. All other constants need only be input once, but can be changed with a single key - press. Also affords full prompting elimnating the need to refer to instructions. **Necessary Accessories for HP-41:** None

Steps: 120 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00875-41-5	$10	$11
FOR HP-71*	00875-71-2	N/A	$12

00876 Vector Operations (Dot and Cross Products)

by J.R. Wolfe, Baltimore, MD

The program is set up as a friendly program which determines the dot and cross products of three dimensional vectors. The program is set up so a single vector can be changed and either dot or cross product is outputted; as requested. **Necessary Accessories for HP-41:** None

Steps: 130 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00876-41-3	$10	$12
FOR HP-71*	00876-71-0	N/A	$14

00877 Space Hunt

by K.C. Crandall, Walnut Creek, CA

In this game you hunt for a hidden spaceship in a user-defined grid. You can choose between a 2 or 3 dimensional game, and a ship that moves or is stationary. You enter the coordinates of each missile shot and the distance missed is displayed. When you hit the ship you are rated according to the number of missiles used. **Necessary Accessories for HP-41:** None

Steps: 156 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00877-41-1	$10	$12
FOR HP-71*	00877-71-8	N/A	$14

00878 Bearing Pile

by D.E. Carte, Upper Marlboro, MD

Program calculates the bearing capacity of a single pile using Janbus' formula. Based on the effort used to drive the pile into the soil. Program calculates ultimate capacity for steel, wood, and concrete piles. **Necessary Accessories for HP-41:** None

Steps: 184 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00878-41-9	$10	$13
FOR HP-71*	00878-71-6	N/A	$14

00879 Cubic Spline

by R. Cimmino, Naples, Italy

This program calculates at first the four coefficients of the cubic polynomial passing through any four non-collinear assigned points; then prompts for an input x-value and determines the related interpolated y-value allowing the user to calculate as many interpolated values as required. The four coefficient of the cubic spline are left, at the end of the program execution, in four memory registers, in order to be used, eventually, by a subsequent routine to calculate first and second derivative and the radius of curvature at any given point. **Necessary Accessories for HP-41:** None

Steps: 136 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00879-41-7	$10	$11
FOR HP-71*	00879-71-4	N/A	$12

00880 Tafel Equation Fit

by B.W. Clare, Coolbellup, Western Australia

Program fits current - voltage data to the modified tafel equation. It allows the determination of all the parameters, including the tafel slope, the ohmic drop, and the exchange current density. Errors are given, as is a residual for each point. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 387 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00880-41-5	$10	$14
FOR HP-71*	00880-71-2	N/A	$16

00881 Calorimetry

by B.W. Clare, Coolbellup, Western Australia

Designed for the LKB-8700-1 calorimeter, but readily adaptable to other constant environment temperature calorimeters, such as a simple Dewar in a thermostat, this program corrects the measured temperature change for heat leakage by the Regnault Pfaundler method. It is suitable for work of the highest accuracy. **Necessary Accessories for HP-41:** None

Steps: 428 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00881-41-3	$10	$15
FOR HP-71*	00881-71-0	N/A	$18

00882 Condensed Delta Storage

by D.W. Feigal, Sacramento, CA

This is a set of subroutines useful in storing numbers compactly. All 10 digits of each memory register are usable with a code that identifies which register, where in the register the number begins and ends, and where the decimal point is located. One data card can hold more numbers than 3 IBM cards. **Necessary Accessories for HP-41:** None

Steps: 120 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00882-41-1	$10	$11
FOR HP-71*	00882-71-8	N/A	$12

00883 7 X 7 Dot Character Builder (Wand)

by N.H. Blair, Bangkok 16, Thailand

Based on the character builder program in Wand Owners Manual, this program uses the full 7 x 7 dot matrix for special charcters. The wandscan grid for the search and destroy game is used. Once a character has been printed for inspection you can edit it by changing individual dots - adding or deleting, store the character for later use and, make a 'negative' of the character. stored characters may be recorded on a magnetic card. **Necessary Accessories for HP-41:** Wand, Printer, One Memory Module, Wand Manual. Card Reader optional.

Steps: 111 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00883-41-9	$10	$11
FOR HP-71*	00883-71-6	N/A	$12

00884 X-Register Manipulations

by N.H. Blair, Bangkok 16, Thailand

Six short fast routines for manipulating a number in the x register. included are: removal of most significant digit (msd), increase msd by 1, decrease msd by 1, replace all but msd with zeros, replace msd with 1 and remaining digits with zeros, digit reversal. Only the t register is lost by any operation, and digit reversal is the only operation to use data registers. **Necessary Accessories for HP-41:** None

Steps: 74 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00884-41-7	$10	$11
FOR HP-71*	00884-71-4	N/A	$12

00885 Hydraulic Design of Pipes and Channels

by M.L. Jamaldeen, Jeddah, Saudia Arabia

This program calculates velocity and discharge in pipes, (flowing full or part full), in open-flow channels, or determines the diameter or proportional depth of pipe for a known discharge, using the Colebrook-White equation, regarded as the most accurate basis for hydraulic design and experimentally confirmed over very wide range. Program #00656C can be very useful (Master Mind-Data Bureau). **Necessary Accessories for HP-41:** One Memory Module, Card Reader. Printer optional. Program #00656C can be very useful (Master Mind-Data Bureau).

Steps: 368 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00885-41-4	$10	$14
FOR HP-71*	00885-71-1	N/A	$16

00886 Contours

by J.N. Junker, Oklahoma City, OK

This program is designed to find contours on a topo map whether the elevation shots be on a grid or shot in by stadia. **Necessary Accessories for HP-41:** None

Steps: 68 HP-41 Bytes:

	Order Program No.	Documentation Only,	W/Cards
FOR HP-41	00886-41-2	$10	$11
FOR HP-71*	00886-71-9	N/A	$12

00887 Poor Edward's Barcode Maker for Type 7 Barcode

by E.M. Keefe, Ankeny, IA

Type 7 barcode (alpha replace : data) can be done relatively easily and for little added cost using the software and hardware in this 'how to' program. **Necessary Accessories for HP-41:** Wand

Steps: 130 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00887-41-0	$10	$12
FOR HP-71*	00887-71-7	N/A	$14

00888 Act Financial Analysis : Independent Student

by E.M. Keefe, Ankeny, IA

This program, like the one for analysis of financial need of the dependent student, is based on the worksheet for 1981-82 for manual calculations of the self supporting student's educational assistance needs. The worksheet may be found in the A.C.T. Handbook for Financial Aid Administrators (p.23). The program prompts for data by line number and may display or suppress intermediate results. **Necessary Accessories for HP-41:** None

Steps: 311 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00888-41-8	$10	$13
FOR HP-71*	00888-71-5	N/A	$14

00889 Percentiles and Percentile Ranks

by A. Leyenberger, Whippany, NJ

This program calculates the percentile scores and/or percentile ranks of data in the form of a frequency distribution. Percentile scores and percentile ranks may also be calculated using the normal distribution, given the mean and standard deviation of a set of data. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 288 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00889-41-6	$10	$13
FOR HP-71*	00889-71-3	N/A	$14

00891 Vapor Pressure

by N.C. Samish, Houston, TX

Determine the vapor pressure of most substances, given the normal boiling point and either the specific gravity or critical properties. Results are accurate for water and most hydrocarbons for temperature between TC/4 and TC, including the sublimation pressure of ice between 32 degrees F and -130 degrees F. Several formulas are used. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 605 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00891-41-2	$10	$18
FOR HP-71*	00891-71-9	N/A	$22

00892 Equal-Tangent Vertical Curve

by D.J.C. Westacott, Edmonton Alberta, Canada

For initial input of B.V.C. & E.V.C. Stations, and B.V.C. & V.P.I. & E.P.C. elevations, this program will calculate, curve elevations for stations within the vertical curve, and grade elevations for stations outside the vertical curve. The program will also calculate chainage of the zero slope station, and the zero slope station's elevation. **Necessary Accessories for HP-41:** None

Steps: 144 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00892-41-0	$10	$12
FOR HP-71*	00892-71-7	N/A	$14

00893 Balanced Horizontal Traverse by the Compass (Bowdich) Rule

by D.J.C. Westacott, Edmonton Alberta, Canada

This program is intended to provide an "idiot proof" solution for calculating area and precision, forcing closed, and balancing a horizontal traverse by the compass (Bowditch) rule. Memory modules, depending on the number of traverse stations. **Necessary Accessories for HP-41:** Memory Modules depending upon the number of traverse stations.

Steps: 195 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00893-41-8	$10	$12
FOR HP-71*	00893-71-5	N/A	$14

00894 Natural Frequencies of Uniform Beams

by L.R. Pendleton, Sunnyvale, CA

This program calculates the natural frequencies of uniform beams with various end conditions - pinned, fixed and free. Any number of nodal frequencies can be calculated starting with the lowest frequency. **Necessary Accessories for HP-41:** None

Steps: 87 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00894-41-6	$10	$11
FOR HP-71*	00894-71-3	N/A	$12

00895 Radial Drill

by J.A. Wurstner, Seneca Falls, NY

Do you figure labor costs for radial drill work? Time study persons: this program calculates S.H.E. for drill operations. If the drill runs with an N.C. machine, it determines which is internal. Has drill, tap, ream, chamfer, upsweep, downsweep time calculations. Several brass, iron and steel hole standards built in. **Necessary Accessories for HP-41:** Three Memory Modules and Printer

Steps: 482 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00895-41-3	$10	$16
FOR HP-71*	00895-71-0	N/A	$18

00896 Hex/Dec Conversion

by R.S. Altman, Clearlake, CA

This program allows the user to convert decimal numbers to hexadecimal and hexadecimal numbers to decimal. Full use is made of the HP-41C's alphanumeric capabilities. **Necessary Accessories for HP-41:** None

Steps: 196 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00896-41-1	$10	$12
FOR HP-71*	00896-71-8	N/A	$14

00897 Scorekeeper for Scrabble

by A. Kosak, Madrid 111 D.F., Mexico

In this program you key in the actual word played and it will count the value for each letter and multiply it by any bonus. You also can key in a 6 letter name for each player which will show at the beginning of his turn with his score until that point. This program will also give special bonus. **Necessary Accessories for HP-41:** One Memory Module

Steps: 317 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00897-41-9	$10	$13
FOR HP-71*	00897-71-6	N/A	$14

00898 Sinusoidal Motion

by L.R. Pendleton, Sunnyvale, CA

For simple harmonic motion of a particle, this program calculates peak acceleration, peak velocity, or peak displacement given frequency and any one of the above. Acceleration is calculated in either G's or inches per second. **Necessary Accessories for HP-41:** None

Steps: 58 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00898-41-7	$10	$11
FOR HP-71*	00898-71-4	N/A	$12

00899 Power "N" of a 2x2 Matrix

by G.D. Presman, Capital Federal, Argentina

This program raises matrices of 2x2, and real coefficients to powers. The method is iterative and the solutions are displayed with alphanumeric texts. **Necessary Accessories for HP-41:** None

Steps: 80 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00899-41-5	$10	$11
FOR HP-71*	00899-71-2	N/A	$12

00900 The Caves

by J.R. Surber, Omaha, NE

"The Caves" is an adventure game in which the player moves about a series of 67 interconnected caves to pick up nine items to total 1200 without dying from various hazards. If you like games, mazes and puzzles with magic you will love "The Caves". **Necessary Accessories for HP-41:** Four Memory Modules or One Quad Memory Module

Steps: 578 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00900-41-1	$10	$18
FOR HP-71*	00900-71-8	N/A	$22

00901 Ridiculously Compleat Factorial

by E.M. Keefe, Ankeny, IA

Let the HP41C compute the "complete" expression for factorial of numbers, e.g. 99!; 100! (158 digits). **Necessary Accessories for HP-41:** None

Steps: 92 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00901-41-9	$10	$11
FOR HP-71*	00901-71-6	N/A	$12

00902 Continuous Beams Through Fixed Points

by P.d.S. Mourao, Belo Horizonte, Brasil

Calculates continuous beams, 2 to 7 spans, plus 2 cantilevers. Each span assumes different length and inertia, uniformly distributed load, and unlimited amount of concentrated loads. Accordingly, suits well to any type of load distribution, even not functionally defined, since it can be discretized as thinly as necessary. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 339 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00902-41-7	$10	$13
FOR HP-71*	00902-71-4	N/A	$14

00903 Reversi

by V. Albillo, Madrid, Spain

This program allows you to play a game of Reversi against the 41C. You can select who moves first and the opening. The 41C can play for you, even against itself. If a printer is present, the board is printed. Good playing level & quite fast. **Necessary Accessories for HP-41:** Three Memory Modules. Printer optional.

Steps: 291 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00903-41-5	$10	$13
FOR HP-71*	00903-71-2	N/A	$14

00904 Octal Register Expansion

by R.A. Riegelmann, Corvallis, OR

This program is used to convert numbers in octal form into a form suitable for loading into a 8-bit register and to convert a register pair into an understandable 16 bit octal address. **Necessary Accessories for HP-41:** None

Steps: 291 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00904-41-3	$10	$13
FOR HP-71*	00904-71-0	N/A	$14

00905 Ingall's Ballistics

by D.R. Buntin, Castlerock, CO

This program calculates the ballistics of a bullet in flight. Velocity, energy, flight time, mid-range height, drop, 10 mph wind drift and trajectory for any sight-in range is calculated for all ranges from muzzle to maximum range input. This program is a complete exterior ballistics system. **Necessary Accessories for HP-41:** One Memory Module

Steps: 277 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00905-41-0	$10	$13
FOR HP-71*	00905-71-7	N/A	$14

00906 Alpha Register Manipulation

by D.M. Green, Oak Park, IL

This program is a combination of three subprograms which allow the user to isolate certain characters of the alpha register. By using these programs, the user can take a specified amount of letters, counting from either the left or right side of the alpha memory. A middle character can also be extracted. **Necessary Accessories for HP-41:** None

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00906-41-8	$10	$12
FOR HP-71*	00906-71-5	N/A	$14

00907 Economic Analysis of Energy Conservation Investments

by P. Glasson, New Durham, NH

Program is designed to help make decisions about energy conservation investments such as insulation, new furnace, or solar collector. It is based on simple present value formulas and "life cycle" cost analysis. The algorithm also uses the rate of escalation of energy costs. **Necessary Accessories for HP-41:** None

Steps: 122 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00907-41-6	$10	$12
FOR HP-71*	00907-71-3	N/A	$14

00908 Reconcile "N.O.W." Checking Account (Interest Checking)

by R.S. Altman, Clearlake, CA

This program allows the user to reconcile his "N.O.W." (negotiable order of withdrawal) interest checking account quickly and completely. A full record is printed of all transactions: checks, deposits, now interest, now charges, void checks. Complete use is made of the HP-41C's alphanumeric capabilities. **Necessary Accessories for HP-41:** Printer

Steps: 88 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00908-41-4	$10	$12
FOR HP-71*	00908-71-1	N/A	$14

00909 Renal Function Tests

by T. Adams, East Lansing, MI
R.D. Heisey, East Lansing, MI
D. Spielman, East Lansing, MI

This program calculates parameters of normal and pathological renal function including test molecular clearance, filtration, reabsorption, fractional reabsorption, excretion, fractional excretion, net transport and extraction, and glomerular filtration, renal (and effective renal) plasma and blood flows, as well as other physiological values which are useful in both clinical and research applications. Data and calculations are stored for solution of equations which can be made in any order. Data needs to be entered only once. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 624 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00909-41-2	$10	$16
FOR HP-71*	00909-71-9	N/A	$18

00910 Black Body Photon Emission

by R.D. Tooley, Placentia, CA

Computes black body photon emission using SI units. Input format follows hp thermal (energy) radiation program (00152C). **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 140 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00910-41-0	$10	$12
FOR HP-71*	00910-71-7	N/A	$14

00911 Musical Scales--Frequencies

by R.S. Altman, Clearlake, CA

This program is intended as a "companion" program to "Frequencies of Musical Pitch—Equal-Tempered Scale" although complete by itself. This program will print the frequencies of all eight notes in any major scale (or natural or harmonic minor scales) in any octave using any note as a starting note for that scale. **Necessary Accessories for HP-41:** One Memory Module

Steps: 261 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00911-41-8	$10	$12
FOR HP-71*	00911-71-5	N/A	$14

00912 Jargon

by M.E. Anderson, Berwyn, IL

1-2 players enter guess-words (equations, jargon, etc.) to discover "word" of 2-6 symbols hidden by opponent or picked by calculator from 31 words read from magnetic card. Display number of matching letters and correct positions. Object: fewest guesses for maximum score. Displays score per round and average score for all rounds. **Necessary Accessories for HP-41:** Quad Memory Module

Steps: 534 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00912-41-6	$10	$20
FOR HP-71*	00912-71-3	N/A	$24

00913 High Resolution Plot of Harmonics of Pulses

by W. Bican, Vienna, Austria

This program calculates and plots for given data: Pulse-length, pauselength, amplitude, 1st wanted harmonic, Y min. and Y max. The highest for the plot admissable harmonic is calculated and stored as X maximum. In the case the plot exceeds Y maximum, instead of the plotmark - which is not a recognizable value - the numerical value is printed at the right hand side of the plot. **Necessary Accessories for HP-41:** Two Memory Modules. Printer and Card Reader optional.

Steps: 484 HP-41 Bytes: 804

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00913-41-4	$10	$14
FOR HP-71*	00913-71-1	N/A	$16

00914 Bending Moment Plotting

by S. Biggs, Suva, Fiji

Calculates a bending moment diagram plot for a simply-supported beam, cantilever, propped cantilever, or fixed-end beam. Eight load types can be superimposed for any required bad input. The number of points for plotting is selected by the user. Program prompts for input. Any consistent units can be used. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 509 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00914-41-2	$10	$14
FOR HP-71*	00914-71-9	N/A	$16

00915 Project Selection/Decision Funding Model

by S.C.J. Coddington, Fariborn, OH

This program automates some rules of thumb for solving projection/funding problems where partial resource allocation is not allowed. This program will work with up to four resource constraints for each project version. It calculates the relative merit of a project version and selects that project over others. **Necessary Accessories for HP-41:** One Memory Module

Steps: 186 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00915-41-9	$10	$12
FOR HP-71*	00915-71-6	N/A	$14

00916 Time Study

by R. Cox, Cedar City, UT

Generates a clock to sequentially time and store up to nine elements of a repetitive operation over any number of cycles. Upon completion of study, elements will be averaged and summed, elements of study will then be displayed with appropriate labeling. **Necessary Accessories for HP-41:** One Memory Module

Steps: 173 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00916-41-7	$10	$12
FOR HP-71*	00916-71-4	N/A	$14

00917 Linear Regression Confidence Intervals

by T.S. Cox, Easley, SC

Given a linear regression line, this program will calculate: 1) Given x, calculate the confidence interval for average y. 2) Given x, calculate the prediction interval for y. 3) Given y, calculate the confidence interval for x. 4) Given a series of points (x, y) calculates linear regression. **Necessary Accessories for HP-41:** One Memory Module

Steps: 307 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00917-41-5	$10	$13
FOR HP-71*	00917-71-2	N/A	$14

00918 Vivitar 283 Flash Guide Number & F-Stop Computations

by F.D. Fink, Vancouver, WA

This program computes guide numbers and f-stops for the Vivitar 283 electronic flash, when given inputs for the films ASA number, with provisions for Vivitar wide angle/telephoto filters and the varipower module. This program will also compute f-stop settings for other electronic flashes when given the guide number and distance. **Necessary Accessories for HP-41:** None

Steps: 128 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00918-41-3	$10	$12
FOR HP-71*	00918-71-0	N/A	$14

00919 Electric Bill and Budget Analysis

by R.A. Finck, Milton, PA

This program will analyze electric bills and budgeted amount for this expense. Gives total kwh, total expense, balance of budgeted amount, monthly average for budget balance for the remaining months in year, kwh per month used, average expense per month, and cost per kwh for the accumulated months. Card reader useful. **Necessary Accessories for HP-41:** Card Reader useful

Steps: 75 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00919-41-1	$10	$11
FOR HP-71*	00919-71-8	N/A	$12

00921 Turbomachinery Calculations

by J.F. Glass, Sherman Oaks, CA

Calculates turbine required flowrate, pump horsepower, turbine exit temperature, nozzle spouting velocity and turbine velocity ratio for a turbopump. Inputs are pump flowrate, pump and turbine efficiencies, density of pumped fluid, turbine drive-gas properties, and turbine pressure ratio. **Necessary Accessories for HP-41:** None

Steps: 165 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00921-41-7	$10	$12
FOR HP-71*	00921-71-4	N/A	$14

00923 Polarization Loss

by R.G. Hartmann, Los Altos, CA

The polarization loss between two antennas of an elliptically polarized radiation pattern is calculated from the given axial ratios of the two antennas. This applies to the 4 cases of maximum and minimum loss and the same and opposite sense of polarization. **Necessary Accessories for HP-41:** None

Steps: 104 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00923-41-3	$10	$12
FOR HP-71*	00923-71-0	N/A	$14

00924 Scorekeeper

by M.E. Hill, Hydesville, CA

Using the HP-41C's alphanumeric capabilities, this program tallies the score of 1 to 5 players for a variety of games. Reviews all or individual scores including number of points on last turn. Ideal for Pinochle, (it remembers the bid), Scrabble, (it has a built-in variable length timer), and others. **Necessary Accessories for HP-41:** One Memory Module

Steps: 266 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00924-41-1	$10	$13
FOR HP-71*	00924-71-8	N/A	$14

00925 Data Packing

by N.H. Blair, Bangkok 16, Thailand

Numbers of less than 10 digits are packed into data registers according to a format specified by the user. For instance 2 x 4 digit numbers or, 4 x 2 digit numbers or, combinations such as a 5 digit number, a 3 digit number & a 2 digit number in each register. Very flexible in this respect. These "mini" registers are designated by number like the normal registers. Store, recall, exchange are provided for. **Necessary Accessories for HP-41:** None

Steps: 122 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00925-41-8	$10	$11
FOR HP-71*	00925-71-5	N/A	$12

00926 Loans with Interest Free and Specified Skip Payments

by E.M. Keefe, Ankeny, IA

Compute uniform payments to a loan where some of the intial payments are interest free and other payments may be skipped. Data may be entered as called for or they may be entered using top row keys allowing for "what-if" solutions. Begin/end solutions are computed easily. **Necessary Accessories for HP-41:** One Memory Module

Steps: 288 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00926-41-6	$10	$13
FOR HP-71*	00926-71-3	N/A	$14

00928 Positional Astronomy of Navigational Objects

by C.S. Parker, Laguna Hills, CA

This program provides position of selected object from "Almanac for Computers" section C & E for sun, moon, planet or star for any specified location on earth or time (daylight or standard), output views declination, GHA, LHA, altitude and azimuth. Also included is a data card reading program for almanac data. **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 190 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00928-41-2	$10	$14
FOR HP-71*	00928-71-9	N/A	$16

00929 Chess 5x5

by V. Albillo, Madrid, Spain

This program challenges you to play chess against the 41C in a 5x5 board, each player having king, queen, bishop, knight, rook, and 5 pawns. All standard rules are implemented, including pawn promotion. Printer present. 5 minutes per move. Good level. **Necessary Accessories for HP-41:** Three Memory Modules and Card Reader. Printer optional.

Steps: 515 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00929-41-0	$10	$17
FOR HP-71*	00929-71-7	N/A	$20

00931 Effective Orifice Area for Pressure Relief Device

by H.Y. Rhyu, Seal Beach, CA

R the API-ASME formula, applicable to selection of pressure relief devices designed to protect tanks containing volatile liquids. The formula relates pressure, molecular weight and vapor temperature. With prompting features, the usage directions are an integral part of the program, also featured is a routine whereby those variables remaining unchanged from the previous calculations need not be re-entered. **Necessary Accessories for HP-41:** None

Steps: 165 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00931-41-6	$10	$12
FOR HP-71*	00931-71-3	N/A	$14

00932 Volume of Air at High Temperature and Pressures

by H.Y. Rhyu, Seal Beach, CA

For air at high temperatures and pressure, this program provides interchangeable solutions for the equation relating specific volume, pressure and temperature. One inputs the variable prompted for, followed by (R/S). If the variable prompted for is the unknown, one simply pushes (R/S). After all three variables are handled in this manner, the program determines which variable is the unknown and solves for it. **Necessary Accessories for HP-41:** None

Steps: 84 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00932-41-4	$10	$11
FOR HP-71*	00932-71-1	N/A	$12

00933 Cost of Pumping

by H.Y. Rhyu, Seal Beach, CA

This program provides interchangeable solutions for the equation relating cost of pumping the liquid to cost of power, dynamic head, specific gravity, efficiency of motor & pump. The alphanumeric capabilities of the 41C fully utilized, instructions are built into the program and one only needs to enter the variables prompted for. For repeat cases where some variables remain unchanged, provisions are made so they need not be re-entered. **Necessary Accessories for HP-41:** None

Steps: 93 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00933-41-2	$10	$11
FOR HP-71*	00933-71-9	N/A	$12

00934 Random Particle Distribution

by H.Y. Rhyu, Seal Beach, CA

The error associated with sampling from a particulate system is due to particle segregation and random particle distribution. For a well-blended (determinate error assumed zero) binary system where the particles are spheres of equal sizes, this program calculates the sampling error in terms of standard deviation of element, e, present in both species and expresses the error as a function of proportion of the two species, conception of e in the two species, sample size, particle volume and densities. **Necessary Accessories for HP-41:** None

Steps: 95 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00934-41-0	$10	$11
FOR HP-71*	00934-71-7	N/A	$12

00935 Metric/English Conversions

by L.D. Thomas, Pocatello, ID

If you have been looking for a metric conversion program, you need look no farther. This program contains 36 popular conversions, and gram. Conversions for volumes, temperature, weights and velocity are provided. This program contains all of the conversions (except from USG to/from MPG) that are featured on the TI metric converter calculator. **Necessary Accessories for HP-41:** None

Steps: 108 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00935-41-7	$10	$12
FOR HP-71*	00935-71-4	N/A	$14

00936 Duct Sizing - Static Regain

by M.F. Schluender, Gladstone, MS

This program computes the pressure loss or regain for either a round or rectangular supply air duct system by the static regain methods employed in the 1972 Ashrae handbook of fundamentals. **Necessary Accessories for HP-41:** One Memory Module. Printer desirable.

Steps: 211 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00936-41-5	$10	$13
FOR HP-71*	00936-71-2	N/A	$14

00937 Practical Signal Timing

by L.D. Thomas, Pocatello, ID

This program computes "practical" cycle intervals (level of service "c" or "e") for fixed time traffic signals, for any number of phases. Amber times, vehicle green times, pedestrian green times, volume to capacity ratio and an estimate of the number of vehicles which could pass through the intersection, for each phase, during the design hour, for the given cycle length. **Necessary Accessories for HP-41:** Two Memory Modules. Card Reader and Printer optional.

Steps: 452 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00937-41-3	$10	$15
FOR HP-71*	00937-71-0	N/A	$18

00938 Simple Janbu Analysis for Mohr Coulomb Material

by J.L. Gilby, Vancouver, Canada

This program uses Janbu's simple solution for the calculation of the factor of safety of a slope in which failure follows a non-circular path. The program has a neat printout of the analysis if the 82143A printer is used, but is also designed to run without the printer. **Necessary Accessories for HP-41:** Card Reader, One Memory Module Minimum (allows 11 slices)

Steps: 290 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00938-41-1	$10	$13
FOR HP-71*	00938-71-8	N/A	$14

00939 Steel Baseplate Design Program-Columns w/or w/o Base Moments

by A.R. Chandler, Kansas City, MO

The program calculates the bolt tension and steel plate thickness of steel column baseplate using criteria in the AISC Steel Construction Manuals - 8th Edition. It also solves base plates with applied moments using a method presented in a recent AISC Engineering Journal. Another companion program is available for use with a printer. **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 232 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00939-41-9	$10	$15
FOR HP-71*	00939-71-6	N/A	$18

00940 Rallye Navigation

by C.R. Clark, Albuquerque, NM

Program performs rallye navigation calculations including (1) time at distance increments, (2) time at specified distance, (3) pauses and gains, (4) distance after specified time increment, (5) distance at specified time, (6) distance at specified official mileage. After most calculations, distance and time (decimal minutes) are displayed simultaneously with labels. Off-course recovery is provided. **Necessary Accessories for HP-41:** None

Steps: 122 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00940-41-7	$10	$12
FOR HP-71*	00940-71-4	N/A	$14

00942 Chi-Square Test for Independence on MxN Contingency Table

by C. Goldman, London, England

Computes the chi-square statistic from a contingency table. This program is restricted only by the memory capacity available: it needs 28 + M.N + M + N + 9 registers, where M=rows and N=columns. A 'size' test is incorporated and the program is easily modified to include the Yate's correction in a 2x2 contingency table. **Necessary Accessories for HP-41:** None

Steps: 108 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00942-41-3	$10	$11
FOR HP-71*	00942-71-0	N/A	$12

00943 Curve Fit-Best Fit-Nine Curves

by W.W. Steffen, Indianapolis, IN

Selects the best fit of nine curves without modifying or destroying data. Data may be added or subtracted at any time for additional calculations. Individual curves may be selected and fit. Any curves may be easily plotted. Prints curve parameters, curve formula, coefficients of determination and correlation, mean, standard deviation and standard error of estimate. **Necessary Accessories for HP-41:** Three Memory Modules, Printer, Card Reader or Wand.

Steps: 601 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00943-41-1	$10	$16
FOR HP-71	NOT AVAIL		

00944 Duhamel's Integral for a Vibrating System

by W.O. Troxell, Fort Collins, CO

This program solves single degree of freedom vibrating systems having a complicated forcing function. The solution yields the displacement as a function of time along with the resulting force on the vibrating structure. the dynamic load factor can then be determined. **Necessary Accessories for HP-41:** None

Steps: 99 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00944-41-9	$10	$11
FOR HP-71*	00944-71-6	N/A	$12

00945 Plot II

by T.F. Morgan, Bellevue, NE

Similar to "PRPLOT", "PLOT II" takes your single-valued function and widens the plot to the number of printer tapes you specify. No scales or axes are printed. A cut and paste operation is required when the plot is finished. **Necessary Accessories for HP-41:** None

Steps: 154 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00945-41-6	$10	$12
FOR HP-71*	00945-71-3	N/A	$14

00946 Bode Analysis: Phase and Gain Crossover Frequencies

by J.A. Pita, Quito, Ecuador

Given a transfer function gh(s), program finds magnitude and phase angle for any frequency without entering data more than once. Calculator can generate by itself a table for ten values of w. Also it finds the phase and gain crossover frequencies given a guess interval by the user. **Necessary Accessories for HP-41:** None

Steps: 546 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00946-41-4	$10	$17
FOR HP-71	NOT AVAIL		

00947 Circle Calculations

by R. Cimmino, Naples, Italy

This program calculates: 1. Given the co-ordinates of three non-collinear points, the center and the radius of the circle passing through these three points; 2. Given center co-ordinates and radius the location of points on the corresponding circle. When used in the first mode, the program can also provide location of points on the circle. **Necessary Accessories for HP-41:** None

Steps: 199 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00947-41-2	$10	$12
FOR HP-71*	00947-71-9	N/A	$14

00949 Deluxe Battleship

by N.M. Johnson, Youngstown, OH

It's you against the computer in a fight to the finish, as each of you try to be the first to destroy the others five ships. You had better be careful, because the computer never duplicates a move. **Necessary Accessories for HP-41:** None

Steps: 186 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00949-41-8	$10	$12
FOR HP-71*	00949-71-5	N/A	$14

00950 Section Properties of Structural Members

by R.A. Power, Garland, TX

This program calculates section properties of plane areas that can be represented as a composite of elements having standard shapes or having predetermined properties. The seven standard shapes have been chosen so that most number cross-sections in structural practice can be represented as a composite of the standard shapes. **Necessary Accessories for HP-41:** None

Steps: 674 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00950-41-6	$10	$16
FOR HP-71*	00950-71-3	N/A	$18

00951 Offset Taping

by D. Terry, Anderson, CA

This program allows for a unique approach to a topographic or a reasonable amount of accuracy must be maintained. By offsetting the zero end of the tape the Rodman chainman reads distance, leaving the transitman free to record angles. **Necessary Accessories for HP-41:** None

Steps: 88 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00951-41-4	$10	$11
FOR HP-71*	00951-71-1	N/A	$12

00952 Bio-Compatibility

by F. Hali, Hillarys, West Australia

Using biorhythmic theory this program calculates compatibility of any two individuals. Output is shown as a percentage compatibility for each cycle (p, s,c) and average compatibility. Program is easy to use and includes date validation and printer output sub-routines which may be deleted to conserve memory. **Necessary Accessories for HP-41:** None

Steps: 214 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00952-41-2	$10	$13
FOR HP-71*	00952-71-9	N/A	$14

00953 Bin/Dec Conversions

by F. Hali, Hillarys, West Australia

Program will convert a 10 bit binary # either side of the radii (e.g. 0-00096 less than or equal to dec less than or equal to 1023) to its decimal equivilant, or any decimal # (0-001 less than dec less than 4096 to its binary equivalent. Program is easy to use (full prompting) and output may be printed double-wide under program control. Ideal for HP-85, BPLOT users. **Necessary Accessories for HP-41:** None

Steps: 231 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00953-41-0	$10	$12
FOR HP-71*	00953-71-7	N/A	$14

00954 Finite Element Heat Transfer

by W.R. Kast, Denver, CO

Using finite time intervals and finite elements, this program calculates thermal transient response and steady state temperature distribution. elements mass, initial temperatures, and all element interconnections are user defined. Options for conductive and/or radiative transfer included plus 2 user defined algorithms available. **Necessary Accessories for HP-41:** None

Steps: 319 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00954-41-8	$10	$13
FOR HP-71*	00954-71-5	N/A	$14

00955 Bohr Hydrogen Atom

by J.R. Derry, New York, NY

This program uses alphanumeric prompting and data format to yield such information about the classical Bohr hydrogen atom as maximum nubers of possible electrons in atom per level, radius of orbital, velocity of electron in orbital; kinetic, potential, and total energies of electrons in orbital. Too, this program lists the five spectra series of the hydrogen atom, the energy of the released photons, and their frequencies. **Necessary Accessories for HP-41:** None

Steps: 164 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00955-41-5	$10	$12
FOR HP-71*	00955-71-2	N/A	$14

00956 Channel Flow

by S. Wood, Yakima, WA

Given various physical properties of a flow in a channel, the program determines the water elevation, wetted perimeter, and velocity of the flow. channel may be canal, river, or any other type of open flow. **Necessary Accessories for HP-41:** None

Steps: 213 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00956-41-3	$10	$12
FOR HP-71*	00956-71-0	N/A	$14

00958 Frequencies of Musical Pitch--Equal-Tempered Scale

by R.S. Altman, Clearlake, CA

Pitch is that qualitative attribute of auditory sensation which denotes highness or lowness in the musical scale and is conditioned primarily on the frequency of sound waves. This program provides the user with the frequency of any note in the musical scale (in any octave). Full use is made of the HP-41C's alphanumeric capabilities. **Necessary Accessories for HP-41:** Printer optional.

Steps: 168 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00958-41-9	$10	$12
FOR HP-71*	00958-71-6	N/A	$14

00959 Resistive Pads & Attenuators

by M.H. Blais, Salem, OR

This program solves for resistive values and minimum attenuation in db for all "l", symmetrical and asymmetrical "t", and "pi" configurations given: input impedance (zi), output impedance (zo) and attenuation desired (db). The program is self prompting and self directing for any of these described configurations. Rapid "t" and "pi" comparisons are also possible. **Necessary Accessories for HP-41:** None

Steps: 226 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00959-41-7	$10	$12
FOR HP-71*	00959-71-4	N/A	$14

00960 Two Way Analysis of Variance with Interactions

by T.S. Cox, Easley, SC

Calculates and labels data for construction of a complete two way analysis of variance. The number of rows and columns is limited only by available memory. The number of replications is unlimited. Probability of F is also calculated. Data points are only entered once. **Necessary Accessories for HP-41:** Three Memory Modules and Printer

Steps: 507 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00960-41-5	$10	$15
FOR HP-71*	00960-71-2	N/A	$18

00962 Perspective w/Translation and Rotation

by C.I. Dinsmore, Seattle, WA

This program computes the "x" and "y" coordinates for a correct perspective of any building or object. Inputs are known x, y and z coordinates of the physical object. Location of the object may be translated or rotated as desired. A scale factor for size adjustment may be used. Useful for architectural application. **Necessary Accessories for HP-41:** Printer optional.

Steps: 149 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00962-41-1	$10	$12
FOR HP-71*	00962-71-8	N/A	$14

00965 Civil War Simulation

by M.G. Green, Salisbury, Zimbabwe

Change the facts of history! Recreate the civil war battles, based on actual facts, and possibly have the south win the war. All factors are interrelated and while the result may be the same as actually happened - it is up to you! **Necessary Accessories for HP-41:** Four Memory Modules (or Quad Memory Module) and Card Reader necessary. Printer desirable.

Steps: 862 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00965-41-4	$10	$21
FOR HP-71*	00965-71-1	N/A	$26

00966 Poor Edward's Barcode Maker Type 6 Numeric Data

by E.M. Keefe, Ankeny, IA

This program generates a pattern of 8 bit bytes in 1's and x's which may be used to generate numeric data type barcodes using the Poor Edward's barcode maker. Then with only a waft of the wand you, too, will be able to put Avagadro's number, the golden ratio, etc. in the 41CV. **Necessary Accessories for HP-41:** Wand

Steps: 215 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00966-41-2	$10	$12
FOR HP-71*	00966-71-9	N/A	$14

00967 Time VS Data Graph

by R. Kimmelman, Clark, NJ

Program will plot straight line (linear regression) through up to 48 consecutive data points. Plots y intercept and point n+1 so that a line can be easily drawn. Program useful for any data to be plotted against time (ie - consecutive months). **Necessary Accessories for HP-41:** Two Memory Modules and Printer

Steps: 248 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00967-41-0	$10	$13
FOR HP-71*	00967-71-7	N/A	$14

00968 Load Capacity of Hot-Air Balloons

by J.G. Kocsis, Mojave, CA

Program is for pre-flight determination of whether the planned grossweight can or cannot be lifted without exceeding the balloon envelope's limit-temperature (tmax.) in the existing atmospheric conditions (O.A.T. Deg f & p in hg.) a. From atmospheric data & tmax & volume of envelope compute grossweight (w): b. Atmospheric data & w & vol. Compute tmax (t); c. Atm. data, tmax & w inputs give needed volume (ft3) (v). **Necessary Accessories for HP-41:** One Memory Module

Steps: 99 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00968-41-8	$10	$12
FOR HP-71*	00968-71-5	N/A	$14

00970 Find Focal Length & Sets Camera Settings for Fixed Object Pl

by R.K. McDonald, Milpitas, CA

Find the exact focal length from two known lens settings & reductions for subsequent computing of any other reduction desired, lens & object (copy board) settings. Program designed for fixed =object plane= process cameras. Fully prompted & labeled. Lens & image plane to reading location delta accounted for in the calculation. **Necessary Accessories for HP-41:** Card Reader optional.

Steps: 147 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00970-41-4	$10	$12
FOR HP-71*	00970-71-1	N/A	$14

00971 Labyrinth-Adventure

by D.A. Munroe, Portland, OR

Explore an underground maze and bring out the three treasures before the beast finds you. Random number initialization provides innumerable mazes for variety and repeatability. Your score depends on retrieving as much treasure in the fewest moves. Names and scores of the top four players are maintained. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 515 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00971-41-2	$10	$15
FOR HP-71*	00971-71-9	N/A	$18

00972 Clausius-Clapeyron Equation

by C. Nelson, Newark, DE

This program solves the integrated form of the Clausius-Clapeyron equation (assuming the heat of vaporization to be constant) for any of the variables (except R), when the remaining variables are given. **Necessary Accessories for HP-41:** None

Steps: 106 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00972-41-0	$10	$11
FOR HP-71*	00972-71-7	N/A	$12

00973 Position of Celestial Bodies by Location, Date and Time

by C.S. Parker, Laguna Hills, CA

Program provides position of selected object from "connaissance des temps". Objects are sun, moon and twelve planets, for any specified location and time. Output views right ascension, declination, lha, altitude and azimuth. "Almanac for Computers" sec. D with eight planets may be used. Star positions are converted to altitude - azimuth coordinates. **Necessary Accessories for HP-41:** Three Memory Modules and Card Reader

Steps: 294 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00973-41-8	$10	$20
FOR HP-71*	00973-71-5	N/A	$24

00974 41C Beattie-Bridgeman's Equation of State

by J.A. Pita, Quito, Ecuador

Given the five Beattie-Bridgeman's constants for a gas (a0, b0, a,b, c) this program finds the pressure, temperature or molar volume given the other two. Calculating t or v requires a Newton-Raphson iteration procedure with accuracy specified by the user and with the ideal (pv=rt) value as starting point. **Necessary Accessories for HP-41:** One Memory Module

Steps: 343 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00974-41-6	$10	$13
FOR HP-71*	00974-71-3	N/A	$14

00975 41C Tube Bending Development

by N.E. Ritchie, Portland, OR

Given the formed part dimensions of a bar or tube centerline, the program will generate all data required for bending the tube. Input: cartesian co-ordinates of end points and bend intersections and bend radius. Output: straight & curved section lengths; total length bend angles; rotation between bends. **Necessary Accessories for HP-41:** Two Memory Modules and Printer

Steps: 355 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00975-41-3	$10	$13
FOR HP-71*	00975-71-0	N/A	$14

00976 41C Hyperbolics

by G. Routh, Castro Valley, CA

This program computes all the hyperbolic functions. Sinh, cosh, tanh, asinh, acosh, atanh, csch, sech, coth, acsch, asech, acoth. This program uses no data registers. **Necessary Accessories for HP-41:** None

Steps: 117 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00976-41-1	$10	$11
FOR HP-71*	00976-71-8	N/A	$12

00978 41C Labor Bugets/Distribution for Architects & Engineers

by W.B. Tracy, Denver, CO

Speeds preparation of and revisions to task/labor worksheets as required by the AIA Cost Based Compensation System. An aid for negotiating professional fees for many government projects. Can also be used to perform a labor distribution from timecards for hourly employees. **Necessary Accessories for HP-41:** Memory Modules, one for each 32 tasks necessary. Printer optional.

Steps: 145 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00978-41-7	$10	$12
FOR HP-71*	00978-71-4	N/A	$14

00979 41C Class Roll with Weighted Cumulative Scores & Analyzer

by V. Yeh, Lexington, KT

Three part program enters, updates, and reviews class roll (twelve character names) keeping cumulative scores. Scores may be weighted. Size of roll depends on number of memory modules (1:17;2:38;3:69; 4:81). Roll and cumulative scores can be stored on magnetic cards. Will utilize printer, card reader if available. **Necessary Accessories for HP-41:** One Memory Module

Steps: 220 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00979-41-5	$10	$13
FOR HP-71*	00979-71-2	N/A	$14

00981 Tabulator

by G. Goodman, Stamford, CT

Simplifies standard crossfooting by requiring each entry to be keyed only once. Summary includes row totals, column totals, row and column proportions, and grand total. Printer recommended for verification of input data. **Necessary Accessories for HP-41:** Printer recommended for verification of input data.

Steps: 163 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00981-41-1	$10	$12
FOR HP-71*	00981-71-8	N/A	$14

00982 Navpac for Yachtsmen

by L. Valier, Honolulu, HI

A program designed for yachtsmen combining the HP 41C Navpac module, its splendid features and long term almanac into routines giving L.O.P.S., time mer. passage, latitude, time body rises/sets, azimuth at rise, long if lat. known and long. from time of sun rise/set. **Necessary Accessories for HP-41:** Three Memory Modules, HP-41C Navpac Module. Printer optional.

Steps: 516 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00982-41-9	$10	$15
FOR HP-71	NOT AVAIL		

00983 CDC Word Conversions

by K. Akima, Boulder, CO

Program will convert CDC 6000 Series/Cyber 70 Series/Cyber 170 Series word represented by 20 octal digits in either integer or real format to its decimal representation. Also provided is 18 bit ones' complement arithmetic for use in address manipulations. The integer conversion is exact. Special displays indicate indefinite and infinite numbers. **Necessary Accessories for HP-41:** None

Steps: 203 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00983-41-7	$10	$12
FOR HP-71*	00983-71-4	N/A	$14

00984 Crout Reduction Subroutine

by H.J. Albert, Bettendorf, IA

This subroutine can solve the problem ax=b when no column or row interchanges are required. Up to a 4x4 problem can be solved with a 41C and a 16x16 problem with the equivalent of four memory modules. As a subroutine, no I/O routines are provided. **Necessary Accessories for HP-41:** None

Steps: 162 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00984-41-5	$10	$12
FOR HP-71*	00984-71-2	N/A	$14

00985 "4-5-6" (Dice Game)

by R.S. Altman, Clearlake, CA

This program simulates the play of "4-5-6", a dice game that allows one player to act as banker and the others to place even-money bets on their throws of three dice. A natural may win, but craps always loses! Full use is made of the HP-41C's flags and alpha-numeric capabilities. Up to 5 people may play. **Necessary Accessories for HP-41:** None

Steps: 338 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00985-41-2	$10	$13
FOR HP-71*	00985-71-9	N/A	$14

00987 Telephone Bill

by B. Barclay, Tempe, AZ

This program divides the telephone bill according to how many roommates there are. Keeps a running account of the bills for the year. Writes it out neatly. Compares the bill to the previous month, keeps track of average cost. **Necessary Accessories for HP-41:** None

Steps: 419 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00987-41-8	$10	$17
FOR HP-71*	00987-71-5	N/A	$20

00988 Chi-Square for Up to 100 Cells

by D. Bednall, Mitcham Victoria, Australia

Two-way chi-square analysis for up to 100 cells. Reads data in a single pass without the need to input marginal totals. Yate's correction can be optioned. Incorporates routine to correct input errors. **Necessary Accessories for HP-41:** None

Steps: 400 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00988-41-6	$10	$14
FOR HP-71*	00988-71-3	N/A	$16

00990 Insertion Sorting Routines

by R. Chandler, Raleigh, NC

This package contains two insertion sorting routines, each designed to function either as a stand-alone program or as a subroutine in a user program. A single control number in the x-register determines the set of contiguous data registers which are to be sorted. **Necessary Accessories for HP-41:** None

Steps: 33 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00990-41-2	$10	$11
FOR HP-71*	00990-71-9	N/A	$12

00991 Linear Standard Error

by L. Craven, Pensacola, FL

This program is used in conjunction with program sigma lin of the HP 41C Stat Pac to calculate the standard error of the slope and standard errors of estimated points. The standard errors can be transformed to confidence intervals (error bars) with tabulated values of student's 't'. **Necessary Accessories for HP-41:** None

Steps: 85 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00991-41-0	$10	$11
FOR HP-71*	00991-71-7	N/A	$12

00992 Growth & Yield Est. for Young-Growth Conifers in N. Calif.

by T.J. Feller, Grass Valley, CA

This program calculates growth and yield data for seven conifers in northern California. Program also expands data to per acre values. All volumes are in cubic feet. **Necessary Accessories for HP-41:** None

Steps: 377 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00992-41-8	$10	$14
FOR HP-71*	00992-71-5	N/A	$16

00993 Dose Conversion Factors for GI Tract and Noble Gases to Lung

by J.W. Ferman, Minneapolis, MN

Program estimates radiological dose to lower large intestine from ingested or inhaled radionuclides and by noble gases to lung. USNRC GI tract clearance and lung capacity parameters are internally contained. Program prompts for input data as needed. **Necessary Accessories for HP-41:** None

Steps: 88 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00993-41-6	$10	$11
FOR HP-71*	00993-71-3	N/A	$12

00994 Word Search Puzzle Generator

by D.J. Geddes, Appleton, WI

This program generates word search puzzles and prints them out for solution by the user. Within a puzzle's grid of letters, words may be found oriented vertically, horizontally, or diagonnally, either forward or reversed in direction. The only user inputs are a random seed and desired grid size. **Necessary Accessories for HP-41:** None

Steps: 127 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00994-41-4	$10	$12
FOR HP-71*	00994-71-1	N/A	$14

00995 Traverse, Inverse, Sideshots, Area and Intersections

by W.A. Gille, Sheridan, OR
D.E. Linscheid, Sheridan, OR

Travplus performs the following survey calculations: traverse, by either az./brg. or field angle input; inverse; sideshots; area; bearing-bearing intersections and bearing-distance intersections as well as automatic compass adjustment of a polygon. Define and print point routines allow user to assign, record and print up to 93 coordinate pairs according to arbitrary point numbers. **Necessary Accessories for HP-41:** Quad Memory Module and Printer

Steps: 377 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00995-41-1	$10	$14
FOR HP-71*	00995-71-8	N/A	$16

00996 Comparator Error Analysis for Successive Approx A/D Circuits

by D.L. Gillooly, Los Gatos, CA

The voltage comparator error contribution in a analog-to-digital converter based on the successive approximation circuit technique is computed. comparator offset voltage, input current and gain error terms are computed in terms of system least significant bits (lsb) to yield a worst case and root-mean square error total. **Necessary Accessories for HP-41:** None

Steps: 138 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00996-41-9	$10	$12
FOR HP-71*	00996-71-6	N/A	$14

00997 Bulk Density for Two Propellants

by J.F. Glass, Sherman Oaks, CA

Provides interchangeable solutions for bulk density, mixture ratio (oxidizer-to-fuel), fuel density, and oxidizer density. Calculates unknown quantity given any three of the quantities. **Necessary Accessories for HP-41:** None

Steps: 188 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00997-41-7	$10	$12
FOR HP-71*	00997-71-4	N/A	$14

00999 Determination of Whole Serum Complement Activity (CH50)

by G. Goodman, Stamford, CT

Measurement of whole serum hemolytic complement is a widely used immunological parameter useful in the diagnosis of certain diseases and in the quantitation of antigen-antibody interactions. This program computes the complement activity in terms of conventional ch50 units. **Necessary Accessories for HP-41:** None

Steps: 165 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	00999-41-3	$10	$14
FOR HP-71*	00999-71-0	N/A	$16

01002 Transpose Music

by P. Holowka, Centerville, OH

This program solves the large problem of transposing music from one key to another. **Necessary Accessories for HP-41:** None

Steps: 106 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01002-41-5	$10	$11
FOR HP-71*	01002-71-2	N/A	$12

01004 Geometric Progressions

by R.M. Kozel, Garfield Heights, OH

Given any three or four of the following of a geometric progression, the program will calculate the remaining values: first term, common ration, number of terms, last term, and sum of the terms. The program also uses part of program 04367D (by Kiyoshi Akima) to solve the difficult combination of a, n,s. **Necessary Accessories for HP-41:** None

Steps: 551 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01004-41-1	$10	$15
FOR HP-71*	01004-71-8	N/A	$18

01006 Interest Checking Verification with Daily Compounding

by R.K. McDonald, Milpitas, CA

Fully prompted-chained xeq. with illegal entry protection for date and entry omission guards. Enter interest rate, date and dollar amount of deposit or withdrawal as prompted and you see n of days flashed followed by the balance then automatically returned for next date entry. The balance, n, t.n, interest paid and t.i paid are displayed upon request any time. Delete last transaction available. Based on 365 daily compounding. **Necessary Accessories for HP-41:** None

Steps: 247 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01006-41-6	$10	$13
FOR HP-71*	01006-71-3	N/A	$14

01007 Tabulator Chain Prompted Improved (Revision A)

by R.K. McDonald, Milpitas, CA

Improved tabulator based on 00179C with clean prompts and output titles. Now upon completion of all entries you are prompted to use (R/S) for display of the grand total (Tot=), the % row and column data is labeled R%1.= and C%1.= etc., and after every data entry you may view the last input with correction key. **Necessary Accessories for HP-41:** May Require Modules Depending on the Number of R&C's.

Steps: 132 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01007-41-4	$10	$12
FOR HP-71*	01007-71-1	N/A	$14

01009 Beam with Varying Moment of Inertia. Stiffness, Fem, Cof

by J.W. Moll, Springfield, IL

For a beam of any variation of moment of inertia and any loading, program computes stiffness, fixed-end moments and carry over factors. **Necessary Accessories for HP-41:** None

Steps: 237 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01009-41-0	$10	$12
FOR HP-71*	01009-71-7	N/A	$14

01010 Precession of Rt Ascension and Declination

by M. O'Brine, Orange, CA

Program calculates the right ascension and declination of an astronomical object at any selected epoch, given the object's position at a known initial epoch. Output is displayed in hours/degrees, minutes, seconds format. **Necessary Accessories for HP-41:** None

Steps: 262 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01010-41-8	$10	$13
FOR HP-71*	01010-71-5	N/A	$14

01011 Thermodynamic Properties of a Substance from Critical Data

by J.A. Pita, Quito, Ecuador

Given critical data; pc, tc, vc, zc, an equation for heat capacity and p, t,h, s, data for a reference state, program finds v, h,s data in the vapor phase (sat. or spht.). Further, program uses Watson's correlation for finding latent heats and then calculating h, s, data for saturated liquid. V data for liquid phase are accomplished using Rackett's equation. **Necessary Accessories for HP-41:** None

Steps: 392 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01011-41-6	$10	$14
FOR HP-71*	01011-71-3	N/A	$16

01012 Properties of Hydrocarbons

by N.C. Samish, Houston, TX

Physical properties of hydrocarbons can be predicted using boiling point and specific gravity. Prediction accuracy is reasonable over the boiling range of 100-850 degree f for the following properties: molecular weight, liquid density, liquid molar volume, critical temperature, critical pressure, critical volume, refractive index, heat of vaporization, ideal gas heat capacity and Van Der Waal's constants. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 322 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01012-41-4	$10	$15
FOR HP-71*	01012-71-1	N/A	$18

01013 Mastermind-Short Version

by J.E. Schiermeier, Cary, NC

This program plays the popular game of "Mastermind" with nine colors in four places. The number of black and white pegs are displayed simultaneously. A unique feature prevents more than one white or black peg from referring to the same peg in code or guess. **Necessary Accessories for HP-41:** None

Steps: 131 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01013-41-2	$10	$12
FOR HP-71*	01013-71-9	N/A	$14

01014 Two Language Dictionary

by M.L. Jamaldeen, Jeddah, Saudia Arabia

This program translates words of one language to a second and viceversa. The program incorporates automatic feed-in of words and review of same. Each magnetic card will hold four maximum 12-letter words and eight maximum 6-letter words of the first language and their corresponding translations. **Necessary Accessories for HP-41:** Card Reader necessary if storage of data in cards is desired.

Steps: 102 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01014-41-0	$10	$11
FOR HP-71*	01014-71-7	N/A	$12

01015 Sound System Performance Predictions

by T.G. Bouliane, Buffalo, NY

Employing readily available base date, this program computes the most relevant performance criteria for supplied equipment in a given acoustic space. A technique is used to apply the effects of occupancy to establish the minimum occupancy required to render a marginally performing system effective in an otherwise unsuitable setting. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 595 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01015-41-7	$10	$17
FOR HP-71*	01015-71-4	N/A	$20

01016 Polynomial Factorization

by J.E. Schiermeier, Cary, NC

This program factors polynomials by synthetic division, provided that the coefficient for the first term is prime and there is no more than one factor of degree 2 or higher. The size is set to allow for degree 10 polynomials, but any degree can be factored by changing the size. **Necessary Accessories for HP-41:** None

Steps: 176 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01016-41-5	$10	$12
FOR HP-71*	01016-71-2	N/A	$14

01017 Bicycle Commuter Computer

by D.A. Schmitt, Littleton, CO

Use your HP-41C to determine speed, pedal cadence, gear ratio and estimated time of arrival. Built-in timer establishes an audible cadence or keeps track of trip time. This program gives you many features found on specialized bicycle computers. Works on any 5 to 21 speed derailleur bicycle. **Necessary Accessories for HP-41:** None

Steps: 173 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01017-41-3	$10	$12
FOR HP-71*	01017-71-0	N/A	$14

01018 Network Match

by A. Schneider, Reseda, CA

Program computes component reactances of selected network. For lowpass, highpass, with minimum or selected q. Source and load parallel impedance are inputs to compute one or all networks (l, t, pi) and solutions. Bandpass may be selected by q. Series/parallel impedance conversion is provided. **Necessary Accessories for HP-41:** None

Steps: 226 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01018-41-1	$10	$12
FOR HP-71*	01018-71-8	N/A	$14

01019 Swirl Velocity

by A. Segall, Broomall, PA

This program uses a free vortex system to approximate the swirl velocity on a axial flow turbo-machine. The program starts at the hib radius and automatically proceeds up the blade in the radial direction, displaying the radius and swirl velocity. This program can also calculate the velocity at one specific point. **Necessary Accessories for HP-41:** None

Steps: 103 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01019-41-9	$10	$11
FOR HP-71*	01019-71-6	N/A	$12

01020 Prime Factorization

by P. Siconolfi, Rochester, NY

This program will prime factor any integer 2 less than-equal to n less than 1, 000, 000, 000. The program will display up to 9 prime factors of n. A prime test subroutine is also used which can exist by itself as a separate program. **Necessary Accessories for HP-41:** None

Steps: 149 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01020-41-7	$10	$12
FOR HP-71*	01020-71-4	N/A	$14

01021 Prime Factorization

by L. Thomsen, McGrath, MN

This short program will factor a positive integer into primes. The alphanumeric abilities of the HP-41 display are used to present the factors and their exponents in a readily understandable manner. This program is very useful for finding the GCD and LCM of more than two numbers. **Necessary Accessories for HP-41:** None

Steps: 70 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01021-41-5	$10	$11
FOR HP-71*	01021-71-2	N/A	$12

01022 Space War

by J. Taylor, Ames, IA

This program simulates a battle between spaceships found in various sectors of a 10 element space. Player either fires into a sector in an attempt to destroy the "Vader Rader" ship, or maneuvers to avoid attacking raders. **Necessary Accessories for HP-41:** None

Steps: 193 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01022-41-3	$10	$12
FOR HP-71*	01022-71-0	N/A	$14

01023 Athletic Endurance Equation

by S.E. Taylor, Ames, IO

The endurance equation estimates the time required to run any distance from 1 to 26.2 miles based upon known performance at a single distance. It also provides comparison with "world class" standards and may also be used to compute equivalent requirements for swimming, bicycling, rollerskating, and race walking as alternative exercise. **Necessary Accessories for HP-41:** None

Steps: 243 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01023-41-1	$10	$13
FOR HP-71*	01023-71-8	N/A	$14

01024 Step Test of Aerobic Capacity: U.S. Forest Service Method

by S.E. Taylor, Ames, IO

This program determines aerobic capacity for men and women of all ages according to age, weight and pulse rate following a 5-minute "step" test. The program follows the method used by the U.S. Forest Service to measure physical fitness and to predict ability of men and women to sustain arduous work (such as fire line duty). The program also estimates the distance a subject is capable of "running" during a 15-minute period, based on the ability to take in, transport, and utilize oxygen. **Necessary Accessories for HP-41:** None

Steps: 345 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01024-41-9	$10	$14
FOR HP-71*	01024-71-6	N/A	$16

01025 Pitot Tube Velocity and Volume Conversion from Traverse

by J.E. Wiley, Naperville, IL

This program computes the velocity at each point of a pitot tube traverse as well as the density factor, average velocity, duct area, and volume at actual conditions; all corrected for barometric pressure and air temperature. Program is suitable for any number of traverse points, duct diameter, air temperature, or barometric pressure. **Necessary Accessories for HP-41:** None

Steps: 113 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01025-41-6	$10	$12
FOR HP-71*	01025-71-3	N/A	$14

01026 Binomial Probability Distribution-Unlimited Parameters

by M.A. Wolf, San Diego, CA

This program computes, by binomial probability distribution, probability of x successes, and at most x successes, in n tries, given constant probability p of success on one try. Because of computational method, there is theoretically no limit on n or x. **Necessary Accessories for HP-41:** None

Steps: 110 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01026-41-4	$10	$11
FOR HP-71*	01026-71-1	N/A	$12

01027 Circular Segments and Sectors

by I. Woo, San Francisco, CA

The program determines the complete properties of a circular segment and sector when two parameters are known. Viz. area of segement and arc length; chord and arc length; height of segment and arc length; etc. **Necessary Accessories for HP-41:** None

Steps: 378 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01027-41-2	$10	$13
FOR HP-71*	01027-71-9	N/A	$14

01028 Equilib. Flash-Using Antoines Eq. to Calc. Equil. and Heat

by R.J. Wooley, Midland, MI

Antoine's vapor pressure equation for each component (up to 5) is used to calculate the equilbrium ratio and latent heat for each component. This data is used in the Rachford-Rice equation, solved via a Newton convergence method. Results are: fraction vaporized, combined heat of vaporization, compositions of all streams. **Necessary Accessories for HP-41:** None

Steps: 244 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01028-41-0	$10	$13
FOR HP-71*	01028-71-7	N/A	$14

01029 Strum1/Structural Miscellaneous Programs/One

by C.I. Dinsmore, Seattle, WA

"Strum1" is a combination of 5 structural programs 1.) A.C.I. 318-77 approximate moments 2.) A.C.I. 318-77 rebar development 3.) rigidity of walls and piers 4.) moment magnification factor for concrete columns 5.) earthquake forces and shears using the static method of the 1979 uniform building code. All on seven cards and are user controled, auto exec. **Necessary Accessories for HP-41:** Three Memory Modules. Card Reader and Printer optional.

Steps: 676 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01029-41-8	$10	$17
FOR HP-71*	01029-71-5	N/A	$20

01030 Acid-Base Factors for Blood and Brain Interstitial Fluid

by T. Adams, East Lansing, MI

This program calculates ph, hydrogen ion concentration, carbon dioxide partial pressure and bicarbonate concentration in arterial and venous blood and brain interstitial fluid for mammals at a body temperature of 37 degrees centigrade. These calculations can be made in any order. Once data have been entered for any calculation, they need not be entered again for other calculations requiring the same information. **Necessary Accessories for HP-41:** None

Steps: 699 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01030-41-6	$10	$17
FOR HP-71*	01030-71-3	N/A	$20

01031 Complete Holidays

by N.J. Gordon, Mountain View, CA

After "telling" the calculator the year you want, all holidays: national, Christian and Jewish are read out as requested, in the form most easily understood (i.e. February 18, 1985). In addition, all holidays of any specified year can be displayed (and printed if desired) in approximate chronological order. **Necessary Accessories for HP-41:** None

Steps: 665 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01031-41-4	$10	$20
FOR HP-71*	01031-71-1	N/A	$24

01032 Curve Fit and Plot-Best Fit-Up to 4th Degree Polynomial

by W.W. Steffen, Indianapolis, IN

Uniquely fit best of 4 polynomials up to fourth degree or randomly selects any one curve, including optional adjustment for degrees of freedom. Prints curve parameters, predicts Y hat and plots curve from entered data. Additions, subtractions, or corrections of data may be made before or after curve fitting. **Necessary Accessories for HP-41:** None

Steps: 605 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01032-41-2	$10	$15
FOR HP-71*	01032-71-9	N/A	$18

01033 Bridged Tee Pad and Equalizer Design

by R. Chinn, Redmond, WA

Design, evaluate bridged-tee pads and dip equalizers. Equalizers may be single or stepped (variable) loss similar to Altec 9017, 9013. Evaluate for in and out impedance, actual loss. Resistor values converted to 5% values from calculated values. Error may be plotted. Changes for non printer uses included. **Necessary Accessories for HP-41:** None

Steps: 890 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01033-41-0	$10	$18
FOR HP-71*	01033-71-7	N/A	$22

01034 Analysis of Laboratory Strength Test Data

by J.L. Gilby, Vancouver, Canada

This package is made up of nine interelated programs that deal with the analysis of data obtained from laboratory rock strength tests. Three programs take the Mohr-Coulomb failure criterion to determine angle of friction and cohesion. Three programs deal with non-linear failure analysis of intact or jointed rock. One program developes the Mohr envelope and one tabulates principal stresses. Programs can be run together without re-entry of data. Programs run with or without printer, a neat printout format is used. For those with only 3 memory modules, a shorter program is described. **Necessary Accessories for HP-41:** Three or more Memory Modules

Steps: 857 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01034-41-8	$10	$19
FOR HP-71*	01034-71-5	N/A	$22

01035 Simplified Bishop Analysis for Mohr Coulomb Material

by J.L. Gilby, Vancouver, Canada

This program uses Bishop's simplified method of slices solution for the calculation of the factor of safety of a slope in which failure follows a circular path. The program has a neat printout of the analysis if the 82143A printer is used but is also designed to run without the printer. **Necessary Accessories for HP-41:** None

Steps: 293 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01035-41-5	$10	$13
FOR HP-71*	01035-71-2	N/A	$14

01036 Cardiac Anesthesia Utility

by H. Casson, Portland, OR

The program provides calculation used in cardiovascular anesthesiology. These include all parameters derived from thermodilution pulmonary artery catheter measurement; temperature correction of blood gases; shunt calculation; infusion rates for drugs. The program plots activated clotting time curves and calculates protamine doses. **Necessary Accessories for HP-41:** None

Steps: 833 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01036-41-3	$10	$19
FOR HP-71*	01036-71-0	N/A	$22

01037 RCA 1802 Microprocessor Mnemonic Generator

by R.M. Squires, Albuquerque, NM

Those of you with "Elf" and similar microcomputers can now decode long machine language programs with ease, as this program displays the assembler mnemonics for a given machine code input. The program is fast and simple to use and the input is in convenient hexadecimal format. **Necessary Accessories for HP-41:** One Memory Module

Steps: 196 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01037-41-1	$10	$14
FOR HP-71*	01037-71-8	N/A	$16

01038 Approximate Impeller Design for Centrifugal Pumps

by G.S. Buck, Baton Rouge, LA

Using only flowrate, head, rotational speed and npsha, impeller width, diameter and efficiency are approximated. Specific speed and suction specific speed are also output as intermediate parameters. **Necessary Accessories for HP-41:** None

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01038-41-9	$10	$12
FOR HP-71*	01038-71-6	N/A	$14

01041 Flowpast Immersed Bodies

by R.A. Green, MS State, MS

Given particle diameter, acceleration, fluid density, particle density, and viscosity this program will determine the appropriate settling range and solve for the terminal velocity. If viscosity is not known this program will solve for the viscosity. **Necessary Accessories for HP-41:** None

Steps: 298 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01041-41-3	$10	$13
FOR HP-71*	01041-71-0	N/A	$14

01042 Find Focal Length & Sets Camera Settings for Fixed Image

by R.K. McDonald, Milpitas, CA

Find the exact focal length from two known lens setting and reductions for subsequent computing of any other reduction desired, lens and object (copy board) settings. Program designed for fixed image plane industrial process cameras and has full prompts and labels. Lens and object to reading location delta accounted for in calculation. **Necessary Accessories for HP-41:** None

Steps: 127 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01042-41-1	$10	$11
FOR HP-71*	01042-71-8	N/A	$12

01043 Positions of the Galilean Satellites of Jupiter

by M. O'Brine, Orange, CA

Program calculates and displays the positions of the Galilean satellites of Jupiter at a selected date and time. Positions can also be plotted over a selected time period. The position of each satellite is plotted using a unique symbol. **Necessary Accessories for HP-41:** None

Steps: 394 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01043-41-9	$10	$15
FOR HP-71*	01043-71-6	N/A	$18

01044 Superbeam

by S. Dusterwald, Las Vegas, NV

Calculates reactions, shear and bending moment at any point, locates points of zero shear, plots shear and bending moment diagrams for any beam with two reactions, cantilever spans at ends if desired. Addressing routine packs all load data into lowest numbered registers maximizing register usage. Up to 22 point loads or moments, or 11 trapezoidal or 15 uniformly distributed loads, or combinations. **Necessary Accessories for HP-41:** Three Memory Modules and Printer

Steps: 666 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01044-41-7	$10	$16
FOR HP-71*	01044-71-4	N/A	$18

01045 Dzip-Shortcut Multicomponent Distillation

by G.L. Whitesell, Denver, CO

Calculates minimum reflux ratio and minimum theoretical stages for a simple distillation column given a material balance and relative volatilities. Also calculates reflux ratio for a trayed column given stages and vice versa. Maximum 10 components. **Necessary Accessories for HP-41:** None

Steps: 270 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01045-41-4	$10	$13
FOR HP-71*	01045-71-1	N/A	$14

01046 Wind Triangle

by C.E. Bravo, Gainesville, FL

This program solves the wind triangle for the "dead reckoning" problem of aircraft navigation, takes into consideration the true course, wind direction and velocity, and the true airspeed and outputs the ground speed and true heading. (It will be very useful for those taking the FAA private pilot written exam. **Necessary Accessories for HP-41:** None

Steps: 80 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01046-41-2	$10	$11
FOR HP-71*	01046-71-9	N/A	$12

01047 Truss Joint Stresses

by K.J. DeBord, Kent, WA

Equations of equilibrium are applied to a section taken around a statically-determinant truss joint. Stresses in the truss members are obtained by solving simultaneous equations. The resulting stresses are optionally resolved into x-y components for each member. **Necessary Accessories for HP-41:** None

Steps: 169 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01047-41-0	$10	$12
FOR HP-71*	01047-71-7	N/A	$14

01048 Threading Infeeds-Constant Volume Metal Removal Rates

by T. Ekstedt, Cincinnati, OH

This program calculates the threadng infeeds necessary to single point cut a thread based upon the constant volume theory of metal removal. The program is for 60 degree "v" threads and prompts the user for: English/Metric, pitch, maximum first depth of cut, and maximum number of passes. **Necessary Accessories for HP-41:** None

Steps: 210 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01048-41-8	$10	$12
FOR HP-71*	01048-71-5	N/A	$14

01049 Textural Analysis

by R. Himes, Duncan, OK

This program computes the mean, standard deviation, skewness and kurtosis given the undefined units from a sieve (or pipette) analysis. The program accepts equally spaced phi classes only in calculating the above moment statistics. Output is in phi units. **Necessary Accessories for HP-41:** None

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01049-41-6	$10	$12
FOR HP-71*	01049-71-3	N/A	$14

01050 Vector Operations

by M.D. Holtz, Mexico City, Mexico

This program calculates basic vector operations such as addition, dot or scalar product, cross product, and the angle between two vectors, either in two or three dimensions. You may execute chain calculations whenever the result is a vector. The program is helpful for anybody into physics, mathematics, engineering, etc. **Necessary Accessories for HP-41:** None

Steps: 127 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01050-41-4	$10	$11
FOR HP-71*	01050-71-1	N/A	$12

01051 Decisions Under Risk & Bayes Theorem for Business Types

by E.M. Keefe, Ankeny, IA

When asked "what should we do?" the manager can now answer with more than the whimsical "You should decide!" armed with "MGR" and the 41-C, the manager can answer such questions as... should we hire outside consultants? How much are they really worth? Should I work or goof off today? Does God exist? What's the Dow Jones average been doing this week? Should we drill or take seismic tests? All is answered on the basis of probability theory including Bayes' theorem. Program features fast and easy data entry and correction and complete explanation of everthing. **Necessary Accessories for HP-41:** None

Steps: 429 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01051-41-2	$10	$14
FOR HP-71*	01051-71-9	N/A	$16

01052 Tones and Semi-Tones

by M. Georgin, Paris, France

This program deals with sound waves. You give the HP-41C two frequencies of your choice and it will determine how many semi-tones there are between the two frequencies introduced. You give the HP-41C one frequency and it will tell you the name of the tune that corresponds to this frequency introduced (long live the alphanumeric display!!). **Necessary Accessories for HP-41:** None

Steps: 168 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01052-41-0	$10	$12
FOR HP-71*	01052-71-7	N/A	$14

01053 Specific Heats of Gases at One Atmosphere

by D. Milroy, St. Anthony, MN

This program provides the specific heats of 13 common gases in units of btu/mol and btu/lb when the temperature in degrees rankine or fahrenheit is given. **Necessary Accessories for HP-41:** None

Steps: 252 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01053-41-8	$10	$13
FOR HP-71*	01053-71-5	N/A	$14

01054 Series-Parallel Rlc Transient Response

by R. Muklewicz, Dunellen, NJ

This program calculates the transient response of series and parallel rlc circuits. Given the component values, this program determines the type of damping and calculates all values required for the general equations given. the voltage or current given time, maximum values, setting time, and plots voltage or current. **Necessary Accessories for HP-41:** None

Steps: 573 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01054-41-6	$10	$16
FOR HP-71*	01054-71-3	N/A	$18

01055 Chi-Square for General MxN Contingency Table

by M.E. Newton, Greenville, PA

Calculates chi-square and degrees of freedom for mxn contingency table. Row and column totals, total sample size, and expected value in each cell are also calculated. M and n are bounded by $(m+1)(n+1) <= 64$* number of memory modules in use. The statistics module and card reader are helpful but not necessary accessories. **Necessary Accessories for HP-41:** Statistics Module and Card Reader helpful.

Steps: 233 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01055-41-3	$10	$12
FOR HP-71*	01055-71-0	N/A	$14

01056 Airfoil Coordinate Interpolation

by R.K. Noble, Westminster, CA

This program calculates contour coordinates at a desired location based upon straight line interpolation along element lines between two defined coordinate locations. The program is written as though airfoil contours are described, and the related terminology is used. The program provides for symmetrical or non-symmetrical coordinate data. **Necessary Accessories for HP-41:** None

Steps: 177 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01056-41-1	$10	$12
FOR HP-71*	01056-71-8	N/A	$14

01057 Ph, Equilibrium Chemistry and Buffers

by H.V. Saad, Cofraily Caracus, Venezuela

This program solves problems of ph, equilibrium chemistry and buffers for the following variables: grams, number of moles, molecular weight, molarity, volume and concentration of acid, base and salt. Grade of dissociation, ph, poh, and concentration of polyprotic acid is also treated. **Necessary Accessories for HP-41:** Four memory modules.

Steps: 946 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01057-41-9	$10	$18
FOR HP-71*	01057-71-6	N/A	$22

01058 Equation of Curve Going Through Two, Three, or Four Points

by N.C. Samish, Houston, TX

Fit $y = ax^{**}3 + bx^{**}2 + cx + d$ to four sets of x, y data; or $y = ax^{**}2 + bx + c$ to three sets, or $y = (ax + b)/(cx + 1)$ to three sets, or $y = ax + b$ to two sets. Coefficients a, b, c, d are given and the y is calculated for any x. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 699 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01058-41-7	$10	$16
FOR HP-71*	01058-71-4	N/A	$18

01059 Number Song

by N.C. Samish, Houston, TX

Have music while you work! This program composes pleasant random tunes that you can control by setting flags. You can use any of ten different beats. The program can also be used to test the frequency of digits generated by a random number generator. **Necessary Accessories for HP-41:** None

Steps: 216 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01059-41-5	$10	$12
FOR HP-71*	01059-71-2	N/A	$14

01061 Hex/Bin/Dec Conversion Table

by A. Zawadzki, Troy, MI

Program designed to print a conversion table of all hexadecimal, binary, and decimal numbers from 0 to 255 decimal. (a)key starts printing the table beginning from 0 and (b)key prompts for the decimal number to be converted, or as a starting point for the table. **Necessary Accessories for HP-41:** None

Steps: 142 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01061-41-1	$10	$12
FOR HP-71*	01061-71-8	N/A	$14

01062 Visual Binary Star Orbits

by A.J.P. Maclean, Springwood NSW, Australia

Given the orbital elements of a visual binary star system, this program calculates the separation and position angle of the secondary star relative to the primary. Additional corrections for precession and proper motion can be applied. You may also compute the apparent eccentricity of the orbit. this program is compatible calculations. **Necessary Accessories for HP-41:** One Memory Module. Card Reader and Printer useful.

Steps: 266 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01062-41-9	$10	$12
FOR HP-71*	01062-71-6	N/A	$14

01063 T and F-Distribution

by A.J.P. Maclean, Springwood NSW, Australia

This program calculates percentage points of the f-distribution, q(f/v1, v2) and the t-distribution, q(t/v). The density functions of the f-distribution, f(f/v1, v2), and the t-distribution, f(t/v), can also be calculated. There is a global function calculating t(v/2) using only the stack. The program has been optimized for speed and is conservative in its use of data registers-needing only the stack and 9 data registers. **Necessary Accessories for HP-41:** One Memory Module

Steps: 394 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01063-41-7	$10	$13
FOR HP-71*	01063-71-4	N/A	$14

01064 Extended Unit Management

by J.F. Glass, Sherman Oaks, CA

This program provides sophisticated error detection and additional functions for the "Unit Management System" contained within the HP-41C Thermal & Transport Science Pac. Features include: detection of inhomogeneous unit entries, detection of unknown or improperly spelled unit names, and a user-defined extension list of units. **Necessary Accessories for HP-41:** Regires HP-41CV or equivalent Memory Modules.

Steps: 458 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01064-41-5	$10	$15
FOR HP-71*	01064-71-2	N/A	$18

01065 Romberg Integration

by K. Akima, Boulder, CO

This program uses the full Romberg method to numerically approximate the integral of any user-supplied function. The display setting can be used to determine the accuracy (and the running time). An entry point is provided for use as a subroutine. **Necessary Accessories for HP-41:** None

Steps: 95 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01065-41-2	$10	$11
FOR HP-71*	01065-71-9	N/A	$12

01066 Complete T Test

by K. Akima, Boulder, CO

This program will calculate the t statistic for 1) one sample test for the mean, 2) difference between means with equal variances, 3) difference between means with unequal variances, and 4) paired t statistics. The data may be grouped or ungrouped. The program will also calculate student's t distribution. **Necessary Accessories for HP-41:** One Memory Module. Printer helpful.

Steps: 361 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01066-41-0	$10	$13
FOR HP-71*	01066-71-7	N/A	$14

01067 Algebraic Operating System

by K. Akima, Boulder, CO

This program enables your HP-41 to run under the algebraic operating system (AOS) with full hierarchy, eight pending operations, 99 levels of parentheses, and implied parentheses opening and closure. If you have trouble using an AOS calculator, this program is not for you. **Necessary Accessories for HP-41:** None

Steps: 137 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01067-41-8	$10	$12
FOR HP-71*	01067-71-5	N/A	$14

01069 Bubble Sort

by T.H. Barfield, University, AL

Two 63-line programs are included which sort numerical data. One program sorts data in ascending order and the other sorts in descending order. Both programs use only the operational stack for computation and both can sort data from any starting register address to any ending register address specified by the operator. **Necessary Accessories for HP-41:** None

Steps: 126 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01069-41-4	$10	$11
FOR HP-71*	01069-71-1	N/A	$12

01070 Vacation Trip Planner

by J.W. Braker, Canoga Park, CA

This program provides a very useful tool in the preparation for any lengthy trip, be it a vacation or business trip. It outputs a neatly formatted listing of beginning intermediate, and end points of an itinerary including incremental time and mileage as well as accumulative time and mileage between points. 82143A printer, reader optional, but handy to load program. **Necessary Accessories for HP-41:** One Memory Module

Steps: 223 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01070-41-2	$10	$12
FOR HP-71*	01070-71-9	N/A	$14

01071 Horizon Coordinates

by M.J. Cook, Oshawa, Canada

Rs longitude, latitude, local 24 hour time, and date, this program will calculate the horizon coordinates of any celestial object providing the declination and right ascension of the object is known. Memory registers can be recalled to provide U.T., and local sidereal time. **Necessary Accessories for HP-41:** None

Steps: 164 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01071-41-0	$10	$12
FOR HP-71*	01071-71-7	N/A	$14

01072 Tilted Plane Curb Returns

by J.A. Folkers, Flagstaff, AZ

Program calculates gutter elevations of curb returns such that all points in the gutter lie in a plane which is defined by the grade lines of the two intersecting curbs. This method is superior to a straight grade from P.C. to P.T. due to its aesthetic value and ease of forming. **Necessary Accessories for HP-41:** None

Steps: 165 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01072-41-8	$10	$12
FOR HP-71*	01072-71-5	N/A	$14

01073 Operation Study

by K. Forney, Lake Hayasu, AZ

Calculates standard labor hours from measured data including rating and allowances. Also input confidence limits and determine observations required to satisfy these conditions. From observed data, a production capacity analysis can be computed for a given period. Also a capacity analysis can be developed from other standards. **Necessary Accessories for HP-41:** None

Steps: 88 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01073-41-6	$10	$12
FOR HP-71*	01073-71-3	N/A	$14

01074 Pseudo-Talk for the Speech Handicapped

by H.C. Gernhardt Jr, Princeton, WV

This program enables a speech handicapped individual to communicate, at the press of a single key, with anyone capable of reading. Using the alpha-numeric capabilities of the HP 41C, it assigns basic sentences to various keys on the keyboard. Sentences can be 'stock' or user individualized based upon needs. **Necessary Accessories for HP-41:** One Memory Module. Quad Memory Module would allow more sentences or other use. Card Reader would ease inputting program.

Steps: 123 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01074-41-4	$10	$14
FOR HP-71*	01074-71-1	N/A	$16

01075 Polyhedrons & Prismatoids

by G.M. Halpern MD, Honolulu, HI

This program solves for the following parameters in polyhedrons, given the length of the sides: diagonal e, altitude v, circumradius r, inradius r, dihedral angle (given), surface area s, and volume. In prismatoids, given sides and altitude v & lateral edge h solves for: diagonal e, circumradius r, area of base b, lateral area a surface area s & volume v. **Necessary Accessories for HP-41:** Quad Memory Module, Printer and Card Reader.

Steps: 68 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01075-41-1	$10	$19
FOR HP-71*	01075-71-8	N/A	$22

01076 LJ Adventure

by L.K. Johnson, Kennewick, WA

You've played the Adventure programs on a computer, now you can play them on your HP-41. Each adventure is stored in data memory, and the Support/Interpreter program using this data shows your surroundings, the items there, and the results of your actions. It is the eyes, ears, and hands of your character. This package contains the Support/Interpreter program, with documentation on how the program works, and how to write your own adventures (which I invite you to submit) and the adventure LJADV "Terrorist Dam #1". **Necessary Accessories for HP-41:** Three Memory Modules or a Quad Memory Module and a Card Reader.

Steps: 553 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01076-41-9	$10	$24
FOR HP-71*	01076-71-6	N/A	$30

01077 Pitch to Frequency

by R. Katz, New York, NY

This program takes an alphabetic pitch and numerical octave from the user and converts it to a frequency in hertz, based on the equal-scale. The answer which is displayed is completely unambiguous: it shows the frequency in hertz, the note (sharp, flat or natural) and the octave. **Necessary Accessories for HP-41:** None

Steps: 104 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01077-41-7	$10	$12
FOR HP-71*	01077-71-4	N/A	$14

01078 Transmission Line Sags, Weight Spans and Related Calculation

by G. Mathewson, Glendale Hts., IL

This program uses exact catenary equations to find conductor tensions, sags, weight spans, pull-off angles, and relative or absolute conductor elevations. Input required (English or Metric units) is conductor tension or sag, conductor weight per foot, elevation of attachment points, and distance between attachment points. **Necessary Accessories for HP-41:** One Memory Module

Steps: 244 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01078-41-5	$10	$12
FOR HP-71*	01078-71-2	N/A	$14

01079 Minimum Clearance Between Two Aerial Conductors

by G. Mathewson, Glendale Hts., IL

This program finds the minimum clearance between two aerial conductors in a given span or at a specified point in that span using exact catenary equations. It is especially useful for short spans having steep slopes. typical use is for conductor vertical to horizontal rolls and crossing clearances. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 474 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01079-41-3	$10	$14
FOR HP-71*	01079-71-0	N/A	$16

01080 Inverse Laplace Transform Solutions of Differential Equation

by J. Medina, Orlando, FL

This program solves a variety of problems involving linear time-invariant differential equations up to 91 or higher order. The ability to evaluate F(S) for any S could be used to help find roots, aid in root locus plots, plot frequency response, etc. This program is easy to use and understand, especially with the prompting provided for coefficient entry and the ease of obtaining the residues or function of time components. **Necessary Accessories for HP-41:** One Memory Module

Steps: 236 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01080-41-1	$10	$13
FOR HP-71*	01080-71-8	N/A	$14

01081 Piles Under Rigid Block

by P.d.S. Mourao, Belo Horizonte, Brasil

Determines piles reactions where a pile cluster supports a concrete rigid block that is subject to a generalized loading, i.e. 3 component forces rx ry rz and 3 component moments mx my mz. **Necessary Accessories for HP-41:** One Memory Module

Steps: 161 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01081-41-9	$10	$12
FOR HP-71*	01081-71-6	N/A	$14

01082 Solution of Tridiagonal Systems

by G.L. Olson, Boulder, CO

System of n equations in the form of a tridiagonal matrix are solved. This routine can be used as a main program or as a subroutine. Required number of memory modules = int((2n-28)/64). **Necessary Accessories for HP-41:** Number of Memory Modules=Int((2n-28)/64)

Steps: 140 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01082-41-7	$10	$12
FOR HP-71*	01082-71-4	N/A	$14

01083 Stationing

by G. Pegan, Garden Grove, CA

This program will calculate and print the stationing points for a straight line or a curve line. Also, given the proper curve information the (highside) outside and (lowside) inside curve distances can be calculated from centertine stationing or the reverse is true. **Necessary Accessories for HP-41:** One Memory Module

Steps: 141 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01083-41-5	$10	$12
FOR HP-71*	01083-71-2	N/A	$14

01084 Chebyshev Polynomial Curve Fit

by R.M. Rhodes, Sunnyvale, CA

Performs Chebyshev polynomial curve fit on a set of data, y1, y2, . . yn sampled at a uniform sampling rate in x. Polynomial fit order may be 2 to x. The program consists of two routines which may be overlaid or executed as subroutine and main program. Program uses recursive techniques and execution time is order dependent. **Necessary Accessories for HP-41:** At least two Memory Modules

Steps: 650 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01084-41-3	$10	$15
FOR HP-71*	01084-71-0	N/A	$18

01085 Smooth Earth Diffraction

by J.L. Roth, Newbury Park, CA

The Smooth Earth Diffraction (SED) program predicts the radio propagation loss relative to free space for smooth earth conditions or conditions of uniform roughness, of a path slightly beyond the radio horizon. This program uses a simplified method, developed by Vogler (1964), for the Standard Van Der Pol-Bremmer Diffraction Theory, as modified by Norton (1941). The program has a self check for validity. **Necessary Accessories for HP-41:** Two Memory Modules and data on Effective Earth Radius; (Extended Function Module is desirable)

Steps: 356 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01085-41-0	$10	$16
FOR HP-71*	01085-71-7	N/A	$18

01086 Binomial Expansion

by J.E. Schiermeier, Cary, NC

This program expands binomials of the (ax+by)**n type and includes the exponents of x in the display. The only limit on n is the number of free registers. **Necessary Accessories for HP-41:** None

Steps: 94 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01086-41-8	$10	$11
FOR HP-71*	01086-71-5	N/A	$12

01087 Base Conversions

by J.E. Schiermeier, Cary, NC

This program converts to and from any base b, 2<=b<=10. **Necessary Accessories for HP-41:** None

Steps: 111 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01087-41-6	$10	$11
FOR HP-71*	01087-71-3	N/A	$12

01088 Football

by J.E. Schiermeier, Cary, NC

You play a game of Football against the calculator. There are six plays to choose from. No other equipment is necessary - the calculator keeps track of and displays all information. The length of the game is controlled by the number of plays you allot at the beginning. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 494 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01088-41-4	$10	$16
FOR HP-71*	01088-71-1	N/A	$18

01089 Viscosity

by N.C. Shammas, Richmond, VA

A package of 4 programs: program 1-calculates low-pressure gas viscosity for polar and non-polar. In each case a second method for estimating the parameters is supplied. Program 2-calculates viscosity of polar and non-polar gases at high pressure. Program 3-uses the Orrick and Erbar Method to estimate liquid viscosity. Program 4-deals with liquid viscosities using Thomas' method. Data are part of programs. **Necessary Accessories for HP-41:** One Memory Module

Steps: 152 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01089-41-2	$10	$17
FOR HP-71*	01089-71-9	N/A	$20

01091 Fertilizer Least Cost Blending

by S.E. Taylor, Ames, IO

This program provides lease cost blending of up to six fertilizer materials for three variants. The output includes the pounds of each material needed to formulate a desired blend, the cost per acre, and the actual amount of each nutrient if composition is utilized. The program is based on Esterhuizen "Simplex" (#00320C) with appropriate input-output modifications. **Necessary Accessories for HP-41:** Two Memory Modules. Printer optional.

Steps: 497 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01091-41-8	$10	$14
FOR HP-71*	01091-71-5	N/A	$16

01093 Label Storage

by J. Wickenberg, Molndal, Sweden

This program makes it possible to store and recall numbers by alphanumerical labels instead of ordinary two digit numbers. This is very useful during complex calculations. It's very annoying to realize after 20 minutes of artful calculation that you've forgotten in which register you stored what. With this program you name your number, press STO "Name", and when you need it, simply RCL "Name". The program also includes a function for changing already stored numbers, XCH, and calculates the number of accessible registers. Size 2n+7. **Necessary Accessories for HP-41:** None

Steps: 144 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01093-41-4	$10	$12
FOR HP-71*	01093-71-1	N/A	$14

01095 Bearing Frequencies

by J.C.I. Morehead, Ambridge, PA

This program calculates the vibration frequencies typically generated by rolling element bearings. It is applicable to Timken Bearing Data as well as ball and needle bearings. Many frequencies calculated may not be observed in a vibration signature. The program is for a rotating shaft and stationary housing. **Necessary Accessories for HP-41:** Printer

Steps: 290 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01095-41-9	$10	$14
FOR HP-71*	01095-71-6	N/A	$16

01098 Solution to Simultaneous Equations with Complex Variable

by R.D. Carey, Cleveland, OH

This program solves a system of simultaneous equations with complex variables, using Gaussian reduction. A fully enhanced HP-41C will be able to solve up to 10 equations. Routines for data entry and recall are included, as well as printout routines if a printer is connected to the system. **Necessary Accessories for HP-41:** One Memory Module for up to 3 equations.

Steps: 326 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01098-41-3	$10	$13
FOR HP-71*	01098-71-0	N/A	$14

01099 Combustion Calculations

by N.S. Charles, Houston, TX

Determine the efficiency of a boiler, the heat rate, the heat released, the air used, the flue gas composition, molecular weight and heat capacity, the SO2 produced, the NOX produced, and other information. Required input is fuel composition, stack gas temperature, excess air for combustion, and boiler power produced. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 523 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01099-41-1	$10	$16
FOR HP-71*	01099-71-8	N/A	$18

01101 ASTM-TBP Distillation

by J.A. Glassett, Texas City, TX

This program converts an Atmospheric ASTM Distillation (D-158) to a TBP Distillation. A procedure similar to that found in the API data book is used with a revised Edmister correlation for 50% temperature. I/O in degrees F. **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 199 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01101-41-5	$10	$13
FOR HP-71*	01101-71-2	N/A	$14

01102 Macro-Economic Model

by C. Goldman, London, England

Player guides the model economy by setting values for five important economic variables. Program outputs 14 other variables and the player's performance is measured at the end of each period by a popularity rating. Model illustrates basic principles of Macro-Economic theory and provides example which can be adjusted, modified or replaced. **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 261 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01102-41-3	$10	$13
FOR HP-71*	01102-71-0	N/A	$14

01103 Compound Interest Tables

by R.A. Green, MS State, MS

This program is for those people who like to or must use interest tables but hate to search through pages of factors. By giving the calculator the interest rate and number of periods it will calculate the factors for F/P (future value given present value), P/F, A/F, A/P, F/A, P/A, A/G, and P/G. **Necessary Accessories for HP-41:** None

Steps: 102 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01103-41-1	$10	$11
FOR HP-71*	01103-71-8	N/A	$12

01104 Cylinders & Cones

by G.M. Halpern MD, Honolulu, HI

This program, given certain parameters, solves volume, surface area, lateral area, area of bases, etc of cylinders, cones, torus & barrels. The formulas are standard, but this program makes full use of the alpha-numeric capabilities of the 41C. Also the subroutines, called by numeric labels, are used to save space. The numeric labels save bytes. **Necessary Accessories for HP-41:** HP-41CV or Quad Memory Module, Card Reader and Printer

Steps: 712 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01104-41-9	$10	$20
FOR HP-71*	01104-71-6	N/A	$24

01105 General Linear Programme, with Reduced Costs

by T.D. Hobson, London, England

This program uses the Tucker-Beale Contracted Tableau Formulation of the linear programme. The optimum solution, and the reduced costs of variables not in the solution, are calculated and displayed. Validation checks are carried out on the constraints input, and the constraint set is tested for infeasibility and unboundedness. If necessary the program will carry out, automatically, a complete phase I and phase II infeasibility form calculation on the initial problem. The size of the largest problem which can be solved is determined only by the availability of data storage. Although powerful this program is easy to use. **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 499 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01105-41-6	$10	$15
FOR HP-71*	01105-71-3	N/A	$18

01106 Determination of Pressure Buildup from Injection

by T.A. Jones, Houston, TX

Areas such as waterflooding, saltwater injection, in-situ mining and waste disposal wells need to predict reservoir pressures in order to design injection systems. This program can predict the rate of pressure buildup at variable radii resulting from constant or variable injection from single or multiple wells. **Necessary Accessories for HP-41:** One Memory Module

Steps: 201 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01106-41-4	$10	$13
FOR HP-71*	01106-71-1	N/A	$14

01107 Spiral

by J. Knepper, Green Bay, WI

This program will generate the information required to properly layout a spiral evenly within a given diameter. It was written as as aide in laying out spiral coils for the bottom of storage tanks. **Necessary Accessories for HP-41:** None

Steps: 130 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01107-41-2	$10	$12
FOR HP-71*	01107-71-9	N/A	$14

01109 Log-Normal Distribution Percentiles

by A. Leyenberger, Whippany, NJ

Given a mean and standard deviation of a set of data, this program will calculate the log-normal distribution percentile value of any percentile (Pth percentile) requested. The Skewness and Kurtosis of the log-normal distribution will also be calculated for the sample. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 212 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01109-41-8	$10	$12
FOR HP-71*	01109-71-5	N/A	$14

01110 Truck Weight Distribution

by E. McGehee, Jackson, MS

This program is useful in matching truck chassis specifications with body and payload requirements. A maximum of three loads may be entered. The program calculates the distribution of all loads to the front and rear axles and estimates the optimum wheel base for the loaded truck chassis. **Necessary Accessories for HP-41:** One Memory Module. Printer desirable.

Steps: 160 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01110-41-6	$10	$12
FOR HP-71*	01110-71-3	N/A	$14

01111 Pipe Spillway Rating

by L.E. Peterson, Nashville, TN

Service spillways often consist of a riser and a pipe. When the pipe fills the driving head is the difference between the reservoir water surface and the hydraulic grade line at the exit. This program solves for either the discharge or the reservoir water surface elevation. SCS guidelines for loss coefficients are included in documentation. **Necessary Accessories for HP-41:** None

Steps: 102 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01111-41-4	$10	$11
FOR HP-71*	01111-71-1	N/A	$12

01112 Economic Pipe Diameter for Turbulent Flow

by J.A. Pita, Quito, Ecuador

This program finds the economic pipe diameter for turbulent flow of Newtonian fluids in schedule 40 steel pipe, based on an equation which uses the concept of return on incremental investment. Conventional calculations were made with a chart given by Perry's Chemical Engineers' Handbook but the use of the calculator gives far more accuracy. **Necessary Accessories for HP-41:** None

Steps: 138 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01112-41-2	$10	$12
FOR HP-71*	01112-71-9	N/A	$14

01113 Bar Graph

by C.R. Pohl, Pittsburgh, PA

This program constructs a y axis and graphically represents data as non-contiguous bars that can be individually labeled. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 270 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01113-41-0	$10	$12
FOR HP-71*	01113-71-7	N/A	$14

01114 Safety-Valve Steam-Flow Capacity

by M.L. Ramsey, Abilene, TX

Given the diameter, lift and discharge coefficient of the valve, the saturated steam pressure and the superheat temperature above saturation temperature if the steam is superheated. The program outputs the area of the valve annulus, ideal flow through the valve and the actual flow through the valve. Program prompts for data and uses alphanumeric capability for output display. **Necessary Accessories for HP-41:** None

Steps: 80 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01114-41-8	$10	$11
FOR HP-71*	01114-71-5	N/A	$12

01115 Microcalc

by J.C. Kerns, Dayton, OH

At last, the electronic worksheet for the HP-41C! Yes Microcalc is the starting program that enables you to be a match to microcomputer users. You can ask "what if" questions and recalculate your worksheet. Microcalc can even be an electronic memo!! Yes you can store dates and appointments. Microcalc is a must for everyone that wants a program that grows with his needs. **Necessary Accessories for HP-41:** None

Steps: 106 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01115-41-5	$10	$11
FOR HP-71*	01115-71-2	N/A	$12

01116 Mann-Whitney Statistic

by J.M.J. Van Lis, Antilles, Netherlands

This program calculates fully automatically the Mann-Whitney statistic on two independent samples of equal and unequal sizes. In contrast to a similar, already existing program (No.00094C), this program itself assigns the ranks of all values from both samples. Error corrector for erroneous input data is provided. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 300 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01116-41-3	$10	$13
FOR HP-71*	01116-71-0	N/A	$14

01117 Running

by D.A. Weikel, San Meteo, CA

This program consists of three separate subprograms useful to runners. Oxyint - estimates the oxygen intake of an individual, which is a gauge of minimum standard for everyday fitness. Pindix - calculates ponderal index and % body fat of an individual. Maratan - estimates the required time to complete a marathon given certain known variables. **Necessary Accessories for HP-41:** None

Steps: 330 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01117-41-1	$10	$14
FOR HP-71*	01117-71-8	N/A	$16

01118 Foreign and Bullion Gold Coin Analysis for Investor/Dealer

by L.N.I. Brandon, Corpus Christi, TX

This program, following "Numismatic News" market format, computes and lists bullion value, buy & sell prices, % buy and % sell for any gold spot price/oz. A coin data table is used and can be changed or updated with built-in program table routines by the user. **Necessary Accessories for HP-41:** Quad Memory Module, Card Reader and Printer.

Steps: 395 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01118-41-9	$10	$21
FOR HP-71*	01118-71-6	N/A	$26

01119 Lamsecon: Local Authority Maintenance and Services Economics

by P.B. Taylor, Launceston Tasmania, Australia

This is a special set of eight programmes for budgeting and cost control of routine expenditures occurring throughout the fiscal year. Although developed for local government maintenance and service activities, the programmes can be used for, or adapted to, any situation in which expenditures tend towards generally predictable patterns from year to year. All programmes are self-prompting and produce compact, easy-to-read print-outs of the relevant data. **Necessary Accessories for HP-41:** Quad Memory or HP-41CV and Card Reader

Steps: 1272 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01119-41-7	$10	$18
FOR HP-71*	01119-71-4	N/A	$22

01120 Architectural Perspective

by D.R. Tindall, Minneapolis, MN

Program calculates 2-point perspective views. Data may be input directly, or up to 239 data points may be stored in memory and/or written on magnetic cards. Data is grid-based; input and output grids may be dissimilar. Heights may be input as grid values or as elevations (in feet or meters). **Necessary Accessories for HP-41:** One Memory Module. Card Reader optional.

Steps: 269 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01120-41-5	$10	$13
FOR HP-71*	01120-71-2	N/A	$14

01121 Wind Chill Warnings

by M.E. Anderson, Berwyn, IL

Program compiles wind chill temperature (Centigrade or Fahrenheit) from given ambient air temperature (Centigrade or Fahrenheit) and given wind velocity (kilometers or miles per hour). The program displays or prints out the inputs, the wind chill temperature, and information relevant to your physical well being and the advisability of open travel. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 244 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01121-41-3	$10	$13
FOR HP-71*	01121-71-0	N/A	$14

01122 Column Loads - S.I. and Imperial Units

by F. Anrep, Toronto, Canada

Program prompts for the level number, area, dead loading, live loading, and extra dead load. Live loads are reduced with one of two formulas inputs and compute column loads are printed, input for next lower level are prompted -- pressing R/S will repeat value of previous level. Output is complete, self contained. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 190 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01122-41-1	$10	$16
FOR HP-71*	01122-71-8	N/A	$18

01123 LSD Steel Beams S.I. and Imperial

by F. Anrep, Toronto, Canada

Limit states design of steel beams subjected to one of 5 loading types. Live and dead loads are kept separate. Required I is calculated based on greater of live load or total load deflection limits which are set by the user. Output is complete and self contained. **Necessary Accessories for HP-41:** Two Memory Modules and Printer

Steps: 427 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01123-41-9	$10	$19
FOR HP-71*	01123-71-6	N/A	$22

01124 Decision

by L.W. Busack, Monaca, PA

Program sets up and solves a decision matrix. Up to 9 separate options can be evaluated against any number of criteria to select the best option. The method breaks up any large decision into a series of small decisions. A printer is not used. **Necessary Accessories for HP-41:** None

Steps: 189 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01124-41-7	$10	$12
FOR HP-71*	01124-71-4	N/A	$14

01126 Real Estate Investment Analysis After-Tax Cash Flows & IRR%

by C.W.I. Cato, Memphis, TN

Given purchase price, rent, tax bracket, mortgage terms - up to two mortgages, appreciation, holding period, etc., program produces before and after tax income for each year, sales proceeds net of capital gains taxes and depreciation recapture, and the after tax internal rate of return. **Necessary Accessories for HP-41:** Two Memory Modules. Card Reader and Printer helpful. Finance Pac or Standard Application Pac.

Steps: 394 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01126-41-2	$10	$14
FOR HP-71*	01126-71-9	N/A	$16

01127 Elev on VC or Tangent in Super Transition at Pts or Interval

by J.R. Cook, West Palm Beach, FL

Given in and out grades, LVC, PI station and elevation, program calculates and stores curve properties for future calculations. Optional super transition requires cross-slopes and stations at two locations plus an offset dimension to function. Additional user options include storing and printing elevations plus choice of auto-interval or isolated point calculations. **Necessary Accessories for HP-41:** One Memory Module

Steps: 235 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01127-41-0	$10	$12
FOR HP-71*	01127-71-7	N/A	$14

01128 Budget Shopper

by R. Cox, Cedar City, UT

This program is for the budget conscious shopper, it prompts for, then sequentially stores a shopping list. At the store it prompts the shopper, accepts quantity and price information on each item and displays a running sum of purchases. Back at home, the printer prints an itemized list of purchases. **Necessary Accessories for HP-41:** One Memory Module or more and Printer.

Steps: 185 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01128-41-8	$10	$12
FOR HP-71*	01128-71-5	N/A	$14

01129 Color Science Tristimulus Integration

by T.S. Cox, Easley, SC

Given reflectance values at 20 nanometer increments from 400 to 700 nanometers, calculates the CIE tristimulus values x, y, and z. From these values the chromaticity coordinates (sometimes called the trichromatic coefficients) are calculated. After calculating x, y, and z, the munsell value functions vx, vy, and vz are calculated. **Necessary Accessories for HP-41:** Two Memory Modules, Card Reader (for fast entry of required numerical data) and Printer

Steps: 289 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01129-41-6	$10	$15
FOR HP-71*	01129-71-3	N/A	$18

01130 Wood Design

by J.A. Crandall, Red Bluff, CA

This program can solve a variety of problems involving a simply supported wood (or other homogeneous material) beam under a uniform load. Calculations include determining horizontal shear, flexural stress and deflection, or when allowable values of the preceding are known, the program can calculate the minimum beam depth for a given width, maximum span length, or maximum uniform load. **Necessary Accessories for HP-41:** One Memory Module

Steps: 332 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01130-41-4	$10	$13
FOR HP-71*	01130-71-1	N/A	$14

01131 Bioplotter

by C. Erickson, Pullman, WA

This program plots a given Person's biorhythms using a three variable simultaneous plotting routine. Input is straightforward and output is both pleasing and an excellent example of the flexibility of the HP-41C system. Unlike other multiple variable plotting routines, this one will print a line every 4-6 seconds. **Necessary Accessories for HP-41:** One Memory Module

Steps: 310 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01131-41-2	$10	$13
FOR HP-71*	01131-71-9	N/A	$14

01132 Field Book Data for Centerline and Curb Offset Staking

by J.A. Folkers, Flagstaff, AZ

Program is designed to calculate deflection angles and short chords for three concentric circular curves, the central curve being centerline, the other two curves being two foot offset lines to back of curb. Data is generated in a format allowing easy entry in a field book. Full use of alphanumerics is made. **Necessary Accessories for HP-41:** None

Steps: 184 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01132-41-0	$10	$12
FOR HP-71*	01132-71-7	N/A	$14

01133 Graph Preparation

by R.A. Green, MS State, MS

This program is useful in preparing graphs. Numbers are generated which are used to label the axis. The user is then prompted for x and y values which are converted to ordered pairs representing graph coordinates. These coordinates can then be plotted. **Necessary Accessories for HP-41:** Printer useful

Steps: 134 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01133-41-8	$10	$12
FOR HP-71*	01133-71-5	N/A	$14

01134 Recordkeeping and Analysis System for Investments

by J.R. Herzfeld, Mercer Island, WA

Program system maintains investments record including user convenience information. Permits segmenting larger portfolios. Output options: Printer or display; portfolio totals only or also data for each item; cost or value. Value mode shows short- or long-term appreciation for each item and entire portfolio. Information easily updated. **Necessary Accessories for HP-41:** Card Reader and Printer

Steps: 192 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01134-41-6	$10	$17
FOR HP-71*	01134-71-3	N/A	$20

01137 Maximum Entropy Priors for Bayes' Theorem

by E.M. Keefe, Ankeny, IA

This program will allow the user to overcome one of the serious objections to Bayesian Statistical Decision Theory. With some Calculus, some Algebra and the Program Mgr3 contained herein, the user will be able to generate probability estimates for an event that both encode all that the user knows about the event while, at the same time, remain unprejudiced about whatever is unknown. (Maximum-entropy, prior, conditional probabilities). **Necessary Accessories for HP-41:** None

Steps: 125 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01137-41-9	$10	$11
FOR HP-71*	01137-71-6	N/A	$12

01138 Accounts Receivable

by W.M. Kiteley, Boulder, CO

Program accumulates accounts receivable into data registers by invoice. It sums both yearly invoices and unpaid invoices. Paid invoices are removed from the data registers and deducted from the unpaid balance. It will also display or print sums and invoices. **Necessary Accessories for HP-41:** One Memory Module and Card Reader. Printer optional.

Steps: 169 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01138-41-7	$10	$15
FOR HP-71*	01138-71-4	N/A	$18

01139 Scan Building Special Characters

by B. Kraengel Jr, Valley Stream, NY

This program lets the user build a full 7x7 dot character with the upside down, mirror image or "negative" characters may be created at will, key, card and Wand programs and a 7x7 matrix are provided. A running summary and the finalized characters are printed. **Necessary Accessories for HP-41:** One Memory Module, Printer and Wand

Steps: 275 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01139-41-5	$10	$13
FOR HP-71*	01139-71-2	N/A	$14

01140 Air Volume Estimated Calculation by Iterative Method

by N.M. Miranda, Buenos Aires, Argentina

This program can be used to compute air volume, air changes per hour, air handling unit entering conditions, apparatus dew point, temperature difference and reheating if required in Hvac systems. **Necessary Accessories for HP-41:** Two Memory Modules, Printer and Card Reader

Steps: 376 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01140-41-3	$10	$15
FOR HP-71*	01140-71-0	N/A	$18

01142 NxN Matrix Multiplication

by M.A. Ordal, Rolla, MO

Any number of n x n matrices can be multiplied together with each matrix input only once, or each matrix can be multiplied by a constant matrix which is input only once. Optional routines use Math Pac I to find the inverse or determinant of a matrix. **Necessary Accessories for HP-41:** One Memory Module

Steps: 290 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01142-41-9	$10	$12
FOR HP-71*	01142-71-6	N/A	$14

01144 Flowshop Scheduling: Optimize N Jobs on M Machines

by R.M. Poor, New York, NY

This program determines the optimum (least total time) schedule for n jobs requiring sequential processing on m machines or other production facilities. **Necessary Accessories for HP-41:** One Memory Module

Steps: 191 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01144-41-5	$10	$12
FOR HP-71*	01144-71-2	N/A	$14

01145 Star Identifier and Celestial Body Locator

by W.J. Quinlan, Evanston, IL

Third of several programs for 41C Navigation Pac, it computes SHA and DEC of unknown star to compare with star chart; or LHA and GHA of Aries for use with star finder; has angle reduction routine; precomputes HC and ZN of key celestial bodies; uses 10 41C Nav. Pac sub-routines. **Necessary Accessories for HP-41:** 41C Nav. Pac and One Memory Module

Steps: 137 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01145-41-2	$10	$12
FOR HP-71	NOT AVAIL		

01146 Local Apparent Noon

by W.J. Quinlan, Evanston, IL

This is the second of several programs intended to be used with the 41C Navigation Pac. It computes the latitude and longitude at local apparent noon; correction for height of eye (DIP); sextant corrections for Sun; and precomputes HC and ZN. It uses 12 41C Nav. Pac. subroutines, including "RM". **Necessary Accessories for HP-41:** 41C Nav. Pac and One Memory Module

Steps: 136 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01146-41-0	$10	$12
FOR HP-71	NOT AVAIL		

01147 Voyage Planner

by W.J. Quinlan, Evanston, IL

This is the first of several programs intended to be used with the 41C Navigation Pac. It computes distance, speed, time-eta, speed by wooden block, date-time, distance to or beyond horizon, and hull speed. It uses three subroutines from the 41C Nav. Pac. **Necessary Accessories for HP-41:** 41C Nav. Pac and Printer

Steps: 98 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01147-41-8	$10	$11
FOR HP-71*	01147-71-5	N/A	$12

01148 Lines of Position

by W.J. Quinlan, Evanston, IL

This is the fourth of several programs for use with the 41C Navigation Pac. It permits traverse (composite) sailing and determination of position from one sextant shot or from distance off beam or distance by vertical angle. It uses three 41C Nav. Pac. subroutines. **Necessary Accessories for HP-41:** One Memory Module. Card Reader necessary for "Drl" - otherwise optional.

Steps: 184 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01148-41-6	$10	$12
FOR HP-71*	01148-71-3	N/A	$14

01150 Temperature Rise by Resistance

by R.W. Streed, N. Mankato, MN

This program solves for the average temperature rise in a copper winding from resistance measurements made after a heat run is terminated. Temperature rise is extrapolated back to the end of the heat run. Constants are included to convert program to aluminum conductors. Applications include motors, alternators, and transformers. **Necessary Accessories for HP-41:** None

Steps: 106 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01150-41-2	$10	$11
FOR HP-71*	01150-71-9	N/A	$12

01151 Probability of Suit Distribution in Contract Bridge

by G.C. Weber, Allison Park, FL

This program calculates the % probability of the distribution of outstanding cards in a suit in the opponents' hands as a function of the number of cards from 2 to 13 in a bridge hand. It also calculates the % probability of being dealt a hand of specific suit distribution. **Necessary Accessories for HP-41:** One Memory Module

Steps: 255 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01151-41-0	$10	$12
FOR HP-71*	01151-71-7	N/A	$14

01152 Floating-Point Octal Conversion and Octal Arithmetic

by M.A. Wolf, San Diego, CA

This program performs octal-decimal conversions for numbers that are integer or non-integer, zero, positive or negative in range of 10-82 to 10-90, and performs direct octal addition, subtraction, multiplication and division between two octal numbers. Useful in Computer Science and other mathematical applications. **Necessary Accessories for HP-41:** None

Steps: 75 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01152-41-8	$10	$11
FOR HP-71*	01152-71-5	N/A	$12

01153 Point on Curve

by S. Wood, Yakima, WA

Given curve data and incoming bearing and quadrant or azimuth of tangent, the program determines bearing perpendicular to the tangent of any station on the curve. Need this bearing to slope stake and cross section roadway at specific station on curve (use hand compass). **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 216 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01153-41-6	$10	$13
FOR HP-71*	01153-71-3	N/A	$14

01154 Retaining Wall Loads

by L.W. Busack, Monaca, PA

Program calculates the resultant force against a wall generated by both the soil itself and uniformly applied surcharge load. Surcharge can be of any width and can be applied at any distance from the wall. Either active or passive soil pressure can be specified. Printer is not used. **Necessary Accessories for HP-41:** None

Steps: 399 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01154-41-4	$10	$14
FOR HP-71*	01154-71-1	N/A	$16

01155 Chi-Squared and Non-Central Chi-Squared Distr. Functions

by J. Brownlow, Lancaster, CA

When x is distributed as chi-squared with n1 degrees of freedom, the program computes pr(x<=x) for any x>=0. When x is distributed as non-central chi-squared, with non-centrality parameter, m, and n2 degrees of freedom the program computes pr(x<=x) for any x>=0. In each case the program computes the exact values of these probabilities (to 9 decimal places). Rather than using a polynomial approximation, infinite series expansions are employed. **Necessary Accessories for HP-41:** None

Steps: 120 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01155-41-1	$10	$11
FOR HP-71*	01155-71-8	N/A	$12

01157 Gamma Fn Also Near Integers <=0

by F.J.D. Belinfante, Gresham, OR

For -69. 53 <=x <=70. 87, program calculates gamma(x), 1/gamma(x), gamma(n+f), or 1/gamma(n+f), the latter two for n=positive or nonpositive integer n and abs(f) <=0.5. Thus, gamma(-4. 99999984365127)is found using input x=n=-5 and y=f=1. 634873E-8. Relative accuracy of results is 3E-10 but for rounding errors increasing with abs(n). **Necessary Accessories for HP-41:** None

Steps: 143 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01157-41-7	$10	$12
FOR HP-71*	01157-71-4	N/A	$14

01158 Ln of Gamma Fn or of Factorial

by F.J.D. Belinfante, Gresham, OR

This program calculates ln gamma(x) for negative as well as positive x, but particularly fast for large positive x <= 4. 673262 E97. By it we can also calculate ln (n factorial) = ln gamma (n+1). Absolute accuracy is 3 E-9 for small x, and relative accuracy is 1 E-9 for large x. **Necessary Accessories for HP-41:** None

Steps: 108 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01158-41-5	$10	$11
FOR HP-71*	01158-71-2	N/A	$12

01159 Darts: 301 Opponent Simulator

by M.A. Beuster, Coronado, CA

This program simulates 301 darts with strategy, throwing, and scoring. The features are: (1) the skill of the calculator can be easily changed; (2) the program displays the points that individual darts make; (3) the program occasionally displays that a dart has bounced off. **Necessary Accessories for HP-41:** One Memory Module

Steps: 418 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01159-41-3	$10	$14
FOR HP-71*	01159-71-0	N/A	$16

01160 Levels of Systems

by J.R. Derry, New York, NY

Program allows user to consider kinematics problems from up to 10 interdependent frames of reference; user-defined coordinate systems of the frames of reference may independently be of different magnitudes; undergo rotations or transformations. **Necessary Accessories for HP-41:** None

Steps: 138 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01160-41-1	$10	$11
FOR HP-71*	01160-71-8	N/A	$12

01161 3-Axis Weight, Cg, and Inertia

by K.J. DeBord, Kent, WA

This program calculates the total weight, center of gravity, mass moments of inertia, and principal axis angles given a 3-dimensional set of mass elements whose weight, center of gravity, and centroidal inertias are known. **Necessary Accessories for HP-41:** One Memory Module

Steps: 224 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01161-41-9	$10	$12
FOR HP-71*	01161-71-6	N/A	$14

01162 Solar Shading

by K.J. Fleming, Chicago, IL

This program can be used by Architects and Engineers for computing Sun altitude angle, azimuth angle, and shading from exterior devices, such as overhangs and fins. It can be used for designing exterior solar shading and also for calculating the shading effect for making heat load calculations. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 273 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01162-41-7	$10	$13
FOR HP-71*	01162-71-4	N/A	$14

01163 Fuels

by C. Gordy, Idleyld Pard., OR

This program prompts for fuel (timber) inventory data and calculates the results in tons/acre. It makes maximum use of the HP-41C features; works with or without the printer; takes data in any order; checks for proper format and is nearly foolproof. Easier and cheaper than using computer time. **Necessary Accessories for HP-41:** Quad Module or HP-41CV and Card Reader. Printer recommended.

Steps: 682 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01163-41-5	$10	$18
FOR HP-71	NOT AVAIL		

01164 Planning Boat Power Prediction

by E. Glowacki, Jacksonville, FL

This program predicts horsepower (EHP) requirements for planning craft over a selected range of speeds and LCG locations. It essentially automates the "Savitsky Short Form" procedure. Other output of interest during preliminary design includes trim angle, bare hull and appended resistance and a factor to predict porpoising. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 326 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01164-41-3	$10	$14
FOR HP-71*	01164-71-0	N/A	$16

01165 Drilling Fluid Volume

by W.A. Goldman, Lafayette, LA

This program is of interest to drilling engineers. It calculates the downhole volume of drilling fluid in a well of any dimensions. Execution time improves with usage. **Necessary Accessories for HP-41:** Memory Modules as necessary

Steps: 189 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01165-41-0	$10	$12
FOR HP-71*	01165-71-7	N/A	$14

01166 Automatic Design of Stairs

by A.W. Hanson, Midland, MI

Program cues user for total rise in inches of stairway. It assumes a rise nearest to and less than 6 1/2 inches. It prints a series of stairs with each succeeding one having one less riser until the angle of the stair exceeds 50 degrees and cues to adjust total run and number of risers. Final stairway prints out. **Necessary Accessories for HP-41:** Printer

Steps: 93 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01166-41-8	$10	$12
FOR HP-71*	01166-71-5	N/A	$14

01167 Graph Plotter

by W.E. Hitchins, Los Angeles, CA

This program simplifies the plotting of any graph (except Pie graphs) by giving the point on the x axis in inches, accurate to the nearest 1/32nd of an inch. The fraction is always reduced to its simplest form. **Necessary Accessories for HP-41:** None

Steps: 126 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01167-41-6	$10	$12
FOR HP-71*	01167-71-3	N/A	$14

01168 Slope Stability Analysis

by D. Holmes, Bettendorf, IA

This program initially computes the factor of safety for Slope Stability Analysis using the ordinary method of slices (OMS). This value is then used to compute the factor of safety using Bishop's Method. The program prompts for all necessary input and tells you what to do next. **Necessary Accessories for HP-41:** One Memory Module for 19 slices - Two Memory Modules for 35 slices.

Steps: 460 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01168-41-4	$10	$15
FOR HP-71*	01168-71-1	N/A	$18

01169 Decision Support Evaluation Parameters Weighting

by J.H. Jones, San Jose, CA

This decision support program uses an Analytic Hierarchy Process (SAATY, Mcgraw Hill, 1980) to determine the relative ranking of up to nine system or component evaluation parameters. The subjective comparison of all combinations of pairs of parameters is converted into a reasonably objective decimal weighting for subsequent use in system/component selection. **Necessary Accessories for HP-41:** Three Memory Modules. Printer optional.

Steps: 291 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01169-41-2	$10	$13
FOR HP-71*	01169-71-9	N/A	$14

01170 Bar Code Classification and Analysis

by B. Kraengel Jr, Valley Stream, NY

Lines of bar code are classified and analyzed by this program. The type indicator is extracted and printed along with the type name. Row numbers or sequence numbers are printed where applicable. The total number of bytes in the line plus their binary, decimal and hexadecimal equivalents are printed. **Necessary Accessories for HP-41:** Printer, Wand, at least one Memory Module.

Steps: 234 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01170-41-0	$10	$14
FOR HP-71	NOT AVAIL		

01171 Pipe Stress

by J. Knepper, Green Bay, WI

This program uses the ANSI Code Criterion Formula to calculate thermal stress in a multi-directional pipe run and compare it to a maximum allowable factor. It also does simple (one-directional) expansion. **Necessary Accessories for HP-41:** None

Steps: 230 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01171-41-8	$10	$13
FOR HP-71*	01171-71-5	N/A	$14

01172 Slide Performance Rating and Sorting

by W.H. Kirts, Blue Springs, MO

Program calculates slide score of a single contest and of all contests entered. The slide number of contests entered and overall score is stored. The slide record is printed out in order stored and then ranked from best to worst performance. Data is read to cards for future updating. **Necessary Accessories for HP-41:** Card Reader and Printer.

Steps: 156 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01172-41-6	$10	$13
FOR HP-71	NOT AVAIL		

01173 Prime Rate Interest Calculations

by K. London, Bethpage, NY

This program creates an interest schedule adjusted for additions or payments of principal for one or more months, where interest is based on the prime rate. Prime rate data can be stored and read from cards. **Necessary Accessories for HP-41:** At least two Memory Modules. Printer suggested. Card Reader optional.

Steps: 474 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01173-41-4	$10	$15
FOR HP-71	NOT AVAIL		

01174 Buttress Design

by S.M. Milazzo, Long Beach, CA

Cut slopes in bedrock having an adverse direction of bedding (dip out of slope) are commonly stabilized through the construction of a fill material buttress. Soil parameters and slope dimensions are inputted, and the buttress dimensions are sized to prohibit translational failure parallel to planes of bedding. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV.

Steps: 1006 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01174-41-2	$10	$19
FOR HP-71*	01174-71-9	N/A	$22

01175 Messier Object Search

by G. Maynard, Palatine, IL

This program will identify the type and coordinates of all Messier objects within a user-specified area of the evening sky. This will aid the astronomer in performing an orderly search of all Messier objects. It also doubles as a ready reference of the coordinates for a desired Messier object. **Necessary Accessories for HP-41:** Two Memory Modules. Printer optional.

Steps: 226 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01175-41-9	$10	$17
FOR HP-71*	01175-71-6	N/A	$20

01176 Analysis of Variance of 2**n Full Factorial Designs

by P.J. White, Danvers, MA

This is a generalized program for the analysis of 2**n full factorial experiments. (N=2 to 5) error is estimated from higher order effects selected by the user. The program calculates mean effects, sums of squares, and f-ratios. Nonsignificant effects can be set to zero, and predicted values calculated. Entirely self prompting. **Necessary Accessories for HP-41:** Three Memory Modules and Printer

Steps: 425 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01176-41-7	$10	$16
FOR HP-71*	01176-71-4	N/A	$18

01178 Index

by J. Walen, Fasanstigen 2, Sweden

Computes the index of an integer to a given primitive root of a prime, using a pseudorandom sequence. **Necessary Accessories for HP-41:** None

Steps: 280 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01178-41-3	$10	$12
FOR HP-71*	01178-71-0	N/A	$14

01180 Design & Rating of Absorbers, Including Packed-Column Design

by R.J. Wooley, Midland, MI

Given inlet flows, key component compositions and packed column characteristics this program will calculate the number of transfer units (NTU), and the required column diameter of the absorber. The outlet gas composition can be calculated if the NTU is given. Also calculated are the minimum liquid flow and minimum NTU. **Necessary Accessories for HP-41:** One Memory Module

Steps: 340 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01180-41-9	$10	$13
FOR HP-71*	01180-71-6	N/A	$14

01181 Long Transmission Lines

by P.J. Vyvadil, Vancouver, Canada

This program is especially designed for calculation of electrical parameters of long transmission lines - over 150 miles, using hyperbolic functions of complex arguments. It can also be used for shorter lines, if greater accuracy is desired. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 292 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01181-41-7	$10	$13
FOR HP-71*	01181-71-4	N/A	$14

01182 Land Survey Measurement

by M.P. Velez, San Juan, PR

This program computes the error of closure, adjusts the traverse and determines the final coordinates, elevations, bearings, horizontal distance of the sides and the area of a polygon. It also computes coordinates and elevations for side shots. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 537 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01182-41-5	$10	$16
FOR HP-71*	01182-71-2	N/A	$18

01183 Federal Corporate Income Taxes 1981 to 1983

by W.B. Tracy, Denver, CO

For calendar and non-calendar year corporations figure income taxes on positive and negative amounts, leaves tax in x register, taxable amount in y register. Uses only stack for calendar year corporations, very fast. Useful tool or subroutine. **Necessary Accessories for HP-41:** None

Steps: 145 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01183-41-3	$10	$12
FOR HP-71*	01183-71-0	N/A	$14

01184 Pavecon: Plant and Vehicle Economics

by P.B. Taylor, Launceston Tasmania, Australia

This is a special set of seven programmes for plant and vehicle fleet budgeting and cost control. The programmes establish hire rates for all classes of plant and vehicles, provide details for replacement planning and analyse actual operating costs to provide cross-checks of base data. All programmes are self-prompting and produce compact, easily-comprehended print-outs of all relevant data. **Necessary Accessories for HP-41:** Quad Memory or HP-41CV, Card Reader and Printer

Steps: 1151 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01184-41-1	$10	$23
FOR HP-71	NOT AVAIL		

01185 Aerobic Points and Caloric Requirements for Running

by S.E. Taylor, Ames, IO

Aerobics became the household word for fitness in the late 1960s. Exercise at least three times per week for a total of 30 points to "maintain satisfactory fitness" (the athlete may accumulate more than 400 points per week). This program calculates and accumulates points based on distance run and pace; and for calorie counters, it also estimates normal daily caloric requirements and calories consumed during exercise sessions. **Necessary Accessories for HP-41:** One Memory Module

Steps: 213 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01185-41-8	$10	$13
FOR HP-71*	01185-71-5	N/A	$14

01186 Spherical

by H.V. Saad, Cofraily Caracus, Venezuela

This program solves problems in optics of the Descartes Equation using the following variables: a=distance object-mirror, b=distance image mirror, f=focal length, i=image size, o=object size, p=power of the mirror, c=optics enter, desv=deviation total of the ray in a prism, refraction angle, density of the prism, incidence angles, emergence angles and the character of images on a mirror. Program is valid for concave and convex mirror. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 559 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01186-41-6	$10	$15
FOR HP-71*	01186-71-3	N/A	$18

01188 Rate of Return

by A. Segall, Broomall, PA

An iterative approximation method is employed with annual cost analysis to arrive at the rate of return for an income expansion project. Three cases are solved: investment>salvage, investment= salvage, and investment<salvage. **Necessary Accessories for HP-41:** None

Steps: 173 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01188-41-2	$10	$13
FOR HP-71*	01188-71-9	N/A	$14

01189 Digital Filter

by E.E. Stoner, St. Charles, MO

Design digital filters for digital control systems or synthesize digital simulations of analog systems. This program computes the digital equivalent of any 1st or 2nd degree continuous transfer function and then computes the frequency response and time response's of the digital form. Any degree possible by cascading elements. Complete prompting. **Necessary Accessories for HP-41:** One Memory Module

Steps: 360 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01189-41-0	$10	$13
FOR HP-71*	01189-71-7	N/A	$14

01190 Linear Line Comparison, Analysis of Covariance & Student

by J.R. Surber, Omaha, NE

Comparison of any two or all lines entered, intercept and t-distribution of any two. All lines entered can be tested by analysis of covariance (slope, elevation and regression). Each line will find x or y approximate, regression values and t-test of regression. Linear formula, statistical, or raw data entry. **Necessary Accessories for HP-41:** Three Memory Modules, expandable data - four Memory Modules. Printer optional.

Steps: 709 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01190-41-8	$10	$23
FOR HP-71*	01190-71-5	N/A	$28

01191 Atmospheric Properties/Velocities/Aerodynamic Calc.

by P.F. Sweetland, Seattle, WA

Minimal keystrokes solve for atmospheric properties, velocity relationships and aerodynamic force equation, based on 1962 U.S. Standard atmosphere. Solves for altitude, pressure, density, temperature and speed-of-sound; relates true, equivalent or calibrated airspeed and mach number, and solves for aerodynamic force, force coefficient or velocity. **Necessary Accessories for HP-41:** One Memory Module

Steps: 308 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01191-41-6	$10	$13
FOR HP-71*	01191-71-3	N/A	$14

01192 Sidereal Time and Julian Date Ephemeris Printout

by C. Rusquellas, Buenos Aires, Argentina

Prints for a given year, an Ephemeris of Julian data and Greenwich Mean Sidereal Time at OH UT. Accuracy +/- 0.001 sec. Users can choose either number of lines per column, or number of total columns. Prints columns headlines and months names. Prints one line each 7 sec. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 272 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01192-41-4	$10	$12
FOR HP-71	NOT AVAIL		

01193 Airfoil Calculations

by R.J. Rolih, Moorabbin Victoria, Australia

This program provides airfoil ordinates and surface slopes for N.A.C.A. Four and five digit airfoil sections relative to both the N.A.C.A. chord and true chord lines. The program will provide ordinates for single abscissae or abscissae given by three inbuilt distributions. **Necessary Accessories for HP-41:** Three Memory Modules. Card Reader optional.

Steps: 930 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01193-41-2	$10	$18
FOR HP-71*	01193-71-9	N/A	$22

01194 Heights vs Desirable Weights for Adult Males and Females

by H.Y. Rhyu, Seal Beach, CA

This program is based on the National Acedemy of Sciences' Table, "Desirable Weights for Heights and Ranges for Adult Males and Females". Given male or female, light, medium for heavy frames and heights, the program outputs the desirable weight. Instructions are very simple since one only needs to answer to the prompts. **Necessary Accessories for HP-41:** None

Steps: 112 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01194-41-0	$10	$12
FOR HP-71*	01194-71-7	N/A	$14

01195 Geometric Patterns

by P.E. Richmond, Franklin, LA

This program calculates the x, y coordinates for three geometric shapes, a line at an angle, an evenly divided arc, and an evenly divided circle. Inputs are, radius of arc/circle or distance on line, degrees to first coordinate, x, y origin of pattern, incremental degrees (if arc), and number of coordinates to generate. All inputs and outputs are printed when printer is attached. Outputs in the form of x, y coordinates suitable for use in n/c programming, drafting, or engineering. **Necessary Accessories for HP-41:** One Memory Module. Printer and Card Reader helpful.

Steps: 275 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01195-41-7	$10	$13
FOR HP-71*	01195-71-4	N/A	$14

01196 Bode Plot of a General Transfer Function

by T. Frenock, Gainesville, FL

This program plots and performs computations of the frequency response of a general mth order by nth order transfer function. It can plot up to about 75 points, compute break frequencies automatically, calculate gain and phase margins automatically, and offer direct comparison of two plots (useful in system compensation). **Necessary Accessories for HP-41:** Two Memory Modules. Quad Memory Module and Printer recommended.

Steps: 526 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01196-41-5	$10	$15
FOR HP-71*	01196-71-2	N/A	$18

01197 Microstrip Design

by C.R. Nuckolls, Fountain Hills, AZ

Given substrate dielectric constant, substrate thickness in mils, desired characteristic impedance, and the frequency in GHZ, this program computes W/H and the length of a quarter wave of microstrip transmission line. Hammerstad's Equations are used to calculate W/H, and Getsinger's Equation optionally corrects line length for dispersion. **Necessary Accessories for HP-41:** One Memory Module

Steps: 249 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01197-41-3	$10	$12
FOR HP-71*	01197-71-0	N/A	$14

01198 Slurry Calculation Chart

by S.M. Neas, Lakeland, FL

This program generates a chart showing % solids by weight versus slurry (pulp) specific gravity, slurry (pulp) and water factors to convert short tons per hour of solids to gallons per minute of slurry (pulp) or water. The user controls the range of % solids printed and is prompted for the required input data. **Necessary Accessories for HP-41:** Printer

Steps: 146 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01198-41-1	$10	$12
FOR HP-71*	01198-71-8	N/A	$14

01199 Calculation of Peptide-Molecular Weight

by L. Nadasdi, San Francisco, CA

This program calculates the molecular weights and the atomic composition of peptides and peptide-derivatives. Amino acids and protecting groups should be keyed in with abbreviations (as used in peptide-chemistry). **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV. Printer optional.

Steps: 346 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01199-41-9	$10	$17
FOR HP-71*	01199-71-6	N/A	$20

01200 Moyer's Space Analysis 75%

by M.W. Malmstrom, West Jordan, UT

Now the general Dentist or Pedodontist can quickly and easily evaluate "space problems" in the early mixed dentition without resorting to long charts and tedious arithmetic. Moyer's space analysis at the 75% level is calculated in the program within +/- 0. mm per arch. Mesial shift (leeway space) for both maxillary and mandibular arch is an additional option! **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 115 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01200-41-5	$10	$13
FOR HP-71*	01200-71-2	N/A	$14

01201 Programmed Equations

by R.K. Meyer, Laramie, WY

PREQ solves a system of n nonlinear equation. Stand alone user subroutines include NR for single iteration of nonlinear equations using Newton-Raphson's method, JM to generate the Jacobian matrix and LE to solve a system of n linear equations by Gaussian elimination using complete pivoting. Preq requires size (n+1)**2. **Necessary Accessories for HP-41:** At least one Memory Module. Printer optional.

Steps: 576 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01201-41-3	$10	$17
FOR HP-71*	01201-71-0	N/A	$20

01202 Warehouse Rent/Sale Arithmetic

by T.M. Edwards, Dallas, TX

This program is handy at negotiation time. "N" months ahead for n year of any term it can highlight the effect of inflation on lease or sale proposals, or not, while figuring dollars per square foot, monthly and annual rental, the effect of vacancy, capitalization, and rental return on cost. **Necessary Accessories for HP-41:** One Memory Module

Steps: 212 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01202-41-1	$10	$12
FOR HP-71*	01202-71-8	N/A	$14

01203 Linear Regression Y=MX+B With Standard Errors

by H.J. Albert, Bettendorf, IA

This program calculates the regression coefficients for the fitting equation y=mx+8. Standard errors for the slope, intercept, x and y are calculated along with the coefficient of determination. As a user convenience, the program is printer compatable and the sigma registers need not be located at a fixed place in memory. **Necessary Accessories for HP-41:** None

Steps: 159 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01203-41-9	$10	$12
FOR HP-71*	01203-71-6	N/A	$14

01204 Exterior Ballistics

by F.H. Schellenberg, Johnstown, PA

This program solves typical exterior ballistics problem for small arms. The program will generate data based on Ingals tables or British 1909 tables. The program is based on a basic program 1980 V5N9, Pg 270 "Exploring Ballistics with Your Computer" by Robert W Jenks. **Necessary Accessories for HP-41:** Four Memory Modules

Steps: 628 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01204-41-7	$10	$19
FOR HP-71*	01204-71-4	N/A	$22

01205 Geosynchronous Satellite

by L.G. Brown, Wichita, KS

This program will compute great circle angle, slant range, bearing, and elevation to any geosynchronous satellite from any ground station, and will indicate when satellite is below horizon. Program uses full alpha-numeric properties of the HP-41C including alpha prompts for input data, and the display of slant range, bearing, and elevation. **Necessary Accessories for HP-41:** None

Steps: 153 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01205-41-4	$10	$12
FOR HP-71*	01205-71-1	N/A	$14

01207 Physical Property Estimation

by R.J. Wooley, Midland, MI

Estimates of the critical constants, heat of vaporization, vapor pressure, acentric factor, liquid density, surface tension, and liquid and vapor-viscosity, heat capacity and thermal conductivity are calculated. Inputs required are molecular weight, normal boiling point and knowledge of structure. Other inputs are asked for and calculated if not known. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV

Steps: 987 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01207-41-0	$10	$20
FOR HP-71*	01207-71-7	N/A	$24

01208 Surface Regression 2

by N.C. Shammas, Richmond, VA

Use your Math Module with this program to fit a surface with (y, x1, x2, x3) points. Projections and the correlation coefficient are available. **Necessary Accessories for HP-41:** Math Module and Quad Memory Module or HP-41CV

Steps: 227 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01208-41-8	$10	$12
FOR HP-71	NOT AVAIL		

01210 Astrological Chart Printer

by N.H. Blair, Bangkok 16, Thailand

If you are into astrology you probably have programs to help you with the calculations involved. This program does the final step for you by drawing the chart - albeit a little simplified. Standard astrological symbols are used for signs and planets using the printer's special character capability. You just store the longitudes of planets, node, ascendant, and MC, and then run the program. The printout is finally cut up and stuck onto a sheet of paper. The chart is about 5 inches diameter. **Necessary Accessories for HP-41:** Two Memory Modules, Card Reader and Printer.

Steps: 420 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01210-41-4	$10	$15
FOR HP-71	NOT AVAIL		

01211 Circular Plate with Hole - Plate 1

by S.A. Porter, Tacoma, WA

This program will provide the user with displacement, slope, and stress solutions at any radius on a circular plate with a center hole considering the outside edge either simply supported or fixed and the inside edge free. The user may apply a uniform pressure load of any bandwidth, a ring load, or a combination of both anywhere on the plate. **Necessary Accessories for HP-41:** Three Memory Modules and Printer

Steps: 815 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01211-41-2	$10	$17
FOR HP-71*	01211-71-9	N/A	$20

01212 Circular Plate with Hole - Plate 2

by S.A. Porter, Tacoma, WA

This program will provide the user with displacement, slope, and stress solutions at any radius on a circular plate with a center hole considering the outside edge free and the inside edge either simply supported or fixed. The user may apply a uniform pressure load of any bandwidth, a ring load, or a combination of both anywhere on the plate. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV and Printer

Steps: 1034 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01212-41-0	$10	$18
FOR HP-71*	01212-71-7	N/A	$22

01213 Pipeline Surge Analysis

by M. Hein, Tulsa, OK

This program is used for surge analysis of a pipeline system that consists of a centrifugal pump at the upstream end of the pipeline, and a time-controlled block valve at its downstream end. The program solves for the pressure and flow rate as functions of time at ten equidistant mileposts along the line. It also stores the maximum attained pressure at each milepost. **Necessary Accessories for HP-41:** Three Memory Modules. Printer optional.

Steps: 647 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01213-41-8	$10	$16
FOR HP-71*	01213-71-5	N/A	$18

01214 Likelihood Estimation of Parameters of Beta Distribution

by J. Brownlow, Lancaster, CA

This program solves for the maximum likelihood estimates of the parameters of a general beta probability density function (defined on the range a, b). The program will supply initial estimates of the parameters, or will take user-provided values. This program also provides the user with the digamma and trigamma functions. **Necessary Accessories for HP-41:** One Memory Module

Steps: 280 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01214-41-6	$10	$12
FOR HP-71*	01214-71-3	N/A	$14

01215 Bend Deductions/Allowances

by P.E. Richmond, Franklin, LA

Given material thickness, radius and degree of bend, this program calculates bend allowance, bend deduction, distance from outside mold line to block line, distance from outside mold line to bend line, and prints problem parameters and solutions when 82143A printer is attached. **Necessary Accessories for HP-41:** One Memory Module. Printer and Card Reader helpful.

Steps: 214 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01215-41-3	$10	$12
FOR HP-71*	01215-71-0	N/A	$14

01217 Array Math (41)

by P.E. Richmond, Franklin, LA

This program allows row/column math using a user defined data array. Inputs are number of rows and columns, and initial data. Operations are constant () row b=row c, and row a () row b=row c where () denotes the following operations: +, -, *, /, b**a, log, ln, 10**b, e**b, 1/b, hms, hr, hms+, hms-, int, & frc. Row "shift", row or col "sum" or "product" operations are also available. A "data write" and "data read" sequence is included for use with the card reader. Row and column listings are produced if 82143a printer is attached. **Necessary Accessories for HP-41:** Two Memory Modules for max. array of 36 elements, three modules for 100 elements and four modules or a Quad Memory Modules for 164 elements. Printer and Card Reader helpful.

Steps: 476 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01217-41-9	$10	$16
FOR HP-71*	01217-71-6	N/A	$18

01219 Compression Spring Check

by S.J. Breese, Monee, IL

Given the wire diameter, mean diameter, free length & number of active coils, this program will check loads, load heights & stress levels for a compression spring. This program is written to be used with the spring design program, but can be used independently. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 235 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01219-41-5	$10	$13
FOR HP-71*	01219-71-2	N/A	$14

01220 Wars - A Version of Startrek

by P.J. Foster, Stoneville, West Australia

Within a universe; you, the captain of a starship must destroy all your enemies before their reinforcements arrive. Beware of space storms and black holes. Experience dangerous living. Occasionally a time gate has to be negotiated. Maintain the ship's shields or be destroyed. Try to obtain a rating of 100. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV. Card Reader helpful.

Steps: 953 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01220-41-3	$10	$19
FOR HP-71*	01220-71-0	N/A	$22

01221 Cut & Fill Calculation of Earthwork X-Sections

by J.A. Kennedy, Arequipa, Peru

From a canal or road x-section reduces, from inclinometer angles and slope distances measured at right - angles from the center-line, the cut and fill required to excavate to a required formation level and width with known batter slope. Co-ords also output for plotting natural section on theoretical section. **Necessary Accessories for HP-41:** One Memory Module

Steps: 381 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01221-41-1	$10	$14
FOR HP-71*	01221-71-8	N/A	$16

01222 Resonant Circuits

by M.D. Owens, Clearfield, UT

Easily determine the impedance, resistance, reactance, q, bandwidth, frequency, inductance, and capacitance of a series, parallel, or parallel resonant circuit with a shunt resistor, using this program. The alphanumerics of the HP-41C is utilized completely, for example, 80 PF will be displayed as such instead of 80 E-12. **Necessary Accessories for HP-41:** One Memory Module

Steps: 404 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01222-41-9	$10	$13
FOR HP-71*	01222-71-6	N/A	$14

01223 Effective Earth Radius

by J.L. Roth, Newbury Park, CA

Given longitude and latitude, the program will compute the surface refractivity referred to mean sea level. Given the antenna height above mean sea level, the program computes: 1) the adjusted surface refractivity, 2) the refractivity gradient, 3) the true earth radius using Clarke's Spheroid of 1866, 4) the ratio of effective earth radius to true earth radius, k, and 5) the effective earth radius. **Necessary Accessories for HP-41:** Three Memory Modules and Topographical Maps or Altimeter

Steps: 506 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01223-41-7	$10	$24
FOR HP-71*	01223-71-4	N/A	$30

01224 Earthwork Quantities

by S.J. White, Salem, OR

This program computes and accumulates excavation and/or fill quantities by the average end area method, with optional prismoidal correction function. Required information; cross section coordinates and the interval between cross sections. **Necessary Accessories for HP-41:** One Memory Module

Steps: 198 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01224-41-5	$10	$12
FOR HP-71*	01224-71-2	N/A	$14

01225 DB Loss Vs. Azimuth Misalignment

by L. Ranzani, San Diego, CA

This program calculates and graphs the decibel loss due to azimuth misalignment of magnetic record-reproduce heads. The graph uses as points the calculated loss in decibels. **Necessary Accessories for HP-41:** One Memory Module, Printer and Card Reader

Steps: 129 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01225-41-2	$10	$14
FOR HP-71	NOT AVAIL		

01226 Wavprop-VHF/UHF Free-Space/Plane-Earth Wave Propagation

by C.R. Vandort, Blackburn So., Vict, Australia

Replaced nomographs used for free-space and plane-earth VHF/UHF field-strength, distance and terminal voltage calculations program prompts inputs not previously entered, when required. Features include view, change input parameters anytime. Plane-earth results automatically checked not to exceed free-space values. Extensive subroutine usage minimizes memory requirements. **Necessary Accessories for HP-41:** One Memory Module

Steps: 281 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01226-41-0	$10	$13
FOR HP-71*	01226-71-7	N/A	$14

01227 Rubik's Cube Solver

by J. Perry, Woking, England

This program will solve the puzzle of Rubik's Cube from any position. The program usually completes a random cube in 5-10 minutes and usually in under 125 moves. All you do is enter the state of your cube when prompted and your HP-41 will do the rest. You are told what to do by using an adapted version of Singmaster's Notation. The program is quite long and has been split into four parts. Extra instructions are supplied for those who have all four ports needed for memory modules. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV, Card Reader or Wand. Printer useful.

Steps: 1553 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01227-41-8	$10	$25
FOR HP-71*	01227-71-5	N/A	$30

01228 Simulation of Rubik's Magic Cube Inc a Complete Soltn Algor.

by W. Alexi, Taunusstein-Orlen, West Germany

This program is a simulation of Rubik's magic cube. It contains A.O. A complete solution algorithm. A distorted cube may be entered and a sequence of moves is computed to restore the cube. The order of a sequence of moves can be computed. **Necessary Accessories for HP-41:** Three Memory Modules and Printer

Steps: 830 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01228-41-6	$10	$17
FOR HP-71*	01228-71-3	N/A	$20

01229 Nicomachus

by C. Glomb, Wrightwood, CA

This program asks you to guess a number between one and a hundred. It then asks you three questions about the number. From the answers it determines the number you were thinking of. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 195 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01229-41-4	$10	$14
FOR HP-71*	01229-71-1	N/A	$16

01230 Beta Distribution

by I. Bond, Auckland 10, New Zealand

For the given parameters n and r of the beta distribution this program computes the PDF (probability density function) and the probability that x lies between limits a and b. The mean, variance and mode are also evaluated. **Necessary Accessories for HP-41:** None

Steps: 152 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01230-41-2	$10	$12
FOR HP-71*	01230-71-9	N/A	$14

01231 N-Complex Simultaneous Linear Equations

by L.R. Abelbeck, Mt. View, CA

A system of n linear simultaneous equations with complex coefficients is solved. The utilization of the "PVT" subroutine in the Math Module enables the program to be under 200 lines. The program prompts for the coefficient matrix and column vector in rectangular or polar form. **Necessary Accessories for HP-41:** Math Module and 1 + Int (N(N+1)/16) Memory Modules

Steps: 198 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01231-41-0	$10	$12
FOR HP-71	NOT AVAIL		

01232 Beam on Elastic Continuous Support

by A.G. Asensio, Viedma (Rio Negro), Argentina

This program computes moment, shear and soil stress by Bleich's Method for finity length beams transforming real beam in an infinite equivalent beam with the aggregate of four fictitious loads. **Necessary Accessories for HP-41:** None

Steps: 592 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01232-41-8	$10	$15
FOR HP-71*	01232-71-5	N/A	$18

01233 Hebrew Typewriter

by D. Barkan, Scarsdale, NY

Using the printer, this program can be used to compose Hebrew words and sentences. Although this is a rather obscure use of the 41-C, when applied to a larger machine like the HP-85, it would be a powerful tool in teaching students foreign languages. **Necessary Accessories for HP-41:** Two Memory Modules, Printer and Card Reader.

Steps: 123 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01233-41-6	$10	$13
FOR HP-71	NOT AVAIL		

01234 Lift and Drag Coefficients for a Supersonic Rhombic Airfoil

by C.E. Bravo, Gainesville, FL

This program calculates the coefficients of lift and drag for any Rhombic airfoil (symetric or asymetric), given its geometry and the supersonic flight conditions (mach number and angle of attack). By running the program at different angles of attack, the aerodynamic polar of the airfoil may be calculated. **Necessary Accessories for HP-41:** One Memory Module and Math Pac I

Steps: 391 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01234-41-4	$10	$14
FOR HP-71	NOT AVAIL		

01235 Right Angle Triangle Solutions-- Automatic

by J.B. Howell, Rockford, IL

A useful and easily implemented program for solving all right triangles. This program simply prompts for the three sides and angle. With any two known values, it then solves for the other two and gives area. Solutions are automatic by simply pressing R/S. Data can be recalled for solving subsequent triangles. **Necessary Accessories for HP-41:** None

Steps: 140 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01235-41-1	$10	$12
FOR HP-71*	01235-71-8	N/A	$14

01236 Planetary Positions

by M.G. Backe, Deerfield, IL

Planet computes the right ascension, declination, distance from Earth, apparent diameter, phase, and magnitude for any of the eight planets. Heliocentric longitude and latitude, and geocentric ecliptic longitude and latitude are also available. User provides the date and planet name. Automatic printout is provided for the printer. **Necessary Accessories for HP-41:** Two Memory Modules and Card Reader. Printer optional.

Steps: 466 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01236-41-9	$10	$18
FOR HP-71	NOT AVAIL		

01237 Integration to Infinite

by F.J.D. Belinfante, Gresham, OR

Program "ITI" performs integration from zero to infinite, of integrands finite at zero and convergent stronger than x**-2 at infinite. Also shown is use of program "ITI" for less convergent integrands and for integration, to plus infinite, from nonzero and from minus infinite. **Necessary Accessories for HP-41:** None

Steps: 62 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01237-41-7	$10	$12
FOR HP-71*	01237-71-4	N/A	$14

01238 Heat Loss Calculations

by H.D. Kallina, Walnut, IA

Program computes heat loss of a home or building, including basements. Surface area, 'R' factor, temperature, air infiltration, etc. are alpha labeled inputs/outputs for easy program use. Inputs can be changed and results analyzed and documented, for best (highest) dollars/btu savings. A must for solar enthusiasts, contractors. **Necessary Accessories for HP-41:** None

Steps: 395 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01238-41-5	$10	$15
FOR HP-71*	01238-71-2	N/A	$18

01239 Gage Calculations

by J.C.d.M. Desouzart, Itajuba, Brazil

Given the basic diameter and tolerances of an axis or a hole, between 1 and 500 milimeters, program will determine all gages and master gages, following I.S.O. norm. The 700 values from tables are already stored in memory using a data pack. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV and Card Reader. Printer optional.

Steps: 633 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01239-41-3	$10	$20
FOR HP-71*	01239-71-0	N/A	$24

01240 An Efficient Ode Solver

by A. Friedman, Livermore, CA

An implementation of a new, highly efficient algorithm based on a "partially-corrected euler" advance, which is second order accurate in the step size using only one function evaluation per step. The step size is doubled and the answer extrapolated to yield third order accuracy and a global error estimate. **Necessary Accessories for HP-41:** None

Steps: 117 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01240-41-1	$10	$11
FOR HP-71*	01240-71-8	N/A	$12

01241 Astronomical Co-ordinate Systems

by V.H. Gert, Aalst, Belgium

This program calculates Julian day number, local sidereal time, and conversions between the horizontal, equatorial, ecliptic and galactic system of co-ordinates. It includes a separate input for the user's geographical position. **Necessary Accessories for HP-41:** None

Steps: 210 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01241-41-9	$10	$12
FOR HP-71*	01241-71-6	N/A	$14

01242 Modified Berggren Equation: Dept HS of Freeze or Thaw

by K. Brown, Anchorage, AK

This program uses the modified Berggren Equation for calculating the depths of freeze or thaw in a multi-layered soil system. Primarily, it is used to determine the required depth of non-frost-susceptible material to prevent thermal degradation or disruption in permafrost or seasonal frost zones. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 396 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01242-41-7	$10	$14
FOR HP-71*	01242-71-4	N/A	$16

01244 Heat Exchanger Calculations

by B.T. Henderson, San Francisco, CA

Given any two, program calculates one of the following: outlet temperatures, exchanger heat transfer coefficient, or exchanger area. Temperature correction factor calculations are included for users choice of either 1) counter current, 2) 1 shell/2 tube passes, or 3) 2 shell/4 tube passes. Heat capacities may be calculated for both liquid and vapor phase hydrocarbons. **Necessary Accessories for HP-41:** None

Steps: 557 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01244-41-3	$10	$16
FOR HP-71*	01244-71-0	N/A	$18

01245 Printed Conversion Tables Temp. Vol. Dist. Wt, Etc.

by A.W. Hanson, Midland, MI

Prints a table that converts n (degrees fahrenheit & degrees centigrade) or factor at the prompt ("factor is") prints tables for converting, volumes, distances, pressures, etc. Between systems. Fahrenheit >/< celsius, kilometers >/< miles, gallons >/< liters. Trim points are printed automatically. 20 rows of 10 columns each assemble on an 8 1/2" x 11" page providing 400 conversions per page. **Necessary Accessories for HP-41:** Printer and Card Reader

Steps: 107 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01245-41-0	$10	$11
FOR HP-71	NOT AVAIL		

01246 Az-El Table Plus Astronomy Utility Routines

by J.F. Heath, Puunene, HI

Az-el table is a system of user oriented programs specifically set up to generate a table of azimuths and elevations for any given date interval, time interval, time increment and ra-dec. Global subroutines include Julian day, local apparent sidereal time, day # of year and date-time output formatting. **Necessary Accessories for HP-41:** Two Memory Modules and Printer

Steps: 440 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01246-41-8	$10	$14
FOR HP-71*	01246-71-5	N/A	$16

01247 The Count of Derg

by S. Balter, New York, NY

A simulation of the management of a country. Some necessary information comes with experience. Other facts, more or less correct, are supplied. Includes land management, plagues, floods, weather, climate, magic, warfare, death and taxes. Game duration is indefinite. Good performance is survival of 25 years. Works with or without printer. **Necessary Accessories for HP-41:** Two Memory Modules. Printer optional.

Steps: 629 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01247-41-6	$10	$15
FOR HP-71*	01247-71-3	N/A	$18

01248 Concrete Beam Design & Analysis Rectangular

by T. Siala, Lincoln, NB

This program will handle strength design and analysis of concrete beams. Using the ultimate strength design in accordance of 1971 ACI code. This program will design the beam with special provision for the deflection problem and will check the ACI code after every design. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 476 HP-41 Bytes: 888

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01248-41-4	$10	$14
FOR HP-71*	01248-71-1	N/A	$16

01249 Gini Coefficient of Concentration

by B.R. Vianna, Belo Horizonte, Brazil

Consider a variable x measured over a set of areal units where the proportionate share of the total x associated with each unit is known. This spatial distribution is to be compared with another, a hypothetical distribution of x in which every areal unit has equal share of the total. **Necessary Accessories for HP-41:** Memory Modules = 1 + int (12+2n)/64)

Steps: 277 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01249-41-2	$10	$13
FOR HP-71*	01249-71-9	N/A	$14

01250 Exam Score Distribution

by K.R. Knoll, Little Rock, AR

This program provides a rapid method to determine basic statistics, distribution, and plot of distribution of examination scores. The exam scores expressed as percentages is required. **Necessary Accessories for HP-41:** Printer

Steps: 211 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01250-41-0	$10	$13
FOR HP-71	NOT AVAIL		

01251 1040C Business Expenses

by W.M. Kiteley, Boulder, CO

The first of three programs, on two cards, accumulates business expenses into accounts (registers) the number of which match the line numbers on the 1040C form. Monthly and yearly lump sums are kept. It will display or print sums and expenses. The second, on two cards, matches the first but also keeps monthly accounts. The last, on two cards, prints sums and expenses by name. **Necessary Accessories for HP-41:** Two Memory Modules and Card Reader. Printer optional.

Steps: 462 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01251-41-8	$10	$18
FOR HP-71	NOT AVAIL		

01253 Inductor Design with Combined D.C. and A.C. Currents

by D.A. Lisle, Aliceville, FL

Program will completely design an inductor and "look up" the proper core given the inductance, D.C. current, A.C. current, frequency, and temperature rise. Program is entirely self prompting and only requires the user to enter the register data cards, when requested, and press R/S. Printout prints the core number, correct number of turns, gap length in inches, and the temperature rise. Program checks for skin effect, core saturation, excessive temperature rise. **Necessary Accessories for HP-41:** Four Memory Modules, Card Reader and Printer

Steps: 486 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01253-41-4	$10	$22
FOR HP-71	NOT AVAIL		

01254 'Respla' Planning Regime

by M. Ormieres, Kusnacht/ZH, Switzerland

Procedure for: hydrodynamic evaluation of planning hulls in smooth water. Program #3 of the package for the planning regime determines the resistance in lbs & kg for 1. barehull, 2. appendices (keel), 3. superstructure and the a) effective power, b) final power in horsepower. **Necessary Accessories for HP-41:** None

Steps: 415 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01254-41-2	$10	$28
FOR HP-71*	01254-71-9	N/A	$34

01255 Flt

by J.T. Melson, Simpsonville, SC

Flt calculates the constants for a smooth lowpass finite impulse response digital filter. Such a filter may be used to smooth data tabulated at equal intervals. **Necessary Accessories for HP-41:** None

Steps: 305 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01255-41-9	$10	$13
FOR HP-71*	01255-71-6	N/A	$14

01256 Load Growth - Least Square Fit Linear and Exponential Curves

by D.H. Mulkey, Salinas, CA

This program uses the Least Square Regression Method to fit electric power loads to both linear and exponential curves. The trend line can then be used to determine the load growth of the area and to project future loads. Routines are included to compute adjustments for transfers. Intended for electric utility engineers, this is #2 of a 41C utility series. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 402 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01256-41-7	$10	$15
FOR HP-71*	01256-71-4	N/A	$18

01257 3 "D"

by M. Naumann, Singen, West Germany

The program enables the user to create accurate perspective drawings of solid objects by calculating the foreshortening projection of points of a three-dimensional object onto a plane. **Necessary Accessories for HP-41:** None

Steps: 106 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01257-41-5	$10	$11
FOR HP-71*	01257-71-2	N/A	$12

01258 Haul Truck Simulation

by P. Rushworth, Lakewood, CO

The haul truck simulation estimates travel time and fuel consumption for variable haul road conditions. Fleet requirements may be estimated with developed cycle times and production scheduling. Provides rapid method of determining effects of changes in mine design in truck/shovel operations. **Necessary Accessories for HP-41:** HP-41CV, Quad RAM or two Memory Modules. Printer desirable.

Steps: 353 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01258-41-3	$10	$14
FOR HP-71*	01258-71-0	N/A	$16

01259 Safety Valve Nozzle Stress

by M.L. Ramsey, Abilene, TX

Calculates safety valve nozzle stress to ensure installation is adequately designed for the reaction forces encountered during the opening of a safety valve. **Necessary Accessories for HP-41:** Two Memory Modules. Printer optional.

Steps: 355 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01259-41-1	$10	$14
FOR HP-71*	01259-71-8	N/A	$16

01260 Sequential Sampling (Binomial, Unit Attribute)

by A. Schneider, Reseda, CA

This program computes the acceptance-rejection criteria, the operating characteristic, the average sample number, and the average outgoing quality as a function of the process average for attribute unit sequential sampling plans. **Necessary Accessories for HP-41:** None

Steps: 153 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01260-41-9	$10	$11
FOR HP-71*	01260-71-6	N/A	$12

01261 Multiloop Nyquist

by E.E. Stoner, St. Charles, MO

Compute the nyquist response of a multiloop feedback control system. The number of loops and the degree of the transfer functions is limited only by the number of registers available. Continuous or sampled data systems may be analyzed. **Necessary Accessories for HP-41:** One Memory Module

Steps: 300 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01261-41-7	$10	$13
FOR HP-71*	01261-71-4	N/A	$14

01262 Series Pipe System

by L.L. Spangler, Phoenix, AZ

Computes total dynamic head in series system of pipes over a specified range of flows at a specified interval. Output can be plotted to construct system curve for pump selection. Will consider single or parallel well pumps, or single or parallel booster pumps. Units are feet, inches, gallons per minute. Will handle 14 pipes with one module, add 32 pipes for each additional module. **Necessary Accessories for HP-41:** At Least One Memory Module. Printer optional.

Steps: 285 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01262-41-5	$10	$13
FOR HP-71*	01262-71-2	N/A	$14

01263 Standard Penetration Test Adjustment for Soil Overburden

by H.D. Thomas, Bartow, FL

The number of blows required to drive a "split-spoon" standard penetration test sampler are adjusted for overburden pressure by this program. Two methods which give comparable results are available to the user. **Necessary Accessories for HP-41:** Printer optional.

Steps: 118 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01263-41-3	$10	$12
FOR HP-71*	01263-71-0	N/A	$14

01265 Emissivity Determination and Computations

by S.E. Taylor, Ames, IO

Emissivity is a crucial parameter in any computation of heat transfer by thermal radiation. This program provides two methods for determining surface emissivities and also provides a method for determining background radiation. Black body radiation may also be calculated. **Necessary Accessories for HP-41:** One Memory Module

Steps: 184 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01265-41-8	$10	$13
FOR HP-71*	01265-71-5	N/A	$14

01266 Conics

by M.V. Barbero, Sevilla, Spain

This program classifies, finds the center and gives the reduced equation of a conic (given by a general equation) formed by section of right circular cone by a plane. The program needs approximately 12 seconds to compute all results. **Necessary Accessories for HP-41:** One Memory Module

Steps: 245 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01266-41-6	$10	$13
FOR HP-71*	01266-71-3	N/A	$14

01267 Stair Design

by H.E. Wyles, Fairfax, VA

This fully prompted and labeled output, program for the HP-41C computes the design for stairs. Uniform building code values are used automatically, but may be changed. Output values are: no. of runs; rise dimensions; no. of risers; no. of treads; tread dimensions; and run length. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 216 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01267-41-4	$10	$13
FOR HP-71*	01267-71-1	N/A	$14

01268 Conduit Sizing

by J.R. Wymer, Brookville, PA

This program will compute the minimum conduit size permitted by the 1981 National Electric Code as well as the percent full for a complete power and control system using A.W.G. size 1 thru 18 wire given the quantity and size of the wires to be used. **Necessary Accessories for HP-41:** One Memory Module

Steps: 200 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01268-41-2	$10	$13
FOR HP-71*	01268-71-9	N/A	$14

01269 Appointment Calendar

by Users' Library, , Corvallis, OR

An interactive program using mass storage or the card reader to create files of upcoming appointments and reminders. Appointments may be added or edited at any time and either viewed, printed or set as alarms interactively or in a group. The program prints out a memo page style calendar starting at any date. Using mass storage, the calculator can search the database automatically every morning and set the alarms for the day without the presence of the user. Program will not stop even if the printer is turned off. **Necessary Accessories for HP-41:** Time Module

Steps: 359 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01269-41-0	$10	$16
FOR HP-71	NOT AVAIL		

01273 Four-Channel Controller

by Users' Library, , Corvallis, OR

Manages independent control of four timers or "channels" with their own alpha names, time, data and note files and simple message alarms or user-defined control alarms. May be used for industrial control, interactive data storage, reminders or general time keeping. Programs and alarm signals may be deleted or added at any time. Data is recalled and printed by channel number. Program additionally synchronizes the stopwatch to any channel for high accuracy timing and outputs a pointer value that will avoid storing splits over any important data. Provides nine registers for user programs. **Necessary Accessories for HP-41:** Time Module

Steps: 245 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01273-41-2	$10	$14
FOR HP-71	NOT AVAIL		

01274 Logbook

by Users' Library, , Corvallis, OR

Logbook uses the HP82180A Extended Functions Module to store the names and times worked for accounts that are billed at an hourly rate. Purchase order numbers, billing codes and descriptive remarks can be stored without regards to length or format. The starting time and date for each account is saved in an ASCII file and requires no data registers to maintain. Files can be viewed or printed at any time and total time worked can be updated on a daily basis. Access to stored information is by account name or the first few letters of the name. Useful in professional offices and any application where time must be recorded and stored in an easy to use format. **Necessary Accessories for HP-41:** Time Module and Extended Functions Module

Steps: 205 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01274-41-0	$10	$12
FOR HP-71	NOT AVAIL		

01276 Playback Programmable Timer

by Users' Library, , Corvallis, OR

A timer interactively programmed by users to playback a series of alpha messages or prompts up to 12 characters in length for specified lengths of time. Optionally, user-defined programs may be run during any segment of the playback sequence. User programs may scroll longer displays, print or perform any desired functions. Periodic tones of frequencies 0-9 may be placed to accompany messages. The program's features include routines to store, recall, save and edit playback sequences and is compatible with any HP-41C storage medium. Two modes are available: manual stop-start or auto sequence w/out pause through entire playback. Modes chosen when intializing. **Necessary Accessories for HP-41:** Time Module

Steps: 275 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01276-41-5	$10	$14
FOR HP-71	NOT AVAIL		

01277 3 D Vector Calculations

by R.L. White, Cambridge, MA

This program performs many common vector-math operations such as addition, subtraction, cross product, dot product, sign change, unit vector, vector magnitude, scalar times vector, matrix times vector, and vector storage, recall and exchange. It also computes the transponse, inverse and determinant of a 3 x 3 matrix. **Necessary Accessories for HP-41:** One Memory Module

Steps: 227 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01277-41-3	$10	$12
FOR HP-71*	01277-71-0	N/A	$14

01278 Standard Beams, Axially Loaded Beams, Beams on Elastic Found

by J.D. Brugman, Chino, CA

This program solves for the shear force, bending moment, slope or deflection at any point along a single span beam with any combination of concentrated moments, concentrated forces or uniformly distributed loads. In addition, the beam may be subjected to one of the following conditions: 1) compressive axial load 2) tensile axial load 3) supported on an elastic foundation. End supports may be any stable combination of fixed, pinned, free or guided. Editing of loads, end supports and other data is included. **Necessary Accessories for HP-41:** Three Memory Modules will allow up to 13 loads. Additional Module will allow up to 34 loads.

Steps: 820 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01278-41-1	$10	$16
FOR HP-71*	01278-71-8	N/A	$18

01280 Hurricane Tracking

by G.D. Lewis, North Palm Beach, FL

This program uses two successive positions of a hurricane to calculate its speed, direction, distance to you, course to you and travel time to you at current speed. **Necessary Accessories for HP-41:** One Memory Module

Steps: 201 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01280-41-7	$10	$12
FOR HP-71*	01280-71-4	N/A	$14

01281 API Gravity Reduction to 60 Degree F

by T.E. Mullins, Cody, WI

This program reproduces API and ASTM Table 5B. Table 5B provides API gravity (density) at 60 degree f from observed API gravity at temperatures other than 60 degree f. **Necessary Accessories for HP-41:** One Memory Module

Steps: 261 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01281-41-5	$10	$13
FOR HP-71*	01281-71-2	N/A	$14

01282 Swerling Radar Cross Section Statistics

by R.M. Rhodes, Sunnyvale, CA

Computes the probability of detection for the four swerling statistics cases (as case chosen by operator) as a function for peak signal to average noise, and number of pulses integrated. Threshold is found at program start by trial and error for selected false alarm probability. Solution of incomplete gamma function is accomplished by Gauss Quadrature routine (included). **Necessary Accessories for HP-41:** Two Memory Modules and Printer

Steps: 284 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01282-41-3	$10	$14
FOR HP-71*	01282-71-0	N/A	$16

01283 Solar System Exposures for Astro-Photography

by M.G. Backe, Deerfield, IL

This program estimates the exposure necessary to take a picture of various phases of the Moon, solar eclipses and the Sun, and planets Mercury through Uranus. Photo takes full advantage of the 41C's alphanumeric capability. User inputs film speed (ASA#), f-ratio of camera system, and object name. **Necessary Accessories for HP-41:** One Memory Module

Steps: 152 HP-41 Bytes: 498

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01283-41-1	$10	$13
FOR HP-71*	01283-71-8	N/A	$14

01284 Sight Reduction and Most Probable Position

by J.T. Rehberg, Cleveland, OH

Given the dead reckoning position coordinates of latitude and longitude, the Greenwich hour angle and declination from the nautical almanac. Calculate the altitude (HC) and azimuth (ZN) of a celestial body. Given the corrected sextant observed altitude (HO) calculate the altitude intercept, the latitude and longitude of the most probable position from a single celestial observation. Accepts and displays data in degrees, minutes and tenths of minutes, degrees and tenths of degrees of ZN, nautical miles and tenths of miles of altitude intercept. Can also be used for star identification. **Necessary Accessories for HP-41:** Card Reader and Printer optional.

Steps: 181 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01284-41-9	$10	$12
FOR HP-71*	01284-71-6	N/A	$14

01285 Time Plan

by L.W. Busack, Monaca, PA

This program is designed to allow the user to schedule activities for the day, week, or month. Each activity is assigned a weight which specifies its priority. After each addition or deletion, the list of items is re-prioritised with the heaviest weighted item appearing first. The program is designed to be used only without the printer attached. **Necessary Accessories for HP-41:** HP-41CV or Memory Modules may be required and Card Reader.

Steps: 200 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01285-41-6	$10	$12
FOR HP-71*	01285-71-3	N/A	$14

01286 Enlarger Settings

by T.M. Green, Lopez, WA

This program calculates where to set an enlarger head for any combination of negative size, lens focal length, easel height and print size, in terms of an arbitrary scale attached to the column, and provides exposure times for any size print relative to the first one. **Necessary Accessories for HP-41:** None

Steps: 80 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01286-41-4	$10	$11
FOR HP-71*	01286-71-1	N/A	$12

01287 Four Atom Decay

by J.W. Ferman, Minneapolis, MN

Kinetics of radio-decay, for chain lengths of up to four atoms, are computed for two optional cases: (1) isotopes introduced into media of interest at a constant rate or as an amount during an interval or (2) fixed initial isotopic amounts at time zero. HP-41 will ask for data as needed. Results read-out in alpha mode. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 459 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01287-41-2	$10	$14
FOR HP-71*	01287-71-9	N/A	$16

01288 Aqueous Flow Simulation

by D.F. Woodhouse, Wolverhampton, United Kingdom

Using prompted values for the aqueous inflow and outflow facility coefficients, the program calculates a series of values of aqueous flow for incremented values of the pressure-difference (p sub in - p sub out) required to move aqueous through the eye. The relationship is also plotted using the printer-plot. **Necessary Accessories for HP-41:** Printer and Card Reader

Steps: 100 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01288-41-0	$10	$11
FOR HP-71	NOT AVAIL		

01289 Compton Crossections

by J.W. Ferman, Minneapolis, MN

Compton scattering, absorption, and total crossections per electron for photon interactions are computed from the equations derived by Klein-Nishina. Mean recoil electron and scattered photon energies are also computed. User must provide initial photon energy in MEV. **Necessary Accessories for HP-41:** None

Steps: 101 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01289-41-8	$10	$11
FOR HP-71*	01289-71-5	N/A	$12

01290 Heat Transfer in Air

by P. Ebert, Goleta, CA

Calculates the equilibrium temperature of body dissipating heat in a free air ambient by means of convection and radiation. Includes subroutines which evaluate air properties as functions of temperature and pressure, useful in other heat transfer and air flow programs. **Necessary Accessories for HP-41:** None

Steps: 178 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01290-41-6	$10	$12
FOR HP-71*	01290-71-3	N/A	$14

01291 Min

by J.T. Melson, Simpsonville, SC

"Min" minimizes a function f(xi) where xi is a vector of 2 or 3 variables. The returned values are f at a local minimum and the values xi at that minimum. Min is particularly useful in fitting data to non-linear equations in a least squares sense. **Necessary Accessories for HP-41:** HP-41CV or Quad Memory Module

Steps: 479 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01291-41-4	$10	$14
FOR HP-71*	01291-71-1	N/A	$16

01293 Ray Tracing for Underwater Sound Transmission

by L.O.J. Kagey, Fullerton, CA

This program provides a model to generate ray tracing plot data for sound transmission in the sea. The program accomodates four ocean layers and ray traces for surface duct and convergence zone sound transmission modes. Data inputs for generating the sound velocity profile (SVP) are requested. **Necessary Accessories for HP-41:** Three Memory Modules and Printer.

Steps: 607 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01293-41-0	$10	$17
FOR HP-71*	01293-71-7	N/A	$20

01294 Cyclone Efficiency

by J.A. Hullender, Gastonia, NC

This program is useful in estimating the dust collection efficiency of gas cyclones. Grade efficiencies for a range of ten particle diameters are calculated, tabulated, and plotted. Overall efficiency is calculated based on an input particle size distribution. Gas pressure drop for the cyclone is also calculated. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV, Printer and Card Reader (Due to program length).

Steps: 734 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01294-41-8	$10	$19
FOR HP-71	NOT AVAIL		

01295 Bases

by E.H. Roques, SS de Jujay, Argentina

This program solves a great number of problems of isolated bases (centered load bases), of reinforced concrete, square or rectangular bases in partition wall, with different sides (eccentric load) determines the side dimensions, and moments in both directions, area, and minimum height for the maximum tension for concrete. **Necessary Accessories for HP-41:** None

Steps: 194 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01295-41-5	$10	$13
FOR HP-71*	01295-71-2	N/A	$14

01296 Machining Time

by D.H. Turner, Southfield, MI

This program calculates the standard time for five types of metal-cutting processes (I.E. turning, milling, drill/reaming, tapping, and c'drill/chamfering). The program automatically prompts alphanumerically for needed variables, which are explained fully in the documentation. Most useful for process engineering or industrial engineering. Very complete documentation. **Necessary Accessories for HP-41:** 188 Register capability. Printer optional.

Steps: 314 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01296-41-3	$10	$15
FOR HP-71	NOT AVAIL		

01297 Histograms with Text

by K. Grau, Odensec, Denmark

A textline up to 4 characters long below the columns, and an axis is made as desired in any position, but it can be suppressed if this is more satisfactory. The program takes up 440 bytes of program memory and 7 data registers are needed. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 245 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01297-41-1	$10	$12
FOR HP-71	NOT AVAIL		

01298 Algebraic Manipulation of Series and Polynomials

by R.M. Ziff, Stony Brook, NY

This program contains 15 subroutines that allow algebraic manipulation of functions f(x) defined as power series of variable order up to x**19. For functions f(x) and g(x), one can calculate f(x)*g(x), f(g(x)), exp(f(x)), ln(f(x)), df/dx, the integral, the inverse function, (f(x))**n, evaluate f(x), and more. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 492 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01298-41-9	$10	$15
FOR HP-71*	01298-71-6	N/A	$18

01300 Enduro

by T. Carter, Dayton, OH

A time vs distance schedule is computed and printed for cross-country motorcycle events (use for rallies, etc also). Inputs include average speeds for each section, mileages to speed changes, total length of event; time and distance to stops and resets. Time, distance, and average speed are printed for each minute. **Necessary Accessories for HP-41:** Three Memory Modules or Quad Memory Module and Printer.

Steps: 421 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01300-41-3	$10	$14
FOR HP-71*	01300-71-0	N/A	$16

01301 Quantity of Tiles Per Square Foot of Floor Space

by R.S. Altman, Clearlake, CA

This program will calculate the number of floor tiles needed to cover n square feet of floor space using standard floor tiles. Calculations may be made with or without provisions for waste. Full use is made of the HP-41C's alphanumeric capabilities. **Necessary Accessories for HP-41:** Printer optional.

Steps: 123 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01301-41-1	$10	$12
FOR HP-71*	01301-71-8	N/A	$14

01302 Nails Per Pound/Kilogram

by R.S. Altman, Clearlake, CA

This program will calculate the approximate number of nails per pound (or kilogram) for common, box, casing, and finishing nails. Full use is made of the HP-41C's alphanumeric capabilities. **Necessary Accessories for HP-41:** None

Steps: 178 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01302-41-9	$10	$12
FOR HP-71*	01302-71-6	N/A	$14

01303 Network of Minimal Length

by L.G. Andermo, Farsta, Sweden

Given the number of vertices and either the coordinates for each vertice or the distances between them, this program finds the shortest network. The used algorithm will deliver the shortest interconnection without the need of examining all possibilities and in a running time proportional to the square of the number of vertices. Four independent input options are available for the user's convenience. Output is a single array representing the edges of the minimal tree. Two innovations, a digital ruler and a digital protractor, provides owners of the wand with two fast and general input options. A description is given of how to build the tools. **Necessary Accessories for HP-41:** None

Steps: 319 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01303-41-7	$10	$13
FOR HP-71*	01303-71-4	N/A	$14

01304 Spheres, Spherical Angles & triangles, Barrels, Ellipsoids

by G.M. Halpern MD, Honolulu, HI

This program, given certain parameters, solves volume, surface area, lateral area of spheres, barrels, ellipsoids, paraboloids & the area of spherical angles and triangles. The formulas are standard, but the program fully utilizes the alphanumeric capabilities of the 41C. Also subroutines, called by numeric labels, save space & bytes. **Necessary Accessories for HP-41:** HP-41CV or Quad Memory Module, Card Reader and Printer.

Steps: 679 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01304-41-5	$10	$19
FOR HP-71*	01304-71-2	N/A	$22

01305 Double Lobatto Quadrature

by K. Harstad, Burbank, CA

This program calculates double or single integrals using the 5-point Lobatto Quadrature Formula on subintervals of the integration variable(s). The user specifies the integrands and inner integral limits, using arbitrary nonsingular functions, and the maximum subinterval length(s). The outer integrand may be any function of the inner integral. **Necessary Accessories for HP-41:** None

Steps: 156 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01305-41-2	$10	$12
FOR HP-71*	01305-71-9	N/A	$14

01306 Systems of Nonlinear Equations

by G. Petz, Haggersten, Sweden

The program solves a system of n(1-13) simultaneous nonlinear equations in n unknowns by an iterative second order method. It can be used as a subroutine also. **Necessary Accessories for HP-41:** None

Steps: 284 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01306-41-0	$10	$13
FOR HP-71*	01306-71-7	N/A	$14

01307 Heating Values

by N.S. Charles, Houston, TX

Determine the heat given off by combustion of gas, liquid or solid fuels, given the fuel composition. The heating value of gas fuels is given in BTU/SCF, and for all fuels the gross and net heating values are given BTU/lb. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 456 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01307-41-8	$10	$15
FOR HP-71*	01307-71-5	N/A	$18

01308 Moving Wheel Loads

by J.D. Routson, Naperville, IL

This program solves for maximum moment, quarter point moment, end shears and column reactions for moving wheel loads over simple spans; includes provision for uniform load. **Necessary Accessories for HP-41:** Two Memory Modules (for more than 16 wheel loads 3 or 4 or required).

Steps: 422 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01308-41-6	$10	$14
FOR HP-71*	01308-71-3	N/A	$16

01309 Critical Path Method for Project Planning & Scheduling

by E.R. Schmeckpeper, Richland, WA

This program uses the critical path method to calculate project duration, the activities which govern the project length, and the degree of freedom in scheduling the non-critical activities. All input data for each activity is stored in a single data register, and all output data for each activity is stored in only two data registers. This results in seven numbers being stored in only three data registers. Maximum problem size is 63 activities. **Necessary Accessories for HP-41:** Two Memory Modules minimum and Printer.

Steps: 475 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01309-41-4	$10	$14
FOR HP-71*	01309-71-1	N/A	$16

01310 Starbattles

by G. Pegan, Garden Grove, CA

Starbattles has three enemy ships attacking Earth. Earth is defended by four earthships with a total of six torpedoes. The object of the game is to find the three enemy ships in a 4 x 4 space quadrant before losing all four earthships. **Necessary Accessories for HP-41:** None

Steps: 208 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01310-41-2	$10	$14
FOR HP-71*	01310-71-9	N/A	$16

01311 Stress Concentration

by A. Segall, Broomall, PA

This program solves cases 1a and 1b of table 37 in Roark: elastic stress concentrations from two U notches in a member of rectangular section. The two loading conditions are axial tension and in plane bending. **Necessary Accessories for HP-41:** One Memory Module

Steps: 298 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01311-41-0	$10	$13
FOR HP-71*	01311-71-7	N/A	$14

01312 Compression Spring Design

by S.J. Breese, Monee, IL

Given the preload, final load, the inside (or outside) diameter that the spring is to fit on (or in) & the amount of deflection (or stroke), this program will calculate the required parameters for a compression spring. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 289 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01312-41-8	$10	$13
FOR HP-71*	01312-71-5	N/A	$14

01313 Checkbook Recordkeeper

by W.E. Wright, Stanford, CA

Enter your checks on the HP-41C as you write them. It calculates your balance and lists checks and deposits. When you receive your bank statement, enter the returned checks and the HP checks your bank's balance and keeps a record of checks still out. Lists are kept on magnetic cards. **Necessary Accessories for HP-41:** Two Memory Modules and Card Reader.

Steps: 369 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01313-41-6	$10	$14
FOR HP-71	NOT AVAIL		

01314 Channel Slide Rule (CSR)

by D.B. McCartney, Carlsbad, CA

Solves all rectangular and trapezoidal channel flow problems. Has input for flow (CFS), depth (ft), bottom width (ft), velocity (fps), side slope (z), energy slope (%), Mannings value (n), and froude number (f). User specifies any 5 or more values; program solves for other values. Includes error codes. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV

Steps: 832 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01314-41-4	$10	$18
FOR HP-71*	01314-71-1	N/A	$22

01315 Fixed Beam Plot of Shear and Bending Moment Diagrams

by M.M. Pierson, Marshfield, MA

This program will plot shear and bending moment diagrams for a beam fixed at both ends and loaded with any combination of full uniform and linear loads as well as point loads. It will also yield numerical values of shear and moment at any point along the beam. Stored on 4 cards (3 programs). **Necessary Accessories for HP-41:** Printer and Two Memory Modules

Steps: 278 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01315-41-1	$10	$14
FOR HP-71	NOT AVAIL		

01316 Momentumline Plotting

by D.P. Klaassen, Putten, Holland

This program calculates and prints the reactive forces and all necessary momentums to plot the momentumline of any girder on two points of support. The load can be any combination of point and equal distributed forces directed up as well as downwards. **Necessary Accessories for HP-41:** Printer

Steps: 194 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01316-41-9	$10	$12
FOR HP-71*	01316-71-6	N/A	$14

01317 XYZ Tabular Data Entry and Linear Interpolation System

by M.R. Woodruff, Savannah, GA

Eliminate the drudgery of organizing, storing, and linearly interpolating (x, y,z) table data! This program does it all with full prompting by your variable names and simulated subscripts. Branches provide data viewing and editing as well as reading and writing of data cards. Bonus - mini version included for even bigger tables. **Necessary Accessories for HP-41:** One Memory Module

Steps: 319 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01317-41-7	$10	$15
FOR HP-71	NOT AVAIL		

01318 Full Poker--5 Card Draw

by N.J. Gordon, Mountain View, CA

You play a fully automatic game of five card-draw poker with full prompting for all phases of antes, betting, drawing, raising, staying, etc. The calculator, against whom you play, can be assigned as aggressive a personality as you wish. This is a full simulation, including bluffing capability. To boot, the calculator doesn't cheat. **Necessary Accessories for HP-41:** Three Memory Modules and Card Reader

Steps: 945 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01318-41-5	$10	$19
FOR HP-71	NOT AVAIL		

01319 Flying

by K.A. Heathman, Phoenix, AZ

4 programs that calculate results of flight calculations routine to light aircraft; distance, true course, and magnetic course from latitude, longitude and variation using the Rhumbline Navigation routine; the center of gravity limits; and converts various aviation related terms to/from metric. **Necessary Accessories for HP-41:** One to three Memory Modules and a Card Reader.

Steps: 884 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01319-41-3	$10	$21
FOR HP-71*	01319-71-0	N/A	$26

01320 Coordinate Geometry System Cgs1

by J.T.J. Potts, Boulder, CO

CGS1--A complete system for coordinate geometry calculations. Stores unlimited size files of N/E coordinates on cards. Computes traverses, inverses, intersections areas, curve data, field angle traverse. Use for subdivision design, highway allignment, wherever lines and curves are used to obtain coordinates. **Necessary Accessories for HP-41:** Two Memory Modules, Card Reader and Printer

Steps: 1445 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01320-41-1	$10	$35
FOR HP-71	NOT AVAIL		

01321 Advanced Star Trek

by J.P. Patterson, Cambridge Bay NWT, Canada

HP-41C version of #00369D, non-print & print. Non-print has sector/course/ weapons angles computor. Printer version has practice firing range. Both star trek programs identical. Functions include: course control; advanced sensor system; adjustable shields; phasers; photon torpedoes; transporter/ tractor beam (for Nubian freighter): three enemy ships: corbomite maneuver (with self-destruct); computer with non-print version gives: course to middle of "mission sector", plots course to any coordinates, & gives weapons firing angles, target practice with print version simulates firing on enemy vessel. Game played in 3-dimension cube. **Necessary Accessories for HP-41:** Three or four Memory Modules

Steps: 1085 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01321-41-9	$10	$30
FOR HP-71*	01321-71-6	N/A	$38

01322 Astronomical Calculations

by A.J.P. Maclean, Springwood NSW, Australia

Eleven programs: Calendar date to Julian day number; Julian day number to Calendar date; local mean sideral time; local hour angle of a celestial body; rigorous reduction for precession and proper motion; reduction of mean to apparent place; astronomical spherical triangle evaluation; hour angle/declination to azimuth/altitude and vice versa; converts between equatorial and ecliptic coordinates; converts equatorial to galactic coordinates and vice versa. The last program calculates the local hour angle of the rising or setting of the Sun or a star, the geometric azimuth of rising or setting, and the inclination of the ecliptic to the horizon. **Necessary Accessories for HP-41:** One Memory Module. Card Reader and Printer optional.

Steps: 1404 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01322-41-7	$10	$27
FOR HP-71*	01322-71-4	N/A	$34

01323 Fluid Properties

by N.C. Shammas, Richmond, VA

Seven programs #1 evaluates the critical properties of hydrocarbons, #2 uses one routine to estimate critical temperature and other to estimate critical volume #3 solves for P, V or T using the Van Der Waals, Equation of State; #4 solves for any state parameter using the Barner-Adler Equation;#5 provides algebraic manipulations of the pressure, temperature, and molar density with the Benedict-Webb-Rubin Equation of State #6 uses the complex Sugie-Lu Equation for the algebraic manipulations of pressure, temperature, and molar volume; #7 uses two methods to evaluate liquid molar densities - Tyn and Calus Gunn and Yamada. **Necessary Accessories for HP-41:** Two Memory Modules and Card Reader.

Steps: 1228 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01323-41-5	$10	$37
FOR HP-71*	01323-71-2	N/A	$46

01324 41CV-Decorative Patterns and Letter Banner Printing

by C.L. Williams, San Jose, CA

Prints large size letters a-z, numbers 0-9 and eight special symbols. Prints seventeen large size patterns of arbitrary length. Included are zig-zags, block styles, chain, saw tooth, happy-sad faces, heart, arrow piercing a heart, ornament, and arrow of optional length. Instructions provided for constructing user's own patterns. Ideal for party decorations, border decorations for posters, bulletin boards, etc. **Necessary Accessories for HP-41:** Printer

Steps: 920 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01324-41-3	$10	$30
FOR HP-71*	01324-71-0	N/A	$38

01325 An RPN Language for Complex Variable Problems

by B.G.D. Adams, Frederictin, Canada

An RPN programming language for complex variable calculations. Includes complex analogues of all stack manipulation, storage, recall operations and numeric functions including hyperbolic functions. Works in rectangular or any polar mode. Compiler, test program and operations manual included containing programs and examples for complex Newton-Raphson Method and Simpson's Rule. **Necessary Accessories for HP-41:** Minimum of three Memory Modules. Card Reader and Printer useful.

Steps: 732 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01325-41-0	$10	$20
FOR HP-71*	01325-71-7	N/A	$24

01326 Bessel Function Arbitrary Order

by K. Akima, Boulder, CO

This program calculates, with an error less than 10 ** -8 the values of the Bessel Function JV (x) of arbitrary order v for ABS (x) less than 10. The program will also calculate the gamma function. **Necessary Accessories for HP-41:** None

Steps: 113 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01326-41-8	$10	$11
FOR HP-71*	01326-71-5	N/A	$12

01330 Non-Central Beta Distribution

by J.S. Chipman, Minneapolis, MN

This program evaluates the non-central beta distribution, as well as the beta function, gamma function, poisson density, and incomplete beta function and ratio. Compatible with "Prplot" for printer plotting. May be used in conjunction with "solve" routine in Math module to obtain critical points of noncentral beta and f distributions. **Necessary Accessories for HP-41:** Two Memory Modules and Math Module

Steps: 432 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01330-41-0	$10	$14
FOR HP-71*	01330-71-7	N/A	$16

01331 High Resolution Histogram Plot with Statistics Tbl. Printout

by K.W. Bradbury, Vineland, NJ

Programs features: *up to 183 user defined cells with Quad memory. *Overflow and underflow cells. *Grouped and ungrouped data capabilities. *Input verification and editing. *Intermediate analysis. *Automatic frequency scaling. *Cell label formatting. *Statistics with mean, SDEV, skewness, kurtosis, % frequency. *Presentable histogram and table printouts. *Regbar routine (patterned after Regplot). **Necessary Accessories for HP-41:** Minimum of three Memory Modules and Printer

Steps: 897 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01331-41-8	$10	$18
FOR HP-71	NOT AVAIL		

01332 Satellite Tracking Oscar 7 & 8

by L.G. Brown, Wichita, KS

This program will compute the bearing and elevation to any satellite in circular orbit (posigrade or retrograde) in real time or rapid list. Orbital parameters and ground station cordinates may be input from keyboard or from data cards during initialization of program. Program utilizes full alpha-numeric properties of HP-41C. **Necessary Accessories for HP-41:** One Memory Module. Card Reader helpful.

Steps: 270 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01332-41-6	$10	$14
FOR HP-71*	01332-71-3	N/A	$16

01333 Non-Linear Curve Fit Using Function Minimization

by K. Butterfield, Los Alamos, NM

This program performs a least square fit to an arbitrary non-linear functions using the simplex function minimization technique of Nelder and Mead. The program prompts for all data and data editing is supported. Ne, two or three variables may be determined. All data is stored in memory. **Necessary Accessories for HP-41:** Three Memory Modules or program separation to conserve memory.

Steps: 446 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01333-41-4	$10	$14
FOR HP-71*	01333-71-1	N/A	$16

01334 Equilibrium Constants for Gas Reactions

by N.S. Charles, Houston, TX

Determine heats of reaction and equilibrium constants for ideal gas reactions. Each of the reactions can be at a different temperature. Data required for each substance are the enthalpy and free energy of formation, and coefficients to cp=a1+a2k+a3k**2+a4k**3, where cp is heat capacity and k is temperature in kelvins. Data are shown for 60 substances. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV and Card Reader. A Stat Pac or HP Library Program #01058C may be needed for new compound data.

Steps: 648 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01334-41-2	$10	$17
FOR HP-71	NOT AVAIL		

01335 Draft

by J. Clausen, Copenhagen F, Denmark DK

This program helps you in constructing drawings of three-dimensional objects, either in parallel view (projection drawing) or in central view (perspective drawing). The program works in a three-dimensional grid, and gives as output points in a two dimensional plane in the form of x/y coordinates. These coordinates you simply plot on your drawingpaper and draw the interconnecting lines or curves. The program is a system consisting of a set of functional program modules and a program monitor which controls the input and execution of a selectable sequence of modules. **Necessary Accessories for HP-41:** None

Steps: 308 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01335-41-9	$10	$13
FOR HP-71*	01335-71-6	N/A	$14

01336 U.S. British Metric Conversions

by J. Cote, Columbia, MD

Are you not tired of trying to search a conversion through multiple programs. Here is the program. From length, area, volume, speed, weight temperature and pressure you will be able to go from any combination of U.S., British and metric units in any direction: U.S. to British, U.S. to metric, British to metric and all reversed conversions. As a new conversion addition, the miles per gallon calculations we all do may now be converted to liters per 100 kilometers. **Necessary Accessories for HP-41:** Three Memory Modules or One Quad Memory Module

Steps: 617 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01336-41-7	$10	$16
FOR HP-71*	01336-71-4	N/A	$18

01338 Insulation Characteristics

by A.R.D. Dasler, Washington, DC

This program solves for either the surface temperature of the thermal insulation, emissivity of the insulation surface, or the apparent k factor. Convective, radiative and total heat losses are calculated separately, not by subtraction or addition of two in combination to find the third. Heat losses are calculated in terms of BTU/sq. T. Hr, BTU/lin. T. Hr, and watts per meter squared. **Necessary Accessories for HP-41:** Three Memory Modules and Printer

Steps: 473 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01338-41-3	$10	$16
FOR HP-71*	01338-71-0	N/A	$18

01339 Curved Beam Loaded Normal to the Plane of Curvature

by K.R. Dawson, Alpine, CA

This program allows the user to compute the transverse shear, bending moment, twisting moment, deflection, bending slope and roll slope at up to 14 points along a curved beam loaded normal to the plane of curvature and having clamped ends. The applied loading may consist of any and all combinations of point load, point moment and point torque as well as distributed load and torque. Loading conditions are combined by superposition. **Necessary Accessories for HP-41:** None

Steps: 751 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01339-41-1	$10	$16
FOR HP-71*	01339-71-8	N/A	$18

01340 Phase Loop Analysis

by F.R. Fluhr, Oxon Hill, MD

This program provides transient response solutions to nonlinear phase-lock-loop differential equations. The nonlinearities include saturation, thresholding, and hysteresis. It also solves the linear case. By proper definition of terms, the program models servo systems of similar type. **Necessary Accessories for HP-41:** One Memory Module or Quad Memory Module. Printer highly desirable.

Steps: 313 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01340-41-9	$10	$13
FOR HP-71*	01340-71-6	N/A	$14

01341 Resistive Pads

by D.C. Garry, Hamilton, New Zealand

Program calculates minimum loss between any two impedances. For unequal impedances an I-type minimum loss pad can be calculated. For equal and unequal impedances a t-pad or pi-pad can be calculated for values of loss greater than the minimum loss. Balances pad easily worked out from values given. **Necessary Accessories for HP-41:** None

Steps: 153 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01341-41-7	$10	$12
FOR HP-71*	01341-71-4	N/A	$14

01342 Rubik Cube Solution

by J.L. Gilby, Vancouver, Canada

Rubik's magic cube has taken the world by storm recently. This program solves the famous cube from any position. The user enters the initial colours of the faces and the HP-41c proceeds to solve the cube using three subroutines. The output is a series of instructions informing which face should be rotated. The program is fully illustrated and the notation used is explained so that it will now be simple to solve the cube. This solution will not break any world records as it is relatively slow. An appendix to this program has been added so that those with the HP-IL Digital Cassette drive can now use it. Changes to run pgm on cassette drive are documented. **Necessary Accessories for HP-41:** HP-41CV or Quad RAM, Card Reader (if cassette drive used, this is only needed for initial entry). Printer optional.

Steps: 1217 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01342-41-5	$10	$24
FOR HP-71	NOT AVAIL		

01343 Increasing Data Storage Efficiency

by P. Glasson, New Durham, NH

This set of three subroutines enables the user to store and recall two data points from each data storage register. Each stored number contains three significant digits, exponent, and sign. The program optionally will clear a storage location. The routines use 25 registers for code, so with 50 or more data points, the program will save memory. **Necessary Accessories for HP-41:** None

Steps: 106 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01343-41-3	$10	$12
FOR HP-71*	01343-71-0	N/A	$14

01346 Rally

by L.E. Hansman, Kitchener, Canada

"Rally" is a fast-paced, action-packed car race run on public roads in which you compete against yourself or friends. Realistic obstacles require you to make split-second decisions in your race against the clock. If you disobey traffic laws as you 'drive' to win, the "***Police***" are just one of the many surprises the HP-41 has waiting for you. **Necessary Accessories for HP-41:** Three Memory Modules. Card Reader helpful.

Steps: 570 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01346-41-6	$10	$17
FOR HP-71*	01346-71-3	N/A	$20

01347 Complete Christian-Era Calendar

by W.E. Hitchins, Los Angeles, CA

Performs calendar functions from Jan. 1, A.D., through Dec. 31, 4903, the entire period of the Christian-Era Calendar that can be calculated with any certainty. Program allows for both the Augustan and Gregorian corrections and computes Julian day, days between dates, day of week, and date of a specified number of days before or after a given date. Rejects invalid dates. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 598 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01347-41-4	$10	$16
FOR HP-71*	01347-71-1	N/A	$18

01348 Septic Tank Volume and Absorption Field

by D. Holmes, Bettendorf, IA

This program computes the minimum septic tank size and length of absorption field trench. Required input includes gallons of sewage per day or number of bedrooms, percolation rate, and the desired trench width. **Necessary Accessories for HP-41:** None

Steps: 266 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01348-41-2	$10	$13
FOR HP-71*	01348-71-9	N/A	$14

01349 Checkers

by D. Hughes, Billings, MT

A game of Checkers in which the player tries to beat the computer. **Necessary Accessories for HP-41:** Checker Board and playing pieces.

Steps: 519 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01349-41-0	$10	$15
FOR HP-71*	01349-71-7	N/A	$18

01350 Rule of 78

by F.L. Jackson, Pomona, CA

This program not only calculates the unearned interest (rebate) and the remaining principal due (balance); but it will also calculate the periodic interest paid for each period, (year; month; week; day) for the full term of the contract. **Necessary Accessories for HP-41:** Printer helpful.

Steps: 108 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01350-41-8	$10	$12
FOR HP-71*	01350-71-5	N/A	$14

01351 Checkbook Tracker - 1

by N.M. Johnson, Youngstown, OH

This program will turn your 41C into a checkbook tracker and error finder. Equipped to handle checks written or those voided, deposits made and service charges, with the balance shown after each transaction. This program includes a printout of all transactions and has a special feature which allows you to make a mistake and recover it in one simple and easy move. The mistake recovery feature is invaluable. **Necessary Accessories for HP-41:** One Memory Module, Card Reader and Printer

Steps: 236 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01351-41-6	$10	$13
FOR HP-71	NOT AVAIL		

01352 Hexadecimal/Decimal/Binary Number Conversions (Hexdeb)

by W.R. Kast, Denver, CO

This program converts binary or hexadecimal values to decimal values; without data re-entry converts decimal to binary or hexadecimal representation. Program limit decimal 1023 max for binary conversions, decimal 1, 048, 575 max for hex conversions. **Necessary Accessories for HP-41:** One Memory Module

Steps: 272 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01352-41-4	$10	$13
FOR HP-71*	01352-71-1	N/A	$14

01353 RNAV

by R.G. Kampe, Gahanna, OH

This program mainly computes navigational fixes (waypoints) along a great-circle route. It repeatedly prompts for the three letter airport or radio facility identifiers normally used in aviation, e.g., Stl for St. Louis, Mo. with the added advantage of not always having to press the R/S key. **Necessary Accessories for HP-41:** Memory Module and Card Reader

Steps: 183 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01353-41-2	$10	$14
FOR HP-71	NOT AVAIL		

01354 Management of 2 Simultaneous Bank Accounts

by J. Kent, Amsterdam, Holland

Manages the administration of two separate bank accounts, allowing movements from one to the other. Keeps owner's and bank's balance separate and keeps track of orders entered in owner's books until they are entered in the bank's balance. Checks stored data and announces disturbances in error messages. **Necessary Accessories for HP-41:** None

Steps: 475 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01354-41-0	$10	$15
FOR HP-71	NOT AVAIL		

01355 Master Mind and Rubik's Cube in One

by J. Kent, Amsterdam, Holland

Execute Rubik-like moves in a secret or displayed code and display responds with master-mind-like information on the resulting code or with the resulting code itself. Restore standard code in as few possible moves. Four display types and three game options for a choice among 28 different games, from very easy to quite difficult. With optional anti-cheat lock. **Necessary Accessories for HP-41:** None

Steps: 647 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01355-41-7	$10	$16
FOR HP-71*	01355-71-4	N/A	$18

01357 Fast Fourier Transform II

by N. Kim, Seattle, WA

This program can compute Discrete Fourier Transform (DFT) or Inverse Dft (IDFT) of up to a 64-point complex sequence, a 128-point real sequence and two 64-point real sequences simultaneously, using the radix-2 decimation-in-time FFT algorithm, and also can plot the magnitude and phase of input and output sequences. **Necessary Accessories for HP-41:** Quad Memory or HP-41CV and Printer

Steps: 684 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01357-41-3	$10	$20
FOR HP-71	NOT AVAIL		

01358 Reinforced Square Footing

by R. Klimoff, Berlin, NJ

Given the allowable bearing pressure, column dimensions, ultimate and service loads, this program will calculate the required footing size and thickness and the required area of reinforcing steel. Given the bar size, the required number of reinforcing bars, a development length check and the bar spacing is calculated. **Necessary Accessories for HP-41:** None

Steps: 292 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01358-41-1	$10	$12
FOR HP-71*	01358-71-8	N/A	$14

01359 Harm (Harmonic Analysis of a Periodic Function)

by J.M. Kos, Holyoke, MA

This program calculates the fourier sine and cosine coefficients for any specified harmonic of a periodic function of arbitrary period. The function is approximated over one period by n equally spaced linear segments. The fourier coefficients of the approximating function are exact. The program is interactive and prompts for all required inputs. **Necessary Accessories for HP-41:** Memory Modules according to the number of points in the approximating function.

Steps: 187 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01359-41-9	$10	$12
FOR HP-71*	01359-71-6	N/A	$14

01360 Complex RPN for Complex Number Treatment

by P. Laedrach, Rufenacht, Switzerland

This 394 steps (767 bytes) program contains 35 complex functions including a 4-level operational stack with all usual stack-manipulations, up to 100 complex storage registers (with 4 memory modules inserted), all four basic arithmetic operations, several mathematical and all exponential, trigonometric and hyperbolic functions with their inverses. With all functions assigned to the appropriate keys in user-mode your HP-41C (complex) lets you handle complex numbers with all the comfort of the RPN-logic as easy as real numbers. **Necessary Accessories for HP-41:** None

Steps: 394 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01360-41-7	$10	$14
FOR HP-71*	01360-71-4	N/A	$16

01361 Earth Dams and Cut Slopes Stability and Safety

by R.K. Lloyd, Albuquerque, NM

With given cross section (defined by coordinate system) and soil parameters, program computes all line intersections with various arcs, and includes a search pattern for the critical arc and lowest factor of safety. Printed output includes coordinates of critical arc, resisting forces, driving forces, and factor of safety. **Necessary Accessories for HP-41:** Printer and three Memory Modules

Steps: 629 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01361-41-5	$10	$16
FOR HP-71*	01361-71-2	N/A	$18

01364 Production Monitor and Record Accumulator Wk, Mth, Qtr & Yr

by R.K. McDonald, Milpitas, CA

Enter the number of units produced and the amount of time (h. Mss) it took to produce them & the program adds 1 to "a number of jobs" register. This data is accumulated in a buffer & displays the un. per. hr. for a few sec. & then returns to enter units prompt. You periodically dump the buffer into wk, mth, qtr, & yr registers for subsequent review. The highest & lowest un. per. hr. is also retained. Completely prompted & has a delete last entry function. **Necessary Accessories for HP-41:** Two Memory Modules and Card Reader

Steps: 266 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01364-41-9	$10	$13
FOR HP-71	NOT AVAIL		

01365 Spline Interpolation for Discrete Data

by B.U. Meier, Zurich, Switzerland

The spline function s(x) is a piecewise polynomial function of degree <=3. s(x) and its derivatives of order 1 & 2 are continuous everywhere ("smoothness"). Calculation of s(x) with n <= 34 data points. The function and the data points are plotted automatically using different symbols for (xk, yk) and interpolated points. A curve discussion is made (maxima, minima and turning points are found) and the integral of the spline at any boundaries within the total interval is given. Minimal number of program registers needed for execution: 125 (main program + largest subroutine). **Necessary Accessories for HP-41:** Minimal number of program registers needed for execution: 125 (Main program + largest subroutine).

Steps: 995 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01365-41-6	$10	$20
FOR HP-71	NOT AVAIL		

01366 Supply Grilles Selection for H Vac Systems

by N.M. Miranda, Buenos Aires, Argentina

This program can be used to compute supply grilles for air distribution according to several variables and correction factors not so easy to do in conventional way (from tables). **Necessary Accessories for HP-41:** None

Steps: 454 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01366-41-4	$10	$15
FOR HP-71*	01366-71-1	N/A	$18

01367 Frame Analysis 3-6 Bays 2 Story

by R.F. Campbell, Salt Lake City, UT

Computes joint moments for 2 story, 3 to 6 bay frame, subjected to either vertical or lateral forces. Columns may be pinned or fixed at base. Frame and loading may be unsymmetrical and program prints balancing forces for sideways correction. Program prompts, vertical load F.E.M.'s and lateral forces. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV, Card Reader, Printer and 16 Cards. Rechargeable Battery Pack recommended.

Steps: 1622 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01367-41-2	$10	$26
FOR HP-71	NOT AVAIL		

01368 Line Coordinate Calculations

by R.K. Noble, Westminster, CA

A package of 6 routines including 2d or 3d coordinate input, 3d line extrapolation, useful for any linear relationship, a plane through 3 points, angle between points (requires 4 points), plane translation rotation and line-line and line-plane intersection (this routine provides for changing the intersecting line after a solution has been output). **Necessary Accessories for HP-41:** One Memory Module

Steps: 850 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01368-41-0	$10	$20
FOR HP-71*	01368-71-7	N/A	$24

01369 Long Distance Phone Call Timer

by W.A. Barnett, Los Angles, CA

Program times long distance phone calls, displaying the cost and duration of calls simultaneously, continually updated. Stores phone rates for three rate periods to four locations. Alerts user with "BEEP" when selected time or cost has accumulated. Accepts non-programmed time rates. Displays key captions. **Necessary Accessories for HP-41:** None

Steps: 170 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01369-41-8	$10	$12
FOR HP-71*	01369-71-5	N/A	$14

01370 Solution of Tridiagonal Matrices by Thomas Algorithm

by L.A. Arreola, Mexico City, MEXICO

The solutions of tridiagonal matrices is found by Thomas Method. This method is valid to systems up to 7 unknowns with an HP-41C. With an additional memory module you can solve systems up to 23 unknowns and with a Quad memory module you can work systems up to 71 unknowns. **Necessary Accessories for HP-41:** Card reader optional

Steps: 161 HP-41 Bytes: 246

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01370-41-6	$10	$12
FOR HP-71*	01370-71-3	N/A	$14

01371 Biorhythm Plotting Routine

by I.D. Chennell, Adelaide, Australia

This program plots biorhythm curves for any month, given birthdate and the month to plot. Each cycle may be plotted separately or all three may be generated. Each plot is headed up with the person's name, the cycle being plotted (physical, sensitivity or cognitive), and the month and year. **Necessary Accessories for HP-41:** One memory module, Printer and Time Module

Steps: 197 HP-41 Bytes: 445

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01371-41-4	$10	$12
FOR HP-71	NOT AVAIL		

01372 Ragman

by D.M. Daniel, Pensacola, FL

Program finds tacking angle, modified wind speed and direction, course to steer on opposite tack, amount of time to spend on each tack to reach the mark. It also finds the speed and distance made good on each tack as well as total time and distance to reach the mark. It also provides for proper solution if conditions change after beginning the first tack. **Necessary Accessories for HP-41:** Two memory modules

Steps: 412 HP-41 Bytes: 837

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01372-41-2	$10	$14
FOR HP-71*	01372-71-9	N/A	$16

01373 The Sailings

by D.M. Daniel, Pensacola, FL

Program solves all basic Sailings problems; crosses the IDL and/or Equator; computes Great Circle Initial Course and Distance; Lats and Los of vertex; computes L0 of legs at regular intervals with corresponding latitude and the course and distance thereto; and composite sailing with limiting latitude. Program then compares the 5 distances involved. **Necessary Accessories for HP-41:** Three memory modules. Printer optional.

Steps: 713 HP-41 Bytes: 1206

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01373-41-0	$10	$16
FOR HP-71*	01373-71-7	N/A	$18

01374 Non-Linear Multiple-Variable Newton-Raphson Technique

by N.M. Okpara, San Jose, CA

The maximum capability of the program is ten non-linear equations. It offers a choice between finite or central difference schemes for the evaluation of the partial derivatives and then uses a Gauss-Jordan row elimination scheme incorporating partial pivoting to solve the resulting system of linear equations. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV. Printer optional. Card Reader convenient.

Steps: 592 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01374-41-8	$10	$23
FOR HP-71*	01374-71-5	N/A	$28

01375 Banded Matrix Solution

by N.M. Okpara, San Jose, CA

Computes solutions to systems of banded matrices which occur in finite-difference or finite-element analysis. In effect, linear systems as high as 60 equations normally outside the scope of the 41C, now become a possibility with this program. Its register saving ability over conventional Gaussian systems is outstanding. **Necessary Accessories for HP-41:** Between one to four Memory Modules. Card Reader and Printer optional.

Steps: 284 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01375-41-5	$10	$12
FOR HP-71*	01375-71-2	N/A	$14

01376 Barometric Levelling

by W. Padrain, Jakarta, Indonesia

Program computes elevation differences (in Metres) between base station and other unknown elevation stations. Barometer readings may be directly in metres or in millibars. Both the single barometer method of linear interpolation of base pressure as well as the two barometer method of known base pressure may be used. Temperature effects are considered. **Necessary Accessories for HP-41:** None

Steps: 122 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01376-41-3	$10	$11
FOR HP-71*	01376-71-0	N/A	$12

01377 Inorganic Carbon Computation

by W. Padrain, Jakarta, Indonesia

Program calculates inorganic carbon species in water, given pH, temperature, alkalinity and ionic strength. Program is similar to 00653C except that only one magnetic card is required, no accessories are necessary, and only eight (instead of 38) storage registers are used. **Necessary Accessories for HP-41:** None

Steps: 119 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01377-41-1	$10	$11
FOR HP-71*	01377-71-8	N/A	$12

01378 Non Uniform Cash Flow Analysis

by M. Parnell, Denfield, Canada

Enter a series of projected cash flows only once. User can then easily check and correct the entries, calculate the net present value, the internal rate of return, and the future value, of all or just part of the cash flow series and for different interest rates and initial investments. **Necessary Accessories for HP-41:** One Memory Module

Steps: 292 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01378-41-9	$10	$13
FOR HP-71*	01378-71-6	N/A	$14

01379 System of Equations: Version 1 (Maximum Accuracy)

by R.O. Pinto, Sao Jose Dos Campos, Brazil

This program solves a system of up to fifteen linear equations with real coefficients in fifteen unknowns. It presents the determinant absolute value of the matrix of coefficients for a first check of the solution. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 220 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01379-41-7	$10	$12
FOR HP-71*	01379-71-4	N/A	$14

01380 System of Equations: Version 2 (Maximum Size)

by R.O. Pinto, Sao Jose Dos Campos, Brazil

This program solves a system of up to thirty linear equations with real coefficients in thirty unknowns. The calculations are done as the coefficients are entered and a minimum storage registers are required for this program. **Necessary Accessories for HP-41:** Memory Modules for more than 6 equations. Printer optional.

Steps: 172 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01380-41-5	$10	$12
FOR HP-71*	01380-71-2	N/A	$14

01381 Circular Plate - No Hole - Plate 0

by S.A. Porter, Tacoma, WA

This program will provide the user with displacement, slope, and stress solutions at any radius on a circular plate with no hole considering the outside edge either simply supported or fixed. The user may apply a uniform pressure load of any bandwidth, a ring load or a center load, or a combination of both anywhere on the plate. **Necessary Accessories for HP-41:** Three Memory Modules and Printer

Steps: 873 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01381-41-3	$10	$17
FOR HP-71*	01381-71-0	N/A	$20

01382 Circular Plate with Hole - Plate 3

by S.A. Porter, Tacoma, WA

This program will provide the user with displacement, slope, and stress solutions at any radius on a circular plate with a center hole considering the outside and inside edge either simply supported or fixed. The user may apply a uniform pressure load of any bandwidth, a ring load, or a combination of both anywhere on the plate. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV and Printer.

Steps: 1158 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01382-41-1	$10	$20
FOR HP-71*	01382-71-8	N/A	$24

01383 Microwave Path Analysis

by R.L. Prather, Vienna, VI

Analyzes path and link parameters for line-of-sight radio link: 1) obstacle clearance in terms of fraction of first fresnel zone, or number of Fresnel zones. 2) free space loss. 3) RF transmission line loss, given length and type. 4) received carrier intensity, given transmit power and parabolic antenna diameters. **Necessary Accessories for HP-41:** Card Reader desirable

Steps: 169 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01383-41-9	$10	$12
FOR HP-71*	01383-71-6	N/A	$14

01384 Celestial Fix or Running Fix

by J.T. Rehberg, Cleveland, OH

Given dead reckoning coordinates of latitude and longitude, Greenwich hour angles, declinations and corrected sextant observed altitudes for two celestial observations. Calculate the coordinates of latitude and longitude for a two body fix or a running fix from the last entered dead reckoning position. The program calculates the computed altitude (HC), azimuth (ZN) and altitude intercept (A) of both observations. Accepts and displays data in degrees, minutes and tenths of minutes, degrees and tenths of degrees of zn, nautical miles and tenths of miles of altitude intercept. **Necessary Accessories for HP-41:** Printer and Card Reader optional.

Steps: 209 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01384-41-7	$10	$13
FOR HP-71*	01384-71-4	N/A	$14

01385 Cosine on a Pedestal Antenna Gain

by R.M. Rhodes, Sunnyvale, CA

This program computes the gain as a function of angle from boresite for a one dimensional antenna with a cosine on a pedestal aperture distribution. Beamwidth and pedestal height are selectable. Output is formatted when used with printer. **Necessary Accessories for HP-41:** None

Steps: 203 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01385-41-4	$10	$12
FOR HP-71*	01385-71-1	N/A	$14

01386 Resonance Region Radar Cross Section of Thin Wires

by R.M. Rhodes, Sunnyvale, CA

Program computes monostatic radar cross section of perfectly conducting thin wires in the resonance region. Input consists of wire length and radius, radiation frequency, and polarization angle. Output is RCS over the desired range of incidence angles at the desired increment of incidence angle. User has option of obtaining average RCS. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 465 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01386-41-2	$10	$14
FOR HP-71*	01386-71-9	N/A	$16

01387 Taylor Weighted Circular Antenna Gain

by R.M. Rhodes, Sunnyvale, CA

Computes gain of a circular antenna with a taylor weighting aperture distribution, as a function of angle with respect to boresite. User inputs antenna diameter, frequency of radiation and desired sidelobe level. When used with printer output is formatted. **Necessary Accessories for HP-41:** Two Memory Modules. Printer and Card Reader desirable.

Steps: 418 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01387-41-0	$10	$15
FOR HP-71*	01387-71-7	N/A	$18

01388 Layout

by P.E. Richmond, Franklin, LA

This program calculates the necessary inputs to set up/program the excellon MK-IVC and XL-3 printed circuit driller/routers. Board layup on flats is calculated as well as edge spacing, datum set points, and tooling hole coordinates. Program can be used with other punching, drilling, or routing equipment with small changes. **Necessary Accessories for HP-41:** Two Memory Modules. Printer and Card Reader helpful.

Steps: 322 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01388-41-8	$10	$13
FOR HP-71*	01388-71-5	N/A	$14

01389 Multi-Function Curvefit

by L. Rojas, Canoga Park, CA

Determines the coefficients of an equation, of up to 14 functions, that will curvefit the input data of up to 3 variables, x(i), y(i) and z(i), by the least square method. The program will also compute new values of the equation using the coefficients. **Necessary Accessories for HP-41:** Math 1 Pac

Steps: 242 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01389-41-6	$10	$13
FOR HP-71	NOT AVAIL		

01390 Dieset

by F. Sagmueller, Hohenberg, Austria

This program calculates with or without printer a dieset for wire drawing with reduction in area for each die unchanged or falling or rising. The reduction in area can be output in % or as logarithmical change (true strain). **Necessary Accessories for HP-41:** None

Steps: 160 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01390-41-4	$10	$11
FOR HP-71*	01390-71-1	N/A	$12

01392 B&W Reciprocity Curve Data

by R. Simons, Atlanta, GA

Using quadratic curve fitting techniques, this program provides all essential reciprocity effect adjustments in time and development required by Kodak professional B&W films as given in tabular and graphical form in Kodak Publication #0-2. **Necessary Accessories for HP-41:** None

Steps: 125 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01392-41-0	$10	$12
FOR HP-71*	01392-71-7	N/A	$14

01393 Cubic

by R.W. Slater, Charleston, CA

This program provides a general solution for real roots of the cubic equation to any desired precision, first displaying the quantity of real roots (1 or 3). Additionally, this program is an integral part of another program which solves fourth-order equations. **Necessary Accessories for HP-41:** For combined programs Quad Memory or HP-41CV.

Steps: 271 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01393-41-8	$10	$16
FOR HP-71*	01393-71-5	N/A	$18

01394 Section Properties - Single Axis

by L.C. Smith, Milwaukee, WI

This program calculates the sectional properties (area, neutral axis, moment of inertia and section modulus) of a cross section composed of orthogonally arranged rectangles (plates). The height, width and location of each retangular component is entered until the entire section has been covered. Numerical integration approximation is also possible. **Necessary Accessories for HP-41:** None

Steps: 94 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01394-41-6	$10	$11
FOR HP-71*	01394-71-3	N/A	$12

01395 Alpha Rotate

by D. Smith, Corvallis, OR

A puzzle!! Not quite Rubik's Cube, but never the less, a challenge. The object is to alphabetize the letters "a" - "p" on a 4x4 playing board. The letters, arranged randomly at the beginning of the game, are maneuvered on the board by rotating blocks of four letters clockwise one position. One special move, allowed only once each game, exchanges any two letters. At any point in a game the playing board may be recorded on a data card. Playing boards may also be generated and recorded. An alternate version for the Wand is also included. **Necessary Accessories for HP-41:** One Memory Module and Printer. Card Reader and Wand optional.

Steps: 274 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01395-41-3	$10	$13
FOR HP-71	NOT AVAIL		

01396 Generalized Manning Equation for Open Channel Flow

by C.W. Slocum, Wellton, AZ

Program accepts five known parameters and calculates unknown flow, or depth, or roughness, or slope for any symmetrical cross section (rectangular, trapezoidal, or triangular). Calculated parameter is stored for use in continuing calculations where effects of variation of one or more of original parameters may be observed. **Necessary Accessories for HP-41:** None

Steps: 165 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01396-41-1	$10	$12
FOR HP-71*	01396-71-8	N/A	$14

01397 Hardy Cross (HDY +)

by L.L. Spangler, Phoenix, AZ

Performs the classic Hardy Cross procedure for multiple pipe looped systems. Utilizes Hazen-Williams equation for computing head losses. Inputs for each pipe are actual or nominal pipe diameter (inches), assumed flow and direction (GPM), pipe length (feet), and Hazen-Williams coefficient. Output can be used to determine elevation of hydraulic grade line and, if elevation is considered, pressure. No limit to number of pipes (nodes) in a loop or number of loops. Maximum number of pipes is 122 with Quad RAM but pipes shared are entered for each loop. **Necessary Accessories for HP-41:** Printer and Quad RAM (if Memory Modules are used deduct 32 pipes for each Module required).

Steps: 283 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01397-41-9	$10	$13
FOR HP-71*	01397-71-6	N/A	$14

01398 Multiple and Polynomial Regression

by B. Stavis, Cambridge, ME

For multiple regression equations up to nine independent variables or polynomial equations up to order nine, the program estimates coefficients, standard errors and t scores of coefficients, r square, standard error of estimate, and residual sum of squares. Provisions are included for correcting erroneous data entries, storage of the cross product matrix for future use, and projections based on the estimated coefficients. **Necessary Accessories for HP-41:** Quad Memory Module for HP-41CV and Math Pac

Steps: 668 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01398-41-7	$10	$15
FOR HP-71	NOT AVAIL		

01399 Ledger, NPV

by B. Stavis, Cambridge, ME

Ledger performs a wide range of manipulations with numbers, as specified by user. It can determine cash flows under any assumptions for up to 20 time periods. NPV computes the net present value of variable cash flows and determines the internal rate of return. **Necessary Accessories for HP-41:** Quad Memory Module or HP041CV (ledger can function with 3 Memory Modules, NPV can function with one Memory Module). Math Pac desirable as it allows use of shorter NPV version.

Steps: 206 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01399-41-5	$10	$17
FOR HP-71*	01399-71-2	N/A	$20

01400 Curve Fit & Automatic Plot Best Fit for Polynomials to 1

by W.W. Steffen, Indianapolis, IN

Uniquely selects the best fit of 11 polynomials, degrees 1 to 11 without destroying data. Data may be subtracted or added at any time. Single curves may be selected and fit. Any curve is easily plotted. Prints coefficients of curve, determination and correlation, standard deviation of y, and standard error of estimate. **Necessary Accessories for HP-41:** Three Memory Modules, Math Pac 1 Module, Printer, Card Reader or Wand

Steps: 354 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01400-41-1	$10	$13
FOR HP-71	NOT AVAIL		

01401 Clinical Cardiopulmonary Calculations for Critical Care

by C.M.D. Soder, Halifax, Canada

Program calculates one or all of the following critical care indices from pulmonary and hemodynamic data: cardiac index: pulmonary and systemic vascular resistance; ventricular stroke and minute work; body surface area; alveolar-arterial O2 - gradient; physiologic shunt and tissue O2 extraction rate. All data input prompted for and output labelled. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 567 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01401-41-9	$10	$17
FOR HP-71*	01401-71-6	N/A	$20

01402 Restricted Three Body Problem

by G.H. Stumpff II, Dayton, OH

Given two masses in circular revolution about their common center of mass due to their mutual gravitational interaction, this program calculates the resulting three dimensional motion of a third, much smaller mass with respect to the two primary masses. Forces on the third mass are gravitational, centrifugal, and the coriolis force. **Necessary Accessories for HP-41:** Rechargeable batteries and AC Power Supply strongly recommended.

Steps: 192 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01402-41-7	$10	$12
FOR HP-71*	01402-71-4	N/A	$14

01403 Cooling Load Calculations

by R.R. Toldano, APO Miami, FL

This program is based on the cooling load calculation method as prepared by Ashrae under Contract #H-2303 and requires the use of tables that appear in the Ashrae Manual #Grp 158. In the form presented, this program will calculate the sensible heat load and latent load (due to people) for an area for three different hours of the day - i.e., (10) 10 A.M. (14) 2 P.M. (17) 5 P.M. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV and Card Reader

Steps: 533 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01403-41-5	$10	$18
FOR HP-71*	01403-71-2	N/A	$22

01404 Hourly Analysis Costing

by C. Tolley, Renmark, South Australia

This program is useful for item area costing, in analysis work. After the hourly $ rate is entered, the hours spent in each area (from an analysis sheet) can be entered and the resulting cost is displayed. A printer is optional. The program lends itself for subroutine use. **Necessary Accessories for HP-41:** None

Steps: 72 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01404-41-3	$10	$11
FOR HP-71*	01404-71-0	N/A	$12

01405 Auto Log for Gas and Maintenance

by H.D. Towne, Steubenville, OH

Program determines the average MPG between each fill-up and records the date, miles accumulated, total cost, and cost per gallon at each fill-up. A conversion routine is included for cost per litre cases. Also included is conditional testing for oil, filter, and spark plug changes. Data can be stored on a card or in available registers. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV. Card Reader optional.

Steps: 107 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01405-41-0	$10	$13
FOR HP-71*	01405-71-7	N/A	$14

01406 State Plane Coordinates

by R. Twilling, Winnetka, IL

A comprehensive software package for dealing with state plane coordinates. Given lat. & long. finds x- and y-coordinates, and vice versa. Converts coordinates directly from one zone to another. Finds mapping angles and scale factors. Also determines distances, arc-chord corrections, grid and geodetic azimuths between any two points. The unique configuration of this 5-program package allows great flexibility without requiring frequent switches of programs or data. All four coordinate systems used in the U.S. can be handled, including the Alaska-1 projection. **Necessary Accessories for HP-41:** Quad Memory Module (although three Modules will suffice with a small sacrifice of flexibility). Card Reader and Printer optional.

Steps: 1575 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01406-41-8	$10	$24
FOR HP-71	NOT AVAIL		

01407 Partial Correlation Coefficient

by B.R. Vianna, Belo Horizonte, Brazil

This program permits the calculation of any partial correlation coefficient up to third-order for five variables, x1, x2, x3, x4, x5, where any one of the variables could be the dependent variable. The calculation is based on the correlation matrix. **Necessary Accessories for HP-41:** One Memory Module

Steps: 186 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01407-41-6	$10	$12
FOR HP-71*	01407-71-3	N/A	$14

01408 1D and 2D Table Lookup

by J.A. Walters, Smyrna, GE

Table lookup with linear interpolation on 1d and 2d tables. May be used alone or as subroutine. Multiple tables allowed in memory. Easy to use as it mimics standard HP-41 functions: stack preserved with x replaced by f(x) or f(x, y). (229 lines) table storage routine also provided (264 lines). **Necessary Accessories for HP-41:** One Memory Module

Steps: 493 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01408-41-4	$10	$15
FOR HP-71*	01408-71-1	N/A	$18

01409 Slope Stakes

by S.J. White, Salem, OR

Provides the "x" and "y" coordinates for the intersection of a given slope ratio with existing ground line and the slope distance from same to center line. Applicable to both construction and design stages. Required: ground line coordinates; slope ratio; and grade structure dimensions. **Necessary Accessories for HP-41:** Printer desirable

Steps: 106 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01409-41-2	$10	$11
FOR HP-71*	01409-71-9	N/A	$12

01410 Variable Root Finder (VRF)

by D. Wile, San Jose, CA

This program solves for the unknown parameter in any equation with any number of known parameters. However, any of the parameters can be solved for without rewriting the program. The selection of the parameter to be solved for is done while the program is running at the time that the known parameters are entered. **Necessary Accessories for HP-41:** None

Steps: 113 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01410-41-0	$10	$12
FOR HP-71*	01410-71-7	N/A	$14

01411 Welded WF Section Properties

by Q.L. Yada, Hastings, NE

This program calculates the gross and net section properties for a welded wide flange plate girder with equal width flanges, but unequal flange thicknesses. **Necessary Accessories for HP-41:** One Memory Module

Steps: 288 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01411-41-8	$10	$13
FOR HP-71*	01411-71-5	N/A	$14

01412 Monitored Solution to F(X)=0 on an Interval

by J.S. Chipman, Minneapolis, MN

This program is a modification of the "SOLVE" routine in the Math Pac which furnishes indexed displays of the succession of trial values of the variable and of the function as well as the number of iterations. Performs with printer attached and on, attached and off, or unattached. **Necessary Accessories for HP-41:** 1 Memory Module.

Steps: 259 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01412-41-6	$10	$12
FOR HP-71*	01412-71-3	N/A	$14

01413 Function Tabulator

by J.S. Chipman, Minneapolis, MN

Calculates and stores a grid of values of any user-defined function capable of being plotted by "PRPLOT" routine, in a form that can be used for subsequent more rapid and repeated plotting. Calculation of maximum and minimum tabulated y values included. Fully prompted. **Necessary Accessories for HP-41:** 2 or more Memory Modules for tabulation of up to 35 x values. Printer for plotting.

Steps: 392 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01413-41-4	$10	$14
FOR HP-71	NOT AVAIL		

01414 LCN for Flexible Pavements

by K.J. DeBord, Kent, WA

This program calculates Load Classification Number (LCN) for single, dual, tandem and dual-tandem sets of wheels (gear) operating on flexible pavement. LCN relates the loading characteristics of a vehicle gear with the load-bearing properties of a pavement. Specifically, it is used to classify airfield pavements and the aircraft operating on them. It is used throughout the world as one method of determining if a large commercial aircraft may operate at an airfield, based on pavement strength considerations. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 225 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01414-41-2	$10	$12
FOR HP-71*	01414-71-9	N/A	$14

01415 Polynomial Curve Fitting, 2nd thru 9th Order

by J.C. Elison, Albuquerque, NM

Eight polynomial equations, 2nd thru 9th order, may be calculated for a given set of (x, y) data using least squares method and Gauss elimination. The data need be entered only once. A coefficient of determination is calculated for each fit. Running time: approximately 3.5 minutes for 9th order fit. **Necessary Accessories for HP-41:** 3 Memory Modules/8th, 9th order; 2 Memory Modules/3rd-7th order; 1 Memory Module/2nd order.

Steps: 293 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01415-41-9	$10	$13
FOR HP-71*	01415-71-6	N/A	$14

01416 Beam/Column Design

by T.J. Fischetti, Whittier, CA

This system will design a beam-column in accordance to the 1980 AISC Specifications. The program is written so that only the design forces and member data need be entered. All preliminary calculations to determine whether or not the proposed beam will be acceptable are conducted by the calculator. **Necessary Accessories for HP-41:** 3 Memory Modules; Card Reader and Printer Optional.

Steps: 717 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01416-41-7	$10	$17
FOR HP-71*	01416-71-4	N/A	$20

01417 Frame Analysis

by T.J. Fischetti, Whittier, CA

This program will determine the member forces of a two story two bay rigid frame. The frame may be subject to two different loading configurations. The program will determine axial forces, shears and end moments for each member of the frame, for each load case. **Necessary Accessories for HP-41:** Card Reader

Steps: 1414 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01417-41-5	$10	$26
FOR HP-71	NOT AVAIL		

01418 CONSIM

by B.G. Honda, Federal Way, WA

Control loop and process simulation. Process is user definable: up to 3rd order, gain, noise factor and deadtime. Controller can be P+I, PID, P + I Smith Predictor or PID Smith Predictor uses Dahlin tuning model. (Gain and 1st order time constant). **Necessary Accessories for HP-41:** Quad Memory Module and Printer.

Steps: 638 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01418-41-3	$10	$18
FOR HP-71	NOT AVAIL		

01419 Tide Predictions

by M.A. Kalcic, Triestee, Italy

This program computes the times and heights of tide at high and low water, also the times the tide is at a required level and its rate of changes. It evaluates level and rate for any hour of the day. **Necessary Accessories for HP-41:** Harmonic constants and daily angles and factors.

Steps: 258 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01419-41-1	$10	$12
FOR HP-71*	01419-71-8	N/A	$14

01420 Bimet-Bimetallic Weld Stress and Deflection for Pipe Joints

by W.R. Kast, Denver, CO

Thermal expansion stress in bimetallic welds for pipe to pipe (same thickness or different thickness) or pipe to fixed end (vessel wall, etc). Full alpha-prompt input; automatic incremental -x listing and plot of stress, deflection if printer attached. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 425 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01420-41-9	$10	$14
FOR HP-71*	01420-71-6	N/A	$16

01422 Reflected Inertia and Flywheels

by J.D. Kite Jr, Raleigh, NC

This program converts an actual system of shafts rotating at different speeds into an equivalent single rotor system directed either to the input (driving) or output (driven) shaft. Also included is the formula for calculating the energy stored by a flywheel given its rotational speed, coefficient of fluctuation and inertia. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 323 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01422-41-5	$10	$14
FOR HP-71*	01422-71-2	N/A	$16

01423 Network Cost Analysis

by W.M. Kolb, Upper Marlboro, MD

This program computes the cost of AT&T voice-grade private line circuits and may be used to evaluate alternative network configurations. The user inputs city pairs and the number of circuits. The program automatically determines distance and selects the appropriate rate schedule. Cumulative monthly costs, mileages and circuits are stored. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 375 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01423-41-3	$10	$20
FOR HP-71*	01423-71-0	N/A	$24

01424 General CAM Program

by W.A. Lance, Cincinnati, OH

These programs (CAM 1 plus 4 Curves) compute the follower (or cutter) radial dimensions, offset or correction angles, when appropriate, velocities, accelerations and pressure angles of radial, offset or swing arm follower systems. The user may select from Cycloidal, Harmonic, Modtrap or Modsin cam curves, combined if desired, with constant velocities. **Necessary Accessories for HP-41:** Quad Memory, Card Reader. Printer optional.

Steps: 566 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01424-41-1	$10	$22
FOR HP-71*	01424-71-8	N/A	$26

01425 Satellites of Jupiter

by G. Maynard, Palatine, IL

This program will calculate and present the relative positions of the four major satellites of Jupiter as they would appear to an observer of Earth. If a printer is used, a graphical representation of the view through a small telescope is also printed. **Necessary Accessories for HP-41:** 2 Memory Modules. Printer desirable

Steps: 500 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01425-41-8	$10	$15
FOR HP-71*	01425-71-5	N/A	$18

01427 Ingredients for a Batch

by J.J. Mommaerts, St Catharines, Canada

Given quantities of ingredients that make up a batch: 1) the quantities required for another batch are calculated and stored, 2) the relative percentages of ingredients may be obtained, 3) the input data may be retrieved. **Necessary Accessories for HP-41:** None

Steps: 109 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01427-41-4	$10	$11
FOR HP-71*	01427-71-1	N/A	$12

01430 Coastal Navigation by Two Bearings

by S. Novik, Halden, Norway

This program uses two bearings, either radio or visual, for known position references as input. The code calculates dead reckoned course, distance to the pre-established destination and the vessel position. The program can use data for the position references from a self composed library. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 468 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01430-41-8	$10	$19
FOR HP-71*	01430-71-5	N/A	$22

01431 Summing Amplifier Design and Analysis

by P.M. Oelund, Redmond, WA

Advanced program for design and analysis of operational-amplifier-implemented summing amplifiers with an arbitrary number of inverting and non-inverting inputs. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 424 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01431-41-6	$10	$14
FOR HP-71*	01431-71-3	N/A	$16

01432 Fix From Two Sextant Readings

by D.M. Daniel, Pensacola, FL

Without benefit of any estimate of position, progam derives a fix from GHA and DEC of two bodies and their observed alitudes (HO) and bearings. **Necessary Accessories for HP-41:** One memory module

Steps: 382 HP-41 Bytes: 646

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01432-41-4	$10	$13
FOR HP-71*	01432-71-1	N/A	$14

01433 Table Look-Up Using the Lagrange Interpolating Polynomial

by A. Schneider, Reseda, CA

This program is designed as a stand-alone program which may be used as a subroutine to interpolate tables of x-y pairs. The polynomial degree may be set from zero to one less than the number of x-y pairs. Included is a routine which prompts for table entry, loads the table pointer register and returns with the next available register. **Necessary Accessories for HP-41:** Additional memory modules depending on table length.

Steps: 137 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01433-41-2	$10	$11
FOR HP-71*	01433-71-9	N/A	$12

01434 Typogenetics

by R. Sheehan, Auckland, New Zealand

This program can help to teach the principles of molecular genetics by the game Typogenetics in Douglas R. Hofstadter's "Godel, Escher, Bach: An Eternal Golden Braid." The tertiary structure of an enzyme coded for a strand is worked out. This enzyme then works on a strand. Find a self-replicating strand. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 716 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01434-41-0	$10	$16
FOR HP-71*	01434-71-7	N/A	$18

01435 Spline - Interpolation - Package

by H.H. Stettmaier, Olching, West Germany

Some programs concerning spline-interpolation or spline-curves: a. Enter data-points (1-, 2- or 3-dimensional), b. Compute natural spline- polynomials, c. Draw the curve point by point, d. Intersect a spline- curve with another geometric object (plane, sphere or user-defined), e. Single, fixed integral (exact, no approximation), f. 2-dimensional integral: area enclosed by the curve (exact too). **Necessary Accessories for HP-41:** None

Steps: 1435 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01435-41-7	$10	$24
FOR HP-71*	01435-71-4	N/A	$30

01436 High Pressure Gas Piping

by M.F. Schluender, Gladstone, MS

This program calculates pipe sizes for gas above 1 PSIG with a 10% pressure loss, using the spitzglas formula. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 147 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01436-41-5	$10	$12
FOR HP-71*	01436-71-2	N/A	$14

01437 Tide Calculations

by S. Stumbo, Seattle, WA

An advanced program for determining the height of tide and associated navigation calculations during any 24 hour day. Times and heights of the day's tides are input from tide tables with local corrections. Output starts with corrected heights and times and, with printer, a graph of time vs. height. Subroutines determine clearance under overhead obstructions such as bridges or power lines for specific times (daily plot also available) and keel clearance from the bottom for given times (plot available). **Necessary Accessories for HP-41:** 2 Memory Modules. Printer desirable but not required.

Steps: 423 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01437-41-3	$10	$15
FOR HP-71	NOT AVAIL		

01438 CIN

by J.H. Timmerman, Apeldoorn, Netherlands

This program approximately calculates the line-integral of a user-definable complex-valued function f along an also user-definable parameterized curve in the complex plane. This parametrization depends on a real parameter s, assuming values between sL and sR. The curve (contour) may be open or closed and the number of its subdivisions may be specified. **Necessary Accessories for HP-41:** None

Steps: 88 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01438-41-1	$10	$11
FOR HP-71*	01438-71-8	N/A	$12

01439 Root Locus Generation

by M.J. Warner, Logan, UT

This program will aid in the generation of root locus plots for control systems. The asymptote center, angles and departure angles can be computed to be drawn on the plot. Various points can be checked to see if they lay on the root locus. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 314 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01439-41-9	$10	$13
FOR HP-71*	01439-71-6	N/A	$14

01440 Statistical Comparison of Epidemiologic Data

by B.C. Webb Phd, Santa Barbara, CA

This program prompts for and collects categorical data for two subject populations. The data is placed into two blocks of data registers, which may be recorded on cards for later use. The grogram then lists the categorical data by parameter (N, the number of cases and %, the percent incidence) for each cohort. The prbgram then compares the two cohorts for each parameter by either the Chi-square test or Fisher's Exact test (if any cell is 5 or less) and prints the resulting P value in the same registration as the previous listing of N and %. **Necessary Accessories for HP-41:** Quad Module, Card Reader and Printer.

Steps: 622 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01440-41-7	$10	$17
FOR HP-71	NOT AVAIL		

01441 Reduction of Circuit Diagram to Matrix Eigenvalue Problem

by W.E. Wright, Stanford, CA

For a circuit of N nodes (N<=10), this program finds the matrix of order less than or equal to N, whose eigenvalues are (optionally) the poles or the zeros of the circuit. Allowed elements are: resistors, capacitors and voltage controlled current sources. **Necessary Accessories for HP-41:** At least 2 Memory Modules necessary. Card Reader helpful.

Steps: 666 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01441-41-5	$10	$18
FOR HP-71*	01441-71-2	N/A	$22

01442 Interpolation and Extrapolation

by N. Gale, Columbus, IN

This program linearly interpolates between an array of x, y ordinates and linearly extrapolates in the region beyond the range of data ordinates. **Necessary Accessories for HP-41:** None

Steps: 98 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01442-41-3	$10	$11
FOR HP-71*	01442-71-0	N/A	$12

01443 Diesel Fuel Spray Penetration

by N. Gale, Columbus, IN

This program calculates six properties of a diesel engine fuel spray. Relative penetration is the most significant of these and is determined with and without swirl. This is the proportional distance the fuel spray tip has passed to the combustion chamber wall by the time combustion starts. **Necessary Accessories for HP-41:** 1 Memory Module or HP-41CV

Steps: 283 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01443-41-1	$10	$14
FOR HP-71*	01443-71-8	N/A	$16

01444 Decline Curve Analysis

by P.A. Canan, Wichita Falls, TX

Program will calculate the two unknown variables for either exponential, harmonic, or hyperbolic production-decline curves. Two known variables must be supplied besides the initial production rate, one of which must be either final production rate or the fractional decline rate. Projection of annual production can also be calculated. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 480 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01444-41-9	$10	$15
FOR HP-71*	01444-71-6	N/A	$18

01445 Fine Curve Plot with HP-82143A Peripheral Printer

by A. Girard, Cagnes/Mer, France

This program gives a high quality plot of any function Y=F(X). It works in a way similar to "PRPLOT" printer program, but uses maximum definition of 168 columns in one print line, and plots 3 points in one print line, giving a more "continuous" aspect to the output curve and/or allowing shorter paper length for similar number of plotted points. **Necessary Accessories for HP-41:** One Memory Module.

Steps: 230 HP-41 Bytes: 375

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01445-41-6	$10	$12
FOR HP-71	NOT AVAIL		

01446 Linear Multiple Regression Analysis

by H.J. Albert, Bettendorf, IA

This collection of seven programs and subroutines allows the user to fit multifactor data to an equation of the form Y=bo+b1x1+b2x2+bkxk, where BO may be set to zero if desired. Problems having up to 15 independent variables have been handled using a Quad Memory Ram. Standard errors and evaluation of the significance of the fit can be calculated. **Necessary Accessories for HP-41:** Card reader, printer and two Memory Modules for the examples given, plus 12 magnetic cards.

Steps: 1537 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01446-41-4	$10	$24
FOR HP-71	NOT AVAIL		

01448 Programmer Plus

by J.H. Boardman, Tucson, AZ

A development and testing tool for programmers. Inter base conversions between Hex, Decimal, Octal. Select input/output modes independently. Signed and unsigned display for all bases. Boolean functions: AND, OR, EXCLUSIVE OR, 1'S AND 2'S Complementation. Bit rotation and justification operations. Variable simulated word size (2 to 32 bits). All routines usable in Boolean Calculator style or callable from user written program. Techniques given for reducing memory requirement. **Necessary Accessories for HP-41:** Quad Module

Steps: 616 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01448-41-0	$10	$17
FOR HP-71*	01448-71-7	N/A	$20

01449 Polynomial Derivatives

by I. Bond, Auckland 10, New Zealand

Given the coefficients of a polynomial of degree N, this program calculates the coefficients of the derivative polynomial for any order K. The values of this derivative for arbitrary values of X can then be found. SIZE = 2*N+8. **Necessary Accessories for HP-41:** One Memory Module if N>12.

Steps: 140 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01449-41-8	$10	$11
FOR HP-71*	01449-71-5	N/A	$12

01450 Precessional Calculations

by I. Bond, Auckland 10, New Zealand

Given the time of one epoch and the time of another, this program can be used to: 1) Calculate the precessional constants, 2) Perform rigorous reduction for the effects of proper motion and precession, 3) Calculate the effects of precession on proper motion. **Necessary Accessories for HP-41:** One Memory Module

Steps: 292 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01450-41-6	$10	$13
FOR HP-71*	01450-71-3	N/A	$14

01451 Vented Loudspeaker Box Tunings

by T.G. Bouliane, Buffalo, NY

Using data on the loudspeaker in question, this program solves for the "optimum" vented enclosure and permits the user to vary the tuning parameters to test alternate tunings. A 1/3-octave response listing is provided and, with the accessory printer, the frequency response is plotted. **Necessary Accessories for HP-41:** Quad Module. Peripheral printer optional.

Steps: 660 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01451-41-4	$10	$18
FOR HP-71	NOT AVAIL		

01452 Airplane Takeoff Field Length

by G. Carichner, Valencia, CA

Computes airplane engine-out balanced field length based on segment input data. This is an excellent preliminary design tool when winds, runway slope and thrust inclination angle can be neglected. All data is stored thus permitting easy reruns with similar conditions. Additional computations include all-engine field length, decision speed (V1), and optionally the air distance from liftoff to the obstacle height. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 382 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01452-41-2	$10	$13
FOR HP-71*	01452-71-9	N/A	$14

01453 Geometric Moving Average for Quarterly Forecasting

by Y. Chan, Petaling Jaya, Malaysia

This program forecasts the production tonnage for the next four quarters or updates the new quarter value. It can be modified to forecast sale, prices and other values quarterly. **Necessary Accessories for HP-41:** Quad Module, Card Reader and Printer

Steps: 271 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01453-41-0	$10	$13
FOR HP-71*	01453-71-7	N/A	$14

01454 Osculating Inverse Interpolation

by J.F.G. Darby, Parkville, Australia

Finds and stores the constants of Salzer's decomposition of the Hermite interpolation formula for the inverse of a function known, together with its derivative, at certain arbitrarily spaced points, so that the argument can be found for any other point in the range. **Necessary Accessories for HP-41:** One Memory Module

Steps: 127 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01454-41-8	$10	$12
FOR HP-71*	01454-71-5	N/A	$14

01455 Beams: Simply Supported, Cantilever and Fixed at Both Ends

by G. Dicu, Bucuresti, Romania

This program calculates for each of the beams mentioned in the title, the support reactions and the static functions (shear, moment, slope and deflection) on the whole beam length. The loads may be distributed loads, point loads and moments. The distance between two successive points in what are computed the static functions is equal with the lowest value between d.max (imposed by user) and di (the spacing between two successive load's points). If a printer is connected, it also plots the computed function. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 511 HP-41 Bytes: 874

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01455-41-5	$10	$14
FOR HP-71	NOT AVAIL		

01456 Automated Spread-Sheet

by R. Fessenden, Brunswick, ME

This program is a financial planning tool. It provides most of the basic functions needed for the creation and manipulation of rows of data, and allows for user-written routines to supplement those built in. It provides print-outs in either row or column form. Each row of data has an alphanumeric label. **Necessary Accessories for HP-41:** One Memory Module. Card Reader and Printer essential for print-outs.

Steps: 333 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01456-41-3	$10	$13
FOR HP-71*	01456-71-0	N/A	$14

01457 Growth and Yield of Douglas Fir

by B. Flye, Longview, WA

Program computes stand data from three knowns: age, site index or height, basal area or percent of normal basal area. Selectable outputs available: age total or breast high, site index, basal area data. Tarif, height, diameter, cubic volume total stem or to a 6 inch top, Scribner volume 16 or 32 foot logs to a six inch top and grows the stand for a user specified number of years providing new stand data at requested intervals. **Necessary Accessories for HP-41:** Two Memory Modules. Card reader and printer helpful.

Steps: 562 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01457-41-1	$10	$16
FOR HP-71*	01457-71-8	N/A	$18

01458 Coordinate Geometry I

by J. Fox, Seattle, WA

Point # file system for coordinates. Allows entry of coords prior to or during calculations for flexibility. Alpha prompting and formatted output with or without printer. Includes Trav, Sideshots, Inv, Radial Stakeout and 3 intersections. **Necessary Accessories for HP-41:** Three memory modules. Printer optional.

Steps: 626 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01458-41-9	$10	$16
FOR HP-71*	01458-71-6	N/A	$18

01460 Data Correlation

by T.M. Green, Lopez, WA

Two short programs load and update data cards which are used in pairs, as desired, in a main program to calculate the correlation function between the two loaded data sets, for any number of intervals up to 30. **Necessary Accessories for HP-41:** One Memory Module (-C), and Card Reader.

Steps: 180 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01460-41-5	$10	$13
FOR HP-71	NOT AVAIL		

01461 Stock Control

by F. Hali, Hillarys, West Australia

Program allows complete control of up to 154 stock items using the weighted average method. Fully formatted, printed audit trails/reports provide hard copy of all transactions. Operations supported: purchases, sales, returns in/out, file maintenance, qty/cost queries, COGS, cost of stock, stock report, reorder report, printer enable/disable, data card updating-dumping-loading. Data validation with error routines are included. Requires 152 registers and includes extensive documentation plus users guide. **Necessary Accessories for HP-41:** Two Memory Modules, Card Reader and Printer

Steps: 456 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01461-41-3	$10	$16
FOR HP-71	NOT AVAIL		

01462 Complex Error Function

by K. Harstad, Burbank, CA

This program calculates the complex error function over the entire complex plane. The Voigt function, Fresnel integrals and Dawson's integral are also obtained. The program is designed to be used interactively, or as a subroutine. **Necessary Accessories for HP-41:** One Memory Module.

Steps: 211 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01462-41-1	$10	$13
FOR HP-71*	01462-71-8	N/A	$14

01465 Electric Transmission Line

by D.H. Mulkey, Salinas, CA

This program will calculate the complex line currents, bus voltages, and losses on either a radial or a looped electric transmission line. The source voltage, impedance of each line section, and the load taken off the system at each bus are the required inputs. The program can also calculate the source voltage from a given end-of-line voltage. With three Memory Modules, 28 line sections and loads can be stored; with four or a Quad, 59 line sections and loads can be stored. Intended for electric utility engineers, this is number one of an HP-41 utility series. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 609 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01465-41-4	$10	$16
FOR HP-71*	01465-71-1	N/A	$18

01466 Complex Variable Operational Stack

by P.M. Oelund, Redmond, WA

This collection of subroutines maintains and manipulates a variable-length stack of complex variables, and provides capability for arithmetic operations on complex numbers. Especially suitable for A.C. circuit analysis. **Necessary Accessories for HP-41:** One Memory Module

Steps: 208 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01466-41-2	$10	$12
FOR HP-71*	01466-71-9	N/A	$14

01467 Assembly Language Simulator

by J.B. Pelz, Rochester, NY

This program simulates a simple integer assembly language processor. Integer range: +/- 499, 999. Negative integers are handled with ten's complement notation. Instruction codes include: load, store, add, subtract, multiply, divide, conditional and unconditional branching. Six digit instructions and data can be loaded into 89 memory addresses. Simple review/editing of programs. **Necessary Accessories for HP-41:** Two Memory Modules. Card Reader optional.

Steps: 215 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01467-41-0	$10	$12
FOR HP-71*	01467-71-7	N/A	$14

01468 Bishop Slope Stability Analysis

by C.R. Kuhn, Westfir, OR

This program solves the equation for the Bishop's Simplified Method of slope stability analysis. Allowing the operator to consider a system with up to three soils and up to ten lines in the profile being considered (soil unit boundaries count as lines in the profile). **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 471 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01468-41-8	$10	$15
FOR HP-71*	01468-71-5	N/A	$18

01469 One Down Automatic Golf Presses

by R.B. Reese, Austin, TX

This program solves the tedious problem of accurately figuring one down automatic Golf bets. It will compute the outcome of front nine or second nine bets and with a printer, you can make hard copy of each players scores, the outcome of the bets and who won the money. **Necessary Accessories for HP-41:** Card reader and printer helpful.

Steps: 282 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01469-41-6	$10	$14
FOR HP-71*	01469-71-3	N/A	$16

01471 HVAC Duct Weight Calculator

by E.R. Schmeckpeper, Richland, WA

This program calculates the weight per foot, weight per given span, and natural frequency for round or rectangular cross-sectional ductwork. All calculations are based upon SMACNA standard duct systems designed for 6" W.G. galvanized sheet metal construction. **Necessary Accessories for HP-41:** Printer optional

Steps: 236 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01471-41-2	$10	$12
FOR HP-71*	01471-71-9	N/A	$14

01472 Camel

by K. Sharp, Galax, VA

Your objective is to travel 200 miles across the desert while evading a tribe of pygmy cannibals. You have one quart of water which may be replenished at an oasis or by another traveller. All types of hazards may be encountered during your journey. (Warning: This game is addictive). **Necessary Accessories for HP-41:** None

Steps: 358 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01472-41-0	$10	$16
FOR HP-71*	01472-71-7	N/A	$18

01473 1, 2,3 Way ANOVA with Multiple Range Test (Scheffe)

by N.R. Sinclair, London, Canada

One-, two- or three-way ANOVAs, without or with replication (equal or unequal) giving averages for groups and ordering from highest to lowest averages. Multiple range comparisons, using Scheffe's test, between two contrast sets calculate critical and observed S-values which are used to determine significance of differences between sets. **Necessary Accessories for HP-41:** Quad Module and Printer (for Multiple Range test).

Steps: 766 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01473-41-8	$10	$17
FOR HP-71*	01473-71-5	N/A	$20

01474 Seismic Reflection Normal Move Out Equation

by T.W. Stander, Lawrence, KS

This program solves basic normal moveout equations governing seismic ray/path reflections without dipping beds. Travel time, zero offset time, offset distance, average velocity and depth to bed, reflection angle are input and/or computed values. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 244 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01474-41-6	$10	$13
FOR HP-71*	01474-71-3	N/A	$14

01475 Interchangeable Solutions (Important Subroutine)

by H.H. Suarez, Geneva, Switzerland

This set gives two programs that resolve the following problem: you have N variables that related to each other by some formulas, for instance, Var 1 = F(Var2, Var7); K variables are given as data. You want to compute the value of the N-K remaining variables. The first program uses a so called "descending" method which is very "intelligent" and the last a so called "ascending" method, very powerful and rapid. Extensive documentation. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 1447 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01475-41-3	$10	$26
FOR HP-71*	01475-71-0	N/A	$32

01476 Superheterodyne Tracking

by E.M. Vazquez, San Isidro, Argentina

This program permits ease and fast computation of tuning circuit constants employed in superhet's receivers. Several alternatives are considered in the program to cover padded oscillator circuits, padded or non-padded signal ciruits, plus an auxiliary method to determine tracking and tuning points. Program occupies 112 registers, recorded on 3 cards; documentation is 23 pages including examples. **Necessary Accessories for HP-41:** One Memory Module; Printer is optional

Steps: 338 HP-41 Bytes: 651

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01476-41-1	$10	$13
FOR HP-71*	01476-71-8	N/A	$14

01478 Decimal to Vulgar Fraction Converter

by S. Thomassen, Linkoping, Sweden

This program converts decimal numbers including integers to vulgar fractions. For numbers containing integer, two different display forms are available. The stack and registers R01 through R10 will remain unaltered. **Necessary Accessories for HP-41:** None

Steps: 100 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01478-41-7	$10	$11
FOR HP-71*	01478-71-4	N/A	$12

01479 Telephone List

by B. Vandenbosch, Houston, TX

Telephone List - shows all characteristics of a "real world" computer program: file creation, record find, file browse, record change/delete, and file compact/condense. A maximum of 50 names and 50 numbers with area code can be handled. **Necessary Accessories for HP-41:** Quad Memory. Printer an advantage, but not essential.

Steps: 212 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01479-41-5	$10	$12
FOR HP-71*	01479-71-2	N/A	$14

01480 Real Estate Agent's Finance Advisor for Purchasers

by G.R. Webb, Chicago, IL

This program assists in counseling prospective purchasers in the various facets of real estate finance and mortgaging. It will calculate down payment, mortgage balance, closing cost estimates, payments, tax advantages and other data for conventional, VA, FHA and FHA Graduated Payment mortgages at any interest rate. This program can qualify any purchaser for a mortgage as per government and lending institution procedures. It determines the maximum house a buyer can qualify for under each type of mortgage. **Necessary Accessories for HP-41:** Quad Module. Printer and Card Reader helpful.

Steps: 942 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01480-41-3	$10	$21
FOR HP-71*	01480-71-0	N/A	$26

01481 Rubber Bridge Scorekeeper

by D.B. Westcott, Islington, Canada

This very friendly program calculates and accumulates the score on any possible combination of hands and stores the details of the bid and tricks made, including honors for each hand played (maximum 68) for review at any time. It also keeps track of the number of hands played and the deal. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 579 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01481-41-1	$10	$15
FOR HP-71*	01481-71-8	N/A	$18

01482 Blackjack

by S. Wolcik, Turlock, CA

Play an automated game of Blackjack against your HP-41. As player, you may bet, stand, hit, split pairs and play one down for eleven. Single display shows won, lost or tied hands and bank status. Illegal bet and play are not allowed. 104 card deck is used. Winning 4 times an initial bank wins game. **Necessary Accessories for HP-41:** 3 Memory Modules or Quad Memory Module

Steps: 685 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01482-41-9	$10	$17
FOR HP-71*	01482-71-6	N/A	$20

01484 Gear Measurement

by J.G. Aldridge, Greenwood, IN

Prompting for and converting data (three angular modes) in millimeters or inches, program calculates pitch diameter, base diameter, dimension over rolls, block dimension, diameter at contact point, roll angles and lead. It generates spacing table and calculates lead checker setting, involute and arcinvolute functions in main program or from keyboard. **Necessary Accessories for HP-41:** 2 Memory Modules (Card Reader Optional)

Steps: 531 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01484-41-5	$10	$15
FOR HP-71*	01484-71-2	N/A	$18

01487 Wire Tables and Wire Use

by R.D. Church, Candor, NY

Find diameter, fusing current, capacity, weight, cir. mils, of copper wire given AWG number. Also gives AWG and resistance for power, temperature, length and current. Finds wire area from AWG and turns, or will solve for turns, based on dimensions of winding area. Uses exponential method functions, full alpha labels and prompting for ease. **Necessary Accessories for HP-41:** Card Reader desirable, Quad Module.

Steps: 384 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01487-41-8	$10	$15
FOR HP-71*	01487-71-5	N/A	$18

01488 Iterative Multiplication of Matrices

by D. Dzierzgowski, Saint Ghislain, Belgium

This program computes the product of two matrices A and B, shows the result (option), prompts for a third matrix C, Computes the product A*B*C, and so on. It also computes A**N = A*A*...*A (N times). **Necessary Accessories for HP-41:** At least 1 Memory Module.

Steps: 275 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01488-41-6	$10	$13
FOR HP-71*	01488-71-3	N/A	$14

01491 Math Baseball

by R.W. Johanns, Wampsville, NY

Math baseball is a two player game testing skills in mental arithmetic. Interest is kept up by keeping score as in a game of baseball. The action is in real time. The closer the response (guess) is to the correct answer, the better the hit. Several hits together score runs. **Necessary Accessories for HP-41:** Card Reader would be desirable to load in the program.

Steps: 268 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01491-41-0	$10	$13
FOR HP-71*	01491-71-7	N/A	$14

01493 Analysis of Sieving Results

by L. Kennedy, Dundee, Scotland

The size distribution of crystals grown in solution, such as in a large commercial crystallizer, can be approximated by an empirical equation: the results from sieving a sample of the crystal product can be manipulated to determine the constants of this equation. The normal size of sample for sieving is 100g; the program does not assume this; however, it will determine the size of sample from the sieve data. **Necessary Accessories for HP-41:** One Memory Module

Steps: 216 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01493-41-6	$10	$12
FOR HP-71*	01493-71-3	N/A	$14

01494 Simplification of Algebraic Expressions

by J. Kottalam, East Lansing, MI

This program simplifies algebraic expressions of several variables involving addition, multiplication, integral powers (but not division) and parentheses. The HP-41C's ability beyond number crunching is demonstrated. **Necessary Accessories for HP-41:** 4 Memory Modules

Steps: 730 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01494-41-4	$10	$15
FOR HP-71*	01494-71-1	N/A	$18

01495 Distribution Factor Calculation

by W.W. Lauer, Canton, OH

This program computes all distribution factors required for continuous frame analysis. It is adapted for use with single story or multistory structures and the ends of the first and last spans may also be fixed or pinned. **Necessary Accessories for HP-41:** "Structural Analysis" application module.

Steps: 292 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01495-41-1	$10	$13
FOR HP-71*	01495-71-8	N/A	$14

01496 "Conbeam" (Flex. Strength of R.C. and Bonded P.S.C. Beams)

by A.H. Mattock, Seattle, WA

Calculates flexural strength of various concrete beam sections reinforced with any combination of bonded prestressed and unprestressed tension reinforcement and compression reinforcement. Unprestressed tension reinforcement may be either reinforcing bar or same steel as used for prestressed reinforcement. Complete stress-strain curve for reinforcing bar may be specified if desired. **Necessary Accessories for HP-41:** Card Reader, Printer, Quad Memory Module

Steps: 885 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01496-41-9	$10	$18
FOR HP-71*	01496-71-6	N/A	$22

01497 Grade Staking

by W.M. Moffett, Cambridge, OH

This program assists the surveyor or contractor in the measuring of "Ground Elevations" (real or assumed). The "Invert Elevations" (flow line of drain lines or the finish grades or excavation projects) and the difference (cut or fill). **Necessary Accessories for HP-41:** 2 Memory Modules; Printer is optional.

Steps: 492 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01497-41-7	$10	$15
FOR HP-71*	01497-71-4	N/A	$18

01498 Radio Direction Finding Accuracy

by F.W. Niedenfuhr, Washington, D.C.

Program calculates the target location error CEP and the dimensions and orientation of the error ellipse for a three sensor line-of-bearing radio direction finder. Input variables are sensor RMS accuracy, spacing between sensors, and the radio emitter coordinates. A weighted least squares intersection of three bearing lines is used to estimate the accuracy of the DF fix. **Necessary Accessories for HP-41:** None

Steps: 177 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01498-41-5	$10	$12
FOR HP-71*	01498-71-2	N/A	$14

01499 Extended Range Factorial, Combination & Permutation

by D.L. Olson, Broomfield, CO

This program will figure the factorial of a number greater than 69. It is based on Stirling's approximation. Using this and/or Fact (depending on the values chosen) combination and permutation can be found with other parts of the program. **Necessary Accessories for HP-41:**

Steps: 123 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01499-41-3	$10	$11
FOR HP-71*	01499-71-0	N/A	$12

01500 Signal Processing - Fast Fourier Transform

by B. Persson, Twickenham Middx, England

Time and frequency domain processing of a signal represented by a sequence of complex numbers is provided as is transformation from one domain to the other. Operations are carried out in place (with optional readout of intermediate results) and can be reiterated in any meaningful sequence. Also provided is a set of simple processing routines, structured for easy addition or substitution of the user's own processing routines. Forward and inverse discrete fourier transformation data held in a defined set of storage registers can be computed. **Necessary Accessories for HP-41:** 1 Memory Module (minimum)

Steps: 269 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01500-41-8	$10	$18
FOR HP-71*	01500-71-5	N/A	$22

01501 Orthogonal Base Polynomial Fit.

by P. Roussel, Brugge, Belgium

The program fits polynomials of ascending degree (up to the 5th) through a set of input points. It also computes the according Student t - value, the correlation coefficient and sample standard deviation. The program is printer-compatible and allows for a PRPLOT run between computations of different degree polynomials. the program uses orthogonal bases set up in the polynomial vectorspace for reducing round off and subtractive cancellation. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 315 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01501-41-6	$10	$12
FOR HP-71*	01501-71-3	N/A	$14

01502 Economic Recovery Act of 1981 Accelerated Depreciation Table

by R. Sills, Northbrook, IL

This program calculates the depreciation schedule and remaining book value for assets, as set forth in the accelerated depreciation schedules of the 1981 Economic Recovery Act. Input includes asset value, year the asset is placed in service and whether the asset is used for research and development. **Necessary Accessories for HP-41:** None

Steps: 186 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01502-41-4	$10	$12
FOR HP-71*	01502-71-1	N/A	$14

01503 Solar Heating Savings Analysis

by N.J. Volny, Bend, OR

2 programs find building heat loss coefficient, heating load and estimation of the annual heat savings of a building using passive solar heating. Program 1, "Building Loss Coefficient", solves for heat loss, coefficient & heating load for a building and is used to obtain the Load Collector Ratio. Program 2, "Solar Savings Fraction", estimates annual heating savings on a monthly basis. Passive Solar Systems may be Direct Gain, Trombe Wall or Water Wall, all with or without night insulation. **Necessary Accessories for HP-41:** Printer, 1 memory module, card reader.

Steps: 368 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01503-41-2	$10	$22
FOR HP-71	NOT AVAIL		

01504 Reduction of Measured Distances for Temp Tape Length & Slope

by D.A. Voltz, Vinyard Haven, MA

This program stores tape length correction values for one or more tapes, recalls these tapes by serial numbers and by inputting field distance, temperature and zenith angle, solves for horizontal distances. For ease in use, all user steps are fully prompted. **Necessary Accessories for HP-41:** None

Steps: 132 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01504-41-0	$10	$12
FOR HP-71*	01504-71-7	N/A	$14

01505 Spectral Reflectance Computations for Thin Film Coatings

by R.T. Yamada, Santa Barbara, CA

Spectral reflectances for thin film optical coating designs are computed using an algorithm developed for electrical transmission calculations. The method is iterative. Application is limited to normal incidence angle and for essentially non-absorbing materials. For example, program capability is 48 spectral points for a 35 layer filter design. **Necessary Accessories for HP-41:** 3 Memory Modules, Printer, Card Reader

Steps: 474 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01505-41-7	$10	$15
FOR HP-71	NOT AVAIL		

01506 Constant Percent Decline Analysis

by S.D. Attaya, The Woodlands, TX

Given any 3 of 5 unknowns, program will solve for other two. Variables are initial rate, final rate, cumulative production, decline, or production time. Newton's Iteration Method utilized to permit solution of est. initial rate of offset operator's well (for economic and performance evaluations on new drilling prospects) given present rate, cum. production to date and time on line (generally available). Previous programs would not solve all combinations of input. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 371 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01506-41-5	$10	$14
FOR HP-71*	01506-71-2	N/A	$16

01507 Product of Polynomials

by I.R. Aizcorbe, Madrid, Spain

This program computes the product on two polynomials of degree less than or equal to seven. If the printer is connected, all solutions will be printed. You can see the solution by only pressing "A". The program has the possibility to exchange the second polynomials by another one and computes its product with the first. **Necessary Accessories for HP-41:** None

Steps: 121 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01507-41-3	$10	$11
FOR HP-71*	01507-71-0	N/A	$12

01508 Model Rocket Altitude and Speed Tracking (MRAST)

by F. Mandeville, Ottawa, Canada

This program finds out how high and fast your rocket went. It also can keep in memory, the last five performances. It can be used to confirm the prediction given by the program, 41-00568-3. **Necessary Accessories for HP-41:** One Memory Module

Steps: 158 HP-41 Bytes: 377

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01508-41-1	$10	$12
FOR HP-71*	01508-71-8	N/A	$14

01509 Timber Design - 1977 NDS (WD7 7)

by J.F. Bradford, Portland, OR

Solves Unity Equations for combined stresses using 1977 NDS. Tension members (net section), laterally unsupported beams and columns. Calculates shear stress in notched or unnotched beams. Automatic input of allowable stresses for any grade material. Wet conditions, repetitive use and load duration factors as needed. Versatile, fast, easy to use. **Necessary Accessories for HP-41:** 3 Memory Modules required. Printer optional.

Steps: 476 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01509-41-9	$10	$22
FOR HP-71*	01509-71-6	N/A	$26

01510 Personal Budget

by W.J. Cheeseman, Wellesley, MA

A comprehensive personal budgeting program including: (a) 73 income and expense accounts; (b) automatic updating of checking, savings, cash, loan and charge account balances; (c) printed and dated journal for all transactions (d) year-to-date, monthly average and budget reports. **Necessary Accessories for HP-41:** Quad Memory Module, Printer and Card Reader.

Steps: 830 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01510-41-7	$10	$22
FOR HP-71	NOT AVAIL		

01511 Pipe Heat Loss and Economics

by L.A. Church, Edmonton, Canda

This program calculates surface temperature and heat loss through bare or insulated pipe given operating and ambient temperature, physical dimensions and insulation properties. Two insulation layers may be input. An annual operating cost is calculated using 12 economic inputs. A discounted pay back period is calculated to evaluate insulation additions to bare or existing insulation. **Necessary Accessories for HP-41:** None

Steps: 582 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01511-41-5	$10	$16
FOR HP-71*	01511-71-2	N/A	$18

01512 Marathon Pace Calculation

by B.O. Fletcher, Palo Alto, CA

This program calculates incremental paces from 5 mile splits and finish time for Marathon runners. In addition to paces between 5 mile points, overall pace, last 1+ mile pace and final 10 kilometer pace are calculated and displayed in alpha-numeric format. **Necessary Accessories for HP-41:** None

Steps: 129 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01512-41-3	$10	$12
FOR HP-71*	01512-71-0	N/A	$14

01513 Volumetric Calculation for Inventory by Contour Point Survey

by J.R. Knowles, Lewiston, ID

This program uses measured triangular horizontal distances and vertical depths to calculate volumes. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 381 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01513-41-1	$10	$14
FOR HP-71*	01513-71-8	N/A	$16

01514 Space

by R.L. Leuchtmann Jr, Honolulu, HI

Space is an attempt to bring the popular video game Space Invaders to 41C users. It displays one row of an infinite number of Invaders at a time. After you have finished off one row of Invaders, a Deathship scrolls across the display. If you miss this Deathship it will enter the earth's atmosphere and disintegrate the earth with its powerful weapons. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 400 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01514-41-9	$10	$15
FOR HP-71*	01514-71-6	N/A	$18

01515 Monthly Payment Amortization (Monpay) (Max Loan)

by C. Scheske, Creve Coeur, MO

This program will determine a maximum loan available for a given monthly principal and interest payment. For a given loan a month by month listing of outstanding balance, interest and principle will be shown along with annual and total interest. **Necessary Accessories for HP-41:** 1 Memory Module. Card Reader and Printer desirable.

Steps: 242 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01515-41-6	$10	$16
FOR HP-71*	01515-71-3	N/A	$18

01518 Transistor Hybrid-Pi Model for Small Signal Amplifiers

by K. Fischer, Blacksburg, VA

Given the "h" parameters from a transistor data sheet, this program computes the hybrid-pi variables so that a linear model of the transistor can be drawn. The program prompts for all variables. All outputs will be printed if a printer is attached, printing the inputs is optional. **Necessary Accessories for HP-41:** One Memory Module (Printer optional).

Steps: 196 HP-41 Bytes: 562

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01518-41-0	$10	$13
FOR HP-71*	01518-71-7	N/A	$14

01519 Complete Blackjack

by R. Twilling, Winnetka, IL

Blow your bankroll with this totally accurate simulation of Nevada-style Blackjack. Supercedes all previous Blackjack programs. Allows multiple pair-splitting and doubling-down. The dealer (41C) checks all your bets and decisions for legality. Impossible to cheat, impossible to make an honest mistake and scramble the game. Fun and safe for all ages and incomes. **Necessary Accessories for HP-41:** 3 Memory Modules. Printer optional.

Steps: 591 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01519-41-8	$10	$16
FOR HP-71*	01519-71-5	N/A	$18

01520 Lighting Power Budget (LPB)

by R.A. Yates, Springfield, OR

This program calculates (and documents with printer) the allowable energy budget for building lighting in accordance with the Illuminating Engineering Society's Recommended Lighting Power Budget Determination Procedure, EMS-1. Also seen as a part of the ASHRAE Standard 90-75R. **Necessary Accessories for HP-41:** Three Memory Modules. Printer and Card Reader recommended, but not required.

Steps: 588 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01520-41-6	$10	$17
FOR HP-71*	01520-71-3	N/A	$20

01521 Red Pine Yield Projection for Field Use

by R.H. Arps, Grand Rapids, MI

For red pine, age 25 or older, compute height and average DBH for age. Compute basal area, cubic feet, cords and board feet for acre and stand. Thin to residual basal area stored and display thinning volumes. Project per acre annual increment to years of thinning interval. Cumulate thinning volumes. **Necessary Accessories for HP-41:** None

Steps: 371 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01521-41-4	$10	$25
FOR HP-71*	01521-71-1	N/A	$30

01522 Adams-Moulton Method

by K. Akima, Boulder, CO

This program integrates a differential equation by the Adams-Moulton predictor-corrector method. The Adams Moulton method is faster than the popular Runge-Kutta, and just as accurate. The Quartic Runge-Kutta is used to prime the Adams-Moulton. **Necessary Accessories for HP-41:** None

Steps: 137 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01522-41-2	$10	$11
FOR HP-71*	01522-71-9	N/A	$12

01523 Symbolic Differentiation

by D. Strebe, Springville, UT

This program allows algebraic entry of a formula which can be differentiated. After the differentiation, the solution may be expressed as a formula or as a numeric quantity which is the derivative at some point. **Necessary Accessories for HP-41:** Quad Memory Module

Steps: 960 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01523-41-0	$10	$23
FOR HP-71*	01523-71-7	N/A	$28

01524 Sunpath Diagrams

by R. McCluney, Cape Canaveral, FL

Sunpath calculates solar altitudes and azimuths for each daylit hour of the day, given date and site latitude. A blank chart is furnished for plotting sunpaths for each month. Illustrated procedures are given for using the results. Suntime converts from solar time to local standard time and vice versa. **Necessary Accessories for HP-41:** 2 Memory Modules for either Sunpath or Suntime, 3 Modules for both simultaneously.

Steps: 596 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01524-41-8	$10	$18
FOR HP-71*	01524-71-5	N/A	$22

01525 Payback Time

by R. McCluney, Cape Canaveral, FL

This program calculates straight and escalated payback times, return on investment, and net cash flow for any energy-saving system or strategy involving an initial expenditure that produces subsequent yearly dollar savings. The effects of inflation, interest rates, operating and maintenance costs, and resale value (or value added) are included. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 388 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01525-41-5	$10	$14
FOR HP-71*	01525-71-2	N/A	$16

01526 General Network Reduction Program

by D. Lange, Hamburg 55, West Germany

This program analyzes networks of up to 80 elements. Network elements allowed are resistors, capacitors, inductors, reactors, rigid voltage and current sources in any serial or parallel combination. Output functions are voltages, currents or impedances in any branch of the network. Either amplitude or phase transfer functions can be plotted. **Necessary Accessories for HP-41:** 4 Memory Modules for 80 network elements, printer if plots are desired.

Steps: 442 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01526-41-3	$10	$15
FOR HP-71	NOT AVAIL		

01527 Flight Computer System

by J.M. Beaton, Corvallis, OR

This set of programs is designed for use in combination with Aviation Application Pac. Together they convert the 41-C into a complete flight computer. Major programs include: Alt. computations (T.A., D.A.); Course and Distance between 2 points using Rhumblines; Wind Correction Angle Comp. (WCA, GS, TH, MVC); and an Inflight Log that assists in controlling flight progress. Utilities include: Temperature, Distance and Time conversions, True Air Temperature, and weighted average ground speed. A set of suggested key reassignments round out the package. **Necessary Accessories for HP-41:** Quad Memory Module, Aviation Pac Rom (Keyboard Overlay recommended)

Steps: 694 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01527-41-1	$10	$31
FOR HP-71	NOT AVAIL		

01528 Textile Yarn Skein Break Statistics

by T.S. Cox, Easley, SC

Given the desired yarn count, statistic, breaking load in pounds, and actual yarn count (cotton count), calculates actual break factor and break factor adjusted for desired count. **Necessary Accessories for HP-41:** Quad Memory Module, Printer, Card Reader

Steps: 534 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01528-41-9	$10	$16
FOR HP-71	NOT AVAIL		

01529 Function Table Printer

by D.C. Eastman, Salem, MA

This program uses the accumulation function of the printer to print a table of values for a function calculated by another program written by the user. It is very useful to print tables of values not available in mathematical handbooks. **Necessary Accessories for HP-41:** 1 Memory Module and Printer. Card Reader useful.

Steps: 128 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01529-41-7	$10	$12
FOR HP-71*	01529-71-4	N/A	$14

01530 Cubic Spline Interpolation

by D.F. Durschmidt, Phoenix, AZ

Given up to 33 randomly spaced data points this program generates the Cubic Spline which passes through all of them. When the Spline is evaluated both value and slope at the desired point can be obtained. This could be the last interpolation program you ever need. **Necessary Accessories for HP-41:** 2 - 4 Memory Modules.

Steps: 504 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01530-41-5	$10	$15
FOR HP-71*	01530-71-2	N/A	$18

01531 Weighted Linear/Quadratic Regression with Standard Errors

by R.L. Fagaly, San Diego, CA

This program performs a least-squares quadratic (parabolic) ($y = A + Bx + Cx^{**}2$) regression. It also calculates the standard errors in A, B, & C along with the correlation coefficient ($R^{**}2$) for the calculated line. The input values (x, y, and sigma if used) are saved. The user may also select a linear ($y = A + Bx$) regression with standard errors and $R^{**}2$ using the same data used to obtain a quadratic fit. The input data can also be given an individual weight if desired. HP 67/97 keystrokes (287) are also given. **Necessary Accessories for HP-41:** 1 Memory Module.

Steps: 299 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01531-41-3	$10	$12
FOR HP-71*	01531-71-0	N/A	$14

01532 Preliminary Design Conditions Program

by K.J. Fleming, Chicago, IL

This program can be useful to architects and engineers. With input of gross building area and perimeter, the program computes preliminary design of mechanical space conditions and planning information for three types of buildings. System requirements for Electrical and Mechanical areas and loads are then given. **Necessary Accessories for HP-41:** 1 Memory Module, Printer (Printer required for program as listed-- modification required for exclusion)

Steps: 237 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01532-41-1	$10	$14
FOR HP-71*	01532-71-8	N/A	$16

01533 Regression, Slope, Intercept Comparison of 2 Straight Lines

by P.A. Friedman PhD, Houston, TX

This program computes and compares the slopes (b1, b2, b1 vs b2), intercepts (a1, a2, a1 vs a2) and regression coefficients (R1, R2, R1 vs R2) for two least squares fit for a straight line regression model. Additions or deletions to either group may be made. Degrees of freedom (DF) and T (or Z) values are indicated. **Necessary Accessories for HP-41:** One Memory Module

Steps: 299 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01533-41-9	$10	$13
FOR HP-71*	01533-71-6	N/A	$14

01534 Laguerre's Polynomial Root Finder

by D.L. Griffin, Blackfoot, ID

This program can be used to find the real and complex roots of a polynomial of up to degree 80. Data input utilizes error recovery and prompts for degree, size, accuracy, and coefficients. Laguerre's iteration method converges fast and gives good global convergence. A printer may be used for output. **Necessary Accessories for HP-41:** 2 to 4 Memory Modules

Steps: 371 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01534-41-7	$10	$13
FOR HP-71*	01534-71-4	N/A	$14

01536 Yields for Second Growth Species of California's Coast

by J. Henshaw, Nevada City, CA

This program calculates volume, basal area (BA), volume-BA ratio, BA growth, volume growth, height growth, and volume growth percent for individual trees of redwood, Douglas-fir, and white wood species. Volume and growth information can be calculated in either board foot or cubic foot measure. The program also expands data to per acre values given individual tree data and an average basal area per acre. **Necessary Accessories for HP-41:** 3 Memory Modules (Printer - optional)

Steps: 469 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01536-41-2	$10	$15
FOR HP-71*	01536-71-9	N/A	$18

01537 Time Zone Convertor

by W.E. Hitchins, Los Angeles, CA

Converts local time in any time zone to time in any other time zone on earth or to GMT. Besides the 25 standard time zones, all major areas with half-hour differentials can be calculated. GMT display is on a 24-hour clock while others are on a 12-hour clock with a.m. or p.m. identified. Display also indicates whether new time is the same day as input, the next day, or the day before. Program has been designed for simplicity of operation and operational keys have been spaced to minimize risk of error. Rejects nonsense times. **Necessary Accessories for HP-41:** HP-41C requires 2 Memory Modules

Steps: 313 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01537-41-0	$10	$14
FOR HP-71*	01537-71-7	N/A	$16

01538 Beam Program with Stirrup Design-Simple 2

by J.M. Kanitkar, Houston, TX

This program computes end reactions, maximum shear stress and maximum bending moment in a beam under any combination of loading. It designs stirrups required in concrete beams and displays stirrup spacing. In addition, it can calculate deflection, slope, shear and moment at any point in a beam. **Necessary Accessories for HP-41:** 3 Memory Modules and Structural Analysis Pac

Steps: 692 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01538-41-8	$10	$16
FOR HP-71*	01538-71-5	N/A	$18

01539 Complex Root Finder with Deflation

by M. Kvale, Cincinnati, OH

This program finds the roots of an equation, whether real or complex. The program is unique in that one may supply an initial guess and get a root, or one may use the root deflation feature and have the program automatically find a user-specified number of roots. **Necessary Accessories for HP-41:** 2 Memory Modules are required

Steps: 391 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01539-41-6	$10	$13
FOR HP-71*	01539-71-3	N/A	$14

01540 Gears

by G. Laragan, Lewiston, ID

This program calculates bicycle gearing and shift sequences for bicycles with up to 3 front cogs and up to 7 rear cogs. The gears are output in descending order and the corresponding shift sequence is displayed as a ratio of F(N):R(N). Arbitrary changes can then be made to determine their effect. **Necessary Accessories for HP-41:** 1 additional Memory Module. Printer optional. Card Reader helpful.

Steps: 284 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01540-41-4	$10	$13
FOR HP-71*	01540-71-1	N/A	$14

01541 Continuous Beam - Support Moments, Reactions & Int. Moments

by J.O. Moore, Brigham City, UT

Calculates support moments, reactions and interior moments for continuous beams of up to 7 spans and 2 cantilevers. End supports can be simple or fixed. Uniform load and any number of concentrated loads can be input for each span. Moment of inertia is input for each span. **Necessary Accessories for HP-41:** 3 Memory Modules, Printer optional.

Steps: 570 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01541-41-2	$10	$16
FOR HP-71	NOT AVAIL		

01542 PROB: t - and F - Distribution Probabilities

by S.L. Morgan, Columbia, SC

Given (1) a calculated t-value and its number of degrees of freedom (n), or (2) a calculated F-value and its two degrees of freedom (n1 for the numerator, n2 for the denominator), this program calculates the probability of not exceeding that value of t or F (with its associated degree(s) of freedom) by chance. **Necessary Accessories for HP-41:** Program Memory required is 498 bytes; size required is 011. 1 Memory Module is needed.

Steps: 374 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01542-41-0	$10	$13
FOR HP-71*	01542-71-7	N/A	$14

01543 Lambert-Beer / Nernst

by P. Michel, Ichtegem, Belgium

This program is used to compute the results of colorimetric and potentiometric (selective electrodes) determinations by means of the equations of Lambert-Beer and Nernst, using statistics concerning linear regression and confidence limits. 1. It prints out the results of the measurements. 2. It computes standard curves and their confidence limits. 3. It computes concentrations of unknown samples with confidence limits. Results are printed out automatically in the correct unities. New standard data are stored on a magnetic card per element, so that future analytical results can be interpreted after entering the appropriate stand. data card. **Necessary Accessories for HP-41:** 2 Memory Modules; Printer and Card Reader optional

Steps: 323 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01543-41-8	$10	$16
FOR HP-71	NOT AVAIL		

01544 Simple Batch Distillation for Two Components

by J.A. Pita, Quito, Ecuador

This program solves several problems arising from the simple batch distillation of a binary solution. Seven different cases can be treated. Calculations are based on the relative volatility of the mixture and program helps in finding it from equilibrium data. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 367 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01544-41-6	$10	$13
FOR HP-71*	01544-71-3	N/A	$14

01545 Intelligent Problem-Solving of Heat Exchangers Calculations

by J.A. Pita, Quito, Ecuador

This program solves problems concerning four types of heat exchangers: parallel flow, counter flow, one shell pass, two shell passes. Calculator prompts for all data and a zero is entered for each variable that program must evaluate. Program selects the solution method based on availability of data, shifting from LMTD approach to NTU approach when necessary and displaying messages on path followed or giving reasons for calculator impossibility to solve the problem. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 857 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01545-41-3	$10	$17
FOR HP-71*	01545-71-0	N/A	$20

01546 Photovoltaic System: Panel Peak Power and Battery Size

by P.S. Rieszer, Salta, Argentina

This program allows the user to determine a photovoltaic system needed to satisfy the energy requirements of a certain installation. The user is prompted for the monthly mean of daily radiation in MJ/m2-day for every month of the year and for the monthly load in Wh. The program displays a set of pair of values. The first one is the peak power of the photovoltaic array in W, the second is the battery size in Wh. Each pair of values assures that the battery level will never fall below 30% of its maximum charge during a whole year. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 110 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01546-41-1	$10	$12
FOR HP-71*	01546-71-8	N/A	$14

01547 Personal Financial Balance Sheet

by H.P. Rockwell, Indianapolis, IN

This program produces one's personal balance sheet, printing all current assets, fixed assets, liabilities and net worth. The change from last year and the per cent of the net worth in current assets. Items are totalized in each category until entering zero. Program then proceeds to the next group. **Necessary Accessories for HP-41:** Printer convenient, not necessary. Balance sheet form provided in lieu of printer.

Steps: 129 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01547-41-9	$10	$12
FOR HP-71*	01547-71-6	N/A	$14

01549 Division of Polynomials

by N.M. Schwartz, Chihuahua, Mexico

Given the coefficients of two polynomials N & M, of degrees n & m respectively, this program calculates N/M, displays the resultant polynomial (of degree n-m), including the remainder of the division performed. **Necessary Accessories for HP-41:** Depending on n degree, 1 (at least) or more Memory Modules are required.

Steps: 180 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01549-41-5	$10	$12
FOR HP-71*	01549-71-2	N/A	$14

01550 Storm Water Detention Pond Design

by J.C. Seelbach, Sterling Heights, MI

Computes required detention volume and required pipe size or outflow rate for a gravity outflow basin. Or, required volume for a constant rate (pump) outlet. Volume of water flowing into basin found using Rational Formula. Calculus used to determine instantaneously changing outflow rate. Required volume is the difference between these. **Necessary Accessories for HP-41:** None

Steps: 203 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01550-41-3	$10	$12
FOR HP-71*	01550-71-0	N/A	$14

01551 Labyrinth

by K. Veenstra, Concord, CA

Guided by a compass, a single player tries to escape a maze by finding all the randomly hidden parts of a magical loadstone wand. Teleporting trolls hamper progress, but the explorer can blast and jump walls and blast trolls. Up to 10 by 10 cell maze with 41CV. Two programs. **Necessary Accessories for HP-41:** 3 Memory Modules minimum, Card reader.

Steps: 962 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01551-41-1	$10	$18
FOR HP-71	NOT AVAIL		

01552 Giant Pattern

by J. Czajkowski, San Diego, CA

As the name implies, this program generates a Giant Pattern using the input data, and can be presented in any of the following modes: double-wide, standard character, special character, or continuous std. character 1-127. Once the data is entered in any of the above modes, it can be used again in any other mode simply by storing it on mag cards and rerunning the program in a different mode. The program allows for many changes to the original pattern matrix, only in respect to appearance, not the backbone matrix. **Necessary Accessories for HP-41:** One Memory Module, Printer and Card Reader.

Steps: 430 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01552-41-9	$10	$14
FOR HP-71	NOT AVAIL		

01553 Greek Alphabet

by R.S. Altman, Clearlake, CA

This program is designed to help fellow HP-41C users who may want to use letters of the Greek alphabet in their own programs, as these are common in Engineering and Mathematics. This program uses "synthetic text" lines to produce non-standard printer characters and "alpha" or "acchr" for the standard printer characters. Use of synthetic functions increases speed and uses less memory than similar program using BLDSPEC printer function. **Necessary Accessories for HP-41:** 1 Memory Module, Card Reader (or Wand), Printer.

Steps: 247 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01553-41-7	$10	$13
FOR HP-71	NOT AVAIL		

01554 Model Rocket Altitude Tracking Data Reduction

by T. Beach, Waterville, MN

Calculates the altitude attained by a model rocket from two station tracking system data. Program uses both Vertical Midpoint (old NAR standard) and Geodesic data reduction methods. **Necessary Accessories for HP-41:** None

Steps: 191 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01554-41-5	$10	$12
FOR HP-71*	01554-71-2	N/A	$14

01555 Cost of Sales and Inventory for Small Shop

by E.D.H. Briones, Monterrey Neuv Leon, Mexico

Computes cost of goods sold and new inventory for small shop, keeping record of cost per item and inventory units. Accepts 40 different items per run. To work with more than 40, it is necessary to run the program as many times as multiples of 40 items you have. **Necessary Accessories for HP-41:** 2 Memory Modules, Card Reader (Printer optional)

Steps: 72 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01555-41-2	$10	$11
FOR HP-71*	01555-71-9	N/A	$12

01556 Five Azimuthal Projections

by M.J. Cook, Oshawa, Canada

Program calculates X and Y coordinates for construction of Gnomonic, Orthographic, Equidistant and Lambert Equal Area projections. The grids may be polar, equatorial or oblique. Program prompts for all input data and labels all output data. Audio signal of input and output is included. Program can be edited if no memory module is available. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 213 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01556-41-0	$10	$12
FOR HP-71*	01556-71-7	N/A	$14

01557 Two Way Analysis of Variance with Replicates

by P. Cooper, Melbourne, Australia

This program permits the complete ANOVA table to be generated for up to 13 by 13 classes with equal numbers of replicates. Data may be corrected during entry and program clearly prompts for all input. 3 by 3 ANOVA is solvable with only one memory module. **Necessary Accessories for HP-41:** At least 1 Memory Module

Steps: 412 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01557-41-8	$10	$13
FOR HP-71*	01557-71-5	N/A	$14

01558 Angle Between Two Planes

by W.B. Davis, La Jolla, CA

This program calculates the acute angle between two planes formed by four points, two of which are common to both planes. The program calculates the angle THETA using the X, Y,Z coordinates of the points and finds the distances between the points. In draftsman's terms this figures valley angles for any type of chute. **Necessary Accessories for HP-41:** 1 Memory Module. Printer optional.

Steps: 256 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01558-41-6	$10	$12
FOR HP-71*	01558-71-3	N/A	$14

01559 Standard Variances

by M.G. Green, Salisbury, Zimbabwe

The commonly used main Standard Variances for Cost or Management Accounting all in one Program. Variances are available for (i) Sales and Trading, giving Price, Volume and Cost; (ii) Production, giving Volume and Material Use; and (iii) Material Price. **Necessary Accessories for HP-41:** 2 Modules. Printer Desirable.

Steps: 489 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01559-41-4	$10	$15
FOR HP-71*	01559-71-1	N/A	$18

01560 Quick-Sort

by R.E. Gregg, Broomfield, CO

Sorts up to 200 numbers in ascending order much faster than a bubble sort. **Necessary Accessories for HP-41:** 4 Memory Modules

Steps: 213 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01560-41-2	$10	$12
FOR HP-71*	01560-71-9	N/A	$14

01563 Bond

by W.H. Kirkgaard, Clarksburg, CA

This program computes the yield-to-maturity of a bond given the price, coupon rate (payable semiannually), and the years to maturity. Or the program will determine the present value of a bond with a given coupon rate (semi-annual coupons), the years-to-maturity, and the desired yield. **Necessary Accessories for HP-41:** None

Steps: 184 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01563-41-6	$10	$12
FOR HP-71*	01563-71-3	N/A	$14

01564 Life Cycle Cost Analysis

by K. Landrum, Tigard, OR

The program calculates the present value for comparing alternatives in any energy system selection. The useful life, first year maintenance and energy costs, escalation rate of maintenance and energy, replacement cost, and time value of money are considered. **Necessary Accessories for HP-41:** Printer

Steps: 176 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01564-41-4	$10	$13
FOR HP-71*	01564-71-1	N/A	$14

01565 Mound

by L. Lafrenier, Lake Tomahawk, WI

This program solves 8 parameters for the Wisconsin Type 3 Mound Septic System given the loading rate, soil percolation rate, % slope at site, absorption area width and length. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 188 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01565-41-1	$10	$12
FOR HP-71*	01565-71-8	N/A	$14

01566 Best Way to Solve Simultaneous Equation up to 3 Unknowns

by F. Leung, El Cajon, CA

This program transforms your HP-41C(V) to an equation solver. You actually write the equation, bit by bit, to the display. So now you can check visually as you proceed. If the wrong equation is entered, the program also provides a way to rewrite the previous equation you have written. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 225 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01566-41-9	$10	$12
FOR HP-71*	01566-71-6	N/A	$14

01567 Ion Selective Electrodes. Known Addition Method

by A.E. Ortiz, Cordoba, Argentina

Do you work with ion selective electrodes? This program will make all the calculations you need for a sample analysis by the standard solution known addition method. The program follows all the steps of this method. It computes the slope of the electrode in assay conditions, the size of a convenient addition and the sample concentration. Also, you will obtain a printed report with all results. **Necessary Accessories for HP-41:** 1 Memory Module and Printer

Steps: 192 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01567-41-7	$10	$14
FOR HP-71*	01567-71-4	N/A	$16

01568 Equivalent Sphere Illumination

by G.I. Roper, Denver, CO

This program can be used to determine Equivalent Sphere Illumination (ESI). ESI is a measure of visual display visibility. ESI is a function of display contrast, C, and background Luminance, Lb. It is calculated using the Relative Contrast Sensitivity (RCS) function of luminance. This program is most useful when recording field measurements of contrast. **Necessary Accessories for HP-41:** None, however, input variables can be obtained from field measurements using a photometer and Contrast/ESI Meter.

Steps: 288 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01568-41-5	$10	$13
FOR HP-71*	01568-71-2	N/A	$14

01569 Equilibrium Flash

by N.C. Samish, Houston, TX

Given the moles of up to 10 compounds and the K's (Y/X ratios), the program will compute the equilibrium phase compositions. Ideal K's are calculated if the critical properties and boiling points of the components are furnished. A rugged algorithm is used that always comes to a solution. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 487 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01569-41-3	$10	$15
FOR HP-71*	01569-71-0	N/A	$18

01570 Comparison of Three Equations of State

by N.C. Samish, Houston, TX

Which is the best equation-of-state? This program allows the quick comparison of three of the best methods for predicting the PVT properties of a pure substance. Needed input is critical pressure and temperature, normal boiling point or acentric factor, and a temperature and volume at which the predicted pressure is desired. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 683 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01570-41-1	$10	$16
FOR HP-71*	01570-71-8	N/A	$18

01571 Japanese Katakana

by J. Schoenbrun, Santa Monica, CA

This program enables storage and printing of the Japanese Katakana alphabet. Part 1 loads the storage registers, and Part 2 is used to print them. **Necessary Accessories for HP-41:** Quad Memory Modules and Printer (Card Reader optional)

Steps: 1089 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01571-41-9	$10	$21
FOR HP-71	NOT AVAIL		

01572 RC Circuit Table

by R. Simons, Atlanta, GA

Program prompts for input of resistance in ohms, capacitance in farads, the frequency range of interest and the steps of that range. The calculator will then generate a formatted table of the frequencies, the output voltage (as a percent of input voltage) and the phase angle between output voltage and input voltage. **Necessary Accessories for HP-41:** Printer

Steps: 111 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01572-41-7	$10	$12
FOR HP-71*	01572-71-4	N/A	$14

01574 PI-Network Impedance Matching

by R. Simons, Atlanta, GA

Program outputs the components of a PI-Network, lossless between two resistive impedances. Program prompts for the entry of impedance, #21 and #22, the operating frequency, f, and the desired system, Q. **Necessary Accessories for HP-41:** None

Steps: 118 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01574-41-3	$10	$11
FOR HP-71*	01574-71-0	N/A	$12

01575 Quadratic Curve Fit

by R. Simons, Atlanta, GA

Program conditions x, y data to fit a curve of form $y=ax2+bx+c$ to data points with the sum of the squares of the deviations minimized. Program is an HP-41 adaptation of HP-25 programs by Curtis Adams and Phillip Wasson. **Necessary Accessories for HP-41:** None

Steps: 212 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01575-41-0	$10	$12
FOR HP-71*	01575-71-7	N/A	$14

01576 F Distribution (All Cases)

by R. Simons, Atlanta, GA

Program computes the right hand tail of the F Distribution, i.e., $Q(F)= Pr(x>F)$ for all cases of degrees of freedom odd or even. Program automatically selects the case of degrees of freedom odd or even, i.e., (1) Df1 even (2) Df2 even, (3) smaller of Df1, Df2 if both even and (4) Df1, Df2 both odd. (41C rewrite of 00270D), Stoll. **Necessary Accessories for HP-41:** 1 Memory Module or 41CV

Steps: 250 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01576-41-8	$10	$12
FOR HP-71*	01576-71-5	N/A	$14

01577 L-Pad Minimum Loss

by R. Simons, Atlanta, GA

Program outputs the L-Pad resistors R1 and R2 along with the system loss in decibels. Prompts are provided for the entry of the two impedances Z1 and Z2, required by the program. **Necessary Accessories for HP-41:** None

Steps: 86 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01577-41-6	$10	$11
FOR HP-71*	01577-71-3	N/A	$12

01578 Linear-Exponential Curve Fit

by E. Franco, Atlanta, GA
R. Simons, Atlanta, GA

This program fits x and y data points to a curve of the form $Y=Ax/Bx$ and is a useful model in the biological sciences - in describing the interaction of parasites and white blood cells, and may be useful in dose-response and response-time curves. Provides R2, a,b, x-Ymax, Ymax. **Necessary Accessories for HP-41:** None

Steps: 138 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01578-41-4	$10	$12
FOR HP-71*	01578-71-1	N/A	$14

01580 Checkbook Made Easy

by J.S. Ulrick, Berkeley, CA

Balances checkbook and reconciles statement with minimum input. Balance prompts for deposit date and amount; displays sequential check numbers and prompts for amounts. Statement reconciliation prompts for deposits received and bank charge; outstanding checks, displayed by number and amount, are reconciled by a Y/N type response. **Necessary Accessories for HP-41:** 1 Memory Module, Card Reader (Printer optional).

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01580-41-0	$10	$12
FOR HP-71	NOT AVAIL		

01581 Linear Water Wave Theory

by T. Walton Jr, Woodbridge, VA

Linear Wave Theory is used to compute wave height, wave number, wave celerity, shoaling coefficient, refraction coefficient, and horizontal and vertical velocities. Input parameters are wave period, deep water wave angle, deep water wave height, water depth, depth of interest, and wave phase angle. English or metric units may be used. **Necessary Accessories for HP-41:** HP82143A Printer

Steps: 238 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01581-41-8	$10	$13
FOR HP-71*	01581-71-5	N/A	$14

01582 Markov Chain, Discrete Time

by B.R. Vianna, Belo Horizonte, Brazil

Given a tally matrix of order 8 or less, this program calculates the transition probability matrix, the initial vector and, through the procedure known as "powering the matrix", solves for the limiting steady-state. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 254 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01582-41-6	$10	$13
FOR HP-71*	01582-71-3	N/A	$14

01583 Aqueous Facility Tonography

by D.F. Woodhouse, Wolverhampton, United Kingdom

Program calculates the ophthalmological aqueous facility coefficient (c) using Goldmann applanation, ocular rigidity and up to 20 Schiotz values measured along the tonography curve. The results are averaged and error estimated by the standard deviation and also the correlation coefficient of the curve. **Necessary Accessories for HP-41:** 82143A Printer; 82104A Card-Reader; Quad Memory (or 2 Memory Modules)

Steps: 244 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01583-41-4	$10	$13
FOR HP-71*	01583-71-1	N/A	$14

01584 CG and Composite Radius Gyration Calculations

by R.L. Zimmerman, Littleton, CO

This program calculates Center of Gravity in one, two, or three dimensions, or calculates a three dimensional composite Radius of Gyration given the weight, centroid, and individual radii of gyration of the component parts. Provisions are made to allow outside access to the output portion of the program. **Necessary Accessories for HP-41:** None

Steps: 207 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01584-41-2	$10	$12
FOR HP-71*	01584-71-9	N/A	$14

01585 Simple Linear Regression

by D.P. Brooks, Dayton, OH

This program solves a variety of least squares and simple linear regression problems for statistics students and managers. Given one independent and one dependent variable, it will accept historical data then solve for the sum of squares, intercept, slope, variance, forecast values of Y, confidence intervals, and hypothesis tests. **Necessary Accessories for HP-41:** 1 Memory Module may be necessary.

Steps: 211 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01585-41-9	$10	$12
FOR HP-71*	01585-71-6	N/A	$14

01586 Fire Danger

by W.J.B. Crane, Canberra, Australia

This program computes fire danger for both grasslands and forests; a numerical index, a hazard rating, rate of spread, and in the case of forest fires - flame height and spotting distance. Two subprograms compute drought and humidity. Fire danger can be projected forward using current and forecast conditions. **Necessary Accessories for HP-41:** Quad Memory. Printer advantageous but not essential.

Steps: 863 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01586-41-7	$10	$21
FOR HP-71*	01586-71-4	N/A	$26

01587 Inverse Interpolation by Salzer's Method

by J.F.G. Darby, Parkville, Australia

Two programs. The first finds and stores the coefficients of Salzer's Inverse Interpolation formula given three to six function values known as uniform spacings of the independent variable. The second finds and stores the coefficients of Salzer's decomposition of the Lagrange Interpolation polynomial for the inverse functions. After the coefficients are stored both programs can evaluate the formula for any chosen value of y to give the corresponding value of x. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 375 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01587-41-5	$10	$13
FOR HP-71*	01587-71-2	N/A	$14

01588 League Bowling Statistics and Set Up

by K. Fletcher, West Palm Beach, FL

This program automatically computes and maintains averages, number of games, and total pins for all participants in a bowling league consisting of any number of teams. The program is entirely self-prompting and will reduce the weekly drudgery of the league statistician. Provisions exist for substitutes, absent bowlers, changes and corrections. **Necessary Accessories for HP-41:** 1 Memory Module. Card Reader, Printer suggested.

Steps: 310 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01588-41-3	$10	$14
FOR HP-71	NOT AVAIL		

01589 Growth and Yield of Alder

by B. Flye, Longview, WA

Program computes stand data from three knowns, age, site index, or height, basal area or percent of normal basal area. Selectable output available: age total or breast high, site index, basal area data, tarif, height, diameter, cubic volume total stem or to a 6 inch top, Scribner volumes 16 or 32 foot logs to a 6 inch top and grows the stand for a user specified number of years providing new stand data at requested intervals. **Necessary Accessories for HP-41:** 2 Memory Modules, Card Reader and Printer helpful but not needed.

Steps: 472 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01589-41-1	$10	$15
FOR HP-71*	01589-71-8	N/A	$18

01590 Restriction Orifices

by J.D. Green, Des Plaines, IL

Solve 3 types of problems: 1) If pressure drop remains constant will solve for bore given flow rate or vice-versa. For liquids/gases; 2) When the pressure drop varies with time (like pressurizing a vessel). Variables are bore, time, flow rate. Given one variable, it solves the other two. Gas only; 3) When orifice is used to both measure and restrict, solves for bore and differential pressure (flange taps). Gas only. **Necessary Accessories for HP-41:** 2 Memory Modules, Card Reader. Printer is optional.

Steps: 534 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01590-41-9	$10	$14
FOR HP-71*	01590-71-6	N/A	$16

01592 Super-Plot

by H. Woelper, Clausthal, West Germany

This program (S-PLOT) is able to plot up to five functions in one diagram. For each axis you can chose, whether it is divided linear or logarithmic. A suitable format for the axis labels is determined automatically; relative labels or scientific format is used if necessary. Some extra services are available. **Necessary Accessories for HP-41:** 3 Memory Modules and Printer.

Steps: 697 HP-41 Bytes: 1322

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01592-41-5	$10	$16
FOR HP-71	NOT AVAIL		

01593 The Ultimate Calendar - A.D. & B.C.

by W.E. Hitchins, Los Angeles, CA

Complete calendar from Jan. 1, 45 B.C. to Feb. 28, 4904 A.D., the entire period of the Julio-Gregorian calendar that can be calculated with certainty. Computes days between dates, day of week, day of year, days remaining in the year, date of a number of days before or after a given date, Julian day, and conversion of julian day to calendar date. Invalid dates are rejected. Program allows for Roman errors in inserting leap years between 45 B.C. and 8 B.C. and for both the Augustan and Gregorian corrections. **Necessary Accessories for HP-41:** HP-41C requires 3 Memory Modules. Card Reader or Wand useful.

Steps: 706 HP-41 Bytes: 1395

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01593-41-3	$10	$17
FOR HP-71*	01593-71-0	N/A	$20

01594 Stock Roll Calculations

by W.W. Lauer, Canton, OH

This program solves problems incurred when a material is continuously spiral wrapped around a core. It will solve for the remaining unknown when provided with any 3 of the following: a. Final diameter, b. Empty core diameter, c. Length of material, d. Material thickness. Materials consisting of 2 dissimilar thicknesses may be used. **Necessary Accessories for HP-41:** None

Steps: 160 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01594-41-1	$10	$12
FOR HP-71*	01594-71-8	N/A	$14

01595 Fractions Calculator

by C. Manning, Canberra, Australia

This program adds, subtracts, multiplies, and divides fractions; it converts between decimals and fractions, and vice versa, and finds GCD and LCM. Advantages over similar programs are more flexible entry, two level stack for easy chain calculations, automatic reduction to the simplest mixed number, and easy to remember key locations. **Necessary Accessories for HP-41:** None

Steps: 97 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01595-41-8	$10	$11
FOR HP-71*	01595-71-5	N/A	$12

01596 Sideral Time, Horizontal & Equatorial Hourary Co-ordinates

by C. Merlo, Padova, Italy

Giving date, time, longitude, latitude of observation point and Declination and Right Ascension of a sidereal object, the program calculates the horizontal coordinates: azimuth, altitude, zenital distance, and the equatorial hourary coordinate: hour angle. Equinox equation, Greenwich sidereal time, local sidereal time are also calculated. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 550 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01596-41-6	$10	$15
FOR HP-71*	01596-71-3	N/A	$18

01598 Three Simultaneous Linear Equations

by R. Simons, Atlanta, GA

Program uses the Gauss Reduction Method to quickly and economically find the unknowns. Program has full alphanumeric prompting for fast, and convenient, data entry; a routine for immediate data correction following an incorrect entry; a routine for automatic, sequential review of the contents of all data registers and an answer recall routine. **Necessary Accessories for HP-41:** None

Steps: 167 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01598-41-2	$10	$12
FOR HP-71*	01598-71-9	N/A	$14

01599 Address Book

by K.A. Stork, Bozeman, MT

The HP-41C keeps your address files on mag-cards, one track per entry, (name, address, phone #, birthday, and anniversary). The printer gives a handy output but is not required. **Necessary Accessories for HP-41:** 1 Memory Module, Card Reader. Printer optional.

Steps: 111 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01599-41-0	$10	$12
FOR HP-71	NOT AVAIL		

01600 Viscosity of Gas Mixture at Low Density

by M. Tremblay, Ste-Foy, Canada

This program computes the viscosity of a mixture of up to 92 (8 without memory modules) different gases. You must enter the following data for each gas: mole fraction, molecular weight and viscosity. The result is computed rapidly with the help of the Chapman-Enskog Theory. **Necessary Accessories for HP-41:** None

Steps: 139 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01600-41-6	$10	$11
FOR HP-71*	01600-71-3	N/A	$12

01601 Mining Calculation

by L. van Rooyen, Johannesburg, South Africa

Program calculates the pillar width for an underground coal mine. A pillar width is initially guessed, and the correct width calculated no matter how wrong the guess. The farther out the guess, the longer the computation time. **Necessary Accessories for HP-41:** None

Steps: 67 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01601-41-4	$10	$11
FOR HP-71*	01601-71-1	N/A	$12

01602 PEPL

by J.D. West, Indianapolis, IN

This program solves for natural gas (.6 Sp.Grv.) flow thru pipelines, using the PEPL (Panhandle Pipeline) formula. Extensive use is made of labels and prompts to make execution very simple. Inputs and solutions can be in user's choice of miles or feet, and CFH or MCF/D. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 244 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01602-41-2	$10	$13
FOR HP-71*	01602-71-9	N/A	$14

01603 Data Analysis of Three Element Strain Gage Rosettes

by R.C. Williams, Northport, NY

This program performs the analysis of data from any three element strain gage rosettes mounted on a stressed model. The program will print or display the accompanying strains, stresses, principal stresses and principal directions with respect to a chosen X-Y coordinate system. **Necessary Accessories for HP-41:** 3 Memory Modules; Printer optional.

Steps: 539 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01603-41-0	$10	$16
FOR HP-71*	01603-71-7	N/A	$18

01604 Newton's Method in up to 11 Variables

by R. Winkel, Columbia, MO

Uses routines in the math module to solve systems of equations using Newton's Method. Requires one, two or three memory modules depending on size of system of equations. (Solves one to eleven equations/unknowns). **Necessary Accessories for HP-41:** Math Module, Memory Modules as needed.

Steps: 210 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01604-41-8	$10	$12
FOR HP-71	NOT AVAIL		

01605 Intraocular-Implant Lens-Power

by D.F. Woodhouse, Wolverhampton, United Kingdom

This program calculates the dioptric power of the intraocular implant used after cataract surgery from keratometric and ultrasonic data. It also plots the change of power required as the position of the implant varies up to seven millimetres from the corneal surface. **Necessary Accessories for HP-41:** 82104A Card Reader; 82143A Printer.

Steps: 92 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01605-41-5	$10	$11
FOR HP-71	NOT AVAIL		

01606 Sailing-Force Plot

by D.F. Woodhouse, Wolverhampton, United Kingdom

Program prompts for beat-angle and produces a plot of relative force provided for varying direction of main sail boom for as many angles as required; then outputs plot of maximum sailing force available at each angle of beat. **Necessary Accessories for HP-41:** Peripheral Printer, 82143A.

Steps: 72 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01606-41-3	$10	$11
FOR HP-71	NOT AVAIL		

01607 Acoustic Wavelength, Temperature and Velocity

by H.E. Wyles, Fairfax, VA

This program calculates interchangable solutions between frequency, wavelength, temperature and velocity for sound in air. Values, for input and output, may be expressed directly in feet, inches, meters, centimeters, milimeters, Hertz, Kilohertz, degrees Celsius, degrees Fahrenheit, velocity in meters per second, and velocity in feet per second. Inputs and outputs are fully labeled. **Necessary Accessories for HP-41:** 1 Memory Module. Printer optional.

Steps: 324 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01607-41-1	$10	$14
FOR HP-71*	01607-71-8	N/A	$16

01609 National Economy

by K. Akima, Boulder, CO

This program implements the Keynesian model of the national economy with three sectors: Business, Consumers, and Government. Input is any subset of primary parameters and state variables, output is any of the remaining ones. Some of the secondary variables may also be calculated. **Necessary Accessories for HP-41:** None

Steps: 200 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01609-41-7	$10	$12
FOR HP-71*	01609-71-4	N/A	$14

01610 Steel Strength Design

by J.C. Anderson, Palos Verdes, CA

This program is a group of nine interactive programs which use a common data base to design beams, columns and beam-columns in steel. The programs are based on the strength design provisions contained in Part II of the AISC Specification. **Necessary Accessories for HP-41:** None

Steps: 755 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01610-41-5	$10	$19
FOR HP-71*	01610-71-2	N/A	$22

01611 Stirrups Placement in Concrete Beams with Uniform Load

by J.A. Arrieta, Miami, FL

This program helps place vertical stirrups in reinforced concrete beams with uniform load (ultimate) according to ACI 318-77 Code, in English units. It has a different approach than existing program 01892 D, "Concrete Beam Shear Reinforcing". **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 193 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01611-41-3	$10	$12
FOR HP-71*	01611-71-0	N/A	$14

01612 True Active Filter Design

by W. Bican, Vienna, Austria

This program calculates active filters with real available capacitors instead of ideal - non available - capacitors. In such a case, just the rippletactor alpha has to be calculated, depending on the ratio C2/C5, which means Q(1/alpha) is changed (improved). The ratio C2/C5 is related to the low pass calculation. **Necessary Accessories for HP-41:** 1 Memory Module. Printer optional.

Steps: 236 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01612-41-1	$10	$12
FOR HP-71*	01612-71-8	N/A	$14

01613 Base Transformation and Arithmetic

by P.V. Cabieses, Lima, Peru

This program performs base conversion of a positive or negative integer from one base to another base. Arithmetic of two numbers on a same base N1 is also performed for addition, subtraction, multiplication and division, answer is displayed on base N2. The bases are integer values from 2 to 23. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 314 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01613-41-9	$10	$13
FOR HP-71*	01613-71-6	N/A	$14

01615 Barcodes on the 82143A Printer

by C. Erickson, Pullman, WA

This program will generate one, two and three byte wand legible barcodes using the standard HP-82143A Printer and the black thermal paper. **Necessary Accessories for HP-41:** HP-82143A Printer

Steps: 103 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01615-41-4	$10	$11
FOR HP-71	NOT AVAIL		

01616 Double Precision Hexadecimal Conversion

by L. Ewing, Santa Barbara, CA

Program computes hexidecimal-to-decimal and decimal-to-hexidecimal conversions for 12-digit hex values. Twelve digit hex corresponds to 15-digit decimal (FFFFFFFFFFF is approximately 2.81 E15). Conversions are efficient, taking about 1 1/2 second per hex digit (slightly longer for H-D than D-H). **Necessary Accessories for HP-41:** None

Steps: 189 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01616-41-2	$10	$12
FOR HP-71*	01616-71-9	N/A	$14

01617 Space Cleaner

by F. Rinaldi, Montigny-les-Metz, France

You are the Commander of a Nuclear Powered Reconnointer Space Ship (NPRSS). The NPRSS is the cleaner of the vast galaxy. Within the galaxy somewhere, among the stars, lie some sinister meteors, known throughout space as interstellar danger, and liable for important space ship's damages. Your mission, as Commander of the NPRSS, is to detect and destroy all the meteors you find on your way. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 574 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01617-41-0	$10	$16
FOR HP-71*	01617-71-7	N/A	$18

01618 CONCBM

by W.H. Kirkgaard, Clarksburg, CA

Program designs or reviews reinforced concrete beams. With known material strengths and dimensions, the minimum reinforcing steel area is computed for a given ultimate bending moment. For a beam of known properties, the ultimate bending moment is calculated. **Necessary Accessories for HP-41:** None

Steps: 93 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01618-41-8	$10	$11
FOR HP-71*	01618-71-5	N/A	$12

01619 2 X 2 Complex Matrix

by W. Liu, Sugar Land, TX

This program determines the determinant of a 2 X 2 complex matrix. It also solves the two unknown variables by Cramer's rule. The calculation does not require data re-entry. **Necessary Accessories for HP-41:** None

Steps: 181 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01619-41-6	$10	$12
FOR HP-71*	01619-71-3	N/A	$14

01620 Checkbook Reconciler

by M.D. Owens, Clearfield, UT

Let your 41C reconcile your checking account. Enter your checks and deposits into the 41C. When they clear, just enter it's number, the 41C tells you what your bank statement and checkbook balance should show. It records outstanding checks, deposits and balance on a magnetic card for future use. **Necessary Accessories for HP-41:** One Memory Module, Card Reader

Steps: 177 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01620-41-4	$10	$12
FOR HP-71	NOT AVAIL		

01621 Frequencies and Mode Shapes for a General 3-DOF System

by C.C. Richie, Downey, CA

Natural frequencies and mode shapes for a general 3 mass and 6 spring system are determined. The natural frequencies and mode shapes are sorted in ascending order. To obtain the best numerical accuracy, three alternate mode shape solutions are evaluated. **Necessary Accessories for HP-41:** None

Steps: 580 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01621-41-2	$10	$15
FOR HP-71*	01621-71-9	N/A	$18

01622 Finite Difference Heat Transfer Two Dimensional

by G.S. Buck, Baton Rouge, LA

The relaxation method is used to solve conduction/convection heat transfer problems with or without heat generation. Four node types can be used. A maximum of 70 nodes are available. After node numbers and types are assigned, the finite difference equations are generated and solved by HP41C. **Necessary Accessories for HP-41:** Printer and Quad Memory Module

Steps: 604 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01622-41-0	$10	$18
FOR HP-71*	01622-71-7	N/A	$22

01623 Internal Combustion Engine Performance Calculations

by N. Gale, Columbus, IN

This program solves eight equations that relate twenty performance parameters of internal combustion engines. The unknown variables in four of these equations can be defined by the user. Many variables are common to several equations: so once any variable has been input or calculated it does not have to be re-entered. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 325 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01623-41-8	$10	$14
FOR HP-71*	01623-71-5	N/A	$16

01624 Morse Code (Compiled Transmit, Single Character or Practice)

by H.C. Gernhardt Jr, Princeton, WV

This program transmits code at a speed of 4-7 wpm. Single characters or groups of characters may be 'sent', or random practice code generated. Character entry is by pressing the appropriate alpha key(s). One long and one short tone of the same frequency is used. 'Synthetic' lines are 'tone 3' and 'tone Q'. No other synthetic functions required. Assignments are not necessary. **Necessary Accessories for HP-41:** 3 Memory Modules; Card Reader or Wand mandatory.

Steps: 400 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01624-41-6	$10	$16
FOR HP-71*	01624-71-3	N/A	$18

01625 Mass Properties Summation

by B.G. Giancola, Saratoga, CA

This program combines the mass properties (i.e. Weight, Centers of Gravity, Moments and Products of Inertia) of any number parts into one composite part or assembly. **Necessary Accessories for HP-41:** None

Steps: 178 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01625-41-3	$10	$12
FOR HP-71*	01625-71-0	N/A	$14

01626 Dimension Addition

by E.E. Gilbert, Mableton, GA

This program accepts any quantity of different dimensions in the format of feet, inches, and fractions of an inch for fractions through 32nds, adds them together and displays the total sum of all dimensions in the same format of feet, inches, and fractions of an inch. **Necessary Accessories for HP-41:** None

Steps: 198 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01626-41-1	$10	$12
FOR HP-71*	01626-71-8	N/A	$14

01627 Horizontal Vessel Volume

by J.A. Glassett, Texas City, TX

Program calculates the volume of material in partially filled horizontal cylindrical vessels with flat heads, dished heads, elliptical heads or hemispherical heads. Also calculates the volume in a vertical cylindrical tank. **Necessary Accessories for HP-41:** None

Steps: 149 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01627-41-9	$10	$12
FOR HP-71*	01627-71-6	N/A	$14

01630 Internal Rate of Return

by G. Goodman, Stamford, CT

This program calculates the Internal Rate of Return (Discount Rate of Return or Yield) for up to 40 cash flows on the basic HP-41C. Each additional memory module adds 64 more cash flows. This program is an improved version of 00194C both in printed output and in the ability to back up and change previous entries. **Necessary Accessories for HP-41:** None. Printer optional.

Steps: 74 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01630-41-3	$10	$11
FOR HP-71*	01630-71-0	N/A	$12

01631 Installment Sale of Property Tax Differential

by J. Klein, New York, NY

This program is intended to calculate the tax differential to the seller on an installment sale versus an outright, i.e., lump sum sale of a piece of property. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 239 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01631-41-1	$10	$12
FOR HP-71*	01631-71-8	N/A	$14

01633 Conversion of Drug Infusion

by M.R. Marler, Pittsburgh, PA

Converts drug infusion rate from micrograms/kilogram/min to cubic centimeters/hour given the drug concentration in micrograms/cubic centimeter. **Necessary Accessories for HP-41:** Printer

Steps: 76 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01633-41-7	$10	$11
FOR HP-71*	01633-71-4	N/A	$12

01634 Expense Account w/Summary

by P.D. Miner, Orlando, FL

An expense report which keeps a record of each entry into categories of lodging, meals, guest meals, car rental, car expense, taxi, telephone, gratuities, cleaning, supplies, and other by prompting for each item by day. The summary lists expenses by day, category, and item including totals for each. **Necessary Accessories for HP-41:** Card Reader 82104A, Printer 82143A

Steps: 346 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01634-41-5	$10	$16
FOR HP-71	NOT AVAIL		

01636 VHF Radio Jamming

by F.W. Niedenfuhr, Washington, D.C.

Program computes jam-to-signal ratios and communication ranges in a jammed or unjammed environment, using a smooth earth approximation. Input parameters include antenna heights and directional gains, transmitter power, frequency and bandwidth, required and tolerable signal-to-noise ratios, relative positions of the participants, and electrical constants of the earth. Program is arranged to facilitate evaluation of effects of changing input parameters. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 201 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01636-41-0	$10	$13
FOR HP-71*	01636-71-7	N/A	$14

01637 Finding Best Curve Fit Among Twelve Equations

by J.A. Pita, Quito, Ecuador

Given a number of data pairs, this program fits twelve different equations to data by the method of least squares. Comparing the correlation coefficients obtained, program finds the best fit. The parameters of the twelve equations can be displayed (a, b and r2) and the user can make projections for any of the equations. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 805 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01637-41-8	$10	$16
FOR HP-71*	01637-71-5	N/A	$18

01638 Musical Transposition

by P.L. Rossiter, Mont Albert, Australia

This program transposes musical notes from one major key to another so that the resulting note has the correct interval from its new tonic. **Necessary Accessories for HP-41:** None

Steps: 176 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01638-41-6	$10	$12
FOR HP-71*	01638-71-3	N/A	$14

01641 Pipe Sizing (Hazen Williams)

by M.F. Schluender, Gladstone, MS

This program calculates pipe size, velocity, pressure loss, and total pressure loss for a given set of parameters for either individual pipes or a system. Any fluid may be used if the "C" values are available. **Necessary Accessories for HP-41:** 1 Memory Module (Printer Desirable)

Steps: 218 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01641-41-0	$10	$13
FOR HP-71*	01641-71-7	N/A	$14

01642 Game of Rhythms

by H.H. Suarez, Geneva, Switzerland

Since the HP-41 displays the status of flags 0-4, this program uses that characteristic to generate a game that exercises the sense of rhythm. This game has 4 levels of difficulty, and was found very interesting by the great majority of the people that played it. **Necessary Accessories for HP-41:** None

Steps: 126 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01642-41-8	$10	$12
FOR HP-71*	01642-71-5	N/A	$14

01643 Periodic Table of the Elements and Electron Structure

by M. Tremblay, Ste-Foy, Canada

Incredible. Carry a periodic table of the elements in your HP-41. The program asks you for the element (usually 2 letters) then gives you: atomic number, oxidation state, atomic weight, state, neutrons, density, melting point, first energy of ionization, electronegativity. Moreover it computes the electron structure of every element. EX: 41"14/5d"10/65"2/6p"2 (Lead, Pb). **Necessary Accessories for HP-41:** Card Reader and Quad Module (or HP-41CV)

Steps: 879 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01643-41-6	$10	$27
FOR HP-71	NOT AVAIL		

01644 Bar Code Generator

by B. Schafer, Corvallis, OR

This program, when coupled with knowledge from the 82153-90019 "Create Your Own HP-41 Bar Code" manual, will allow the user to print up to 16 continuous bytes of bar coded information. Required inputs are made as the decimal equivalent of the binary code. **Necessary Accessories for HP-41:** HP-IL Module 82160A, HP-Thermal Printer 82162

Steps: 74 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01644-41-4	$10	$11
FOR HP-71	NOT AVAIL		

01645 Real - H, Y, and Z Parameter Transistor Characteristics

by L.R. Abelbeck, Mt. View, CA

This program permits conversion between any real h, y or z - parameter matrix and/or common emitter, base, or collector circuit configuration. Given source and load resistances, the program calculates: input resistance, output resistance, insertion power gain, transducer power gain, available power gain, device voltage gain, system voltage gain and current gain. **Necessary Accessories for HP-41:** 2 Memory Modules required, Printer optional

Steps: 473 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01645-41-1	$10	$15
FOR HP-71*	01645-71-8	N/A	$18

01647 Expansion Tank Selection

by E. Auchter, Hoffman Estates, IL

Expansion tanks with or without diaphragms are sized for operating temperatures between 100 and 400 F with the expansion tank connection at pump suction or discharge or with the expansion tank location at the top of the system. System volume is also calculated and displayed based on standard steel pipe flow. **Necessary Accessories for HP-41:** 2 Memory Modules or Quad Module. Printer optional.

Steps: 303 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01647-41-7	$10	$14
FOR HP-71*	01647-71-4	N/A	$16

01648 Stable Density Functions

by J. Brownlow, Lancaster, CA

This program evaluates stable density functions for parameters alpha and gamma (0 < alpha < 1, abs gamma < alpha or 1 < alpha < 2 , abs gamma < 2 - alpha). The program requires x>o; values of f(x; alpha, gamma) for negative x are given by f(x; alpha, -gamma). Program uses the log of the gamma function instead of the gamma function. **Necessary Accessories for HP-41:** None

Steps: 197 HP-41 Bytes: 292

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01648-41-5	$10	$12
FOR HP-71*	01648-71-2	N/A	$14

01649 Viscosity Corrections for Centrifugal Pumps

by G.S. Buck, Baton Rouge, LA

Centrifugal pump performance for viscous liquids is based on water performance corrected by factors from the Hydraulic Institute. These factors are a function of flow, head and viscosity, shown in figure 63 of the Hydraulic Institute Standards. This program uses curve fitted equations to replace figure 63. Also, given water performance, the viscous performance is calculated. **Necessary Accessories for HP-41:** None

Steps: 178 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01649-41-3	$10	$12
FOR HP-71*	01649-71-0	N/A	$14

01650 Speed Conversions

by T.R. Casey, Torrance, CA

This program provides for fast, easy conversions of the following speed units: miles/hour, knots, feet/min., feet/sec., meters/sec., kilometers/hour. Any one is converted to any other with a single keystroke. Outputs are labeled. **Necessary Accessories for HP-41:** None

Steps: 105 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01650-41-1	$10	$12
FOR HP-71*	01650-71-8	N/A	$14

01651 Shaly Sand Analysis

by J.F. Devaney, Corpus Christi, TX

This program can be used to perform a rapid well-site analysis of shaly sand intervals in oil and gas wells. It calculates total effective porosity (corrected for gas effect) and water saturation in shaly hydrocarbon bearing intervals, using data available from the following open hole logs; Compensated Neutron, Formation Density, Induction and Gamma Ray. **Necessary Accessories for HP-41:** 1 Memory Module (Printer optional)

Steps: 254 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01651-41-9	$10	$13
FOR HP-71*	01651-71-6	N/A	$14

01652 Tumor Volume and Statistics

by J.R. Dunn II, Detroit, MI

Calculates spherical or cylindrical volume, depending upon width/length ratio of two vernier caliper measurements. Individual tumors numbered and the volume displayed. Mean, S.D., SEM, % CV displayed for each group. The first group may be designated a control and the % control of the mean and SEM of subsequent groups is then calculated. Errors deleted. Fully prompted. **Necessary Accessories for HP-41:** None

Steps: 161 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01652-41-7	$10	$12
FOR HP-71*	01652-71-4	N/A	$14

01654 Checkers

by C. Erickson, Pullman, WA

This program plays a competitive game of checkers. Output includes a complete checker board, updated after every round. Other features include move time limit with warnings, Kinging, multiple jumps, stalemate and default. The computer move logic also features random choice from moves of equal computed point value, simulating an unpredictable human opponent. **Necessary Accessories for HP-41:** Quad Memory Module, Printer

Steps: 972 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01654-41-3	$10	$18
FOR HP-71	NOT AVAIL		

01655 Copper Wire Gage Calculations

by R.S. Fernandez, San Francisco, CA

This automatically running program determines what copper wire gage # (14 AWG to 700 MCM) to use for electrical feeder and branch circuits. Its output satisfies the 1981 National Electrical Code. There are 5 data cards provided which allows user to choose between 25 different wire insolations. **Necessary Accessories for HP-41:** Quad or 1 Memory Module and Card Reader (Printer optional)

Steps: 267 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01655-41-0	$10	$18
FOR HP-71	NOT AVAIL		

01656 Vanishing Premium

by P.D. Harkins, Jackson, MO

This program uses dividend accumulations under a participating whole life policy to make the annual premium seemingly "vanish". Dividends and cash values are arranged in memory by duration (loading program included). Program determines minimum number of years for premium payment, then summarizes. **Necessary Accessories for HP-41:** 1 Memory Module, Card Reader

Steps: 168 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01656-41-8	$10	$13
FOR HP-71	NOT AVAIL		

01657 Unified Soil Classification

by B.D. Heinrich, Fresno, CA

A soil sample is classified by the Unified Soil Classification System, when given standard soil data. Such as percent passing U.S. standard sieves, units, both plastic and liquid and so forth. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 222 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01657-41-6	$10	$13
FOR HP-71*	01657-71-3	N/A	$14

01658 Cryptograms

by P.S. Henry, Berkeley, CA

Creates cryptograms using either a calculator generated map, or a user-input map. Encodes and decodes alpha register using this. Most data is held in extended memory, except while generating map. Map may be cleared to hyphens. Individual letters may be specified for different mapping after map is completed. Maps may be stored on cards. **Necessary Accessories for HP-41:** 1 Memory Module, Extended Functions Module, (Printer/Card Reader optional)

Steps: 309 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01658-41-4	$10	$14
FOR HP-71	NOT AVAIL		

01659 Account Balance with Daily Compounding

by W.E. Hitchins, Los Angeles, CA

Computes the balance and accumulated interest on any savings-type account where the interest rate is compounded daily (on a 360 or 365-day basis) and deposits and withdrawals are made at irregular intervals. Provision is made to alter interest rate should this change during the period. **Necessary Accessories for HP-41:** None

Steps: 169 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01659-41-2	$10	$12
FOR HP-71*	01659-71-9	N/A	$14

01660 Geodesic Arc Length, Azimuth

by B.T. Iwatake, Honolulu, HI

Input latitude and longitude of two points and get distance, azimuth, and back azimuth based on the reference ellipsoid of your choice. Uses the Andoyer-Lambert formulas with second order flattening term as derived by Thomas. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 308 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01660-41-0	$10	$12
FOR HP-71*	01660-71-7	N/A	$14

01661 Arithmetic and Geometric Sequences

by J.N. Junker, Oklahoma City, OK

This program will find the number that you are in search of and the sum of these numbers whether the sequence be arithmetic or geometric. **Necessary Accessories for HP-41:** None

Steps: 101 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01661-41-8	$10	$11
FOR HP-71*	01661-71-5	N/A	$12

01662 Binary / Hex / Decimal Conversions

by T.K. Kalaf, Tempe, AZ

Programs to convert Binary or Hex values 'to or from' their Decimal equivalent's w/o data re-entry; so each can be easily called as a subroutine. Outputs are labeled and incorrect inputs yield 41C error messages. Conversion limits are up to a 21 digit-span for Hex or Binary values. **Necessary Accessories for HP-41:** Extended Functions Module

Steps: 93 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01662-41-6	$10	$11
FOR HP-71*	01662-71-3	N/A	$12

01663 Bigger Base Conversion

by T. Langland, Phoenix, AZ

This program converts integers between any base between 2 and 20, including binary, decimal, and hexadecimal. Binary up to 18 digits, decimal up to 10 E10, and hexadecimal up to 2540BE3FF can be converted by this program. Expandable to calculate bases larger than 20 when needed. **Necessary Accessories for HP-41:** None

Steps: 188 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01663-41-4	$10	$12
FOR HP-71*	01663-71-1	N/A	$14

01665 Partial Fraction

by N.C. Lee, Stony Brook, NY

Express $F(x) = N(x)/D(x)$ in partial fraction form. N(x) can be polynomial or product-of-zeros form, D(x) must be product-of-poles. Each pole has multiplicity 1 to 4. Size requirement is $n + 2d + 15$, where n = order of numerator, d = number of poles. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 271 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01665-41-9	$10	$12
FOR HP-71*	01665-71-6	N/A	$14

01666 Profit Sharing Stock File and Transaction Record

by G. Maynard, Palatine, IL

Three programs are included to create a file on magnetic cards and to update the file, to summarize the total cost and worth for each stock, and to print out a summary of stock purchase transactions and dividend payments. These programs are suited for those plans that do not include payment of broker fees by the plan participant. **Necessary Accessories for HP-41:** One Memory Module, Printer, Card Reader

Steps: 318 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01666-41-7	$10	$14
FOR HP-71	NOT AVAIL		

01667 Complex Roots of Polynomials

by P. Schultz, Dielheim, West Germany

This program based on a new algorithm computes the real and complex roots of polynomials up to the power of 100 (tested) or more. Special qualities are: 1) low number of needed data registers, 2) automatic computing of all roots, 3) high accuracy even in the case of several identical roots. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 236 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01667-41-5	$10	$12
FOR HP-71*	01667-71-2	N/A	$14

01668 Tape Deck Counter to Time Converter

by R.K. McDonald, Milpitas, CA

Convert non-linear reading of a tape deck counter to running time or time to counter no.'s. This program has been reworked from 01573D for the 41C and provides complete chain prompting that leads you to all inputs and labels all outputs. **Necessary Accessories for HP-41:** None

Steps: 131 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01668-41-3	$10	$11
FOR HP-71*	01668-71-0	N/A	$12

01669 Aitken's Method of Interpolation

by T.F. Morgan, Bellevue, NE

Aitken's Method of Interpolation is a popular alternative to the difference formulas of other methods. It is unnecessary to choose the degree of the approximating polynomial in advance and the method works for unequally-spaced arguments. The basic HP-41C will handle up to ten data pair. **Necessary Accessories for HP-41:** None

Steps: 104 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01669-41-1	$10	$11
FOR HP-71*	01669-71-8	N/A	$12

01670 Adenylate Cyclase Specific Activity Calculations PH*CYC

by A.M. Morrishow, Bronx, NY

PH*CYC program calculates adenylate cyclase (E.C. 4.6.1.1.) specific activity (PM-CAMP/min/mg) by the Salomon, Londus, and Rodbell Method. The user inputs counts obtained by the dual-labeled procedure for points (one to ten determinators per point), and output is specific activity, activation relative to basal, and activation t-test. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 365 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01670-41-9	$10	$15
FOR HP-71*	01670-71-6	N/A	$18

01671 Pipe Flow / Part Full Pipe Flow Calculator

by W. Padrain, Jakarta, Indonesia

Two programs. The first solves for the missing variables given the value of any two of the flow variables (diameter, flow, velocity, or grade), using either the Hazen Williams or Mannings formula. The second solves for the ratio of flow depth to diameter or ratio of actual flow to full pipe flow given the other value. Flow velocity and velocity ratio for equivalent cleansing power are also found. Variable roughness coefficient is used. Units are metric. These programs can be used for sewer design. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 238 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01671-41-7	$10	$16
FOR HP-71*	01671-71-4	N/A	$18

01672 Cooling Tower Estimates by Correlations Based on Real Data

by J.A. Pita, Quito, Ecuador

This program uses several correlations for estimating the following parameters of cooling towers' sizing: tower volume, net weight, packing weight (for overseas export), operating weight (for foundation design), rated motor capacity (for electric power planning), number of cells, FOB price and tower height. Type of tower: crossflow induced draft type with variable pitch axial flow fan. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 118 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01672-41-5	$10	$12
FOR HP-71*	01672-71-2	N/A	$14

01673 Saturated Steam Pipe Design

by J.A. Pita, Quito, Ecuador

Given the condition of a saturated steam (pressure or temperature) and given any two of the following: diameter (in meters), velocity of steam (in meters per hour) and flow rate (either in cubic meters per hour or kilograms per hour), this program will calculate the remaining variable, thus performing an adequate pipe design. Units for P must be atmospheres (absolute) and T must be in degrees centigrades. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 195 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01673-41-3	$10	$13
FOR HP-71*	01673-71-0	N/A	$14

01674 Combustor Flame Temperature

by M.L. Ramsey, Abilene, TX

Program calculates the flame temperature for a boiler, furnace or other combustor. The required data for the program is composition of flue gas, lb. of flue gas per lb. of fuel, higher heating value of the fuel and the preheat temperature of the comburent plus fuel. **Necessary Accessories for HP-41:** 1 Memory Module. Printer optional

Steps: 238 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01674-41-1	$10	$12
FOR HP-71*	01674-71-8	N/A	$14

01675 Safety Valve Vent Stack

by M.L. Ramsey, Abilene, TX

Program will give an approximation of safety valve vent stack ID and will then allow the user to verify that the vent stack is adequately designed. Vent stack anchor design information and piping design pressures are also outputed. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 313 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01675-41-8	$10	$13
FOR HP-71*	01675-71-5	N/A	$14

01676 Fast Walsh Transform

by R.M. Rhodes, Sunnyvale, CA

Program computes the Walsh transform or Inverse Walsh transform in Walsh order or Hadamard order. Input is a set of N(equal to an integer power of 2) real numbers, with N less than or equal to 32. Output is the Walsh transformed data set and Power/Phase Spectra. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 482 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01676-41-6	$10	$14
FOR HP-71*	01676-71-3	N/A	$16

01678 Decimal / Binary / Hexadecimal Conversions

by F.F. van Santbrink, Fort De France, West Indies

Program converts decimal, binary or hexadecimal entry into decimal, binary or hexadecimal equivalent. Upper limits: Dec - 4095, Bin - 1111 1111 1111, Hex - FFF. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 238 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01678-41-2	$10	$12
FOR HP-71*	01678-71-9	N/A	$14

01679 Reverse Curves Between Two Parallel Lines

by M. Shrout, Greeley, CO

Given a distance between two parallel lines, and the degree of curvature for two simple curves, calculates the simple curve data. The two curves need not have the same degree of curvature. **Necessary Accessories for HP-41:** 1 Memory Module (or HP-41CV), Printer optional

Steps: 175 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01679-41-0	$10	$12
FOR HP-71*	01679-71-7	N/A	$14

01681 Four Degree of Freedom Spring Constants

by G.H. Stumpff II, Dayton, OH

A linear arrangement of five springs fixed at opposite ends and interconnected by four masses will have four resonant frequencies. This program calculates four of the five spring constants given the values of the masses, resonant frequencies, and one of the end spring constants. It then computes the eigenvectors. This program could be useful in evaluating the physical structure of a mechanical system using frequency response measurements. **Necessary Accessories for HP-41:** 1 Memory Module, Printer optional

Steps: 601 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01681-41-6	$10	$15
FOR HP-71*	01681-71-3	N/A	$18

01682 Heat Loss or Gain by Insulated Pipe

by T.M. Trainor, Augusta, GA

This program calculates heat loss or gain by an insulated, and uninsulated, pipe and the temperature of the outside insulation wall. Data required are pipe diameter, insulation diameter, pipe temperature, air temperature and windspeed, surface emissivity of pipe and insulation, and thermal conductivity of the insulation. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 270 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01682-41-4	$10	$13
FOR HP-71*	01682-71-1	N/A	$14

01683 Well Function of U

by J.S. Ulrick, Berkeley, CA

This program calculates the well function of U from the Theis equation for all positive values of U. A polynomial approximation is used which is more accurate and computationally more efficient than the infinite series approximation. No data registers are used. **Necessary Accessories for HP-41:** None

Steps: 50 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01683-41-2	$10	$11
FOR HP-71*	01683-71-9	N/A	$12

01684 SINR

by B.J. van der Merwe, Vanderbijlpark, South Africa

This program fully employs the "Sine Rule" of mathematics for solving 'Triangle Solution' problems. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 445 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01684-41-0	$10	$14
FOR HP-71*	01684-71-7	N/A	$16

01686 Voltage Wave-Form Analysis

by A. Zawadzki, Troy, MI

This program provides a technique for analyzing voltage wave-form obtained from oscilloscope screen. The picture is divided into N equal parts and the Y value (voltage) of each segment is entered into calculator. Program computes effective (RMS) and average (AVR) values as well as Form and Crest factors. **Necessary Accessories for HP-41:** None

Steps: 100 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01686-41-5	$10	$11
FOR HP-71*	01686-71-2	N/A	$12

01687 Interior Alaska Variable Plot & Individual Tree Cruise Calcs

by D.H. Wieczorek, College, AK

Given number of trees of size class, number of trees per plot, acreage and defect % for a variable plot cruise program will generate volumes, V-BAR's, etc. and will output entire cruise volumes on a per acre basis and all statistics. For individual Tree Cruise inputs are # trees by size class, % cruise and % defect to output all gross and net volumes and statistics. Solves for white spruce, bd. ft. or cu. ft.; paper birch and quaking aspen, cu. ft. only. **Necessary Accessories for HP-41:** Two Memory Modules or Quad RAM Module

Steps: 439 HP-41 Bytes: 1005

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01687-41-3	$10	$15
FOR HP-71*	01687-71-0	N/A	$18

01688 T Bills

by J.C. Wittmann, Sequim, WA

Given treasury bill face value and maturity in months plus either premium or treasury discount rate, this program calculates treasury rate or premium, equivalent coupon rate, and for 12 month bills, the corresponding all savers certificate rate. The program rejects invalid inputs and adjusts for leap year calculations. **Necessary Accessories for HP-41:** None

Steps: 143 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01688-41-1	$10	$12
FOR HP-71*	01688-71-8	N/A	$14

01689 Grain Capacity

by Q.L. Yada, Hastings, NE

This group of programs calculates the grain storage capacity of vertical and/or slant wall buildings for one or two slope piles. The grain pile starts part way up the wall and then either slopes away to its peak at a determined angle less than or equal to the natural repose angle or slopes away at the natural repose angle until a predetermined distance below roof and then follows the roof slope to the peak. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 986 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01689-41-9	$10	$22
FOR HP-71*	01689-71-6	N/A	$26

01690 Moment Resistant Column Anchor Bolt Tension

by Q.L. Yada, Hastings, NE

Program solves for the anchor bolt tension that results from a large moment applied at the base of a column which has one or two line(s) of bolts resisting the overturning moment. **Necessary Accessories for HP-41:** None

Steps: 216 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01690-41-7	$10	$12
FOR HP-71*	01690-71-4	N/A	$14

01691 Auto-Banner

by C. Erickson, Pullman, WA

This program is incredibly fast and easy to use. The user simply keys in an alpha string, the 41C does the rest. 106 of the 127 special characters are also supported by keying in the character's ACCHR number and executing the function XTOA to add the character to the ALPHA string. **Necessary Accessories for HP-41:** 1 82106A Memory Module, 82180A X-Functions Module, Printer

Steps: 105 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01691-41-5	$10	$15
FOR HP-71	NOT AVAIL		

01692 Sun Shade

by B. Kraengel Jr. Valley Stream, NY

Architects, engineers and solar designers will find this program useful. It computes the shading from any type of shading device anywhere in the world. Time can be solar, standard or daylight saving. Sun positions and other solar parameters are computed. Two powerful design tools are introduced. S/L for fast shading calculations with ordinary arithmetic and a sunrise to sunset Shade Line. **Necessary Accessories for HP-41:** 3 Memory Modules, HP82143A Printer. Card Reader or Wand recommended.

Steps: 624 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01692-41-3	$10	$16
FOR HP-71	NOT AVAIL		

01693 Thermodynamic Properties of Saturated & Superheated Steam

by R.J. Wooley, Midland, MI
J.J. Martin, Ann Arbor, MI

Calculate the thermodynamic properties, specific volume, enthalpy and entropy of saturated (liquid and vapor) and superheated steam given temperature and pressure. One equation of state, Martin's, is used over the entire range of T & P, down to VR=.59. The calculated properties are within the tolerances given by the International Skeleton Tables (Steam). **Necessary Accessories for HP-41:** Quad Memory (Printer helpful)

Steps: 1047 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01693-41-1	$10	$20
FOR HP-71*	01693-71-8	N/A	$24

01694 Symbolic Logic: Summary and Applications

by E.M. Keefe, Ankeny, IA

Being a relatively complete treatment of elementary symbolic logic. Logical operators defined include AND, OR, NOT, IMPLCATION (if...then) EXPLICATION (only if), EQUIVALENCE (if and only if), EXCLUSIVE OR. The operators are based on the definitions of Lukaciewisz (RPN) and thus hold for one kind of three-valued logic. These same definitions will work for Boolean Logic when the base is 2. Thus the program may be used to simulate digital logic circuits. The user must write the progrms to simulate these circuits, but examples are given to show how to do this expeditiously. **Necessary Accessories for HP-41:** One Memory Module

Steps: 186 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01694-41-9	$10	$17
FOR HP-71*	01694-71-6	N/A	$20

01695 Star Position Prediction

by M. Cox, Dunedin, New Zealand

Given latitude, right ascension declination and local sideral time this program computes the azimuth and zenith distance to the celestial body. Designed for surveyors taking stellar observations. A subroutine for repeated predictions is provided as are results formating routine for use with printer. **Necessary Accessories for HP-41:** 1 Memory Module (Printer optional)

Steps: 222 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01695-41-6	$10	$12
FOR HP-71*	01695-71-3	N/A	$14

01696 Rectangular Mode Program

by C.J. Fruge, Rayne, LA

Program computes the possible modes in all rectangular spaces for a given harmonic level. The program sorts the answers, and then prints the harmonic "bunching" effect prevalent in small rooms. Program can be used in metric or English measurements. **Necessary Accessories for HP-41:** Printer

Steps: 238 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01696-41-4	$10	$12
FOR HP-71*	01696-71-1	N/A	$14

01697 Pressure Vessel Design

by O.A. Hock, Kuala Lumpur, Malaysia

The program determines the plate thickness or the max. allowable working pressure of pressure vessel. Vessel with three different types of head are considered, viz hemispherical, ellipsoidal and dished. Computation based on internal dimensions of vessel and conditions of the vessel. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 233 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01697-41-2	$10	$13
FOR HP-71*	01697-71-9	N/A	$14

01698 Hydraulic Design of a Storm Water Pumping Station

by P.D. Wlaschin, Vancouver, WA

This program routes a given storm hydrograph through an underground storm water pumping station. Flow may enter the pumping basin through any number of box and pipe culverts. Water is stored both within the basin and the connecting culverts. The water is then removed by a network of hydraulic pumps. **Necessary Accessories for HP-41:** Printer, 3 Memory Modules

Steps: 556 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01698-41-0	$10	$15
FOR HP-71*	01698-71-7	N/A	$18

01699 Traffic Counter

by L.D. Thomas, Pocatello, ID

This program converts the HP-41C into a traffic counter capable of keeping track of twelve independent moves thru a typical intersection. The program divides the twelve moves into a four legged intersection, with each leg having three independent moves (left turn, thru move, right turn). On command, the tallys for the twelve moves are printed by the printer. **Necessary Accessories for HP-41:** 1 Memory Module and Printer

Steps: 327 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01699-41-8	$10	$14
FOR HP-71	NOT AVAIL		

01700 Roadway Illumination Design

by C.L. Merrill, Pocatello, ID

This program computes information necessary for roadway illumination design. The illuminaire spacing or average maintained foot-candles are computed from the given data. The coefficient of utilization can be computed from the mast-arm overhang and luminaire mounting height. **Necessary Accessories for HP-41:** None

Steps: 132 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01700-41-4	$10	$12
FOR HP-71*	01700-71-1	N/A	$14

01701 Circular Curve Layout for Base Line or Offset Line

by L.D. Pierce, San Diego, CA

This program provides calculations for circular curve field layout. The program will provide the following data: stations, deltas, right deflections, left deflections and chord distances for either base line or offset line. Data is computed on either an interval or point solution with the end station computed also. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 245 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01701-41-2	$10	$13
FOR HP-71*	01701-71-9	N/A	$14

01702 Topographic Surveying

by R. Van Dyke, Fresno, CA

This program calculates horizontal distance and elevation from the three stadia wire readings; using any vertical angle mode (direct or inverted). It also incorporates a stadia check by comparing half stadia to full stadia; calculates tape topo, x*sections in percent or degrees and vertical angle profiles. **Necessary Accessories for HP-41:** None

Steps: 104 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01702-41-0	$10	$12
FOR HP-71*	01702-71-7	N/A	$14

01703 Loudspeaker Parameter Calculations

by A. Medin, San Diego, CA

Program computes parameters of an unknown driver so that a box may be designed. Program requires measurements be made using a DVM, signal generator and a test box (to be made by user). Parameters supplied are: "FS", "Q", and "VAS". **Necessary Accessories for HP-41:** None

Steps: 102 HP-41 Bytes: 189

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01703-41-8	$10	$11
FOR HP-71*	01703-71-5	N/A	$12

01704 Automatic YMIN and YMAX Calculator

by J. Goulston, Sharon, MA

Program finds YMIN and YMAX for a function within-range specified by XMIN and XMAX and then plots the function. The extrema are found by checking each Y value that results as the X value is incremented from XMIN XMAX. The X increment is user specified. Using this program, the extra plot will fit on one piece of paper. **Necessary Accessories for HP-41:** Printer

Steps: 65 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01704-41-6	$10	$11
FOR HP-71*	01704-71-3	N/A	$12

01705 Short Staple Spinning

by R.D. Buckmann, Brusque, Brazil

This program solves problems concerning short staple yarn twist parameters and spinning machinery production, for textile industries. **Necessary Accessories for HP-41:** None

Steps: 107 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01705-41-3	$10	$12
FOR HP-71*	01705-71-0	N/A	$14

01706 Spirals

by B.E. Thompson, Salem, OR

This program calculates field data for spirals and offset spirals. It enables the user to set on any point on the spiral (or offset) and sight any other point or sight tangent. Options: (1) Chaining from (successive stations) or (one station and moving ahead when desired), (2) Auto-stationing. **Necessary Accessories for HP-41:** 1 Memory Module (Printer useful)

Steps: 269 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01706-41-1	$10	$13
FOR HP-71*	01706-71-8	N/A	$14

01707 Hertz to Notes Conversion

by D. Fleisher, Rochester, NY

Converts: A) Any frequency (in Hertz) to the corresponding musical pitch name, octave number, and deviation from exact pitch or; B) Any note name, octave, and deviation to the corresponding frequency. Pitches are based on the Equal Tempered scale, octaves are numbered by USA Standards recommendation, and deviations are in cents (1/100 half step). **Necessary Accessories for HP-41:** None

Steps: 147 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01707-41-9	$10	$12
FOR HP-71*	01707-71-6	N/A	$14

01708 Three-Point Problem

by P. Rushworth, Lakewood, CO

Simplifies 3-point problems. Given elevations of three points and two user-supplied measurements the strike line and dip are computed. **Necessary Accessories for HP-41:** None

Steps: 56 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01708-41-7	$10	$11
FOR HP-71*	01708-71-4	N/A	$12

01709 Automatic Selection Fix

by D.M. Daniel, Pensacola, FL

Program derives a fix from a combination of any two of from three to six observations from estimated DR coordinates, using a and Zn from observations of different bodies. Note: This is more friendly than original version of same program. **Necessary Accessories for HP-41:** None

Steps: 142 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01709-41-5	$10	$12
FOR HP-71*	01709-71-2	N/A	$14

01710 Preflight Planning

by R.W. Meals, Redlands, CA

Program designed to provide complete navigational preflight planning assistance. Allows entry of data in coordinate form, or from radio or navigational aid charts. It eliminates need for use of hand held (E6B type) or manual computers. Allows direct computation of distances and true courses. **Necessary Accessories for HP-41:** 3 Memory Pacs or Quad Memory Pac

Steps: 461 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01710-41-3	$10	$16
FOR HP-71*	01710-71-0	N/A	$18

01711 Ten Class Histogram with Distribution Fit and Plotting

by J.R. Merrill, Waterford, CT

This program generates any number of 4 - 10 class histograms without destroying the data base. It will fit either a normal curve or a uniform distribution to the resultant histogram and allows the plotting of bar charts. Additionally, a chi-square goodness of fit coefficient is calculated. **Necessary Accessories for HP-41:** 82143A Printer; 82182 Time Module 82180A Extended Functions 82181A Extended Memory (depends on data file size)

Steps: 603 HP-41 Bytes: 1170

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01711-41-1	$10	$16
FOR HP-71	NOT AVAIL		

01712 CPM - An HP-41CV Implementation

by E. Koh, Baltimore, MD

This program solves an Event-Oriented Critical Path Method network problem. Limited by the 41-CV's memory size, the program can handle up to 20 activities or events. However, by adopting the "Divide-and-Conquer" rule, this program is capable of solving networks with unlimited amount of activities. **Necessary Accessories for HP-41:** 4 Memory Modules

Steps: 242 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01712-41-9	$10	$13
FOR HP-71*	01712-71-6	N/A	$14

01713 Bayesian Theory

by E.M. Keefe, Ankeny, IA

Package provides an understanding of Bayesian probability theory and routines to solve problems that can be solved using Bayesian theory. Useful for forecasting, based on incoming data. **Necessary Accessories for HP-41:** 2 Memory Modules and Program #1051C

Steps: 1094 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01713-41-7	$10	$20
FOR HP-71*	01713-71-4	N/A	$24

01714 Center Line to Center Line

by G.R. Bruno, Paterson, NJ

The program will calculate the pitch length of a belt/chain or the center distance between the two pulleys/sprockets, given one of the unknowns and the two pitch diameters of the pulleys/sprockets. **Necessary Accessories for HP-41:** None

Steps: 138 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01714-41-5	$10	$12
FOR HP-71*	01714-71-2	N/A	$14

01715 Fin Temperature and Heat Transfer Rate

by K. Fischer, Blacksburg, VA

This program solves the temperature at a given point on a rod or rectangular fin. It also solves the heat transfer rate. The program prompts the user for all variables, and works for all three fin cases: 1) Very long fins; 2) Fin with heat loss at the end; 3) Fin with insulated end. User needs subroutines for hyperbolic functions. **Necessary Accessories for HP-41:** 1 Memory Module. Math Pac or Hyperbolic functions

Steps: 214 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01715-41-2	$10	$12
FOR HP-71*	01715-71-9	N/A	$14

01716 1 to 10 Spot Keno

by T.R. Casey, Torrance, CA

Plays 1 to 10 Spot Keno. Player selects # of spots and # of games. Payoffs are typical of Nevada Casinos. Program prompts for players selections and keeps track of all totals. If printer is attached prints out numbers drawn and all totals in a very neat format. Program is quite fast (approx. 2 min. per game - less without printer). **Necessary Accessories for HP-41:** 3 Memory Modules. Printer not necessary but helpful.

Steps: 401 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01716-41-0	$10	$14
FOR HP-71*	01716-71-7	N/A	$16

01717 Soil Bacteriology

by P.E. Flathman, Bascom, OH

Using U.S. EPA microbiological procedures, program calculates number of bacteria per unit mass oven dry soil (or sediment). User inputs: (1) Data to determine soil moisture content and (2) Enumeration data of the bacterial population in a moist soil (or sediment) sample based on standard plate count (or MPN) techniques. **Necessary Accessories for HP-41:** None

Steps: 64 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01717-41-8	$10	$11
FOR HP-71*	01717-71-5	N/A	$12

01718 OBV (On Balance Volume)

by J.I. Foster, Alamo, CA

This program calculates Granville's "On Balance Volume" for any stock after adjusting for the market's influence. It stores up to 90 OBVs and the highs and lows. After five highs and lows, it displays each succeeding new one. A record of all data can be printed. **Necessary Accessories for HP-41:** 3 Memory Modules, Printer, Card Reader

Steps: 139 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01718-41-6	$10	$13
FOR HP-71*	01718-71-3	N/A	$14

01719 Windmill Design

by E.P. Gasparek, Camillus, NY

This program evaluates a horizontal axis windmill at specified conditions. Inputs are blade chord and twist angles. The program evaluates performance at each input point and numerically integrates this data to calculate output power. A second program mode allows the user to design for optimum blade twist, chord, and RPM. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 443 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01719-41-4	$10	$15
FOR HP-71*	01719-71-1	N/A	$18

01720 Stock Plot

by J.R. Grandstaff, Oak Park, IL

This program will plot a graph of a weekly input of stock prices. The X axis will be labelled by the date of the month. **Necessary Accessories for HP-41:** HP82143A Printer

Steps: 99 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01720-41-2	$10	$11
FOR HP-71	NOT AVAIL		

01721 Heap Sort

by N.C. Lee, Stony Brook, NY

Sort numbers in ascending order with R01 = min. The algorithm has time complexity of N log N, which is the theoretical limit. Sort time for 200 numbers is 12 to 13 minutes, and is fairly data-independent. No scratch register required. Input/viewing routines provided. **Necessary Accessories for HP-41:** None

Steps: 111 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01721-41-0	$10	$11
FOR HP-71*	01721-71-7	N/A	$12

01722 Mercurial Barometer Corrections

by R.L. McElderry, Naranja, FL

Using Centigrade temperature, uncorrected mercurial barometer readings,[2] instrument corrections, elevation above sea level, average elevation for 100 mile radius, and latitude, this program produces corrected barometric pressure without the use of gravity or temperature correction tables. Readings are given for both millibar and inch scales. Printer is useful. **Necessary Accessories for HP-41:** 1 Memory Module (Printer optional)

Steps: 172 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01722-41-8	$10	$13
FOR HP-71*	01722-71-5	N/A	$14

01723 Intersections of Two Circles

by N.E. Ritchie, Portland, OR

Given two circles in the form (X-A)**2+(Y-B)**2=R**2, the program will first determine how many intersections exist (none, one, or two). Then it will provide the X & Y coordinates of the intersections. **Necessary Accessories for HP-41:** 1 Memory Module (Printer optional)

Steps: 234 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01723-41-6	$10	$12
FOR HP-71*	01723-71-3	N/A	$14

01724 Equilibrium K-Values

by N.C. Samish, Houston, TX

Determine equilibrium K-values (Y/X) for both ideal and non-ideal substances in ideal solutions. Required data are normal boiling point, critical temperature and pressure, and the temperature and pressure of the substance. The acentric factor is also calculated. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 527 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01724-41-4	$10	$16
FOR HP-71*	01724-71-1	N/A	$18

01725 Bessel Functions of Integer Order

by S.H. Tedder, Tulsa, OK

This program uses recursion to calculate the Bessel functions of the first and second kind, for any integral order, and for any positive real argument. The running time can be fairly lengthy, but the program has great generality and high accuracy. **Necessary Accessories for HP-41:** None

Steps: 220 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01725-41-1	$10	$12
FOR HP-71*	01725-71-8	N/A	$14

01726 Optic Transfert Matrices, PI and T Networks Transformations

by M. Tremblay, Ste-Foy, Canada

This program computes the transfert matrice of a "PI" or "T" network. "PI" network is two lenses separated by a certain distance. "T" network is one lens between two distances. Transformations between "T" and "PI" are also performed. **Necessary Accessories for HP-41:** None

Steps: 156 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01726-41-9	$10	$12
FOR HP-71*	01726-71-6	N/A	$14

01727 Steady Radial Groundwater Flow in a Finite Leaky Aquifer

by P.K.M. van der Heijde, Indianapolis, IN

This program solves for piezometric head in an isotropic homogeneous leaky aquifer of finite extent with a discharge well in its center. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 208 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01727-41-7	$10	$12
FOR HP-71*	01727-71-4	N/A	$14

01728 Basic Electronics 01 OHM's Law

by J.F. Woldering, Euclid, OH

This program provides interchangeable solutions with labeling for common OHM's Law equations involving voltage, current, resistance, power, charge, time, energy, conductance, and quantity of electrons. **Necessary Accessories for HP-41:** None

Steps: 238 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01728-41-5	$10	$12
FOR HP-71*	01728-71-2	N/A	$14

01731 DOSE

by J.W. Ferman, Minneapolis, MN

The I.C.R.P. Multi-Compartment Respiratory Tract Model is used to predict doses to organs from radionuclide depositions in the nasopharyngeal, tracheobronchial, and pulmonary regions. For gastrointestinal tract doses, the four-segment model is used. Ingestion is included for user convenience. Infant, child, teen, and adult doses are displayed for arbitrary uptake and exposure time episodes. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 668 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01731-41-9	$10	$16
FOR HP-71*	01731-71-6	N/A	$18

01732 Rock Permeability by Constant/Falling Head Tests

by J.L. Gilby, Vancouver, Canada

This program is designed to calculate the permeability of rock using either the constant or falling head test. If an 82143A Printer is in use input and output data will be printed, if not results will be displayed. **Necessary Accessories for HP-41:** 1 Memory Module (Card Reader and 82143A Printer optional)

Steps: 183 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01732-41-7	$10	$12
FOR HP-71*	01732-71-4	N/A	$14

01733 Numerical Integration

by G. Goodman, Stamford, CT

This program performs numerical integration using either Simpson's rule or the trapezoidal rule. The integrand may be an explicit function or may be specified at a discrete set of equally spaced points. For the discrete case, the user will be prompted for the function values. The program can be called as a subroutine, is compact, and uses only 7 data registers. **Necessary Accessories for HP-41:** None

Steps: 94 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01733-41-5	$10	$11
FOR HP-71*	01733-71-2	N/A	$12

01734 Plane Geometry of Regular Polygons

by G.M. Halpern MD, Honolulu, HI

This program solves plane geometry problems involving Regular Polygons. Given certain facts, other parameters of each polygon are calculated and printed. Calculation and printout are automatic after the prompted factors are all entered. There are 17 different problems and 23 subroutines. These subroutines label and print the answers. **Necessary Accessories for HP-41:** Quad Module, Card Reader and Printer

Steps: 790 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01734-41-3	$10	$20
FOR HP-71*	01734-71-0	N/A	$24

01736 Transmitted Force

by A. Segall, Broomall, PA

This program solves for the transmitted force in a spring, damping, vibration isolation system with a sinusoidal exiting force. If the transmitted force is known, the rotational speed is calculated. Phase angle, natural frequency of undamped oscillation, transmissibility and damping ratio are also calculated for both cases. **Necessary Accessories for HP-41:** None

Steps: 196 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01736-41-8	$10	$12
FOR HP-71*	01736-71-5	N/A	$14

01737 Alphabetical Sort

by P.F. Sweetland, Seattle, WA

Puts random lists of words into alphabetical order. Words can be added at any time, and the list will be reordered. **Necessary Accessories for HP-41:** 1 Memory Module is necessary, but a Printer, Card Reader and Additional Memory Modules extend the program's capability

Steps: 187 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	01737-41-6	$10	$12
FOR HP-71*	01737-71-3	N/A	$14

01738 Grade Computer

by L.D. Thomas, Pocatello, ID

This program computes the elevations for five separate points across a desired roadway section. These elevations may be computed for any station or on any predetermined interval at any depth from finished grade. The program does not require symmetrical sections and allows the user to vary the widths, crownslopes and curb elevations for the left and right sides of the section, independent of each other. **Necessary Accessories for HP-41:** 2 (or more) Memory Modules and Card Reader. Printer suggested

Steps: 502 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01738-41-4	$10	$14
FOR HP-71	NOT AVAIL		

01739 Stock Market Tycoon

by J. Zuckor, New York, NY

You have five years (20 quarters) to turn $100, 000 into a fortune, and become a Stock Market Tycoon. You can buy and sell 10 different stocks for cash or on credit. You will endure inflation or recession, enjoy bull markets or suffer bear markets. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 388 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01739-41-2	$10	$14
FOR HP-71*	01739-71-9	N/A	$16

01740 Grain Capacity for Circular Bin

by Q.L. Yada, Hastings, NE

This program calculates the grain storage capacity of a vertical walled circular bin which is level full or heaped full. **Necessary Accessories for HP-41:** None

Steps: 126 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01740-41-0	$10	$12
FOR HP-71*	01740-71-7	N/A	$14

01741 Cantilever/Suspended Span Beams

by F. Anrep, Toronto, Canada

Program calculates all positive and negative moments, joint shears and reactions for lines of cantilever/suspended beams. User chooses L.L. variation factor, spacing of supports (columns), and of point load(s). User chooses from one to five point loads between supports. Output is complete and selfcontained. Useful for service load or limit states design, S.I. or imperial units. **Necessary Accessories for HP-41:** Quad Module, Printer

Steps: 1119 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01741-41-8	$10	$18
FOR HP-71*	01741-71-5	N/A	$22

01743 Surveying Conversions

by M. Cox, Dunedin, New Zealand

Designed for New Zealand and other countries which have gone from imperial to metric units. This program gives conversions to and from links acres and other units used in the commonwealth. Note that feet and inches are not catered for. Full use of alphanumerics is made. **Necessary Accessories for HP-41:** Printer optional

Steps: 170 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01743-41-4	$10	$12
FOR HP-71*	01743-71-1	N/A	$14

01744 Printerless Plotting Routine

by L.K. Brown, Fayetteville, AR

This program plots a function you program in, on the display of the calculator. The program asks for minimum and maximum values of X, and the number of points to be plotted. X and Y values are listed, minimum and maximum values of Y are displayed, and Y is plotted. **Necessary Accessories for HP-41:** None

Steps: 134 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01744-41-2	$10	$12
FOR HP-71*	01744-71-9	N/A	$14

01745 Distance and Direction

by W.E. Hitchins, Los Angeles, CA

Computes great circle distance between any two points on the face of the globe including coordinates at the poles or 180 degrees apart and also initial heading in degrees, minutes, and seconds or by mariner's (32-point) compass. Distance is given in nautical miles, statute miles, or kilometers. Can be used with or without a printer. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 344 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01745-41-9	$10	$14
FOR HP-71*	01745-71-6	N/A	$16

01746 System of N Linear Equations with Complex Coefficients

by H. Martinsen, Belle Chasse, LA

Evaluates real and imaginary parts of N unknowns of a system of linear equations. Program designed for easy input and editing of coefficients. (N=9 max for standard 41CV or equivalent). **Necessary Accessories for HP-41:** 1 + INT ((2N(N+1) + 44) / 64) Memory Modules

Steps: 434 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01746-41-7	$10	$14
FOR HP-71*	01746-71-4	N/A	$16

01747 Chemistry Solution

by D.T.A. Minh, Chaisy le Rai, France

This program computes the ph, pka, c, q of a solution containing one acid-base pair. The four data can be introduced in any order (only two data are required) and the HP41C will compute, ph, pka, c, q (the factor dissolution) and [a] and [b]. **Necessary Accessories for HP-41:** 3 Memory Modules, Card Reader

Steps: 781 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01747-41-5	$10	$16
FOR HP-71*	01747-71-2	N/A	$18

01748 Strains and the Ellipse of Elasticity

by P.d.S. Mourao, Belo Horizonte, Brasil

One of the most beautiful theories on frames' deformations was created by Culmann, and it stands paramount among others, as being able to predict displacements without considering internal effects. This program is based on it and allows the finding of structurals' displacements at sections produced by any vector force acting at any point. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 318 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01748-41-3	$10	$16
FOR HP-71*	01748-71-0	N/A	$18

01751 Vector Products and Magnitudes

by M. Stevens, Cincinnati, OH

This program solves dot and cross products of two vectors. The dimension of the vectors for the dot product can possibly be up to 9.999999999 x 10**99. The program also computes the magnitude of vectors which can possibly be of dimension up to 9.999999999 x 10**99. **Necessary Accessories for HP-41:** None

Steps: 83 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01751-41-7	$10	$11
FOR HP-71*	01751-71-4	N/A	$12

01752 Hueckel Pi Molecular Orbital Calculation (HMO-PI)

by Z. Tomasic, Austin, TX

This program calculates Pi orbital energies, orbital coefficients and total pi-electron energy of linear or monocyclic conjugated hydrocarbons without branching in Hueckel approximation. For input it requires only size (i.e., number of carbon atoms in molecule), charge and type (cyclic or linear). Size must be less than 1000 and bigger than 1 for linear or bigger than 2 for cyclic molecule. No explicit diagonalization of Hueckel secular determinant is done. **Necessary Accessories for HP-41:** 3 Memory Modules. Printer is recommended but not essential.

Steps: 500 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01752-41-5	$10	$17
FOR HP-71*	01752-71-2	N/A	$20

01753 Symbol Selection and/or Permutation

by R.D. Cooper, Houston, TX

Program will systematically select and/or permute a non-null subset of a symbolic set of up to ten members. Provision has been made for the use of output routines other than the one in the program. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 239 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01753-41-3	$10	$13
FOR HP-71*	01753-71-0	N/A	$14

01754 ANG-Line Orientations in an Orthogonal System

by R.S. Miksch, Sunnyvale, CA

Find six orientation angles and three direction cosines of a line, given any two of the angles or any two non-zero direction cosines. With intersecting lines or planes, find junction angle and descriptor angles of normal "hinge" line. Useful for struts, frames, pivoted members, and mitered surfaces. **Necessary Accessories for HP-41:** 2 Single Density Memory Modules (or equivalent memory capacity)

Steps: 432 HP-41 Bytes: 8756

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01754-41-1	$10	$14
FOR HP-71*	01754-71-8	N/A	$16

01755 Cubic and Quartic Solution

by M. Stevens, Cincinnati, OH

This program solves third and fourth degree polynomials. All roots, real and complex, are found. The program can be used to find the eigenvalues of third and fourth degree characteristic polynomials. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 394 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01755-41-8	$10	$13
FOR HP-71*	01755-71-5	N/A	$14

01756 Placidus Houses

by G. De Tandt, Balegem, Belgium

For Astrologers who use the Placidian System for house division in determining the cusps of the MC, 11th, 12th, ASC, 2nd and 3rd houses. This program replaces the book of tables and eliminates all interpolation chores when given the Sidereal Time and Latitude of the event. **Necessary Accessories for HP-41:** None

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01756-41-6	$10	$12
FOR HP-71*	01756-71-3	N/A	$14

01757 Horizontal Curves: Widening & Safe Stopping-Sight Distance

by G. Neely, Cook, WA

This program computes required safe stopping-sight distance, actual stopping-sight distance, required curve widening and runout distance for curve widening tapers on roads with fixed radius horizontal curves for either a standard lowboy or log truck. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 298 HP-41 Bytes: 753

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01757-41-4	$10	$14
FOR HP-71*	01757-71-1	N/A	$16

01758 Vibration Conversions and Guidelines

by G.S. Buck, Baton Rouge, LA

Machinery vibration problems involve displacement, velocity, acceleration and frequency. For systems having only one frequency of vibration, there is a unique relationship between these parameters. Knowing any two variables, the remaining two can be found. A relative severity is also determined. **Necessary Accessories for HP-41:** None

Steps: 186 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01758-41-2	$10	$12
FOR HP-71*	01758-71-9	N/A	$14

01760 Lat/Lon from Sun Rise/Set Times without Sextant or Almanac

by J.W. Bosworth, Columbus, OH

Given the month, day, times of sunrise and sunset, and time zone, this program will determine users' latitude and longitude. The solution is derived from the declination analemma for the sun. Input times and LAT/LON outputs are in the format: HH.MM. Alpha prompts and output tags. **Necessary Accessories for HP-41:** None

Steps: 154 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01760-41-8	$10	$12
FOR HP-71*	01760-71-5	N/A	$14

01761 Transmission Line Simulator

by T.H. Martin, Albuquerque, NM

This program simulates an electrical transmission line by inputting impressed voltage, initial voltages, line impedances, element time length, problem length, and line losses per element. The calculated voltages are stepped from one line element to the next while being modified to simulate line losses and impedance mismatch. Up to 85 elements can be simulated with a quad memory with any number of time steps desired. **Necessary Accessories for HP-41:** Printer, Quad Memory

Steps: 270 HP-41 Bytes: 474

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01761-41-6	$10	$15
FOR HP-71*	01761-71-3	N/A	$18

01762 Blackbody Calculator

by S.F. Johnston, Ville Vanier, Canada

With this program, a user can compute all quantities related to the spectral emittance of a blackbody source, including integrated emittance between two wave lengths. Both photon and energy-density units are accommodated. Alphanumeric labeling is used for all outputs. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 208 HP-41 Bytes: 444

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01762-41-4	$10	$12
FOR HP-71*	01762-71-1	N/A	$14

01763 Swords and Sorcery

by P.O. Johnson, Rochester, NH

Off you go into the forest to find the dungeon and rescue the princess. Pick up gold, girls, and magic swords along the way, but beware the trolls, satyrs and other terrors. Find the dungeon, fight the guard, and maybe you're rich enough to marry the princess. **Necessary Accessories for HP-41:** Quad Memory (Printer optional)

Steps: 559 HP-41 Bytes: 1964

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01763-41-2	$10	$19
FOR HP-71*	01763-71-9	N/A	$22

01765 Bayes's Theorem/7 Var. Interchangeable Solution for 2 Events

by E.M. Keefe, Ankeny, IA

For the minimal case of two events, this program will compute the solutions for some of the variables in the standard forms of BAYES THEOREM when given the other variables. As a bonus, a program to compute the binomial distribution is included to facilitate working one of the samples. The main program shows one way to handle many interrelated variables (7) in an interchangeable fashion. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 243 HP-41 Bytes: 451

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01765-41-7	$10	$13
FOR HP-71*	01765-71-4	N/A	$14

01766 Area and Center of Gravity by Coordinate Geometry

by J.D. Gavlak, Cleveland, OH
E. Forsberg, Cleveland, OH

This program calculates the center of gravity (both X and Y coordinates) and area in square units of any traverse or area when the coordinates of all points are known. The program can be used to determine the C.G. of flat plates and centroids of earthwork sections. **Necessary Accessories for HP-41:** None

Steps: 98 HP-41 Bytes: 157

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01766-41-5	$10	$11
FOR HP-71*	01766-71-2	N/A	$12

01767 Time vs Data Plot III - Two Data Sets

by R. Kimmelman, Clark, NJ

Program will plot linear regression for two data sets on two separate axis. The Y-axis scale is the same for both plots. The 'Y' intercept and point N+1 are plotted so that a line can be easily drawn. Up to 36 consecutive data points (per set) will be plotted. Program useful for any data to be plotted against time (ie, consecutive months). **Necessary Accessories for HP-41:** 2 Memory Modules, Printer

Steps: 358 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01767-41-3	$10	$14
FOR HP-71	NOT AVAIL		

01768 Superelevated Roadway Design with Elevations

by G. Laragan, Lewiston, ID

Calculates roadway centerline and shoulder elevations for superelevated roadway curves rotated about the centerline. The program can be used in conjunction with the HP Surveying Module; however, the required subroutines are supplied for storage in RAM. In addition to solving for various combinations of horizontal and vertical alignments, the program provides checks of several primary design parameters. **Necessary Accessories for HP-41:** 3 Memory Modules. Printer optional; Card Reader helpful. Only 2 Memory Modules are required if the HP Surveying Module is used.

Steps: 638 HP-41 Bytes: 1259

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01768-41-1	$10	$17
FOR HP-71*	01768-71-8	N/A	$20

01769 Closed Box Loudspeaker Design for Hobbyists

by A. Medin, San Diego, CA

Program enables the hobbyist to demonstrate the characteristics of a given driver in various sized enclosures. Parameters computed are "F3" (cut-off frequence) and "QTC" (bass characteristics). **Necessary Accessories for HP-41:**

Steps: 82 HP-41 Bytes: 171

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01769-41-9	$10	$11
FOR HP-71*	01769-71-6	N/A	$12

01770 Poisson Sequential Probability Ratio Test

by J. Brownlow, Lancaster, CA

Given that a random variable X comes from a poisson distribution, this program sets up and performs a sequential probability ratio test of the simple hypothesis that X came from a distribution with parameter L0 versus the hypothesis that it came from a distribution with parameter L1. **Necessary Accessories for HP-41:** None

Steps: 122 HP-41 Bytes: 253

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01770-41-7	$10	$12
FOR HP-71*	01770-71-4	N/A	$14

01771 Grade Calculator

by W. Cohn, Vancouver, Canada

The program computes weighted standard scores for up to ten separate tests for any number of students. The output gives a precise rank ordering of all your students, using the criteria of the tests you specify and the weights you assign. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 104 HP-41 Bytes: 201

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01771-41-5	$10	$11
FOR HP-71*	01771-71-2	N/A	$12

01772 Alphabetic Sort

by C. Cressler, Phillipsburg, NJ

This program will alphabetize over 200 words in under 18 minutes and display the result accordingly. It is surprisingly fast. This program can also sort hex numbers as well as any alpha display according to its ASCII number. **Necessary Accessories for HP-41:** Extended Function Module, 1 Memory Module

Steps: 270 HP-41 Bytes: 480

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01772-41-3	$10	$13
FOR HP-71	NOT AVAIL		

01773 Building Heat Loss Calculation

by H.K. Deakins, Kingsport, TN

This program calculates building heat loss in BTU/hr., KW, and the heat transmission coefficient. The seasonal KWH is calculated using the degree day method. Also the seasonal KWH for a typical heat pump can be calculated. The above information is necessary to determine the size of heating systems for buildings. Some program line constants may need to be changed to suit the user's needs depending on geographic location. **Necessary Accessories for HP-41:** Card Reader and Printer helpful but not necessary.

Steps: 166 HP-41 Bytes: 342

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01773-41-1	$10	$12
FOR HP-71*	01773-71-8	N/A	$14

01774 Formatted Register Review

by R.E. DeBolt, Pickerington, OH

Provides for viewing the contents of the registers in main memory beginning with a given register number. Features: (1) Shows all significant digits (useful for viewing very large or very small numbers), (2) Does not show insignificant zeros, (3) Identifies alpha contents of registers, (4) Uses stack, lastx and alpha registers, and (5) Main memory registers are undisturbed. **Necessary Accessories for HP-41:** None

Steps: 86 HP-41 Bytes: 162

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01774-41-9	$10	$11
FOR HP-71*	01774-71-6	N/A	$12

01775 Circular Pipe Friction Losses

by G. Deperis, Montreal, Canada

This program calculates the friction losses in circular pipe, for water flow. The program contains a subroutine which calculates the Reynolds number. **Necessary Accessories for HP-41:** None

Steps: 121 HP-41 Bytes: 290

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01775-41-6	$10	$12
FOR HP-71*	01775-71-3	N/A	$14

01776 Test Corrector

by J.C.d.M. Desouzart, Itajuba, Brazil

This program was designed to help teachers compute the grades of their tests. But more than that, the program illustrates a correction method particularly useful for several types of tests. **Necessary Accessories for HP-41:** 3 Memory Modules (Printer optional)

Steps: 645 HP-41 Bytes: 1167

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01776-41-4	$10	$16
FOR HP-71*	01776-71-1	N/A	$18

01777 The Wire Calculator

by J.R. Fuhrman, Anaheim, CA

Program simplifies wire sizing problems associated with aerospace electrical subsystem design and implementation. It solves for wire gauge, length, current, voltage drop, temperature and resistance. Basis is orbiter specification MB0150-048 (MIL-W-81381A) for nickel coated wire in sizes #26 thru #0 gauge. Provides for English or metric input/output data. **Necessary Accessories for HP-41:** 2 Memory Modules

Steps: 325 HP-41 Bytes: 792

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01777-41-2	$10	$14
FOR HP-71*	01777-71-9	N/A	$16

01778 Shortcut Multicomponent Distillation Design

by R.A. Green, MS State, MS

If the compositions of the feed, overhead, and bottoms streams are known and the relative volatilities are known, this program will calculate the minimum reflux ratio and the minimum number of stages. It will then calculate the number of stages or reflux ratio given one of the two. Uses Underwood and Fenske Equations with the Gilliland correlation. **Necessary Accessories for HP-41:** 2 Memory Modules (Printer is useful)

Steps: 326 HP-41 Bytes: 572

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01778-41-0	$10	$13
FOR HP-71*	01778-71-7	N/A	$14

01779 The Workload of the Anatomic Pathologists

by S.L. Haber MD, Santa Clara, CA

By keying in each day's last Surgical Pathology accession number, and the name/code of the Pathologist responsible for that day, one can easily determine each Pathologist's workload for any period of time, the total number of cases submitted, the number of days in that period, and the average number of cases per day. **Necessary Accessories for HP-41:** HP-41C/CV with Card Reader and Printer

Steps: 226 HP-41 Bytes: 671

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01779-41-8	$10	$13
FOR HP-71*	01779-71-5	N/A	$14

01780 Print Time for Enlargements or Paper Speed Change

by W.P. Hannah, Monterey, CA

Given an initial print time for a specific print size and paper speed, this program calculates the new printing time required when either final print size is to be enlarged/reduced or paper speed is to be changed. Different audio signals for information display and inputs facilitate darkroom use. **Necessary Accessories for HP-41:** None

Steps: 73 HP-41 Bytes: 185

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01780-41-6	$10	$11
FOR HP-71*	01780-71-3	N/A	$12

01781 Design Special Characters

by S. Kot, Winnipeg, Canada

This program aids in designing special characters on the HP82143A Peripheral Printer. **Necessary Accessories for HP-41:** HP82143A Peripheral Printer

Steps: 60 HP-41 Bytes: 102

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01781-41-4	$10	$11
FOR HP-71	NOT AVAIL		

01782 Polynomial Curve Fitting

by D.L. Long, Logan, UT

Fits data to up to a thirteenth degree polynomial. Points need not be equally spaced. Uses linear or logarithmic scales. All inputs and outputs are prompted for easy use. Data can be edited if input incorrectly. Uses least squares method. Math pac required. **Necessary Accessories for HP-41:** Math Pac, 1 to 4 Memory Modules

Steps: 215 HP-41 Bytes: 355

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01782-41-2	$10	$12
FOR HP-71	NOT AVAIL		

01783 Typing Tutor

by G. Maynard, Palatine, IL

Do you get lost when typing in words with the 41C keyboard? Can you type 50 words per minute on a QWERTY keyboard and find yourself lucky to type 50 letters in the same time? The purpose of this program is to provide typing practice by flashing each letter in a random order and asking you to match it as quickly as possible. The stopwatch of the Time Module is used to let the user know how long it takes. **Necessary Accessories for HP-41:** 41C Time Module

Steps: 137 HP-41 Bytes: 301

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01783-41-0	$10	$12
FOR HP-71	NOT AVAIL		

01784 Treasure Quest

by G. Maynard, Palatine, IL

Treasure Quest takes the traveler on a trip through highlands and caverns. The goal of the traveler is to gather and return to safe storage all treasures scattered throughout this fixed world. There are numerous hazards to be encountered, most favoring experience over luck. The 41C's alpha capability is used to give the traveler a vivid picture of his surroundings. When the game ends automatically, the score is presented for that game. **Necessary Accessories for HP-41:** Quad Module

Steps: 819 HP-41 Bytes: 2104

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01784-41-8	$10	$20
FOR HP-71*	01784-71-5	N/A	$24

01785 Computation of the Proper Motion of Stars

by L. Nielsen, Durham, NH

This program calculates the change in proper motion of a star taking into account the precession of the equinoxes. The program uses two rigorous equations from Woodward and Clemence, "Spherical Astronomy" and a routine for the calculation of precessional constants from "Mathematical Astronomy with a Pocket Calculator" by Aubrey Jones. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 202 HP-41 Bytes: 377

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01785-41-5	$10	$12
FOR HP-71*	01785-71-2	N/A	$14

01787 Fluid Flow through Square-Edge Orifice

by N.C. Samish, Houston, TX

Determine the flow of fluids through an orifice in a pipe, given the size of the orifice and the pipe, the pressure drop, and the fluid viscosity and density. The orifice diameter can be as high as 0.8 of the pipe diameter. Results are valid for viscous liquids as well as gases. **Necessary Accessories for HP-41:** Quad Memory, X Functions, X Memory

Steps: 1082 HP-41 Bytes: 3450

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01787-41-1	$10	$30
FOR HP-71	NOT AVAIL		

01788 Coord Transformation: Drill/Practice or Test Questions

by E.M. Keefe, Ankeny, IA

Physics Instructors: Take Note. Program Pt1 will give you one more way to use your HP-41. Crankout Test Questions and Keys (no 2 questions alike). "Students" may use the calculator for Drill and Practice in Spherical/Cartesian Coord. Transformations (3 Dimensional) and have the answer checked on the spot. (Good practice for taking Physics from Instructors who do not allow Programable Calculators during tests). A summary of Program Development is a Bonus: So you can design your own programs along the same lines. **Necessary Accessories for HP-41:** Extended Function Module + 1 Memory Module, Printer; Time Module Optional Program is Printer Compatible (without or with and/or On-Off).

Steps: 245 HP-41 Bytes: 545

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01788-41-9	$10	$13
FOR HP-71*	01788-71-6	N/A	$14

01789 Mass Flag

by H. Goceoglu, New York, NY

This program allows you to have up to thousands of Flags, depending on the number of available Storage Registers. SF, CF, FS? and FS?C Routines are included. These Routines can be used manually or can be called by other programs. One Register is necessary per 33 Flags. **Necessary Accessories for HP-41:** None

Steps: 47 HP-41 Bytes: 095

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01789-41-7	$10	$11
FOR HP-71*	01789-71-4	N/A	$12

01790 ESR Order Parameter Calculations

by T.R. Tritton, New Haven, CT

This program calculates order parameters from electron spin resonance (ESR) data. Such order parameters are a widely employed measure of the fluidity of cellular membranes. **Necessary Accessories for HP-41:** Printer optional

Steps: 97 HP-41 Bytes: 212

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01790-41-5	$10	$11
FOR HP-71*	01790-71-2	N/A	$12

01791 Belts

by G.R. Bruno, Paterson, NJ

The program will calculate the pitch length of a belt/chain in a multiple pulley/sprocket drive system, given only the pitch diameters and the X-Y coordinates of the pulleys/sprockets. **Necessary Accessories for HP-41:** None. Documentation for use with X-Function Module also included.

Steps: 222 HP-41 Bytes: 383

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01791-41-3	$10	$12
FOR HP-71*	01791-71-0	N/A	$14

01792 Ohm's Law and Power, for Design and Repair

by L. McKusick, Los Angeles, CA

Volts, ohms, amps and watts. Given any two, this program immediately finds the other two. Features include: Display rounding and labeling; a save option; simple re-use of any value. With printer, optional, prints double wide in blocks of four. **Necessary Accessories for HP-41:** None

Steps: 186 HP-41 Bytes: 347

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01792-41-1	$10	$12
FOR HP-71*	01792-71-8	N/A	$14

01793 Root Locus Solver

by C.B. Wentworth, Bay Village, OH

This program finds real and complex roots of a closed loop system for user specified gain. Gain is easily changed to trace a locus. New trial roots readily find different loci. Storage is organized for any order. Twelfth order with twelve zeros requires only one memory module. **Necessary Accessories for HP-41:** One memory module.

Steps: 276 HP-41 Bytes: 447

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01793-41-9	$10	$12
FOR HP-71*	01793-71-6	N/A	$14

01794 Size Packed Columns

by W.H. Kirts, Blue Springs, MO

Program will calculate either the column diameter or the pressure drop of a packed column using "NORTON's Generalized pressure drop Correlation". **Necessary Accessories for HP-41:** Printer not required (Desirable)

Steps: 210 HP-41 Bytes: 462

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01794-41-7	$10	$13
FOR HP-71*	01794-71-4	N/A	$14

01795 Time Needed to Empty a Tank

by W.H. Kirts, Blue Springs, MO

Program will calculate the time needed to drain a tank (4 type of tanks) using an open line (3 types of lines). **Necessary Accessories for HP-41:** Printer is optional.

Steps: 161 HP-41 Bytes: 395

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01795-41-4	$10	$12
FOR HP-71*	01795-71-1	N/A	$14

01796 Cylinder Radar Cross Section

by G.H. Stumpff II, Dayton, OH

This program calculates the bistatic radar cross section of a totally reflecting, nonabsorbing circular cylinder for a plane wave incident perpendicular to the cylinder axis. The polarization can be at any specified angle to the cylinder axis. Restrictions on the cylinder size and radiation wavelength are minimal. **Necessary Accessories for HP-41:** One memory module required.

Steps: 379 HP-41 Bytes: 607

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01796-41-2	$10	$13
FOR HP-71*	01796-71-9	N/A	$14

01797 Projectile Equations of Motion

by B.R. Groves, East ST. Kilda, Australia

If a projectile is fixed with a given velocity and angle, it will have a definite position at any given time. Given any three of velocity, angle, time, horizontal distance or altitude, the other two will be computed. Air resistance is neglected. Metric or English and all angle units applicable. **Necessary Accessories for HP-41:** 1 Additional Memory Module: Printer Optional.

Steps: 380 HP-41 Bytes: 719

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01797-41-0	$10	$14
FOR HP-71*	01797-71-7	N/A	$16

01798 Cram3L: Cramers Rule Calculations of Third Level Equations

by W. Furlow, Phoenix, AZ

This program uses Cramer's Rule to solve 3 equation-3 variable problems. The equations must be in standard form: AX+BY+CZ=D, and if the system of equations is inconsistent, a "data error" results. Data is inputed by entering the variable A1, A2, A3, B1, B2 etc., and pressing Run/Start after each. Output is in X, Y,Z form, as in a plane in space. **Necessary Accessories for HP-41:** None.

Steps: 143 HP-41 Bytes: 235

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01798-41-8	$10	$12
FOR HP-71*	01798-71-5	N/A	$14

01799 Laser Beam Variable Attenuator

by F.R. Fluhr, Oxon Hill, MD

Equations describing the input/output power transfer of a unique Laser Beam Variable Attenuator are solved. Power output as a function of setting, attenuator setting for a given output power, the radial irradiance profile at a given setting, and the power density along the optic axis can be solved. **Necessary Accessories for HP-41:** One Memory Module required for the HP-41c. Printer Desired.

Steps: 313 HP-41 Bytes: 590

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01799-41-6	$10	$13
FOR HP-71*	01799-71-3	N/A	$14

01800 Chebyshev Series-304 Samples

by A. Couette, Orange Park, FL

Computes discrete Chebyshev Minimax representation from properly spaced samples. As unique features, only Memory 00 and 14 Program Memories are used. Intermediate results are kept in the stack enabling faster calculation. Up to 304 samples can be processed with Full Memory Capability. Coefficients may be computed in any order. **Necessary Accessories for HP-41:** Up to 48 Samples: None - 304 Samples: Full Memory

Steps: 59 HP-41 Bytes: 166

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01800-41-2	$10	$12
FOR HP-71*	01800-71-9	N/A	$14

01801 Mine Production Rate

by P. Rushworth, Lakewood, CO

The program determines the productivity rate in tons per foot of advance. Input are material density, pillar and entry dimensions and number of entries. Calculations are incremented through user selected mining heights. **Necessary Accessories for HP-41:** None

Steps: 119 HP-41 Bytes: 254

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01801-41-0	$10	$12
FOR HP-71*	01801-71-7	N/A	$14

01803 Reserve Calculation

by P. Rushworth, Lakewood, CO

The program calculates and assigns coal reserves to a designated category, such as: measured, indicated or inferred. Input are planimeter data, which may be averaged over several runs, seam height and the tonnage factor. Raw data is printed and output labeled for reference. **Necessary Accessories for HP-41:** Printer

Steps: 153 HP-41 Bytes: 380

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01803-41-6	$10	$12
FOR HP-71*	01803-71-3	N/A	$14

01804 Interactive Flight Information Manager

by J.D. Shaughnessy PhD, Newport News, VA
J.T. Farmer, Morganfield, KY

Program is useful for IFR and VFR planning and enroute flight management functions. Features include: extensive alphanumeric prompting, functional keyboard, clock function, extensive data storage/recall capability, look ahead/look back for distances, times, and fuel reserves, and automatic printing with the HP printer. Useful for other modes of transportation. **Necessary Accessories for HP-41:** Quad Module. Card Reader optional. Printer useful, but not required.

Steps: 807 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01804-41-4	$10	$18
FOR HP-71*	01804-71-1	N/A	$22

01805 ASCII File Resized

by J.R. Cook, West Palm Beach, FL

Useful housekeeping program to automatically change the size of an existing Extended Function/Memory ASCII file without the need to key in any of the original file over again. The only required input for this program is the name of the file to be resized and the size desired. **Necessary Accessories for HP-41:** Extended Function/Memory Module

Steps: 92 HP-41 Bytes: 171

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01805-41-1	$10	$11
FOR HP-71	NOT AVAIL		

01806 Oxygen Deficit in a Polluted Stream with Time

by C.J. Lee, Seoul, Korea

This program determines the oxygen deficit in a polluted stream with time. Oxygen deficit will be printed out in 1/10 of a day interval until it is at a maximum. Input data can be entered either by hand or a data card. Computed maximum oxygen deficit and original input data can be saved on a magnetic card. **Necessary Accessories for HP-41:** 3 Memory modules and printer.

Steps: 367 HP-41 Bytes: 1039

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01806-41-9	$10	$17
FOR HP-71	NOT AVAIL		

01807 Line Through a Point and Tangent to a Circle

by N.E. Ritchie, Portland, OR

Given the circle's radius and center co-ordinates and the point's coordinates, the two tangent points and distance between a tangent point and the given point are calculated. The program will also provide formulas for the tangent lines and/or lines normal to the tangent and through the circle center. Very user friendly. **Necessary Accessories for HP-41:** None

Steps: 167 HP-41 Bytes: 403

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01807-41-7	$10	$12
FOR HP-71*	01807-71-4	N/A	$14

01808 Uniformly Accelerated Motion: Interchangeable Solutions

by E.M. Keefe, Ankeny, IA

Second program in a series for First-Term Physics: PT2 differs from #00236C not in results but in method of Data Entry (Key in 3 unknowns: 41C 'Jumps' to solution of the other 2 unknowns). User may play "What-If" very readily. Program uses X<>F function to expedite Multiple Flag Testing and Branching. **Necessary Accessories for HP-41:** Extended Function Module (uses only X<>F function)

Steps: 229 HP-41 Bytes: 409

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01808-41-5	$10	$12
FOR HP-71*	01808-71-2	N/A	$14

01809 Hex to Decimal Conversion

by J. Wolfer, Berrien Springs, MI

Program exploits key assignments to convert from hexadecimal to decimal almost as fast as normal key entry. Integer only. Number of digits limited only by precision of calculator, effectively eight hex. digits. **Necessary Accessories for HP-41:** None

Steps: 135 HP-41 Bytes: 273

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01809-41-3	$10	$12
FOR HP-71*	01809-71-0	N/A	$14

01810 Areas of Polygons, Triangles, Trapezoids, Rhombi & Circle

by G.M. Halpern MD, Honolulu, HI

This program calculates area of various plane Geometric figures, given certain known parameters. Once the knowns are entered, calculation is automatic. It will calculate other parameters when given the area & one other factor. It uses usual algorithms. The subroutines (14) label input and print-out. There are 28 problems. **Necessary Accessories for HP-41:** Quad Module

Steps: 795 HP-41 Bytes: 2216

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01810-41-1	$10	$21
FOR HP-71*	01810-71-8	N/A	$26

01811 Plenum Temperature Calculation

by M.F. Schluender, Gladstone, MS

This program solves the ceiling plenum temperature equations. **Necessary Accessories for HP-41:** 1 Memory module

Steps: 181 HP-41 Bytes: 367

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01811-41-9	$10	$12
FOR HP-71*	01811-71-6	N/A	$14

01812 Sample Size Determination - Single Sampling

by M.J. Madigan, Webster, NY

This program provides sample size (n) and acceptance number (c) for a single sampling plan that will closely approximate given risks. The user specifies Alpha for an AQL (p1) and Beta for a RQL (p2). Any reasonable value for the risks and fraction defective may be used. The result, n, c, may be used to plot the associated OC Curve. **Necessary Accessories for HP-41:** None

Steps: 136 HP-41 Bytes: 267

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01812-41-7	$10	$12
FOR HP-71*	01812-71-4	N/A	$14

01813 Multicomponent System Manufacturing Cost with Tabular Output

by J.F. Levy, Dresher, PA

Program permits calculation of manufacturing costs for mixtures of up to thirty-plus components from raw material cost, composition, processing cost and packaging cost inputs. Program affords printed table (printer available). A shorter program without printout capability is also provided. **Necessary Accessories for HP-41:** Printer & quad module desirable, but a 6 component mixture can still be handled with 2 memory modules. The shorter program will handle up to 11 components with only 1 memory module (no printout).

Steps: 474 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01813-41-5	$10	$15
FOR HP-71*	01813-71-2	N/A	$18

01814 Eigenvalue/Vectors for Nth Order Systems.

by W.B. Davis, La Jolla, CA

This program will compute eigenvalues/vectors for systems up to and including 7th order. It uses the standard format B X=Lambda A X where A is diagonal and B is symmetric. Options include finding the square roots of the eigenvalues and normalizing the eigenvectors. SIZE check, data correction and data review subroutines are included. A plotting program for mode shapes is also included. **Necessary Accessories for HP-41:** Minimum of three Memory Modules required for 6th & 7th order systems. Printer is optional. Printer & Card Reader necessary to merge and run Plotting Prgm.

Steps: 775 HP-41 Bytes: 1372

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01814-41-3	$10	$17
FOR HP-71	NOT AVAIL		

01815 Calculating the Driller's Angles

by J.L.D. Marsh, Sunnyvale, CA

Translates borehole angle measurement sensor outputs to coordinate frame of the drilling rig. Outputs inclination (drift), azimuth (hole direction), gravity tool face angle (rotation) and magnetic tool face angle. **Necessary Accessories for HP-41:** HP 82143A Printer

Steps: 178 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01815-41-0	$10	$13
FOR HP-71*	01815-71-7	N/A	$14

01816 Gears

by D. Hughes, Billings, MT

Figure out the gear ratios for bikes, such as touring bikes, for maximum gear efficiency. **Necessary Accessories for HP-41:** Bicycle Gear Set

Steps: 92 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01816-41-8	$10	$11
FOR HP-71*	01816-71-5	N/A	$12

01817 Percent Rehandle

by J. Bores, Boise, ID

This program solves for the percent of rehandled material associated with surface mining of up to 4 horizontally-bedded ore horizons by excavating overburden and partings with a dragline that uncovers ore in two passes. **Necessary Accessories for HP-41:** Printer (Optional)

Steps: 1126 HP-41 Bytes: 1885

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01817-41-6	$10	$19
FOR HP-71*	01817-71-3	N/A	$22

01818 Fourier Series-300 Samples

by A. Couette, Orange Park, FL

Computes discrete fourier representation from equally spaced samples. As unique features, only Memory 00 and 18 program memories are used. Intermediate results are kept in the stack enabling faster calculations. Up to 300 samples can be used with full memory capability. Coefficients may be computed in any order. **Necessary Accessories for HP-41:** Up to 44 Samples: None - 300 Samples: Full Memory.

Steps: 77 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01818-41-4	$10	$13
FOR HP-71*	01818-71-1	N/A	$14

01819 Drill Hole Drift Survey

by E.J. Garrison, Reno, NV

This program solves for the coordinates of selected points down a drill hole, in three dimensions, given the surface coordinates of the hole collar and hole orientation data obtainable from single shot type down the hole survey tools. **Necessary Accessories for HP-41:** None

Steps: 49 HP-41 Bytes: 179

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01819-41-2	$10	$11
FOR HP-71*	01819-71-9	N/A	$12

01821 Internal Combustion Engine Cycle Otto

by G.A. Velez-D, Bogota, Colombia

This program calculates pressure and temperature at each point of an internal combustion engine cycle Otto; moreover calculates work, thermal efficiency, indicates mean effective pressure, indicates horsepower and torque. Input data are atmospherical pressure and room temperature, compression ratio, displacement or bore X stroke and RPM maximum. Units in English or Metric system. **Necessary Accessories for HP-41:** Two Memory Module

Steps: 505 HP-41 Bytes: 945

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01821-41-8	$10	$15
FOR HP-71*	01821-71-5	N/A	$18

01822 PRPLOT 5

by A. Kannel, Stockholm, Sweden

1 - 5 functions of X can be plotted in one diagram with high resolution and good readability. During execution, 21 X-values and corresponding function values are displayed for manual notation if a table is desired. AWO, by noting corresponding values, the curves are separated. **Necessary Accessories for HP-41:** Peripheral Printer (82143A)

Steps: 298 HP-41 Bytes: 548

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01822-41-6	$10	$13
FOR HP-71	NOT AVAIL		

01823 Reliability Evaluation

by M.L. Ramsey, Abilene, TX

Program determines the total annual cost for evaluation purposes based on the systems reliability/availability, mean time between failures and time to repair. **Necessary Accessories for HP-41:** None

Steps: 106 HP-41 Bytes: 206

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01823-41-4	$10	$11
FOR HP-71*	01823-71-1	N/A	$12

01824 Exchanger Film Coefficient

by M.L. Ramsey, Abilene, TX

This program calculates the film coefficient of heat transfer of water flowing through the tubes of a shell-and-tube type heat exchanger. In addition, the program calculates the fluid velocity through the tubes given the number of tubes or the number of tubes given a maximum velocity limitation. **Necessary Accessories for HP-41:** None

Steps: 126 HP-41 Bytes: 262

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01824-41-2	$10	$12
FOR HP-71*	01824-71-9	N/A	$14

01825 Rectangular Phased Array of Short Dipoles Gain Pattern

by R.M. Rhodes, Sunnyvale, CA

Computes the pattern gain of a rectangular phased array of short dipoles. User inputs number of elements, spacing, beam position, desired aperture weighting (uniform, Hamming, or Hanning) and azimuth cut. Gain is computed over a selected elevation angle range with desired increment. Plot available with extended Function module. **Necessary Accessories for HP-41:** 2 Memory Modules. Printer and Extended Function Module desirable.

Steps: 417 HP-41 Bytes: 801

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01825-41-9	$10	$14
FOR HP-71	NOT AVAIL		

01826 ESP Tester and Trainer

by C.T. Tart, Davis, CA

"ESP" generates an undisplayed, psuedo-ramdom target number. The user must use extrasensory perception (ESP) to guess them more frequently than chance. The program gives immediate feedback of target identity to allow learning what psychological conditions go with success, and automatically tabulates run results. Use it with or without a printer. **Necessary Accessories for HP-41:** 1 memory module; printer helpful, not necessary.

Steps: 123 HP-41 Bytes: 297

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01826-41-7	$10	$12
FOR HP-71*	01826-71-4	N/A	$14

01827 Mechanics of Wave Motion

by P.K. Belcher, Houston, TX

This program solves a variety of wave equations including wavelength, pressure factors, wave energy fractions, shoaling coefficients, group velocity to deepwater wave velocity ratios, and energy coefficients based on the Linear wave theory using a Newton-Raphson searching scheme. Use of this program saves interpolation of ocean wave tables. **Necessary Accessories for HP-41:**

Steps: 205 HP-41 Bytes: 379

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01827-41-5	$10	$12
FOR HP-71*	01827-71-2	N/A	$14

01828 Mass

by J.B. Warren, Wayzata, MN

This program computes the mass, center of gravity, longitudinal moment of inertia and transverse moment of inertia of an arbitrary body of revolution. **Necessary Accessories for HP-41:** One Memory Module. Printer Helpful.

Steps: 301 HP-41 Bytes: 569

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01828-41-3	$10	$13
FOR HP-71*	01828-71-0	N/A	$14

01829 Vortac/Tacan Point to Point Navigation

by E. Finley, Kingsville, TX

This program computes Distance, Course, Wind Corrected Heading and ETE to a Tacan defined destination (Radial & DME) from a present Radial and DME. Wind and TAS are prestored in locations compatible with Aviation X programs. Easy in-flight updating of present position is provided. **Necessary Accessories for HP-41:** None.

Steps: 128 HP-41 Bytes: 266

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01829-41-1	$10	$12
FOR HP-71*	01829-71-8	N/A	$14

01830 Plain Failure Analysis of Rock Slopes

by J.L. Gilby, Vancouver, Canada

This program calculates the factor of safety of a slope in which the potential failure plane is between the base of a tension crack and the toe of the slope. It allows input of various tension crack positions (B) and displays the factor of safety. If an optional Printer is used results for a series of B values will be tabulated and a plot of B against factor of safety will be printed. **Necessary Accessories for HP-41:** 2 Memory Modules: Printer Optional

Steps: 411 HP-41 Bytes: 810

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01830-41-9	$10	$14
FOR HP-71*	01830-71-6	N/A	$16

01831 Logic, a Simulation Program for Digital Logic Circuits

by R.E. Heil, Haverhill, MA

This program simulates the operation of a Digital Logic Circuit by operating on the input states given by the user to produce the corresponding circuit output states. The circuit may consist of up to forty to fifty logical gates of various types and have up to ten inputs and ten outputs. **Necessary Accessories for HP-41:** None

Steps: 635 HP-41 Bytes: 1245

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01831-41-7	$10	$16
FOR HP-71*	01831-71-4	N/A	$18

01832 Conic Sections

by J.E. Schiermeier, Cary, NC

This program takes a general second degree without an xy-term and determines the conic section: circle, ellipse, parabola, or hyperbola. Then it gives all information necessary for graphing such as center, distance to foci and vertices, direction, length of latus rectum, and other information specific to just one section. **Necessary Accessories for HP-41:** None

Steps: 230 HP-41 Bytes: 386

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01832-41-5	$10	$12
FOR HP-71*	01832-71-2	N/A	$14

01833 Conic Sections with Rotation

by J.E. Schiermeier, Cary, NC

This program will take any general second degree equation and determine the conic section: circle, ellipse, hyperbola, or parabola. If the equation has an xy-term, the program will rotate the axes and rewrite the equation without the xy-term for the new axes. Then all information necessary for graphing will be given. **Necessary Accessories for HP-41:** One Memory Module

Steps: 312 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01833-41-3	$10	$13
FOR HP-71*	01833-71-0	N/A	$14

01834 Lat/Lon to or from Bearing/Distance

by E. Finley, Kingsville, TX

This program calculates the True or Magnetic Bearing and Distance from one set of Lat/Lon coordinates to another. Also, given one set of coordinates and a Bearing/Distance from those coordinates it will determine the Lat/Lon of the Bearing/Distance point. Assumes flat Earth and a Rhumbline Route. **Necessary Accessories for HP-41:** 1 Memory Module. (It could easily be modified, as only 45 Registers are needed.

Steps: 136 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01834-41-1	$10	$12
FOR HP-71*	01834-71-8	N/A	$14

01835 Statics of Cables

by G.K. Ziran, Frankfurt/Main, W. Germany

Given the horizontal and vertical distances between two bearings, specific weight and maximum sag of a two-point-suspended cable, this program solves for size, angles, and components of all forces, position of max. sag and length of cable. Positions of any sag and sag at any position may be calculated. Includes plotting, routine. **Necessary Accessories for HP-41:** One memory module, Math Pac I. Printer optional.

Steps: 263 HP-41 Bytes: 411

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01835-41-8	$10	$12
FOR HP-71	NOT AVAIL		

01838 Chemical Process Equipment Cost Estimation

by W.H. Kirts, Blue Springs, MO

One mainline program, five instructional programs, and 25 equipment subroutines which will estimate chemical process equipment costs. Costs are estimated based on January 1982 data and is corrected for inflation using the Marshall and Swift Index published by Chemical Engineering Magazine biweekly. Programs are based on an article from that magazine. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC. **Necessary Accessories for HP-41:** Cassette Drive and Printer, Quad Memory Module.

Steps: 4911 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Media
FOR HP-41	01838-41-2	N/A	$20
FOR HP-71	NOT AVAIL		

01839 Unique Nth Degree Polynomial through N+1 Points

by C. Manning, Canberra, Australia

This program finds the unique Nth degree polynomial through N+1 data points (N<15). A short and powerful program. Can also be used to aid long division of polynomials. **Necessary Accessories for HP-41:** 1 NT(N up arrow 2/49+1) Memory Modules. (One for degree, N<7).

Steps: 275 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01839-41-0	$10	$12
FOR HP-71*	01839-71-7	N/A	$14

01840 State Observability of a Digital System

by E.C. Schmidt, Milo, ME

This program uses the "A" & "D" matrices of the dynamic equation of a system to produce the "L" matrix. The program can handle up to a 10 X 10 "A" matrix with a quad memory module. Is set up to use the Mathemathics Application Pac. on the "L" matrix. Has a size check built in. **Necessary Accessories for HP-41:** One or more memory modules.

Steps: 249 HP-41 Bytes: 445

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01840-41-8	$10	$12
FOR HP-71*	01840-71-5	N/A	$14

01841 Spectrophotometric and Spectrofluorometric Assays

by J.R. Dunn II, Detroit, MI

Sample calculations in any photometric assay which yields a linear calibration curve. Blanks and range factored in each absorbance. Curve slope, Y-intercept, R are given. Experimental dilution, assay dilution, enzyme amount and number of minutes give concentration in Mass/Vol/Min. Results may be further normalized per unit of DNA and/or Protein. Fully prompted. **Necessary Accessories for HP-41:** One Memory Module; Printer Optional.

Steps: 271 HP-41 Bytes: 574

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01841-41-6	$10	$13
FOR HP-71*	01841-71-3	N/A	$14

01842 Calculation of Polynomials

by W. Reitgruber, Sollenau, Austria

From a Polynomial you know some points or other data like: X=3, Maximum, points of Inflections or only: f'(-3)=2 or f"(1)=7. The program will calculate the coefficients of the Polynomial. **Necessary Accessories for HP-41:** Mathematic - Pac ("Matrix")

Steps: 121 HP-41 Bytes: 216

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01842-41-4	$10	$11
FOR HP-71	NOT AVAIL		

01843 CDC 6000 Series Disassembler

by K. Akima, Boulder, CO

Given the octal, machine-code representation of the CDC 6000 series Computer, this program will produce the corresponding COMPASS (Comprehensive Assembler) mnemonics. This can be used as an aid in interpreting dumps. **Necessary Accessories for HP-41:** One Memory Module

Steps: 364 HP-41 Bytes: 648

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01843-41-2	$10	$13
FOR HP-71*	01843-71-9	N/A	$14

01844 Select Calendar Number from Gregorian or Julian Input Year

by G.W. Killian, Stamford, CT

For any Gregorian or Julian input year from ten billion BC to ten billion AD the program will select which of the fourteen possible calendars should be used. Julian calendar answers are distinguished with a "" in the display answer. **Necessary Accessories for HP-41:** None

Steps: 100 HP-41 Bytes: 179

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01844-41-0	$10	$11
FOR HP-71*	01844-71-7	N/A	$12

01845 Decimals to Fractional Inches

by G. Pegan, Garden Grove, CA

Converts the decimal of feet or inches to inches and/or fraction of an inch. 0.662 feet converted to 7 and 15/32 inch or 0.464 inch to 15/32 of an inch. Also solves for the error between the input and the answer (output). **Necessary Accessories for HP-41:** Card Reader

Steps: 87 HP-41 Bytes: 293

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01845-41-7	$10	$12
FOR HP-71*	01845-71-4	N/A	$14

01846 Mole Fraction for N Components

by S.M. Neas, Lakeland, FL

This program calculates mole fractions for N components given weight and molecular weight. User controls the number of components and is prompted for the required input data. Output will be printed if the printer is attached. Once the molecular weights have been entered different weights may be easily calculated. **Necessary Accessories for HP-41:** Printer and Memory Modules are Optional.

Steps: 114 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01846-41-5	$10	$11
FOR HP-71*	01846-71-2	N/A	$12

01847 Pipe Branch Reinforcement Calculation

by T.M. Trainor, Augusta, GA

This program provides a quick check to determine whether welded pipe branches are capable of sustaining internal design pressures in accordance with ANSI B31.1-1980, Code for Power Piping. The program also provides the user with error messages if inputs are made that violate certain code rules. **Necessary Accessories for HP-41:** Two memory modules

Steps: 359 HP-41 Bytes: 782

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01847-41-3	$10	$14
FOR HP-71*	01847-71-0	N/A	$16

01848 Citizens Band 40 Channel Frequency Conversion and List

by J.F. Woldering, Euclid, OH

This program provides easy conversion between citizen's band channels and their respective frequencies. It will also show or print a list of all 40 channels and their frequencies. Useful for those monitoring CB with a programmable scanner, someone buying or sorting crystals, or a technician adjusting a transceiver's frequency. **Necessary Accessories for HP-41:** None, but a printer enhances operation.

Steps: 158 HP-41 Bytes: 317

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01848-41-1	$10	$12
FOR HP-71*	01848-71-8	N/A	$14

01849 Temperature Dependent Failure Rate Projections

by D. Luttropp, Ft Collins, CO

Some failure mechanisms of electronic components are strongly dependent on temperature. This program makes it easy to enter the parameters and see the effects of changes and predict results under other conditions. It uses an Arrhenius model which is a well accepted way of relating failure ratio at different temperatures. **Necessary Accessories for HP-41:** None

Steps: 208 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01849-41-9	$10	$12
FOR HP-71*	01849-71-6	N/A	$14

01850 Credit Card - Extended Functions/Memory

by A.L. Zeichick, Bangor, ME

This program creates and maintains credit card information–card name and number, amount charged, credit limit and expiration date–in an Extended Memory ASCII file. The program demonstrates the use of ASCII files and many new Extended ALPHA functions. **Necessary Accessories for HP-41:** Extended Functions/Memory module, at least one Memory Module.

Steps: 285 HP-41 Bytes: 657

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01850-41-7	$10	$13
FOR HP-71	NOT AVAIL		

01852 Case VI Oblique Spherical Triangles -- 6 Variations

by G.M. Halpern MD, Honolulu, HI

This program solves CASE IV Oblique Spherical Triangles. There are 6 variations, four of which have 2 solutions. A single set of algorithms are used, where 2 angles and a side opposite one of them are known. This is a companion program to one solving Case I thru V oblique spherical triangles. **Necessary Accessories for HP-41:** Two memory modules

Steps: 329 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01852-41-3	$10	$15
FOR HP-71*	01852-71-0	N/A	$18

01853 Superheated Steam Pipe Design

by J.A. Pita, Quito, Ecuador

Given pressure and temperature of a superheated steam, this program finds velocity, diameter of pipe or flow rate given any two of them. Also, given velocity, diameter and mass flow rate, pressure or temperature is found if any of the two are given. **Necessary Accessories for HP-41:** One memory module.

Steps: 318 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01853-41-1	$10	$14
FOR HP-71*	01853-71-8	N/A	$16

01857 Financial Institutions Analysis

by R.E. Barragan-N, Bogota 2, Columbia

With the data of averaged Balances and Profit & Loss Statements of two or more (infinite) periods, it analyzes and/or simulates with 50 outputs for each two periods the key variables determining the performance of a Financial Institution: Return, Net Income, Losses, Debt, Others, and their relationships. **Necessary Accessories for HP-41:** Quad Memory Module. Card Reader and Printer Desirable.

Steps: 535 HP-41 Bytes: 1351

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01857-41-2	$10	$17
FOR HP-71	NOT AVAIL		

01858 Electric Rate Analysis I

by J.J. Brown, Boise, ID

General purpose electric rate analysis program to compare two rates. Can handle up to a five block energy rate, a monthly customer charge, and a monthly minimum charge for each of two rates. Output options include single point kWh comparison or table of kWh versus charges in user selectable increments of kWh. **Necessary Accessories for HP-41:** 3 Memory Modules and Printer

Steps: 669 HP-41 Bytes: 1513

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01858-41-0	$10	$17
FOR HP-71	NOT AVAIL		

01859 Pipe-Sizing for Compressible Flow

by J. Huang, Corvallis, OR

This program is designed to solve a broad range of pipe-sizing problems for compressible flow. The program assumes that flow is isothermal, and that either the upstream pressure or the downstream pressure is known. The Mach number can be found at the inlet and, more importantly, at the outlet-where sonic velocity may limit the flow. **Necessary Accessories for HP-41:** Quad Module, Extended Function Module. Optional: Thermal Printer, Card Reader or Wand.

Steps: 908 HP-41 Bytes: 2361

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01859-41-8	$10	$22
FOR HP-71	NOT AVAIL		

01860 Inelastic Collisions

by M. Stevens, Cincinnati, OH

This program solves inelastic collisions for two dimensions. The program deals with variables: 2 angles, M1, M2, V1, U1, Vf. Knowing six of the variables, the sevanth variable can be computed. Also the program calculates initial and final kinetic energy and the energy loss. **Necessary Accessories for HP-41:** None

Steps: 232 HP-41 Bytes: 316

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01860-41-6	$10	$12
FOR HP-71*	01860-71-3	N/A	$14

01861 Improve Your Tapecounter

by S.T. Christensen, Ringsted, Denmark

Supply a few facts about your Tape-Recorder and your Tape in use. Then, knowing the reading of the Tape-Counter, your HP-41 gives the remaining amount of playtime. And winding or rewinding X min and Y sec from any spot on the Tape is from now on made very easy by this program. **Necessary Accessories for HP-41:** None

Steps: 168 HP-41 Bytes: 287

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01861-41-4	$10	$12
FOR HP-71*	01861-71-1	N/A	$14

01862 Tank Drainage Time

by M.L. Ramsey, Abilene, TX

The program determines the time required to drain a vessel under the head of its own liquid. The vessel is a flat-end horizontal tank. **Necessary Accessories for HP-41:** None

Steps: 96 HP-41 Bytes: 217

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01862-41-2	$10	$11
FOR HP-71*	01862-71-9	N/A	$12

01863 Cp' from Tables

by E.C. Schmidt, Milo, ME

The program converts equations for Cp to real values. It has a built in size check and is set up to take "N" terms. The power of the "T" may be +, - or 0. It uses 2N+6 data registers. It will run on HP-41C with five terms in the equation. **Necessary Accessories for HP-41:** None

Steps: 164 HP-41 Bytes: 320

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01863-41-0	$10	$12
FOR HP-71*	01863-71-7	N/A	$14

01864 FAA AC 90-45A Computation of Geodesic Information

by R.G. Wilson, Wichita, KS

The FAA presents "Mathematical formualas (they) used for geodetic computations (which) are derived from a procedure developed by Sodano (U.S. Army Engineer; Geodesy, Intelligence and Mapping Research and Development Agency; Fort Belvoir, Virginia.) The method provides very good direct and inverse computational compatibility; it is used by the FAA for all Route development." **Necessary Accessories for HP-41:** One (1) HP 82106A memory. Optional: HP00041-14007 NavPac and HP82180A Extended Functions

Steps: 640 HP-41 Bytes: 825

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01864-41-8	$10	$14
FOR HP-71*	01864-71-5	N/A	$16

01865 Analemmic Sundial Design

by S.F. Johnston, Ville Vanier, Canada

Given the observer's Latitude and Longitude, this program calculates the layout of an Analemmic Sundial of the desired size. This movable-Gnomon design gives times accurate to one minute (Limited only by the Sundial dimensions and Gnomon shadow width). **Necessary Accessories for HP-41:** One Memory Module; Card Reader desirable.

Steps: 227 HP-41 Bytes: 469

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01865-41-5	$10	$13
FOR HP-71*	01865-71-2	N/A	$14

01866 Photographer's Log

by T.F. Morgan, Bellevue, NE

This program creates an ASCII file in Extended Memory for each roll of film, storing roll number, film type and speed and data for each frame. Minimum per frame data are shutter speed and aperture with a 24-character text routine available as a user option. **Necessary Accessories for HP-41:** One Memory Module, Extended Funcitons/Memory Module(s). Printer.

Steps: 219 HP-41 Bytes: 505

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01866-41-3	$10	$13
FOR HP-71	NOT AVAIL		

01868 Cash Flow Analysis

by J.A.H. Roquette, Miami, FL

Generates and prints up to 19 cash flows for analysis considering expansion rates of sales, salaries and sundry expenses that can be manipulated. Calculations include positive or negative interest rates according to the nature of accumulated cash flow. After taxes analysis is included. Many "what if" possibilities are included for input and calculations. **Necessary Accessories for HP-41:** 3 Memory modules and printer.

Steps: 441 HP-41 Bytes: 947

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01868-41-9	$10	$15
FOR HP-71*	01868-71-6	N/A	$18

01869 Optical Properties of Solids

by S.F. Johnston, Ville Vanier, Canada

This program evaluates the Optical Constants Reflectivity, Refractive Index, Absorption coefficient, and Complex Dielectric constant. At a user-specified frequency. The model is that of Drude, modified by the presence of up to four Lorentz Oscillators. Model parameters can be saved or read on one Magnetic Card Track. **Necessary Accessories for HP-41:** 1 Memory Module and (Optionally) Card Reader.

Steps: 222 HP-41 Bytes: 493

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01869-41-7	$10	$13
FOR HP-71	NOT AVAIL		

01870 Strip Transmission Line Design

by W.H. Lockyear, Torrance, CA

This program designs and analyzes strip transmission lines using S.B. Cohn's formulas. Given the ground plane spacing, strip thickness and desired impedance it iterates to find the strip width. Alternatively, the impedance for a given strip width may be calculated. (This program should not be confused with the microstrip programs). **Necessary Accessories for HP-41:** One Memory Module

Steps: 213 HP-41 Bytes: 511

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01870-41-5	$10	$13
FOR HP-71*	01870-71-2	N/A	$14

01871 108 Weights & Measures

by W.E. Hitchins, Los Angeles, CA

Converts interchangeably between 108 weights and measures: 25 measures of length; 15 of mass (weight); 24 of capacity or volume; 16 of surface measure; 6 of energy; 5 of force; 7 of power, and 10 of pressure. Units include American, British, metric, Systeme International (S.I.), and American and Continental advertising and printers' measures. Rejects nonsense conversions. **Necessary Accessories for HP-41:** Quad Module. Card Reader or Wand highly recommended.

Steps: 613 HP-41 Bytes: 2173

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01871-41-3	$10	$21
FOR HP-71*	01871-71-0	N/A	$26

01872 Calendars

by D. Amos, Willoughby, Australia

Calculates and prints a calendar for a given year, and a single or any number of months, AD.0 to AD.4000. Prints 1 year within 1 Min 45 Sec. Also a Julian Calendar with the same options AD.0 to AD.4200, for chronological history documents, etc. Can function without a printer. **Necessary Accessories for HP-41:** Printer, 1 Memory Module

Steps: 213 HP-41 Bytes: 491

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01872-41-1	$10	$13
FOR HP-71*	01872-71-8	N/A	$14

01873 Oblique Spherical Triangles - Case I thru V

by G.M. Halpern MD, Honolulu, HI

This program solves Oblique Spherical Triangles, Case I thru V, including the Polar Triangles. All the varieties of Cases III thru V are handled. Standard formulae are used and variations in each case use the same algorithm. The different printouts (alphanumeric) of angle and side are controlled by flags 00 thru 06. The flags are set automatically when each LBL is keyed. Triangles with two solutions are solved automatically. **Necessary Accessories for HP-41:** Quad Module, Printer and Card Reader.

Steps: 1012 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01873-41-9	$10	$20
FOR HP-71*	01873-71-6	N/A	$24

01874 Atmospheric Properties

by J.G. Kocsis, Mojave, CA

Program computes the following properties of air as a function of altitude (up to 20000m): density, speed of sound ratio, pressure ratio, temperature ratio. Units, both in metric and in British system can be used. **Necessary Accessories for HP-41:** One Memory Module

Steps: 217 HP-41 Bytes: 4916

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01874-41-7	$10	$13
FOR HP-71*	01874-71-4	N/A	$14

01875 Beams on Elastic Foundation

by M. Walsh, De Portneuf, Canada

Find deflection, slope, moment, shear or bearing (or a beam on an elastic foundation) due to triangular, uniform or concentrated load, moment, externally created angular or transversal deformation with free, fixed, simply supported or guided left or right end restraints. Size required is 31+2* number of loads. **Necessary Accessories for HP-41:** 3 Memory modules or quad memory.

Steps: 825 HP-41 Bytes: 1465

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01875-41-4	$10	$17
FOR HP-71*	01875-71-1	N/A	$20

01876 Round Building Room Areas & Dimensions

by W.B. Tracy, Denver, CO

Round office buildings pose a difficult problem to architects and space planners dimensionally, especially in calculating sensitive "rentable area" for the developer. This program puts the calculus into the hands of the space planner to solve the problems that arise where the rectangular planning grid meets a curved wall. **Necessary Accessories for HP-41:** None

Steps: 96 HP-41 Bytes: 172

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01876-41-2	$10	$11
FOR HP-71*	01876-71-9	N/A	$12

01877 Monthly Tide Predictions

by M.A. Kalcic, Triestee, Italy

31-day tide predictions. Within this period, program computes times, heights at high and low water, evaluates tide height and rate of change at given times, finds times at given height of tide--for all the world. Harmonic constants and daily tidal angles and factors. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 470 HP-41 Bytes: 920

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01877-41-0	$10	$14
FOR HP-71	NOT AVAIL		

01878 Pharmacokinetic Parameters from Serum Drug Concentrations

by E.M. Jones, Charleston, SC

This program determines Vd and/or Ke for any drug in any patient from SDC's taken during any of four dosing schemes. Steady state concentrations are projected. It can be used with others designed to prospectively estimate parameters or design dosage regimens. **Necessary Accessories for HP-41:** Quad Module (or HP-41CV) and Card Reader

Steps: 715 HP-41 Bytes: 1585

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01878-41-8	$10	$18
FOR HP-71	NOT AVAIL		

01879 Solid Bar Graph

by R.L. Gardner, Anamosa, IA

You will like these bold, legible, easy-to-read Graphs. Complete control of Y and X Axis included. Program includes fast, easy Data Register input. Ideal for Graphs of weather, market, sales, costs, financial or whatever Data you have. Comprehensive comparison at a glance. **Necessary Accessories for HP-41:** HP-IL Module, HP-82162A Thermal Printer and 1 Memory Module

Steps: 152 HP-41 Bytes: 348

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01879-41-6	$10	$12
FOR HP-71	NOT AVAIL		

01880 Coal Quality Weighted Averages

by P. Rushworth, Lakewood, CO

Computes weighted averages of user selected coal quality characteristics. **Necessary Accessories for HP-41:** None

Steps: 104 HP-41 Bytes: 214

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01880-41-4	$10	$11
FOR HP-71*	01880-71-1	N/A	$12

01881 West Coast Board Foot Volume

by D. Olsen, Bellingham, WA

This program calculates and cumulates by species the gross, net and cull volumes for any 9 species at a time. It is based on the volume calculations established in the "Official Rules for the Following Log Scaling and Grading Bureaus: Columbia River, Grays Harbor, Northern California, Puget Sound, Southern Oregon, and Yamhill." **Necessary Accessories for HP-41:** For diameters up to 56 inches, 2 Memory Modules are necessary; diameters to 120 inches require 3 Memory Modules. Printer and card reader optional.

Steps: 251 HP-41 Bytes: 382

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01881-41-2	$10	$17
FOR HP-71*	01881-71-9	N/A	$20

01882 Building Society Paid-Up Share Account Interest Calculations

by C. Goldman, London, England

Calculates interest due on paid-up share accounts with U.K. building society institutions. Provides a choice of three interest bases adopted by societies. Where a Financial Decisions Module is not available, a Memory Module may be used instead in conjunction with the subroutine included in the program listing. **Necessary Accessories for HP-41:** Financial I Module or Memory Module

Steps: 227 HP-41 Bytes: 429

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01882-41-0	$10	$12
FOR HP-71*	01882-71-7	N/A	$14

01883 Delta to Y, Y to Delta Conversion for Complex Impedances

by K. Fischer, Blacksburg, VA

Given the three complex impedances of a Delta or "Y" load, this program will calculate the equivalent impedances of the other type load. The complex impedances must be of the form (R + jX). The program prompts for all inputs. **Necessary Accessories for HP-41:** Printer is optional.

Steps: 183 HP-41 Bytes: 365

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01883-41-8	$10	$12
FOR HP-71*	01883-71-5	N/A	$14

01884 Slopestake Set and Check

by R. Heusser, Packwood, WA

This program provides control over all possible variables in setting or checking slopestakes, including ditch data, and cutslopes and fillslopes. Output is actual cut or fill from stake to grade, and actual horizontal distance from stake to centerline, compared to calculated horizontal distance based on template data and stake location. **Necessary Accessories for HP-41:** None

Steps: 100 HP-41 Bytes: 229

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01884-41-6	$10	$12
FOR HP-71*	01884-71-3	N/A	$14

01885 Buckets, a Data Collector by Category

by D.H. Turner, Southfield, MI

"BUCKETS" allows easy collection and analysis of data that is associated with a category: rejects per part number, labor hours by department. This program allows that data entered with its category designation in one entry. General statistics include for all entries: total, mean, standard deviation, and sample size. For each category the output includes: category designation, total for entries, percent of category total to the total for all number of entries. If a printer is attached, output is well-formatted with decimal aligning and additionally a bar chart is available. **Necessary Accessories for HP-41:** One Memory Module Minimum

Steps: 270 HP-41 Bytes: 807

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01885-41-3	$10	$14
FOR HP-71*	01885-71-0	N/A	$16

01886 Synthetic Division

by M. Stevens, Cincinnati, OH

This program does synthetic division for polynomials with real coefficients and for real monomial divisors. The program will give the quotient, or it can give p(c). The program can be used to find intervals in which p(x) = 0. The divisor is of the form x + c, where c is a real value. **Necessary Accessories for HP-41:**

Steps: 121 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01886-41-1	$10	$12
FOR HP-71*	01886-71-8	N/A	$14

01887 Spur Gear Dimensions and Cutting Data

by K.A. Stork, Bozeman, MT

Provides quick and accurate cutting data and drawing dimensions, both of which are required for detail drawings. Also handy for the machinist in setting up for gear production on various machine tools. **Necessary Accessories for HP-41:** One Memory Module. Printer optional.

Steps: 185 HP-41 Bytes: 510

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01887-41-9	$10	$13
FOR HP-71*	01887-71-6	N/A	$14

01888 Reaction Rate Evaluation

by R.M. Kozel, Garfield Heights, OH

Given kinetic data on a reaction (concentrations and the times at which those concentrations occurred), this program will evaluate that data for a user specified reaction order. The program computes the correlation coefficient, the slope, the y-intercept, the rate constant, the initial concentration, and the half-life. Linear estimation is also permitted. One Memory Module is required to accomodate the program and 31 data points. Each additional Memory Module permits an additional 32 data points. **Necessary Accessories for HP-41:** One Memory Module minimum.

Steps: 227 HP-41 Bytes: 364

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01888-41-7	$10	$12
FOR HP-71*	01888-71-4	N/A	$14

01889 Splitting the Bill--the Ultimate in Dining Convenience

by P.J. Yannone, Waco, TX

Your workmates will be convinced of the HP-41's power and versatility after lunch with the Bill Splitter. Referring to a maximum of six persons by their initials, HP calculates individual totals, tax, tip, built-in gratuities, change due, and the denominations to ask for it in for easy distribution to each member of the party. Easy information review. Special subroutines eliminate round-off error. R/S in totaling procedure is not required due to automatic execution. Programmed alpha instructions assure super simplified execution. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 521 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01889-41-5	$10	$16
FOR HP-71*	01889-71-2	N/A	$18

01890 U Value

by E.T. Kinghorn, Greenville, SC

This program finds the required R-value (thermal resistance) of insulation necessary for a variety of walls, foundations and roofs. It also solves for an adjusted U-value (overall heat transmission coefficient) for stud walls. R-values for 32 various materials are furnished; and are addressed by name in lieu of register number. **Necessary Accessories for HP-41:** Memory Module (Printer helpful, not required)

Steps: 113 HP-41 Bytes: 333

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01890-41-3	$10	$14
FOR HP-71*	01890-71-0	N/A	$16

01891 Biorhythms & Compatibility for You or People in History

by W.E. Hitchins, Los Angeles, CA

Calculates the biorhythm for anyone born since October 15, 1582, for any date up to September 10, 4320. Includes the compatibility test for any two people born in the same period. Display indicates whether person is in the negative or positive phase of each cycle, warns of critical and minicritical days. Date input/output can be American or European style. Time module makes operation extremely fast. **Necessary Accessories for HP-41:** 1 memory module, Time module; (Printer optional)

Steps: 262 HP-41 Bytes: 0639

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01891-41-1	$10	$13
FOR HP-71	NOT AVAIL		

01892 Clarke's Mid-Latitude Geodetic Formulae

by M. Cox, Dunedin, New Zealand

Given latitude and longitude of a point and either the latitude and longitude of another or an azimuth and distance to another, this program will calculate the missing information. Over distances of up to 150 km the results are to geodetic accuracy. Any spheroid can be used, 'International' data supplied. **Necessary Accessories for HP-41:** One memory module.

Steps: 446 HP-41 Bytes: 695

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01892-41-9	$10	$14
FOR HP-71*	01892-71-6	N/A	$16

01893 Auto Computer

by D.P. Bleicher, Palmer, AK

This program computes eta, mpg for current fillup and trip, miles traveled, avg. mph, gal of fuel remaining in tank and miles to travel on remainder of fuel. Updated information is computed after entry of current odometer reading and time is entered. **Necessary Accessories for HP-41:** None

Steps: 156 HP-41 Bytes: 382

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01893-41-7	$10	$12
FOR HP-71*	01893-71-4	N/A	$14

01894 Joint Venture Financing

by C. Goldman, London, England

Investment is recovered by a two part levy on sales; 1st levy period runs until capital plus compound interest is recovered; 2nd stage usually equals first levy period, alternatively user can specify 1st or 2nd periods. Program calculates levies, 1st levy period, money and real internal rates of return. **Necessary Accessories for HP-41:** Three memory modules.

Steps: 715 HP-41 Bytes: 1351

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01894-41-5	$10	$17
FOR HP-71*	01894-71-2	N/A	$20

01896 Queue

by L.E. Hansman, Kitchener, Canada

Fully integrated program enables the user to compute queueing Statistics for 6 different queue types. The program has been written in a modular manner so the user may delete seqments of the program which do not apply to his/her situation. This feature enables the user to run even the longest of the routines on an HP-41C with only 1 memory module! The types are as follows: Type A-Single server model with arbitrary service times, Type B-Multiserver model with Poisson arrivals & exponential service times, Type C-Basic single server model, Type D-Single server model with a finite queue, Type E-Models with a finite calling population, Type F-Single server model. **Necessary Accessories for HP-41:** 3 memory modules, card reader helpful.

Steps: 908 HP-41 Bytes: 1610

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01896-41-0	$10	$18
FOR HP-71*	01896-71-7	N/A	$22

01897 Series RL, RC, RLC Circuit Parameters

by M. Donoghue, Dunedin, New Zealand

This program computes the following series-circuit parameters: RL circuit; inductive reactance, impedance, phase angle, RC circuit capacitive reactance , impedance, phase-angle, RLC circuit capacitive reactance, inductive reactance, impedance, phase ange, resonant frequency, and magnification factor, Q. All required data prompted for with alpha. All outputs labelled with alpha. **Necessary Accessories for HP-41:** None

Steps: 149 HP-41 Bytes: 355

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01897-41-8	$10	$12
FOR HP-71*	01897-71-5	N/A	$14

01898 Simultaneous Equations and Math for Complex Numbers

by W.W. Lauer, Canton, OH

Solves simultaneous equations involving real or complex numbers. Useful in circuit analysis. Also performs +, -, *, / of complex numbers using RPN. The length of the stack depends upon the available memory space. Input may be in rectangular or polar form for either program. **Necessary Accessories for HP-41:** One Memory Module (permits 3 unknowns) Two Memory Modules (permits 6 unknowns) Three Memory Modules (permits 8 unknowns)

Steps: 363 HP-41 Bytes: 577

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01898-41-6	$10	$13
FOR HP-71*	01898-71-3	N/A	$14

01899 Routine Centrifugation Calculations

by T. Langland, Phoenix, AZ

This program is really two programs in one. The first solves interchangeably for the radius, revolutions per second, or the relative centrifugal force of a centrifuge. The second can determine the revolutions per minute required to generate a sucrose density gradient equivalent to a standard sucrose density gradient at a given rpm and time. **Necessary Accessories for HP-41:** None

Steps: 102 HP-41 Bytes: 157

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01899-41-4	$10	$11
FOR HP-71*	01899-71-1	N/A	$12

01900 Oblique Stereographic Projection

by M.J. Cook, Oshawa, Canada

This program will compute the X and Y coordinates for plotting an oblique stereographic projection. Full prompting, automatic X and Y coordinate viewing, and tone signals for input-output is featured. **Necessary Accessories for HP-41:** None

Steps: 78 HP-41 Bytes: 133

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01900-41-0	$10	$11
FOR HP-71*	01900-71-7	N/A	$12

01901 Morse Code, XFN/XMEM Module Trainer

by E.M. Keefe, Ankeny, IA

This program demonstrates some of the many powerful functions of the XFN/XMEM Module: #82180A. As a morse code training device, the program accepts alpha messages, massages the messages and produces audible code at the rate of approximately 6.5 words/min. Tone 8=DAH; Tone P (synthetic tone 120)=DIH. **Necessary Accessories for HP-41:** Extended Function Module; 2 Memory Modules; Card Reader or Wand

Steps: 504 HP-41 Bytes: 1028

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01901-41-8	$10	$16
FOR HP-71	NOT AVAIL		

01902 Infusion Drug Dosage Table

by D.A. Gosse, Iowa City, IA

Given patient's weight, drug name and solution strength this program prints the input data and a table with drip rate in microdrops per minute and corresponding drug dose in micrograms per kilogram per minute. The usual dosage ranges are also listed for Dopamine, Epinephrine, Lidocaine, and Nitroprusside, however, any drug name can be used. **Necessary Accessories for HP-41:** 24 column printer, one memory module

Steps: 179 HP-41 Bytes: 602

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01902-41-6	$10	$13
FOR HP-71*	01902-71-3	N/A	$14

01904 Fisher's Exact Probability Test for 2x2 Contingency Tables

by E. Franco, Atlanta, GA
R. Simons, Atlanta, GA

Program calculates Fisher's exact probability value for 2x2 contingency tables with automatic testing for extremes. Both marginal and grand totals may exceed 69 because fast algorithm for large factorials is used. Rearrangement of the table prior to testing is not necessary. **Necessary Accessories for HP-41:** None required. Printer optional.

Steps: 157 HP-41 Bytes: 259

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01904-41-2	$10	$12
FOR HP-71*	01904-71-9	N/A	$14

01907 Multiple File Bookkeeper

by H. Martinsen, Belle Chasse, LA

Program allows user to store various bookkeeping files. Records in file are defined by character string (12 or less) and corresponding dollar value (sign indicates asset or deficit). Records can easily be added, updated or deleted. The entire file is neatly printed with total assets and deficits as well as grand total. **Necessary Accessories for HP-41:** Extended Function Module, Printer, Memory Module

Steps: 235 HP-41 Bytes: 562

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01907-41-5	$10	$13
FOR HP-71	NOT AVAIL		

01908 Radar Plotting with Timer

by M.A. Kalcic, Triestee, Italy

This program plots concurrently 5 radar targets. It returns relative, true course, speed of targets, CPA times, distances and bearings. Your own ship may alter course and speed in the process.With your ship's simulated course and speed alterations, the program forecasts plotted targets CPA times, distances and bearings for the best course-of-action to avoid complex close-quarters situations. No stopwatch is needed. The Time Module feeds times directly to calculations. **Necessary Accessories for HP-41:** Time Module

Steps: 339 HP-41 Bytes: 568

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01908-41-3	$10	$13
FOR HP-71	NOT AVAIL		

01909 CAD1 - Time Domain Analysis for Nonlinear Networks

by N.C. Lee, Stony Brook, NY

This calculator-aided design program can perform DC or Time Domain analysis for arbitrary networks. Components allowed are linear L, C, R, independent current/voltage sources, current or voltage controlled current sources and user defined nonlinear devices. Modified companion models and Newton-Raphson algorithm are used. Outputs are all the node voltages. **Necessary Accessories for HP-41:** Minimum One Memory Module, Printer Helpful

Steps: 649 HP-41 Bytes: 1106

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01909-41-1	$10	$16
FOR HP-71*	01909-71-8	N/A	$18

01910 Man. Radiogoniometer Position Calculations w/3 Measurements

by P.E. Montoreano, Buenos Aires, Argentina

Given position and direction of three broadcasting stations, this program finds possible position of ship and indetermination radius (error). **Necessary Accessories for HP-41:** One Memory Module (Printer optional)

Steps: 244 HP-41 Bytes: 413

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01910-41-9	$10	$12
FOR HP-71*	01910-71-6	N/A	$14

01911 Fractional Arithmetic

by J. Knobloch, Berlin 37, West Germany

This program calculates with fractions. It also allows user to convert a decimal number into a fraction. For example the following calculation can be made: 1/4 + 5/6*(0, 1875 + 8/7) Result: 913/672. **Necessary Accessories for HP-41:** One Memory Module

Steps: 292 HP-41 Bytes: 461

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01911-41-7	$10	$13
FOR HP-71*	01911-71-4	N/A	$14

01912 Broadening Effects; Collision, Doppler & Natural Width

by M. Tremblay, Ste-Foy, Canada

This program computes the three major broadening effects of spectral lines. It then displays the effects in their decreasing order so you know the relative weight of each efect, namely: the natural width (intrinsic property), the Doppler effect and the collision effect. **Necessary Accessories for HP-41:** None

Steps: 112 HP-41 Bytes: 274

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01912-41-5	$10	$12
FOR HP-71*	01912-71-2	N/A	$14

01913 Pile Group Analysis

by J.A. Arrieta, Miami, FL

This program computes the load on each pile in a group with applied load and moment, in any consistent system of units. The program is as useful for the design as for the revision of "as built" clusters with displaced piles. Rigid cap and elastic behavior of soil and piles are assumed. **Necessary Accessories for HP-41:** None up to 9 piles; extra memory needed from then on.

Steps: 127 HP-41 Bytes: 206

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01913-41-3	$10	$11
FOR HP-71*	01913-71-0	N/A	$12

01916 Multiloop Feedback Analysis

by E.E. Stoner, St. Charles, MO

This program will reduce a multiloop feedback system consisting of up to 9 transfer functions to a single transfer function and will output the system characteristic equation. The user may define both closed loop and open loop (Nyquist) transfer functions and obtain their frequency responses (Continuous or discrete systems). **Necessary Accessories for HP-41:** 2 Memory Modules (more are necessary for large problems)

Steps: 550 HP-41 Bytes: 947

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01916-41-6	$10	$15
FOR HP-71*	01916-71-3	N/A	$18

01918 Arma (2, 2) Time Series Model Generator

by J. Brownlow, Lancaster, CA

This program generates a time series from a (Box-Jenkins) ARMA (2, 2) model. The user supplies parameters for the process. Actually any time series of the form ARMA (p, q) $o<=p<=2$, $o<=q<=2$ may be generated. The disturbance terms are normally distributed, generated by the Box-Muller transformation. **Necessary Accessories for HP-41:** None

Steps: 104 HP-41 Bytes: 231

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01918-41-2	$10	$12
FOR HP-71*	01918-71-9	N/A	$14

01920 Twin Rudder Settings - Ackermann Principal

by W.E. Hitchins, Los Angeles, CA

You can improve the performance and speed of your catamaran or any boat with twin rudders by setting the rudder angles according to Ackermann geometry. Only three inputs are necessary to find the crosslink length and the tiller head angle. Input and output may be in feet and inches, decimal feet, or meters. Much faster and more accurate than ruler and compass! Program may be used with or without a printer. **Necessary Accessories for HP-41:** 1 memory module

Steps: 261 HP-41 Bytes: 526

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01920-41-8	$10	$13
FOR HP-71*	01920-71-5	N/A	$14

01921 Phone Directory II

by C.A. Pearce, Berwyn, IL

A phone directory which holds up to 98 names and phone numbers (including any area codes). Program will allow deletion of any name, addition of a name, prevent overflow of names, changing of either name, number or both, and uses extensive indirect pointer operation to prevent the need for "packing" names when one is deleted. Documentation covers use of indirect pointers and 3 additional programs are included: Write Data to mag cards, Write Data to cassette tape and 'Scan' data on display or printer. **Necessary Accessories for HP-41:** Quad Memory Module and Card Reader (or HP-IL with Digital Cassette Drive)

Steps: 241 HP-41 Bytes: 986

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01921-41-6	$10	$15
FOR HP-71	NOT AVAIL		

01922 VCR Playing Time Calculator

by C.A. Pearce, Berwyn, IL

This program will calculate the running time remaining on any VHS brand cassette, without the need for the VCR (Video Cassette Recorder) counter. (Requires the running times of items taped to be known.) This program converts and displays times in any of the three standard VHS speeds (SP, LP, and SLP or EP). **Necessary Accessories for HP-41:** None

Steps: 254 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01922-41-4	$10	$12
FOR HP-71*	01922-71-1	N/A	$14

01923 Hydrocyclone Efficiency

by M.L. Ramsey, Abilene, TX

This program calculates the mean size and the Tromp value for each size fraction for use in determining the efficiency for each size fraction of a hydrocyclone. **Necessary Accessories for HP-41:** 2 Memory Modules, Printer optional

Steps: 399 HP-41 Bytes: 753

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01923-41-2	$10	$14
FOR HP-71*	01923-71-9	N/A	$16

01925 Energy Cash Flow

by Users' Library, , Corvallis, OR

Program gives information about the affordability of an energy related investment. This program uses many input variables (several are optional) to create a more accurate model of the cost and return on an energy investment than is possible with simple breakeven analysis. One of the major advantages of Energy Cash Flow is that results appear in dollars on an annual basis so answers are meaningful to the typical investor. The program automatically uses the general inflation rate to adjust dollar amounts back to base year value. This program is available in the Solar Engineering Solutions Book. **Necessary Accessories for HP-41:** None

Steps: 425 HP-41 Bytes: 814

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01925-41-7	$10	$14
FOR HP-71*	01925-71-4	N/A	$16

01926 Financial Report Analyzer

by W.E. Hitchins, Los Angeles, CA

Using information from a company's financial report (& the latest stock price), this program provides 33 calculations a potential investor needs but are not always readily available. Output includes P/E ratio, net sales change, operating margin of profit, net profit ratio, operating cost ratio, return on equity, earnings per share, primary earnings per share, fully diluted earnings per share, dividends per share, payout ratio, net book value per share, stock ratio, net asset value per bond, bond ratio, bond interest coverage, net asset value per preferred share, preferred dividend inventory turnover, leverage, and comparisons. **Necessary Accessories for HP-41:** HP-41C requires Quad Memory Module; both models require Extended Functions/ Memory Module.

Steps: 733 HP-41 Bytes: 1881

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01926-41-5	$10	$19
FOR HP-71	NOT AVAIL		

01928 Audio Power Output

by M. Smith, Victoria, Canada

Program calculates the relative power output from a loudspeaker when positioned near three walls, as compared to empty-space (or anechoic chamber). Computes relative output at 56 different frequencies and stores these values, with frequency for quick recovery. Also computes relative power output for any given frequency. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 215 HP-41 Bytes: 309

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01928-41-1	$10	$12
FOR HP-71*	01928-71-8	N/A	$14

01929 Five Way Temperature Conversions

by W.E. Hitchins, Los Angeles, CA

Converts iterchangeably between the five temperature measuring systems: Celsius, Fahrenheit, Kelvin, Rankine and Reaumur. Rejects nonsense temperatures (less than 0 Kelvins). Uses a linear regression formula for speed with accuracy. **Necessary Accessories for HP-41:** None

Steps: 82 HP-41 Bytes: 179

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01929-41-9	$10	$11
FOR HP-71*	01929-71-6	N/A	$12

01930 Greek Characters

by S.C. Kenney, Falls Church, VA

With this program, you can write Greek words with majuscules or minuscules. Minuscule vowels bearing accents are also available. The program contains synthetic lines. Without a card reader (or wand), knowledge of synthetic programming is necessary ("REG"/"CODE" Method). **Necessary Accessories for HP-41:** 1 Memory Module; 82143A or 82162A Printer

Steps: 181 HP-41 Bytes: 636

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01930-41-7	$10	$13
FOR HP-71	NOT AVAIL		

01931 Fresnel Reflection Coefficients

by G.H. Stumpff II, Dayton, OH

This program calculates the Fresnel amplitude reflection coefficients for an electromagnetic wave incident on an interface separating two media. Both states of polarization are considered and the relative index of reflection can be complex. **Necessary Accessories for HP-41:** None

Steps: 141 HP-41 Bytes: 230

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01931-41-5	$10	$12
FOR HP-71*	01931-71-2	N/A	$14

01932 Automatic Banner

by C.L. Williams, San Jose, CA

Automatic banner printing of A-Z, 0-9 and eleven special symbols. Provides fast, automatic printing of well shaped characters. Text up to 72 characters long. Techniques of synthetic programming have been efficiently used. Print any desired phrases. Ideal for names, posters, slogans, etc. **Necessary Accessories for HP-41:** 82143A or 82162A Printer (Quad Memory Module if using 41C)

Steps: 842 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01932-41-3	$10	$20
FOR HP-71*	01932-71-0	N/A	$24

01933 Freq Response and Bode of a N Poles N Zeros Transfert FX

by M. Tremblay, Ste-Foy, Canada

This progam gives the phase and magnitude (normal and in decibel), response of a transfert function with up to 279 poles and zeros (quad module). You don't have to re-enter the coefficients since they are stored. Integral control and phase lead compensation are easily performed. Recorded on only 1 card. **Necessary Accessories for HP-41:** None

Steps: 143 HP-41 Bytes: 224

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01933-41-1	$10	$11
FOR HP-71*	01933-71-8	N/A	$12

01934 Bearing Turner

by M. Shrout, Greeley, CO

Given a beginning bearing, program will solve for new bearing after each successive deflection is entered. Labels output N/S bea E/W. Faster than a traverse when distances and coordinates are not needed. **Necessary Accessories for HP-41:** None

Steps: 91 HP-41 Bytes: 161

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01934-41-9	$10	$11
FOR HP-71*	01934-71-6	N/A	$12

01935 Base Conversion

by A. Davis, Spring Valley, NY

This program converts any number, real or integer, from any base to any other base, two through ten inclusive. The conversion is accomplished through a process known as the remainder theorem. **Necessary Accessories for HP-41:** None

Steps: 235 HP-41 Bytes: 364

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01935-41-6	$10	$12
FOR HP-71*	01935-71-3	N/A	$14

01936 Reverberation Time

by M. Smith, Victoria, Canada

Given the dimensions of the room, and the average absorption coefficient, the reverberaton time (RE 60db), given by the Sabine, Norris-Eyring, or Fitzroy equation is given. User decides which equation is applicable. Also, given the measured RT, the Norris-Eyring or Sabine absorption coefficient (average) is calculated. **Necessary Accessories for HP-41:** None

Steps: 119 HP-41 Bytes: 216

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01936-41-4	$10	$11
FOR HP-71*	01936-71-1	N/A	$12

01937 Accelerated Cost Recovery System

by E.R. Hoegg, Houston, TX

Calculates depreciation expense, accumulated depreciation and remaining book value for "recovery" property placed in service after Dec. 31, 1980 and before Jan. 1, 1985. This program reflects the accelerated cost recovery system (ACRS) promulgated under the Economic Recovery Tax Act of 1981. **Necessary Accessories for HP-41:** One Memory Module; (Printer & Card Reader are optional)

Steps: 244 HP-41 Bytes: 512

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01937-41-2	$10	$13
FOR HP-71*	01937-71-9	N/A	$14

01938 Equivalent Rates

by S.A. Stoler, Buenos Aires, Argentina

This program computes the equivalence between different rate of interest (360 or 365 basis) and compares the different financial operations. It computes: annual nominal rate, annual discount rate, annual effective rate and monthly effective rate. **Necessary Accessories for HP-41:** None

Steps: 157 HP-41 Bytes: 323

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01938-41-0	$10	$12
FOR HP-71*	01938-71-7	N/A	$14

01939 Sight Reduction and Automatic Selection Fix

by D.M. Daniel, Pensacola, FL

Program computes Hc, Zn and Intercept of from 3 to 6 sights, storing improper registers for use if the fix. It then selects automatically your choice of two pair of a & Zn by sight number and calculates coordinates of the actual position. **Necessary Accessories for HP-41:** One memory module

Steps: 250 HP-41 Bytes: 451

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01939-41-8	$10	$13
FOR HP-71*	01939-71-5	N/A	$14

01940 Maximum Truck Weight-Bridge Formula B

by R.R. Schmitt, Baltimore, MD

This program calculates the maximum gross weights for trucks on the Interstate Highway System allowed by the bridge formula (Table B), as specified by Federal Law. **Necessary Accessories for HP-41:** None

Steps: 88 HP-41 Bytes: 77

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01940-41-6	$10	$11
FOR HP-71*	01940-71-3	N/A	$12

01941 SC/MP II Disassembler

by G.K. Ziran, Frankfurt/Main, W. Germany

This 1.9 kB program supplies the user with a comfortable disassembler for machine-language programs of the micro-processor SC/MP II. Prints a clearly arranged program and/or date listing. **Necessary Accessories for HP-41:** Printer, Extended Functions Module; (Quad Memory Module if using the 41C)

Steps: 574 HP-41 Bytes: 1894

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01941-41-4	$10	$19
FOR HP-71*	01941-71-1	N/A	$22

01943 Long Distance Time and Charges

by J.F. Woldering, Euclid, OH

Using the HP82182A Time Module, this program shows a dynamic display of long distance time and charges as you talk. Features include a log of each call, cumulative totals, tax calculation, use of calculator while talking, finding current rate period, converting time and charges, direct dial or operator assisted calls. **Necessary Accessories for HP-41:** HP82182A Time Module; (Printer is useful)

Steps: 190 HP-41 Bytes: 362

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01943-41-0	$10	$12
FOR HP-71	NOT AVAIL		

01945 UC-Universal Horizontal Curve Any Combination of Spirals

by M. Shrout, Greeley, CO

This 2 package program solves 5 types of horizontal curves: Type 00 Equal length spirals Type 01 Spiraled on near end only Type 02 Spiraled on far end only Type 03 Different length spiral on each end Type 04 No spirals After solving curve, a second program prints curve stations in station format (e.g., 123 + 45.67). **Necessary Accessories for HP-41:** Quad Memory Module (Printer is recommended for first program and necessary for second program)

Steps: 1103 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01945-41-5	$10	$21
FOR HP-71	NOT AVAIL		

01946 Polynomial Evaluation Utilizing the Math Pac

by R.M. Kozel, Garfield Heights, OH

The POLY routine in the Math Pac suffers from the limitation that the leading coefficient of any polynomial evaluated by the routine must be one. This program corrects this by rewriting the polynomial in its original form. This allows INTG and SOLVE to be used on the polynomial. True evaluation can be performed, and x can be found for any given f(x). **Necessary Accessories for HP-41:** HP41 Math Pac - 00041-15003

Steps: 75 HP-41 Bytes: 153

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01946-41-3	$10	$11
FOR HP-71*	01946-71-0	N/A	$12

01947 High Resolution Print Plot

by J. Freericks, Paramus, NJ

Similar to "Prplot", "Hrprpl" plots seven points per line and widens the axis to as many tapes as you specify. Both a scale and an axis are printed, if desired. Execution time is approximately 48 seconds per line. A printer and two Memory Modules are needed. **Necessary Accessories for HP-41:** HP-82143A Battery-Operable Printer/Plotter and Two HP-82106A Memory Modules

Steps: 383 HP-41 Bytes: 710

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01947-41-1	$10	$14
FOR HP-71	NOT AVAIL		

01948 Belleville Washer Spring Design

by C.J. Lee, Seoul, Korea

This program computes the required loading and the stress produced for various deflections of a Belleville washer spring when its configurations are given. It will start with a deflection of 0.001 inch and increase in steps of 0.002 inch until the stress produced exceeds the allowable stress or until the spring has been pressed into a flat position. **Necessary Accessories for HP-41:** Printer and One Memory Module

Steps: 328 HP-41 Bytes: 584

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01948-41-9	$10	$13
FOR HP-71*	01948-71-6	N/A	$14

01950 Sunrise, Sunset and Civil, Nautical & Astronomical Twilight

by D.M. Daniel, Pensacola, FL

Given DR L, Lo and the year and the date (MM.DD), program will compute Sunrise, Sunset, Nautical, Civil or Astronomical Twilight to within + 2m for any date in the latter half of this century. Useful for Lat between 65 degrees N and 65 degrees S. **Necessary Accessories for HP-41:** One Memory Module (Printer optional)

Steps: 233 HP-41 Bytes: 423

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01950-41-5	$10	$12
FOR HP-71*	01950-71-2	N/A	$14

01952 Crane/Outrigger Reactions and Stability

by C.I. Dinsmore, Seattle, WA

This program computes outrigger float reactions or wheel tandem reactions for a truck crane, and internally checks stability for specified lift loads, horizontal boom angle, and operating radius. A valuable program for those concerned with truck crane installations such as construction sites, piers and docks. A warning "tipping" is displayed if instability is detected. **Necessary Accessories for HP-41:** Two Memory Modules or HP-41CV; (Printer is optional)

Steps: HP-41 Bytes: 959

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01952-41-1	$10	$15
FOR HP-71*	01952-71-8	N/A	$18

01953 Volumes and Areas of Common Shapes

by C.J. Lee, Seoul, Korea

This is a set of two programs which will compute the volumes and areas of common shapes. One program will compute the volumes of a hemisphere, semiellipsoid of revolution, parabolic of revolution, cone and a pyramid. The other program computes semielliptical area, parabolic area, parabolic spandrel, general spandrel and circular sector. **Necessary Accessories for HP-41:** None

Steps: 165 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01953-41-9	$10	$12
FOR HP-71*	01953-71-6	N/A	$14

01954 Mass, Polar and Moments of Inertia - Common Geometric Shapes

by C.J. Lee, Seoul, Korea

This is a set of three programs which will compute the Mass Moments, Moments and Polar Moments of Inertia of common geometric shapes. The common shapes for mass moments are slender rod, thin rectangular plate, rectangular prism, thin disk, circular cylinder, circular cone and sphere for moments. The shapes are rectangle, triangle, circle, semicircle, quarter-circle and ellipse and for polar moments the shapes are rectangle, circle, semicircle, quarter-circle and ellipse. **Necessary Accessories for HP-41:** None

Steps: 436 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01954-41-7	$10	$15
FOR HP-71*	01954-71-4	N/A	$18

01955 Centroids of Common Shapes of Volumes, Areas and Lines

by C.J. Lee, Seoul, Korea

This is a set of three programs which compute centroids of common shapes of volumes, areas and lines. Common shapes for volumes are hemisphere, semiellipsoid of revolution, parabolic of revolution, cone and pyramid, common shapes of areas are triangular, quarter-circular, semicircular, quarter-elliptical, semielliptical, semiparabolic, parabolic, parabolic spandrel, general spandrel and circular. Common shapes of lines are quarter-circular arc, semicircular arc and arc of a circle. **Necessary Accessories for HP-41:** None

Steps: 337 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01955-41-4	$10	$14
FOR HP-71*	01955-71-1	N/A	$16

01956 Accurate Statistics

by M. Hale, Ames, OH

This program alleviates the problem of loss of significant digits associated with the SIGMA + and - functions. The program is designed to operate like the usual statistical keys for user convenience. Linear correlation and regression coefficients are obtained with a keystroke. **Necessary Accessories for HP-41:** None

Steps: HP-41 Bytes: 117

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01956-41-2	$10	$11
FOR HP-71*	01956-71-9	N/A	$12

01957 Flow Computations for Various Open Channel Configurations

by M.J. Hanson, Sandpoint, ID

Computes flow given normal depth, or normal depth given flow, and critical depth for rectangular, triangular, trapezoidal, circular or parabolic channels. Standard output is normal depth, top width and flow. User may select additional outputs including area, wetted perimeter, hydraulic radius and/or average velocity. (S.I. or U.S. units). **Necessary Accessories for HP-41:** Three Memory Modules, Quad Memory Module or a CV; (Printer is optional)

Steps: HP-41 Bytes: 1442

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01957-41-0	$10	$17
FOR HP-71	NOT AVAIL		

01958 Mortgage Analysis

by J.W. Pearce, Mt Laurel, NJ

This program computes the Net Present Value, after tax, of a home mortgage over the borrowers expected holding period. It takes into account varying down payments, interest rates, points, and rates of return for investors. **Necessary Accessories for HP-41:** Quad Memory Module, Real Estate Module; (Printer is helpful)

Steps: 503 HP-41 Bytes: 1614

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01958-41-8	$10	$19
FOR HP-71	NOT AVAIL		

01959 Expansion Stresses in Plane Piping Configurations

by A. Nisargand, Richland, WA

Program calculates maximum bending stress, its locations and end reactions due to thermal expansion for any plane configuration consisting of a maximum fifteen legs. Required input consists of material and section properties and configuration geometry. Program assumes two rigid restraints at two ends. Average time for problem solution is one minute. **Necessary Accessories for HP-41:** 4 Memory Modules

Steps: 603 HP-41 Bytes: 1139

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01959-41-6	$10	$17
FOR HP-71*	01959-71-3	N/A	$20

01960 Adaptive Quadrature

by K. Akima, Boulder, CO

Given a function f(x), this program will integrate it using an adaptive Simpson's method to concentrate on the rough regions. Up to 24 levels of recursion synthetically provided. The user provides an error tolerance. **Necessary Accessories for HP-41:** Extended Functions/Memory Module, at least One Memory Module. A Card Reader or Wand is needed to load the program.

Steps: 314 HP-41 Bytes: 560

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01960-41-4	$10	$13
FOR HP-71*	01960-71-1	N/A	$14

01961 Vectorial Algebra Utilities--Point -- Line -- Plane

by P.E. Montoreano, Buenos Aires, Argentina

Given the necessary vectors, this program can solve for: Norm, Modulus, Director Cosines and Angles, Scalar Product, Vectorial Product, Mixt Product, Double Vectorial Product, All Angles, Projections, Planes and All Distances. **Necessary Accessories for HP-41:** Two Memory Modules (Printer optional)

Steps: 675 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01961-41-2	$10	$16
FOR HP-71*	01961-71-9	N/A	$18

01962 Design and Rating of Packed Columns

by R.J. Wooley, Midland, MI

Using equations fit to pressure drop curves published by the Norton Co., the design diameter for a packed column at flooding or six other user specified pressure drops is calculated. Given diameter the program will rate the column (calculate the pressure drop). Properties required are: densities, liquid viscosity, flow rates and packing type. **Necessary Accessories for HP-41:** 2 Memory Modules; (Printer is helpful)

Steps: 447 HP-41 Bytes: 1052

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01962-41-0	$10	$16
FOR HP-71*	01962-71-7	N/A	$18

01963 Working Days Between Dates

by P. Rushworth, Lakewood, CO

Program determines the number of working days between dates in one calendar year given user supplied holiday dates. The program assumes a five-day week, but may be modified for other work week lengths. **Necessary Accessories for HP-41:** Time Module (Card Reader useful)

Steps: 132 HP-41 Bytes: 216

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01963-41-8	$10	$11
FOR HP-71	NOT AVAIL		

01965 Quasi-Independance & Ordered Categories in Contingency Table

by F. Beland, Ste-Foy, Canada

The usual hypothesis of complete independance in bivariate contingency tables does not exhaust all possible hypotheses. Five models can be tested here on an RxC contingency table. Using an iterative procedure, four tests involving the ordering of categories are available. The usual independance hypothesis is also available. Structural zeros can be defined on cells of the table in each of the five models. **Necessary Accessories for HP-41:** Quad Memory Module and Card Reader

Steps: 704 HP-41 Bytes: 1448

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01965-41-3	$10	$18
FOR HP-71	NOT AVAIL		

01966 Binary Operations

by P. Kokol, Maribor, Yugoslavia

This program solves many problems with binary numbers. The user can compute all arithmetic operations (+, -,/, *) and the following logical operations:] XOR, AND, OR and negation. It is also possible to convert binary numbers to decimal and decimal numbers to binary. The maximum size of numbers is 10 bits. **Necessary Accessories for HP-41:** None

Steps: 200 HP-41 Bytes: 342

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01966-41-1	$10	$12
FOR HP-71*	01966-71-8	N/A	$14

01967 Warshalls Algorithm

by P. Kokol, Maribor, Yugoslavia

This program transforms one as input given matrix M into its transitive completion M+ where M is the square Boolean matrix with maximal rank of 80 (with quad RAM). Some error correction and editing routines and size test are added. Program runs quite long, so some current execution status information is shown on display. **Necessary Accessories for HP-41:** One Memory Module and Printer

Steps: 282 HP-41 Bytes: 478

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01967-41-9	$10	$13
FOR HP-71*	01967-71-6	N/A	$14

01968 Permutations and Combinations with Extended Limits

by M. Veverka, Brisbane, Australia

This program finds the number of permutations or combinations with the added feature of extended limits. If the answer is within the calculator's limits, this program will find it. **Necessary Accessories for HP-41:** None

Steps: 83 HP-41 Bytes: 134

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01968-41-7	$10	$11
FOR HP-71*	01968-71-4	N/A	$12

01969 Axman

by R.L. Gardner, Anamosa, IA

The AXMAN goes to the barnyard to get a chicken for dinner but he comes up against one smart chicken. You are the AXMAN and you have six moves to WHACK the chicken or he will get away. A fast moving game requiring thought and planning. Running score displayed. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 433 HP-41 Bytes: 931

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01969-41-5	$10	$15
FOR HP-71*	01969-71-2	N/A	$18

01970 DPM Quench Correction

by J.R. Dunn II, Detroit, MI

A samples Channels Ratio Quench correction curve is calculated. The ratio of Channel A (narrow window) and Channel B (wide window) versus the efficiency of Channel B (CPM/Total DPM added) is used to compute a least squares L.R. The efficiency of the samples, calculated with their A/B ratio, is used to determine the actual DPM. Fully prompted. Printer is optional. **Necessary Accessories for HP-41:** None

Steps: 148 HP-41 Bytes: 284

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01970-41-3	$10	$12
FOR HP-71*	01970-71-0	N/A	$14

01971 Advance Skips and Residual

by K.R. Reaves, Glen Ellyn, Il

This program solves for the periodic payment amount necessary to achieve a desired yield when advance rentals, residual value (purchase option) and skip payments must be taken into consideration in the structure of the transaction. Some, all or none of the above variables may be present. **Necessary Accessories for HP-41:** None

Steps: 178 HP-41 Bytes: 420

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01971-41-1	$10	$12
FOR HP-71*	01971-71-8	N/A	$14

01972 User Selected Curve Fitting

by D. Erskine, Portola Valley, CA

Directed by a user devised control program, the basic program will fit equally or unequally spaced data to a variety of curves defined by equations in the general form $Y = AX1 + BX2 + CX3 + DX4 + EX5$. Twelve sample Control and Evaluation programs are included. Program does not compute coefficient of determination or provide a means for data correction. **Necessary Accessories for HP-41:** One Memory Module for the basic program and any one of the Control and Evaluation programs.

Steps: 346 HP-41 Bytes: 1333

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01972-41-9	$10	$20
FOR HP-71*	01972-71-6	N/A	$24

01973 Real Roots of a Real Coefficient Polynomial-Up to degree 249

by P.E. Montoreano, Buenos Aires, Argentina

Program finds all real roots of a polynomial (degree 249 and below)s by Newton-Raphson's method; using Ruffini's Rule to divide polynomial by (x-b). All roots remain in memory after exectuion. P(x) and P1(x) can be evaluated. Ruffini's Rule can be used separately. Machine handles degree 57 polynomials with one memory module (249 with 4). **Necessary Accessories for HP-41:** One Memory Module (Printer optional)

Steps: 258 HP-41 Bytes: 453

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01973-41-7	$10	$13
FOR HP-71*	01973-71-4	N/A	$14

01974 Curve Fitting with Predictions for X and Y

by W.E. Hitchins, Los Angeles, CA

Here's a program that starts where the Stat Pac leaves off when it comes to curve fitting – and you do not need the Stat Pac! You can fit linear, logarithmic, exponential, and power curves and make predictions for both X and Y easily and quickly. **Necessary Accessories for HP-41:** None

Steps: 220 HP-41 Bytes: 390

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01974-41-5	$10	$12
FOR HP-71*	01974-71-2	N/A	$14

01975 Traverse Area Boundary Survey (Tabs)

by G. Pegan, Garden Grove, CA

This program will calculate the area and closure of a lot, traverse the boundary by BRG/DIST, coord or any combination thereof, calculates the arc, radius, delta and tangent lengths of a curve along the boundary line. **Necessary Accessories for HP-41:** One Memory Module and Card Reader

Steps: 457 HP-41 Bytes: 845

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01975-41-2	$10	$14
FOR HP-71*	01975-71-9	N/A	$16

01976 Shop Prices Coding

by J.M. Levy, Capital Federal, Argentina

Even though the products in your shop have prices, you may not want those prices to be generally known. What better way to control this information than to have a price code that only you can decipher. This can be easily done. Enter the price into the calculator and you will see it in code. If you enter the code you will obtain the price. The user can transform prices up to $999999, 99. This program uses only 3 storage registers. **Necessary Accessories for HP-41:** None

Steps: 172 HP-41 Bytes: 340

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01976-41-0	$10	$12
FOR HP-71*	01976-71-7	N/A	$14

01977 Baseball Fever

by D.R. Stauffer, University Park, PA

From the national anthem to the final out – in extra innings if necessary – this unbelievably complete, yet easy-to-play game of strategy and chance includes balls, strikes, all hit-types, fouls, double plays and errors. Two players press keys to pitch, swing, take, bunt, steal and obtain additional game related informaton. Improper response loops make user errors impossible. **Necessary Accessories for HP-41:** 4 Memory Modules

Steps: 857 HP-41 Bytes: 2119

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01977-41-8	$10	$20
FOR HP-71*	01977-71-5	N/A	$24

01978 Critical Field Length for Jet Aircraft

by E. Finley, Kingsville, TX

This program calculates the critical field length and refusal speed for multi-engine jet aircraft. The entire velocity and distance time history can be determined. The engine thrusts are assumed to be constant. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 442 HP-41 Bytes: 944

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01978-41-6	$10	$14
FOR HP-71*	01978-71-3	N/A	$16

01980 Attack

by M.T. Duffin, Indianapolis, IN

Be the pilot of a bomber out to destroy the enemy! You're stuck above the clouds but your printer displays clues returned from each smart bomb dropped and scans the battlefield upon request. Skill is judged by the number of bombs required and the time used (with option time module). **Necessary Accessories for HP-41:** Printer; 2 Memory Modules if using the 41C

Steps: 422 HP-41 Bytes: 848

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01980-41-2	$10	$14
FOR HP-71	NOT AVAIL		

01981 Import Calculation

by G.K. Ziran, Frankfurt/Main, W. Germany

Calculates cost and sales price out of FOB or CIF price, units/ctn., weight, freight-rate, duty and other costs. This program is a fast and valuable tool for use on your desk or on visits to fairs and suppliers. Operates with or without printer. **Necessary Accessories for HP-41:** 1 Memory Module; (Printer is optional)

Steps: 229 HP-41 Bytes: 770

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01981-41-0	$10	$14
FOR HP-71*	01981-71-7	N/A	$16

01982 Computerized Periodic Table of Elements

by C.J. Lee, Seoul, Korea

This three program set is a computerized periodic table of elements. Program 1 contains 73 elements listing atomic number, name, atomic weight and group number. Program 2 and 3 represent Lanthanide and Actinide series. For these, atomic number, name and atomic weight are printed out. Names are abbreviated. **Necessary Accessories for HP-41:** None

Steps: 939 HP-41 Bytes: 2935

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01982-41-8	$10	$24
FOR HP-71*	01982-71-5	N/A	$30

01983 Electric Rate Analysis II

by J.J. Brown, Boise, ID

General purpose electric rate analysis program to compare two rates. Supports Hopkinson and Wright type demand rates with up to five energy blocks, up to three demand blocks, a customer charge, and monthly minimum. The two rates need not be the same type. Both rates and the results of comparisons are printed. **Necessary Accessories for HP-41:** Three Memory Modules or Quad Memory Module, and Printer

Steps: 734 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01983-41-6	$10	$17
FOR HP-71	NOT AVAIL		

01984 Bus Admittance Matrix of an Electric Power System

by A.R. Hernandez A., Santo Domingo, Rep. Dom Wl

Computes the values of admittances between buses I-J, or the whole electric power system, given all the power lines parameters per unit length, number of buses and longitudes between buses. May be easily modified to be used as part of a load flow program. Number of buses should be <23. **Necessary Accessories for HP-41:** Quad Memory Module; (Card Reader and Printer optional)

Steps: 288 HP-41 Bytes: 462

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01984-41-4	$10	$13
FOR HP-71*	01984-71-1	N/A	$14

01985 Computer Communication Network 1 - Capacity and Delay

by N.C. Lee, Stony Brook, NY

Program performs capacity allocation and obtains message delay for each link in a computer communication network. Four types of assignment rules used: Square-Root (min. system delay), Min-Max (equal link delay), Proportional and Equal allocation. User friendly and printer compatible. **Necessary Accessories for HP-41:** One Memory Module

Steps: 239 HP-41 Bytes: 441

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01985-41-1	$10	$12
FOR HP-71*	01985-71-8	N/A	$14

01986 Temperature Conversions

by R.L. Thomas, Houston, TX

This program calculates the following temperature conversions: 1) Celsius to Fahrenheit; 2) Celsius to Kelvin; 3) Celsius to Rankine; 4) Fahrenheit to Kelvin; 5) Fahrenheit to Rankine; 6) Kelvin to Rankine. It contains full alpha prompting for input and output. Each conversion is independent of the others. **Necessary Accessories for HP-41:** None

Steps: 141 HP-41 Bytes: 337

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01986-41-9	$10	$12
FOR HP-71*	01986-71-6	N/A	$14

01987 Option Straddle Calculation

by J. Schoenbrun, Santa Monica, CA

This program permits the computation and odds of Breakeven and twenty-five percent profit achievement on the purchase of Straddles (simultaneous purchase of equal quantities of Calls and Puts). Probabilities are based on volatility and days remaining before expiration. Commissions are figured in complete with profits. **Necessary Accessories for HP-41:** 1 Memory Module, Printer

Steps: 153 HP-41 Bytes: 371

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01987-41-7	$10	$12
FOR HP-71*	01987-71-4	N/A	$14

01989 Fret and Holiday Patterns

by C.L. Williams, San Jose, CA

Prints six large size fret patterns (similar to classic art of ancient Greece) of arbitrary length. Also prints patterns associated with the winter holiday season. Holiday patterns include snow-flake, snow, holly (bell's?), and an ornamented tree. Ideal for border decorations and cheer in the holiday season. **Necessary Accessories for HP-41:** 82143A or 82162A Printer; (Quad Memory Module if using 41C)

Steps: 953 HP-41 Bytes: 2227

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01989-41-3	$10	$20
FOR HP-71*	01989-71-0	N/A	$24

01990 Tank Volumes in Partly Filled Tanks

by W.H. Kirts, Blue Springs, MO

Program will calculate gallons of liquids in partly filled tanks. Tanks can be conical, spherical, vertical cylindrical or horizontal cylindrical tanks. Horizontal tanks can have flat, dished or hemispherical heads. A table will be printed out with gallons per % of full or gallons per incremental height set by input. **Necessary Accessories for HP-41:** Printer

Steps: 614 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01990-41-1	$10	$16
FOR HP-71*	01990-71-8	N/A	$18

01991 Critical Steam Flow

by M.L. Ramsey, Abilene, TX

This program aids plant engineers and designers in determining saturated and superheated steam flow rates through open pipes. A typical problem would require finding the maximum steam flow that can pass through vents or determining boiler drum pressure for blowing turbine piping during preoperational cleaning. **Necessary Accessories for HP-41:** None

Steps: 133 HP-41 Bytes: 233

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01991-41-9	$10	$12
FOR HP-71*	01991-71-6	N/A	$14

01992 Foundation Bolt Design

by M.L. Ramsey, Abilene, TX

This program calculates the maximum foundation loads for different, common bolt patterns. The program enables the engineer or designer to select suitable anchor bolts for his particular bolt pattern. **Necessary Accessories for HP-41:** 1 Memory module (Printer optional)

Steps: 253 HP-41 Bytes: 458

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01992-41-7	$10	$13
FOR HP-71*	01992-71-4	N/A	$14

01993 Circle Computations

by J.E. Schiermeier, Cary, NC

This program calculates the center and radius of a circle given 3 points, length of side and area of an inscribed or circumscribed regular polygon, equally spaced points on a circle, and the area of a sector and segment. None of the area routines use any storage registers. **Necessary Accessories for HP-41:** None

Steps: 217 HP-41 Bytes: 345

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01993-41-5	$10	$12
FOR HP-71*	01993-71-2	N/A	$14

01994 King of Sumer

by J.E. Schiermeier, Cary, NC

As King of Sumer, you must make decisions essential to the survival of your country; how many peasants to feed, how much land to plant, how much land to buy or sell, and how much research to fund. Each year you can be plagued by epidemics, floods, fires, etc. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 330 HP-41 Bytes: 535

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01994-41-3	$10	$13
FOR HP-71*	01994-71-0	N/A	$14

01996 Internal Combustion Engine Fuels

by G.V. Duque, Bogota, Colombia

This program calculates the balance of different types of hydrocarbon fuels for combustion engines. Also calculates air-fuel ratio, approximate heat combustion of fuel and weight of all combustion products for any one air excess. The inputs are fuel combustion (hydrocarbons only). Units in English or Metric system. **Necessary Accessories for HP-41:** One Memory Module

Steps: 412 HP-41 Bytes: 788

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01996-41-8	$10	$14
FOR HP-71*	01996-71-5	N/A	$16

01997 U.S. Air Force & Marine Corps Percent Body Fat

by W.D. Everett, Luke AFB, AZ

The U.S. Air Force and U.S. Marine Corps formulas for determining percent body fat are used to determine a desired body weight and maximum allowable body weight. 90% confidence limits about the estimate of percent body fat are provided. The Seltzer obesity index is calculated for men as well as a maximum weight for health. **Necessary Accessories for HP-41:** None if programs are used one at a time

Steps: 499 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01997-41-6	$10	$18
FOR HP-71*	01997-71-3	N/A	$22

01999 Comet Ephemerides

by C.E. Spratt, Victoria, Canada

Given the orbital elements of a comet, referred to a standard epoch and given the geocentric equatorial rectangular coordinates X, Y, Z, of the Sun referred to the same epoch. This program computes the geometric right ascension and declination, radius vector, distance from the Earth, elongation from the Sun, phase angle and finally the magnitude. The program will calculate elliptical, parabolic or hyperbolic cases. **Necessary Accessories for HP-41:** One Memory Module; (Card Reader is useful)

Steps: 412 HP-41 Bytes: 437

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	01999-41-2	$10	$13
FOR HP-71*	01999-71-9	N/A	$14

02000 Solutions to Some Common Aeronautical Problems

by M.T. Duffin, Indianapolis, IN

These two programs help you with common aeronautical problems. The first provides an interchangeable solution for delta, weight and altitude. The second solves for either inlet mass flow ration or airflow (given the other). All inputs and outputs are labelled for friendly operation. **Necessary Accessories for HP-41:** None

Steps: 208 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02000-41-8	$10	$14
FOR HP-71*	02000-71-5	N/A	$16

02001 Points on an Ellipse and Line Parallel to the Ellipse

by J.C. Budd, Austin, TX

This program calculates points on an ellipse and points on a line parallel to an ellipse either inside or outside in the Cartesian coordinate system. **Necessary Accessories for HP-41:** Printer/Plotter

Steps: 256 HP-41 Bytes: 560

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02001-41-6	$10	$13
FOR HP-71	NOT AVAIL		

02002 Cubic Equation

by J.E. Schiermeier, Cary, NC

This program calculates the 3 roots, both real and complex, or any cubic equation. By using equations, it is faster and more accurate than iteration techniques. No initial guesses are necessary. **Necessary Accessories for HP-41:** None

Steps: 134 HP-41 Bytes: 187

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02002-41-4	$10	$11
FOR HP-71*	02002-71-1	N/A	$12

02003 Short Circuit Calculation for 1 to 9 Buses

by B.B. Kahn, Chicago, Il

The program evaluates the three phase symmetrical short circuit currents for a power distribution system. It is capable of handling either radial or network systems for up to 9 buses. Inputs include bus voltages, available short circuit KVA, transformer ratings and impedances, cable reactances and resistances, motor horsepower and reactances. **Necessary Accessories for HP-41:** Three Memory Modules, and Printer

Steps: 446 HP-41 Bytes: 1090

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02003-41-2	$10	$15
FOR HP-71*	02003-71-9	N/A	$18

02004 Metering Orifice Program for Flange Tap Square-Edged Orifice

by H.K. Deakins, Kingsport, TN

This program solves the orifice equations for square edged, flat plate, concentric orifices. Given two of the following three variables the program calculates the third; Meter Differential, Mass Flowrate and Orifice Plate Hole diameter. The program is applicable in English, Metric and SI units. For Liquid, Gas and Steam service. Drain and/or vent hole provisions. **Necessary Accessories for HP-41:** Printer and Two Memory Modules

Steps: 493 HP-41 Bytes: 889

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02004-41-0	$10	$14
FOR HP-71*	02004-71-7	N/A	$16

02005 Flow Through Orifices for Incompressible Fluids

by S.M. Neas, Lakeland, FL

This program solves for orifice diameter if given flow or solves for flow if orifice diameter is given for incompressible fluids. If printer is attached complete printed output including project title, date, input and output data is given. **Necessary Accessories for HP-41:** Printer is optional

Steps: 142 HP-41 Bytes: 318

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02005-41-7	$10	$12
FOR HP-71*	02005-71-4	N/A	$14

02006 Calculation of Limits

by H.H. Suarez, Geneva, Switzerland

This program computes the limit of a function F(x) when x tends to a real or infinite limit. This program computes that limit with a good compromise between the precision and the time, it sometimes sacrifices the latter to find the limit. With all types of subtleties, this program is able to compute almost all the limits. N.B.1: the limit may be equal to the infinite. N.B.2: this program has been tested for many limits. **Necessary Accessories for HP-41:** 1 Memory Module

Steps: 377 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02006-41-5	$10	$13
FOR HP-71*	02006-71-2	N/A	$14

02007 Acid Gas Dewpoint

by S.M. Neas, Lakeland, FL

This program solves for the dewpoint of gases containing any one of the following acids: HBr, HCl, HNO3, H2SO3, H2SO4. The input data is in the form of either partial pressure or volume % of the acid and water. The output is in the form of the dewpoint in degrees. If the printer is attached all inputs and outputs will be printed. **Necessary Accessories for HP-41:** One Memory Module (Printer optional)

Steps: 168 HP-41 Bytes: 439

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02007-41-3	$10	$12
FOR HP-71*	02007-71-0	N/A	$14

02008 Poker--5 Card Draw with Alpha Presentation of Suit

by R. Iglesias N., Caracas, Venezuela

You play an honest game of five card draw poker against the calculator. The calculator will show the card value and its suit in an alphanumeric presentation as: 2 OF CLUBS, 13 OF SPADES, etc. and will also identify each hand as: STRAIGHT, ONE PAIR, etc. **Necessary Accessories for HP-41:** Card Reader and a Quad Memory Module

Steps: 1056 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02008-41-1	$10	$19
FOR HP-71	NOT AVAIL		

02009 Parallel Channel Flow

by C.L. Williams, San Jose, CA

Calculates individual flow in two or three parallel channels and system pressure drop. Options include printer, SI or English units, Colebrook-White (Moody) friction correlation, and form-loss as K= A + B*(RE**C). Ideal for detailed/accurate analysis of systems with arbitrary channel geometry and subchannel flow within industrial equipment. **Necessary Accessories for HP-41:** Quad Memory Module if using 41C (Printer is optional)

Steps: 727 HP-41 Bytes: 1750

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02009-41-9	$10	$18
FOR HP-71*	02009-71-6	N/A	$22

02010 Base Conversions

by R. Anati, Kfar Shmariahu, Israel

This program performs base conversions of a positive integer from one base N1 to another base N2 (2<=N1, N2<=16), base 10 to base N and base N to base 10 (2<=N<=16). **Necessary Accessories for HP-41:** One Memory Module

Steps: 229 HP-41 Bytes: 436

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02010-41-7	$10	$12
FOR HP-71*	02010-71-4	N/A	$14

02011 Engine Trend Monitoring Program for PT6A-11/21/25/27/28

by F.F. Mujica, Punta Arenas, Chile

This program helps to monitor engine performances and is sufficient to key in observed cockpit panel readings. The calculator will calculate and display the delta ITT, fuel flow and NG; these can then be plotted directly. **Necessary Accessories for HP-41:** One Memory Module

Steps: 209 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02011-41-5	$10	$13
FOR HP-71*	02011-71-2	N/A	$14

02013 Stocks File and Evaluation

by W.H. Kirts, Blue Springs, MO

Program maintains a file of stocks. File can be expanded, updated listed and sorted. Sort routine looks for stocks with losses and stocks which have reached the target selling price. **Necessary Accessories for HP-41:** Printer, Card Reader and at least 2 Memory Modules

Steps: 380 HP-41 Bytes: 905

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02013-41-1	$10	$15
FOR HP-71	NOT AVAIL		

02014 Ultimate Strength Beam

by S. Dusterwald, Las Vegas, NV

Design and analysis of rectangular reinforced concrete sections for flexure and shear, with or without compression and/or shear reinforcement, in accordance with all requirements of the Ultimate Strength Design method of ACI 318-77. Design portion of program provides rational methods for determining required section sizes and reinforcing configurations. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV and 82143A Printer

Steps: 1096 HP-41 Bytes: 2028

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02014-41-9	$10	$20
FOR HP-71*	02014-71-6	N/A	$24

02015 Wind Capsize Point for Multihulls

by W.E. Hitchins, Los Angeles, CA

Calculates the wind capsize point of a multihull sail craft using both the conventional static formula as well as the dynamic formula that allows for gusts of wind. Output is given in knots, miles per hour, and on the Beaufort scale. Input is in tons or pounds, feet and inches, and square feet, according to the correct parameter. **Necessary Accessories for HP-41:** One Memory Module

Steps: 242 HP-41 Bytes: 514

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02015-41-6	$10	$13
FOR HP-71*	02015-71-3	N/A	$14

02017 Path Losses in Land Mobile Radio Systems

by J.B. Osow, La Plata, Argentina

This program solves A) Path losses calculation; B) Link calculation in land mobile radio systems for three kinds of terrains: small/medium city, large city, suburban or open areas. **Necessary Accessories for HP-41:** 2 Memory Modules and Card Reader

Steps: 758 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02017-41-2	$10	$14
FOR HP-71*	02017-71-9	N/A	$16

02018 Symmetrical and Unsymmetrical Leaf Spring Properties

by A. Medin, San Diego, CA

This is a set of two programs. "Unsymmetrical Leaf Spring Properties" will output deflection from geometry, stress from load, and load rate after making simple measurements and inputting them to the program. "Symmetrical Leaf Spring Properties" will output deflection from geometry, stress from load, and load rate for symmetrical leaf springs. These programs were designed to enable the hobbiest/racer to locate suitable springs quickly and without special tools from salvage yards. **Necessary Accessories for HP-41:** None

Steps: 208 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02018-41-0	$10	$12
FOR HP-71*	02018-71-7	N/A	$14

02019 Torsion Bar Analysis and Auto Clutch Calculations

by A. Medin, San Diego, CA

This is a set of two programs. "Torsion Bar Analysis" enables the user to compute the torque capacity of a given automotive clutch, or compute the plate pressure rquired to transmit a given amount of torque. "Auto Clutch Calculations" enables the user to compute to torque capacity of a given automotive clutch, or compute the plate pressure required to transmit a given amount of torque. **Necessary Accessories for HP-41:** None

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02019-41-8	$10	$12
FOR HP-71*	02019-71-5	N/A	$14

02020 Lateral Acceleration & Aerodynamic Forces & Road Load Req

by A. Medin, San Diego, CA

Set of two programs. "Lateral Acceleration" requires radius of turn and weight of car. Forces then computed by inputing either speed or time. Outputs are lateral acceleration as a percent of gravity and centrifugal force in pounds. Designed primarily for use with skid-pad, but, with close approximations can be made without. "Aerodynamic Forces and Road Load Requirements" will compute dimensionless aerodynamic drag affecting an auto, horsepower required to move car at said speed, and total drag affecting auto using coast down test described in Program Description 1. Used to evaluate changes in airdams, spoilers, etc. **Necessary Accessories for HP-41:** None

Steps: 162 HP-41 Bytes: 399

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02020-41-6	$10	$12
FOR HP-71*	02020-71-3	N/A	$14

02021 Control System State Controllability and Observability

by E.C. Schmidt, Milo, ME

This program uses the "A", "B" and "D" matrixes of a digital control system to produce the "Q" and "L" matrixes. It also checks if the matrix is singular or not. Needs at least one memory module but with a quad module it can do a 10 x 10 system. **Necessary Accessories for HP-41:** One Memory Module

Steps: 303 HP-41 Bytes: 571

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02021-41-4	$10	$13
FOR HP-71*	02021-71-1	N/A	$14

02025 USMC Male/Female Physical Fitness Test

by J.W. Mohr, Yuma, AZ

A two program package to calculate the score and class for participants in the U.S. Marine Corps Physical Fitness Test (PFT). The programs prompt for participants age and the results of the physical test performed, check for the required minimums and assign a class based on score and age group. No charts or reference tables are required. One program scores females, the other scores males. **Necessary Accessories for HP-41:** One Memory Module

Steps: 487 HP-41 Bytes: 906

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02025-41-5	$10	$15
FOR HP-71*	02025-71-2	N/A	$18

02026 Polynomial Fitting

by N. Levanon, Tel - Aviv, Israel

This program solves for the coefficients of a polynomial of any order N using N+1 data points. The program requires only 17+2N storage registers and it is characterized by a very high accuracy. There are no restrictions on the spacing between data points. **Necessary Accessories for HP-41:** One Memory Module

Steps: 244 HP-41 Bytes: 339

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02026-41-3	$10	$12
FOR HP-71*	02026-71-0	N/A	$14

02027 Option Write - Cash

by J. Schoenbrun, Santa Monica, CA

Annualized rate of return is computed on the sale of options on any quantity of stock. Complete prompting is given for all entries, and commissions are figured in on the purchase (and possible sale) of the stock and the options. Outputs are annualized rate of return IF the option is exercised and annualized rate of return IF the option is NOT exercised. Program assumes a 360 day year. **Necessary Accessories for HP-41:** None

Steps: 63 HP-41 Bytes: 186

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02027-41-1	$10	$11
FOR HP-71*	02027-71-8	N/A	$12

02028 Cylindrical Waveguide

by G.H. Stumpff II, Dayton, OH

This program calculates the electric and magnetic field components in a cylindrical waveguide. Inputs to the program are: mode desired by user, position at which fields are to be calculated, radiation frequency, electrical properties of propagation medium, cylinder size and the mode cut-off frequency parameter. **Necessary Accessories for HP-41:** One Memory Module

Steps: 354 HP-41 Bytes: 660

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02028-41-9	$10	$14
FOR HP-71*	02028-71-6	N/A	$16

02029 Collisions: Conservation of Linear Momentum

by E.M. Keefe, Ankeny, IA

Third program in the "Physics Teacher" series uses a slightly different approach to yield interchangeable solutions between eleven variables, including the coefficient of restitution, when two bodies collide centrally with each other. Both elastic and inelastic collisions are solvable. **Necessary Accessories for HP-41:** One Memory Module

Steps: 346 HP-41 Bytes: 553

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02029-41-7	$10	$13
FOR HP-71*	02029-71-4	N/A	$14

02030 Basic Longwall Parameters

by P. Rushworth, Lakewood, CO

Generates longwall performance data through user selected ranges of seam height, web depth, face length and tons per shift. Output is in the form of production per shift, required shearer velocity, advance per shift and shifts to complete panel. Assumes DERD, snake at gates. **Necessary Accessories for HP-41:** One Memory Module; Printer

Steps: 306 HP-41 Bytes: 732

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02030-41-5	$10	$14
FOR HP-71*	02030-71-2	N/A	$16

02031 Oscilloscope Utility-Frequency to Timebase Conversion

by J.G.P. Towle, Mason, MI

End guesswork about timebase settings and/or frequency of observed waveform. Program converts user-input frequency to correct timebase settings (5, 2 or 1) X (100, 10, ..., or .001) (micro- or milli-seconds). Or user sets timebase and enters waveform "length" and program computes frequency and displays as Hz, KHz, or MHz. Saves time, reduces errors. **Necessary Accessories for HP-41:** None (Printer is optional)

Steps: 196 HP-41 Bytes: 390

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02031-41-3	$10	$12
FOR HP-71*	02031-71-0	N/A	$14

02032 Index Calculation for Busines Basic Isam Files

by J.F. Woldering, Euclid, OH

This program simulates business BASIC's "INDEXCALC" program. After you enter the length of the Isam key, the length of a data record, number of data records, and index blocking factor, program calculates keys per index block, number of index blocks at each level, total index blocks, and total data blocks. **Necessary Accessories for HP-41:** None; (Printer is helpful)

Steps: 138 HP-41 Bytes: 284

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02032-41-1	$10	$12
FOR HP-71*	02032-71-8	N/A	$14

02033 Cascaded Noise Figure 2nd/3rd Order Intercept Point Analysis

by P. Sharrit, Scottsdale, AZ

This program provides noise figure, noise temperature, 2nd and 3rd order intercept points and intermod levels (both coherent & RSS) of a system with up to 50 stored elements. Friendly edits allow easy review/edit of stored values, easy add or delete of any element or temporary evaluation of any portion of the system. **Necessary Accessories for HP-41:** HP41CV or Quad Memory Module

Steps: 612 HP-41 Bytes: 1421

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02033-41-9	$10	$17
FOR HP-71*	02033-71-6	N/A	$20

02034 Skin Effect at High Power Frequencies with Litz Wire Option

by D.A. Lisle, Aliceville, FL

This program calculates the effective increase in resistance of a cylindrical copper conductor at high power frequencies given the AWG and frequency. The option calculates the outside diameter of litz wire of the equivilent wire area along with the number of strands and the AWG of each strand. DOCUMENTATION WITH 2 CARDS - $12. **Necessary Accessories for HP-41:** None; (Printer is optional)

Steps: 167 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02034-41-7	$10	$12
FOR HP-71*	02034-71-4	N/A	$14

02035 Framingham Risk Equation

by W.D. Everett, Luke AFB, AZ

This program predicts the probability of developing cardiovascular disease over 8 years in asymptomatic adults ages 35-74 according to sex, age, cholesterol, systolic blood pressure, smoking history, left ventricular hypertrophy and glucose intolerance. This risk is compared to average risk of that age and to a hypothetical minimum risk. A cardiovascular equivalent age is estimated. **Necessary Accessories for HP-41:** One Memory Module; (Printer is optional)

Steps: 388 HP-41 Bytes: 867

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02035-41-4	$10	$13
FOR HP-71*	02035-71-1	N/A	$14

02036 Chi Square & Fast T Distribution

by E. Franco, Atlanta, GA

A two program package. The first computes the right hand tail value of the chi-square distribution from 0 to x squared given the number of degrees of freedom. It is shorter and faster than a similar program in the STAT PAC module. The second computes the area (I-P) under the T distribution curve. Also, the right hand tail and the 2-tailed P values are provided. In this program, the upper value of DF is not limited to 141. Can be used as a subroutine. **Necessary Accessories for HP-41:** None (Printer optional)

Steps: 186 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02036-41-2	$10	$12
FOR HP-71*	02036-71-9	N/A	$14

02037 Biorhythms and Coincidences

by P. Legros, Brussels, Belgium
P. Maryssael, Brussels, Belgium

When the birth date is entered by the user, this program calculates the biorhythms for the Physical (P), Sensitive (S) and Cognitive (C). From the biodate it then calculates the biorhythms for the desired amount of days (the date is displayed!) and will tell the user the number of days and the date of a minimum, maximum or critical biorhythm for either the P, the S, the C, the P+S, the S+C, the P+C or the P+S+C. All dates are in the MM.DDYYYY format. **Necessary Accessories for HP-41:** None

Steps: 220 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02037-41-0	$10	$12
FOR HP-71*	02037-71-7	N/A	$14

02038 Cribbage Board

by S. Hardman, Orem, UT
M. Hardman, Orem, UT

Your calculator now becomes a cribbage board, complete with prompts and tones. Program pegs points during the play, scores hand and crib, keeps track of who deals, total game scores, and checks for win and lurch. A must for the cribbage enthusiast. Will the versatility of the 41 never cease? **Necessary Accessories for HP-41:** One Memory Module

Steps: 292 HP-41 Bytes: 642

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02038-41-8	$10	$13
FOR HP-71*	02038-71-5	N/A	$14

02039 Phone Book/Area Codes

by E.R. Selvig, La Canada, CA

Provides permanent phone directory of names/numbers/area codes. Searches for a name and returns number. Up to 12 character name with area code. Convenient prompts. Easy correction. No surprise memory wipes. Not affected by use of main memory registers. Allows total directory review. Program stores in only 33 registers of extended memory. **Necessary Accessories for HP-41:** Extended Function/Memory Module

Steps: 70 HP-41 Bytes: 227

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02039-41-6	$10	$12
FOR HP-71	NOT AVAIL		

02040 Acidity and Oxygen Contents of Blood

by S.T. Christensen, Ringsted, Denmark

Two programs using the same prompting routine. Program #1 computes saturated and normal oxygen contents of blood. Program #2 computes hydrogencarbonate ion concentration, base excess and ions of dissociated CO2. Both programs output CO2 partial pressure and PH at 37 degrees C. The program uses the "IN" and "OUT" subroutines painted in Key Notes V5 No.1. **Necessary Accessories for HP-41:** None

Steps: 177 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02040-41-4	$10	$12
FOR HP-71*	02040-71-1	N/A	$14

02042 Heat Exchanger Rating

by V.K. Patel, Marcus Hook, PA

The program calculates unknown temperatures, heat duty and LMTD correction factor in a counter/co-current shell and tube exchanger. Specific heats are calculated at fluid mean temperatures. Program can also handle constant temperature phase change. Has a built-in correlation for specific heats of hydrocarbon liquids. **Necessary Accessories for HP-41:** One Memory Module

Steps: 319 HP-41 Bytes: 448

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02042-41-0	$10	$12
FOR HP-71*	02042-71-7	N/A	$14

02043 Time Recorder for Dungeons and Dragons

by A.U. Witkowski, New York, NY

This program records time (incremented by the user in segments, rounds and turns). It also records twenty pending events and their time of occurance. When the present time surpasses the recorder time it displays the six letter "warning" entered by the user. **Necessary Accessories for HP-41:** One Memory Module

Steps: 185 HP-41 Bytes: 435

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02043-41-8	$10	$12
FOR HP-71*	02043-71-5	N/A	$14

02044 Randomized Gem Rolling for Dungeons and Dragons

by A.U. Witkowski, New York, NY

This program "rolls" and determines the type of gem found. You may specify the value of the gem or have it done randomly. You also may specify how many will be rolled. Printout is available if printer is used. **Necessary Accessories for HP-41:** Two Memory Modules; (Printer is desirable)

Steps: 351 HP-41 Bytes: 1235

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02044-41-6	$10	$16
FOR HP-71*	02044-71-3	N/A	$18

02045 Axman Video

by R.L. Gardner, Anamosa, IA

A video game with graphic playing board displayed. The Axman goes to the barnyard to get a chicken for dinner but he comes up against one smart chicken. You are the Axman and you have six moves to WHACK the chicken or he gets away. All moves and scores displayed. **Necessary Accessories for HP-41:** Quad Memory Module, HP-IL Module, Video Interface, Monitor or TV.

Steps: 843 HP-41 Bytes: 2044

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02045-41-3	$10	$20
FOR HP-71*	02045-71-0	N/A	$24

02046 Jaws, The Electronic Shark

by J.F. Woldering, Euclid, OH

Go for a swim in shark-infested waters as you take a dare to accumulate points. Then jump in again to double or triple your score. Just don't stay in swimming too long or you'll lose all the points for your turn, and become dinner for Jaws. 1 or 2 players may participate. **Necessary Accessories for HP-41:** None

Steps: 168 HP-41 Bytes: 329

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02046-41-1	$10	$12
FOR HP-71*	02046-71-8	N/A	$14

02047 Look Angles

by C.R. Barrett, Ottawa, Canada

On occasions it is necessary to provide observers with the azimuth and elevation at which they must look in order to observe a certain point or event along the trajectory of a sounding rocket. Given the pertinent data, this program will calculate the appropriate "Look Angles" for each observer. **Necessary Accessories for HP-41:** One Memory Module

Steps: 270 HP-41 Bytes: 495

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02047-41-9	$10	$13
FOR HP-71*	02047-71-6	N/A	$14

02048 Ideal and Van Der Waals Gas Laws

by A. Katz, Montreal, Canada

This program will solve problems involving pressure, volume, moles, R, and temperature by the Ideal, Boyle's, Avogadro's, Charles, Van Der Waals and General gas laws. Data need not be reentered. **Necessary Accessories for HP-41:** One Memory Module

Steps: 240 HP-41 Bytes: 400

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02048-41-7	$10	$12
FOR HP-71*	02048-71-4	N/A	$14

02049 Aeronautical Calculations with a Tabular Polar

by M.R. Woodruff, Savannah, GA

A two program package. Both use a tabular polar of the form CD=f (M, CL). The first makes the calculation of drag easy once the polar is stored. Inputs needed to compute drag are then flight conditions and gross weight. The second program iterates to find the mach number for minimum drag using the tabular polar. The linear interpolation used in these program is in subroutine form and can be easily separated for use by other programs. **Necessary Accessories for HP-41:** At least two Memory Modules

Steps: 494 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02049-41-5	$10	$24
FOR HP-71*	02049-71-2	N/A	$30

02050 Thermal Conductivities of Low Pressure Gas Mixtures

by J.A. Glassett, Texas City, TX

This program calculates the thermal conductivity of gas mixtures of any number of components. The Wassiljewa equation is used along with the Mason and Saxem modification. Further modification is made by the reference. Required input is mole fraction, molecular weight, TC, PC, pure component thermal conductivities and system temperature. **Necessary Accessories for HP-41:** One Memory Module

Steps: 442 HP-41 Bytes: 442

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02050-41-3	$10	$12
FOR HP-71*	02050-71-0	N/A	$14

02051 Short Cylinder Analysis - Cylinder 3

by S.A. Porter, Tacoma, WA

This program will provide the user with radial displacement, slope, and stress solutions at any longitudinal location on a short cylinder with the left end free and the right end either simply supported, fixed, free or guided. In addition, CYLINDER 3 will consider cylinders infinite to the left and infinite in both directins. The user may apply a pressure load of any bandwidth, a ring load, a moment load, an axial load, or any combination of these loads anywhere on the cylinder. **Necessary Accessories for HP-41:** Quad Memory Module and Printer

Steps: 1052 HP-41 Bytes: 2046

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02051-41-1	$10	$20
FOR HP-71	NOT AVAIL		

02052 Viscosities of Gas Mixtures at Low Pressures

by J.A. Glassett, Texas City, TX

This program calculates the viscosity of gas mixtures of any number of components. Pure component viscosities are first calculated based on kinetic theory. The mixture algorithm is by Reid, et.al. coupled with the Wilke approximation. Required input is mole fractions, molecular weights, system temperature and readily available Lennard-Jones parameters. **Necessary Accessories for HP-41:** One Memory Module

Steps: 282 HP-41 Bytes: 557

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	02052-41-9	$10	$13
FOR HP-71*	02052-71-6	N/A	$14

02053 General Base Conversions Maintaining the Stack

by W. Mier-Jedrzejowicz, London, England

Converts integers in the ALPHA register up to 7 digits long in any base from 2 through 17 to and from decimal numbers in the X register. It is short, fast, versatile, checks errors, can be called as a subroutine and maintains the stack contents allowing intermediate calculations and conversions. **Necessary Accessories for HP-41:** None (Printer is optional)

Steps: 128 HP-41 Bytes: 224

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02053-41-7	$10	$11
FOR HP-71*	02053-71-4	N/A	$12

02055 48 Column Word Processing Printer W/Four Character Fonts

by D.K. Allen, Sunnyvale, CA

This program will print five horizontal lines of 48 characters each. Roman upper and lower cases, full greek upper and lower cases, numerals, and 18 special characters are available. Automatic text entry. Fonts can be mixed, ideal for formulas and writing which use greek characters, i.e., Math, Physics, Philosophy and History. Synthetic program. **Necessary Accessories for HP-41:** Quad RAM, Printer (Card Reader or wand unless user can key in synthetic functions)

Steps: 512 HP-41 Bytes: 1890

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02055-41-2	$10	$19
FOR HP-71	NOT AVAIL		

02056 AAS Data Analyst - Report Generator For Bench Top

by C. Chong, Kowloon, HONG KONG

Program analyzes data from a) standard calibration and b) standard addition using linear regression with visual and audio prompts for input. Printer generates report as you input data. Program calculates and prints means and standard deviations for absorbances, regression parameters and result in G/L or % according to sample nature. Uses synthetic functions. **Necessary Accessories for HP-41:** One memory module, Printer, and Card Reader (unless user is able to key in synthetic instructions).

Steps: 323 HP-41 Bytes: 702

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02056-41-0	$10	$14
FOR HP-71	NOT AVAIL		

02057 Electrotechnical Calculations

by K. Rosenhagen, Blender-Einste, W. Germany

Under the input of three known variables (U, I, Q, t, P, W or R) the program calculates the four unknown variables fully automatically. **Necessary Accessories for HP-41:** One Memory Module

Steps: 350 HP-41 Bytes: 555

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02057-41-8	$10	$13
FOR HP-71*	02057-71-5	N/A	$14

02058 AISC Structural Steel Column Design

by P.K. Belcher, Houston, TX

This program analyzes structural steel W-shape columns which are acted upon by lateral moments, axial forces, or a combination of the two. The program is based upon the most recent American Institute of Steel Constructin standards. It contains several complex subroutines making an in-depth analysis possible. **Necessary Accessories for HP-41:** Four Memory Modules or Quad Memory Module; (Printer is optional)

Steps: 900 HP-41 Bytes: 1876

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02058-41-6	$10	$19
FOR HP-71*	02058-71-3	N/A	$22

02059 Segmental Curve Fitting

by P.d.S. Mourao, Belo Horizonte, Brasil

Performs curve fitting, dividing a curve into contiguous branches, not necessarily continuous among themselves. Each segment will be a second degree curve whose coefficients are determined by the program. Also serves as auxiliary to the program Dynamic Analysis Subsidies. **Necessary Accessories for HP-41:** None

Steps: 74 HP-41 Bytes: 123

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02059-41-4	$10	$11
FOR HP-71*	02059-71-1	N/A	$12

02060 DCOMP

by P. Imbimbo, Santa Rosa, CA

DCOMP is a comprehensive program used to analyze earthwork quantities by the borrow-pit method. Use of the cassette drive is required and allows for virtually unlimited data storage capabilities. Using DCOMP, earthwork analysis becomes a simple and manageable task. Alternative situations can easily be tested and grade adjustments rapidly checked. English units are used. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC. **Necessary Accessories for HP-41:** Cassette Drive, HP-IL Module, Printer, HP-41CV or 41C with Quad Memory Module

Steps: 701 HP-41 Bytes: 1841

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02060-41-2	N/A	$20
FOR HP-71	NOT AVAIL		

02061 Agricultural Band and Broadcast Spraying Calculations

by D.C. Kyrobie, Moorhead, MN

The program performs eight types of calculation common to agricultural band and broadcast spraying. It manages two sets of data, each with a file of eight chemical records and eight facts. It figures costs of spraying and keeps an inventory. The chemicals are selectively included in tank-mix formulations. **Necessary Accessories for HP-41:** None

Steps: 749 HP-41 Bytes: 1560

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02061-41-0	$10	$17
FOR HP-71*	02061-71-7	N/A	$20

02062 Critical Buckling Load for a Pin Ended Variable Sect Column

by J.J. Vanhoof, Arlington, TX

This program will determine the critical buckling load of a pin ended column having up to ten section changes. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 383 HP-41 Bytes: 606

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02062-41-8	$10	$13
FOR HP-71*	02062-71-5	N/A	$14

02063 Minimum Time or Fuel Paths to Climb

by M.R. Woodruff, Savannah, GA

This program iterates to find the climb paths for minimum time or fuel. Tabular data for CD, thrust, and fuel flow are required. The linear interpolation used is in subroutine form and is unique in that it will handle two different variables stored in the same data register. **Necessary Accessories for HP-41:** HP-41CV or Quad Memory Module

Steps: 382 HP-41 Bytes: 687

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02063-41-6	$10	$20
FOR HP-71*	02063-71-3	N/A	$24

02064 Wedge Failure Analysis

by T. Langland, Phoenix, AZ

This program solves problems involving slope failure of a rock wedge without having to draw stereoplots. Will solve: dry slope with no tension crack, dry slope with tension crack, or slope with tension crack and water pressure. Gives factor of safety and results of calculation tables. Can include external forces. **Necessary Accessories for HP-41:** Four Memory Modules; (Card Reader is recommended)

Steps: 736 HP-41 Bytes: 1287

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02064-41-4	$10	$16
FOR HP-71*	02064-71-1	N/A	$18

02066 Cylindrical Tank Volumes (Horiz or Vert)

by T.R. Casey, Torrance, CA

Program will calculate volume of a horizontal or vertical cylindrical tank, given the level in feet and inches. Volume can be in gallons (U.S.) or barrels (U.S. Petroleum). Program is very easy to use. Prompts for all inputs and labels all outputs. **Necessary Accessories for HP-41:** None

Steps: 111 HP-41 Bytes: 240

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02066-41-9	$10	$12
FOR HP-71*	02066-71-6	N/A	$14

02067 FDT - Film Developing Timer

by J.H. Cato, Nicholls, GA

This program calculates the development times for six B&W film/developer combinations over a range of temperatures (F or C). It then functions as a timer for the entire processing cycle (in accordance with Kodak Darkroom Dataguide - 6th Ed.) with agitation reminders and drain interval provision. Customization possible. **Necessary Accessories for HP-41:** One memory module

Steps: 327 HP-41 Bytes: 714

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02067-41-7	$10	$14
FOR HP-71*	02067-71-4	N/A	$16

02068 Set Intersections and Venn Diagrams

by L. Brown, Renton, WA

Set intersections, displayed in venn diagrams, help you find and show causes and effects in a collection of data. The program handles as many as 128 different intersections of as many as 7 sets with counts as high as 999 for any intersection. **Necessary Accessories for HP-41:** Two memory modules. Printer and Card Reader optional.

Steps: 300 HP-41 Bytes: 594

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02068-41-5	$10	$13
FOR HP-71*	02068-71-2	N/A	$14

02069 Derby

by J.E. Schiermeier, Cary, NC

This program simulates a horse race with ten horses. Up to four players may bet, and the pari-mutuel system is used to award returns. The player may bet on win, place, or show, and the odds may be displayed. The program is fully automatic. **Necessary Accessories for HP-41:** Two Memory Modules or equivalent memory

Steps: 299 HP-41 Bytes: 572

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02069-41-3	$10	$13
FOR HP-71*	02069-71-0	N/A	$14

02070 Quartic Equation

by J.E. Schiermeier, Cary, NC

This program calculates the 4 roots, both real and complex, of any quartic (fourth degree) equation. By using equations, it is faster and more accurate than iteration techniques. No initial guesses are necessary. **Necessary Accessories for HP-41:** None

Steps: 293 HP-41 Bytes: 368

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02070-41-1	$10	$12
FOR HP-71*	02070-71-8	N/A	$14

02071 Multiplication of Binomials/Polynomials

by N. Ho, Kowloon, Hong Kong

This program calculates (A) expansion of 2 binomials and calculation of their product with given the coefficients of 2 binomials and exponent N, M; (B) binomial expansion; (C) the product of 2 polynomials with degree N, M; (D) the square of a polynomial with degree N. **Necessary Accessories for HP-41:** Quad Ram and Extended Functions/Memory Module

Steps: 307 HP-41 Bytes: 586

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02071-41-9	$10	$13
FOR HP-71*	02071-71-6	N/A	$14

02072 Leaf Spring Design Calculations

by E.T. Souvie, Royal Oak, MI

This program is an aid for the designer of multi-leaf springs. With the input of eight design parameters, this program will produce an appropriate gage thickness, number of leaves, total stack thickness, final design stress, active spring weight and natural spring frequency. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 334 HP-41 Bytes: 773

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02072-41-7	$10	$14
FOR HP-71*	02072-71-4	N/A	$16

02073 Conversion From Wt. Fraction to Mole Fraction and Vice Versa

by R.J. Wooley, Midland, MI

Using the molecular weight of each component, weight fractions can be converted to mole fractions or mole fractions to weight fractions. Components are normalized and ave mw calculated. Any number of components (to 135) can be accepted - the program will create registers as needed. The program can be rerun, if the same components are used, mw need not be reentered. **Necessary Accessories for HP-41:** Memory modules if more than 9 components. Extended Functions module optional.

Steps: 151 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02073-41-5	$10	$14
FOR HP-71*	02073-71-2	N/A	$16

02074 Clay Pigeon Shooting

by P. Scherrer, Boulogne Sur Mer, France

As in real clay pigeon shooting, the popular French sport, you wait a certain time (different for each shooting) and then shoot at the pigeon flying through the display. You destroy it only if you fired with the correct angle. Two levels of difficulty, two speeds for pigeon. **Necessary Accessories for HP-41:** None

Steps: 117 HP-41 Bytes: 307

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02074-41-3	$10	$12
FOR HP-71*	02074-71-0	N/A	$14

02075 Pediatric Emergency Drug List

by D.A. Gosse, Iowa City, IA

This program prints a list of 23 drugs and individual doses calculated for the patient's weight. The list is preceeded by the input data which consists of a patient identification number and body weight in kilograms. **Necessary Accessories for HP-41:** 24 Column Printer, Two Memory Modules

Steps: 232 HP-41 Bytes: 900

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02075-41-0	$10	$15
FOR HP-71*	02075-71-7	N/A	$18

02076 Underwater Sound Propagation

by L.O.J. Kagey, Fullerton, CA

Program calculates values related to underwater sound propagation at sea or in large bodies of fresh water. All parameters are calculated and output automatically in either English or SI units following the cued input. This program is an improved HP-41C version of HP-67 program #3080D by the same author. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 520 HP-41 Bytes: 1270

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02076-41-8	$10	$16
FOR HP-71*	02076-71-5	N/A	$18

02077 82905B Word Processor

by J.L. Gilby, Vancouver, Canada

This program is designed to use the HP-41/82905B impact printer to type letters or memos, it also allows reports to be typed. The cassette based program has the facility to hold addresses, text files capable of holding approximately five pages of text and sign-off files to end letters. Review, correction, insert and delete/insert routines are provided to access and alter text routines. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC. **Necessary Accessories for HP-41:** HP-41CV, HP-82160A HP-IL Module, HP-82161A Digital Cassette Drive, HP-82905B Impact Printer and HP-82180A Extended Functions/Memory Module; (Also recommended: HP-82181A Extended Memory Module and HP-82182A Time Module).

Steps: 429 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02077-41-6	N/A	$20
FOR HP-71	NOT AVAIL		

02078 Matrix Least Squares for Linear Models

by J.H. Nickel, Houston, TX

This program uses matrix least squares to fit linear models to data stored on a cassette. The output consists of the parameter estimates, an ANOVA table, correlation coefficients for the parameters and the model, Fisher F-tests for goodness of fit and lack of fit, and the variance/covariance matrix. Confidence limits for the parameters can be determined by input of the appropriate F value also. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE CASSETTE/HP-IL DISC. **Necessary Accessories for HP-41:** Quad Memory Module (HP-41C only); Extended Functions/Memory Module, HP-IL Interface, 82161A Cassette, any printer

Steps: 1023 HP-41 Bytes: 2192

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02078-41-4	N/A	$20
FOR HP-71	NOT AVAIL		

02079 Bridge Deck Elevations I

by S.L. Stroh, Tampa, FL

Program computes bridge finished deck elevations at equal increments up to 15 longitudinal lines. Program will handle two segments of vertical alignment (tangents or vertical curves). Bents may have different skew angles. Crowned sections are permitted. Curves, non-parallel longitudinal lines, and superelevation transitions are not permitted. **Necessary Accessories for HP-41:** Quad Memory Module, Printer

Steps: 626 HP-41 Bytes: 001292

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02079-41-2	$10	$16
FOR HP-71	NOT AVAIL		

02080 Sun Ephemeris

by J.J. Lynch, North Grafton, MA

This is a versatile program with a wide range of options providing data, from date and observer position, on selected twilight-zones, with times and azimuths, and declination at zone-minimum. Precision routines relate time, height, azimuth and rise-angle, and curves can be traced by Plot-routines. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV; HP-82143A or HP-82162A Printers are optional but necessary for Plot-routines.

Steps: 1082 HP-41 Bytes: 2056

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02080-41-0	$10	$20
FOR HP-71*	02080-71-7	N/A	$24

02081 Design of Fillet Welds

by A. Jayaraman, Niantic, CT

Given the forces and moments acting at the centroid of a fillet weld and the dimensions of the weld, this program calculates the load/unit length of weld and the size of weld required to sustain the load without getting overstressed for ten most commonly used weld connections. **Necessary Accessories for HP-41:** One Memory Module

Steps: 419 HP-41 Bytes: 587

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02081-41-8	$10	$13
FOR HP-71*	02081-71-5	N/A	$14

02082 Tungsten Lamp Characteristics

by P. Cooper, Melbourne, Australia

Given the nominal colour temperature and nominal operating voltage of a tungsten filament lamp, this program calculates the colour temperature and relative luminous brightness when used at reduced voltages. The relative spectral intensity may be calculated for any wavelength, for a given colour temperature. NO BAR CODE IS AVAILABLE WITH THIS PROGRAM. **Necessary Accessories for HP-41:** None

Steps: 152 HP-41 Bytes: 408

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02082-41-6	$10	$12
FOR HP-71*	02082-71-3	N/A	$14

02083 Multicomponent Distillation Column Design

by R.J. Wooley, Midland, MI

Given feed rate and composition, heavy and light key specifications, Antoine vapor pressure constants and column pressure, Fenske's minimum trays and Underwood's minimum reflux are calculated. Using Gilliland's correlation the actual number of trays at a specified reflux is determined. Fair's equations calculate trayed column diameter at three tray spacings. **Necessary Accessories for HP-41:** Quad Memory Module

Steps: 954 HP-41 Bytes: 1786

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02083-41-4	$10	$18
FOR HP-71*	02083-71-1	N/A	$22

02084 Earth Pressures of Cohesive or Cohesionless Soils

by T.R. Tyhurst, Georgetown, Canada

Using Rankine's Theory and the the Trial Wedge Method, this program computes: Ho, W, C, alpha max., Pa or Pp on cohesive or cohesionless soils. The calculator prompts for all data and the output is labeled for easy identification. Necessary input: <i (slope), height, internal friction angle, specific weight of soil, slope of wall, cohesive stress. **Necessary Accessories for HP-41:** One Memory Module

Steps: 239 HP-41 Bytes: 432

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02084-41-2	$10	$12
FOR HP-71*	02084-71-9	N/A	$14

02085 Table Calculations

by P.S. Seufzer, Augusta, WI

This program allows columns of a numerical table to be stored as files in data registers. Given the formula of an unknown column the program will create values in a new file from known columns. Also included are housekeeping routines, a data file editor, and file storage on magnetic cards. **Necessary Accessories for HP-41:** Two Memory Modules; (Card Reader is helpful)

Steps: 526 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02085-41-9	$10	$15
FOR HP-71	NOT AVAIL		

02086 Truth Table - Combinational Circuits

by N.C. Lee, Stony Brook, NY

Automatically plots the complete truth table (or just one particular state) for multiple-output digital circuits. Gates provided are inverter, 2-input AND, OR, XOR, NAND, NOR & XNOR. The number of inputs plus outputs is limited by available program and data registers. Maximum is 23. **Necessary Accessories for HP-41:** Printer is helpful.

Steps: 146 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02086-41-7	$10	$12
FOR HP-71*	02086-71-4	N/A	$14

02087 Bar Code on the HP-82143A Peripheral Printer

by W. Louie, Brooklyn, NY

This program produces bar code on the HP-82143A Peripheral Printer. The bar code is NOT directly readable. Only boundaries for the bars are printed. The user must fill in the bars and photocopy in order to use. Inputs are made in either hexadecimal, binary, or decimal. Includes a full list of references. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV, Printer; (Card Reader is helpful)

Steps: 333 HP-41 Bytes: 802

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02087-41-5	$10	$14
FOR HP-71	NOT AVAIL		

02088 Gravity Tides

by O. Muller, Rochester, NY

The gravitational effects of the moon, the sun, and the gravity tide correction are calculated by this program for any point on earth at any time in the twentieth century. In the process, the earth-moon and earth-sun distances are determined, as well as zenith angles, etc. **Necessary Accessories for HP-41:** Three Memory Modules or One Quad Module

Steps: 585 HP-41 Bytes: 1173

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02088-41-3	$10	$16
FOR HP-71*	02088-71-0	N/A	$18

02089 New Moon and Full Moon Day of Month (Improved)

by N.C. Lee, Stony Brook, NY

Computes day and time (GMT) for new or full moon given any month between 1 AD and 2500 AD. **Necessary Accessories for HP-41:** None

Steps: 119 HP-41 Bytes: 235

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02089-41-1	$10	$12
FOR HP-71*	02089-71-8	N/A	$14

02090 Analysis of Pin-Jointed 2-D Frames

by B.R. Groves, East ST. Kilda, Australia

Computes the forces in 2-D frames by the pin-joint method of resolving known forces acting on the joint. Unique data entry system saves node computations so data is only entered once. Frames of any size handled by overwriting when memory is full. HP-41CV saves 66 nodes at one time. **Necessary Accessories for HP-41:** One Memory Module; (Printer is optional)

Steps: 182 HP-41 Bytes: 329

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02090-41-9	$10	$12
FOR HP-71*	02090-71-6	N/A	$14

02091 Position of Sun and Planets II

by D.R. Poulos, San Jose, CA

Finds position, right acension and declination of Sun, Mercury, Venus, Mars, Jupiter and Saturn. Also finds apparent diameter in seconds of arc. Equations for orbital parameters which need to be calculated are provided. Limited to epochs between 1950.0 and 2000.0. **Necessary Accessories for HP-41:** One Memory Module

Steps: 287 HP-41 Bytes: 395

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02091-41-7	$10	$12
FOR HP-71*	02091-71-4	N/A	$14

02092 Kingdom

by G. Cawsey, Gloucestershire, England

You are the ruler of a kingdom. Your task is to manage that kingdom for as long as possible. Each year you decide how much corn to plant and how much to use for food. Beware of variable harvests and assassination attempts. **Necessary Accessories for HP-41:** One Memory Module; (or HP-41CV)

Steps: 176 HP-41 Bytes: 437

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02092-41-5	$10	$12
FOR HP-71*	02092-71-2	N/A	$14

02093 Binomial Expansions

by N. Ho, Kowloon, Hong Kong

This program expands the binomial expression (A*X**N + B*Y**M)**P and (A*X**N + B*X**M)P. A, B,M, N and P can be any real numbers. And calculate the coefficient or value of the term by input its power of X or term number. Also find the numberical greatest term and numerical greatest coefficient. Quad RAM is necessary and X Functions module is helpful. **Necessary Accessories for HP-41:** Quad RAM; (Extended Functions Module)

Steps: 236 HP-41 Bytes: 410

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02093-41-3	$10	$12
FOR HP-71*	02093-71-0	N/A	$14

02094 Enigma

by M. Cracknell, Ruwi, Sultanate of Oman

This program will allow the coding of a message, 24 characters at a time. By replacing each character with an ASC II character between 19 and 111. Without the key (seed) the code is practically unbreakable. The program will similarly allow the decoding of a message, line by line. The output is only sensible if the lines are decoded in the same order as they are encoded. **Necessary Accessories for HP-41:** 82161A Digital Cassette Drive, Printer and Extended Functions Module

Steps: 122 HP-41 Bytes: 245

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02094-41-1	$10	$12
FOR HP-71*	02094-71-8	N/A	$14

02095 Degree Day Calculation at a Given Base Temperature

by D.P. Bleicher, Palmer, AK

Program calculates degree days and cummulative degree days above a user given base temperature, making it adaptable to many biological and engineering applications. Alpha prompts and local labels make the program easy to use and provides reminders of important data points. One step modification for heating need estimations. **Necessary Accessories for HP-41:** None

Steps: 84 HP-41 Bytes: 237

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02095-41-8	$10	$12
FOR HP-71*	02095-71-5	N/A	$14

02096 Bioplot

by P.E. Baker, Oklahoma City, OK

This program simultaneously plots the three sinusoidal biorhythm curves in one attractive output. Each curve clearly identifies the biorhythmic cycle it represents and each day's values are dated. The subject's date of birth and the plot's starting date are also printed for convenience. **Necessary Accessories for HP-41:** One Memory Module, Printer

Steps: 360 HP-41 Bytes: 598

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02096-41-6	$10	$13
FOR HP-71	NOT AVAIL		

02097 Super-Yahtzee

by G.K. Ziran, Frankfurt/Main, W. Germany

A fully automated version for up to 4 players. Entries are reduced to a minimum. HP-41 does not participate in the game but checks all entries for validity, keeps score and prints each throw (special characters) as well as score-tables. **Necessary Accessories for HP-41:** HP-41CV; or HP-41C with Quad RAM; Printer

Steps: 702 HP-41 Bytes: 1615

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02097-41-4	$10	$18
FOR HP-71	NOT AVAIL		

02098 Banner Printing Special

by J.R. Grandstaff, Oak Park, IL

This program prints all 127 standard characters in banners, using any standard print symbol, in positive or negative print. It uses the Extended Functions/Memory. It has 4 modes: PHRASE, CHAR NO?, DECIMAL CODE (build your own char.), and BINARY CODE (graphics). All 4 can be used as subroutines. **Necessary Accessories for HP-41:** One Memory Module, Card Reader, Printer, Extended Function/Memory Module and One Memory Module

Steps: 207 HP-41 Bytes: 338

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02098-41-2	$10	$17
FOR HP-71	NOT AVAIL		

02099 Labyrinth-Adventure Deluxe

by D.A. Munroe, Portland, OR

Major additions to #00971C: A measured, limited air supply; random magic words for special entry/exit; unattended move sequences; checkpoint feature allows instant restoration of a previous game state; better magic wand usage; better scoring; more open mazes; faster execution; names, scores of top four players maintained. **Necessary Accessories for HP-41:** Four Memory Modules or One Quad Memory Module

Steps: 872 HP-41 Bytes: 1632

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02099-41-0	$10	$18
FOR HP-71*	02099-71-7	N/A	$22

02100 Yahtzee

by D. Angel, Tel-Aviv, Israel

This program simulates 5 dice for playing the Japanese game - YAHTZEE. **Necessary Accessories for HP-41:** None

Steps: 125 HP-41 Bytes: 288

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02100-41-6	$10	$12
FOR HP-71*	02100-71-3	N/A	$14

02102 Invisible Enemy

by N.C. Lee, Stony Brook, NY

To search and destroy 3 enemy spaceships, guided only by tones from your sonar. Be careful not to get hit or crash onto the boundaries of confined space. Two options, 10 levels of difficulties. Requires clear mind, fast reaction and good hearing. **Necessary Accessories for HP-41:** One Memory Module

Steps: 228 HP-41 Bytes: 443

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02102-41-2	$10	$12
FOR HP-71*	02102-71-9	N/A	$14

02103 20-Digit RPN

by N.C. Lee, Stony Brook, NY

This program establishes a double-precision, extended-range RPN stack for floating point arithematics. Each number is represented by a 20-digit mantissa plus a 10-digit exponent. Operations include +, -,*, /,Enter, Sto, RCl, X<>Y, RDN, LastX and View. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 500 HP-41 Bytes: 783

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02103-41-0	$10	$14
FOR HP-71*	02103-71-7	N/A	$16

02104 Gnort

by J. Lang, Yakima, WA

Hidden in a maze of twenty caves is a dreaded Gnort, a fierce Wumpus, and four other dangers. You, the hunter, must move through the maze and kill both the Wumpus and Gnort without yourself being killed. **Necessary Accessories for HP-41:** One Memory Module or HP-41CV

Steps: 307 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02104-41-8	$10	$13
FOR HP-71*	02104-71-5	N/A	$14

02105 Scientific Notation Problems

by L.J. Burger, Camarillo, CA

This program prints out multiplication and division problems in scientific notation format, stores the problems and answers in an ASCII file in Extended Memory and prints out the problems with answers from the ASCII file. The problems are numbered. **Necessary Accessories for HP-41:** HP-41C and Two Memory Modules or HP-41CV, Extended Function Memory Module, and any Printer.

Steps: 367 HP-41 Bytes: 833

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02105-41-5	$10	$14
FOR HP-71	NOT AVAIL		

02106 Newton Interpolation Polynomial

by H. Woelper, Clausthal, West Germany

This program computes to n+1 given datapairs (X1, Y1) (I=0, 1,2, 3,..., n) the only possible polynomial with degree less or equal to n and p(X1)=Y1. You may increase n whenever you want. p(X) may be computed for each real X. **Necessary Accessories for HP-41:** None

Steps: 76 HP-41 Bytes: 138

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02106-41-3	$10	$11
FOR HP-71*	02106-71-0	N/A	$12

02107 Sectional Cone Fabrication

by G.C. Lizalek, Oak Brook, IL

Two programs that plot concentric and non-concentric cones on sheetmetal. Output can be decimal or fractional. Metal thickness is accounted for, and any section of the cone can be plotted. This is used for a square to round, with or without a radius corner. Compound terminating planes can also be used. **Necessary Accessories for HP-41:** At least three Memory Modules, or a Quad Memory Module

Steps: 1718 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02107-41-1	$10	$26
FOR HP-71*	02107-71-8	N/A	$32

02108 Arithmetic Teacher 2

by L.J. Burger, Camarillo, CA

This program uses Don Malm's random number routine to generate two random numbers for the operands in multiplication, division, addition and subtraction problems. Elementary students can vary the maximum numbers for each of the operands and learn math tables. A seed prompt is included and a prompt for more problems is used. "YES" branches to more problems; "NO" branches to "END OF PROBLEMS". **Necessary Accessories for HP-41:** One Memory Module

Steps: 226 HP-41 Bytes: 540

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02108-41-9	$10	$13
FOR HP-71*	02108-71-6	N/A	$14

02109 Generating a Sample From a Stable Distribution

by A.L. Bruffett, San Jose, CA

This program generates a random sample from an arbitrary stable distribution with location parameter zero and scale parameter one. The characteristic (Alpha) and skewness (Beta) must be specified by the user. **Necessary Accessories for HP-41:** One Memory Module

Steps: 243 HP-41 Bytes: 351

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02109-41-7	$10	$12
FOR HP-71*	02109-71-4	N/A	$14

02110 Pareto Distribution

by A.L. Bruffett, San Jose, CA

This program computes the maximum likelihood estimate of the parameter, C, of a Pareto distribution, given a sample. This program also evaluates the density, distribution and inverse distribution functions, and will generate Pareto-distributed random observations with parameter C. **Necessary Accessories for HP-41:** None

Steps: 146 HP-41 Bytes: 396

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02110-41-5	$10	$12
FOR HP-71*	02110-71-2	N/A	$14

02111 Spectrum Analysis by the Maximum Entropy Method

by S.C. Kenney, Falls Church, VA

The maximum entropy method (MEM) is a frequency estimation enhancement technique which provides accurate frequency. Measurements where the usual periodogram or discrete power spectrum (computed by the FFT) fails to yield frequency measurements. **Necessary Accessories for HP-41:** Quad Memory Module is recommended, however, 3 Singles will work.

Steps: 508 HP-41 Bytes: 813

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02111-41-3	$10	$15
FOR HP-71*	02111-71-0	N/A	$18

02112 Simultaneous Equations (MXM) Variable Size

by P. Rubio, Columbia, MO

This program utilizes the ITERATION METHOD and its restrictions (see Operating Limits and Warnings) for solving any system of M equations with M variables. A trial vector can be entered or the default assumption is a unit trial vector upon which, convergence to a solution is attained. One advantage of the iteration method is that does not carry round off error. **Necessary Accessories for HP-41:** Minimum of One Memory Module

Steps: 273 HP-41 Bytes: 493

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02112-41-1	$10	$13
FOR HP-71*	02112-71-8	N/A	$14

02113 Activated Sludge Process Control Calculations

by G.J. Gent, Kihei, HI

Converts laboratory data into useful units that are necessary to control an activated sludge system. **Necessary Accessories for HP-41:** None

Steps: 126 HP-41 Bytes: 330

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02113-41-9	$10	$12
FOR HP-71*	02113-71-6	N/A	$14

02114 Integrated Cost/Task Schedule

by C.L. Williams, San Jose, CA

Given the irregular time periods and costs of various overlapping tasks, this program solves for each period's incremental cost and the cumulative cost. Operates with (high resolution histograms) or without the printer. Options include rounding scheme and overall cost multipliers. Ideal for cost-scheduling the simple or complicated jobs. **Necessary Accessories for HP-41:** Quad Memory Module if using HP-41C; (Printer is optional)

Steps: 870 HP-41 Bytes: 1741

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02114-41-7	$10	$18
FOR HP-71*	02114-71-4	N/A	$22

02115 Stoichiometry of a Chemical Equation

by H.H. Suarez, Geneva, Switzerland

This program determines the stoichiometric coefficients or any kind of chemical equation (Ox.-Red....). Most of the equations may be processed by the program. All intervening molecules must be entered. They may be charged. This program is pretty simple to use, and very flexible. The results are integer and reduced. **Necessary Accessories for HP-41:** One Memory Module, Math I Rom or "Matrix" Program

Steps: 260 HP-41 Bytes: 405

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02115-41-4	$10	$12
FOR HP-71*	02115-71-1	N/A	$14

02116 Genetic Code

by R. Rauch, Berlin 47, Germany

This program computes the Codogen, the basetriplet from the complementary DNA-cord, the Codon, Anticodon and the aminoacid, if one of these four triplets is known. To a given aminoacid the program calculates all possible basecodes and shows to each code all triplets as mentioned above. **Necessary Accessories for HP-41:** Three Memory Modules or HP-41CV

Steps: 429 HP-41 Bytes: 937

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02116-41-2	$10	$15
FOR HP-71*	02116-71-9	N/A	$18

02117 Routine ECG Determinations "ECG"

by J.C. Meeroff, Coral Springs, FL

Program calculates basic ECG scalar values: 1) QRS mean frontal plane axis, 2) heart rate and R-R interval, 3) P-R interval and 4) Q-T and Q-Tc intervals. Program requires input of height in millimeters of both positive and negative deflections of the QRS complex in leads I and III and width in millimeters of P-R, R-R and Q-T intervals. **Necessary Accessories for HP-41:** None

Steps: 103 HP-41 Bytes: 283

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02117-41-0	$10	$12
FOR HP-71*	02117-71-7	N/A	$14

02118 Maximum Moment Under 18 Moving Loads

by P.d.S. Mourao, Belo Horizonte, Brasil

A loading train runs over a 2 to 7 spans continuous beam. The user names a support, and the program calculates the maximum bending moment that occurs there, situating the train. One to 18 loads. **Necessary Accessories for HP-41:** Three Memory Modules

Steps: 443 HP-41 Bytes: 800

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02118-41-8	$10	$14
FOR HP-71*	02118-71-5	N/A	$16

02120 Correlation Matrix Storage

by J.H. Jacobs, San Diego, CA

This program is an adjunct to program PARTIAL. It is used in lieu of program RMATRIX when only the correlation coefficients are known or when it is more convenient to enter the correlations instead of the data. It prompts for and stores sample size and correlations in the appropriate registers. **Necessary Accessories for HP-41:** One Memory Module (in order to use program PARTIAL)

Steps: 82 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02120-41-4	$10	$11
FOR HP-71*	02120-71-1	N/A	$12

02121 Correlation Matrix

by J.H. Jacobs, San Diego, CA

Purposes of program RMATRIX: 1) To compute, display, provide random access to, and to prepare for program PARTIAL a correlation matrix from data (19 x 19 matrix max.). 2) To compute, display, and provide random access to the means and sample standard deviations for data used to generate above correlation matrix. **Necessary Accessories for HP-41:** One Memory Module

Steps: 312 HP-41 Bytes: 512

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02121-41-2	$10	$13
FOR HP-71*	02121-71-9	N/A	$14

02122 Partial Correlation

by J.H. Jacobs, San Diego, CA

Computes partial correlations up to the 13th-order involving any of the variables in zero-order matrix entered by RMATRIX or STO MAT. User directs order in which variables are controlled, and intermediate partials are displayed. Degrees of freedom and t-statistic (for last partial) are also provided. **Necessary Accessories for HP-41:** One Memory Module

Steps: 344 HP-41 Bytes: 547

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02122-41-0	$10	$13
FOR HP-71*	02122-71-7	N/A	$14

02123 X-Ray Characteristic Lines

by M.D. Leonard, Amherst, MA

Provides the practicing x-ray analyst with ready conversion between wavelength of characteristic emission line and atomic number of emitting atom. Combines the technique of interchangeable solution and Kelly's equations. **Necessary Accessories for HP-41:** None

Steps: 94 HP-41 Bytes: 256

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02123-41-8	$10	$12
FOR HP-71*	02123-71-5	N/A	$14

02124 Sample Test, Probability of Lot Acceptance

by E. Batikoff, Rehovot, Israel

This program solves for the probability of acceptance of a lot with a given percentage of good units, based on the results of a test by attributes of a sample with a known size and known acceptance number. Hypergeometric and binomial distribution are presented to be selected by user. **Necessary Accessories for HP-41:** None

Steps: 107 HP-41 Bytes: 177

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02124-41-6	$10	$11
FOR HP-71*	02124-71-3	N/A	$12

02125 Natural Gas Properties from Specific Gravity

by K.J. Johnson, Metairie, LA

Program calculates natural gas properties using specific gravity and non-hydrocarbon mole fractions. Properties provided are Z factor, P/Z, density, viscosity, and formation volume factor. Each property is addressable through a local label and program gives error message when correlations do not apply. **Necessary Accessories for HP-41:** None

Steps: 467 HP-41 Bytes: 961

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02125-41-3	$10	$15
FOR HP-71*	02125-71-0	N/A	$18

02126 Hex/Dec Conversion for 32 Bit Floating-Point or 2's Comp Int

by W.C. Wurst, Nashua, NH

This program converts 32 bit floating-point (Intel) or 32 bit twos complement integers from hexadecimal to decimal and vice-versa. Easy to use and user friendly, the program will warn if the input is "OUT OF RANGE" or a "DATA ERROR" occurs. **Necessary Accessories for HP-41:** Two Memory Modules or HP-41CV

Steps: 453 HP-41 Bytes: 845

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02126-41-1	$10	$15
FOR HP-71*	02126-71-8	N/A	$18

02127 Key Assignments

by J.E. Parchman, Newbury Park, CA

These programs are used to maintain and access a set of assignment files in extended memory. The files are used to dynamically reassign specified keys. The programs should be useful for those who: A) Have no card reader; B) Have many user programs assigned to keys; and C) Change key assignments often. **Necessary Accessories for HP-41:** None

Steps: 288 HP-41 Bytes: 700

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02127-41-9	$10	$15
FOR HP-71*	02127-71-6	N/A	$18

02128 Air-Free Natural Gas Analysis from Composition

by K.L. White, Plaestine, TX

Knowing the composition of up to 14 components of a gas mixture, this program calculates: Percent free-nitrogen associated with the gas, Dry and saturated heating values, Gas gravity, Compressibility, Gallons per thousand cubic feet of gas, Pseudocritical pressure and temperature. Heating values and GPM are corrected for standard pressure and Tc and Pc are corrected for sour gas content. The program utilizes 1981 GPA factors for use in custody transfer and other applications. **Necessary Accessories for HP-41:** HP-82162A Printer, Quad Memory Module and Cassette Drive

Steps: 841 HP-41 Bytes: 1756

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02128-41-7	$10	$18
FOR HP-71*	02128-71-4	N/A	$22

02130 PANSOC-Package for Analysis of Statistics on Calculators

by D. Bednall, Mitcham Victoria, Australia

PANSOC is a package of 13 programs for the analysis of social sciences data. Large data sets can be analyzed. Multiple level cross-tabulations of variables, frequency listings and means can be produced. Programs to establish, label, edit, change and back-up data files are included. Records consisting of a maximum of 60 variables can be used. THIS PROGRAM MUST BE SOLD RECORDED ON TWO CASSETTES/HP-IL DISCS. **Necessary Accessories for HP-41:** HP-41CV or HP-41 with Quad Module, HP-IL, Cassette Drive, Extended Functions Module, Extended Memory Modules; (Printer desirable with some programs).

Steps: 4325 HP-41 Bytes: 9646

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02130-41-3	N/A	$30
FOR HP-71	NOT AVAIL		

02131 IRS Interest Computation

by B. Larson, Plano, TX

This program uses IRS rules to compute interest on a tax deficiency (or tax refund) for any period from 1/1/70 - 6/30/83. A subroutine will update for later developments. The program also computes a simple interest rate to help comparisons of alternative courses of action. **Necessary Accessories for HP-41:** Two Memory Modules; (Printer is optional)

Steps: 262 HP-41 Bytes: 580

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02131-41-1	$10	$13
FOR HP-71*	02131-71-8	N/A	$14

02132 Curve Fit for 12 Different Functions

by H. Woelper, Clausthal, West Germany

The program stores x-y-data-pairs, gives the chance to correct them and to store them on magnetic cards and tries to fit 12 different functions, using transformations and linear regression. If a transformation is senseless the function is let out. Entry with magnetic stored data is possible. This is an improved version of a German program. **Necessary Accessories for HP-41:** One Memory Module, Card Reader; (Printer is useful)

Steps: 290 HP-41 Bytes: 504

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02132-41-9	$10	$13
FOR HP-71*	02132-71-6	N/A	$14

02133 Relativistic Rocket

by C. Langin, Centralia, IL

Given ship mass, fuel mass, exhaust velocity, and constant acceleration, program finds distance and time able to accelerate and final velocity and mass, all in reference frames of both ship and takeoff planet. **Necessary Accessories for HP-41:** One Memory Module

Steps: 291 HP-41 Bytes: 809

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02133-41-7	$10	$14
FOR HP-71*	02133-71-4	N/A	$16

02134 Riedel-Plank-Miller Correlation for Vapor Pressures

by J.A. Pita, Quito, Ecuador

This program uses a correlation for estimating the vapor pressure of a substance at a given temperature. Input data are the critical temperature and pressure, the normal boiling point and the temperature at which vapor pressure is desired. This correlation has a great degree of accuracy and its data requirement are not difficult to find. **Necessary Accessories for HP-41:** None

Steps: 103 HP-41 Bytes: 170

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02134-41-5	$10	$11
FOR HP-71*	02134-71-2	N/A	$12

02135 Stock Solution Dilution II: Up to Ten Components Per Mix

by G.L. Davis, Aspen, CO

Solves for the volumes of concentrated stock solutions required to give a desired final concentratin, given the initial volume, the initial concentrations (if any), and the concentrations of the stock solutions (M, %,etc.). It corrects for volume addition errors using Newton's method. Extension of Stock Dilution I. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 310 HP-41 Bytes: 638

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02135-41-2	$10	$13
FOR HP-71*	02135-71-9	N/A	$14

02136 Universal Curve Fit

by B.H. Geyer, Liverpool, NY

This four part program might have been titled "The Thinking Man's Curve Fit". It will indeed fit any function which the user programs to an arbitrarily spaced X, Y data set. However, the user may have to supply a rather good initial approximate function which the program will then optimize. **Necessary Accessories for HP-41:** PPC ROM, Extended Functions Module; (Printer is desirable)

Steps: 1061 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02136-41-0	$10	$20
FOR HP-71*	02136-71-7	N/A	$24

02137 Coldplate Heat Exchanger Performance

by P. Ebert, Goleta, CA

This program calculates the thermal and flow performance of coldplate-type air heat exchangers for formed or cast straight fins and cast pin fins. No empirical fin data is required. The program calculates all necessary areas and air physical properties on the basis of user supplied fin geometry and inlet temperature. **Necessary Accessories for HP-41:** Two Memory Modules; (Printer is optional but adds utility to program).

Steps: 588 HP-41 Bytes: 982

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02137-41-8	$10	$15
FOR HP-71*	02137-71-5	N/A	$18

02138 Runge-Kutta Method of 4th Order to Solve Diff. Eq. First Ord

by H. Woelper, Clausthal, West Germany

Given a 1st order differential equation $y' = f'(x, y)$ and a data pair (Xo, Yo), another points (Xn, Yn) (n=1, 2,3, ...) are calculated by the use of the 4th order Runge-Kutta method. **Necessary Accessories for HP-41:** Printer is useful

Steps: 103 HP-41 Bytes: 211

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02138-41-6	$10	$11
FOR HP-71*	02138-71-3	N/A	$12

02139 Three-Phase Distribution Networks

by D.T.A. Minh, Chaisy le Rai, France

This program is a powerful tool to resolve three-phase four-pole cables power distribution systems frequently used in lighting, public services, parks, industries and many other applications, permitting the user an easy and very fast computation of cable size to be employed to fulfill voltage drop specification at extreme loads. Program analyzes copper and aluminum buried installations and for 380V/50HZ or 220V/60HZ. **Necessary Accessories for HP-41:** One Memory Module; (Printer is optional)

Steps: 194 HP-41 Bytes: 415

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02139-41-4	$10	$12
FOR HP-71*	02139-71-1	N/A	$14

02140 Complete Fanning (or Moody) Friction Factor Chart

by M.G. Pool, Rock Springs, WY

This program completely duplicates the Fanning (or Moody, using the included modifications) Friction Factor Chart relating Friction Factor, Reynolds Number, and Relative Roughness Ratio. Given any 2 of the 3 factors above, the third factor will automatically be computed and the resulting flow type indicated (i.e., Turbulent, Transition or Laminar). **Necessary Accessories for HP-41:** One Memory Module or HP-41CV

Steps: 387 HP-41 Bytes: 736

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02140-41-2	$10	$14
FOR HP-71*	02140-71-9	N/A	$16

02141 Lawn Watering Timer

by P. Rushworth, Lakewood, CO

The program determines the rate of flow from two sprinkler systems. Given the rate of evapotranspiration the optimum lawn watering time is calculated. Alarms are set and reset to indicate the need to either move or shut off the sprinkler. A nomograph for computing evapotranspiration is included. **Necessary Accessories for HP-41:** HP-82182A Time Module

Steps: 154 HP-41 Bytes: 296

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02141-41-0	$10	$12
FOR HP-71*	02141-71-7	N/A	$14

02142 Buildup

by T.B. Crow, San Antonio, TX

This program calculates Horner-plot data from bottom-hole pressure measurements of a shut-in oil or gas well. The flow period prior to shut-in can be either single-rate or multi-rate. Reservoir properties are calculated. **Necessary Accessories for HP-41:** Three Memory Modules; (Printer is optional)

Steps: 582 HP-41 Bytes: 1390

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02142-41-8	$10	$17
FOR HP-71*	02142-71-5	N/A	$20

02143 Chemical Phasical Property Data Bank

by R.J. Wooley, Midland, MI

The eleven temperature correlated properties (with temperature limits), vapor pressure, surface tension, heats of vaporization and formation, liquid density and the liquid and vapor properties of thermal conductivity, viscosity and heat capacity and seven point properties are stored in a data bank (on HP-IL cassette) for 57 compounds. Printed output is in three formats. An input program allows all or some properties to be added on new compounds as well as updating existing compounds. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC. **Necessary Accessories for HP-41:** HP-IL Cassette and Quad Memory Module; (Printer is optional)

Steps: 1384 HP-41 Bytes: 3235

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02143-41-6	N/A	$20
FOR HP-71	NOT AVAIL		

02144 Calculation for Cryogenic Processing

by J. Huang, Corvallis, OR

This program is designed to calculate the solubility of a substance when it is mixed with another compound under extreme temperature. With the aid of the cassette drive, data such as critical pressure, temperature volume and so forth, could be extracted easily without the use of a table. This program is extremely useful when used in the design of processing equipment, since precipitation may occur and create a solid coating which eventually fouls the processing equipment. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC. **Necessary Accessories for HP-41:** Extended Function Module, HP-82161A Digital Cassette Drive, Quad Memory Module or HP-41CV; (HP-82162A Thermal Printer is optional)

Steps: 820 HP-41 Bytes: 2060

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02144-41-4	N/A	$20
FOR HP-71	NOT AVAIL		

02145 Aero

by R. Mann, Billerica, MA

This program will compute Mach number, knots calibrated airspeed, knots equivalent airspeed, or knots true airspeed given pressure altitude, static air temperature and any one of the above four computed values. Calculations are accurate for subsonic and supersonic conditions up to a pressure altitude of 82, 021 feet. **Necessary Accessories for HP-41:** Two Memory Modules

Steps: 399 HP-41 Bytes: 927

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02145-41-1	$10	$15
FOR HP-71*	02145-71-8	N/A	$18

02146 Numeric Mastermind

by M.V. Barbero, Sevilla, Spain

This program is a version of the famous game. The HP-41 generates a random 4 digit number. You have 10 opportunities before the HP-41 tells you the secret code. The number of black and white pegs are shown simultaneously. The program is complete with beeps and tones. Test time is fast. **Necessary Accessories for HP-41:** None

Steps: 171 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02146-41-9	$10	$12
FOR HP-71*	02146-71-6	N/A	$14

02147 Four-Parameter Logistic Curve Fitting and Description

by S.L. Petrovic, Dallas, TX

The program fits up to 20 data pairs to the four-parameter logistic equation Y=(A-D)/(1+(X/C)B)+D using iterative weighting to adjust the parameters until a convergence is achieved. The program then describes the pairs used in terms of "best" parameters, and can also describe any proper unknowns in terms of these. The program can be used to fit many types of binding data. **Necessary Accessories for HP-41:** Three 64 Register Memory Modules or Quad Memory Module or HP-41CV

Steps: 654 HP-41 Bytes: 1254

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02147-41-7	$10	$16
FOR HP-71*	02147-71-4	N/A	$18

02148 Resting Membrane Potentials

by G. Steven, West Allis, WI

Calculates Nernst and Goldman (GHK) equations for Na+, K+, and C1-. User inputs any change in membrane permeability to or concentrations of these ions. (Program "knows" textbook values). Very useful in helping one understand the role of permeabilities and concentrations in developing a potential across a semi-permeable membrane. **Necessary Accessories for HP-41:** None

Steps: 140 HP-41 Bytes: 286

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02148-41-5	$10	$12
FOR HP-71*	02148-71-2	N/A	$14

02149 Mini Bar Code Generator

by E.B. Pinkos, Laurel, MD

This program generates one and two byte "mini" bar code. Unique features include: Inputting bar code data with or without Wand; Can generate null byte; Program is user friendly; Extensive knowledge of bar code unnecessary; Error checks are built into program; Paper keyboard with decimal byte values included with literature. **Necessary Accessories for HP-41:** 82162A Printer, Optical Wand, Black Thermal Paper

Steps: 138 HP-41 Bytes: 284

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02149-41-3	$10	$12
FOR HP-71*	02149-71-0	N/A	$14

02150 Spherical Trig Solutions

by J. Fox, Seattle, WA

This program is a compact package of solutions for spherical triangles to be used either directly from the keyboard or as a set of subroutines by another program. All six cases of spherical triangles are solved including the two ambiguous cases. **Necessary Accessories for HP-41:** None

Steps: 138 HP-41 Bytes: 240

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02150-41-1	$10	$12
FOR HP-71*	02150-71-8	N/A	$14

02151 Ephemerides of Asteroids

by D.J. Tholen, Tucson, AZ

This program generates ephemerides for asteroids. Quantities calculated include right ascension and declination of the asteroid, with respect to the mean equator and equinox of both 1950 and of date, heliocentric and geocentric distances, magnitude (including the opposition effect), phase angle, elongation, and ecliptic longitude and latitude. **Necessary Accessories for HP-41:** Three Memory Modules; (Card Reader and Printer are optional)

Steps: 644 HP-41 Bytes: 1202

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02151-41-9	$10	$16
FOR HP-71*	02151-71-6	N/A	$18

02152 Conveyor Calculations

by P. Rushworth, Lakewood, CO

Allows for interchangeable solution of belt width, speed and peak capacity in tons per hour. The program then computes length, conveyor angle, gravity hp, friction hp, belt hp, motor hp, kw, tightside tension and PIW; given material density, change in elevation and K factor. Inclined, horizontal or decline conveyors may be evaluated. **Necessary Accessories for HP-41:** HP-41CV, Quad Ram and Two Memory Modules

Steps: 447 HP-41 Bytes: 975

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02152-41-7	$10	$15
FOR HP-71*	02152-71-4	N/A	$18

02153 Starwars

by S.W. Manning, Torrens, AUSTRALIA

You are Luke Skywalker. This program gives you the opportunity to recreate his daring and dangerous mission that destroyed the Empire's Deathstar, thus saving the goodguys at the Rebel base. It's the time pressure, do or die excitement of a tactical dogfight, with full graphics displays, audio effects and running AVIEWs. **Necessary Accessories for HP-41:** 3 Memory Modules, or Quad, or 41CV.

Steps: 510 HP-41 Bytes: 1333

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02153-41-5	$10	$16
FOR HP-71*	02153-71-2	N/A	$18

02154 Editex

by I.R. Aizcorbe, Madrid, Spain

With this program you can write text with your HP-41 and have complete control of it. It is possible to correct words at any moment and at any point of the text. You can clear words, groups of words, one or more lines, insert new lines and print it totally or partially. **Necessary Accessories for HP-41:** Extended Function/Memory Module;(Extended Memory Modules and Printer are optional)

Steps: 118 HP-41 Bytes: 281

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02154-41-3	$10	$12
FOR HP-71*	02154-71-0	N/A	$14

02155 Cryptography on the HP-41C/CV

by S.P. Sande, Aurora, CO

Given a keyword and seed number, this program encodes and decodes messages entered one letter at a time using the HP-41C alpha capabilities. Code virtually unbreakable if keys unknown. Uses modified keyword transposition algorithm. Keywords up to eight letters long. **Necessary Accessories for HP-41:** One Memory Module or HP-41CV

Steps: 335 HP-41 Bytes: 775

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02155-41-0	$10	$14
FOR HP-71*	02155-71-7	N/A	$16

02156 Contract Payment Schedule Print-Out

by R.L. Gardner, Anamosa, IA

Program prints pertinent information and data of real estate contracts with month by month, year by year listing of payments, amount of interest, amount paid on principal and current balance. Prints yearly totals of same. Automatic amortization. Equally useful to real estate agents and individuals with contracts. **Necessary Accessories for HP-41:** One Memory Module, HP-IL, HP-82161A Thermal Printer; (Video Interface and Monitor are useful).

Steps: 248 HP-41 Bytes: 740

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02156-41-8	$10	$14
FOR HP-71*	02156-71-5	N/A	$16

02157 Impedance Matching Networks

by C. Fantanas, Delaware, OH

Performs all necessary calculations for 5 impedance-matching networks, the source and load impedances being complex. An externally callable subroutine (with global label) performs series-to-parallel and parallel-to-series impedance conversions. Also included is a program that displays the mantissa of a number stored in the X register - the contents of the stack, the L register and the status of the display. It uses a string process. **Necessary Accessories for HP-41:** None

Steps: 233 HP-41 Bytes: 390

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02157-41-6	$10	$13
FOR HP-71*	02157-71-3	N/A	$14

02158 Right Circular Cones

by R.M. Kozel, Garfield Heights, OH

This program gives a complete treatment of right circular cones. The program computes the radius, height, slant height, lateral area, total area, volume, base area and base circumference of any right circular cone given any two of these eight possible inputs. There are 28 possible cases, and the program solves each and every feasible case for a total of twenty unique and solvable cases. **Necessary Accessories for HP-41:** One Memory Module

Steps: 401 HP-41 Bytes: 757

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02158-41-4	$10	$14
FOR HP-71*	02158-71-1	N/A	$16

02160 Right Cylinders

by R.M. Kozel, Garfield Heights, OH

This program gives a complete treatment of right circular cylinders. The program computes the radius, height, lateral area, total area, volume, base area and base circumference of any right circular cylinder given any two of these seven possible inputs. There are 21 possible cases, and the program solves each and every feasible case for a total of seventeen unique and solvable cases. **Necessary Accessories for HP-41:** One Memory Module

Steps: 356 HP-41 Bytes: 645

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02160-41-0	$10	$13
FOR HP-71*	02160-71-7	N/A	$14

02161 Control Valve Sizing

by J.M. Lavole, Boston, MA

Sizes valve CV for liquids, gases and vapors even in cases involving reducers, choked flow and viscous liquids. Features any consistent set of units without altering program, prompts for data including engineering units checks and corrects for choked flow, reducers, transitional or laminar flow and calculates resulting aerodynamic and hydrodynamic noise. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV; (Card Reader and/or Printer are optional).

Steps: 799 HP-41 Bytes: 1589

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02161-41-8	$10	$24
FOR HP-71*	02161-71-5	N/A	$30

02162 Medical Dental Service Business S Revenue Ananlysis

by D.L.D. Pearson, Pueblo, CO

Nine interactive programs. Very transparent and friendly. File for each month, quarter, half and year. 43 user-definable accounts per file. Data input: time spent and revenue produced. Outputs (single account or block of accounts): input data, revenue/hr., % of total revenue, productivity ratio, file totals and plot of ratios. Programs and four years data on each cassette. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK. **Necessary Accessories for HP-41:** Quad Memory Module or HP-41CV, Extended Functions Module, HP-IL, HP-82162A Printer and HP-82161A Digital Cassette Drive.

Steps: 2224 HP-41 Bytes: 6335

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02162-41-6	N/A	$20
FOR HP-71	NOT AVAIL		

02163 Physical Growth Percentiles

by P.C. Jensen, Newport, RI

Calculates new physical growth percentile curves prepared by National Center for Health Statistics for infants aged birth - 36 months. NCHS percentiles can be used to identify potential health and nutritional problems. Displays percentile distributions for length, body weight, and head circumference for age, and body weight for length. **Necessary Accessories for HP-41:** Three Memory Modules and Card Reader

Steps: 285 HP-41 Bytes: 554

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02163-41-4	$10	$35
FOR HP-71*	02163-71-1	N/A	$44

02164 Foundation Settlement Based on Consolidation Curves

by T.F. Blake, Newbury Park, CA

Program computes the approximate total settlement beneath the center of shallow, uniformly loaded, continuous, rectangular, and round footings based on up to five consolidation curves. User inputs consolidation curve data, specifies flexible or rigid footing, bearing pressure, dimensions of footing, and either Boussinesq or Westergaard loading theory. Input data and calculation results are printed in detailed, labeled format. **Necessary Accessories for HP-41:** Four memory modules and Printer

Steps: 721 HP-41 Bytes: 238

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02164-41-2	$10	$20
FOR HP-71*	02164-71-9	N/A	$24

02165 Invaders 2

by S.P. Sande, Aurora, CO

Instead of one alien, up to ten appear randomly on display. Zap aliens by "firing" at display locations. Hit aliens to gain points. If you miss you lose points, aliens gain points. Eight waves of aliens. Features vivid alpha graphics, "MARCHING" alien attack message. **Necessary Accessories for HP-41:** One memory module

Steps: 190 HP-41 Bytes: 442

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02165-41-9	$10	$12
FOR HP-71*	02165-71-6	N/A	$14

02166 Stock Dilution I: Laboratory Solution Preparation

by G.L. Davis, Aspen, CO

Solves for the volume of a concentrated stock solution that is required to convert a solution of known volume (or a desired final volume) and known initial concentration (if any) to a desired final concentration. Stock solution concentration may be expressed as M, %, etc. Uses Newton's Method. Useful as a subroutine. **Necessary Accessories for HP-41:** None

Steps: 73 HP-41 Bytes: 164

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02166-41-7	$10	$11
FOR HP-71*	02166-71-4	N/A	$12

02167 Sniper

by M. Fix, Indianapolis, IN

You are separated from your platoon with five rounds of ammunition and four grenades. You see around you a row of trees and one enemy personell. What will you do? What will he do? The enemy person is controlled by the calculator. Is he stronger? Who will survive? **Necessary Accessories for HP-41:** Three memory modules

Steps: 675 HP-41 Bytes: 1337

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02167-41-5	$10	$16
FOR HP-71*	02167-71-2	N/A	$18

02168 Video Bar Graph

by R.L. Gardner, Anamosa, IA

Bold, legible, easy to read graphs are displayed on your video screen. Complete control of Y and X axis increment. Long graphs can be scrolled on screen. Program includes fast, easy Data Register input. Useful analytical tool for weather, markets, sales, costs, financial, etc., data. Comprehensive comparison at a glance. **Necessary Accessories for HP-41:** Two memory modules, HP Interface Loop, Video Interface, Monitor or TV

Steps: 344 HP-41 Bytes: 964

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02168-41-3	$10	$15
FOR HP-71	NOT AVAIL		

02169 Automated Tally Sheet With "What If?" Capabilities

by E.M. Keefe, Ankeny, IA

"Tally" is a how-to program, demonstrating how to develop a program for the HP-41 (with XFCN MOD) that will accept almost two dozen inputs from a tally sheet, process the data and display the intermediate and final results. Beyond this, any or all initial inputs may be changed (the results are recomputed automatically), and either all results may be viewed or selected results may be recalled using the line numbers from the tally sheet. A concrete example from the commercial roofing business is used. **Necessary Accessories for HP-41:** Two memory modules + Extended Function/Extended memory module

Steps: 375 HP-41 Bytes: 0714

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02169-41-1	$10	$14
FOR HP-71*	02169-71-8	N/A	$16

02171 Stability and Analysis of Retaining Walls

by G.A. Tofarides, Washington, DC

The program is capable of computing 13 design parameters of 14 different retaining-wall configurations. The program input are: geometrical characteristics of a R/W, soil parameters and soil profile. The program output are: active force, passive force, resisting moment, overturning moment, factor of safety (overturning), vertical resultant and its position, resisting force, driving force, factor of safety (sliding), eccentricity, max. and min. soil pressure. **Necessary Accessories for HP-41:** Two memory modules. Card Reader and Printer optional.

Steps: 360 HP-41 Bytes: 657

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02171-41-7	$10	$14
FOR HP-71*	02171-71-4	N/A	$16

02172 Smooth

by B.A. Fairbank, San Antonio, TX

This program comprises 24 interrelated menu-driven programs which smooth data sets, such as time series data, of up to 80 values. SMOOTH includes six main smoothers, several subsidiary operations, and supporting programs for I/O. Application areas include all behavioral, natural, and social sciences, plus business, medicine, and economics. **Necessary Accessories for HP-41:** 41CV or Quad module needed. Card Reader and Printer suggested.

Steps: 657 HP-41 Bytes: 1272

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02172-41-5	$10	$16
FOR HP-71	NOT AVAIL		

02173 Ph of 13 Different Cases

by M.V. Barbero, Sevilla, Spain

This program calculates the pH of 13 different acid/base equillbriums: weak acid + strong base; moderately strong acid; weak acid; strong acid; strong acid + weak base; strong base; weak acid + weak base; weak base; moderately strong base; weak acid + weak acid; semineutralized weak acid; diprotic acid; weak base + weak base. The program uses a theory called "the condition of the proton". It is very quick and it has a good exactness. **Necessary Accessories for HP-41:** One memory module

Steps: 271 HP-41 Bytes: 729

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02173-41-3	$10	$14
FOR HP-71*	02173-71-0	N/A	$16

02174 Basic 1.0 - System

by N. Bittner, Grolsheim, GERMANY

With these three programs, you can execute basic-programs on your HP-41C/CV. **Necessary Accessories for HP-41:** HP-41C: Quad-RAM and Printer. Card Reader optional.

Steps: 2455 HP-41 Bytes: 4801

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02174-41-1	$10	$32
FOR HP-71	NOT AVAIL		

02175 Spherical Right, Quadrantal and Isosceles Triangles

by G.M. Halpern MD, Honolulu, HI

This program solves all Spherical Right, Quarantal & Isosceles Triangles. It uses the 10 fundamental rules for solving Right Spherical Triangles and prompts for (Sides a, b, c) (Angles A, B, C). If the given side or angle is greater than zero, it will be printed, otherwise the display shows the next side/angle to be entered. Once all known factors are entered, XEQing the proper label will initiate calculation and print-out of the unknowns. **Necessary Accessories for HP-41:** HP-41C with Quad Module or HP-41CV, Card Reader, Printer

Steps: 770 HP-41 Bytes: 1595

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02175-41-8	$10	$18
FOR HP-71	NOT AVAIL		

02176 Extended Functions Extended

by E.M. Keefe, Ankeny, IA

This package is a series of programs that demonstrate some of the many possible uses of the Extended Functions Module. With these programs you can control up to 2000+ flags, move and swap blocks of registers indirectly, create a calculator with a very fast extended stack and an easy-to-use complex number stack, clear specified blocks of registers quickly and give the HP-41 a new display format: FIX-ENG. **Necessary Accessories for HP-41:** Extended Functions/Extended memory module + one memory module

Steps: 429 HP-41 Bytes: 1171

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02176-41-6	$10	$16
FOR HP-71	NOT AVAIL		

02178 Maximum Absolute Positive Moment Under 18 Moving Loads

by P.d.S. Mourao, Belo Horizonte, Brasil

A 1 to 18 train load runs over a 1 to several continuous spans. User chooses 1 span and gets the output: 1) The maximum absolute positive moment; 2) The abscissa where it occurs; 3) Related position of the train (also available the left reaction). First part runs a single span, and second part takes into account two neighboring spans, decreasing previous moment. **Necessary Accessories for HP-41:** Two memory modules

Steps: 407 HP-41 Bytes: 933

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02178-41-2	$10	$14
FOR HP-71*	02178-71-9	N/A	$16

02179 Spiral Offsets and Deflections

by M. Shrout, Greeley, CO

Given the overall length of a highway spiral and the spiral angle, will find either tangent offsets, or deflection and distance, from the T.S/S.T. to any point on the spiral, or both. **Necessary Accessories for HP-41:** None

Steps: 136 HP-41 Bytes: 0343

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02179-41-0	$10	$12
FOR HP-71*	02179-71-7	N/A	$14

02180 EDM Topog Reduction

by M. Shrout, Greeley, CO

Reduces EDM topography from angle/distance to station and offset left/right relative to a centerline or baseline. EDM can be on CL or on a point either left or right of CL. Backsight can be ahead or back, or to the point from which EDM is located from CL. **Necessary Accessories for HP-41:** None

Steps: 127 HP-41 Bytes: 270

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02180-41-8	$10	$12
FOR HP-71*	02180-71-5	N/A	$14

02181 Profit Sharing Allocation

by J.N. Albritton, Montgomery, AL

This program provides the allocations of an integrated or non-integrated profit-sharing or money purchase pension plan. It is useful in the preparation of Form 5302 for filing with the Internal Revenue Service and for plan design, especially in determining the proper or best integration level for a particular participant group. This program will handle up to 25 above integration level participants and the remainder of the participants as a group as found on Form 5302. **Necessary Accessories for HP-41:** One memory module. Card Reader and Printer optional.

Steps: 203 HP-41 Bytes: 471

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02181-41-6	$10	$13
FOR HP-71*	02181-71-3	N/A	$14

02183 Component Reliability

by D.P. Brooks, Dayton, OH

This program develops component to full system reliability given circuit type (parallel/series) and mean time between failures or component reliability if known. It uses a building block technique. **Necessary Accessories for HP-41:** None

Steps: 128 HP-41 Bytes: 325

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02183-41-2	$10	$12
FOR HP-71*	02183-71-9	N/A	$14

02184 8085 Disassembler

by G.K. Ziran, Frankfurt/Main, W. Germany

This program disassembles machine-coded programs of the 8080/8085 microprocessor. Program listings are printed and contain address, hex-code and mnemonic. Printing of data lists is possible. Also calculates length of disassembled routines. **Necessary Accessories for HP-41:** Printer and X-Functions Module and Quad RAM for HP-41C

Steps: 794 HP-41 Bytes: 1834

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02184-41-0	$10	$19
FOR HP-71*	02184-71-7	N/A	$22

02185 M/M/S Queue Characteristics

by W.P. Hannah, Monterey, CA

Selected steady state characteristics are calculated for the multiple server queue with Poisson arrivals and exponential service rates (M/M/S). Calculated characteristics are: traffic intensity, expected queue and system lengths, expected times in queue and system, probability of idle servers, probability of waiting for service, and probability that system length is between any two given numbers. Highly readable printed output is produced. An option is programmed for use without a printer and instructions provided to eliminate the print related. **Necessary Accessories for HP-41:** Two memory modules; Printer (82162A) optional. No modules if program is reduced (instructions provided) to elminate print portions.

Steps: 497 HP-41 Bytes: 1002

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02185-41-7	$10	$15
FOR HP-71	NOT AVAIL		

02186 Concrete Foundations For Lightning Fixtures Support Columns

by E.M. Vazquez, San Isidro, Argentina

This program permits an easy and fast computation of foundations employed to support steel column in lightning systems. Both 'round' and 'square' columns with symmetrical or not top loads are covered and general theory of this system is explained as part of a 21 page documentation set. Program is 622 bytes (89 registers) long, employs size 016 and is recorded in three cards. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 298 HP-41 Bytes: 622

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02186-41-5	$10	$13
FOR HP-71*	02186-71-2	N/A	$14

02187 Listing of Data of Harmonics of Pulses

by W. Bican, Vienna, Austria

Program calculates for given parameters - pulselength, pauselength, amplitude and highest wanted harmonic - following data: Harmonic number, amplitude of the harmonic and phase-angle phi and lists them in the same order. **Necessary Accessories for HP-41:** One memory module, and Printer. Card Reader optional.

Steps: 242 HP-41 Bytes: 469

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02187-41-3	$10	$13
FOR HP-71*	02187-71-0	N/A	$14

02191 US-Horizontal Curve With Unequal Length Spirals

by M. Shrout, Greeley, CO

Solves horizontal curve with different length spiral on each end. This program can use "PCURSTA", User's Library program number 01945C. **Necessary Accessories for HP-41:** One memory module

Steps: 310 HP-41 Bytes: 617

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02191-41-5	$10	$13
FOR HP-71*	02191-71-2	N/A	$14

02192 Solar Time To/From Local Time

by R.A. Green, MS State, MS

Given local longitude, standard meridian, day and month this program will perform the conversion between local and solar time. Daylight savings time is considered. **Necessary Accessories for HP-41:** None

Steps: 122 HP-41 Bytes: 752

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02192-41-3	$10	$12
FOR HP-71*	02192-71-0	N/A	$14

02193 Atmospheric Conditions

by P.L. Graves, Palos Verdes Estates, CA

This program solves for temperature in Fahrenheit and Celsius, pressure in PSI and inches of mercury, density, speed of sound, density altitude and sigma using altitude and temperature conditions as input. This program accepts standard day, ISA + nn, and fixed temperature inputs. **Necessary Accessories for HP-41:** None

Steps: 130 HP-41 Bytes: 304

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02193-41-1	$10	$12
FOR HP-71*	02193-71-8	N/A	$14

02194 Temperature Correction Filters

by P. Cooper, Melbourne, Australia

Given the colour temperature of the film and the temperature of the light source, the program calculates the mired shift required, the mired filter to give that shift, and the wratten filter equivalents. Very useful for mixing film and light sources. **Necessary Accessories for HP-41:** One memory module

Steps: 120 HP-41 Bytes: 283

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02194-41-9	$10	$12
FOR HP-71*	02194-71-6	N/A	$14

02195 TV Plotting a First Approximation

by E.M. Keefe, Ankeny, IA

dTVP" is a very low resolution plotting routine for the HP 82163A Video Interface. The user codes the function to be plotted and then runs "TVP". The range of "x" is prompted for and the values and range of "y" are computed and displayed. Final output is an unlabelled "dot-sketch" (31x15) of the function on the video screen. Better resolution is sacrificed in the interest of having something happening on the video screen: deemed more desirable for demonstration and/or classroom use. **Necessary Accessories for HP-41:** HP-IL module, Video Interface and one memory module

Steps: 169 HP-41 Bytes: 322

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02195-41-6	$10	$12
FOR HP-71*	02195-71-3	N/A	$14

02196 Statistical Budgets

by E.M. Vazquez, San Isidro, Argentina

In the business practice there is a permanent truth: 'actual costs never coincide with budget costs'. In fact there is a zero probability that both costs may be equal. Many facts generate the difference and are more convenient to handle the concept of work/project cost as a variable instead of an absolute value. This program takes advantage of this concept and permits a very practical 'most probable cost' determination. **Necessary Accessories for HP-41:** Printer optional

Steps: 103 HP-41 Bytes: 206

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02196-41-4	$10	$11
FOR HP-71*	02196-71-1	N/A	$12

02197 Simultaneous 1st Order Difeq

by J.P. Testa, Minot AFB, ND

Program solves one to nine simultaneous first order differential equations by 4th order Runge-Kutta method. User can choose interval of change of X as well as the number of steps to that X. **Necessary Accessories for HP-41:** Program requires at least two memory modules. Printer is optional.

Steps: 291 HP-41 Bytes: 0871

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02197-41-2	$10	$15
FOR HP-71*	02197-71-9	N/A	$18

02198 Propagation Path Loss

by C.L. Fruchter, Annandale, VA

This program calculates the mean path loss between two antennas over irregular terrain (land or water). The user is prompted for all data and data tables are provided. The user can also calculate the path loss not exceeded between 10% and 90% of the time and plot the loss as a function of distance if a printer is available. For frequencies of 20 MHz or higher. **Necessary Accessories for HP-41:** HP-41CV. Card Reader or Digital Cassette Drive recommended

Steps: 2914 HP-41 Bytes: 9436

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02198-41-0	$10	$38
FOR HP-71	NOT AVAIL		

02199 Process Capability Study: Data Collect, Store, and Histogram

by D.C. Peckham, Berea, KY

Process capability studies can be performed on approximately seventy (70) dimensions simultaneously. The HP-41 that uses this program is assumed to be totally dedicated to this program. Data is collected in random order by part number, dimension, and date. Two data collection modes are provided: one for occasional user; one for experienced user. Data is easily edited and sorted into permanent files. Statistical analysis, histogram, and data listing are requested by part number and dimension. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC. **Necessary Accessories for HP-41:** Quad-Memory, X-Function Module, Cassette Drive 82161A, Printer 82162A. Time Module optional but recommended.

Steps: 2295 HP-41 Bytes: 5418

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02199-41-8	N/A	$20
FOR HP-71	NOT AVAIL		

02200 Budget Managing and Projecting System

by D.V. Wright, Ovideo, SPAIN

B-MAPS is a Cassette Drive based system that automatically and totally manages a User-defined file system that perfectly matches his budget estate. The budget estate can be composed of up to twenty accounts including multiple checking, saving, loans, and stocks. Interest accruements, loan amortizations, direct deposits/withdrawals, and stock purchases can be handled as single or repeating time events. "What-if" projections can be made without losing the base budget estate. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK. **Necessary Accessories for HP-41:** Quad Module (or CV), Extended Functions Module, Cassette Drive. Printer highly recommended.

Steps: 1356 HP-41 Bytes: 2888

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02200-41-4	N/A	$20
FOR HP-71	NOT AVAIL		

02201 Calculation For Head Loss and Centrifugal Pump

by J. Huang, Corvallis, OR

This program is designed to determine the pressure drop within the transmission line and its equivalent length. It will also determine the friction and the velocity in the pipe line. Most importantly, a program that calculates the discharge pressure for the pump has been added. So that the user may calculate the head loss in the pipe line and calculate the pressure from the pump for a specific segment of the pipe line directly, or separately. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC. **Necessary Accessories for HP-41:** X-Function/Memory module, 82161A Digital Cassette Drive, 82162A Thermal Printer, Quad module or CV

Steps: 848 HP-41 Bytes: 2233

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02201-41-2	N/A	$20
FOR HP-71	NOT AVAIL		

02202 National Structure Inventory & Appraisal Sufficiency Rating

by A.J. Rhodes, Jefferson City, MI

This program can be used to obtain a numerical rating of a bridge based on its structural adequacy and safety, serviceability and functional obsolescence, and essentiality for public use. The parameters used are the same for all states and approved by the American Association of State Highway and Transportation officials. **Necessary Accessories for HP-41:** Quad Memory Module; Extended Function/Memory Module

Steps: 808 HP-41 Bytes: 1429

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02202-41-0	$10	$17
FOR HP-71*	02202-71-7	N/A	$20

02203 Manual Electronic Flash Calculator

by P.R. Wearn, Fairfield, CT

Program calculates any of the following variables; F/Stop; Flash-to-subject distance; power output ratio (if available) assuming at least one of the variables is known. Allowance can be made for on-flash accessories such as filters, wide-angle diffusers and telephoto attachments provided the manufactures filter factor is known. **Necessary Accessories for HP-41:** None

Steps: 139 HP-41 Bytes: 289

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02203-41-8	$10	$12
FOR HP-71*	02203-71-5	N/A	$14

02204 Fix from Two Objects

by D.M. Daniel, Pensacola, FL

Program uses two simultaneous compass bearings on two charted objects to compute the vessel's position at the time of the observation. **Necessary Accessories for HP-41:** None

Steps: 161 HP-41 Bytes: 288

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02204-41-6	$10	$11
FOR HP-71*	02204-71-3	N/A	$12

02205 Sumner Line of Position

by D.M. Daniel, Pensacola, FL

From a single observation of the sun giving GHA, Dec & HO together with the DR Lat, program finds corresponding longitude. Assume a second Lat (10' or 20' more or less than the DR Lat) and get a second corresponding longitude for the other end of the LOP. Note: Program is set to run with Flag 21 clear but will accept Printer without change. It runs equally well with Flag 21 set and Printer on. **Necessary Accessories for HP-41:** None

Steps: 103 HP-41 Bytes: 198

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02205-41-3	$10	$11
FOR HP-71*	02205-71-0	N/A	$12

02206 Mercator Sailing

by D.M. Daniel, Pensacola, FL

Given the Starting Position (L1 & L01) and the destination (L2 & L02), program will compute the TRUE Course and the Distance. If given the starting position and the TRUE Course and distance, it will compute the destination position (L2 & L02). It will cross the Equator and the two meridians of the International Date Line and of Greenwich. Note: While program is set to run with Flag 21 clear, it is also set to run with a printer without any changes necessary. It runs equally well with Flag 21 clear or set - see sample run on page 6 of program documentation. **Necessary Accessories for HP-41:** One Memory Module

Steps: 235 HP-41 Bytes: 413

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02206-41-1	$10	$12
FOR HP-71*	02206-71-8	N/A	$14

02207 Formula Calculation From a Mineral Analysis

by H.R. Ballard, Dunedin, New Zealand

The program determines, from an oxide weight mineral analysis, a chemical formula on the basis of a given number of anions, e.g., O, OH, F, Cl, S. "Modular" subroutines allow rapid insertion or deletion of specific elements to tailor the program to user's needs or calculator memory capacity. **Necessary Accessories for HP-41:** One or more memory modules - depending upon the number of elements included in program.

Steps: 276 HP-41 Bytes: 619

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02207-41-9	$10	$13
FOR HP-71*	02207-71-6	N/A	$14

02208 Grand Traverse or Round 'Square' Robin

by D.M. Daniel, Pensacola, FL

Given the True Course, vessel speed, variation and deviation, program computes Compass Course and Speed Made Good. Then given the starting position, time of start and desired arrival time, it computes the new position (DR). It also keeps track of cumulative distance. Program is unique in that it will 'run down the latitude' with ease. It should be excellent for a Predicted Log Contest. **Necessary Accessories for HP-41:** One memory module

Steps: 241 HP-41 Bytes: 365

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02208-41-7	$10	$13
FOR HP-71*	02208-71-4	N/A	$14

02209 Rhumb Line Sailing

by D.M. Daniel, Pensacola, FL

Given the starting and destination coordinates, program computes Course and Distance. When given new destination coordinates program uses former destination coordinates as new starting coordinates and computes course and distance for that leg. Sums leg distance for total distance. Will do any number of legs. **Necessary Accessories for HP-41:** None

Steps: 167 HP-41 Bytes: 281

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02209-41-5	$10	$12
FOR HP-71*	02209-71-2	N/A	$14

02210 Signs - A Fast and Versatile Banner Program

by R.E. Swanson, Portland, OR

With this program, signs are printed at the rate of six 9-row characters per minute (more than 80 percent of maximum print rate). 56 banner characters are accessible from the Alpha keyboard. Five prompts allow selection from 7 print modes: Half-/Full-Height; Normal/Inverse; Align/Random; Self-/Common- Fill, i.e., a matching, else a common fill-character chosen by the user. **Necessary Accessories for HP-41:** Quad Memory, Extended Functions Module, HP 82143A or 82162A Printer

Steps: 824 HP-41 Bytes: 1945

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02210-41-3	$10	$19
FOR HP-71*	02210-71-0	N/A	$22

02211 Road Grade Computer

by R.T.J. Martin, Jacksonville, NC

Program computes stations and elevations for symmetrical and unsymmetrical vertical curves and also for straight grades. For vertical curves, program will compute turning point station and elevation. Will solve for station elevation or if a station interval distance is inputed, program will automatically output successive stations and elevations until end or pvt. station is output. Data is output in standard form: STA=12+56.67 not 1256.67! **Necessary Accessories for HP-41:** One memory module. Card Reader and Printer optional.

Steps: 207 HP-41 Bytes: 434

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02211-41-1	$10	$12
FOR HP-71*	02211-71-8	N/A	$14

02213 Tacan Point to Point With in Flight Wind Calculations

by E. Finley, Kingsville, TX

This program computes course, distance and wind corrected headings, ETE and ETA to a tacan or VOR/DME defined destination. Easy in flight updating of present position is provided, and when updated the wind and ground speed are calculated. A global label is provided for the wind triangle subroutine for use by other programs. **Necessary Accessories for HP-41:** Time Module and one memory module

Steps: 272 HP-41 Bytes: 508

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02213-41-7	$10	$13
FOR HP-71	NOT AVAIL		

02214 Close Up and Depth of Field Solutions

by T.M. Green, Lopez, WA

Program calculates the distance, from either camera lens or film plane, to an object so that it will exactly fill the film and calculates the close-up exposure correction, both numerically and as an f stop correction. It also calculates depth of field for any circumstances and the hyperfocal distance. **Necessary Accessories for HP-41:** None, but will print output if printer is available

Steps: 126 HP-41 Bytes: 345

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02214-41-5	$10	$12
FOR HP-71*	02214-71-2	N/A	$14

02215 Sortcon

by S.J. Breese, Monee, IL

This program will take dimensions from a drawing, put them in numerical order (low to high) and convert them from inches to millimeters or millimeters to inches. Duplicate dimensions are ignored and only printed once on the printout. All columns have aligned decimal points. The printout is suitable for attachment to the drawing. **Necessary Accessories for HP-41:** Printer. Basic calculator will sort 7 numbers, add 64 numbers per memory module.

Steps: 173 HP-41 Bytes: 396

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02215-41-2	$10	$12
FOR HP-71*	02215-71-9	N/A	$14

02216 Continuous Beam Analysis

by B.R. Townsend, Orlando, FL

Program analyzes continuous beams with constant I, one to ten spans. Input beam parameters, including fixed, free, or cantilevered ends, any combination of linear and concentrated loads. Program internally calculates reactions, fixed-end moments, distribution factors, outputs moments and shears at each support. Loadings and output fully documented. **Necessary Accessories for HP-41:** Quad Memory Module and Printer

Steps: 809 HP-41 Bytes: 1696

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02216-41-0	$10	$18
FOR HP-71*	02216-71-7	N/A	$22

02217 Continuous Miner Productivity

by P. Rushworth, Lakewood, CO

Program requires user-specific data pertaining to tons per foot of advance and average mine productivity per shift. Various entry configurations and ranges of cutting heights may be evaluated. Output is time in shifts and production in tons given length of entry and cutting height. **Necessary Accessories for HP-41:** One memory module and Printer

Steps: 198 HP-41 Bytes: 434

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02217-41-8	$10	$12
FOR HP-71*	02217-71-5	N/A	$14

02218 Fire Resistance of Protected Steel Columns

by T.F. Heausler, New Orleans, LA

Program uses the American Iron and Steel Institutes' accepted methods for calculating the fire resistance of protected steel columns predicated on the ASTM E119 Fire Exposure Standard. Program handles wide flange, tubular and pipe columns protected with Gypsum Wallboard, cementitious or mineral fiber spray and regular or lightweight concrete encasement. **Necessary Accessories for HP-41:** One memory module or equivalent space

Steps: 304 HP-41 Bytes: 699

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02218-41-6	$10	$14
FOR HP-71*	02218-71-3	N/A	$16

02219 Finned Heat Sink Thermal Resistance

by P. Ebert, Goleta, CA

This program calculates the thermal resistance and temperature rise for a straight fin heat sink under free convection conditions. The radiation treatment accounts correctly for fin shielding effects, and convection is calculated on the basis of a recent correlation developed specifically for this geometry, with all properties evaluated at the actual operating temperature. **Necessary Accessories for HP-41:** Two memory modules

Steps: 640 HP-41 Bytes: 891

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02219-41-4	$10	$14
FOR HP-71*	02219-71-1	N/A	$16

02220 Phosphate Buffer Composition

by T. Langland, Phoenix, AZ

This program computes the concentrations of mono- and dibasic phosphate salts required for preparation of buffers of desired pH and total phosphate concentration at 25 degrees Celcius. This program also permits compensation for the presence of other neutral electrolytes in solution and their effect they will have on the apparent pK2 of phosphate. **Necessary Accessories for HP-41:** None

Steps: 111 HP-41 Bytes: 181

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02220-41-2	$10	$11
FOR HP-71*	02220-71-9	N/A	$12

02221 Manifold Multiple Pipe Sizing

by W.H. Thomson, Bakersfield, CA

Program calculates headloss in PVC manifold supplying laterals in drip and micro-sprinkler systems using Darcy-Weisbach formulas. Changes pipe sizes when headloss gradient is equaled or exceeded. Equations and theory by J. Keller & G. Watters from Utah State University and Papers of ASAE and Rainbird "Trickle Irrigation Design" by J. Keller. Program also gives total cost, total HL and total GPM. Fully prompted. **Necessary Accessories for HP-41:** Printer

Steps: 275 HP-41 Bytes: 554

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02221-41-0	$10	$14
FOR HP-71	NOT AVAIL		

02222 Jewish-Common Era Calendar Conversions

by W.E. Hitchins, Los Angeles, CA

Converts between dates on the Jewish calendar and the Julian/Gregorian calendar. Provides days between dates, Julian day, date of a given number of days before or after a known date, day of week, and converts Julian day to both Jewish and Julian/Gregorian date. Valid from Jan. 1, 1 to Feb. 28, 4904 C.E. (A.D>) or Tebet 16, 3761 to Adar 6, 8664 A.M. **Necessary Accessories for HP-41:** Quad Module; Extended Functions/Memory Module. Printer optional.

Steps: 1012 HP-41 Bytes: 1910

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02222-41-8	$10	$19
FOR HP-71	NOT AVAIL		

02224 Development Calculator For Black and White Films

by D. Hodges, Pinner, England

This program enables a photographer to perform calculations involving development time, temperature and negative contrast when processing black- and-white films. The routine uses the method of interchangeable solutions, and may also be used to determine the development number for a particular film/developer combination. **Necessary Accessories for HP-41:** None

Steps: 111 HP-41 Bytes: 188

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02224-41-4	$10	$11
FOR HP-71*	02224-71-1	N/A	$12

02228 Random Vibration

by E. Batikoff, Rehovot, Israel

This program calculates the resulting RMS' acceleration stress in a body subjected to random vibration. The parameters of the calculation range are entered by defining the frequency range zone by zone the acceleration spectral density of each zone and the slope. Undefined frequencies or spectral densities are deduced by the program by prompting for parameters of adjoining zones. **Necessary Accessories for HP-41:** None

Steps: 189 HP-41 Bytes: 374

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02228-41-5	$10	$12
FOR HP-71*	02228-71-2	N/A	$14

02229 Video Cursor Control and Text-Writing Routines

by R.E. Swanson, Portland, OR

This program has 24 routines to automate the 1) sending of escape sequences to the video interface (position cursor, scroll through display memory, clear display), and 2) text printing in u.c./l.c. & normal/inverse modes. Alpha cells may be loaded directly, or indirectly from character codes in stack. All routines may be executed manually, are fully subroutinable, and are optimized for execution time. Documentation includes numerous examples. **Necessary Accessories for HP-41:** HP-IL module, Video Interface, X-Functions Module, Moniter

Steps: 183 HP-41 Bytes: 563

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02229-41-3	$10	$13
FOR HP-71	NOT AVAIL		

02231 Third Order Ricatti Equation

by A.G. Thompson, Adelaide, SOUTH AUSTRALIA

This program determines the optimal feedback coefficients to minimize a performance index for a third order regulator. The algebraic matrix Ricatti equation is solved by a convergent iterative method. The system state equations must be transformed to phase-variable form for solution. The program is restricted to single-input systems. **Necessary Accessories for HP-41:** One memory module

Steps: 206 HP-41 Bytes: 322

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02231-41-9	$10	$12
FOR HP-71*	02231-71-6	N/A	$14

02232 Tide Calculations Heights, Time & Depth of Water to Low Tide

by A.J. Seper, Manaimo, CANADA

Input the tide tables and the program will calculate the height of tide at any specified time between high and low water. Also the time at which any specified height is reached can be calculated. If a sounder reading and its time are inputted the depth of water at low tide is calculated. This is a useful feature for the yachtsman. A display routine is included. **Necessary Accessories for HP-41:** None

Steps: 186 HP-41 Bytes: 407

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02232-41-7	$10	$12
FOR HP-71*	02232-71-4	N/A	$14

02233 Polynomial Interpolation With the Divideo Difference Table

by M. Tremblay, Ste-Foy, Canada

This program will interpolate a polynomial of maximum degree 19 (Quad or 41CV) with the divided difference table computed from the initial points. Every term of the table is computed/displayed and the polynomial is found rapidly in its Newton form. Any starting point can be changed and polynomial thus recomputed/evaluated. **Necessary Accessories for HP-41:** One memory module

Steps: 271 HP-41 Bytes: 446

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02233-41-5	$10	$12
FOR HP-71*	02233-71-2	N/A	$14

02235 Bowl: A Football Game For the HP-41

by J.W. Dyer, Decatur, GA

This is the "Cadillac" of calculator football games. Play football against another player or against the HP-41. The HP-41 is a smart opponent and difficult to beat. Current down, yards to go and field position, as well as probability are factors in the HP-41's play selection. The two-player game is a gripping contest of strategy and nerves. **Necessary Accessories for HP-41:** Quad memory or HP-41CV. Card Reader or Wand are recommended.

Steps: 971 HP-41 Bytes: 2128

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02235-41-0	$10	$20
FOR HP-71*	02235-71-7	N/A	$24

02237 Fourth-Order Ricatti Equation

by A.G. Thompson, Adelaide, SOUTH AUSTRALIA

The optimal feedback gains to minimize a quadratic performance index for a fourth order regulator are determined by this program. The state equations for the system must be transformed to phase-variable form. The matrix Ricatti equation is solved using a convergent iterative method. The program is restricted to single-input systems. **Necessary Accessories for HP-41:** None

Steps: 280 HP-41 Bytes: 467

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02237-41-6	$10	$13
FOR HP-71*	02237-71-3	N/A	$14

02238 Estimation of Left-Turn Capacity

by R.H. Grabowski, New Westminster, CANADA

Quickly estimate the left-turn capacity of a signalized intersection, which does not have a left-turn phase, and either has or has not a left-turn bay. Variables input by user are only: number of approach lanes; opposing volume; cycle, green, and amber lengths. May require slight modification for other cities. **Necessary Accessories for HP-41:** None

Steps: 158 HP-41 Bytes: 308

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02238-41-4	$10	$12
FOR HP-71*	02238-71-1	N/A	$14

02239 Root N and Complex Root of a Complex Number

by M.V. Barbero, Sevilla, Spain

This program calculates the root N and the complex root of a complex number. The inputs and outputs of the first problem are available in rectangular and trigonometric form. The N roots are computed. Quick execution time. **Necessary Accessories for HP-41:** None

Steps: 143 HP-41 Bytes: 262

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02239-41-2	$10	$12
FOR HP-71*	02239-71-9	N/A	$14

02241 Sixth Order Vented - Box Design from Loudspeaker Parameters

by D.T. McGillicuddy, Wrentham, MA

Given the expected Q of the vented-box, and the Thiele/Small parameters of a loudspeaker driver, the program finds the box volume and tuning, auxiliary filter frequency and Q, the system cutoff frequency, and estimates the acoustic power output, for the three classes of sixth-order Thiele/Small/ Benson alignments. **Necessary Accessories for HP-41:** Three memory modules (or Quad Memory) and Printer.

Steps: 867 HP-41 Bytes: 1428

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02241-41-8	$10	$17
FOR HP-71*	02241-71-5	N/A	$20

02242 Survival Analysis by the Actuarial Life-Table Method

by R.D. Moses, Bethesda, MD

This program enables one to construct actuarial survival curves by the life-table method. It uses input data in standard life-table format, and produces for each time interval cumulative survival probability and its standard error. **Necessary Accessories for HP-41:** One memory module

Steps: 103 HP-41 Bytes: 0217

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02242-41-6	$10	$12
FOR HP-71*	02242-71-3	N/A	$14

02243 Distance off Great Circle Track

by D.M. Daniel, Pensacola, FL

Program finds Great Circle Initial Course and Distance. To a Point(3) off Track it will find the closest point thereto on Course (Lx & LOx) and the course and distance from there to Point 3 (Cx3 & Dx3). Also finds distance from Departure to Point X and the percentage of the trip. Program works just as well for Air as for Sea. It is unique in that it saves hundreds of steps by varying the contents of registers and using the same 43 step routine for ten different equations. **Necessary Accessories for HP-41:** One memory module

Steps: 318 HP-41 Bytes: 508

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02243-41-4	$10	$13
FOR HP-71*	02243-71-1	N/A	$14

02244 Heat Loss From Insulated Pipelines

by F.M. Shoemaker, Bellingham, WA

Program calculates heat loss (watts/ft) for pipelines with up to four insulation layers of varying thickness and conductivities. **Necessary Accessories for HP-41:** One memory module and Printer.

Steps: 254 HP-41 Bytes: 563

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02244-41-2	$10	$13
FOR HP-71*	02244-71-9	N/A	$14

02245 Helicoidal Beams (Staies) Analysis

by A. Dusan, Belgrade, YUGOSLAVIA

This program solves all redundants at midspan of a uniformly loaded helicoidal girder-beam fixed at its ends. After that, the program solves and plots sectional forces at any section demanded by user. Input data are: Radius of girder, depth, width, story height, angle between midspan's section and support and value of uniform load. Output are: section forces at any section between midspan and support. **Necessary Accessories for HP-41:** None

Steps: 491 HP-41 Bytes: 835

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02245-41-9	$10	$14
FOR HP-71*	02245-71-6	N/A	$16

02246 Biorhythm Plot/Print

by S. McIntosh, Cankaya, Ankara, TURKEY

This program plots or prints the three biorhythm cycles for any number of days during any months from March 1900 to February 2100. **Necessary Accessories for HP-41:** 82143 Printer and one memory module

Steps: 184 HP-41 Bytes: 393

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02246-41-7	$10	$12
FOR HP-71	NOT AVAIL		

02247 Moment Distribution Around a Box Frame

by R.J. Rockefeller, Savannah, GA

This program was written to handle the frequently encountered situation in which four walls support each other by distributing loads horizontally rather than vertically. It distributes moment around a box shaped frame after fixed end moments and member geometry are input. Output are the final moments at each end of each member. **Necessary Accessories for HP-41:** One memory module

Steps: 212 HP-41 Bytes: 333

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02247-41-5	$10	$12
FOR HP-71*	02247-71-2	N/A	$14

02248 Beam Design

by J.A. Beyers, Marietta, GA

This program can be used to pick and size a beam according to AISC specs. Eighth edition having the following requirements. Types of loads: 1) Distributed 2) Concentrated or 3) Implied moments. Types of connections: 1) Simply supported 2) Fixed one end supported on other or 3) Fixed both ends. **Necessary Accessories for HP-41:** 41CV or 41C W/Quad module, Card Reader. Printer optional.

Steps: 949 HP-41 Bytes: 1764

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02248-41-3	$10	$18
FOR HP-71*	02248-71-0	N/A	$22

02249 Calendar Events by Month (Events)

by J.E. Kjemtrup, Los Gatos, CA

Scans, calculates and neatly prints holidays (from a list of 27) within any user selected YEAR/MONTH. Also checkmarked monthly calendar, complete annual Gregorian or Julian calendar, and finally program extensions for birthdays, anniversaries, dates to remember, etc., using RSUB. **Necessary Accessories for HP-41:** HP-41CV or 4 memory modules, Card Reader and Printer

Steps: 970 HP-41 Bytes: 3408

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02249-41-1	$10	$24
FOR HP-71	NOT AVAIL		

02250 Actual Rate of Return

by C. Langin, Centralia, IL

Given the dollar amount of income, number of days in month, beginning balance of investment, and daily changes in the amount of the investment, computes the annual rate of return compounded daily for one month. Use to analyze and compare cash flow strategies, MMF's and other investments. **Necessary Accessories for HP-41:** One memory module

Steps: 268 HP-41 Bytes: 611

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02250-41-9	$10	$13
FOR HP-71*	02250-71-6	N/A	$14

02251 PHRF Race Results

by G.T. Neily, Duncan, CANADA

Program "LOAD" segment prompts for Sail Number, Division (up to 6), PHRF rating. Rating and DIV. of up to 105 Yachts is entered once. "RESULTS" segment prompts for race course data, then sail number and finish times. A bubble "SORT" is done. Output lists each Yacht, DIV, corrected time from fastest to slowest. **Necessary Accessories for HP-41:** Card Reader optional

Steps: 220 HP-41 Bytes: 612

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02251-41-7	$10	$13
FOR HP-71	NOT AVAIL		

02253 Inventory

by P. Heidrich, Rheinstetten 2, West Germany

The program enables you to handle all the data which you need to make your inventory. You can create a file on tape where you can store all your articles, search one, change one, delete one, make input of the actual quantity of articles you have and to print a list where you can see: article number, article name, cost price, sales price, profit, quantity, new quantity, number of sold articles and articles you must order. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK. **Necessary Accessories for HP-41:** HP-41CV; X-Function Module; X-Memory Modules optional; Cassette Drive; HP82905B Matrix Printer.

Steps: 620 HP-41 Bytes: 1584

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02253-41-3	N/A	$20
FOR HP-71	NOT AVAIL		

02255 Polynomial Interpolation I - Progressive Method

by C. Rusquellas, Buenos Aires, Argentina

Given n points, computes a (n-1) order polynomial. You can enter some points in any order, evaluate, add more points, and so on. Fast algorithm, rejects redundant points. One memory module can hold 23 points. Evaluation subroutine can be called from other programs (R00 to R11 not used in evaluation). **Necessary Accessories for HP-41:** One or more memory modules. Card Reader and Printer optional.

Steps: 231 HP-41 Bytes: 0441

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02255-41-8	$10	$12
FOR HP-71*	02255-71-5	N/A	$14

02256 Horizontal Curve Layout by PC Deflection & Short Chord Meth.

by R.T.J. Martin, Jacksonville, NC

Given the following: radius, delta, PC station, road width and offset distance. Output: (1) Centerline curve data (radius, delta, arc, tangent, Pc. & Pt. station). (2) Curve deflection data - at a given station or automatically, given an interval distance until pt. station is outputed. (3) Centerline short chord distance between stations and left and right of centerline - if road width and offset distance are inputed. **Necessary Accessories for HP-41:** One memory module. Card Reader and Printer optional.

Steps: 220 HP-41 Bytes: 0401

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02256-41-6	$10	$12
FOR HP-71*	02256-71-3	N/A	$14

02257 Airfoil Coordinate Data Generation

by W. Louie, Brooklyn, NY

Given any chord length, this program calculates upper, lower, and mean camber line coordinates, maximum thickness, maximum camber, position of maximum camber, and stations along the chord for N.A.C.A. 4 and 5 digit series airfoils. Inputs are in percent chord, as per N.A.C.A. standards. Output is on the printer in tabular form with headings and/or titles. Data can be saved on two magnetic cards. **Necessary Accessories for HP-41:** Quad Module or HP-41CV, Printer, Card Reader helpful.

Steps: 319 HP-41 Bytes: 0896

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02257-41-4	$10	$14
FOR HP-71*	02257-71-1	N/A	$16

02258 Bessel Polynomials

by T. Van Nguyen, Stockton, CA

This program computes the coefficients b subscript n of complex Bessel polynomial of order n for n less than or equal to 11. For n equals 11, b subscript 0 equals b subscript 1 equals 13, 749, 310, 575 which exceeds the number of digits that can be displayed on the HP-41C. When the program is executed, simply input the order N, and all the coefficients from b subscript 0 to b subscript n will be displayed. **Necessary Accessories for HP-41:** None

Steps: 78 HP-41 Bytes: 0141

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02258-41-2	$10	$11
FOR HP-71*	02258-71-9	N/A	$12

02259 Date: Counting by Weekdays

by W.E. Hitchins, Los Angeles, CA

Calculates the date and day of the week for a given number of weekdays before or after a given date. Valid from March 1, 1900, through February 28, 2100. May be used as a main program or subroutine. **Necessary Accessories for HP-41:** One Memory Module

Steps: 307 HP-41 Bytes: 0538

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02259-41-0	$10	$13
FOR HP-71*	02259-71-7	N/A	$14

02260 Flow Meas. of V-Notched, Rectangular, or Cipolletti Weirs

by J.G. Cacavias, Savannah, GA

Program calculates flow in CFS through a v-notched, rectangular or cipolletti sharp-crested weir. Parameters are height of flow and geometry of weir. Program also takes into account the number of end contractions for rectangular. **Necessary Accessories for HP-41:** None

Steps: 125 HP-41 Bytes: 0297

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02260-41-8	$10	$12
FOR HP-71*	02260-71-5	N/A	$14

02262 One Way Slabs in Reinforced Concrete

by B.T. Opsahl, Hosle, Norway

The program computes the design load, design bending-moment, bending moment capasity, area of tensile reinforcement for continuous, simply supported and cantilevered one-way slabs. All computation is in "Ultimate Limit State" and is based on "Simplified Computation of Moments". **Necessary Accessories for HP-41:** One memory module

Steps: 239 HP-41 Bytes: 0595

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02262-41-4	$10	$13
FOR HP-71*	02262-71-1	N/A	$14

02264 Numeric Barcode For the 82162A Printer

by M.G. Backe, Deerfield, IL

This program, when coupled with the HP-IL Printer (82162A), will automatically generate numeric barcode. No knowledge of barcode is required of the user. User simply places number in x and executes bar-dta. The program may also be used as a subroutine. **Necessary Accessories for HP-41:** 82160A HP-IL module, 82162A Thermal Printer, Extended Functions module, one memory module if the HP-41C is used.

Steps: 227 HP-41 Bytes: 0386

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02264-41-0	$10	$12
FOR HP-71	NOT AVAIL		

02265 Longitude Solution

by D.M. Daniel, Pensacola, FL

For centuries navigators vainly sought to determine longitude. This program finds longitude in a few minutes by either of two methods: 1) By determining true latitude from a round of star sights the combining meridian angle with GHA to obtain longitude, or 2) by lunar distance method which will give true time and thus true longitude. **Necessary Accessories for HP-41:** Two memory modules

Steps: 525 HP-41 Bytes: 1001

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02265-41-7	$10	$15
FOR HP-71*	02265-71-4	N/A	$18

02266 Great Circle Sailing

by D.M. Daniel, Pensacola, FL

Given starting and destination coordinates, program computes Initial Great Circle Course and Distance; coordinates of the vertex of the Great Circle; coordinates of intermediate points at regular intervals of longitude and the course and distance thereto; and finally the total leg distance as compared to the Great Circle Distance. **Necessary Accessories for HP-41:** One memory module

Steps: 393 HP-41 Bytes: 640

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02266-41-5	$10	$13
FOR HP-71*	02266-71-2	N/A	$14

02267 State Controllable From Dynamic Equations

by E.C. Schmidt, Milo, ME

The dynamic equations of a linear digital control system in the form $x(k+1)=Ax(k)+Bu(k)$ is checked to see if it is state controllable or not. The Q matrix is displayed. Is set up to handle a MxN A matrix and 1 or more columns in the B matrix. **Necessary Accessories for HP-41:** One or more memory modules

Steps: 268 HP-41 Bytes: 0520

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02267-41-3	$10	$13
FOR HP-71*	02267-71-0	N/A	$14

02269 Four-Variable Dynamic Linear Model of US Economy

by R. Belling, Jersey City, NJ

From quarterly government spending and change in money supply, and past values of some endogenous variables, the program computes and adds to its pipeline memory the current values of GNP, interest rate, investment, and consumption. Coefficients used are those of Pindyck and Rubinfeld for the period 1955-1 to 1971-4. **Necessary Accessories for HP-41:** None

Steps: 115 HP-41 Bytes: 0364

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02269-41-9	$10	$12
FOR HP-71*	02269-71-6	N/A	$14

02270 Auto Regressive Power Spectra, Yule-Walker Method

by R.M. Rhodes, Sunnyvale, CA

Computes the Power Spectral Density of a time function using the Levinson- Durbin Algorithm to solve the Yule Walker equations. Solution makes use of recursive relations involving the Autocorrelation function. Method is more efficient then Fourier Transform for small sample sizes. The Akaike Final Prediction Error is calculated to aid in order selection. **Necessary Accessories for HP-41:** Extended Function/Memory Module. Quadram or CV.

Steps: 614 HP-41 Bytes: 1065

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02270-41-7	$10	$15
FOR HP-71	NOT AVAIL		

02271 Badmen at Crooked Tree

by E. Barnatan, Asseret, Israel

The town of Crooked Tree is about to be invaded by a gang of badmen. You have been appointed sheriff (because of your reputation as a dead shot). You and your two sixshooters are all that stands between them and disaster. Vivid graphics. **Necessary Accessories for HP-41:** 2 memory modules. Card Reader optional. If Card Reader or Wand is not available - Extended Functions module is needed.

Steps: 260 HP-41 Bytes: 0887

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02271-41-5	$10	$14
FOR HP-71*	02271-71-2	N/A	$16

02272 Rectangular Tied Concrete Column Interaction Curve Data

by B.R. Townsend, Orlando, FL

Given concrete strength, column size, reinforcing sizes, and reinforcing distribution, this program solves the C.R.S.I. "Universal Strength Design Formulas for Rectangular Tied Columns" for critical points on the load/moment interaction curve. **Necessary Accessories for HP-41:** Quad memory module. Printer optional.

Steps: 1020 HP-41 Bytes: 1946

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02272-41-3	$10	$19
FOR HP-71*	02272-71-0	N/A	$22

02273 Spiralled Curve

by M. Shrout, Greeley, CO

Solves horizontal spiralled curve. Curve based on arc definition. Only inputs are deflection, degree of curvature, and length of spiral. This program can use "Pcursta", Users' Library #01945C, to print curve stations. **Necessary Accessories for HP-41:** One memory module. Printer recommended.

Steps: 232 HP-41 Bytes: 0455

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02273-41-1	$10	$13
FOR HP-71*	02273-71-8	N/A	$14

02274 Complex Exponential Integral by Continued Fractions

by S.H. Tedder, Tulsa, OK

EKZ computes the complex exponential integral from a continued fraction representation, to within a user-specified tolerance. The method is valid in the entire complex plane, except the origin and the negative real axis. Convergence is too slow to be practical for $ABS(Z) < 0.05$. The method is valid for complex order. But only real orders are considered in this program. **Necessary Accessories for HP-41:** None

Steps: 139 HP-41 Bytes: 0216

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02274-41-9	$10	$11
FOR HP-71*	02274-71-6	N/A	$12

02275 Solstices and Equinoxes

by D. Hodges, Pinner, England

For a given calendar year, this program calculates the dates and clock times of the vernal equinox, summer solstice, autumnal equinox and winter solstice. The algorithms used are valid for a time period extending several centuries either side of the epoch 1900.0 and have an accuracy of 0.001 of a day. **Necessary Accessories for HP-41:** 82104A Card Reader; 82106A memory module (HP-41 only).

Steps: 171 HP-41 Bytes: 0247

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02275-41-6	$10	$13
FOR HP-71	NOT AVAIL		

02276 Mileage

by S.J. Breese, Monee, IL

This program is designed to tabulate one's monthly fuel usage, calculate the mileage for each tank of gas, and summarize one's fuel usage for the month. The program prompts for all inputs. Partial fuel fill ups can be input also. Miles may be input directly from an odometer or trip meter. **Necessary Accessories for HP-41:** Printer and one memory module

Steps: 219 HP-41 Bytes: 0620

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02276-41-4	$10	$13
FOR HP-71*	02276-71-1	N/A	$14

02277 Cash Budget Worksheet

by P. Carter, Palo Alto, CA

You have a checking account and a money-market fund. Your objective is to keep a minimum amount of cash in your checking account and to transfer all surplus cash to the interest-earning fund. Use the special worksheet (supplied) to forecast your checking account's balance for the next seven weeks. Then perform a "what-if?" analysis to find the best timing of cash transfers into and out of your checking account. **Necessary Accessories for HP-41:** One memory module

Steps: 148 HP-41 Bytes: 0340

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02277-41-2	$10	$12
FOR HP-71*	02277-71-9	N/A	$14

02278 Aeronautical Engineering Subroutines

by M.R. Woodruff, Savannah, GA

This collection of seventeen subroutines simplifies the programming of common aircraft performance problems. Pressure ratio, temperature ratio, dynamic pressure, and speed of sound are all based on the standard atmosphere. Velocity conversions are provided for Mach number, equivalent airspeed, calibrated airspeed, and true airspeed. No data registers are required. **Necessary Accessories for HP-41:** One memory module for all routines at one time.

Steps: 204 HP-41 Bytes: 0686

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02278-41-0	$10	$24
FOR HP-71*	02278-71-7	N/A	$30

02279 Finite Length Beam on Elastic Foundation-Concentrated Loads

by N.S. Tanner, Elizabethton, TN

This program solves for the bending moment, shear, and foundation reaction at all points desired along a finite-length free-free beam on an elastic foundation, subjected to one or more concentrated loads applied at one or more locations along the beam. Any set of consistent units may be used. Less program storage is required compared to more elaborate programs which consider unusual loading the boundary conditions. **Necessary Accessories for HP-41:** One memory module or equivalent

Steps: 210 HP-41 Bytes: 0317

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02279-41-8	$10	$12
FOR HP-71*	02279-71-5	N/A	$14

02280 ASME Equations 8, 9, 10, 11, Modification Program

by A. Nisargand, Richland, WA

Change in piping components such as adding couplings, replacing piping bends with welded elbows are very common during installation. It is very expensive to reanalyze such changes on large scale piping analysis programs. This program obviates the need for reanalysis when changes include stress itensification factors, pipe geometry and pressure. **Necessary Accessories for HP-41:** None

Steps: 120 HP-41 Bytes: 0319

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02280-41-6	$10	$12
FOR HP-71*	02280-71-3	N/A	$14

02282 Arithmetic, Geometric, Harmonic Progressions

by G.M. Halpern MD, Honolulu, HI

This program calculates Arithmetic, Geometric and Harmonic Progressions; prints them and solves for unknown factors, given three known factors. The factors are 1) Number of terms. 2) Difference or ratio. 3) First term. 4) Last term. **Necessary Accessories for HP-41:** HP-41 with two memory modules. HP-41CV and Printer. Card Reader optional.

Steps: 481 HP-41 Bytes: 0934

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02282-41-2	$10	$15
FOR HP-71*	02282-71-9	N/A	$18

02283 Easy Shopper

by C. McGinty, Coeur d'Alene, ID

A user friendly grocery shopping aid that not only keeps a running grand total, but automatically adds the sales tax and displays a running grand total. It shows you how much of your budget you have left, deducting how much will go to the sales tax. It also offers a comparison sequence, very friendly, that not only tells you the best buy, but also how much you would save, including tax, for best product. Typed instructions. **Necessary Accessories for HP-41:** One memory module

Steps: 199 HP-41 Bytes: 0567

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02283-41-0	$10	$13
FOR HP-71*	02283-71-7	N/A	$14

02284 Sort/Merge for Extended Memory ASCII Files

by G. Goodman, Stamford, CT

This is a general utility sort program for Extended Memory ASCII files. Sort fields may contain any character except the null byte. Each character is ordered according to its equivalent numeric value. The user must specify the sort field's starting location and length (up to 24 characters long), and whether the sort is to be in ascending or descending order. New records may easily be merged into an already sorted file. A subroutine entry point is also provided. **Necessary Accessories for HP-41:** Extended Functions Module

Steps: 139 HP-41 Bytes: 287

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02284-41-8	$10	$12
FOR HP-71	NOT AVAIL		

02285 Power Factor Correction For Electrical Systems

by H.K. Deakins, Kingsport, TN

This program calculates: (1) Capacitive KVAR to improve the power factor in electrical systems. (2) The capacitive KVAR for induction motors, according to HP. RPM, and starting torque. After KVAR standard values (from Mfg's Catalogs) are chosen the program solves for the resulting values of capacitor current, total combined current, power factor, KVA and minimum wire ampacity for capacitor connection. **Necessary Accessories for HP-41:** One memory module. Card Reader and Printer helpful.

Steps: 205 HP-41 Bytes: 0405

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02285-41-5	$10	$12
FOR HP-71*	02285-71-2	N/A	$14

02286 Tanscendental Equation Solver

by J. Kottalam, East Lansing, MI

A translation of the fortran routine ZEROIN to solve F(X) = 0, combining the certainty of the bisection method and the speed of secant interpolation. This program can be either used interactively or called by other programs. **Necessary Accessories for HP-41:** None

Steps: 180 HP-41 Bytes: 0239

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02286-41-3	$10	$12
FOR HP-71*	02286-71-0	N/A	$14

02287 Fix Area Solution - Closing Back To Beginning Point

by R.T.J. Martin, Jacksonville, NC

Given a predetermined area to be contained by a traverse, program will traverse around a boundary and compute closing bearings and distances needed to contain this predetermined area. Program will not traverse a curve boundary but segment area can be handled by program. Program will handle a curve if long chord distance and chord bearing is known. **Necessary Accessories for HP-41:** Card Reader and Printer optional.

Steps: 133 HP-41 Bytes: 0224

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02287-41-1	$10	$11
FOR HP-71*	02287-71-8	N/A	$12

02288 Perspective Made Simple

by R.A. Barnett, Germiston, South Africa

Program features simple user method of obtaining coordinates of successive points for transfer to a perspective view, by entering the height or distance from reference planes and pressing one key in the case of rectangular objects. Even less work for preselected number of points around circles and ellipses. Tilting, Rotation and Declination. **Necessary Accessories for HP-41:** One memory module

Steps: 223 HP-41 Bytes: 0427

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02288-41-9	$10	$12
FOR HP-71*	02288-71-6	N/A	$14

02291 Wire Size Calculation - Millivolt Drop

by J.C. Lyons, Broadview Hts, OH

This program calculates the voltage drop of any D.C. circuit and determines the gauge of (A.W.G.) stranded wire recommended for that circuit. Temperature, wire length, total number of connections, total number of terminations, and current draw of the load are prompted for and considered in the wire gauge selection. **Necessary Accessories for HP-41:** One memory module

Steps: 192 HP-41 Bytes: 0556

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02291-41-3	$10	$13
FOR HP-71*	02291-71-0	N/A	$14

02294 The Gas Card

by C. McGinty, Coeur d'Alene, ID

A lotta program in a little card for those persons who would like to easily compute their miles per gallon with each fillup and readily know if it's better or worse than average. This friendly setup is all on one magnetic card. The program is on one side and the running total data is on the other. A liter-to-gallon conversion is built in and the instructions are typed. It's simple and very handy. **Necessary Accessories for HP-41:** Card Reader

Steps: 91 HP-41 Bytes: 0310

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02294-41-7	$10	$12
FOR HP-71	NOT AVAIL		

02295 Nozzle Reinforcements Per ASME Sect. VIII

by K. Postma, Santa Fe Springs, CA

This program will calculate if nozzle reinforcement is required in a pressure vessel per ASME sect. VIII. If a pad is required it will calculate the minimum required dimensions of the pad, taking in account stick-thru, in- and outside weldsizes and the maximum allowable pad diameter. **Necessary Accessories for HP-41:** Printer optional but recommended

Steps: 375 HP-41 Bytes: 0804

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02295-41-4	$10	$14
FOR HP-71*	02295-71-1	N/A	$16

02296 Microtrek II

by P. Glasson, New Durham, NH

Microtrek is a calculator version of the popular space war game available for many computer systems. The program is designed for two to four players who battle each other, rather than against a computer enemy. Play proceeds on 50 x 50 grid indefinitely or high score wins or give each player a total time limit. **Necessary Accessories for HP-41:** Two memory modules

Steps: 651 HP-41 Bytes: 1219

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02296-41-2	$10	$16
FOR HP-71*	02296-71-9	N/A	$18

02298 The Lost Word

by V. Herlicq, Neuilly Sur Seine, France

This word game is harder than master mind because you must find the hidden word: guessing a 6 letter word and the HP-41 will indicate only the number of letters in the right place. If you don't guess a 6 letter word the HP-41 will refuse it! Also time is running against you! **Necessary Accessories for HP-41:** X-Function and Time Module

Steps: 102 HP-41 Bytes: 0212

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02298-41-8	$10	$11
FOR HP-71	NOT AVAIL		

02299 Supercalendar: Seven Million Days - Past, Present & Future

by W.E. Hitchins, Los Angeles, CA

Practical, hard-working calendar valid from 9999 B.C. to 9999 A.D. Dates can be entered U.S., British, or Continental style. Computes days between dates, date of a number of days before or after a date, Julian day as well as modified Julian day, modified Julian day or Julian day to calendar date, day of week, and converts Julian calendar to Gregorian and vice versa only when valid. Uses the modern chronologer's method for projecting the Julian calendar backwards. Invalid dates and dates outside of its range are rejected. **Necessary Accessories for HP-41:** Two memory modules

Steps: 521 HP-41 Bytes: 1060

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02299-41-6	$10	$15
FOR HP-71*	02299-71-3	N/A	$18

02300 Complexly Loaded Reinforced Concrete Retaining Wall Design

by R.J. Rockefeller, Savannah, GA

The program will design and analyze concrete retaining walls loaded by two backfill earth types, all on toe, raised water table and surcharging in addition to moments, shears, and axial loads applied at the top of the wall. In design, program outputs required footing dimensions and internal forces necessary for concrete design. In analysis stability is assured and forces calculated. Ultimate strength design method is used IAW ACI 318-77. Completely interactive. **Necessary Accessories for HP-41:** Three memory modules. Card Reader helpful.

Steps: 873 HP-41 Bytes: 1496

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02300-41-2	$10	$17
FOR HP-71*	02300-71-9	N/A	$20

02301 Binomial Expansion

by G.M. Halpern MD, Honolulu, HI

This program calculates Binomial Expansion, given the following parameters. In the example $(3x+2y)^5$, the calculator will request the exponent of the binomial(5), the coefficient of x & y (3&2), the exponent of x & y (1&2) & then will, on request calculate the rth term, the first three terms, or in the above example all 6 terms. All results are printed and labeled. The program will not operate without the printer because of the use of PRA which speeds up printing. **Necessary Accessories for HP-41:** HP-41 with one memory module. HP-41CV: Printer and Card Reader.

Steps: 213 HP-41 Bytes: 0506

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02301-41-0	$10	$13
FOR HP-71*	02301-71-7	N/A	$14

02302 Time and Altitude on Prime Vertical

by D.M. Daniel, Pensacola, FL

When taking an observation on the prime vertical, the latitude and declination must be of the same name, but declination can be greater or less than latitude of the observer. Program computes the time and altitude on the prime vertical (when lat is more than dec) or time and altitude on nearest approach to PV (when lat is less than dec), so navigator can plan his sights. Program goes on to compute Zn in both cases. Note: Program is set to run with Flag 21 CLEAR BUT will accept Printer without change. When run on Printer program stops only for data entry. **Necessary Accessories for HP-41:** None

Steps: 200 HP-41 Bytes: 0341

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02302-41-8	$10	$12
FOR HP-71*	02302-71-5	N/A	$14

02303 Seismic Reflection Field Array Design

by E.C. Taber, Houston, TX

Source and receiver arrays for reflection surveys must be designed to generate and receive a maximum of energy within the signal spectrum and a minimum of energy outside the spectrum. This program helps to optimize field arrays for the best signal to noise ratio. Results are plotted. **Necessary Accessories for HP-41:** Printer and one memory module. Card Reader helpful.

Steps: 113 HP-41 Bytes: 0347

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02303-41-6	$10	$12
FOR HP-71	NOT AVAIL		

02305 Error Calculations

by I. Bond, Auckland 10, New Zealand

This program performs arithmetic operations on numbers with uncertainties. A user manipulable pseudo-stack is created so that complicated expressions can be evaluated. Ideal for students. **Necessary Accessories for HP-41:** None

Steps: 139 HP-41 Bytes: 0231

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02305-41-1	$10	$12
FOR HP-71*	02305-71-8	N/A	$14

02306 Duncan's Multiple Range Test For Equal/Unequal Replications

by J.R. Black, Gainesville, FL

Performs Duncan's Multiple Range Test to separate differences among treatments where Analysis of Variance has previously shown a significant difference exists between treatment means. Will perform Kramer's adaptation to unequal subclass numbers (reps). Up to twenty mean values may be compared. Prompts for all input data. **Necessary Accessories for HP-41:** Printer and two memory modules

Steps: 162 HP-41 Bytes: 0342

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02306-41-9	$10	$12
FOR HP-71*	02306-71-6	N/A	$14

02307 Accounts Receivable

by L.W. Busack, Monaca, PA

This accounts receivable program will keep track of up to 71 entries. Each account is identified by a six letter name. The data payment is due and the amount are stored. The program can record the accounts on magnetic cards, print out the accounts (total or partial), update (all or partial), add new accounts, delete accounts, or review accounts (all or partial). **Necessary Accessories for HP-41:** Card Reader and Printer optional.

Steps: 312 HP-41 Bytes: 0667

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02307-41-7	$10	$13
FOR HP-71*	02307-71-4	N/A	$14

02308 Truss Deformation

by P.d.S. Mourao, Belo Horizonte, Brasil

Calculates vertical displacements of serial joints composing both above and below situated polygonal members of a loaded truss, thus obtaining the elastic line of deformation. **Necessary Accessories for HP-41:** Two memory modules

Steps: 223 HP-41 Bytes: 0516

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02308-41-5	$10	$13
FOR HP-71*	02308-71-2	N/A	$14

02309 Triangle Computations Sides and Angles

by N.M. Johnson, Youngstown, OH

This program will solve any real triangle given the coordinates of each of its vertices. Using the distance formula to determine the length of each side, the Law of Cosine to compute each angle and finally the Half - Perimeter Equation to compute the area of the triangle. Program will solve any real triangle given any three parts of that triangle. You enter your three known parts in any order following the rules of SSS, (Side-Side-Side), SAS, (Side-Angle-Side), SSA, (Side-Side-Angle), or SAA, (Side-Angle-Angle). The calculator will then compute the remaining three sides as long as the information given is that of a legally existing triangle. **Necessary Accessories for HP-41:** One Memory Module. Card Reader Optional

Steps: 268 HP-41 Bytes: 0445

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02309-41-3	$10	$12
FOR HP-71*	02309-71-0	N/A	$14

02310 Triangle Computation Coordinates

by N.M. Johnson, Youngstown, OH

This program will solve any real triangle given the coordinates of each of its vertices. Using the distance formula to determine the length of each side, the Law of Cosine to compute each angle and finally the Half-Perimeter Equation to compute the area of the triangle. Card Reader can be used for easy loading of program. 58 total registers are used. **Necessary Accessories for HP-41:** Card Reader optional

Steps: 180 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02310-41-1	$10	$12
FOR HP-71*	02310-71-8	N/A	$14

02311 3W Leveling With HP-41 Used For Data Storage

by R. Lutz, Goiania, Brazil

With this program, the HP-41 is used for storage of data obtained in the field during a 3W level survey, checks gross erroneous readings and data can be viewed before storage. The second part prints the data and computes the elevations, distances and total distance. **Necessary Accessories for HP-41:** One memory module, Card Reader and Printer

Steps: 261 HP-41 Bytes: 0580

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02311-41-9	$10	$14
FOR HP-71	NOT AVAIL		

02313 Taquimetric Survey For Compass Theodolites

by R. Lutz, Goiania, Brazil

These programs were developed for taquimetric surveys with compass theodolites. The HP-41C is used for data storage in the field and in the office. Calculates; Azimuth, difference in level, real distance and coordinates without reentering the data manually for each phase of calculations. This system is perfectly usable for other theodolites with a clamp on compass, if it has the necessary distance wires. **Necessary Accessories for HP-41:** Minimum of one memory module. Card Reader and Printer optional.

Steps: 419 HP-41 Bytes: 966

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02313-41-5	$10	$18
FOR HP-71*	02313-71-2	N/A	$22

02315 Critical Path Analysis

by D.L. Destang, St Lucia, WEST INDIES

This program scans forward and backwards through activities of a project time scheduling plan and determines the critical path activities and the critical path duration. The method employed is the Precedence Diagramming Method (PIM). **Necessary Accessories for HP-41:** At least two memory modules

Steps: 260 HP-41 Bytes: 581

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02315-41-0	$10	$13
FOR HP-71*	02315-71-7	N/A	$14

02316 Differential Equations 1 Order: Euler, R-k 2, Taylor 2nd Ord

by M. Tremblay, Ste-Foy, Canada

This program solves differential equations of the first order using the three fast methods: Euler, Runge-Kutta of the second order and Taylor of the second order. With the same entries you can switch from one method to the other. **Necessary Accessories for HP-41:** None

Steps: 108 HP-41 Bytes: 197

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02316-41-8	$10	$11
FOR HP-71*	02316-71-5	N/A	$12

02317 HP Top Row Financial Keys With Sign Convention

by P. Legros, Brussels, Belgium
P. Maryssael, Brussels, Belgium

This program duplicates the five top row financial keys of current HP financial calculators (HP-92, 37E, 38E). The program uses the cash flow sign convention as well as the special store or solve capability of each of the financial keys. The "BEGIN/END", "12x", "12/", "CLF" (Clear Financial registers), "LSTF" (LiST Financial registers) toggles, and a "print/no print" option are all available. **Necessary Accessories for HP-41:** One memory module. Print optional.

Steps: 239 HP-41 Bytes: 484

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02317-41-6	$10	$12
FOR HP-71*	02317-71-3	N/A	$14

02318 Hangmath 1.0

by S.R. Johnson, Yreka, CA

Make learning fun with Hangmath, the educational game. A merger of math quizzes and the game of Hangman, Hangmath features changeable difficulty levels (from first grade to post-college): aural and visual special effects, complete error trapping, full user prompting, and the optional saving of all calculator status and registers. The program is designed to only produce integral solutions for all functions (range: 1 to 9801). Hangmath the educational program that makes learning fun for all ages. **Necessary Accessories for HP-41:** Two memory modules and an Extended Functions Module

Steps: 393 HP-41 Bytes: 876

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02318-41-4	$10	$14
FOR HP-71	NOT AVAIL		

02319 Automatic Point Storage With the 41 Survey Pac

by R.T.J. Martin, Jacksonville, NC

Program provides point storage to the traverse, inverse, and sideshot program (pages 10-29), in the HP-41 Survey Pac. A maximum of 110 point coordinates can be stored. Allows inverse between points in memory without reentering coordinates. A compass/Crandell Rule Adjustment program is included. Adjustment program, automatically recalls, adjust, restore, and output finish traverse - without needing input. HP-41 Survey Pac Module must be used! **Necessary Accessories for HP-41:** HP-41 with Quad Memory, 41 Survey Pac. Card Reader and Printer optional.

Steps: 568 HP-41 Bytes: 934

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02319-41-2	$10	$15
FOR HP-71	NOT AVAIL		

02320 Moments and Shears For Simple Spans With AASHTO Live Loads

by S.L. Stroh, Tampa, FL

Program computes moments or shears at a specified point for AASHTO live loading on a simple span. Program will handle H or HS truck configurations (including alternate lane loading) for 20-44 loading or a multiple thereof as provided in AASHTO. If a Printer is attached, a plot of the moment or shear envelope can be generated. **Necessary Accessories for HP-41:** Two memory modules; printer required.

Steps: 618 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02320-41-0	$10	$16
FOR HP-71	NOT AVAIL		

02321 Quartic, Cubic, and Quadratic Equations

by J.E. Schiermeier, Cary, NC

This program calculates and displays all roots, both real and complex, of any quartic, cubic, or quadratic equation. Because it uses equations instead of iteration techniques, the roots are calculated faster and automatically accurate within the limits of the calculator. No initial guesses are necessary. **Necessary Accessories for HP-41:** One memory module

Steps: 428 HP-41 Bytes: 585

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02321-41-8	$10	$13
FOR HP-71*	02321-71-5	N/A	$14

02322 Turing Machine Simulator

by J.E. Schiermeier, Cary, NC

This program contains an editor, display routines, and an execution routine to develop and execute state tables for a Turing machine. The Turing machine ws a conceptual development of Alan P. Turing in 1936 and is the lowest level machine containing the basic characteristics of any computer system: storage, program and logic. **Necessary Accessories for HP-41:** Four memory modules

Steps: 647 HP-41 Bytes: 1239

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02322-41-6	$10	$16
FOR HP-71*	02322-71-3	N/A	$18

02323 Numerical Complex Functions

by J.E. Schiermeier, Cary, NC

This short (148 bytes) program calculates the following functions for rectangular complex numbers: +, -, *, /, 1/z, z**w, z**1/2, z**2, log(z), 10**z, ln(z), and exp(z). Each function may be executed from its normal position on the keyboard. Since each routine is independent and uses no storage registers, it may be called by another program if a global label is added. **Necessary Accessories for HP-41:** None

Steps: 123 HP-41 Bytes: 343

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02323-41-4	$10	$11
FOR HP-71*	02323-71-1	N/A	$12

02324 Foot-Inch Pound-Ounce Arithmetic

by J.E. Schiermeier, Cary, NC

This program adds, subtracts, multiplies by a constant, and divides by a constant for numbers in the foot-inch and pound-ounce forms. Division of square feet by linear feet, and multiplication of linear feet are possible. Conversions to and from linear decimal feet, square decimal feet, and decimal pounds, as well as to and from meters are provided. **Necessary Accessories for HP-41:** None

Steps: 133 HP-41 Bytes: 293

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02324-41-2	$10	$12
FOR HP-71*	02324-71-9	N/A	$14

02325 Babbage Difference Engine

by J.E. Schiermeier, Cary, NC

This program simulates the Babbage Difference Engine and finds values for integer x values of an nth degree polynomial given any n+1 points with succesive x-values. This program is capable of handling any polynomial with real coefficients of degree 1 or higher. The polynomial does not have to be programmed, and no program changes ever have to be made. **Necessary Accessories for HP-41:** None

Steps: 122 HP-41 Bytes: 207

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02325-41-9	$10	$11
FOR HP-71*	02325-71-6	N/A	$12

02327 Domino

by P. Legros, Brussels, Belgium
P. Maryssael, Brussels, Belgium

This program simulates a game of domino between you and your eitchpee. There are four levels of difficulty. After a seed has been inputed your eitchpee generates and distributes the 28 stones as follows: 7 for you and her, and 14 that constitute the stock from which either you or her will take a stone when either you or her cannot play. Note it is impossible to cheat because the dominoes you play have to be introduced during pauses. The program is provided with many alphanumerical comments indicating to you what's happening, what you have to do, and when you have to do it so that anyone who doesn't know the game immediately familiarizes with it. **Necessary Accessories for HP-41:** Three memory modules

Steps: 523 HP-41 Bytes: 1101

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02327-41-5	$10	$15
FOR HP-71*	02327-71-2	N/A	$18

02328 CIPW NORM

by D. Dingwell, Edmonton, CANADA

This program computes the CIPW norm of any igneous rock analysis. Input is wt.% of the major oxides and output is wt.% normative minerals. **Necessary Accessories for HP-41:** Three memory modules

Steps: 550 HP-41 Bytes: 1140

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02328-41-3	$10	$22
FOR HP-71*	02328-71-0	N/A	$26

02329 Files: Rename, Change Size and Duplicate

by C. Manning, Canberra, Australia

This program facilitates the handling of data and ASCII files. Three routines: one will change the name of a file, the second will duplicate a file (under a different name), and the third will increase or decrease the size of a file. All three preserve the contents of the file. **Necessary Accessories for HP-41:** Extended Functions Memory Module

Steps: 129 HP-41 Bytes: 290

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02329-41-1	$10	$12
FOR HP-71	NOT AVAIL		

02332 Polynomial Interpolation II - Explicit Form & Derivative

by C. Rusquellas, Buenos Aires, Argentina

Given n points, computes a (n-1) order polynomial, and its first derivative. Uses "PVT" program from MATH 1 module to solve the equations system. With one memory module can hold 6 points. The evaluation subroutine can be called from other programs (R00 to R11 not used in evaluation). **Necessary Accessories for HP-41:** One or more memory modules; Math 1 Module. Printer optional.

Steps: 222 HP-41 Bytes: 402

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02332-41-5	$10	$12
FOR HP-71	NOT AVAIL		

02334 Data Table Processing

by A. Johnstone, Terre Haute, IN

This program enables the construction of a two-dimensional worksheet of alpha or numeric entries. Routines enable insertion, change, or inspection of any single entry, row, column, or the entire table. User can specify "what if" calculations which will then be performed on all or part of the table. At home, the program can help with budget planning. In the lab, it will process raw data into useful numbers with ease. **Necessary Accessories for HP-41:** Minimum of one memory module. Card Reader and Extended Functions Module optional.

Steps: 213 HP-41 Bytes: 453

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02334-41-1	$10	$16
FOR HP-71	NOT AVAIL		

02335 Foundation Design

by R. Meacock, Sarnia, CANADA

This program designs spread footing foundations and computes the factor of safety against overturning and the bearing pressures for any combination of vertical, horizontal load or moment. A 'friendly' input and attractive formatted output warn the user of excesses with beeps and instructions or produce a satisfactory solution. **Necessary Accessories for HP-41:** One memory module, card reader and printer

Steps: 266 HP-41 Bytes: 622

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02335-41-8	$10	$13
FOR HP-71*	02335-71-5	N/A	$14

02336 Molecular Mass Calculator

by C. Manning, Canberra, Australia

This program finds the mass of a molecule given its formula, the atomic mass of an atom given its atomic number, and the atomic number of an atom given its formula. This program uses the great speed and efficiency of the POSFL statement to make a "look up" table practical for the first time. **Necessary Accessories for HP-41:** One memory module and Extended Functions Memory Module

Steps: 112 HP-41 Bytes: 213

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02336-41-6	$10	$14
FOR HP-71	NOT AVAIL		

02337 Independent Equations From Complex Reaction Equations

by E.C. Schmidt, Milo, ME

This program is used to get independent equations from complex reaction equations. It works on both chemical reactions equilibra and control systems interaction equations. This program has a built in size check and needs one or more memory modules to do 5x5 or larger matrixes. **Necessary Accessories for HP-41:** One memory module

Steps: 226 HP-41 Bytes: 417

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02337-41-4	$10	$12
FOR HP-71*	02337-71-1	N/A	$14

02338 Approximate Method of Real to Ideal Gas Conversion

by E.C. Schmidt, Milo, ME

This program produces delta H' and delta S' for the conversion of a real gas to an ideal gas. The program provides results that are valid, to a reasonable approximation (excluding highly polar and associating molecules) if the reduced volume is greater than or equal to two. **Necessary Accessories for HP-41:** None

Steps: 106 HP-41 Bytes: 187

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02338-41-2	$10	$11
FOR HP-71*	02338-71-9	N/A	$12

02339 Pitzer and Redlich-Kwong Equations For a Real Gas

by E.C. Schmidt, Milo, ME

This program is set up to use TP or TV data and gives Z for a real gas. Pitzer is used with an acentric factor and V sub 4 greater than two. Redlick-Kwong is set up to find Z if V is known or unknown and the accentric factor is unknown. **Necessary Accessories for HP-41:** One memory module

Steps: 208 HP-41 Bytes: 394

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02339-41-0	$10	$12
FOR HP-71*	02339-71-7	N/A	$14

02340 "Axbend" Steel Axial-Bending Interaction Equations

by D.P. Reilly, Oakland, CA

This program solves the AISC combined axial-bending equations 1.6-1a and 1.6-1b or 1.6-2 for 1 or 2 axes, and static or seismic loading conditions. Inputs are the member properties, the end restraint factors and the loads on the member. **Necessary Accessories for HP-41:** Two memory modules or equivalent. Card Reader and Printer optional.

Steps: 431 HP-41 Bytes: 917

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02340-41-8	$10	$14
FOR HP-71*	02340-71-5	N/A	$16

02341 Vertical Curve Alignment

by R. Riiber, South Burlington, VT

This program solves problems related to alignment of any vertical curve by equation of parabola. For easy book keeping the program computes and displays station, height of curve and tagent offset. **Necessary Accessories for HP-41:** Printer optional

Steps: 186 HP-41 Bytes: 309

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02341-41-6	$10	$12
FOR HP-71*	02341-71-3	N/A	$14

02342 Perspective Drawing

by N.C. Lee, Stony Brook, NY

This program provides a complete treatment for one-point perspective drawing. The viewing parameters specified are: view reference point, center of projection, view plane normal, orientation and scale of view plane. User may enter the coordinates of an object and draw it projection. He may also change any viewing parameter without re-entering all coordinates. **Necessary Accessories for HP-41:** One memory module. Printer helpful.

Steps: 285 HP-41 Bytes: 448

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02342-41-4	$10	$12
FOR HP-71*	02342-71-1	N/A	$14

02343 Coordinate Transformations (Improved)

by N.C. Lee, Stony Brook, NY

This program provides 2-dimensional and 3-dimensional coordinate translation and/or rotation. It performs the same functions as #00244C, but is more user friendly, and with some possible sources of errors eliminated. The total registers required is also reduced (from 74 to 61) so that program can run on a standard 41C. **Necessary Accessories for HP-41:** None

Steps: 173 HP-41 Bytes: 266

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02343-41-2	$10	$12
FOR HP-71*	02343-71-9	N/A	$14

02344 Radioimmunoassay

by J. Cote, Columbia, MD

This program will, through modular sequences of code, permit the entry, plotting and interpolation of counts in a radioimmumoassay. Up to approximately 50 points can be entered, corrected, analysed and plotted by an adaptation of the full size mathematical model (not an abbreviated less precise form) developed by Rodbard and Lewald. With full memory configuration, up to approximately 200 unknown counts can be entered, corrected and analysed on one run. A possibility of return to 'old curves' is also included. **Necessary Accessories for HP-41:** One memory module. Card Reader optional.

Steps: 1258 HP-41 Bytes: 2225

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02344-41-0	$10	$23
FOR HP-71*	02344-71-7	N/A	$28

02345 6502 Disassembler Mnemonic Generator

by H. Lee, Montreal, CANADA

For a given machine code input, in either hexadecimal or decimal, program generates 6502 microprocessor mnemonics. **Necessary Accessories for HP-41:** Quad Memory and Extended Functions Module. Card Reader optional but recommended.

Steps: 346 HP-41 Bytes: 881

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02345-41-7	$10	$18
FOR HP-71	NOT AVAIL		

02346 Newton-Raphson Solution to F(x)=0; Newton's Method

by P.R. Jemian, Auburn, AL

Program looks for individual roots to a global label function using the iterative Newton Raphson Technique. Successive approximations are displayed (or printed). Program is short! Fits on one side of a program card. May also be used as a subprogram by another program. Minimal user interaction. Derivative is calculated by a slope formula. **Necessary Accessories for HP-41:** None

Steps: 62 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02346-41-5	$10	$12
FOR HP-71*	02346-71-2	N/A	$14

02347 Verify Your Interest Checking Statement

by R.K. McDonald, Milpitas, CA

Fully chain prompted with illegal entry protection and last entry delete. Start by entering the current year, interest rate, each deposit/debit with its date and you can easily check out your monthly interest checking statement. The data collected is balance, interest paid for each entry, number of days for each entry, total interest paid, and total number of days for the overall period. **Necessary Accessories for HP-41:** One memory module, Time Module and Extended Functions Module

Steps: 28 HP-41 Bytes: 254

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02347-41-3	$10	$12
FOR HP-71	NOT AVAIL		

02348 Cash Register

by J.E. Schiermeier, Cary, NC

This totally automatic cash register provides categories for taxable and non-taxable merchandise, prescriptions, cigarettes, and alcohol. Provisions are also made for vendor coupons and percent discounts on taxable merchandise and prescriptions, as well as calculation of sales tax. Separate categories are used for cash, checks, and bank cards, and overrings, refunded sales, and voided sales are also facilitated. A cumulative total is kept and may be displayed at any time. **Necessary Accessories for HP-41:** Two memory modules

Steps: 360 HP-41 Bytes: 777

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02348-41-1	$10	$14
FOR HP-71*	02348-71-8	N/A	$16

02349 Numerical Integration - Polar and Rectangular

by J.E. Schiermeier, Cary, NC

This program finds the area between two curves or under one curve in a finite interval given either points at equally-spaced intervals or the equations in polar or rectangular form. For rectangular equations, the user has a choice of: Trapezoidal Rule, Simpson's Rule, Durand's Rule, or Weddle's Rule. For polar equations, there is one method, using sectors of circles. **Necessary Accessories for HP-41:** One memory module

Steps: 199 HP-41 Bytes: 407

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02349-41-9	$10	$12
FOR HP-71*	02349-71-6	N/A	$14

02350 Cone, Cylinder, and Sphere Computations

by J.E. Schiermeier, Cary, NC

This program calculates: lateral and surface area, volume, and slant height of cones; lateral and surface area, volume, and slant height of frustums; lateral and surface area, and volume of cylinders; surface area and volume of spheres; surface area and volume of a zone and segment; surface area of a line; and volume of a sector. All inputs are prompted for, and all outputs are labelled. No storage registers are used. **Necessary Accessories for HP-41:** None

Steps: 232 HP-41 Bytes: 357

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02350-41-7	$10	$12
FOR HP-71*	02350-71-4	N/A	$14

02351 New- and Full Moon Predictions (NAFM)

by J.E. Kjemtrup, Los Gatos, CA

Predicts New- and Full Moons within any given month to three minutes accuracy from year 1700 through 2050. Useful back to year AD 1 but at gradually decreasing accuracy. Program also establishes accurate relationships between Gregorian dates, Julian dates, Julian day numbers and weekdays. Neat printouts if printer available. **Necessary Accessories for HP-41:** HP-41CV (or four memory modules) and Card Reader

Steps: 917 HP-41 Bytes: 1923

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02351-41-5	$10	$20
FOR HP-71*	02351-71-2	N/A	$24

02352 Corr. of Tie Line Data For Ternary Systems by Hand's Method

by J.A. Pita, Quito, Ecuador

Given data of compositions for two tie lines in a ternary system, this program uses Hand's correlation for estimating several other tie lines, either in form of a table or as values for a specified point. Also, coordinates for the plait point can be found. A least squares fit is employed in this program. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 291 HP-41 Bytes: 532

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02352-41-3	$10	$15
FOR HP-71*	02352-71-0	N/A	$18

02353 Heat Tracing Requirements For Pipelines

by J.A. Pita, Quito, Ecuador

This program estimates the number of heat tracers required for a pipe, with or without transfer cement, giving also other values of interest such as the surface temperature of insulated pipe, heat transferred, flowrate for heating fluid. An iterative solution is carried out for calculating the film heat-transfer coefficient to air. **Necessary Accessories for HP-41:** One memory module

Steps: 189 HP-41 Bytes: 386

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02353-41-1	$10	$12
FOR HP-71*	02353-71-8	N/A	$14

02354 Gasuse-Heating Gas Use Rate Analyzer and Cost Projector

by A. Gold-Pitegoff, Brookline, MA

Program calculates heating gas use and tracks cost through a heating season. Output variables include useage rate (undred cubic feet per degree day) and projected seasonal cost assuming average and actual winter severity. Provision is made for data entry, correction, card storage, and printout in several formats. Contains synthetic code. **Necessary Accessories for HP-41:** Two memory modules. Card Reader and Printer helpful.

Steps: 426 HP-41 Bytes: 888

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02354-41-9	$10	$14
FOR HP-71	NOT AVAIL		

02355 Matrix Multiplication (A - super n - B)

by E.C. Schmidt, Milo, ME

This program takes the "A" and "B" matrix and produces the "A - super n - B! matrix (where n= any integer greater than zero). Changes are included so the program can be used without the Extended Functions Module and with a Printer). **Necessary Accessories for HP-41:** One + memory modules and Extended Functions Memory Module

Steps: 218 HP-41 Bytes: 390

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02355-41-6	$10	$12
FOR HP-71*	02355-71-3	N/A	$14

02356 Packed Tower Hydraulic Design

by C. Hsieh, Wilmington, MA

This program solves a variety of problems involved in packed tower hydraulic design, which includes: tower diameter estimation tower pressure drop calculation gas flow rate calculation flooding gas flow rate calculation **Necessary Accessories for HP-41:** None

Steps: 328 HP-41 Bytes: 649

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02356-41-4	$10	$13
FOR HP-71*	02356-71-1	N/A	$14

02357 Smooth Routine

by R.A. Scholl, Palo Alto, CA

This program "smooths" irregular data (such as month-to-month sales) without distorting fine structure (such as seasonal influences). Especially useful for plotting business data to observe trends. **Necessary Accessories for HP-41:** None

Steps: 122 HP-41 Bytes: 241

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02357-41-2	$10	$12
FOR HP-71*	02357-71-9	N/A	$14

02358 Taylor Excitation Function For Linear Antenna

by G.H. Stumpff II, Dayton, OH

This program calculates the Taylor distribution across a linear antenna. This would be useful, for example, in calculating an antenna's radiation pattern in the near field or fresnel region for which simple analytic expressions do not exist and the fundamental antenna integral must be used. Inputs to the program are sidelobe level, number of constant sidelobes, source length to wavelength ratio, and position on source for which excitation value is desired. **Necessary Accessories for HP-41:** None

Steps: 139 HP-41 Bytes: 228

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02358-41-0	$10	$12
FOR HP-71*	02358-71-7	N/A	$14

02359 Legendre Functions

by L.O.J. Kagey, Fullerton, CA

This program calculates values for Legendre Functions of the first kind - P sub n (x) - and Legendre Functions of the second kind - Q sub n (x) - where n and x are greater than or equal to 0. **Necessary Accessories for HP-41:** None

Steps: 236 HP-41 Bytes: 329

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02359-41-8	$10	$12
FOR HP-71*	02359-71-5	N/A	$14

02360 Numerical Differentiation by Three-Point and Five-Point Form

by J.A. Pita, Quito, Ecuador

This program uses three or five-point formulas for finding the first derivative of equally spaced data points. The slope at each point is found. Formulas were derived using the method of undetermined coefficients. **Necessary Accessories for HP-41:** None

Steps: 201 HP-41 Bytes: 292

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02360-41-6	$10	$12
FOR HP-71*	02360-71-3	N/A	$14

02361 Great Circle Direction Converted To Mercator Direction

by D.M. Daniel, Pensacola, FL

Program converts a radio (great-circle) bearing to a Mercator direction so it can be plotted on a Mercator chart, or it will convert a Mercator direction as measured on a chart to a great-circle bearing. It is unique in that it selects, automatically, from eight choices of plus and minus to determine whether the conversion angle is to be added to or subtracted from the bearing in question. **Necessary Accessories for HP-41:** None

Steps: 184 HP-41 Bytes: 0336

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02361-41-4	$10	$12
FOR HP-71*	02361-71-1	N/A	$14

02362 1, 2, 3 Dimensions - Inter/Integ (Quadratic)

by M. Walsh, De Portneuf, Canada

Elements with quadratic sides for interpolation or numerical integration. Included: L3 T6 Q8 C10 and H20. Useful to describe geometrical domain with curved boundary or to use a better approximation than a linear one. "1, 2, 3 Dimensions - Integration (Basic)" required for integration. "1, 2, 3 Dimensions - Interpolation (Basic)" absolutely required. **Necessary Accessories for HP-41:** Up to three memory modules

Steps: 760 HP-41 Bytes: 1396

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02362-41-2	$10	$17
FOR HP-71*	02362-71-9	N/A	$20

02363 1, 2, 3 Dimensions - Integration (Basic)

by M. Walsh, De Portneuf, Canada

Using finite element techniques, numerical integration on 1, 2 or 3 dimensions domain of a function of 1, 2 or 3 independent variables can be performed. Program: 1, 2, 3 Dimensions - Interpolation (Basic) is required. **Necessary Accessories for HP-41:** Two memory modules

Steps: 930 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02363-41-0	$10	$15
FOR HP-71*	02363-71-7	N/A	$18

02364 1, 2, 3 Dimensions - Interpolation (Basic)

by M. Walsh, De Portneuf, Canada

Using finite elements technique, allow interpolation of function (of 1, 2 or 3 parameters) known at only some points. Can be immediately used as main program or as subroutine ... and, in this last case, without any prompt for input - but using 1 level of subroutine. (Elements: Line, Triangle, Quadrilatere, Tetraedre) **Necessary Accessories for HP-41:** Two memory modules - three for complex cases

Steps: 725 HP-41 Bytes: 1190

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02364-41-8	$10	$16
FOR HP-71*	02364-71-5	N/A	$18

02365 Noah's Ark

by N. Nanji, Ann Arbor, MI

The flood has receded and the animals are ready to return to land from the Ark. But first they must be paired up. You, as Noah, are the only person who can do this. The animals are presently in crates. Opening two crates at a time, you must try to pair them up in as few tries as possible. A challenging, entertaining, and definitely addicting game that is also guaranteed to improve your memory. **Necessary Accessories for HP-41:** Memory module, Extended Functions module and Card Reader

Steps: 218 HP-41 Bytes: 553

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02365-41-5	$10	$14
FOR HP-71	NOT AVAIL		

02366 Pressure Vessel Shell & Head Design Per ASME Sect VIII, Div1

by K. Postma, Santa Fe Springs, CA

Three programs will calculate the minimum required wall thickness of plate or pipe shells, semi-elliptical heads and flanged and dished heads. They will also calculate seamless wall thicknesses inside or outside the spherical portion of the heads. Stress reduction factors and pipe rolling tolerances are calculated when applicable. This program is designed to work with Reinforcement program Library #41-02295-1. **Necessary Accessories for HP-41:** Printer optional

Steps: 450 HP-41 Bytes: 1091

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02366-41-3	$10	$16
FOR HP-71*	02366-71-0	N/A	$18

02367 Gross Printing

by P. Heidrich, Rheinstetten 2, West Germany

The program enables you to print with the HP 82162A Printer up to 9 lines of alpha-text sideways on the paper (HP 82143A up to 4 lines). For the text you can use the characters 13 and 28-127 of the standard character set. The program uses synthetic functions. **Necessary Accessories for HP-41:** Three memory modules, Printer, Card Reader, Wand or Cassette Drive (to load program - due to synthetic functions)

Steps: 433 HP-41 Bytes: 1482

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02367-41-1	$10	$17
FOR HP-71	NOT AVAIL		

02368 Water Analyses: Charge and Conductivity Balance

by T.R.P. Holm, Brooklyn Park, MN

Use this program to check the accuracy of chemical analyses of natural and waste waters. Program prompts for major ion concentrations, conductivity, and temperature. Program then calculates charge balance error and conductivity error. (Equivalent conductivities generated by program.) Input concentrations can be in mg/l or mM. **Necessary Accessories for HP-41:** None. Printer optional.

Steps: 187 HP-41 Bytes: 476

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02368-41-9	$10	$13
FOR HP-71*	02368-71-6	N/A	$14

02369 Advanced Complex Operations

by R.M. Kozel, Garfield Heights, OH

This program utilizes the complex functions provided in the Math Pac to provide the following functions of the complex variable z: cscz, secz, cotz, sinhz, coshz, tanhz, cschz, sechz, cothz, asinz, acosz, atanz, acscz, acecz, acotz, asinhz, acoshz, atanhz, acschz, asechz, and acothz. The program uses the same format as the Complex Operations program provided with the Math Pac. **Necessary Accessories for HP-41:** One memory module and the Math Pac

Steps: 255 HP-41 Bytes: 630

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02369-41-7	$10	$13
FOR HP-71	NOT AVAIL		

02370 Laser Blast

by D. Lange, Wichita, KS

The player faces a variety of enemy spaceships and attempts to score points by blasting them with his laser guns before they blast him. The HP-41 simulates the radar screen of a patroling spaceship by identifying the type of enemy and tracking it as it approaches. **Necessary Accessories for HP-41:** None

Steps: 198 HP-41 Bytes: 491

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02370-41-5	$10	$13
FOR HP-71*	02370-71-2	N/A	$14

02372 HP-15C Program Printer

by N.C. Lee, Stony Brook, NY

This program takes the HP-15C keycodes as input and produces formated program listing (line number, keycodes and function names) on the printer. Editing functions are provided for program stored, including goto line number, delete, insert and renumber lines. Useful for program development and documentation. **Necessary Accessories for HP-41:** Minimum of two memory modules and Printer

Steps: 541 HP-41 Bytes: 1127

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02372-41-1	$10	$16
FOR HP-71*	02372-71-8	N/A	$18

02373 Rotational Motion Equations

by J. Meredith, Englewood, CO

Given three of five variables: angular acceleration; initial angular velocity; angular velocity; angular displacement or time, an unknown or both unknowns will be calculated. Furthermore, this program calculates the radial and tangential acceleration components and the resultant acceleration's direction and magnitude. **Necessary Accessories for HP-41:** One memory module

Steps: 398 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02373-41-9	$10	$13
FOR HP-71*	02373-71-6	N/A	$14

02374 Porticos and Arches Calculation

by P.d.S. Mourao, Belo Horizonte, Brasil

For porticos and Arches with known left reactions from a loading, calculates at any section the normal force N, the transverse force VS and the bending moment M, allowing besides to find right reactions. **Necessary Accessories for HP-41:** None

Steps: 91 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02374-41-7	$10	$12
FOR HP-71*	02374-71-4	N/A	$14

02375 Dynamic Analysis Subsidies

by P.d.S. Mourao, Belo Horizonte, Brasil

Determines the single degree of freedom self-frequency of vibration of a structure by Rayleigh's method, using a devised technique that includes a new process of curve fitting. **Necessary Accessories for HP-41:** One memory module

Steps: 282 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02375-41-4	$10	$12
FOR HP-71*	02375-71-1	N/A	$14

02376 Developed Length Program

by D.C. Peckham, Berea, KY

This program calculates the developed length for plates with any number of bends. The program will accept any units (inches, mm, etc.,) but the same units must be used for all dimensions of any part. **Necessary Accessories for HP-41:** One memory module

Steps: 217 HP-41 Bytes: 368

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02376-41-2	$10	$12
FOR HP-71*	02376-71-9	N/A	$14

02377 Bandspread For Comm. Receivers

by E.M. Vazquez, San Isidro, Argentina

This program permits an easy and very fast computation of constants involved in bandspreading of timing circuits for communication's receivers. Program occupies only 31 registers (215) bytes), is 109 lines long and is recorded in one full cord. **Necessary Accessories for HP-41:** Printer optional.

Steps: 109 HP-41 Bytes: 215

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02377-41-0	$10	$11
FOR HP-71*	02377-71-7	N/A	$12

02378 True Battleship Challenger

by E.M. Vazquez, San Isidro, Argentina

This program replaces one player and challenges you in the Battleship game. It places its ships in different ways with different seeds and then plays against you in an "intelligent" form. A dramatic reduction in memory space occupied (compared with similar programs) was achieved by use of alpha registers as transitory storage numeric registers and/or counters. Documentation set is 14 pages and describes how to replace card reader instructions. **Necessary Accessories for HP-41:** Two memory modules. Card Reader optional.

Steps: 482 HP-41 Bytes: 928

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02378-41-8	$10	$15
FOR HP-71	NOT AVAIL		

02379 Three-Phase Cable Computer

by E.M. Vazquez, San Isidro, Argentina

This program permits an easy and fast method to determine cable's size in three-phase power systems. Both aerial and buried installations are covered, in four-pole, three single-pole lied and separated cables both in copper and aluminum constructions and for types to 1, 100V. Program length is 665 bytes (95) registers), is recorded in three full cards plus a data card. **Necessary Accessories for HP-41:** One memory module and Card Reader. Printer optional.

Steps: 301 HP-41 Bytes: 665

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02379-41-6	$10	$14
FOR HP-71	NOT AVAIL		

02380 Payment

by K.J. Wallace, Sharpsville, IN

This program calculates mortgage payment, remaining balance, and gives an amortization schedule for a conventional balance, and gives an amortization schedule for a conventional fixed rate mortgage. Prompts for years, interest rate, and amount borrowed, then returns payment amount. The program then prompts for dates. Will give total interest and total principal paid between two user specified dates. **Necessary Accessories for HP-41:** One memory module

Steps: 214 HP-41 Bytes: 409

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02380-41-4	$10	$12
FOR HP-71*	02380-71-1	N/A	$14

02381 Time, Fuel, and Distance to Climb

by M.R. Woodruff, Savannah, GA

This program iterates on AOA and FPA to find the time, fuel, and distance throughout a scheduled climb. Tabular data for Co, thrust, and fuel flow are required. The linear interpolation subroutine used is unique in that it will handle two different variables stored in the same data register. **Necessary Accessories for HP-41:** Quad Module and Printer

Steps: 561 HP-41 Bytes: 1034

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02381-41-2	$10	$21
FOR HP-71	NOT AVAIL		

02382 Highways

by D. Thayer, San Leandro, CA

Before you take a vacation, give this game a whirl. It has all the fun of traveling the highways ... full motels, flat tires, fenderbenders and other joys of traveling by auto. You have 50 different highways to travel on and rack up as many miles as possible before getting wiped out. Included is a separate utility program so you can configure your own highway system. It will also allow you to store and recall up to 6 integers (from 1 to 255) in each register for as many registers as you may want. **Necessary Accessories for HP-41:** Two memory modules and Extended Function Memory Module

Steps: 324 HP-41 Bytes: 784

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02382-41-0	$10	$17
FOR HP-71*	02382-71-7	N/A	$20

02383 Live Capacity and Properties of Round Bins or Tanks

by R.M. Kaufmann, Pierrefonds, CANADA

This program computes the live capacities in tons, cuft or usgal, of any size cone bottom bin or flat bottom tank, filled with granular material or water. Depending on the input it also computes the diameter, height and area of platework in square feet. **Necessary Accessories for HP-41:** One memory module

Steps: 259 HP-41 Bytes: 465

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02383-41-8	$10	$13
FOR HP-71*	02383-71-5	N/A	$14

02384 Critical Shaft Speed

by D. Thayer, San Leandro, CA

Given distance between bearings, distance from bearing to rotor, rotor weight and shaft diameter, this program will compute the first critical speed for three arrangements with two bearings. 1) One rotor suspended, 2) Two rotors suspended and 3) One rotor overhung. Shafts weights are allowed for and either solid or hollow shafts can be used. Deflection due to motor belt pull will be used if motor H.P., motor R.P.M., motor pully diameter and pully overhang is entered. **Necessary Accessories for HP-41:** One memory module

Steps: 266 HP-41 Bytes: 466

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02384-41-6	$10	$13
FOR HP-71*	02384-71-3	N/A	$14

02385 Properties of Logarithmic Spiral Segments

by T. Langland, Phoenix, AZ

This program will compute several properties of logarithmic spiral segment, such as the length of the arc, the area of the spiral segment, the moments about the pole, the variable radius vector, and the coordinates of the centroid of the sector area of the spiral. **Necessary Accessories for HP-41:** None

Steps: 135 HP-41 Bytes: 188

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02385-41-3	$10	$11
FOR HP-71*	02385-71-0	N/A	$12

02386 General Ledger

by M.G. Green, Salisbury, Zimbabwe

Complete Accounting records within the General Ledger; Facility for Budgets on Revenue Accounts; All Account Titles at User's discretion; Coding structure allows User to have sub-totals on printouts; Full Journal entry facility; Extraction of Accounts by Income Statement (with or without Budgets and Variances) and Balance Sheet. Additional program gives Sub-ledgers. **Necessary Accessories for HP-41:** 41CV or 41C with Quad Module; Extended Functions Module (HP82180A) and at least one Extended Memory Module (HP82181A); Printer; Cassette Drive

Steps: 868 HP-41 Bytes: 446

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02386-41-1	$10	$24
FOR HP-71	NOT AVAIL		

02387 Past Blackbody Integrals

by C.J. Willers, Pretoria, South Africa

Blackbody radiant excitance and photon excitance in any spectral band, for any temperature is calculated by summation of a series rather than by numerical integration. This provides fast and accurate results for any spectral region. **Necessary Accessories for HP-41:** One Memory Module

Steps: 194 HP-41 Bytes: 387

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02387-41-9	$10	$12
FOR HP-71*	02387-71-6	N/A	$14

02389 Hobbit Adventure

by J. Bryan, San Diego, CA

Somewhere nearby is a colossal cave where others have found fortunes in jewels and gold. You command the calculator to search for these treasures. This is a mini version of the program found on many large computers. **Necessary Accessories for HP-41:** None

Steps: 407 HP-41 Bytes: 1400

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02389-41-5	$10	$17
FOR HP-71*	02389-71-2	N/A	$20

02393 Linear Regression with Standard Deviations

by G. Steven, West Allis, WI

Computes slope, intercept, correlation, and standard deviations of the slope, intercept, and Y-values. Has efficient routines to add, change, and delete data pairs. Gives new Y for X, and new X for Y. Compresses each data pair into one register, so X and Y values must be positive, less than 1000. **Necessary Accessories for HP-41:** One Memory Module

Steps: 268 HP-41 Bytes: 522

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02393-41-7	$10	$13
FOR HP-71*	02393-71-4	N/A	$14

02394 Ceiling Plenum Temperature

by M.P. Leimer, Kansas City, MO

This program uses an iterative method to calculate the Plenum Temperature in a ceiling return air plenum, given the appropriate areas, U-values, and cooling load temperature differences (CLTD's). The program works for both heating and cooling, and for three system types: 1) Constant air volume, 2) Variable air volume, and 3) Fixed CFM known beforehand (e.g. computer room make-up air systems.) It also accepts as input a constant quantity of exhause air. **Necessary Accessories for HP-41:** One Memory Module (Printer is optional)

Steps: 302 HP-41 Bytes: 625

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02394-41-5	$10	$13
FOR HP-71*	02394-71-2	N/A	$14

02395 Extended Stock

by P. Galvin, Middletown, CT

Extended Stock uses the features and storage of the HP Extended Functions/ Memory Module to facilitate portfolio value calculations. It enables users to create extended memory files containing stock names and numbers of shares owned. The user can add or delete entries, list the contents of any of the files, or display or print each stock's value at current prices and the total worth of the stocks. **Necessary Accessories for HP-41:** Extended Functions/Memory Module (Printer is recommended).

Steps: 118 HP-41 Bytes: 276

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02395-41-2	$10	$12
FOR HP-71	NOT AVAIL		

02396 Shiphunting

by R. Rauch, Berlin 47, Germany

This program makes your HP-41C into a serious shiphunting rival. You must shoot off ships, which a random number generator places into a 10x10 grid. The generator provides for an always different ship arrangement of the calculator, if you start the program with a different number. After three misses the calculator shoots off your ships (three tactics available). After three misses of him it's your turn again. **Necessary Accessories for HP-41:** Four memory modules or Quad ROM

Steps: 796 HP-41 Bytes: 1496

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02396-41-0	$10	$17
FOR HP-71*	02396-71-7	N/A	$20

02397 Dielectric Sheet Electromagnetic Wave Transmission

by G.H. Stumpff II, Dayton, OH

This program calculates the efficiency at which a planar sheet of dielectric material transmits electromagnetic energy contained in a plane wave incident on the sheet. Attenuation effects in the dielectric and phase effects are also considered. **Necessary Accessories for HP-41:** One Memory Module and Library program number 01931C (cards included are required).

Steps: 350 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02397-41-8	$10	$14
FOR HP-71*	02397-71-5	N/A	$16

02398 Short Dipole over Ground Plane

by G.H. Stumpff II, Dayton, OH

This program calculates the far-field E- and H-plane radiation patterns of a short dipole antenna in close proximity to a ground plane. The interaction between the radiation and the ground plane is modelled using Fresnel plane wave reflection coefficients. The dipole may be either perpendicular or parallel to the ground plane. **Necessary Accessories for HP-41:** One Memory Module (41C only) and Library program #01931c required. Printer is optional.

Steps: 304 HP-41 Bytes: 592

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02398-41-6	$10	$14
FOR HP-71*	02398-71-3	N/A	$16

02400 Checkbook - Extended Memory

by J.E. Schiermeier, Cary, NC

This program uses an ASCII file in extended memory instead of Card Reader to store checks and deposits. Each check or deposit is entered with a number, date, ALPHA description, and amount. Two balances are kept: bank balance and checkbook balance. Upon clearing the bank, only the number is needed to change the bank balance and delete the transaction. Facilities also include voiding checks, displaying balances, and displaying specified transactions. **Necessary Accessories for HP-41:** Extended Functions Memory Module. One memory module.

Steps: 284 HP-41 Bytes: 611

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02400-41-0	$10	$13
FOR HP-71	NOT AVAIL		

02403 Bessel Functions of Integer Order

by L.O.J. Kagey, Fullerton, CA

The program consists of four routines which calculate solutions for Bessel functions of the first kind, J sub n (x), the second kind, Y sub n (x), and modified Bessel functions of the first kind, I sub n (x), and second kind, K sub n (x). Functions are calculated for positive integer order and positive argument. **Necessary Accessories for HP-41:** Three memory modules (or equivalent)

Steps: 643 HP-41 Bytes: 1356

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02403-41-4	$10	$17
FOR HP-71*	02403-71-1	N/A	$20

02405 Universal Transverse Mercator Zone to Zone Transformations

by T.H. Barfield, University, AL

This program transforms coordinates and azimuths from one universal transverse mercator (UTM) grid zone to an adjacent one. It complements computations done on Department of the Army (DA) Forms 4212 and 4259 (UTM zone to zone grid and azimuth transformations). DA Technical Manual 5-241-2 must be used for some of the program input data. **Necessary Accessories for HP-41:** None

Steps: 169 HP-41 Bytes: 291

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02405-41-9	$10	$12
FOR HP-71*	02405-71-6	N/A	$14

02406 Ideal Diode Equation

by M.H. Downing, Sunnyvale, CA

This program solves the volt-ampere characteristic of an ideal diode at room temperature. The forward voltage is calculated in terms of its forward current, reverse saturation current, and equivalent series d-c bulk resistance of a diode without knowing the doping levels. **Necessary Accessories for HP-41:** Card Reader and Printer optional

Steps: 82 HP-41 Bytes: 152

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02406-41-7	$10	$11
FOR HP-71*	02406-71-4	N/A	$12

02407 Natural Gas Measurement Via Orfice Meter

by K.J. Johnson, Metairie, LA

Program calculates natural gas rate through an orifice meter given internal diameter of pipe, orifice size, upstream pressure, differential pressure, temperature, pressure base, temperature base and gas specific gravity. **Necessary Accessories for HP-41:** Petroleum Fluids Pac, three memory modules and Card Reader.

Steps: 205 HP-41 Bytes: 578

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02407-41-5	$10	$24
FOR HP-71	NOT AVAIL		

02408 Pile Group Analysis by Elastic Centre Method

by V. Lang, Singapore, SINGAPORE

This program determines forces in each pile in a system consisting of both vertical and raking piles. **Necessary Accessories for HP-41:** Quad memory module or HP-41CV. Printer optional.

Steps: 294 HP-41 Bytes: 587

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02408-41-3	$10	$14
FOR HP-71*	02408-71-0	N/A	$16

02409 6502 Disassembler

by G.K. Ziran, Frankfurt/Main, W. Germany

This program disassembles machine-coded programs of the 6500 microprocessor family. The listings are printed and contain address, hex-code and mnemonic. The program also allows for printing of data and calculates length of the disassembled routines, as well as the target addresses for relative branch operations. **Necessary Accessories for HP-41:** Printer and X-Functions module. Quad RAM for HP-41C

Steps: 1057 HP-41 Bytes: 2048

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02409-41-1	$10	$20
FOR HP-71*	02409-71-8	N/A	$24

02411 Steel Tube/Pipe Column

by K.F. Dunker, Ames, IO

Steel tube or pipe columns with axial loads in combination with biaxial bending are checked by the program in accordance with Part I of the 1978 AISC Specification. Output from the program includes the results from both stability and yield interaction formulas. Section property values must be provided by the user. **Necessary Accessories for HP-41:** Three memory modules

Steps: 638 HP-41 Bytes: 1365

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02411-41-7	$10	$17
FOR HP-71*	02411-71-4	N/A	$20

02412 Steel Wide Flange Column

by K.F. Dunker, Ames, IO

Steel wide flange columns with axial loads in combination with biaxial bending are checked by the program in accordance with Part I of the 1978 AISC Specification. The program checks local buckling for both web and flange. Output includes results from both stability and yield interaction formulas. Section property values must be provided by the user. **Necessary Accessories for HP-41:** Three memory modules

Steps: 723 HP-41 Bytes: 1449

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02412-41-5	$10	$17
FOR HP-71*	02412-71-2	N/A	$20

02413 HOME - Household Organizer and Manager or Expenditures Prog

by M.S. Daskin, Evanston, IL

This program allows the user to record expenditures in one of thirty categories. Monthly category totals and grand total may be stored on a card. Month cards may be summed and stored on a year-to-date card. Extensive error checking and correcting included. Category titles may be changed easily. **Necessary Accessories for HP-41:** Three memory modules. Card Reader optional.

Steps: 387 HP-41 Bytes: 1119

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02413-41-3	$10	$15
FOR HP-71	NOT AVAIL		

02414 n Complex Simultaneous Equations

by M.J. Jones, Irvine, CA

Program will solve a system of n simultaneous equations with complex coefficients. Will solve for n=2 with one additional memory module, n=4 with two, n=5 with three, and n=7 with four or a Quad memory module. Tips included for using the Math Pac ROM to perform the same task. Also, tips included for using the Extended Functions module to decrease memory requirements. **Necessary Accessories for HP-41:** One memory module. Quad for 7 equations.

Steps: 364 HP-41 Bytes: 608

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02414-41-1	$10	$13
FOR HP-71*	02414-71-8	N/A	$14

02415 Radar Equation

by G.H. Stumpff II, Dayton, OH

This program calculates any one of the variables in the radar equation given values for all the other variables. The program also calculates the single look probability of detection for both scintillating and non-scintillating targets. Slant range to ground and to airborne target can be calculated. There is also a subroutine to evaluate the effect of rain and other attenuating media on detection range. **Necessary Accessories for HP-41:** Two memory modules

Steps: 570 HP-41 Bytes: 806

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02415-41-8	$10	$14
FOR HP-71*	02415-71-5	N/A	$16

02416 Advanced Las Vegas Blackjack, With Rules of Play Options

by R.S. Mushin, Downey, CA

This program simulates Las Vegas Style Blackjack with one player (you) against the dealer (HP-41). All standard rules are incorporated and the program is initialized for a particular casino's rules on pair splitting, doubling down, surrender, if dealer hits soft, number of decks, and betting limits. Insurance is always offered. The player can count aces as 1 or 11 and the hand is played until 21 is exceeded. Input data and plays are checked; if illegal an error message is displayed, the play is not executed, and the previous conditions resumed. **Necessary Accessories for HP-41:** Four memory modules. Time Modules optional.

Steps: 795 HP-41 Bytes: 1797

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02416-41-6	$10	$19
FOR HP-71*	02416-71-3	N/A	$22

02417 Horizontal Curve - Spiraled or Simple

by M. Shrout, Greeley, CO

Solves horizontal curve - either spiraled or simple. Curve based on arc definition. Simple curve may be defined by degree or radius. This program can use "PCURSTA", Users' Library #01945C, to print curve stations. **Necessary Accessories for HP-41:** One memory module

Steps: 293 HP-41 Bytes: 545

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02417-41-4	$10	$13
FOR HP-71*	02417-71-1	N/A	$14

02418 Audio Tape Counter/Timer Conversions

by D. Hayden, Rocky Hill, NJ

This program makes conversions between a tape counter (cassette, reel to reel, you name it), and real time. Functions include skipping a passage, elapsed time for a given counter reading and vice versa, and time between readings. Easy to write you own routines. Comes with separate routine to compute two necessary constants for your player experimentally. **Necessary Accessories for HP-41:** One working tape deck

Steps: 76 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02418-41-2	$10	$12
FOR HP-71*	02418-71-9	N/A	$14

02419 Tropical Year Calculations

by W.E. Hitchins, Los Angeles, CA

Astronomers, chronologists, and calendar enthusiasts now have an easy program to calculate the length of the tropical year for any year past or present. Program also calculates accumulated tropical years from 1582 to any year in the future or from 1900 to any year in the past (down to 900 A.D.). High accuracy is maintained to 10 decimal places, whatever the length of the integer (representing whole days). This feature allows checking the accuracy of the mean year of any calendar system with high precision. **Necessary Accessories for HP-41:** None

Steps: 164 HP-41 Bytes: 328

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02419-41-0	$10	$12
FOR HP-71*	02419-71-7	N/A	$14

02420 Masonry Wall Analysis

by M.N. Pohll, Fresno, CA

Analyzes a solid grouted concrete masonry wall for combined axial and bending loads in accordance with uniform building code criteria. Printer ouput highly annodated for use as final structural calculations. **Necessary Accessories for HP-41:** One memory module and Printer

Steps: 297 HP-41 Bytes: 691

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02420-41-8	$10	$14
FOR HP-71*	02420-71-5	N/A	$16

02422 Resistor Color Code Interpreter

by E.P. Ludvik, Birmingham, AL

This program prompts the user for two letter band colors, checks each band for validity, display all bands after last prompt, allow the user to easily edit any band, calculate the resistor value in proper alpha units, and display tolerance value. The user may view or edit the bands at any time after the last band has been entered. **Necessary Accessories for HP-41:** None

Steps: 255 HP-41 Bytes: 581

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02422-41-4	$10	$13
FOR HP-71*	02422-71-1	N/A	$14

02423 Gravity Wall Analysis

by S.L. Stroh, Tampa, FL

This program provides a rapid means for investigating stability or gravity walls. Analysis includes factor of safety for overturning and sliding. Check for location of resultant of forces is within middle one-third of wall. And report of minimum and maximum bearing pressure. Analysis includes consideration of variable backfill slope and passive pressure. Wall may include extended toe. Edit feature allows revision of selected parameters and reanalysis with minimal input. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 509 HP-41 Bytes: 967

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02423-41-2	$10	$15
FOR HP-71*	02423-71-9	N/A	$18

02424 Curve Spiraled on One End Only

by M. Shrout, Greeley, CO

Solves horizontal curve with spiral on one end only. Curve based on arc definition. This program can use "PCURSTA", Library #01945C, to print curve stations. **Necessary Accessories for HP-41:** One memory module. Printer recommended.

Steps: 196 HP-41 Bytes: 414

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02424-41-0	$10	$12
FOR HP-71*	02424-71-7	N/A	$14

02425 Stabilizer With Zener Diode or Gas Diode LBL "STAB"

by I.R. Aizcorbe, Madrid, Spain

This program computes the stability factor, output resistance, limiter resistance and maximum input voltage variation for specific parameters of this circuit. **Necessary Accessories for HP-41:** Printer optional

Steps: 135 HP-41 Bytes: 260

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02425-41-7	$10	$12
FOR HP-71*	02425-71-4	N/A	$14

02426 Voltage Multiplier LBL "VOMUL"

by I.R. Aizcorbe, Madrid, Spain

This program enables you to calculate the output voltage and ripple of a n section multiplier. Also, you can obtain the multiplier component value to have a predeterminate output voltage and ripple. **Necessary Accessories for HP-41:** None

Steps: 185 HP-41 Bytes: 261

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02426-41-5	$10	$12
FOR HP-71*	02426-71-2	N/A	$14

02427 DME With Approach Timer and Wind Triangle

by T.R. Casey, Torrance, CA

Uses Time Module to provide time and distance remaining to a fix. Provides for input of distances and groundspeeds during pre-flight and gives constant readings during flight. Also provides low fuel warning alarms and missed approach alarms. Wind triangle program is included for convenience of flight planning. **Necessary Accessories for HP-41:** One memory module and Time Module

Steps: 216 HP-41 Bytes: 509

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02427-41-3	$10	$13
FOR HP-71	NOT AVAIL		

02429 Unsymmetrical Verticle Curves

by M.T. Yoshimura, Honolulu, HI

This program calculates station and elevation data for unequal tangent verticle curves and equal tangent curves. Required variables are length of each tangent, beginning and ending grades and either PC STA & Elev or PI STA & Elev. **Necessary Accessories for HP-41:** Three memory modules

Steps: 473 HP-41 Bytes: 812

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02429-41-9	$10	$14
FOR HP-71*	02429-71-6	N/A	$16

02430 Traverse Angle Balance Made Easy

by J. Apple, White House, TN

Balance traverse angles for closed traverse or line traverse closing on a known point. Can use angles left or right or deflection angles. Input reference bearing, closing bearing if different from reference and angles. Output of total angular error, error per setup and adjusted or unadjusted bearings or azimuths. Input is fully prompted for. Allows you to review all angles input and change any angle at any time. **Necessary Accessories for HP-41:** One memory module

Steps: 320 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02430-41-7	$10	$13
FOR HP-71*	02430-71-4	N/A	$14

02431 Video-Calc

by S.E. Taylor, Ames, IO

Electronic worksheet for the HP-41C. This program is an adaptation of MicroCalc (0116C) that uses the Video Interface to produce a 4-column by 5-row micro-spread sheet. The user can input ALPHA data or numerical data in any selected cell, display all cells on video unit or a single cell on the HP-41C. Whole sheet re-calculation is available on command. **Necessary Accessories for HP-41:** Two memory modules, IL Module, Video-Interface.

Steps: 396 HP-41 Bytes: 877

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02431-41-5	$10	$14
FOR HP-71	NOT AVAIL		

02432 U.B.C. Embedment Depth For Poles

by D. Lilljedahl, Dallas, TX

This program solves for the required footing depth using the 1979 Uniform Building Code method as outlined in section 2907(f). The soil bearing pressure and load parameters are input using local labels, then the user enters the desired pole diameter. Either constrained or non-constrained poles can be designed. **Necessary Accessories for HP-41:** None

Steps: 140 HP-41 Bytes: 273

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02432-41-3	$10	$12
FOR HP-71*	02432-71-0	N/A	$14

02433 Battleships

by A. Watson, Edenvale 1610, South Africa

Challenge your battle strategy with this rapid-fire, war game. HP-41 selects the enemy positions. Isolate and destroy its concealed troopship, sub and battleship, on a ten-by-ten board supplied with the program. HP-41 bleeps out the hits and misses. Your skill and strategy alone will determine your score. **Necessary Accessories for HP-41:** Two memory modules

Steps: 605 HP-41 Bytes: 1006

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02433-41-1	$10	$15
FOR HP-71*	02433-71-8	N/A	$18

02434 Polynomials Modific., Newton Form and Shifted Power Form

by M. Tremblay, Ste-Foy, Canada

From a polynomial in the shifted power form (Taylor expansion) or in the Newton form, you can enter new centers, obtain the power form or evaluate the polynomial at a point 2. The coefficients and the centers are stored in the calculator thus at any time 3 routines help you to visualize them. Maximum degree is 84 (41CV or Quad). **Necessary Accessories for HP-41:** One memory module and X-Functions module

Steps: 246 HP-41 Bytes: 395

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02434-41-9	$10	$12
FOR HP-71*	02434-71-6	N/A	$14

02435 Treasure Island

by D. Ristanovic, Belgrade, YUGOSLAVIA

This is an adventure game program. You are on an island looking for treasure. The map of the island is different each time you play the game. Try to find the treasure before you starve. You have to take care about a lot of things: natives, sharks, deep well, hurricanes, etc. **Necessary Accessories for HP-41:** One memory module

Steps: 289 HP-41 Bytes: 587

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02435-41-6	$10	$13
FOR HP-71*	02435-71-3	N/A	$14

02437 Khrgian and Mazin Freq Distr

by E.M. Keefe, Ankeny, IA

This program computes a table of frequencies and cumulative frequencies for integer values of X for the Khrgian and Mazin Frequency Distribution: A*X 2*exp(-B*X). Useful in atmospheric physics. Discrete values of X are also accommodated to save on interpolation. **Necessary Accessories for HP-41:** None

Steps: 114 HP-41 Bytes: 183

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02437-41-2	$10	$11
FOR HP-71*	02437-71-9	N/A	$12

02438 Non-Linear Error For Curve Fit

by E.M. Keefe, Ankeny, IA

In Aviation Engineering, data is sometimes "fit" to a straight line with the goodness of fit determined by the criterion of "non-linear-error". This program will accept data as prompted for; compute the best straight line to fit the data and compute the NLE. Original data is preserved and may be added to, deleted from, printed out, stored, etc. **Necessary Accessories for HP-41:** Two memory modules

Steps: 260 HP-41 Bytes: 471

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02438-41-0	$10	$13
FOR HP-71*	02438-71-7	N/A	$14

02439 Cost Estimator With Electronic Spreadsheet Characteristics

by E.M. Keefe, Ankeny, IA

With the HP-41C/V (or Quad memory module) this program will accommodate 72 items in a typical cost estimating spread sheet. The user enters # of units, and cost per unit for each item of material and the time per unit for labor as well as the average labor charge per hour. The program computes and stores these figures for future recall or change. A running subtotal is maintained at all times. Changes to input data may be made at any time during the program. **Necessary Accessories for HP-41:** Extended Functions/Extended Memory Module

Steps: 283 HP-41 Bytes: 568

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02439-41-8	$10	$13
FOR HP-71*	02439-71-5	N/A	$14

02441 Decimal to Fraction

by J. Henzi, Valdivia, CHILE

This program changes decimal numbers in fractions. It is available for rational periodic or non-periodic numbers. **Necessary Accessories for HP-41:** None

Steps: 94 HP-41 Bytes: 186

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02441-41-4	$10	$11
FOR HP-71*	02441-71-1	N/A	$12

02442 Schedule By Constraints

by J.E. Schlermeier, Cary, NC

For a set of events, this program finds the logically consistent sequence, given a matrix showing which events must necessarily precede others. The program returns the ordered list of events, and it leaves the ordered matrix in the registers. One memory module will accommodate 16 events; 2, 28 events; 3, 35 events; and 4, 40 events. **Necessary Accessories for HP-41:** One memory module

Steps: 361 HP-41 Bytes: 500

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02442-41-2	$10	$13
FOR HP-71*	02442-71-9	N/A	$14

02443 Matrix Operations

by J.E. Schlermeier, Cary, NC

This program solves a system of simultaneous equations, finds the inverse or determinant of a matrix, or uses Gaussian elimination to reduce the matrix to echelon form. The size of the matrix is limited only by the amount of same way. **Necessary Accessories for HP-41:** One memory module

Steps: 287 HP-41 Bytes: 505

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02443-41-0	$10	$13
FOR HP-71*	02443-71-7	N/A	$14

02444 Airstream Energy Balances

by J.A. Pita, Quito, Ecuador

Predicting the final temperature of two airstreams that mix, or exchange heat without mixing, involves an iterative procedure because both air and water-vapor enthalpies must be considered simultaneously. This program uses correlations for those enthalpies in order to solve such problems quickly. English units are used. **Necessary Accessories for HP-41:** One memory module

Steps: 165 HP-41 Bytes: 317

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02444-41-8	$10	$12
FOR HP-71*	02444-71-5	N/A	$14

02445 Short Circuit Rating of Cables

by R.D. Guppy, St James - Perth, WESTERN AUSTRALIA

Program calculates either the maximum allowable short circuit current for, or the minimum cross-sectional area of, a cable, given the cable conductor and insulation material, fault duration, cable insulation operating temperature (rated or actual), and either the conductor cross-sectional area or the short circuit current to be withstood. Program will calculate actual cable insulation operating temperature. **Necessary Accessories for HP-41:** One memory module; card reader and printer are required.

Steps: 273 HP-41 Bytes: 611

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02445-41-5	$10	$14
FOR HP-71	NOT AVAIL		

02446 Map Check One

by R.T.J. Martin, Jacksonville, NC

Given a traverse consisting of bearings and horizontal distances - program will solve for the following: Linear error of closure; Total error of North's and East's; Closure precision; Total traverse distance; Area in square feet and acres; Closing bearing and distance to beginning point. Also, program will solve for missing side of a closed traverse. In addition, program will remove a traverse side input incorrectly - without having to start over! **Necessary Accessories for HP-41:** One memory module. Printer and Card Reader optional.

Steps: 220 HP-41 Bytes: 413

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02446-41-3	$10	$12
FOR HP-71*	02446-71-0	N/A	$14

02447 Shoot-out at the OK Corral

by R.L. Gardner, Anamosa, IA

A video displayed graphic of the OK Corral is the background for a shoot-out between Wyatt Earp and Blinky, the last two remaining from the famous shoot-out. You are Wyatt and you have an unusual way of aiming your trusty Peacemaker. Can you get Blinky before he gets you? **Necessary Accessories for HP-41:** Quad memory modules, Extended Function-Memory Module, HP-Interface Loop, Video Interface and a monitor or TV.

Steps: 726 HP-41 Bytes: 1817

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02447-41-1	$10	$19
FOR HP-71	NOT AVAIL		

02448 Multi-Purpose Bar Graph

by R.L. Gardner, Anamosa, IA

Program produces graphs from a function or data, with or without an average bar(s) and a choice of bars showing one or two values. All choices have prompts. Ideal for comparing two sets of values such as two year monthly comparison of sales, growth, yields, rainfall or whatever. **Necessary Accessories for HP-41:** Two memory modules, HP-Interface Loop, 82162 Thermal Printer

Steps: 339 HP-41 Bytes: 710

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02448-41-9	$10	$14
FOR HP-71	NOT AVAIL		

02449 Surface Tensions of Aqueous Organic Solutions

by J.A. Pita, Quito, Ecuador

Given the surface tensions and molar volumes of the pure components at a given temperature (water and organic compound), this program estimates the surface tension for a solution of a given molar composition. The method of Tamura, Kurata and Ocani is employed here. Any composition greater than zero and less than one can be employed. **Necessary Accessories for HP-41:** None

Steps: 171 HP-41 Bytes: 252

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02449-41-7	$10	$12
FOR HP-71*	02449-71-4	N/A	$14

02450 Sizing or Electrical Conduit For Traffic Signal Design

by R.H. Grabowski, New Westminster, CANADA

In designing traffic signal systems, the correct diameters of many conduit need to be found quickly and error-free. This program helps overcome the limitations of using tables or formulae. It will provide the design diameter based on 26% or 40% fill factor, using wire gauges #4 through #14, and DLC wire. **Necessary Accessories for HP-41:** Printer useful

Steps: 153 HP-41 Bytes: 442

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02450-41-5	$10	$12
FOR HP-71*	02450-71-2	N/A	$14

02452 Simply Supported and Cantilevered Steel Beams

by B.T. Opsahl, Hosle, Norway

The program computes the design load, design bending moment and design strength of simply supported and cantilevered steelbeams in both "Ultimate Limit State" and "Ultimate Seviceability State". It also suggests which profile to use and computes the static bending and result stress in the beam chosen. Calculations done according to Norwegian Standard, NS 3473. **Necessary Accessories for HP-41:** Quad RAM or three memory modules

Steps: 470 HP-41 Bytes: 1148

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02452-41-1	$10	$20
FOR HP-71*	02452-71-8	N/A	$24

02453 Geosycronous Satellite Pointing Calculation

by R.C. Counts, Richardson, TX

Calculates azimuth and elevation of geosycronous satellites within a specified satellite longitudinal range. When a printer is attached, a plot of the satellites azimuth vs elevation can be generated. This plot is extremely useful when evaluating an earth station location. Local horizon elevations may be drawn by the user over the plot and antenna shading problems easily identified. Satellite pointing information may be printed in convenient table form also. **Necessary Accessories for HP-41:** One memory module. Printer helpful.

Steps: 357 HP-41 Bytes: 745

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02453-41-9	$10	$14
FOR HP-71	NOT AVAIL		

02454 Redfern's Mercator Computation

by M. Cox, Dunedin, New Zealand

Using Redfern's formulae, this program converts latitude and longitude to northings and eastings (and vice-versa) on any transverse mercator projection on any spheroid. Examples are given on how to store projection details of commonly used projections in the program. Examples are given using Southern Hemisphere data only. **Necessary Accessories for HP-41:** Two memory modules

Steps: 709 HP-41 Bytes: 1115

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02454-41-7	$10	$15
FOR HP-71*	02454-71-4	N/A	$18

02455 Long Term Financing

by G.K. Ziran, Frankfurt/Main, W. Germany

This program will help you project your companies long term financing requirements. Input data are income, assets, dividends and various other cost. A valuable and fast tool for analysing consequences of different schedules and decisions. **Necessary Accessories for HP-41:** One memory module. Printer recommended.

Steps: 226 HP-41 Bytes: 587

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02455-41-4	$10	$13
FOR HP-71*	02455-71-1	N/A	$14

02456 Gravimeter Data Reduction To Boguer Anomaly

by H.R. Ballard, Dunedin, New Zealand

The program calculates a Boguer Anomaly value (not terrain corrected) from prompted inputs for Boguer slab density, time, gravimeter reading, elevation and north-south distance from base station in either miles, kilometers or minutes of latitude. Drift is assumed to be linear and evaluated from base occupation times and gravimeter readings. **Necessary Accessories for HP-41:** None

Steps: 120 HP-41 Bytes: 260

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02456-41-2	$10	$12
FOR HP-71*	02456-71-9	N/A	$14

02458 The Tower of Brahma

by W.E. Hitchins, Los Angeles, CA

On the banks of the Ganges, in the City of Varanasi, there is a temple with a dome that marks the center of the Earth. Below the dome are three diamond rods, on one of which there are a number of disks of the finest gold, each disk being larger than the one above. This is the Tower of Brahma. Your task is to move the disks according to the Laws of Brahma to another of the rods, one by one, so you may reach nirvana. There are 33 levels of difficulty with theoretical completion times from 1 second to 272 years! **Necessary Accessories for HP-41:** One to three memory modules according to level of difficulty

Steps: 298 HP-41 Bytes: 613

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02458-41-8	$10	$13
FOR HP-71*	02458-71-5	N/A	$14

02459 AASHTO Prestressed Beams Type II, III, IV, V and VI

by S.L. Stroh, Tampa, FL

Program is specifically for design of composite prestressed AASHTO beam (type II, III, IV, V and VI) roadway bridges with HS 20-44 loading. Program computes losses, stresses at midspan and end of beam at release and final conditions, ultimate strength, cracking moment, beam shortening, D.L. deflection, residual camber, anchorage, and shear steel requirements at 20 th points in accordance with 1980 AASHTO code. **Necessary Accessories for HP-41:** Quad memory module, Printer and Card Reader

Steps: 2030 HP-41 Bytes: 4269

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02459-41-6	$10	$31
FOR HP-71	NOT AVAIL		

02460 Fast and Sure Root Finder

by M. Tremblay, Ste-Foy, Canada

This root finder is a powerful combination of the secant and bisection methods. Using their respective advantages, the program assures fast convergence (guaranteed) on an interval of a general function $f(x)=0$. Helpful to solve all the periodic function and the functions with many zeros. **Necessary Accessories for HP-41:** None

Steps: 140 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02460-41-4	$10	$11
FOR HP-71*	02460-71-1	N/A	$12

02461 XROM Bar Code Generator

by E.B. Pinkos, Laurel, MD

This program generates two byte paper keyboard (type 5) bar code for any XROM or group of XROM's within the same HP-41 application pac or peripheral device. Extensive knowledge of bar code generation is not essential. The user must simply input title of desired XROM module and desired start and finish XROM ID and Function numbers. A list of XROM ID and Function numbers is included with literature for easy reference. **Necessary Accessories for HP-41:** 82162A IL-Printer, Black Thermal Paper. Optical Wand optional.

Steps: 159 HP-41 Bytes: 343

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02461-41-2	$10	$12
FOR HP-71	NOT AVAIL		

02462 Calendar Printer, for any month of any year

by N.M. Johnson, Youngstown, OH

Ever try to plan ahead or wonder what day a certain date fell on?, but you couldn't find a calendar when you needed it, especially for the past. Well, you'll never have that problem again with Calendar Printer. Given any year, (0001 A.D. - the future) and any month of that year, this program will compute and print a calendar for that month. The program will even mark out special days with an asterisk to remind you of its importance. **Necessary Accessories for HP-41:** One memory module and Printer. Card Reader optional.

Steps: 240 HP-41 Bytes: 496

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02462-41-0	$10	$13
FOR HP-71*	02462-71-7	N/A	$14

02463 Third Order Lens System Design-Transversal Aberrations

by C. Rusquellas, Buenos Aires, Argentina

Given a system of N thin spherical lenses, this program based on the "lens bending" method, computes the transversal aberrations for different surface curvatures of the lenses, but keeping the individual powers as a constant; thus, it is easy to find the configuration that minimizes the total aberrations. The system can also include spherical mirrors. **Necessary Accessories for HP-41:** One or more memory modules. Printer optional.

Steps: 392 HP-41 Bytes: 617

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02463-41-8	$10	$13
FOR HP-71*	02463-71-5	N/A	$14

02464 Multiprinting of Matrices

by P. Kokol, Maribor, Yugoslavia

This program enables multiprinting of matrices. Multiprinting denotes printing on more stripes and then glued these together. The user must input the number of rows and columns, the number of places and the number of decimal places for one number. With this input parameters the user can choose his/her own format for printing. Note that this program is meant as a subroutine. **Necessary Accessories for HP-41:** Printer

Steps: 103 HP-41 Bytes: 155

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02464-41-6	$10	$11
FOR HP-71*	02464-71-3	N/A	$12

02465 Grocery Shopping With Cost Comparison

by G. Steven, West Allis, WI

Enter groceries as you put them in the shopping cart (as taxable or non-taxable) and the program displays the running total of the cost of the groceries. Can delete items that are put back on the shelf. Does cost comparisons: Enter cost and units of items 1 and 2, and it prompts you to BUY ITEM 1 or to BUY ITEM 2. **Necessary Accessories for HP-41:** None

Steps: 88 HP-41 Bytes: 223

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02465-41-3	$10	$11
FOR HP-71*	02465-71-0	N/A	$12

02466 Math Flashcard - For Children and Adults

by G. Steven, West Allis, WI

This program flashes addition, subtraction, multiplication, and division problems. For +, -, and *, the 2 numbers can be from 1 to 3 digits each; for /, the quotient and divisor can be 1 or 2 digits each (calculates dividend from these). This allows for use as a child's tutor or an adult's "mind exerciser" or just for practice. Displays correct answer if incorrect. Calculates time taken per correct response (user inputs time at start and finish). **Necessary Accessories for HP-41:** One memory module

Steps: 210 HP-41 Bytes: 476

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02466-41-1	$10	$13
FOR HP-71*	02466-71-8	N/A	$14

02467 Moment of Inertia For Composite Areas

by T. Langland, Phoenix, AZ

This program quickly and accurately computes composite moments of inertia and locations of center of gravity for any combination of rectangular or special sections. **Necessary Accessories for HP-41:** None

Steps: 113 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02467-41-9	$10	$11
FOR HP-71*	02467-71-6	N/A	$12

02468 Linear Array Directivity

by G.H. Stumpff II, Dayton, OH

This program calculates the directivity of an antenna consisting of a linear array of isotropic radiators as a function of look angle. The element positions and excitations (amplitude and phase) can be completely arbitrary; the spacings and excitations need not be uniform. **Necessary Accessories for HP-41:** None

Steps: 148 HP-41 Bytes: 252

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02468-41-7	$10	$12
FOR HP-71*	02468-71-4	N/A	$14

02469 Two Port Parameters Convertion

by G. Ringler, Buenos Aires, ARGENTINA

This program will compute any of the thirty (30) conversions between the most common two port parameters matrix. They are z, y, direct transmission, inverse transmission, h and g. The direct application is in the procedure to find the new parameter matrix of a two port network formed by other two or more two-port networks. **Necessary Accessories for HP-41:** Four memory modules

Steps: 771 HP-41 Bytes: 1287

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02469-41-5	$10	$16
FOR HP-71*	02469-71-2	N/A	$18

02470 Bolt Prying Action in Steel Connections

by R.J. Rockefeller, Savannah, GA

This program uses elastic theory as presented in the AISC Manual of Steel Construction, 8th edition to determine the effects of bolt prying on steel connections with bolts in tension. It returns the bolt force and fitting thickness required based on load and connection geometry. Fully user interactive and prompted and output is clearly labeled. **Necessary Accessories for HP-41:** None

Steps: 150 HP-41 Bytes: 260

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02470-41-3	$10	$12
FOR HP-71*	02470-71-0	N/A	$14

02471 Reinforced Concrete Corbel and Bracket Design

by R.J. Rockefeller, Savannah, GA

This program designs steel reinforced concrete corbels and brackets in accordance with ACI 318-77. It selects based on user input of material properties, loads and basic geometry and outputs the least steel required and minimum steel depth needed. User interactive and fully prompted and labeled. **Necessary Accessories for HP-41:** One memory module

Steps: 340 HP-41 Bytes: 643

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02471-41-1	$10	$13
FOR HP-71*	02471-71-8	N/A	$14

02472 Extended Memory ASCII File Management Program

by J.P. Kleespies, Lynbrook, NY

This program provides the capability to easily construct ASCII files in extended memory, to record the contents of these files on magnetic cards for future use, and to read them back into extended memory when required. **Necessary Accessories for HP-41:** Extended Functions/Memory Module, HP 82180A; Card Reader, 82104A.

Steps: 239 HP-41 Bytes: 520

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02472-41-9	$10	$13
FOR HP-71	NOT AVAIL		

02473 Alpha Aspects

by R. Iglesias N., Caracas, Venezuela

This program will calculate the FEAW and CFM counts, the major aspects and the angle (orb.) from an exact aspect. It will display the aspects found with alpha characters. Example: SEX: JUP SAT, TRI: MARS MOON, OPO: ASC PLU, etc. **Necessary Accessories for HP-41:** One memory module and Card Reader. Printer useful.

Steps: 251 HP-41 Bytes: 607

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02473-41-7	$10	$13
FOR HP-71	NOT AVAIL		

02474 Diameter Estimation of Vapor-Liquid Contacting Trays

by J.A. Pita, Quito, Ecuador

Using a procedure based on Fair's correlation for entrainment flooding this program finds the tray diameter provided the following data are given: Mass flow and densities of vapor and liquid, surface tension of liquid, ratio of vapor hole area to tray active area, a flooding factor, a foaming factor and the tray spacing. Some default values are recommended for the data. The estimation works with bubble cap and sieve trays. Can be used with value trays also. **Necessary Accessories for HP-41:** None

Steps: 157 HP-41 Bytes: 339

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02474-41-5	$10	$12
FOR HP-71*	02474-71-2	N/A	$14

02475 The Gamma Function and Related Functions

by L.O.J. Kagey, Fullerton, CA

This program and its subroutines provides for calculation of the Gamma Function, the Incomplete Gamma Function, the Beta Function, and the group of related functions known as the Psi Function (Digamma Function) and the Polygamma Functions. Each function may be accessed separately and their modular structure permit easy adaptation as subroutines for other programs. **Necessary Accessories for HP-41:** Three memory modules

Steps: 687 HP-41 Bytes: 1444

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02475-41-2	$10	$17
FOR HP-71*	02475-71-9	N/A	$20

02476 Simple Curve Solver

by R.T.J. Martin, Jacksonville, NC

Given any two of the following: Radius or degree of curve, (arc definition), delta, arc length or tangent. Program will solve for the following: Radius, degree of curve, delta, arc length, long chord, tangent, and segment area (in square feet). **Necessary Accessories for HP-41:** Card Reader and Printer optional

Steps: 132 HP-41 Bytes: 220

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02476-41-0	$10	$11
FOR HP-71*	02476-71-7	N/A	$12

02477 Properties For Solids of Revolution

by S.A. Porter, Tacoma, WA

This program will provide the user with surface area, weight, centroids, and both the traverse and axial mass moment of inertia for any homogeneous solid of revolution defined by an arbitrary cross section. **Necessary Accessories for HP-41:** Three memory modules. Printer optional.

Steps: 714 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02477-41-8	$10	$16
FOR HP-71*	02477-71-5	N/A	$18

02478 The Dungeon Master

by P. Galvin, Middletown, CT

"The Dungeon Master" frees its human counterpart from worrying about wandering monsters, adventurer rest periods and experience, DM initiative rolls, and all other time and dice-related aspects of "Dungeons and Dragons". This enables the DM, with the help of the enclosed adventure log sheet, to run a game easily and quickly. **Necessary Accessories for HP-41:** None

Steps: 168 HP-41 Bytes: 304

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02478-41-6	$10	$12
FOR HP-71*	02478-71-3	N/A	$14

02479 Off Shore Navigation For Sail Racer/Cruisers

by R.P. Anderson, Port Townsend, WA

For offshore navigator who must maintain accurate dead reckoning position. Object is to eliminate difficult chart work under sailing conditions. Needs only attention to compass, speed, and time. Program has separate "tide" corrections. Execution of "MK" computes proper sailing heading to any mark given its bearing and distance. **Necessary Accessories for HP-41:** One memory module. Card Reader optional.

Steps: 214 HP-41 Bytes: 498

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02479-41-4	$10	$13
FOR HP-71*	02479-71-1	N/A	$14

02482 Plane Analytic Geometry Straight Lines

by G.M. Halpern MD, Honolulu, HI

This program solves analytic problems involving "Straight Lines". Area of a triangle, two point lines, point and slope, intercept, parallel lines, perpendicular lines and normal forms of the equation of a line. Solution of matrices are involved in some of these problems, otherwise standard formulas are used. The program requires the use of the printer because some graphic subroutines are used. **Necessary Accessories for HP-41:** Two memory modules. Printer and Card Reader optional.

Steps: 657 HP-41 Bytes: 1233

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02482-41-8	$10	$16
FOR HP-71	NOT AVAIL		

02483 Confluent Hypergeometric Function

by S.H. Tedder, Tulsa, OK

This program calculates values of the confluent hypergeometric function. The function includes as special cases many of the functions of mathematical physics, including bessel functions, solutions of the Schroedinger equation for Coulomb and for harmonic oscillator potentials. The fresnel integrals of classical optics, and many others. The program runs much faster than a straightforward evaluation of the infinite series. **Necessary Accessories for HP-41:** None

Steps: 153 HP-41 Bytes: 105

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02483-41-6	$10	$11
FOR HP-71*	02483-71-3	N/A	$12

02484 GTHML

by M.H. Bramson, Ann Arbor, MI

This program calculates the energy requirements and cost of energy to heat a structure with a ground water sourced heat pump. The program also calculates the amount and cost of conventional fuels (oil, gas, propane or electric) and compares their cost to the ground water sourced heat pump energy cost. **Necessary Accessories for HP-41:** One memory module

Steps: 293 HP-41 Bytes: 625

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02484-41-4	$10	$13
FOR HP-71*	02484-71-1	N/A	$14

02485 Polynomial Equation Graph

by T.G.J. Huckabee, N Charleston, SC

This program will allow the user to manually plot any polynomial equation by inputing just the coefficients for the x power terms. the program then prompts for "X" and computes f(x) til user is done. Program is written for easy recovery from errors entered by the user. The program's limit for the x power terms is determined by setting of the SIZE function. Written as time saver for student since equation is entered only once. **Necessary Accessories for HP-41:** None

Steps: 80 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02485-41-1	$10	$11
FOR HP-71*	02485-71-8	N/A	$12

02486 Time Constants of RC Circuits

by G.E.J. Warren, Sylvester, GA

Program calculates TC- time constant, R- resistance, C- capacitance, NTC- number of time constants, t- time period, curve percent from the universal time constant chart, EC- capacitor voltage at charge and discharge, ER- resistor voltage at charge or discharge, and I- current at charge or discharge. Alpha prompts are used in the input and alpha labels used in the output. **Necessary Accessories for HP-41:** One memory module

Steps: 273 HP-41 Bytes: 472

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02486-41-9	$10	$13
FOR HP-71*	02486-71-6	N/A	$14

02487 Time Constants of L R Circuits

by G.E.J. Warren, Sylvester, GA

Program calculates TC- time constant, L- inductance, C- Capacitance, NTC- number of time constants, t- time period, curve percent from the universal time constant chart, I- current @ maximum @ build up and decay, ER- resistor voltage @ build up and decay, EL- inductor voltage. Alpha prompts are used in the input and alpha labels used in the output. **Necessary Accessories for HP-41:** One memory module

Steps: 283 HP-41 Bytes: 512

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02487-41-7	$10	$13
FOR HP-71*	02487-71-4	N/A	$14

02488 Challenge Tic-Tac-Toe

by N.M. Johnson, Youngstown, OH

Can you take the challenge? Can you beat the HP-41C in a simple game of Tic-Tac-Toe? This program takes over where Tic-Tac-Toe (00948C) left off. Here we try to even the odds in your favor and you still can't win! The HP-41C does all the menial tasks, so all your concentrations can be on the game. There are three board graphics options, first and second player options and more, but the Wise Old Machine is still unbeatable! **Necessary Accessories for HP-41:** Two memory modules and printer. Card Reader optional.

Steps: 502 HP-41 Bytes: 1041

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02488-41-5	$10	$15
FOR HP-71*	02488-71-2	N/A	$18

02490 Conversions: Metric/English Plus Temperature and More

by N.M. Johnson, Youngstown, OH

This program will convert Metric Units to their equivalent English units and vice versa. In addition to the 98 Metric/English conversions and 84 metric/metric conversions plus 3 temperature conversions for a grand total of 201 dual conversions plus 3. All of this without the loss of any keyboard functions or user functions and the use of only 3 storage registers. Big things come in small programs. **Necessary Accessories for HP-41:** One memory module

Steps: 188 HP-41 Bytes: 502

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02490-41-1	$10	$13
FOR HP-71*	02490-71-8	N/A	$14

02491 Financial Calculations

by I. Tsalyuk, Fountain Valley, CA

This program solves a variety of problems involving money, time, and interest. Assumes payments are at the end of the compounding period. One key operations "R/S" is used to enter and calculate financial parameters. **Necessary Accessories for HP-41:** None

Steps: 186 HP-41 Bytes: 285

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02491-41-9	$10	$12
FOR HP-71*	02491-71-6	N/A	$14

02492 Cargo Insurance Valuation and Premium

by J.B. Russell, Seattle, WA

Most marine and other cargo insurance is based on a percentage of the CIF value of the shipment, usually 110%. As this includes the insurance premium itself as well as the other costs, calculating the insurance valuation and premiums can be time consuming and, for those not familiar with it, confusing. This program will automatically perform all the required calculations and provide the total CIF value, valuation for insurance purposes, marine risk premium, war risk premium, and the total premium. The program also calculates brokers discounts and commissions. **Necessary Accessories for HP-41:** Printer optional

Steps: 199 HP-41 Bytes: 397

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02492-41-7	$10	$12
FOR HP-71*	02492-71-4	N/A	$14

02493 Noise Figure Calculations

by E. Setaro, Mexico DF, MEXICO

Program calculates noise figures for receivers and amplifiers using various types of noise generators. It also determines effective noise temperature (TR) and RMG noise voltage (MV/MHZ Bandwidth). **Necessary Accessories for HP-41:** One memory module

Steps: 217 HP-41 Bytes: 574

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02493-41-5	$10	$13
FOR HP-71*	02493-71-2	N/A	$14

02494 Four Layer Weathering Static Correction Computation

by S. McIntosh, Cankaya, Ankara, TURKEY

The program calculates and prints out static corrections for up to four weathered layers. All velocities depths, elevations and travel times are also printed in groups according to layers. The replacement velocity and the datum plane elevation, which are constant in most areas, are entered and stored in data registers and can be changed by going to the appropriate steps. (These values are also printed). **Necessary Accessories for HP-41:** 82143A Printer and two memory modules

Steps: 195 HP-41 Bytes: 551

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02494-41-3	$10	$13
FOR HP-71*	02494-71-0	N/A	$14

02495 Cost Estimator

by E.B. Pinkos, Laurel, MD

Attention cost estimators! A customized program just for you. This user- friendly program computes direct and indirect costs related to labor, materials, equipment, small tools, subcontractors and suppliers. Subcontractor and prime contractor costs may be computed individually or collectively. Two operational modes allow the user to apply pre-set or inputed rates for overhead, G & A, and profit. Included also are sales and payroll taxes, insurance, fringes, straight time, overtime, bond, and weighted profit guideline routines. **Necessary Accessories for HP-41:** HP-41CV, IL-Printer, Extended Functions/Memory Module

Steps: 706 HP-41 Bytes: 2223

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02495-41-0	$10	$20
FOR HP-71	NOT AVAIL		

02496 Disequation Evaluation

by S. Diina, Grottaferrata, ITALY

This program permits evaluation of second degree disequations. User inputs are the coefficients (a, b, c) and the type of disequation, or a no-solution message. Particular effort was made to insure portability and reliability: result is a compact, no data regs using program. Subroutine call option provided, fully standard and HP-IL printer compatible. **Necessary Accessories for HP-41:** None

Steps: 82 HP-41 Bytes: 179

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02496-41-8	$10	$13
FOR HP-71	NOT AVAIL		

02497 Transducer Array Shading by the Dolph-Chebyshev Method

by L.O.J. Kagey, Fullerton, CA

This program leads the user through the calculation of the parameters needed to optimize an underwater transducer array beam pattern by the Dolph- Chebyshev method for shading an array, a practical application using Chebyshev polynomials. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 300 HP-41 Bytes: 546

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02497-41-6	$10	$13
FOR HP-71*	02497-71-3	N/A	$14

02498 Sound Speed in Air and Water

by L.O.J. Kagey, Fullerton, CA

This program calculates the speed of sound in air or water for user-selected parameters of barometric pressure, air temperature, humidity, water temperature, salinity and water depth. Calculations are made for either English or SI units. **Necessary Accessories for HP-41:** Two memory modules

Steps: 394 HP-41 Bytes: 1050

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02498-41-4	$10	$15
FOR HP-71*	02498-71-1	N/A	$18

02499 Ultimate Base Conversions

by T. Valere, Paris, FRANCE

This program converts numbers from an arbitrary base to another with three major features: 1) converts signed integers 2) of up to 24 digits (using alpha) 3) conversion bases nge from 2 to 36 (to 73 with printer). Uses letters A-Z (for bases <37) as "digits". Ready to be used as a promptless subroutine or as a prompting program. Needs no data registers (but the stack plus alpha) nor extended memory. Uses no synthetic programming. **Necessary Accessories for HP-41:** Extended Functions module

Steps: 162 HP-41 Bytes: 288

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02499-41-2	$10	$13
FOR HP-71	NOT AVAIL		

02500 Delta to y, y to Delta Conversion With Complex Impedances

by C. Martinez, Santiago, CHILE

This program changes the load configuration from delta to y or vice verse. The program prompts for all impedances that must be of the form R+jx. **Necessary Accessories for HP-41:** Printer optional

Steps: 141 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02500-41-7	$10	$12
FOR HP-71*	02500-71-4	N/A	$14

02501 Solution To System of Up to 16 Equations Simultaneously

by S. Fort, Indianapolis, IN

This program solves up to sixteen (16) simultaneous equations by a modified Gauss-Jordan method. It also allows for reviewing and editing the coefficients before they are used in the solution. The coefficients are entered as they appear in the order of the equation, instead of by two separate matrices, thus making entry easier. **Necessary Accessories for HP-41:** Additional memory if over a 4x4 system.

Steps: 139 HP-41 Bytes: 224

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02501-41-5	$10	$11
FOR HP-71*	02501-71-2	N/A	$12

02502 ASCII File Maintenance Routines For Extended Memory

by G.E. McCabe, San Jose, CA

This program package contains six interrelated routines for the most efficient and convenient use of Extended Memory space. Most significant of these is a program that will "PACK" and ASCII file to free any unused registers for other Extended Memory files or programs. Also there are routines to tell you how many bytes or how many registers are being utilized within a file. A resizing routine is included to expand or compress a file. **Necessary Accessories for HP-41:** Extended memory module

Steps: 191 HP-41 Bytes: 394

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02502-41-3	$10	$12
FOR HP-71	NOT AVAIL		

02503 Gram-Schmidt Orthogonalization

by I. Bond, Auckland 10, New Zealand

Given a set of m independent vectors in n-dimensional space this program reduces them to an equivalent set of m orthogonal vectors using the Gram-Schmidt process. **Necessary Accessories for HP-41:** Memory modules as according to total reg = (m+1)n+57

Steps: 201 HP-41 Bytes: 324

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02503-41-1	$10	$12
FOR HP-71*	02503-71-8	N/A	$14

02504 N-Dimensional Vector Operation

by I. Bond, Auckland 10, New Zealand

This program performs various operations on two vectors, U & V, in n-dimensional space. These operations are: p-norm, scalar multiplication, U-V, U+V, U.V (dot product), and if n=3 UxV (cross product). **Necessary Accessories for HP-41:** Memory modules required if n is greater than 3.

Steps: 192 HP-41 Bytes: 372

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02504-41-9	$10	$12
FOR HP-71*	02504-71-6	N/A	$14

02505 File Management

by E. Batikoff, Rehovot, Israel

This program collects and displays budgetary parameters of a set of "stocks" and is able to follow up to 20 current rates for each stock. By using FIFO concept entered current rates are displayed. In addition, it calculates and displays partial and grand totals. Efficient use of the HP-41C stack and YAST two work registers results in a maximal data storage capability. **Necessary Accessories for HP-41:** 2-4 memory modules. Printer optional.

Steps: 322 HP-41 Bytes: 678

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02505-41-6	$10	$14
FOR HP-71*	02505-71-3	N/A	$16

02506 Calendar Printout Using 82905B Impact Printer

by J.L. Gilby, Vancouver, Canada

This program gives a printout of a calendar for any year between 1900 and 2099 using the 82905B Impact Printer. **Necessary Accessories for HP-41:** One memory module, 82182A Time Module, 82160A HP-IL module, 82905B Impact Printer.

Steps: 282 HP-41 Bytes: 672

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02506-41-4	$10	$13
FOR HP-71	NOT AVAIL		

02507 Arabic Alphabet

by B. Omran, Katana, Syria

Using this program you can print Arabic letters in all of its configurations at the beginning, the middle and at the end of a word in a proportional spacing fashion (up to 50 letters a line on the HP 82162). You can access the subroutines in three ways, using global labels, local labels or number dependent function. **Necessary Accessories for HP-41:** Three memory modules and Printer

Steps: 700 HP-41 Bytes: 1517

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02507-41-2	$10	$17
FOR HP-71	NOT AVAIL		

02508 Subdivision Evaluation

by D. Crimmins, Encinitas, CA

Based on eight items of input data, program calculates any of the five major variables in a project evaluation, namely N, number of units, L, cost of raw land, %P, the developer's profit as % of sales, P, Selling price of a unit, and H, on-site construction cost of a unit. It then flashes a review of all the inputs selected, and displays a financial statement of the project. **Necessary Accessories for HP-41:** None

Steps: 498 HP-41 Bytes: 822

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02508-41-0	$10	$14
FOR HP-71*	02508-71-7	N/A	$16

02509 Capital Budgeting

by T. Langland, Phoenix, AZ

This program computes the present value, after taxes and depreciation, of a series of cash flows created by the acquisition of an asset. This result can then be used as a measure of the profitability of a project. **Necessary Accessories for HP-41:** One memory module

Steps: 189 HP-41 Bytes: 353

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02509-41-8	$10	$12
FOR HP-71*	02509-71-5	N/A	$14

02510 Flash Composition Calculations

by M.P. Wagner, St Albert, CANADA

For an isothermal flash of a mixture of to ten components, the vapour to feed ratio, and vapour and liquid compositions are calculated. Equilibrium ratios for each component, and initial composition must be known. **Necessary Accessories for HP-41:** None

Steps: 117 HP-41 Bytes: 177

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02510-41-6	$10	$11
FOR HP-71*	02510-71-3	N/A	$12

02513 Weighted Logit-Logria Method

by J.R. Dunn II, Detroit, MI

Calculates a smoothly weighted logit-log regression where weights are largest around the ED50 and decrease progressively outward. Programs use B or F and factors in dilutions for unknowns. Any number of standards, unknowns and replicates may be used. Output includes % NSB, % Bo, B/Bo, R, RMS, slope, Y intercept, ED50 (and their standard errors), unknown concentrations, % CV (if replicates) and % error of curve. Fully prompted. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 527 HP-41 Bytes: 1006

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02513-41-0	$10	$15
FOR HP-71*	02513-71-7	N/A	$18

02514 Circle-Line Intersection

by N.E. Ritchie, Portland, OR

Given a circle (x-A)**2+(Y-B)**2=R**2 and, a line Y=MX+C or X=N, the program will first determine how many intersections exist (none, one, or two). Then it will provide the X&Y coordinates of the intersections. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 205 HP-41 Bytes: 385

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02514-41-8	$10	$12
FOR HP-71*	02514-71-5	N/A	$14

02515 Taylor Series

by J. Warner, Ann Arbor, MI

This program calculates the coefficients in a Taylor or Maclarin series expansion of a user defined function. The first eleven coefficients are determined, with the help of central difference formulae for the derivatives. Lower coefficients are accurate to 7-10 significant figures; highest coefficient to 1-3 significant figures. **Necessary Accessories for HP-41:** Two memory modules

Steps: 376 HP-41 Bytes: 794

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02515-41-5	$10	$14
FOR HP-71*	02515-71-2	N/A	$16

02516 Special Functions

by J. Warner, Ann Arbor, MI

This program computes nineteen different special functions of mathematical physics, each with a separate global label, and consumes only 92 registers of program memory, plus five data registers and one flag. Includes: Legendre, Laguerre, Modified Bessel, Hypergeometric, Chebyshev, Hermite, Whittaker and other functions. No prompting - you simply load the stack with indices and an x value. **Necessary Accessories for HP-41:** One memory module

Steps: 411 HP-41 Bytes: 644

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02516-41-3	$10	$13
FOR HP-71*	02516-71-0	N/A	$14

02517 Radio Point to Point Path Data Calculation

by J.B. Osow, La Plata, Argentina

This program is designed to solve radio point to point path. Useful equations are used to compute attenuation vs clearance A0=f(c/c.6;M) made by author himself. Computes distance, azimuths, free space loss, antenna system, profile, attenuation vs path by equations and received signal level at received port for engineering path completely. **Necessary Accessories for HP-41:** Two memory modules. Card Reader convenient.

Steps: 515 HP-41 Bytes: 1058

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02517-41-1	$10	$15
FOR HP-71*	02517-71-8	N/A	$18

02518 Save and Restore Machine State

by M. Lewis, San Diego, CA

Comprises two programs: SSAVE and RESTO. SSAVE saves the states (set or clear) of flags 00-48. RESTO takes SSAVE output as input to: 1. Set flags 00-30. 2. Set display format and No. of digits according to flags 36-41. 3. Set grads, rads, or degrees according to flags 42-43. 4. Set alpha mode on/off according to flag 48. **Necessary Accessories for HP-41:** None

Steps: 195 HP-41 Bytes: 322

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02518-41-9	$10	$12
FOR HP-71*	02518-71-6	N/A	$14

02519 Frequency/Plot Control, FP

by N. Bercovitz, Anaheim, CA

When called by a master program FP requests inputs and furnishes frequencies (additive or multiplicative sequence) for calculation, controls storing of data as calculated, and controls plotting based on requested plot limits and axis. Other independent variables, such as time, may be substituted for frequency. **Necessary Accessories for HP-41:** Printer optional

Steps: 76 HP-41 Bytes: 153

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02519-41-7	$10	$11
FOR HP-71*	02519-71-4	N/A	$12

02520 Op Amp Circuit Analysis, Oap

by N. Bercovitz, Anaheim, CA

Calculates response of general op amp feedback amplifier, inverting or noninverting. Gives feedback factor, loop gain, error factor, and gain. Does not account for forward transmission through feedback impedance - usually negligible error. Much faster than matrix method. Requires Library program #2519C for frequency selection and plot control. **Necessary Accessories for HP-41:** 2 memory modules. Printer optional.

Steps: 290 HP-41 Bytes: 572

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02520-41-5	$10	$13
FOR HP-71*	02520-71-2	N/A	$14

02521 Linear Programming

by T. Sumananant, Nonthaburi, THAILAND

This program is used to solve a wide variety of linear programming problems by using the simplex method. The program can check the multiple optimal solution, no feasible solution and unbounded Z. **Necessary Accessories for HP-41:** Two memory modules

Steps: 543 HP-41 Bytes: 956

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02521-41-3	$10	$15
FOR HP-71*	02521-71-0	N/A	$18

02522 Sizing Calculations For Condensate-Return Lines

by J.A. Pita, Quito, Ecuador

This program allows quickly sizing of return headers for flashing steam- condensate systems. It makes the following calculations: a) Calculates the amount of condensate flashed for any given condensate-return header pressure from 15 to 140 psia. Initial steam pressures may vary between 40 and 615 psia. b) Finds pressure drop (psi/100 ft of line) in return header c) Calculates velocity of the steam-condensate mixture and displays a warning message at velocities over 5000 ft/min. **Necessary Accessories for HP-41:** One memory module

Steps: 152 HP-41 Bytes: 420

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02522-41-1	$10	$12
FOR HP-71*	02522-71-8	N/A	$14

02523 Rectangular Throated Flume Flow Calculations

by W.J. Russell, Benoni, SOUTH AFRICA

This program will solve for one unknown among the variables of flow, head, flume throat width and approach channel width, provided that the flume throat length is also known. The user can select imperial units or metric units operation and may also select an optional alarm mode which monitors certain limitations on the flume dimensions. **Necessary Accessories for HP-41:** One memory module

Steps: 397 HP-41 Bytes: 831

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02523-41-9	$10	$14
FOR HP-71*	02523-71-6	N/A	$16

02524 Equation of State: Beattie-Bridgeman

by B. Appelbaum, Bronx, NY

Calculates molar volume of any gas given the temperature, pressure and Beattie-Bridgeman constants. Uses Newton's method for an iterative solution. Based on ideal gas law for a first guess. **Necessary Accessories for HP-41:** None

Steps: 175 HP-41 Bytes: 296

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02524-41-7	$10	$12
FOR HP-71*	02524-71-4	N/A	$14

02525 Investigate Double Reinf. Beams

by M.A. Abel, Los Angeles, CA

Program will investigate double or single reinforced concrete or masonry section by elastic design method. Given section dimensions, modular ratio, area and location of reinforcing, and bending moment; will display constants k, j, z and material stresses. Format follows design office procedure. Eliminates need for cumbersome design aids. **Necessary Accessories for HP-41:** Printer optional

Steps: 177 HP-41 Bytes: 315

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02525-41-4	$10	$12
FOR HP-71*	02525-71-1	N/A	$14

02526 User Program Analysis and Compilation

by B.W. Bailey, Seattle, WA

This package analyzes any HP-41C program, preparing and displaying/printing a table of labels with line numbers and branch distances. In some circumstances the user program can be compiled and executed while in Extended Memory. Supporting functions such as checksum recomputation are included. Synthetic techniques used. **Necessary Accessories for HP-41:** 3 memory modules, Extended Functions memory module, card reader or wand (for synthetic functions)

Steps: 866 HP-41 Bytes: 1107

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02526-41-2	$10	$15
FOR HP-71	NOT AVAIL		

02528 Gin Rummy Scorekeeper

by P. Kozloff, New York, NY

Keeps score for two Gin Rummy players. Has Hollywood and spades-doubling options. Uses any game count, box or gin bonuses. Automatically doubles for Schneider. Displays games scores after each hand. Can display game scores, or total scores and net differences at any time. Saves cumulative running scores. User friendly. **Necessary Accessories for HP-41:** One memory module

Steps: 240 HP-41 Bytes: 471

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02528-41-8	$10	$13
FOR HP-71*	02528-71-5	N/A	$14

02529 Working Days Calendar Functions

by D.V. Wright, Ovideo, SPAIN

This program computes the number of inclusive working days between two dates. Or, the last date given a specified start date and number of inclusive days. User selects the number of working days per week to be considered in making calculations. **Necessary Accessories for HP-41:** Time Module

Steps: 139 HP-41 Bytes: 235

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02529-41-6	$10	$12
FOR HP-71	NOT AVAIL		

02530 Working Stress Design of Rectangular Concrete Beams

by S.L. Stroh, Tampa, FL

Program provides a quick and convenient means for working stress design of rectangular concrete beams with mild steel reinforcing. Program will accomodate compression reinforcement. Input consists of fic, fy, b, d, and As. Output consists of moments for tension and compression sides of beam and kd. All input is prompted and output is annotated. **Necessary Accessories for HP-41:** Printer optional

Steps: 202 HP-41 Bytes: 309

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02530-41-4	$10	$12
FOR HP-71*	02530-71-1	N/A	$14

02531 Worldwide Calendar and Time

by W.E. Hitchins, Los Angeles, CA

Calculates Julian day corrected for local mean time and provides universal time for date and local mean time for any other point on the globe. Converts Julian day to local date and time and provides day of week and modified Julian day as well as days (and fractional days) between dates as well as the date of a given number of days (and fractional days) before or after a given date. Valid from January 1, 4713 B.C. to December 31, 9999 A.D. Input and output can be American or European style as desired. Input accuracy is up to 10 decimal places for Julian day. May be used with or without a printer. **Necessary Accessories for HP-41:** Quad module. Card Reader or Wand recommended.

Steps: 860 HP-41 Bytes: 1793

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02531-41-2	$10	$18
FOR HP-71*	02531-71-9	N/A	$22

02532 Panzerblitz Attack Results System (PARS)

by R.L. Summitt, Charlotte, NC

PARS is a great aid in speeding up play and removes the drudgery of looking thru combat charts. It is designed for Avalon Hill's Panzerblitz Wargame. By reading in data cards and input of a few parameters, PARS will output adjusted attacker:defender ratio and die modifications needed to resolve combat. **Necessary Accessories for HP-41:** Quad module. Card Reader optional.

Steps: 385 HP-41 Bytes: 1086

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02532-41-0	$10	$22
FOR HP-71	NOT AVAIL		

02533 Substitute Missing Precipitation Data

by T. Langland, Phoenix, AZ

Since short breaks in precipitation records are common (instrument failure, observer absence, lost data, etc.), it is often necessary to fill in missing data. This program utilizes five different methods which are in common usage by several agencies to estimate the data at the gauge where the record is missing. **Necessary Accessories for HP-41:** One memory module

Steps: 251 HP-41 Bytes: 447

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02533-41-8	$10	$12
FOR HP-71*	02533-71-5	N/A	$14

02534 Bessel Functions J & Y

by C.B. Henderson, Alexandria, VA

Computes the bessel functions JN(X) and YN(X) for positive integral order n and positive argument x. Combinations of JN(X) and YN(X) are useful in expressing the general solutions to several differential equations. For faster computation, polynomial approximations are used for X=>3. **Necessary Accessories for HP-41:** One memory module

Steps: 364 HP-41 Bytes: 643

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02534-41-6	$10	$13
FOR HP-71*	02534-71-3	N/A	$14

02535 Safe Cracker

by T. Langland, Phoenix, AZ

In this game, you are a burglar and must open a safe. The combination is three random numbers between 1 and 99. As you enter the numbers you want the safe's dial to turn to, you will hear a number of clicks to let you know you are getting closer to the proper number. When you have found all three numbers, the safe will open. Makes full use of the HP's alphanumeric and tone capabilities. **Necessary Accessories for HP-41:** Two memory modules

Steps: 390 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02535-41-3	$10	$14
FOR HP-71*	02535-71-0	N/A	$16

02536 Polyhedral Dice

by R.P. Peterson, Idaho Falls, ID

This program simulates rolling the standard polyhedral dice used in most war games and role-playing games. It includes four-sided, six-sided, eight-sided, ten-sided, twelve-sided, twenty-sided, and percentile dice. Multiple rolls of each die and also user specified limits are possible. **Necessary Accessories for HP-41:** None

Steps: 133 HP-41 Bytes: 292

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02536-41-1	$10	$12
FOR HP-71*	02536-71-8	N/A	$14

02537 Hearing Loss Rating

by G.M. Halpern MD, Honolulu, HI

This program calculates hearing losses in db and by percentage, given the audiometer readings in db at four frequencies. These are 500, 1000, 2000 and 3000 cycles per second. The age of the subject and the four frequencies are entered into the calculator (frequencies in db loss). The calculator then calculates the gross loss of hearing acuity in db and percentage. It then calculates the net loss by subtracting the presbycusis factor which is based on the subject's age. This is done for each ear and then the combined loss is calculated. **Necessary Accessories for HP-41:** 41C with Quad Module or 41CV. Card Reader and Printer optional.

Steps: 375 HP-41 Bytes: 1471

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02537-41-9	$10	$19
FOR HP-71*	02537-71-6	N/A	$22

02538 Rigorous Correction For the Effects of Precession

by D.R. Poulos, San Jose, CA

Program corrects for the effects of precession and proper motion in right ascension and declination. Program should not be used to find positions previous to epoch 1950.0. However, there are no restrictions to future epochs. **Necessary Accessories for HP-41:** Card Reader optional

Steps: 199 HP-41 Bytes: 297

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02538-41-7	$10	$12
FOR HP-71*	02538-71-4	N/A	$14

02539 Number Generator Pack

by D. Ristanovic, Belgrade, YUGOSLAVIA

This program consists of four programs that generate: Perfect numbers, Narcissistic numbers, Persistence Numbers & Egyptian fractions. The most interesting program, Perfect Numbers Generator, will generate all the perfect numbers below 10 11 (there are 6 of them) in only 1 min. 40 sec. Methods are explained under Program Description. **Necessary Accessories for HP-41:** None

Steps: 306 HP-41 Bytes: 519

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02539-41-5	$10	$14
FOR HP-71*	02539-71-2	N/A	$16

02540 Tank Battle

by J.E. Schiermeier, Cary, NC

Your are the commander of a tank and must defend yourself against enemy tanks. Your tank may fire upon the enemy and move in any direction, but you are destroyed if the enemy gets too close. The enemy tanks come one at a time at random velocities and move both while the shots are in the air and while you are deciding. They always home in on your position. **Necessary Accessories for HP-41:** Time module

Steps: 177 HP-41 Bytes: 320

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02540-41-3	$10	$12
FOR HP-71	NOT AVAIL		

02541 Base Conversions With Complements

by J.E. Schiermeier, Cary, NC

This program converts between decimal and any base from 2 to 36. Both integers and real numbers may be converted, and the program also provides for conversions using the complements of these bases, if the user chooses this option. **Necessary Accessories for HP-41:** Extended Functions/Memory Module

Steps: 221 HP-41 Bytes: 348

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02541-41-1	$10	$12
FOR HP-71*	02541-71-8	N/A	$14

02542 Keynesian Macroeconomic Model

by J.E. Schiermeier, Cary, NC

This program contains a Keynesian macroeconomic model of the goods and services market, complete with consumption, investment, government expenditures, taxes, and transfer payments, with both autonomous and income- dependent components. Calculations (assigned to keys) include: equilibrium and component outputs; change in output for a given component change; inflationary or deflationary gaps; changes in taxes, government expenditures, or both (balanced budget) to eliminate the gap; demand at a given output; and government deficit. **Necessary Accessories for HP-41:** One memory module

Steps: 278 HP-41 Bytes: 519

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02542-41-9	$10	$13
FOR HP-71*	02542-71-6	N/A	$14

02543 Turing Machine Simulator With Extended Memory

by J.E. Schiermeier, Cary, NC

This program contains an editor, display routines, and an execution routine, all with extensive error recovery, to develop and execute state tables for a Turing machine. It is similar to 02322C, Turing Machine Simulator, except that it uses extended memory to store tapes and state tables. Consequently, several tables may be stored simultaneously and used by the program. **Necessary Accessories for HP-41:** Three memory modules and Extended Functions/Memory Module

Steps: 640 HP-41 Bytes: 1304

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02543-41-7	$10	$16
FOR HP-71	NOT AVAIL		

02544 Trigonometric Complex Functions

by J.E. Schiermeier, Cary, NC

For complex numbers in rectangular form, this program calculates the following trigonometric functions: sin z, asin z, cos z, acos z, tan z, atan z, sinh z, asinh z, cosh z, acosh z, tanh z, atanh z, and their reciprocal functions. Each function is automatically assigned to a keyboard location and uses no storage registers. **Necessary Accessories for HP-41:** None

Steps: 230 HP-41 Bytes: 311

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02544-41-5	$10	$12
FOR HP-71*	02544-71-2	N/A	$14

02545 Differential Pressure by Two-K Method

by L. Scott, Tulsa, OK

This program calculates the pressure drop due to friction loss of fluid flowing through pipe and fittings. The unique features of the program are that it prompts the user for all inputs including the quantity of programmed pipe fittings and it uses a direct solution correlation (covering laminar, transition and turbulent flow regimes) to calculate the Darcy friction factor. The program contains 'k' values for the pipe fittings eliminating the need to refer to literature. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 340 HP-41 Bytes: 291

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02545-41-2	$10	$14
FOR HP-71*	02545-71-9	N/A	$16

02546 Orifice Calculations For Flow Measurements

by J.M. Lavoie, Boston, MA

HP-41C version of Library program 04704D. Facilitates initial program entry and performing successive calculations without the continual card re-entry required in 04704D. Solves ASME/ISO equations for square-edged, flat plate, concentric orifices, given two of the following: meter differential, flow rate, orifice hole diamter, the program calculates the third. Applicable for English, metric or S.I. units; liquid, gas or vapor service; flange, radius, vena contracta, corner or pipe taps, drain and/or vent hold correction; and various orifice material corrections. **Necessary Accessories for HP-41:** Quad memory module (if HP-41C). Card Reader and Printer optional.

Steps: 1084 HP-41 Bytes: 1840

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02546-41-0	$10	$20
FOR HP-71*	02546-71-7	N/A	$24

02547 Moving X, S and R Control Charts

by R. Zuiker, Zion, IL

This program determines the moving average, moving standard deviation and moving range for samples of size 105 or less; automatically computes control limits, and plots values with outliers identified by an "invalid symbol". **Necessary Accessories for HP-41:** Quad Memory Module. Card Reader. Printer/Plotter.

Steps: 591 HP-41 Bytes: 1335

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02547-41-8	$10	$16
FOR HP-71	NOT AVAIL		

02548 HP41/HP75 Register Communications Programs "IN41" "OUT41"

by P. Vivequin, Wellington, New Zealand

These two programs (one each of the HP-41 and HP-75) provide a quick method of transfering the contents of a block of registers resident in the HP-41 main memory or the contents of a BASIC data file in HP-75 memory, to a LIF1 file on the 82161A Digital Cassette Drive. Data transfer routines in each program allow both read and write capabilities for immediate processing of data. **Necessary Accessories for HP-41:** 82180A X-Functions Module. 82160A HP-IL. 82161A Digital Cassette Drive.

Steps: 196 HP-41 Bytes: 406

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02548-41-6	$10	$13
FOR HP-71	NOT AVAIL		

02549 Solutions For Linear Systems of Equations With 2&3 Unknowns

by M. Harabor, Phoenix, AZ

These two independent programs solves systems of equations with two and three unknowns respectively. Each program prompts for coefficients input. The output is explicit and fast. **Necessary Accessories for HP-41:** Printer optional

Steps: 283 HP-41 Bytes: 455

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02549-41-4	$10	$13
FOR HP-71*	02549-71-1	N/A	$14

02550 Time Solution

by D.M. Daniel, Pensacola, FL

Program find the time from a single sight of the sun, or it finds the time when the sun will be on the Prime Vertical so one can work a 'time sight' or when it is necessary to find the longitude. **Necessary Accessories for HP-41:** One memory module

Steps: 291 HP-41 Bytes: 504

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02550-41-2	$10	$13
FOR HP-71*	02550-71-9	N/A	$14

02551 Single Variable Max, or Min Finder

by J.P. Lawrence, Tigard, OR

Using the Fibonacci Single Variable search method; the most efficient univariable search technique, this program finds the minimum or maximum of a function with a single minimum or maximum point within specified limits. **Necessary Accessories for HP-41:** None

Steps: 136 HP-41 Bytes: 204

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02551-41-0	$10	$11
FOR HP-71*	02551-71-7	N/A	$12

02552 Reading and Writing X-funct. ASCII Files to and From Cards

by M.T. Turner, Salem, OR

This program reads cards for the HP82104A Card Reader and stores them in X-function ASCII files. It also writes cards storing data from X-function ASCII files onto cards. **Necessary Accessories for HP-41:** Extended Functions/Memory Module and Card Reader

Steps: 157 HP-41 Bytes: 308

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02552-41-8	$10	$12
FOR HP-71	NOT AVAIL		

02553 ASCII File Editor

by J.E. Schiermeier, Cary, NC

This program contains a complete editor for handling ASCII files in extended memory with maximum 24 character records. Facilties include: appending, inserting, deleting, exchanging, locating strings, substituting one string for another, duplicating a record, copying a block of records, reading part or all of a file into the current one, writing part or all of the current file into another, determining the length, displaying, clearing, and purging. Very extensive error recovery is also implemented. **Necessary Accessories for HP-41:** Three memory modules, extended functions/memory module

Steps: 717 HP-41 Bytes: 1595

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02553-41-6	$10	$18
FOR HP-71	NOT AVAIL		

02554 Floating Point Conversions

by J.E. Schiermeier, Cary, NC

This program converts between decimal and binary floating point. The user defines the bias and number of bits for the exponent and mantissa, which only needs to be done once per type of word. The bits are packed 10 per register, and the only constraint on the size of the word is number of available registers. All inputs are prompted for, and the outputs are clearly displayed and available in the storage registers. **Necessary Accessories for HP-41:** One memory module

Steps: 321 HP-41 Bytes: 503

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02554-41-4	$10	$13
FOR HP-71*	02554-71-1	N/A	$14

02555 Triangles Solutions-All Cases

by M. Harabor, Phoenix, AZ

This program solves any triangle, when three elements are known. All cases (combinations of known elements) are reduced to four cases. The program prompts for input and "CASE #?". The output is explicit. **Necessary Accessories for HP-41:** Printer optional

Steps: 439 HP-41 Bytes: 252

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02555-41-1	$10	$12
FOR HP-71*	02555-71-8	N/A	$14

02556 Direct Age Adjusted Death Rate

by V. Arena, Pittsburgh, PA

Computes the direct age adjusted death, along with its corresponding sample variance and standard error. This method is based on C.L. Chiang's paper: "Standard Error of Age-Adjusted Death Rate", Vital Statistics - Special Reports, Volume 47, No. 9 (1961). **Necessary Accessories for HP-41:** Card Reader optional.

Steps: 133 HP-41 Bytes: 460

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02556-41-9	$10	$12
FOR HP-71*	02556-71-6	N/A	$14

02557 Adventure

by D.M. Green, Oak Park, IL

Solve riddles, combat fierce opponents, and dodge traps with artifacts found during your journeys! All this is found in ADVENTURE, a game that gives you total control over your destiny. ADVENTURE has several highlights: It is modular, I/O is separate to allow adaption to other Mass-Storage devices, and full instructions are given on how to create your own scenerios. Don't worry, though. A complete Dungeon Complex is provided for your enjoyment. **Necessary Accessories for HP-41:** Quad RAM. Card Reader optional.

Steps: 537 HP-41 Bytes: 1209

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02557-41-7	$10	$27
FOR HP-71	NOT AVAIL		

02558 Pipe Friction Loss

by L. Scott, Tulsa, OK

This program calculates the friction loss due to fluid flowing in a straight pipe. The unique feature of this program is that it uses a direct solution correlation to calculate the Darey friction factor. The correlation covers laminar, transition and turbulent flow regimes and should give much faster results than iterative methods without sacrificing accuracy. **Necessary Accessories for HP-41:** Printer optional

Steps: 133 HP-41 Bytes: 288

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02558-41-5	$10	$12
FOR HP-71*	02558-71-2	N/A	$14

02559 Surveyor's Star Almanac

by M. Cox, Dunedin, New Zealand

Using the Star Alamanc in the Navigation Module this program takes the number of a star from the "Star Almanac for Land Surveyors" and, if the module, returns the right ascension and declination for further use. **Necessary Accessories for HP-41:** Navigation Module

Steps: 169 HP-41 Bytes: 389

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02559-41-3	$10	$12
FOR HP-71	NOT AVAIL		

02560 Statistical Analysis of Automobile Use by Kalman Filter

by S.H. Tedder, Tulsa, OK

This program applies a sophisticated statistical test based on the "Kalman Filter" to let you know when a change in gas mileage is too large to be a chance occurrence. The method is recursive, so that it doesn't need to use your car's past mileage history, conserving storage. **Necessary Accessories for HP-41:** One memory module. Card Reader optional.

Steps: 255 HP-41 Bytes: 556

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02560-41-1	$10	$13
FOR HP-71	NOT AVAIL		

02561 Learning Curve For Manufacturing

by W.E. Hitchins, Los Angeles, CA

Calculates manufacturing cost variables based on the learning curve suitable for production planning and marketing. Input any three known parameters and the fourth can be calculated as well as the average cost of any number of units between any two limits set by the user. Program uses a simple to use technique and provides several checks against careless input. Can be used with printer and HP-IL video interface. **Necessary Accessories for HP-41:** None

Steps: 154 HP-41 Bytes: 340

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02561-41-9	$10	$12
FOR HP-71*	02561-71-6	N/A	$14

02562 Calculations on the Australian Map Grid (AMG)

by R. Belford, Nedlands, Australia

This program reduces observed quantities using calculations appropriate to the Australian Map Grid to first order accuracy. Output is Northing and Easting of final point. **Necessary Accessories for HP-41:** One memory module

Steps: 249 HP-41 Bytes: 393

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02562-41-7	$10	$12
FOR HP-71*	02562-71-4	N/A	$14

02563 Ultimate Strength Design of Rectangular Concrete Beams

by S.L. Stroh, Tampa, FL

Program provides a quick and convenient means for ultimate strength design of rectangular reinforced concrete beams. For single layer reinforcement, program will solve for Mu given As or As given Mu. Given several layers of reinforcement program will solve for Mu using strain compatibility. Checks are included for As Min. and .75 Asb. Design is in accordance with AASHTO specifications. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 577 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02563-41-5	$10	$15
FOR HP-71*	02563-71-2	N/A	$18

02564 Liquid Metering Orifice Sizing

by F.M. Shoemaker, Bellingham, WA

The program calculates the capacity, differential pressure, or bore size, and the flow coefficient for flange - tape orifices in liquid service. **Necessary Accessories for HP-41:** Two memory modules

Steps: 463 HP-41 Bytes: 1008

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02564-41-3	$10	$15
FOR HP-71*	02564-71-0	N/A	$18

02565 Replacement Model

by D.L.T. Yat, Kowloon, Hong Kong

Program calculates the cost for individual replacement and group replacement cost for exchanging items that fail abruptly such as light bulbs and staff wastage. **Necessary Accessories for HP-41:** One memory module

Steps: 192 HP-41 Bytes: 315

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02565-41-0	$10	$12
FOR HP-71*	02565-71-7	N/A	$14

02566 Rigorous Reduction From One Epoch to Another

by T. Langland, Phoenix, AZ

This program will perform rigorous reduction calculations from one epoch to another, which will be accurate to within 0.001 seconds in right ascension and 0.01 seconds in declination. All effects of precession and proper motion are taken into consideration. **Necessary Accessories for HP-41:** One memory module

Steps: 288 HP-41 Bytes: 613

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02566-41-8	$10	$12
FOR HP-71*	02566-71-5	N/A	$14

02567 General Chemistry I: Periodic Chart, Formula Weight and More

by N.M. Johnson, Youngstown, OH

This program can solve four basic chemistry functions. It can: Use the Periodic Chart to find the Atomic Weight of an element: Calculate the Formula Weight of any given formula; Determine the Empirical Formula given the elements and their percent composition; Compute the Percent by Weight for any element in a given formula. An invaluable asset for chemist and college chemistry students. **Necessary Accessories for HP-41:** Three memory modules. Printer optional.

Steps: 498 HP-41 Bytes: 1352

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02567-41-6	$10	$17
FOR HP-71*	02567-71-3	N/A	$20

02568 Weir Plate Flow Calculations

by J.R.B. Cusack, Dhahran, Saudi Arabia

This program will solve one unknown among the variables in the Francis equation for flow over a rectangular weir or the Cone equation for flow over a V-notch weir. The user can work in U.S. (cusecs and feet) or metric (cubic metre/hour and metres) units. As the equations are only valid over a limited range of weir dimensions, the user has the option of selecting an alarm mode which monitors these limits. Fully documented. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 423 HP-41 Bytes: 853

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02568-41-4	$10	$14
FOR HP-71*	02568-71-1	N/A	$16

02569 Profile - 2 Elements

by S.J. White, Salem, OR

Produces printout that reflects relationship of computed grade and given surface elevations. Plotting is at 1/2" intervals on a fixed "X" scale of 1" = 100'. Provides choice of: Begining and Ending stations; "Y" scale; "X" axis and Begining Grade elevations; and Percent of Grade. Prompts for all input. Related Programs #01224C, #01409C. **Necessary Accessories for HP-41:** One or more memory modules and printer. Card Reader optional.

Steps: 244 HP-41 Bytes: 441

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02569-41-2	$10	$12
FOR HP-71	NOT AVAIL		

02570 Shearing Force in Fixation Pieces (Screw revits pins etc)

by M.d.C. Quartim, Guarulhos, Brasil

This program calculates the resultant shearing force acting in a fixation piece (screw, rivets, pins, etc ...) of a system with several pieces that is subject to external forces and moments. HP-41CV solves up to 135 pieces and HP-41C up to 7. **Necessary Accessories for HP-41:** None

Steps: 151 HP-41 Bytes: 252

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02570-41-0	$10	$12
FOR HP-71*	02570-71-7	N/A	$14

02571 Direct Execution Bar Code For XROM Functions

by K.W. Lakey, Houston, TX

"XROMBC" will generate two-byte direct execution bar code from XROM function numbers. The user simply inputs the XROM accessory number and function number for any plug-in module or peripheral. The program will print bar code for as many XROM functions as the user specifies. All function bar code outputs are labeled by their XROM numbers; dividing lines are printed to separate each two-byte section. This makes identification and cutting much easier. **Necessary Accessories for HP-41:** Plotter Module, Extended Functions/Memory Module, Printer (82162A)

Steps: 123 HP-41 Bytes: 307

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02571-41-8	$10	$12
FOR HP-71	NOT AVAIL		

02572 Solitaire

by D.M. Green, Oak Park, IL

Plays a complete game of Solitaire. All aspects of the card game Solitaire are simulated by the program, including placing KINGS on empty columns of the playing board, and moving whole sets of cards from one column to another. If you have ever tried to play Solitaire in a moving car or airplane (and had your playing cards sloshed about), you will realize why this program is indispensible. **Necessary Accessories for HP-41:** Quad RAM. Printer helpful.

Steps: 562 HP-41 Bytes: 1119

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02572-41-6	$10	$16
FOR HP-71*	02572-71-3	N/A	$18

02573 Sun Angle

by R.A. Bergman, Cape Town, South Africa

Program calculates solar altitude and azimuth anywhere on earth and corrects for distance from the standard time meridian. Altitude is measured from horizontal = 0 degree and vertical = 90 degree. Azimuth is output as a bearing on the L019 survey system (North = 180 degree) but may also be output for a NORTH = 0 degree system by omitting lines 146 + 148. **Necessary Accessories for HP-41:** One memory module

Steps: 252 HP-41 Bytes: 0484

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02573-41-4	$10	$13
FOR HP-71*	02573-71-1	N/A	$14

02574 Exhaust Design Criteria For Four Stroke Engines

by R.A. Bergman, Cape Town, South Africa

This program calculates the length of individual cylinders exhaust pipes and their internal diameters up to the point where the individual pipes blend into a collector or a change in diameter is made. An internal diameter for the collector is also calculated. No storage registers are used, only the stack. **Necessary Accessories for HP-41:** None

Steps: 76 HP-41 Bytes: 181

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02574-41-2	$10	$11
FOR HP-71*	02574-71-9	N/A	$12

02575 First and Follow Sets

by P. Kokol, Marlbor, Yugoslavia

This program enables us to compute FIRST and FOLLOW sets for one as input given context-free grammar (in BNF). It can be a valuable tool by constructing compilers (27 pages, 1697 bytes). **Necessary Accessories for HP-41:** Quad RAM, X-function and memory, printer

Steps: 820 HP-41 Bytes: 1696

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02575-41-9	$10	$19
FOR HP-71	NOT AVAIL		

02576 Complex Matrix Calculations

by A. Melimopoulos, Caracas, Venezuela

This program calculates the determinant and inverse of up to 9x9 complex matrix, and gives the solution of a system of simultaneous equations in 9 unknowns. **Necessary Accessories for HP-41:** Quad Memory Module

Steps: 490 HP-41 Bytes: 755

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02576-41-7	$10	$14
FOR HP-71*	02576-71-4	N/A	$16

02577 Standard Ad Units and Advertisement Sizes

by W.E. Hitchins, Los Angeles, CA

With an input of the column width of a newspaper in picas, the space between the columns, and the depth of an ad in any unit, the program calculates the width of the advertisement in inches and picas for a given number of columns and advises which Standard Ad Unit (SAU) number it fits or if the ad is non-standard. If the ad is slightly smaller than an SAU size, display indicates that it will float. Other indicators are if the ad will fit a tabloid and if the size is only for a 6-column broadsheet. Included is an advertisers' and printers' measure converter interchangeable between picas, lines, ciceros, inches, and millimeters. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 582 HP-41 Bytes: 1213

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02577-41-5	$10	$16
FOR HP-71*	02577-71-2	N/A	$18

02578 Saturation on pH - Calculation of Langelier & Ryzner Indices

by R.L. Dielman, Green Springs, OH

To anticipate problems associated with the operation of cooling towers (i.e., scaling or corrosive behavior of the water), two indices are commonly used. These are the Langelier and Ryzner (aggressive) indices. The program will calculate values for both based on either a full or partial water analysis. **Necessary Accessories for HP-41:** One memory module. Card Reader optional.

Steps: 171 HP-41 Bytes: 590

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02578-41-3	$10	$12
FOR HP-71*	02578-71-0	N/A	$14

02579 Solutions of a Second Degree Matrix Equation

by M.V. Barbero, Sevilla, Spain

This program solves the matrix equation AX**2 + BX + CI = M, where M is a 2x2 matrix. I is the unitary matrix (second error) and A, B and C are real numbers. The solutions X are four 2x2 matrices with real elements. **Necessary Accessories for HP-41:** One memory module

Steps: 208 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02579-41-1	$10	$12
FOR HP-71*	02579-71-8	N/A	$14

02580 Random Number Generator Test

by P. Kokol, Marlbor, Yugoslavia

It is very important to test whether the random number generator is satisfactory or not. This can be done with many aspects of a generated string of random numbers. Frequency and poker test are used in this program. Results can be printed or displayed. **Necessary Accessories for HP-41:** Memory module, X-Functions Module. Printer optional.

Steps: 201 HP-41 Bytes: 424

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02580-41-9	$10	$12
FOR HP-71*	02580-71-6	N/A	$14

02581 Ro-Diagram-Pollards Method

by P. Kokol, Maribor, Yugoslavia

This program computes c (number of points in circular part), t (the number of points in tail) and L (the leader) of ro-diagram of function f(x). The program is a valuable tool by testing the behavior of functions or random number generators. **Necessary Accessories for HP-41:** None

Steps: 145 HP-41 Bytes: 306

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02581-41-7	$10	$12
FOR HP-71*	02581-71-4	N/A	$14

02582 Two-Plane Balancing

by R. Berard, Pine Falls, Canada

This program performs vector calculations to calculate corrections weights for single and 2-plane balancing, as well as vector addition for summation of several trial weights into a single correction weight. Input requirements are original unbalance and phase angle, as well as unbalance at either plane resulting from respective application of trial weights, and size and location of trial weights applied. **Necessary Accessories for HP-41:** None

Steps: 255 HP-41 Bytes: 504

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02582-41-5	$10	$13
FOR HP-71*	02582-71-2	N/A	$14

02583 Base Conversions To and From Base 10 to 2 Through 37

by S. Fort, Indianapolis, IN

This program converts base 10 numerals into any specified base ranging from 2 to 37. It also takes any specified base between 2 and 37 inclusive and will convert it into base 10. **Necessary Accessories for HP-41:** Extended Function Module

Steps: 79 HP-41 Bytes: 0133

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02583-41-3	$10	$11
FOR HP-71*	02583-71-0	N/A	$12

02584 PVT Calculations Using Soave-Redlich-Kwong Equation of State

by J.A. Pita, Quito, Ecuador

This program provides interchangeable solutions for P, V and T of a pure substance using an enhanced version of the Redlich-Kwong equation of state. Any system of units may be employed but they must be consistent. Although solution for P is straight-forward, solutions for V and T require iteration using Newton-Raphson's method. The molar volume for the liquid phase may be calculated also. **Necessary Accessories for HP-41:** One memory module

Steps: 268 HP-41 Bytes: 382

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02584-41-1	$10	$12
FOR HP-71*	02584-71-8	N/A	$14

02585 Mathematical Modeling of a Catalytic Reformer of Methane

by J.A. Pita, Quito, Ecuador

Given molar flows of methane and water vapor fed to a primary reformer and of air to a secondary reformer operating at a fixed temperature, this program finds the molar flow of all products and their percent composition. Each variable can be changed independently for evaluating its effect on the operation. The catalytic reforming of methane is the most important phase in the production of synthetic gas. **Necessary Accessories for HP-41:** None

Steps: 191 HP-41 Bytes: 349

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02585-41-8	$10	$12
FOR HP-71*	02585-71-5	N/A	$14

02586 Combinatorial Calculations on Separation Sequences

by J.A. Pita, Quito, Ecuador

Given a process feed of R components to be separated into R products using sequences of single-feed, two-product separators using energy-separating agents, this program finds the number of possible sequences of separation, number of subgroups of adjacent components (that is, ordered in decreasing relative volatility) and the number of unique (not repeated) splits that are possible. The inverse problem can be also solved: Find R when any combination result is already known. **Necessary Accessories for HP-41:** None

Steps: 114 HP-41 Bytes: 223

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02586-41-6	$10	$11
FOR HP-71*	02586-71-3	N/A	$12

02587 Cost Estimation For Heat-Transfer Equipment

by J.A. Pita, Quito, Ecuador

This program estimates the cost for heat-transfer equipment, namely the following: shell-tube heat exchangers, double-pipe heat exchangers, air coolers, furnaces and heaters. It is based in correlations made from data of Guthrie's Capital Cost Estimating. Use of cost indexes can update the cost to any time from 1968. **Necessary Accessories for HP-41:** One memory module

Steps: 181 HP-41 Bytes: 491

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02587-41-4	$10	$13
FOR HP-71*	02587-71-1	N/A	$14

02588 Molar Volumes by Ackerman's Corr. of Redlich-Kwong Equation

by J.A. Pita, Quito, Ecuador

This program finds molar volumes of a pure substance (gas phase) using a correction for Redlich-Kwong compressibility factor including the acentric factor by means of two complex equations, using 25 constants, proposed by Ackerman. With this correction, the results are in good agreement with the compressibility factor charts of Pitzer's correlation. This version of R-K equation is not very popular because of the need of electronic computation but now it is here, at hand. **Necessary Accessories for HP-41:** One memory module

Steps: 250 HP-41 Bytes: 512

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02588-41-2	$10	$13
FOR HP-71*	02588-71-9	N/A	$14

02589 Heat-Transfer Time in Jacketed Vessels: Isothermal Medium

by J.A. Pita, Quito, Ecuador

For a process fluid being heated or cooled into a jacketed vessel with an isothermal heat-transfer medium this program provides interchangeable solutions for all the following: Mass of process fluid, initial temerature, final temperature, isothermal medium temperature, overall heat-transfer coefficient, heat-transfer area and heating time. Any one of these can be calculated if all others are known. **Necessary Accessories for HP-41:** None

Steps: 171 HP-41 Bytes: 273

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02589-41-0	$10	$12
FOR HP-71*	02589-71-7	N/A	$14

02590 General Material Balances Involving Binary Systems

by J.A. Pita, Quito, Ecuador

Given any binary system in which n feeds are input ($n <= 10$) which compositions and flows are known and m products are withdrawn ($m <= 10$), also known, this program finds the flows of two unknowns: two feeds, two products or one feed and one product provided that their compositions are known. This is a common problem in binary separations in which some streams are known and only two independent material balance equations can be stated. The general procedure presented here allows for a flexible solution of those problems. **Necessary Accessories for HP-41:** One memory module

Steps: 148 HP-41 Bytes: 317

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02590-41-8	$10	$12
FOR HP-71*	02590-71-5	N/A	$14

02591 Land Locator

by P. Rushworth, Lakewood, CO

Program displays quarter-quarter-quarter breakdown of a section given distance in feet from the North or South line and East or West line. Points located on a quarter line are denoted with an asterisk. Program use speeds quarter-quarter-quarter determinations and reduces errors. **Necessary Accessories for HP-41:** None

Steps: 143 HP-41 Bytes: 279

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02591-41-6	$10	$12
FOR HP-71*	02591-71-3	N/A	$14

02592 Survey Pac Supplement - Point Storage For Trav and Inter

by S.L. Stroh, Tampa, FL

The Survey Pac is a powerful tool for coordinate geometry, however it is lacking one significant feature: a means to store and retreive coordinate points. This program supplements the Survey Pac with revised trav. and Inter. routines that are integrated with point storage, retrieval, and manipulation routines. Points may be stored to memory or to magnetic cards. With Quad memory module approximately 70 points may be stored in the HP-41. **Necessary Accessories for HP-41:** Survey Pac, three memory modules. Printer and Card Reader optional.

Steps: 623 HP-41 Bytes: 1154

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02592-41-4	$10	$16
FOR HP-71	NOT AVAIL		

02593 Flex 1

by M.A. Abel, Los Angeles, CA

Designs single reinforced concrete or masonry section by elastic design method. Given section dimensions, modular ratio, bending moment, and allowable stresses, program computes steel area at which fc and then fs will be at respective allowables. With user selected area, displays k, fc, fs and respective stress ratios. Very useful with masonry where fc is very sensitive to As. Avoids need for cumbersome design aids in concrete investigations. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 207 HP-41 Bytes: 443

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02593-41-2	$10	$12
FOR HP-71*	02593-71-9	N/A	$14

02594 Amina's Panel

by N. Nanji, Ann Arbor, MI

This is a challenging puzzle that will keep your mind boggled for many hours. Amina's panel consists of ten digits, each of which may be incremented by unity. However, each digit has a dependent digit which will simultaneously increment by two. Your objective is to manipulate the digits in such a way that you can get a pre-specified combination. Good Luck. **Necessary Accessories for HP-41:** None

Steps: 93 HP-41 Bytes: 0183

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02594-41-0	$10	$11
FOR HP-71*	02594-71-7	N/A	$12

02595 BOGA

by T. Langland, Phoenix, AZ

The boga is hiding on a grid that you can change the size of, up to 20 by 20. You are to try to find the boga before he finds you. You can choose any starting position for yourself, and will be given clues as to the boga's position as you search him out. You must be quick however, because the boga has a very good nose and can sniff you out pretty fast! **Necessary Accessories for HP-41:** One memory module

Steps: 338 HP-41 Bytes: 720

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02595-41-7	$10	$14
FOR HP-71*	02595-71-4	N/A	$16

02596 Brent's Minimum Finder Algorithm

by K. Anaimugan, Canberra City, Australia

This algorithm finds the minimum of a function within an interval. The user must supply the function to be evaluated and the interval to be scanned. The method uses a combination of GOLDEN-SECTION SEARCH and SUCCESSIVE PARABOLIC INTERPOLATION. The algorithm solves ONE-DIMENSIONAL OPTIMISATION problems. **Necessary Accessories for HP-41:** One memory module

Steps: 300 HP-41 Bytes: 454

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02596-41-5	$10	$13
FOR HP-71*	02596-71-2	N/A	$14

02597 Doppler Effect: Interchangeable Solutions

by G. Schmidtke, Fayetteville, NC

This program solves for one of the following given the other four: wave velocity, observer velocity, source velocity, original frequency, shifted frequency. It will not solve problems in which the observer and source are moving in the same direction, but one of their velocities can be equal to zero. **Necessary Accessories for HP-41:** None

Steps: 111 HP-41 Bytes: 219

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02597-41-3	$10	$11
FOR HP-71*	02597-71-0	N/A	$12

02598 Predesign of Columns in a Building of N Stories

by F.R. Medina, Quito, Ecuador

Given the stories number, load per area, concrete and steel strength, the contributor area and location of the column, this program finds the concrete area necessary for the column in each story and its dimensions. **Necessary Accessories for HP-41:** Printer desirable

Steps: 149 HP-41 Bytes: 272

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02598-41-1	$10	$12
FOR HP-71*	02598-71-8	N/A	$14

02599 Alalysis of Plane Trusses of A Maximum of 136 Bars

by F.R. Medina, Quito, Ecuador

Giving angles of unknown forces (maximum 2 forces in a joint), magnitudes and angles of known forces, this program calculates the compression or tension stresses for each bar. **Necessary Accessories for HP-41:** For 136 bars - a Quad module or HP-41CV required

Steps: 149 HP-41 Bytes: 288

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02599-41-9	$10	$12
FOR HP-71*	02599-71-6	N/A	$14

02600 General Chemistry II: Periodic Chart & Electron Config

by N.M. Johnson, Youngstown, OH

This program uses the Periodic Table of Elements to find the Atomic Weight of a given element or to compute the Electron Configuration of that element. This program comes equipped with thirty of the most commonly noted elements of the chart, but can be easily expanded to encompass the entire list of elements. There is an automatic Stack Saver which assists User in avoiding stack data lost. Great for chemist and college chemistry students. **Necessary Accessories for HP-41:** Two memory modules. Printer applicable.

Steps: 390 HP-41 Bytes: 1062

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02600-41-5	$10	$15
FOR HP-71*	02600-71-2	N/A	$18

02601 Advance Mastermind

by N.M. Johnson, Youngstown, OH

Mastermind lovers, this is it! The most versatile game of Mastermind ever. Can you beat the randomly generated code of the HP-41C, which length can be 3 to 9 letters long and is composed of the letters A through J. Not only must you break the code, but can you beat the previously set high score, which is stored with the random seed on a data card. Programmed with printer compatibility. Advance Mastermind is OPTIONFULL!!! **Necessary Accessories for HP-41:** Two memory modules. Card reader and printer optional.

Steps: 450 HP-41 Bytes: 0943

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02601-41-3	$10	$15
FOR HP-71	NOT AVAIL		

02602 Rotor Basic Analysis "RCFT"

by J.D. Berry, Hampton, VI

Thrust and torque (or power) are computed for a hovering helicopter rotor. Rectangular blades with linear twist and arbitrary aspect ratio are acceptable. Aerodynamic coefficients based on rotor disc area are displayed and, optionally, engineering units are displayed. Computation is based on combined momentum and strip analysis. **Necessary Accessories for HP-41:** One memory module

Steps: 319 HP-41 Bytes: 683

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02602-41-1	$10	$14
FOR HP-71*	02602-71-8	N/A	$16

02603 3 Dim Tic Tac Toe

by D. Ristanovic, Belgrade, YUGOSLAVIA

This program is a good opponent in a game of three dimension Tic Tac Toe. It plays pretty fast. It will always win when it has the first move and in some other cases. Allowing all these, it is short: fits on two magnetic cards. **Necessary Accessories for HP-41:** One memory module

Steps: 221 HP-41 Bytes: 410

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02603-41-9	$10	$12
FOR HP-71*	02603-71-6	N/A	$14

02604 Extended Precision Multiplication

by D. Ristanovic, Belgrade, YUGOSLAVIA

This program is designed to help you multiplying big numbers. The word "big" is, of course, relative - you can multiply number A with m digits and number B with n digits providing $m<90$ and $n<270$ which is probably more than you'll even need. If needed, you can modify the program to handle even bigger numbers if additional memory modules are provided. Input and output are very nicely designed. Printer is nice to print results but not a must. **Necessary Accessories for HP-41:** Quad memory

Steps: 138 HP-41 Bytes: 230

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02604-41-7	$10	$12
FOR HP-71*	02604-71-4	N/A	$14

02605 Lighting Calculation-Pt by Pt Method For Single Fixture

by S.A. Mangold, Austin, TX

This program calculates the initial footcandle level at a point on a horizontal or vertical surface from a single fixture using the point-by- point method as described by the IES Handbook. Also included is a useful program (subroutine) for interpolating data from a candlepower distribution curve. **Necessary Accessories for HP-41:** None

Steps: 128 HP-41 Bytes: 282

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02605-41-4	$10	$12
FOR HP-71*	02605-71-1	N/A	$14

02606 Formula 999999

by M.E. Wong, San Francisco, CA

With five numbers, you may add, subtract, multiply, and divide to make a total of nine. Then you position that number in a six digit number to get as close to 999999 as possible. **Necessary Accessories for HP-41:** One memory module

Steps: 351 HP-41 Bytes: 736

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02606-41-2	$10	$14
FOR HP-71*	02606-71-9	N/A	$16

02607 Jumper

by M.E. Wong, San Francisco, CA

This program simulates a game of people jumping on trampolines. The object is to have the trampoline under the jumpers to prevent them from hitting the ground. There are a few interesting surprises in this game which will have you playing this game for hours. **Necessary Accessories for HP-41:** Extended Functions/Memory Module and one memory module

Steps: 324 HP-41 Bytes: 599

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02607-41-0	$10	$13
FOR HP-71	NOT AVAIL		

02608 Mine Field

by M.E. Wong, San Francisco, CA

This program simulates a mine field where the objective of the game is to pass a package across the field and make it safely back. Points are awarded, and there is a difficult level when the player passes 100 points. **Necessary Accessories for HP-41:** Extended Functions module

Steps: 264 HP-41 Bytes: 507

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02608-41-8	$10	$13
FOR HP-71	NOT AVAIL		

02609 Pac Man

by M.E. Wong, San Francisco, CA

This program plays a game similar to Pac Man, the coin-op game. The object is to eat the power cell and consume the enemy for points. An additional Pac Man is awarded if you eat all of the ghosts. It also is programmed to randomly play itself. **Necessary Accessories for HP-41:** One memory module and Extended Functions module

Steps: 423 HP-41 Bytes: 817

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02609-41-6	$10	$14
FOR HP-71	NOT AVAIL		

02610 Swap Poker

by M.E. Wong, San Francisco, CA

This program plays a two player game of Roll Your Own Poker. It utilizes an efficient random card generator and a security system which prevents your opponent from viewing and altering your hand. It also has betting, raising, calling, checking, and forfeiting features. **Necessary Accessories for HP-41:** Extended Functions Module

Steps: 608 HP-41 Bytes: 1286

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02610-41-4	$10	$18
FOR HP-71	NOT AVAIL		

02611 Bubble and Dew Point Temperature of an N Component Mixture

by R.J. Wooley, Midland, MI

This program will readily calculate the bubble point and dew point of a mixture of n components. Antoine's vapor pressure constants must be entered for each compound (for calculation of the equilibrium ratio's, k). Using the extended function module size is automatically allocated. Program can also be run with manual allocation. **Necessary Accessories for HP-41:** One memory module. Extended Function Module optional.

Steps: 299 HP-41 Bytes: 556

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02611-41-2	$10	$13
FOR HP-71*	02611-71-9	N/A	$14

02612 Section Properties - Composite Steel Box and Plate Girders

by S.L. Stroh, Tampa, FL

Program computes section properties for composite steel I girders or box girders constructed of welded plates. Provisions are included for considering longitudinal stiffeners, re-bars, and holes in flanges. Output consists of location of neutral axis, moment of inertia about neutral axis, and section modulus about top and bottom of beam. An edit routine is provided to facilitate checking of multiple similar sections. Governing specifications are AASHTO. **Necessary Accessories for HP-41:** Quad memory and printer

Steps: 730 HP-41 Bytes: 1773

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02612-41-0	$10	$18
FOR HP-71*	02612-71-7	N/A	$22

02613 Spread Sheet

by W.W. Lauer, Canton, OH

This program allows the user to input collected data and manipulate it to produce any user defined output. A maximum of 20 input/output data columns are accommodated. It permits checking and correcting with whatever frequency the user defines. The user must write sub-programs to describe the output desired (register math). **Necessary Accessories for HP-41:** Additional memory modules and Printer

Steps: 241 HP-41 Bytes: 660

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02613-41-8	$10	$14
FOR HP-71*	02613-71-5	N/A	$16

02614 Code Uncoder

by N. Nanji, Ann Arbor, MI

Have you ever considered joining an intelligence agency, becoming a private eye, a detective, or just improving your sensory memory? This game will boost up your power of concentration and develop your sensory and short term memory. The calculator generates an alphanumeric code which you have to quickly memorize, and later repeat the same. Game features: start at any level, automatic level advance, weighted scoring and much more. **Necessary Accessories for HP-41:** Extended Functions module

Steps: 163 HP-41 Bytes: 374

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02614-41-6	$10	$12
FOR HP-71*	02614-71-3	N/A	$14

02615 Pole Position

by D.M. Green, Oak Park, IL

Challenge other drivers at the arena as you pilot your car past a race track's many obstacles. You have two degrees of steering in either direction, have full speed control (accelerate, decelerate, brake, shift gears), and can swerve obstacles. All decisions must be made in one second - making POLE POSITION a true action game. Multiple sound effects (including "funeral dirge") and visual displays provided. For those shaky drivers, relax - there's even a PANIC button. **Necessary Accessories for HP-41:** Three memory modules

Steps: 517 HP-41 Bytes: 1157

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02615-41-3	$10	$17
FOR HP-71*	02615-71-0	N/A	$20

02616 Consumer Price Index 1925-1983 With Quarterly Values

by B.F. Carlson, Waltham, MA

The CPI-W ("Urban Wage Earners and Clerical Workers"). Stores 240 quarterly values - 84% of them exactly, 16% within 1/4% accuracy so as to reproduce all these quarterly values and the exact official annual values. Seven seconds - a new quarter; 30 seconds - a new year. Gives ratios between any selected base year or quarter calculations. Indispensible as for personal property replacement valuation. Prompted and labelled, mistake resistent and updatable to 1990. **Necessary Accessories for HP-41:** Three memory modules. Card reader optional.

Steps: 463 HP-41 Bytes: 864

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02616-41-1	$10	$17
FOR HP-71*	02616-71-8	N/A	$20

02617 Friction Loss in Pipes

by V.K. Patel, Marcus Hook, PA

This program computes pipe friction loss, velocity, and optimum diameter given ID, flow rate, viscosity, and density. Wide choice of most commonly used input units. Automatic density calculation for hydrocarbon liquids and ideal gas, conversion from nominal diameter to standard pipe ID for gases density change taken into account. **Necessary Accessories for HP-41:** One memory module

Steps: 243 HP-41 Bytes: 435

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02617-41-9	$10	$12
FOR HP-71*	02617-71-6	N/A	$14

02618 Dielectric Sheet E-M Wave Reflection Efficiency

by G.H. Stumpff II, Dayton, OH

This program calculates the ratio between the electromagnetic power reflected from a planar sheet of dielectric material and the power that is carried in a plane electromagnetic wave incident on the sheet. Multiple reflections inside the sheet and the associated attenuation and phase effects are included. **Necessary Accessories for HP-41:** One memory module and Library program #01931C (cards included are required). Library program #02397C recommended.

Steps: 321 HP-41 Bytes: 538

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02618-41-7	$10	$14
FOR HP-71*	02618-71-4	N/A	$16

02619 13 Complex Number Operations

by S. Fort, Indianapolis, IN

This program performs 13 common complex number operations. It requires only one data register, saves the last complex number entered, works in polar or rectangular mode, and has an option for input prompts. The prompts and polar/rectangular mode are flag controlled so that the routines can be called by an outside program. **Necessary Accessories for HP-41:** None

Steps: 248 HP-41 Bytes: 0433

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02619-41-5	$10	$12
FOR HP-71*	02619-71-2	N/A	$14

02620 Thomas Algorithm: Solution of A Tridiagonal Matrix

by D. Van Everdingen, Waterloo, Canada

Program solves a tri-diagonal matrix, of maximum size: 9x9, by means of the Thomas algorithm (size of matrix handled can be increased by program modification). **Necessary Accessories for HP-41:** One memory module

Steps: 133 HP-41 Bytes: 0377

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02620-41-3	$10	$12
FOR HP-71*	02620-71-0	N/A	$14

02621 Benkelman Beam Rebound Analysis

by D.R. MacQuarrie, Calgary, Canada

This program calculates the Benkelman Beam rebound and Benkelman Beam rebound corrected to the standard temperature of 70 degrees F. The test is a procedure for the determination of the static Benkelman Beam rebound at a point on a flexible pavement under a standardized axle load, tire size, tire spacing, and tire pressure. Standard deviation and mean value are also given for all data. This program is a real time saver. **Necessary Accessories for HP-41:** Three memory modules or HP-41CV, and printer. Card reader helpful.

Steps: 317 HP-41 Bytes: 816

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02621-41-1	$10	$14
FOR HP-71	NOT AVAIL		

02622 Natural Gas Properties From Petroleum Fluids Pac

by K.J. Johnson, Metairie, LA

Program provides natural gas properties using the Petroleum Fluids Pac. Properties provided are z factor, p/z, density, viscosity, formation volume factor, pressure gradient, and isothermic compressibility. Each property is addressable via a local label and properties can be calculated from composition or from specific gravity. **Necessary Accessories for HP-41:** Two memory modules and Petroleum Fluids Pac.

Steps: 226 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02622-41-9	$10	$13
FOR HP-71	NOT AVAIL		

02623 Calculating Daylength

by D. Vargo, Pago Pago, AS

Calculates daylength between 60 degree North and South latitude for any day given the date, minimum light intensity and latitude. The photosensitivity of many crops makes knowing the length of time the light intensity is above a certain level useful. **Necessary Accessories for HP-41:** None

Steps: 138 HP-41 Bytes: 1036

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02623-41-7	$10	$12
FOR HP-71*	02623-71-4	N/A	$14

02624 The Complete "High Performance Liquid Chromatography" Calc

by A. Watson, Edenvale 1610, South Africa

In order to fully describe HPLC, a number of parameters have been defined, concerning relationships of solvent to solute, efficiency, comparison with thin layer chromatography and resolution of peaks. Liquid Chromatographs, in general, print out a fully notated plot of the detector response. This program uses this information, with physical constants, to evaluate the remaining, unknown parameters. **Necessary Accessories for HP-41:** Four memory modules or one quad memory. 82143A or 82162A printer.

Steps: 858 HP-41 Bytes: 1653

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02624-41-5	$10	$18
FOR HP-71	NOT AVAIL		

02625 Date Calculator

by J.E. Setsaas, Kongsberg, Norway

Program DAY will return the data of a specified day in one of the following formats: +n days, -n days, dd, mm (first occurance of data, month), mm/dd, day (first occurance of weekday), day+n (n'th occurance of weekday) and day-n (n'th occurance of weekday, backwards in time). Output from DAY is in ALPHA (as seen when DATE is executed manually) and in X, both in DMY or MDY format. **Necessary Accessories for HP-41:** Time module and extended functions module

Steps: 160 HP-41 Bytes: 308

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02625-41-2	$10	$12
FOR HP-71	NOT AVAIL		

02626 Statistical Moments M0 - M4 + Skew and Excess

by W. Pinnick, State College, PA

A program to calculate the area and the first four statistical moments for arbitrarily spaced intensity vs time data such as chromatographic peaks. The skew and excess are also determined. Size required = 10 + 2 x number of data pairs. Accuracy of moment determinations increases with increased number of data pairs. Correction of the baseline for drift or zero setting is optional. **Necessary Accessories for HP-41:** One memory module per 32 data points or part thereof

Steps: 191 HP-41 Bytes: 345

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02626-41-0	$10	$12
FOR HP-71*	02626-71-7	N/A	$14

02627 Parshall Flume Flow Calculations

by W.J. Russell, Benoni, SOUTH AFRICA

This program will solve for one unknown among the variables of flow, head and flume size (throat width) by using the Parshall equations. The user can work in Imperial units (cusecs and feet) or Metric units (cubic metres per hour and metres). There are five flow equations which are automatically selected according to flume size. The User has the option of selecting an alarm mode which monitors maximum and minimum conditions. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 578 HP-41 Bytes: 1217

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02627-41-8	$10	$16
FOR HP-71*	02627-71-5	N/A	$18

02628 Cal-Scientific Notation

by L.J. Burger, Camarillo, CA

This program, based on the Arithmetic Teacher, poses 10 multiplication or division problems in exponential (scientific) notation format. A new method of generating both positive and negative numbers is used. Correct answer is given after two wrong answers. A prompt is given for more problems to be done. Program can work with or without a printer. Printer can be attached, but off. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 365 HP-41 Bytes: 908

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02628-41-6	$10	$15
FOR HP-71*	02628-71-3	N/A	$18

02629 Radar Tracking Systems Simulation

by G.H. Stumpff II, Dayton, OH

This program simulates the simpler dynamic processes associated with a radar target tracking system and their affects on signal to noise ratio. The gain functions of both the transmitting and receiving antennas an the target trajectory function are specified (and created) by the user. Other inputs include radar equation parameters and the two antennas second-order dynamical parameters for both vertical and horizontal motion. Output of the program is signal to noise ratio vs time--with or without printout. **Necessary Accessories for HP-41:** Three memory modules minimum and printer

Steps: 452 HP-41 Bytes: 1014

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02629-41-4	$10	$15
FOR HP-71*	02629-71-1	N/A	$18

02630 Z80 Disassembler

by J. Angers, Neuville, Canada

Given the machine-code representation of the Z80 microprocessor in decimal or octal format, this program produces the corresponding Zilog/Mostek mnemonics. **Necessary Accessories for HP-41:** Three memory modules

Steps: 716 HP-41 Bytes: 1568

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02630-41-2	$10	$17
FOR HP-71*	02630-71-9	N/A	$20

02631 Octal Utilities/Fractional Fixed Point Functions

by A. Gross, St Charles, MO

The Octal Utilities program provides octal/decimal scaled conversions, boolean algebra, shift and 2's complement arithmetic functions for fractional fixed point and integer octal numbers. It provides trigonometric functions for fractional numbers and limited (28 bits maximum) double precision multiplication/division for integer and fractional octal numbers. The program can be initialized to handle numbers from 1 to 24 bits in size. **Necessary Accessories for HP-41:** Two memory modules

Steps: 638 HP-41 Bytes: 999

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02631-41-0	$10	$15
FOR HP-71*	02631-71-7	N/A	$18

02632 One and Two Way Analysis of Variance

by P. Legros, Brussels, Belgium
P. Maryssael, Brussels, Belgium

1) One way analysis: the program determines whether observed differences among a sample means can be attributed to chance or whether they are indicative of actual differences among the corresponding population means. The complete Anova table is generated. 2): Two way analysis: the program analyses the total variability of a set of data into components which can be attributed to different sources of variation. It tests the row and column effects independently and generates the Anova table for the case such that (a) each cell has only one observation and (b) the row and column effects do not interact. **Necessary Accessories for HP-41:** Printer Optional

Steps: 191 HP-41 Bytes: 342

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02632-41-8	$10	$12
FOR HP-71*	02632-71-5	N/A	$14

02633 Raytrace I: Spherical Surfaces

by C. Rusquellas, Buenos Aires, Argentina

Given an optical system with up to 12 spherical surfaces (refractive or reflective), this program computes the trajectories of the equivalent to 93 rays, from an object in or out the optical axis, of any angle and at any distance, prints the coordinates of the incidence points on the focal plane, and the spot diagram of the image blur. It can be modified for the HP82143A printer. **Necessary Accessories for HP-41:** Quad memory module or HP-41CV; X-Func module; one X-memory module; HP-IL module and HP82162A printer

Steps: 686 HP-41 Bytes: 1099

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02633-41-6	$10	$15
FOR HP-71	NOT AVAIL		

02634 Sol of Quadratic Equation Complex Form

by M.A. Giolitti, Kenner, LA

Given the coefficients in (Radius, Angle), of a quadratic equation, this program computes the real or complex roots, using the general solution formula. AX (super) 2 + BX + C = 0. The roots are output in the form of (Radius, Angle), and in X1 = RR1 + i1, X2 = RR2 + i2. **Necessary Accessories for HP-41:** None

Steps: 172 HP-41 Bytes: 347

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02634-41-4	$10	$12
FOR HP-71*	02634-71-1	N/A	$14

02635 USPS Navigation Course Checker

by D.M. Daniel, Pensacola, FL

Program is designed to check the Student's work sheets in the United States Power Squadrons' Celestial Navigation Courses. In the first part one enters necesary data and program computes the yellow (Almanac) pages data for comparison with the student's solution. The last three parts compute entries for the HO 229, HP 211 (modified) and calculator solutions for comparison with the student's work sheet. **Necessary Accessories for HP-41:** Four memory modules. Printer highly desirable.

Steps: 1074 HP-41 Bytes: 1993

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02635-41-1	$10	$19
FOR HP-71*	02635-71-8	N/A	$22

02636 Discrete-Time System Response

by P. Kokol, Maribor, Yugoslavia

This program calculates output values for a discrete-time system (response) described by a linear difference equation. The input may be entered by a subroutine which computes the input values or manually. Also you may enter initial conditions if you wish. Response may be printed or plotted (or both) if so required by user. **Necessary Accessories for HP-41:** Two memory modules, X-Functions module. Printer optional.

Steps: 579 HP-41 Bytes: 1049

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02636-41-9	$10	$15
FOR HP-71	NOT AVAIL		

02637 Huffmans Code

by P. Kokol, Maribor, Yugoslavia

This program transforms as input given alphabet and its probabilities into the output alphabet in Huffmans code. The hard copy is printed if printer connected else results are displayed. **Necessary Accessories for HP-41:** Memory module and X-Functions module. Printer optional.

Steps: 265 HP-41 Bytes: 467

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02637-41-7	$10	$13
FOR HP-71	NOT AVAIL		

02638 Nonlinear Least Squares

by J. Warner, Ann Arbor, MI

For an arbitrary user defined function y=f(x, B1, B2 ...) of x and up to nine parameters Bi this program will find the best values of Bi to fit a set of data points (xi, yi). Parameters may be linear or non-linear. Program requires an initial guess, usually within 25 to 50% of the final Bi values. Program is slow, but careful. **Necessary Accessories for HP-41:** Two to four memory modules, Math Pac application module and Extended Functions memory module.

Steps: 464 HP-41 Bytes: 879

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02638-41-5	$10	$15
FOR HP-71	NOT AVAIL		

02639 Blood-Type Matching

by C. Martinez, Santiago, CHILE

This program examines a simple model of blood-type matching and generates the percentages of blood-type matches found in a given population. The blood of an individual is typed by the presence or absence of the three antigens A, B and RH. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 224 HP-41 Bytes: 476

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02639-41-3	$10	$13
FOR HP-71*	02639-71-0	N/A	$14

02640 Transistor Parameter Conversion

by C. Martinez, Santiago, CHILE

Since manufactures' data sheets often provide the low-frequency hybrids parameters of a TRA in only one configuration (CE, CB, or CC). It may be necessary to convert the H-parameters from one configuration to another. This program will perform these conversions for you. **Necessary Accessories for HP-41:** One memory module. Printer and overlay helpful.

Steps: 234 HP-41 Bytes: 434

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02640-41-1	$10	$12
FOR HP-71*	02640-71-8	N/A	$14

02641 Thermal Expansion of Parts

by W.G. Adair, Commerce, GA

This program will calculate the increase or decrease in length or diameter, plus the increase or decrease in stress, for a part subjected to a difference in temperature. Thirteen different metals are labeled in the program, concerning their coeff. of expansion Rates. A chart is included for the modulus of elasticity and Poisson Ratio, when required. **Necessary Accessories for HP-41:** One memory module

Steps: 137 HP-41 Bytes: 402

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02641-41-9	$10	$12
FOR HP-71*	02641-71-6	N/A	$14

02642 System of Simultaneous Equations

by W.G. Adair, Commerce, GA

This program will solve two types of linear equations using Cramer's Rule: two unknowns, x and y within two equations and three unknowns, x, y, and z within three equations. Example problems show user how to check program's matrix calculations, if required. **Necessary Accessories for HP-41:** One memory module

Steps: 249 HP-41 Bytes: 406

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02642-41-7	$10	$12
FOR HP-71*	02642-71-4	N/A	$14

02643 Benedict-Webb-Rubin Equation of State For Mixtures

by E.C. Schmidt, Milo, ME

This program needs 116+ registers (one more for each component over five) and uses the Lorentz combination. This program will find volume, pressure, or temperature if the other two are known (note: will not work if have only one component). The program uses the 1/2 method of find volume and temperature. The program uses a printout to check the input of each set of constants. **Necessary Accessories for HP-41:** Two memory modules

Steps: 401 HP-41 Bytes: 679

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02643-41-5	$10	$14
FOR HP-71*	02643-71-2	N/A	$16

02644 Z-Transformation

by E.C. Schmidt, Milo, ME

This program inverts from the Z domain back into the time domain. It gives the values of the function only at the sampling instants. This program uses the long division methods to get these values. The program has a size check and can be rerun at the end of the run to get the next set of values. **Necessary Accessories for HP-41:** One memory module

Steps: 242 HP-41 Bytes: 441

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02644-41-3	$10	$12
FOR HP-71*	02644-71-0	N/A	$14

02645 Benedict-Webb-Brubin Equation of State

by E.C. Schmidt, Milo, ME

This program will find volume, pressure, or temperature if the other two are known. The program uses the 1/2 value method to find volume or temperature but uses the B-W-R equation to find pressure. Needs 73 registers in all. **Necessary Accessories for HP-41:** One memory module

Steps: 226 HP-41 Bytes: 383

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02645-41-0	$10	$12
FOR HP-71*	02645-71-7	N/A	$14

02646 Encode: Calculator Cryptography Made Easy

by D. Wesseler, Waco, TX

Although not really a word "game", this program will let you encode or decode longer messages with ease. By using two "keys" (a keyword of up to eight letters, and a number) you can generate a virtually unbreakable personalized code. Message entry is done all at one time in lines of up to 24 letters. The message is then transposed using the keyword and number at a rate of approximately 4 seconds per letter. **Necessary Accessories for HP-41:** One memory module and Extended Functions module.

Steps: 195 HP-41 Bytes: 448

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02646-41-8	$10	$12
FOR HP-71*	02646-71-5	N/A	$14

02647 Mortgage Loan Service

by G.J. Andrews, Los Angeles, CA

Computes mortgage loan payments. Maintains loan status card which is updated with each payment. Permits variable interest rate and balloon payment at the end of the repayment period. Permits overpayments, exact payments, underpayments and no payments. Provides interest paid over a given period. **Necessary Accessories for HP-41:** Printer and Card Reader optional

Steps: 236 HP-41 Bytes: 631

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02647-41-6	$10	$13
FOR HP-71	NOT AVAIL		

02648 Direct Integration of Polynomials

by N. Arthur, Reseda, CA

The program calculates the value of the integral of any polynomial up to degree 10. The method of integration is the direct antiderivative of the polynomial. The program prompts for the boundaries of integration and the maximum degree of the function, then any number of coefficients can be entered arbitrarily. The values of boundaries and the degree can be modified without having to reenter the coefficients or reintegration. **Necessary Accessories for HP-41:** None

Steps: 189 HP-41 Bytes: 393

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02648-41-4	$10	$12
FOR HP-71*	02648-71-1	N/A	$14

02649 Fitting Vapor Pressure Data to Antoine Equation/3 Constants

by J.A. Pita, Quito, Ecuador

Given a set of data concerning vapor pressures at various temperatures, this program finds the constants of the equation of Antoine that best fit the data. A least-squares fit is made for two of the constants with the third fixed. Then, the third constant is changed by increments and the regression is performed again. The user specifies the initial, increment and final value of the third constant. The fit that presents the correlation coefficient nearest to unity is displayed as the answer. **Necessary Accessories for HP-41:** One memory module

Steps: 181 HP-41 Bytes: 349

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02649-41-2	$10	$12
FOR HP-71*	02649-71-9	N/A	$14

02650 Spearmans Rank Correlation Coefficient

by M. Doran, S Hobart, Australia

N pairs of (x, y) data are ranked by this program which then calculates the Spearman rank correlation coefficient as a measure of the association between the variables. **Necessary Accessories for HP-41:** At least one memory module

Steps: 157 HP-41 Bytes: 270

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02650-41-0	$10	$12
FOR HP-71*	02650-71-7	N/A	$14

02651 Local Apparent Noon

by J.W.C. Hermans, Wellington, New Zealand

Program calculates the local time of the meridian passage of the sun, without the use of an Almanac. The program prompts for the inputs: Latitude, Date and Time Zone, and uses routines from the Navigation Pac. While the latitude is not actually required it is included in the program so that a natural progression from morning sight to noon is maintained. **Necessary Accessories for HP-41:** One memory module and Navigation Pac

Steps: 70 HP-41 Bytes: 132

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02651-41-8	$10	$11
FOR HP-71	NOT AVAIL		

02652 Astronomical Clock

by C. Rusquellas, Buenos Aires, Argentina

Set of two short and useful programs. The first one, converts your calculator in a sidereal clock, that displays continuously Local Sidereal Time with an error of less than 1, 5 sec. The second program, computes and recomputes Local Hour Angle of a celestial body, given its Right Ascension. The programs are independent, but they can fit together in the basic HP-41C. **Necessary Accessories for HP-41:** Time Module

Steps: 110 HP-41 Bytes: 231

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02652-41-6	$10	$12
FOR HP-71	NOT AVAIL		

02653 Rigid Body Inertial Properties

by G.J. Andrews, Los Angeles, CA

Program computes total weight (or mass), center-of-gravity coordinates and moments and products of inertia of an assembly composed of an arbitrary number of items. May be utilized in the design of spacecraft, airplanes, missiles, rockets, etc. Particularly useful in vibrations analysis. **Necessary Accessories for HP-41:** One memory module and printer

Steps: 258 HP-41 Bytes: 510

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02653-41-4	$10	$13
FOR HP-71*	02653-71-1	N/A	$14

02654 Sum and Difference Frequencies

by J.C.I. Morehead, Ambridge, PA

This program evaluates most of the typical sum and difference frequencies that may be generated by the interaction of a pair of frequencies when rubbing or waveform "clipping" occur. A harmonic order not greater than five is specified by the user. **Necessary Accessories for HP-41:** One memory module and printer (HP 82143A)

Steps: 209 HP-41 Bytes: 372

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02654-41-2	$10	$13
FOR HP-71*	02654-71-9	N/A	$14

02655 Piping Losses Including Fittings and Values

by M.L. Ramsey, Abilene, TX

This program is a must for persons responsible for the calculation of pressure losses in piping systems. The program calculates Reynolds number, friction factor, velocity and pressure loss. Values are assigned to keys for fittings, valves, etc. making the pressure loss calculation extremely easy. Program lines may be deleted if X-Function module not available. **Necessary Accessories for HP-41:** Three memory modules and Extended Functions module

Steps: 537 HP-41 Bytes: 1310

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02655-41-9	$10	$16
FOR HP-71	NOT AVAIL		

02656 Rounding Percentage

by H.R. Rixrath, Buenos Aires, Argentina

"ROUNDING PERCENTAGE" (RP) calculates for nn amounts the percentage of the total corresponding to the sum of those amounts. Each percentage is duly rounded, so that the percentages will always sum up exactly 100%. The resulting percentages for each amount can be displayed without, or with up to 6 decimal positions. **Necessary Accessories for HP-41:** One memory module and an X-Functions module

Steps: 273 HP-41 Bytes: 484

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02656-41-7	$10	$13
FOR HP-71*	02656-71-4	N/A	$14

02657 Proot

by J.M. Conner, La Palma, CA

PROOT calculates real roots of a polynomial of degree N via Newton's Method when given an initial guess. PROOT uses Horner's Algorithm to evaluate the polynomial and its derivative, so that only N multiplications, not 2N-1, are performed per iteration. Also, an iteration index may be specified so that convergence may be monitored. **Necessary Accessories for HP-41:** None

Steps: 148 HP-41 Bytes: 276

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02657-41-5	$10	$12
FOR HP-71*	02657-71-2	N/A	$14

02658 Matrix Multiplication

by A. Day, San Francisco, CA

This program performs the multiplication of two matrices 'A' and 'B'. The number of storage registers required is automatically calculated and displayed for the user. Input is prompted in row, column format after which an edit feature is provided for viewing the entered values and making corrections as required. **Necessary Accessories for HP-41:** At least one memory module. Printer optional.

Steps: 217 HP-41 Bytes: 408

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02658-41-3	$10	$12
FOR HP-71*	02658-71-0	N/A	$14

02659 Pressure Navigation

by J.B. Russell, Seattle, WA

Pressure differential (or pressure pattern) flying and navigation methods enable the pilot to compute a single magnetic heading which will compensate for all winds aloft between points of departure and destination providing a minimum time route with resultant economies of both time and cost. Based on inputs of latitude, magnetic variation, barometric pressure, true course, airspeed, and ground distance program will compute the magnetic heading to be flown. Assignment of data registers aligns with use of registers by the Aviation Pac (0041-15018). Program requires use of 1 memory module but may be modified by reassigning data regs so that no additionaal mem mod req. **Necessary Accessories for HP-41:** One memory module

Steps: 125 HP-41 Bytes: 248

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02659-41-1	$10	$12
FOR HP-71*	02659-71-8	N/A	$14

02660 Spherical Mirrors, Lenses, and Refraction

by J.E. Schiermeier, Cary, NC

This program solves problems dealing with spherical mirrors, thin lenses, and refraction. Variables include: object distance, image distance, focal length, radii, index of refraction, magnification, object height, and image height. At a refractive surface, the indices of refraction and angles of incidence and refraction may be solved. One function enables easier entry of a series of lenses or refractive surfaces. All functions and modes are assigned to keys, facilitating easy use. **Necessary Accessories for HP-41:** Two memory modules

Steps: 487 HP-41 Bytes: 906

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02660-41-9	$10	$15
FOR HP-71*	02660-71-6	N/A	$18

02661 Base and Floating Point Conversions

by J.E. Schiermeier, Cary, NC

This program converts between decimal and any other base from 2 to 36 or any base floating point. Both integers and real numbers may be converted in the simple conversion, and the base b number may be up to 24 characters. In the floating point conversion, the user defines the bias and number of places in the exponent and mantissa. The only constraint on the size of the word is amount of available storage. **Necessary Accessories for HP-41:** One memory module and Extended Functions memory module

Steps: 410 HP-41 Bytes: 658

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02661-41-7	$10	$13
FOR HP-71*	02661-71-4	N/A	$14

02662 Keynesian Macroeconomic Model With Monetary Sector

by J.E. Schiermeier, Cary, NC

This program contains a Keynesian macroeconomic model complete with the goods and services and monetary sectors. The components consist of consumption, investment, government expenditures, taxes, transfer payments, and money supply with both autonomous and income- or interest-dependent factors. Functions, assigned to keys, include: interest rate, equilibrium and component outputs; change in rate or output for a component change; changing a single parameter; government deficit; inflationary or deflationary gap; and monetary and output demand. **Necessary Accessories for HP-41:** One memory module

Steps: 357 HP-41 Bytes: 613

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02662-41-5	$10	$13
FOR HP-71*	02662-71-2	N/A	$14

02663 Thermal Expansion and Conduction

by J.E. Schiermeier, Cary, NC

This program provides interchangeable solutions for thermal expansion or conduction problems. The thermal expansion part solves for temperatures, length or volume, change in length or volume, or coefficients of expansion. The thermal conduction solves for heat current, temperatures, or resistance, using either conductivities or R-factors. A routine sums arrangements of resistors in series or parallel. If resistance has been solved, then the equivalent conductivity or R-factor, area, or thickness may be solved. **Necessary Accessories for HP-41:** One memory module

Steps: 420 HP-41 Bytes: 826

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02663-41-3	$10	$14
FOR HP-71*	02663-71-0	N/A	$16

02664 Arena of Death

by T. Langland, Phoenix, AZ

You are randomly placed in the 15 x 15 playing field of the arena of death. In the arena with you will be find blocked squares, 22 relocation squares, 4 each of tar pits, wall bombs and hide shields, a super trap, and of course, the objective. Sound easy? Well wait until the monster and bird start chasing after you! You had better be quick with your laser blaster or you'll soon be dead! A real challenging game. Makes full use of alphanumeric and tone capabilities. **Necessary Accessories for HP-41:** Quad memory module

Steps: 891 HP-41 Bytes: 1898

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02664-41-1	$10	$19
FOR HP-71*	02664-71-8	N/A	$22

02665 Short Path Beam Heading

by P.S. Rieszer, Salta, Argentina

Most radio amateurs have rotor equipped directional antennas and rely on beam heading charts to find out in which direction the antenna has to be pointed. These charts are useful only for transmission from locations for which they are drawn. This program calculates the exact heading of a beam transmission from any location to another place on earth. More sharpened is the beam width, more accurate has to be the heading of the antenna. The inputs are latitude and longitude of the user's location and of the location he wants to reach. **Necessary Accessories for HP-41:** Printer optional

Steps: 141 HP-41 Bytes: 204

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02665-41-8	$10	$11
FOR HP-71*	02665-71-5	N/A	$12

02666 Transient Conduction (Lumped Capacitance Method)

by N. Nanji, Ann Arbor, MI

This program uses the lumped capacitance method (assumes that the temperature of the solid is spatially uniform at any instant) to solve transient conduction problems. The program calculates the thermal time constant, the time required for the specifed solid to reach a certain temperature when it experiences a sudden temperature change in its environment, and the total energy transfer during the process. **Necessary Accessories for HP-41:** None

Steps: 116 HP-41 Bytes: 251

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02666-41-6	$10	$12
FOR HP-71*	02666-71-3	N/A	$14

02667 Lighting Calculation Point by Point For Multiple Fixtures

by S.A. Mangold, Austin, TX

This program calculates the initial footcandle level at a point on a horizontal or vertical surface from a matrix of up to 16 luminaires using the Point by Point method as described in the IES Handbook. Program contains an interpolation routine for deriving data from a candlepower distribution curve. **Necessary Accessories for HP-41:** One memory module

Steps: 231 HP-41 Bytes: 494

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02667-41-4	$10	$13
FOR HP-71*	02667-71-1	N/A	$14

02668 Ultimate Bearing Capacity of a Pile From SPT

by C.A. Frossard, Sao Paulo, Brasil

Program calculates (quickly) the ultimate bearing capacity of a pile from S.P.T. results. It uses Decourt/Quaresma formula (SI units) which won the International evaluation contest for determination of the ultimate bearing capacity of a pile on the Esopt II - European Symposium of Penetration Test - Amsterdam, Holland (May/1982) - valid for precast, strauss and franki concrete piles. **Necessary Accessories for HP-41:** One memory module. Card Reader and Printer optional.

Steps: 258 HP-41 Bytes: 658

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02668-41-2	$10	$14
FOR HP-71*	02668-71-9	N/A	$16

02669 Open Channel Flow Using Mannings Formula

by K.S. Freier, Albuquerque, NM

Mannings formula for open channel flow. Solves for flow rate, normal depth, slope, or critical depth for rectangular, trapezoidal, or triangular shaped channels. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 309 HP-41 Bytes: 531

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02669-41-0	$10	$13
FOR HP-71*	02669-71-7	N/A	$14

02670 Solutions For Linear Systems of Equations With 4 Unknowns

by M. Harabor, Phoenix, AZ

This program solves systems of equations with four unkowns. The program prompts for coefficients input. The output is explicit and relatively fast. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 312 HP-41 Bytes: 857

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02670-41-8	$10	$14
FOR HP-71*	02670-71-5	N/A	$16

02671 Tube Column Design

by D. Lilljedahl, Dallas, TX

This program aids in design of tube steel columns subjected to combined axial and bending loads using the modified formulas on page 3-9 of the AISC Manual of Steel Construction. Member section properties are input by hand or by using data cards. Results of the formulas are displayed so they can be compared to the AISC load tables to select column sizes. **Necessary Accessories for HP-41:** Three memory modules

Steps: 460 HP-41 Bytes: 1013

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02671-41-6	$10	$15
FOR HP-71*	02671-71-3	N/A	$18

02672 Hangman (SP)

by R.G. Laughton, Footscray, Australia

A word guessing game for two players. First player hides a word (up to ten letters). Second player guesses what letters are in it. Each wrong guess adds a piece to diagrams of gallows and man in display. Tenth wrong guess results in hanging: guesser loses. Calculator plays appropriate tune for win or loss. Non standard characters are created by two synthetic text lines. **Necessary Accessories for HP-41:** One memory module

Steps: 201 HP-41 Bytes: 421

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02672-41-4	$10	$12
FOR HP-71*	02672-71-1	N/A	$14

02673 Pressure Vessel Cost/Weight Estimate (PVCW)

by L. Scott, Tulsa, OK

This program estimates pressure vessel cost as a function of shell weight. It also calculates vessel volume, surface area and shell thickness. The program prompts for all inputs required including inside diameter, tangent length, design pressure, allowable stress and corrosion allowance. The program includes a routine to round up shell thickness to a standard manufactured plate thickness. The cost estimate is current because of use of the most recent Chemical Engineering Fabricated Equipment Index. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 405 HP-41 Bytes: 865

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02673-41-2	$10	$14
FOR HP-71*	02673-71-9	N/A	$16

02674 Design of Commonly Used Beams

by W.G. Adair, Commerce, GA

Input of load, length of beam, E, I, and location of load, program will solve for the maximum deflection, maximum moment, and both reactions. Program will solve for twelve commonly used load conditions. Charts for E, I, and equations are included. **Necessary Accessories for HP-41:** Two memory modules

Steps: 722 HP-41 Bytes: 1236

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02674-41-0	$10	$16
FOR HP-71*	02674-71-7	N/A	$18

02675 Chebyshev Polynomial Evaluation and Coefficients

by L.O.J. Kagey, Fullerton, CA

This program evaluates an important class of Orthogonal Polynomials known as Chebyshev polynomials. Six kinds of Chebyshev polynomials of order N and argument X are evaluated. In addition, the program provides the capability to determine the coefficient vectors of each of the polynomial types. Polynomial interrelationships are utilized in the evaluation process. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 389 HP-41 Bytes: 789

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02675-41-7	$10	$14
FOR HP-71*	02675-71-4	N/A	$16

02676 Extended Memory Matrix Operations

by M. Butler, Ithaca, NY

This program will add, subtract, multiply, and transpose rectangular matrices stored as data files in extended memory. **Necessary Accessories for HP-41:** Extended Functions/memory and one or more memory modules

Steps: 300 HP-41 Bytes: 602

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02676-41-5	$10	$13
FOR HP-71	NOT AVAIL		

02677 Altitude Versus DME Reading For Instrument Approaches

by P. Gustafson, Canberra, Australia

Program calculates the altitude for the distance measuring equipment (DME) cockpit readout for a nominated glide path. The program will accept a course to any azimuth aid (Localiser, VOR, NDB) which may be offset from the extended centreline. The DME does not have to be co-located with the azimuth aid and the program takes into account the offset track and slant range when calculating the DME distance. **Necessary Accessories for HP-41:** Two memory modules

Steps: 559 HP-41 Bytes: 988

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02677-41-3	$10	$15
FOR HP-71*	02677-71-0	N/A	$18

02678 -AGD

by R. Belford, Nedlands, Australia

Input Northing and Easting AMG coordinates and output will be latitude, longitude and grid convergence. **Necessary Accessories for HP-41:** One memory module

Steps: 320 HP-41 Bytes: 466

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02678-41-1	$10	$13
FOR HP-71*	02678-71-8	N/A	$14

02679 IPOS

by R. Belford, Nedlands, Australia

This program uses inputs of Northing and Easting of two points to calculate forward, reverse azimuths and distance between them. **Necessary Accessories for HP-41:** One memory module

Steps: 226 HP-41 Bytes: 345

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02679-41-9	$10	$12
FOR HP-71*	02679-71-6	N/A	$14

02680 Calculation of Easter Sunday

by M.C. Koenig, Litchfield Park, AZ

This program calculates the date of Easter Sunday for any year of the Gregorian Calendar from 1583 onward. A historical abstract, related points of interest, and one alternate method are given. **Necessary Accessories for HP-41:** Card reader and printer optional

Steps: 169 HP-41 Bytes: 224

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02680-41-7	$10	$12
FOR HP-71*	02680-71-4	N/A	$14

02681 Fitting Adsorption Data With Langmuir and B-E-T Equations

by J.A. Pita, Quito, Ecuador

This program fits experimental data of gas volume adsorpted at several partial pressures and calculates the parameters of the Brunauer-Emmett- Teller Equation and Langmuir Isotherm representing these data. Up to 20 data pairs can be analyzed. New values can be predicted by program using both equations. Also, using the parameters resulting from B-E-T equation, volume adsorpted due to multilayers can be predicted keying the number of layers. **Necessary Accessories for HP-41:** Two memory modules

Steps: 316 HP-41 Bytes: 591

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02681-41-5	$10	$13
FOR HP-71*	02681-71-2	N/A	$14

02682 Fuming Sulfuric Acid Concentration Expressed in Various Ways

by J.A. Pita, Quito, Ecuador

Given any of these ways of expressing concentration of a fuming sulfuric acid solution, this program calculates the other five corresponding ways of expression: actual H2SO4 (%), equivalent H2SO4 (%), combined water (%), free SO3 (%), total SO3 (%) and combined SO3 (%). Use of program replaces tables used for that purpose with the advantage of permitting interchangeable conversions from any "KEY ENTRY" form of expressing concentration. **Necessary Accessories for HP-41:** One memory module

Steps: 302 HP-41 Bytes: 562

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02682-41-3	$10	$13
FOR HP-71*	02682-71-0	N/A	$14

02683 Normal and Log-Normal Distributions

by L.A. Arreola, Mexico City, MEXICO

This program can calculate from a normal or log-normal distribution the values of: geometric mean, median, standard deviation and performs a second degree least squares fit to cumulative-percent-less-than versus x curve. **Necessary Accessories for HP-41:** One memory module. Card reader optional.

Steps: 220 HP-41 Bytes: 339

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02683-41-1	$10	$12
FOR HP-71*	02683-71-8	N/A	$14

02684 Change of Phase

by J.E. Schiermeier, Cary, NC

This program calculates the initial or final temperature or the heat required to change the temperature of a substance. The substance may have any melting and boiling points or latent heats, and different specific heats for the different phases of the substance may be entered. If the temperature change starts or stops during a phase change, the amount of each phase at that point may be input or calculated. **Necessary Accessories for HP-41:** Two memory modules

Steps: 430 HP-41 Bytes: 716

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02684-41-9	$10	$14
FOR HP-71*	02684-71-6	N/A	$16

02685 Elastic Collisions in Two Dimensions

by J.E. Schiermeier, Cary, NC

This program will find the result of an elastic collision of two bodies in two dimensions, given a velocity or angle of the final conditions. Given the final conditions and one initial velocity or initial angle, the initial conditions can be calculated. The mass ratio may also be calculated. Both of the sets of solutions are displayed. All inputs are prompted for, and all outputs are clearly labelled. **Necessary Accessories for HP-41:** One memory module

Steps: 390 HP-41 Bytes: 663

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02685-41-6	$10	$13
FOR HP-71*	02685-71-3	N/A	$14

02686 Inelastic Collisions in Two Dimensions

by J.E. Schiermeier, Cary, NC

This program will find the result of an inelastic collision of two bodies in two dimensions. Initial conditions can be calculated from the final results and both initial velocities, both initial angles, velocity and angle of one body, or velocity of one and angle of the other. The mass ratio may also be calculated. In cases where two solutions exist, both are displayed. All inputs are prompted for and all outputs are clearly labeled. **Necessary Accessories for HP-41:** One memory module

Steps: 395 HP-41 Bytes: 626

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02686-41-4	$10	$13
FOR HP-71*	02686-71-1	N/A	$14

02687 Laws of Motion

by J.E. Schiermeier, Cary, NC

This program uses the basic laws of motion to provide solutions for problems involving motion with constant acceleration in one dimension. Values that may be input or solved for include: time, displacement, initial velocity, current velocity, acceleration, mass, momentum, impulse, force, and kinetic energy. Once quantities have been input, the user may select other quantities which are then calculated, if possible. **Necessary Accessories for HP-41:** Two memory modules

Steps: 481 HP-41 Bytes: 864

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02687-41-2	$10	$14
FOR HP-71*	02687-71-9	N/A	$16

02688 Difference Amplifier

by I.R. Aizcorbe, Madrid, Spain

This program computes the output voltage and the gain of difference amplifier in all this configuration: Input: Output: Input: Output: difference difference asymmetric asymmetric asymmetric difference common difference difference asymmetric **Necessary Accessories for HP-41:** Printer optional

Steps: 163 HP-41 Bytes: 315

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02688-41-0	$10	$12
FOR HP-71*	02688-71-7	N/A	$14

02689 Pile Footing Analysis - Axisymmetric Pile Locations

by S.L. Stroh, Tampa, FL

Program was developed to provide a quick means of determining the pile loads for an axisymmetric footing. Pile coordinates for only one quadrant need be entered, as the programs adds the piles required to achieve symmetry about the x and y axis. An edit feature allows the revision of a single parameter and reanalysis of the footing with minimal user input. Output consists of individual pile loads under given axial load and moments. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 436 HP-41 Bytes: 974

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02689-41-8	$10	$15
FOR HP-71*	02689-71-5	N/A	$18

02690 Reflectometer Calculators

by E. Setaro, Mexico DF, MEXICO

This program solves different conversion and calculations commonly used in microwaves/rf coaxial systems, such as: reflection coefficient, standing wave ratio (SWR), return loss and mismatch loss. **Necessary Accessories for HP-41:** Printer optional

Steps: 165 HP-41 Bytes: 378

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02690-41-6	$10	$12
FOR HP-71*	02690-71-3	N/A	$14

02691 Odd-Order Harmonics

by B. Schulman, North Ryde, Australia

The program calculates the maximum amplitude (peak value) and angle of phase of odd-order harmonics (up to the 11th), present in periodic multiple-curves, when given the ordinate values corresponding to twelve equally-spaced subdivisions of a positive semiperiod of the curve. Content of the stack register X (display) present before the execution, is preserved and displayed at the end of the run. **Necessary Accessories for HP-41:** Two memory modules

Steps: 324 HP-41 Bytes: 703

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02691-41-4	$10	$14
FOR HP-71*	02691-71-1	N/A	$16

02692 Vapor-Liquid Equilibrium Temperature Calculations

by J.S. Hood, Auburn, AL

This program solves for bubble-point, dew-point, and equilibrium mixture temperatures. Antoine constants or K-value coefficients-fitted to cubic equations from DePriester's charts - are used. Calculations are made for N components in a batch equilibrium distillation. Plate-by-plate bubble point calculations in a multi-component distillation are also applicable. **Necessary Accessories for HP-41:** One memory module

Steps: 309 HP-41 Bytes: 581

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02692-41-2	$10	$13
FOR HP-71*	02692-71-9	N/A	$14

02693 Analysis of Plane Determinate Trusses With Vertical Loading

by B.R. Townsend, Orlando, FL

Given external loads and reactions, and truss joint coordinates, program calculates member lengths and axial loads for any configuration of plane pin-jointed determinate truss with up to 45 points. Program self-checks for summation of x and y forces = 0 at final joint. Loading may be changed without re-entering coordinates. Program uses unique "rotating" storage system for joint load components to conserve registers. **Necessary Accessories for HP-41:** Quad memory module. Printer optional.

Steps: 546 HP-41 Bytes: 969

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02693-41-0	$10	$15
FOR HP-71*	02693-71-7	N/A	$18

02694 Optimum Flexural Design of Reinforced Concrete Slabs

by B.R. Townsend, Orlando, FL

Given concrete and steel stresses, ultimate bending moment, trial slab thickness, and minimum concrete cover for reinforcing, this program calculates minimum flexural and temperature reinforcing. If trial slab thickness is undersized as determined by strasses, the program increments slab thickness to obtain minimum concrete dimensions. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 367 HP-41 Bytes: 844

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02694-41-8	$10	$14
FOR HP-71*	02694-71-5	N/A	$16

02695 Fillet Weld Effective Throat (TE)

by W.N. Carter, Richland, WA

Solves for the EFFECTIVE THROAT (TE) of skewed fillet welds of equal and unequal leg lengths. Compensates for gap within Code allowance. Based on Structural Welding Code, AWS D1.1. For angles less than 60 deg, the program deducts 1/8" from TE for partial penetration groove welds. Also used for TE of normal 90 deg fillets. Program easy to use. **Necessary Accessories for HP-41:** Printer optional

Steps: 101 HP-41 Bytes: 175

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02695-41-5	$10	$11
FOR HP-71*	02695-71-2	N/A	$12

02696 Continuous Sun Azimuth

by J.W.C. Hermans, Wellington, New Zealand

This program computes for any date and time and in any position the true azimuth of the sun, and then continuously updates the true azimuth every 40 seconds. The only inputs required are Latitude and Longitude. The program is invaluable for compass adjustment. **Necessary Accessories for HP-41:** One memory module, Time Module and Navigation Pac

Steps: 40 HP-41 Bytes: 85

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02696-41-3	$10	$11
FOR HP-71	NOT AVAIL		

02697 Sunrise and Sunset

by J.W.C. Hermans, Wellington, New Zealand

This program calculates the standard time of sunrise or sunset at any position without the use of a Nautical Almanac. Inputs required are: whether sunrise or sunset required, DR latitude, DR longitude, date and time zone. It is useful for planning star sights. **Necessary Accessories for HP-41:** One memory module and Navigation Pac

Steps: 151 HP-41 Bytes: 272

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02697-41-1	$10	$12
FOR HP-71	NOT AVAIL		

02698 Transitive Closure

by P. Kokol, Maribor, Yugoslavia

This program transforms a given matrix M into its transitive completion M+.M is the square Boolean matrix with maximal rank of 175. Some error correction and editing routines are added. Program runs quite long, so some current status informations are shown in the display. The routine for nice printing is included but printer is not necessary for running this program. Warshalls algorithm is used in this program. **Necessary Accessories for HP-41:** Two memory modules, X-Functions module and X-memory module. Printer optional.

Steps: 473 HP-41 Bytes: 813

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02698-41-9	$10	$14
FOR HP-71	NOT AVAIL		

02699 Estimation of Plate Efficiency

by P. Kokol, Maribor, Yugoslavia

For finite-stage contactor columns where the overall column efficiencies are constant, O'Connell has correlated efficiency data on the basis of liquid viscosity and relative volatility. This program calculates efficiency for rectification columns with perforated or bubble cup trays. Efficiency is a function of relative volatility of the light key to the heavy key component times the average viscosity of the feed at the average column temp. **Necessary Accessories for HP-41:** Two memory modules. Extended Functions module and printer optional.

Steps: 397 HP-41 Bytes: 801

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02699-41-7	$10	$14
FOR HP-71*	02699-71-4	N/A	$16

02700 Amateur Satellite Tracking

by J.D. Anderson, Kaysville, UT

This program, uses the capabilities of the Time Module. Automatically calculates, at 2-minute intervals, the elevation and approximate bearing of a satellite in circular orbit. Input data includes station coordinates (2), satellite parameters (3), and data for the specific orbit (2). Once the data is entered, no other keystrokes are needed, and the program will continue to give the satellite's position until it goes out of range. **Necessary Accessories for HP-41:** One memory module and time module

Steps: 385 HP-41 Bytes: 728

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02700-41-3	$10	$14
FOR HP-71	NOT AVAIL		

02702 Interelation of 2 Blocks in Decreasing Order

by I.R. Aizcorbe, Madrid, Spain

This program intercalculates two blocks of registers in decreasing order. These blocks can have different sizes, but both must be decreasing in order. The program has sequence control and error messages. **Necessary Accessories for HP-41:** Memory modules and printer optional

Steps: 88 HP-41 Bytes: 174

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02702-41-9	$10	$11
FOR HP-71*	02702-71-6	N/A	$12

02703 Increasing Decreasing Sort

by I.R. Aizcorbe, Madrid, Spain

This program sorts certain number of registers in decreasing or increasing order using the index of registers. You can display or print the registers. It can be used by another program like routine. **Necessary Accessories for HP-41:** Memory modules and printer are optional

Steps: 87 HP-41 Bytes: 169

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02703-41-7	$10	$11
FOR HP-71*	02703-71-4	N/A	$12

02704 Intercalculation of 2 Blocks of N Registers (Increas.)

by I.R. Aizcorbe, Madrid, Spain

This program intercalculates two blocks of registers in increasing order. Both blocks must be also in increasing order. The program uses only the registers 00, 01, 02. It has a sequence control with error message. It intercalculates 2 blocks of 10 registers in 12 sec. The blocks can have different number of registers. **Necessary Accessories for HP-41:** None

Steps: 88 HP-41 Bytes: 172

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02704-41-5	$10	$11
FOR HP-71*	02704-71-2	N/A	$12

02705 Homogeneous Stellar Model

by A. Feinstein, La Plata, Argentina

A homogeneous stellar model with a radiative core and a convective envelope is computed. Needed input is the gas pressure and its temperature at the center, the hydrogen and helium abundance, the t/g opacity factor and the energy generation coefficient. The system of differential equations are solved by the Runge-Kutta method. The radius, mass, luminosity and effective temperature of the stellar model are obtained. **Necessary Accessories for HP-41:** Quad memory or HP-41CV. Printer highly recommended.

Steps: 670 HP-41 Bytes: 1397

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02705-41-2	$10	$17
FOR HP-71*	02705-71-9	N/A	$20

02706 Two Attenuators Circuits

by I.R. Aizcorbe, Madrid, Spain

This program computes the phase angle, gain, and center frequency or R.C. product of two attenuators circuits: Wien-Robinson Bridge and Double T Filter. **Necessary Accessories for HP-41:** None

Steps: 91 HP-41 Bytes: 190

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02706-41-0	$10	$11
FOR HP-71*	02706-71-7	N/A	$12

02707 Wind Triangle

by A. Nazarov, Mt Stuart, Australia

Wind speed and direction are solved for given true heading, true air speed, true track and ground speed. Alternatively, if wind speed and direction, true track and true air speed are given then the true heading required to maintain track and ground speed are output. **Necessary Accessories for HP-41:** None

Steps: 158 HP-41 Bytes: 836

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02707-41-8	$10	$13
FOR HP-71*	02707-71-5	N/A	$14

02708 Sum Thermal Units in Day Degrees

by E.S. Krafsur, Ames, IA

Program prompts for temperature scale and physiological development threshold. A sine-wave is fit to maximum-minimum temperature curves and the area above developmental threshold integrated. Output is for 12 hr intervals. Cumulative day-degree totals are given for succeeding 24 hr periods in Fahrenheit and Celsius and the days counted. **Necessary Accessories for HP-41:** Printer optional

Steps: 144 HP-41 Bytes: 307

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02708-41-6	$10	$12
FOR HP-71*	02708-71-3	N/A	$14

02709 Plane & Solid Analytic Geomt Pts, Distance, Slopes, Angles

by G.M. Halpern MD, Honolulu, HI

This program solves problems in Plane and Solid Analytic Geometry involving points, distance, slopes, angles and areas. The formulas are routine, and much use is made of Alphanumeric print-outs. Some of these strings are created by synthetic programming. Once the required coordinates are entered, most calculations are automatic after the proper LBL is keyed. All of the entries are printed in order to confirm accuracy of entry. All results are stored so that other calculations can be carried out as desired. **Necessary Accessories for HP-41:** Quad Module or HP-41CV. Printer optional.

Steps: 911 HP-41 Bytes: 1900

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02709-41-4	$10	$19
FOR HP-71	NOT AVAIL		

02710 Queen

by T. Langland, Phoenix, AZ

In this game you will start by placing a chess queen (one only), in any one of the squares on a chess board in the top row or right-hand column. Then the calculator and you will take turns moving the queen only left, down or diagonally down to the left. The object of the game is to be the first one to move the queen to the lower left-hand corner square. **Necessary Accessories for HP-41:** One Chess queen and Chess board

Steps: 247 HP-41 Bytes: 461

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02710-41-2	$10	$13
FOR HP-71*	02710-71-9	N/A	$14

02711 Staircase

by P. Kokol, Maribor, Yugoslavia

You can play the game of Staircase against the calculator with this program. You can choose the number of stairs (between 3 to 6) and the calculator randomly distributes the sticks on each stair. This program is very hard to beat. **Necessary Accessories for HP-41:** Memory module and X-functions module

Steps: 240 HP-41 Bytes: 398

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02711-41-0	$10	$12
FOR HP-71*	02711-71-7	N/A	$14

02712 Reduction of Steel Band Measurements

by B. Pons, Taren Point, Australia

This program reduces observed steel band measurements to horizontal distances. The corrections applied are: temperature, tension (or pull), sag (for any number of bays), and slope. Units are SI units. Any other band can be used, if its coefficient of linear expansion and its cross-sectional area are known. **Necessary Accessories for HP-41:** One memory module

Steps: 198 HP-41 Bytes: 431

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02712-41-8	$10	$12
FOR HP-71*	02712-71-5	N/A	$14

02713 Relief Valve Sizing - Gases & Vapors

by F.M. Shoemaker, Bellingham, WA

The program calculates required orifice areas for safety relief valves in gas and vapor services. Formulae are incorporated to determine backpressure correction factors without the use of charts. Conventional, balanced bellows and pilot operated valves can be accommodated. **Necessary Accessories for HP-41:** Two memory modules and 82143A printer

Steps: 314 HP-41 Bytes: 795

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02713-41-6	$10	$14
FOR HP-71*	02713-71-3	N/A	$16

02714 Heat Transfer Rate

by N. Nanji, Ann Arbor, MI

Calculates the rate of heat transfer by convection, and radiation. Gives the rates of heat transfer due to the individual modes and the total heat transfer rate from a given surface exposed to free air. SI or US Customary units may be used. A practical, easy to use program. **Necessary Accessories for HP-41:** None

Steps: 125 HP-41 Bytes: 342

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02714-41-4	$10	$12
FOR HP-71*	02714-71-1	N/A	$14

02715 Metallurgical Balance

by S.B. Valine, Coleraine, MN

Given product weights and chemistry from a mineral separation, this program calculates the product weight percents, chemical distributions, and composite grade. The number of product streams is limited only by the number of available data registers. Printer and non-printer versions are provided. The printer version tabulates a neat, three-column listing. **Necessary Accessories for HP-41:** 82160A HP-IL module and 82162A Printer optional. Printer version requires at least one memory module.

Steps: 112 HP-41 Bytes: 237

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02715-41-1	$10	$15
FOR HP-71	NOT AVAIL		

02716 Pyramid of Thirteen

by D.M. Green, Oak Park, IL

Play the card game "Pyramid of Thirteen". You are given a "Pyramid" of cards which you must remove two at a time to deplete the pyramid, and thus win. You may only remove cards if nothing lies on top of the cards, and the cards sum 13 (i.e. 3 hearts + 10 clubs = 13). Thankfully, execution is fast for a card game. If you can shorten one register from program, program will fit into ONE memory module. **Necessary Accessories for HP-41:** Two memory modules. Printer and card reader helpful.

Steps: 238 HP-41 Bytes: 447

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02716-41-9	$10	$13
FOR HP-71	NOT AVAIL		

02717 Auto or Crosscorrelation of Large Data Files in Ext-Memory

by A. Seidon, Syosset, NY

Program calculates either the autocorrelation coefficients of a data file or the crosscorrelation coefficients of two data files, when the data files are stored in extended memory. **Necessary Accessories for HP-41:** HP 82180A with or without HP 82181A

Steps: 162 HP-41 Bytes: 350

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02717-41-7	$10	$12
FOR HP-71	NOT AVAIL		

02718 RAT-An Adventure Game For the HP-41C Calculator

by D.A. Taylor, San Diego, CA

This program is an exciting duel of wits between you and the computer (the "Rat") using "Artifical Intelligence" to control the rats moves. **Necessary Accessories for HP-41:** Two memory modules

Steps: 272 HP-41 Bytes: 1070

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02718-41-5	$10	$15
FOR HP-71*	02718-71-2	N/A	$18

02719 Seispac - Reflection Seismic Routines

by J.F. Herlocker Jr, Ledyard, CT

This is a collection of four routines useful in reflection seismic data interpretation. The four routines are: Dix equation (int. velo., depth, and aver. velo.); a routine to calculate interval, average and RMS velocity from time-depth pairs; a routine to determine an instantaneous velocity function, linear in depth, from time-depth pairs; and a routine to calculate an instantaneous velocity function, linear in time, from time-depth pairs. **Necessary Accessories for HP-41:** None

Steps: 224 HP-41 Bytes: 392

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02719-41-3	$10	$12
FOR HP-71*	02719-71-0	N/A	$14

02720 Seismic Fresnel Zone Calculations - HP-41

by J.F. Herlocker Jr, Ledyard, CT

"SFZ" is an improvement on the 67/97 version of this program, since it includes complete prompting and output labeling, as well as a displayed "menu". The program calculates the radius of the Fresnel Zone for reflection seismic data. The calculations are based on either plane or spherical waves and for constant velocity fields or for a field with a linear velocity gradient. **Necessary Accessories for HP-41:** None

Steps: 69 HP-41 Bytes: 146

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02720-41-1	$10	$11
FOR HP-71*	02720-71-8	N/A	$12

02721 Linear Velocity Function Determination and Migration

by J.F. Herlocker Jr, Ledyard, CT

This program accepts up to 240 time-depth pairs (with 41CV) and fits a linear velocity function, linear in depth, to the data in a least-squares sense. Once the function has been determined, depth can be found for any time or time can be found for any depth. In addition, a raypath migration routine is included which uses the parameters from the velocity function. **Necessary Accessories for HP-41:** One memory module

Steps: 238 HP-41 Bytes: 437

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02721-41-9	$10	$12
FOR HP-71*	02721-71-6	N/A	$14

02722 Linear Geophone Array Design and Response

by J.F. Herlocker Jr, Ledyard, CT

This program, which is an elaboration of the 67/97 program of the same name, allows the user to compute spacing or number of geophones for either minimum length or maximum rejection over the noise wavelength range. Given the number of geophones, the spacing between phones and the noise wavelength range, it will compute the array response at any point or average array response over the noise range. This program includes complete input prompts and output labeling as well as audible indications that it is finished. **Necessary Accessories for HP-41:** Printer optional

Steps: 134 HP-41 Bytes: 250

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02722-41-7	$10	$12
FOR HP-71*	02722-71-4	N/A	$14

02723 Geophone Sensitivities For Chebyshev Optimized Arrays

by J.F. Herlocker Jr, Ledyard, CT

This program will quickly calculate the weights to be applied to each individual geophone in a Chebyshev optimized array, based on the number of geophones available and the desired reject ratio in the reject band. The algorithm is based on the method of Reitsch as published in Geophysics, Vol. 44, #6, pp.1142-1143. This program is very similar to the 67/97 program of the same name, but it includes input prompting and output labeling to make the program more user friendly. **Necessary Accessories for HP-41:** Printer helpful

Steps: 129 HP-41 Bytes: 187

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02723-41-5	$10	$11
FOR HP-71*	02723-71-2	N/A	$12

02724 Directional Well Survey - Radius of Curvature Method

by J.F. Herlocker Jr, Ledyard, CT

This program is an amplification of the program of the same name written for the 67/97. This program will perform all of the functions of that program with the addition of Input Prompting and Output Labeling. The program calculates True Vertical Depth, Deviation in the North-South and East-West directions, the Horizontal Distance to TD, the Azimuth to the TD and the Dog-leg Severity for the last segment of the wellbore. **Necessary Accessories for HP-41:** Printer helpful

Steps: 175 HP-41 Bytes: 319

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02724-41-3	$10	$12
FOR HP-71*	02724-71-0	N/A	$14

02725 Density Porosity - Neutron Porosity Crossplot

by J.F. Herlocker Jr, Ledyard, CT

This program will calculate effective porosity (shale- and hydrocarbon- corrected), shale fraction and water saturation using standard log measurements using a density porosity-neutron porosity crossplot method. The evaluation of each point only takes about 10 seconds once the program has been initialized. **Necessary Accessories for HP-41:** None

Steps: 159 HP-41 Bytes: 273

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02725-41-0	$10	$12
FOR HP-71*	02725-71-7	N/A	$14

02726 D and D (TM) Dice and Character Generator

by J.F. Herlocker Jr, Ledyard, CT

This program will generate uniformly distributed pseudo-random numbers based on any number of n-sided dice; n can be from 2 to ?! In addition it will generate D and D (TM) characters by any of the four methods described in the Dungeon Master's Guide. The program is "Menu" driven, all inputs are prompted for and all output is labeled so the program is very user-friendly. The program takes considerably less time than hand-rolling and is very easy to use! **Necessary Accessories for HP-41:** None

Steps: 130 HP-41 Bytes: 282

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02726-41-8	$10	$12
FOR HP-71*	02726-71-5	N/A	$14

02727 D and D (TM) Attack Matrices

by J.F. Herlocker Jr, Ledyard, CT

This program effectively puts the attack matrices from the game Advanced Dungeons and Dragons (TM TSR Games) in your HP-41C; to aid you, the harried DM, in conducting combat. The program is "menu-driven" and all inputs are prompted, making this program very user friendly. Since the program and memory occupy only 36 registers, it can be used with any HP-41C system. **Necessary Accessories for HP-41:** None

Steps: 129 HP-41 Bytes: 237

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02727-41-6	$10	$12
FOR HP-71*	02727-71-3	N/A	$14

02728 Complete Exponential Decline Curve Analysis

by J.F. Herlocker Jr, Ledyard, CT

This program is really complete. It will solve for any two of the following variables given the other three: initial production rate (IPR), final production rate (FPR), total production (TP), decline rate (D), or time (T). The program is very friendly and easy to use, since all input is prompted and all output is labeled and highlighted for "solved" values. **Necessary Accessories for HP-41:** Card Reader or Wand and printer useful

Steps: 218 HP-41 Bytes: 327

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02728-41-4	$10	$12
FOR HP-71*	02728-71-1	N/A	$14

02729 Bulk Density - Neutron Porosity Crossplot

by J.F. Herlocker Jr, Ledyard, CT

This program performs a bulk density-neutron porosity cross-plot, yielding effective porosity, shale percentage and water saturation. Input parameters are resistivities, densities and neutron porosities and gamma ray reading for the matrix material, the shales and the formation waters. Once the program is initialized the evaluation takes only about 15 seconds per point. All input is prompted and all output is labelled, making the program easy to understand and use. **Necessary Accessories for HP-41:** Mass storage and a printer are useful

Steps: 184 HP-41 Bytes: 316

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02729-41-2	$10	$12
FOR HP-71*	02729-71-9	N/A	$14

02730 Slurry Calculations

by S.B. Valine, Coleraine, MN

Given any two of the following four variables: dry solids specific gravity, slurry specific gravity, percent solids by weight, or percent solids by volume, this program calculates the remaining two variables as well as the water to solids ratio, gallons of slurry per minute per ton of dry solids per hour, and cubic feet of slurry per minute per ton of dry solids per hour. **Necessary Accessories for HP-41:** Printer optional

Steps: 241 HP-41 Bytes: 366

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02730-41-0	$10	$12
FOR HP-71*	02730-71-7	N/A	$14

02731 Press Fit of Thick-Walled Cylinders

by N. Arthur, Reseda, CA

The program calculates the interface pressure between two cylinders press-fitted together, given the radial interference of mating parts. It also provides another option to calculate the radial interference of two cylinders given their interface pressure. The program prompts for inside and outside radius of cylinders, their Poisson's ratio, and modulus of elasticity. The program allows the user to check and edit any of the entered data. **Necessary Accessories for HP-41:** None

Steps: 149 HP-41 Bytes: 0280

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02731-41-8	$10	$12
FOR HP-71*	02731-71-5	N/A	$14

02732 Conv of Number Including Fraction of Any Base to Decimal

by A.L.W. Ann, Halifax, Canada

This program will convert any number with fraction part in any base C to its equivalent value in base 10 (decimal number). The base value C must be integer and in the range $2 <= -C <= -9$. **Necessary Accessories for HP-41:** None

Steps: 104 HP-41 Bytes: 161

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02732-41-6	$10	$11
FOR HP-71*	02732-71-3	N/A	$12

02733 Siedel Aberrations

by B. Welker, Albuquerque, NM

Program calculates the five siedel aberrations of a 1 to 6 element lines, with or without an aperture stop. The aberrations are: spherical, sagittal coma, transverse astigmatism, distortion, and petzval field curvature. Program allows for changing the object distance, field of view and ray height at the first surface. **Necessary Accessories for HP-41:** Four modules or Quad module. Printer optional.

Steps: 644 HP-41 Bytes: 1188

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02733-41-4	$10	$16
FOR HP-71*	02733-71-1	N/A	$18

02734 Horizontal and Vertical Displacements of Movement Markers

by A.E. Helmers, Palmer, AK

Field usable program calculates the horizontal distance and direction and vertical distance through which a marker moved, as on a glacier surface, or in unstable soils on a slope, during the time between two triangulation and vertical angle surveys. Simple program additions allow use of card reader for storing data of initial surveys for use during later surveys. **Necessary Accessories for HP-41:** Two memory modules. Card reader optional.

Steps: 407 HP-41 Bytes: 981

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02734-41-2	$10	$15
FOR HP-71*	02734-71-9	N/A	$18

02735 Resistor Value to Color Code

by D.D. Walton, Cincinnati, OH

This program will give you the colors on the first 3 bands for any resistor between .01 ohm and 99, 000, 000, 000 ohms when the ohmic value of the resistor is input. Anything outside of these values is not a valid input for a color coded resistor and therefore will be rejected and also request a new value. **Necessary Accessories for HP-41:** None

Steps: 159 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02735-41-9	$10	$12
FOR HP-71*	02735-71-6	N/A	$14

02736 Ion Exchange Breakthrough Curves

by N.C. Shammas, Richmond, VA

Program calculates breakthrough values for ion exchange resins, based on dimensionless distance and time. Also calculates the fraction of total capacity used. Values of the J function is also obtainable. **Necessary Accessories for HP-41:** None

Steps: 188 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02736-41-7	$10	$12
FOR HP-71*	02736-71-4	N/A	$14

02737 Life Cycle Cost

by A.C. Attwell, Durban, South Africa

Given the real cost of borrowing money, the escalation rates of the cost of energy and maintenance, economic life, % depreciation, marginal tax rate, initial investment cost, first year energy and maintenance costs, this program will calculate the Net Present Value of any energy-consuming installation--known as the LIFE CYCLE COST. Effect of changes in any of the main parameters can be quickly evaluated in order to perform a sensitivity analysis. Full prompting of all input and labeling of output values is available. Automatic printing mode when printer in use. **Necessary Accessories for HP-41:** One memory module

Steps: 289 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02737-41-5	$10	$14
FOR HP-71*	02737-71-2	N/A	$16

02738 Belt Formulas Pulleys and Speeds

by D.D. Walton, Cincinnati, OH

This program automatically prompts you for belt length or pulley speeds and sizes and if insufficient information is present will go through the prompting routine again. Will figure belt length open or crossed, belt speed in ft/per/sec; pulley sizes for required speeds, and speeds for required pulley sizes. **Necessary Accessories for HP-41:** None

Steps: 277 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02738-41-3	$10	$13
FOR HP-71*	02738-71-0	N/A	$14

02739 Sustainable Growth Rate Model

by D. Hickingbotham, Hillsborough, CA

Given a firm's profit margin, dividend payout ratio, debt to equity ratio, current assets to sales ratio, fixed assets to sales ratio, and the expected inflation rate, this program computes the firm's sustainable growth rate (in nominal and real terms) that is consistent with these parameters. Given any six, computes seventh. **Necessary Accessories for HP-41:** None

Steps: 221 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02739-41-1	$10	$12
FOR HP-71*	02739-71-8	N/A	$14

02740 Column Solver

by C.I. Dinsmore, Seattle, WA

Using the 1978 A.I.S.C. Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, COLSOL: provides a ready solution for the analysis of structural steel columns of W, I or H shaped cross sections. Axial loading or combined axial plus bending about x and/or y axes. **Necessary Accessories for HP-41:** None

Steps: 642 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02740-41-9	$10	$16
FOR HP-71*	02740-71-6	N/A	$18

02741 Prestressed Beam "PREBM"

by C.I. Dinsmore, Seattle, WA

The program determines the ultimate flexural strength of bonded prestressed or partially prestressed concrete sections of general form. The calculations make use of the actual stress-strain properties of the prestressing steel and in general result in less conservative more accurate values for flexural strength than EQ. 18-3, A.C.I. Concrete Code. **Necessary Accessories for HP-41:** Three memory modules

Steps: 689 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02741-41-7	$10	$16
FOR HP-71*	02741-71-4	N/A	$18

02742 Flexible Leasing Plans Using The Ratio Method

by P. Vaschalde, Corvallis, OR

This leasing program addresses leasing companies. It provides an original and direct method for leasing plans calculation allowing the user to set up any kind of plan - degressive, flat, progressive - and to check it with the amortization schedule. **Necessary Accessories for HP-41:** None

Steps: 190 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02742-41-5	$10	$12
FOR HP-71*	02742-71-2	N/A	$14

02743 Football Simulation

by R. Sutter, Corvallis, OR

This program simulates an actual game of football. Two players take turns directing an offensive series. Play choices are run, pass, punt, and field goal attempt. A built in "timer" will automatically end game after 60 "minutes". "Minutes" remaining may be recalled just before a play is run. Scores 7 for touchdown, 3 for field goal, and 2 for safety. **Necessary Accessories for HP-41:** Two memory modules. Card reader and printer desirable

Steps: 506 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02743-41-3	$10	$17
FOR HP-71*	02743-71-0	N/A	$20

02744 Memory Tester Game

by R. Sutter, Corvallis, OR

This program tests your short term memory and can be played by two persons on a competitive basis. The calculator displays four numbers then asks you to reenter the four numbers in order. Points are given for the amount of correct numbers reentered. Simply reprogramming step 219 will determine the length of the numbers. It is currently programmed for 2-digits. By changing the 100 at step 219 to 1000 it will generate 3-digit numbers. **Necessary Accessories for HP-41:** One memory module

Steps: 232 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02744-41-1	$10	$13
FOR HP-71	NOT AVAIL		

02745 Mini Slot Machine

by R. Sutter, Corvallis, OR

This game simulates a slot machine. It allows variable bets and winnings. **Necessary Accessories for HP-41:** One memory module

Steps: 168 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02745-41-8	$10	$12
FOR HP-71*	02745-71-5	N/A	$14

02746 Number Hunt

by R. Sutter, Corvallis, OR

This is a number guess program. The calculator hides a whole number between 1 and 1, 000. As you guess, the calculator tells you if you are over 10 high or low or under 10 high or low. After play, the calculator will tell you how you rated. **Necessary Accessories for HP-41:** None

Steps: 124 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02746-41-6	$10	$12
FOR HP-71*	02746-71-3	N/A	$14

02747 Baseball Simulation

by E. Dippel, Corvallis, OR

This program simulates a baseball game with lineups of real players. Program includes section on making data cards of players based on their lifetime statistics. Once data cards are made, the starting lineups are entered in for each team and the game starts. **Necessary Accessories for HP-41:** Three memory modules, printer and card reader

Steps: 519 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02747-41-4	$10	$19
FOR HP-71	NOT AVAIL		

02748 Magic Squares

by R. Salo, Corvalis, OR

This program generates a two-dimensional, square matrix, in which the sums of all the rows, columns, and main diagonals are the same. **Necessary Accessories for HP-41:** None

Steps: 196 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02748-41-2	$10	$12
FOR HP-71*	02748-71-9	N/A	$14

02749 Script Letters

by K.E. Newcomber, Corvallis, OR

This program uses the "special-characters" feature of the HP 82143 printer to form legible script characters. **Necessary Accessories for HP-41:** HP 82143 Printer

Steps: 89 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02749-41-0	$10	$12
FOR HP-71	NOT AVAIL		

02750 Aerial Photography, Mapping Percent of Overlap, Frame

by D. Blessing, Balboa, CA

Program gives camera release interval needed to maintain the desired negative overlap required in aerial mapping. Program allows for changes in altitude, air speed, lenses, and overlap (in any combination, or all at once). Printer gives reminders of user parameters and associated registers for ease in updating. **Necessary Accessories for HP-41:** Printer helpful

Steps: 120 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02750-41-8	$10	$12
FOR HP-71*	02750-71-5	N/A	$14

02751 2Axcon Concrete Column/Biaxial Bending

by C.I. Dinsmore, Seattle, WA

2AXCON computes the ultimate capacity for a given concrete section, subject to a given axial compression load and moments about two perpendicular axes. The concrete section is either square or rectangular with up to 54 reinforcing bars. The method of analysis is based on ultimate strength design, following ACI-1977 Reinforced Concrete Building Code requirements. **Necessary Accessories for HP-41:** Quad memory module or HP-41CV. Printer desirable.

Steps: 621 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02751-41-6	$10	$17
FOR HP-71*	02751-71-3	N/A	$20

02752 TKV$C-Naval Architecture

by J.M. Miller, Washington, DC

The volume, LCG & TCG of irregular shaped tanks or compartments are calculated using either Simpson's First or Second Rule. Both Rules require that the volume be divided into equal sized sections both horizontally and vertically. The number and size of the vertical sections do not need to be the same as the horizontal sections. Offsets of each transverse plane are inputed and the area of each transverse plane is displayed. After all transverse planes are inputed, the volumes and centers are calculated. **Necessary Accessories for HP-41:** 82104A Card Reader

Steps: 196 HP-41 Bytes: 407

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02752-41-4	$10	$12
FOR HP-71	NOT AVAIL		

02753 Simpson's Naval Architecture

by J.M. Miller, Washington, DC

This program calculates the area, longitudinal center of gravity and the transverse center of gravity of smooth irregular shaded areas using either Simpson's First or Second Rule. Simpson's First Rule may be used when the area to be calculated is divided into any even number of equally spaced sections. Simpson's Second Rule may be used when the number of equally spaced sections is a multiple of three. **Necessary Accessories for HP-41:** None

Steps: 113 HP-41 Bytes: 215

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02753-41-2	$10	$11
FOR HP-71*	02753-71-9	N/A	$12

02754 Marginal-Naval Architecture

by J.M. Miller, Washington, DC

This program will calculate the design weight margin, vertical moment, and composite vertical center when given the weight margin percent and the KG margin percent. First the displacement and the vertical center of gravity of lightship are inputed. Next the weight margin percent is inputed and the weight reservation for the margin is calculated. The KG margin percent is inputed and the delta vertical moment, the total vertical moment, and the composite VCG of the margin is calculated. **Necessary Accessories for HP-41:** None

Steps: 51 HP-41 Bytes: 139

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02754-41-0	$10	$11
FOR HP-71*	02754-71-7	N/A	$12

02755 Vessel Calibration

by P.M. Strover, Nkhotakota, Central Africa

This program calculates the volume of any flat-end cylindrical vessel and calibrates for any desired increment whether the vessell is placed horizontally or vertically. **Necessary Accessories for HP-41:** None

Steps: 99 HP-41 Bytes: 178

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02755-41-7	$10	$11
FOR HP-71*	02755-71-4	N/A	$12

02756 System Curve (SYSCRV)

by L. Scott, Tulsa, OK

This program generates a pump discharge piping system curve which is necessary for sizing centrifugal pumps. The program prompts for all inputs required (including quantity of fittings and valves in the discharge line), labels and displays all results and displays a program function prompt. The program contains "k" values for various valves and fittings eliminating the need to refer to the literature. To implement full features of the program requires the HP-IL (82162A) printer. **Necessary Accessories for HP-41:** Quad memory module with HP-41C or HP-41CV. 82160A HP-IL Interface and 82162A HP-IL Printer optional.

Steps: 622 HP-41 Bytes: 1816

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02756-41-5	$10	$19
FOR HP-71	NOT AVAIL		

02757 Hangman

by R.G. Laughton, Footscray, Australia

A word guessing game for two players. First player hides a word (up to ten letters). Second player guesses what letters are in it. Each wrong guess adds a piece of diagrams of gallows and man in display. Tenth wrong guess results in hanging; guesser loses. Calculator plays appropriate tune for win or loss. Non-standard characters for gallows and man are created by initial use of printer or card reader with data card. **Necessary Accessories for HP-41:** Memory module; printer or card reader for data card.

Steps: 238 HP-41 Bytes: 491

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02757-41-3	$10	$13
FOR HP-71	NOT AVAIL		

02758 Concrete Foundation Bolt Design

by W.G. Adair, Commerce, GA

Program will calculate the bolt load for eight commonly used bolt patterns. Input of external forces and bolt radius or pattern, program will give the necessary data to select the proper diameter from the chart provided, when securing heavy machinery or cranes to concrete foundations. **Necessary Accessories for HP-41:** None

Steps: 218 HP-41 Bytes: 0315

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02758-41-1	$10	$12
FOR HP-71*	02758-71-8	N/A	$14

02759 Uniform Gradient Series Financial Calculations

by J.P. Lawrence, Tigard, OR

This program calculates the present value, future value, annual value, interest rate, number of periods, or the gradient value of a uniformly increasing or decreasing series (for example 100, 125, 150, 175, 200 is a uniform increasing series with 25 being the gradient value), given 3 of the other terms. This program calculates series with gradient values directly; but can be used for series which are not gradient. **Necessary Accessories for HP-41:** None

Steps: 188 HP-41 Bytes: 0329

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02759-41-9	$10	$12
FOR HP-71*	02759-71-6	N/A	$14

02760 Quadrics Reduction Classification (by Variants)

by P.E. Montoreano, Buenos Aires, Argentina

This program eliminates rectangular and linear terms (when possible) of the complete second degree equation in three unknowns, identifying the canonic equation found: hyperboloid (1 or 2 leaves): paraboloid (elliptical-hyperbolic): cone; ellipsoid (real-imaginary): cylinders (parabolic- hyperbolic-elliptical): planes (real-imaginary). **Necessary Accessories for HP-41:** 3 Memory modules; extended functions module.

Steps: 588 HP-41 Bytes: 1159

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02760-41-7	$10	$16
FOR HP-71*	02760-71-4	N/A	$18

02761 Calculations of Biorythms

by W.G. Adair, Commerce, GA

Given the birthdate, and any date required after that particular date, the program will calculate the values for physical, emotional, intellectual, plus give the average of the three, and the number of days between the two dates. **Necessary Accessories for HP-41:** None

Steps: 129 HP-41 Bytes: 0238

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02761-41-5	$10	$12
FOR HP-71*	02761-71-2	N/A	$14

02762 X Function Star Trek

by D.K. Doty, Cahokia, IL

This version of Star Trek includes quadrant charting, scans of individual quadrants each containing 100 sectors, photons, phasers, tractor beams, shields, and bases. Scanner shows positions of phasers, Klingons and Enterprise. Course computer is not needed as course changes are given as delta x and delta y. Works well on printer with no modifications. **Necessary Accessories for HP-41:** Quad Memory and Extended Functions Modules

Steps: 811 HP-41 Bytes: 1750

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02762-41-3	$10	$18
FOR HP-71	NOT AVAIL		

02763 Scalar EKG "EKG"

by J.C. Meeroff, Coral Springs, FL

Program calculates and evaluates P, QRS, T and G mean frontal plane axis; 2) QRS-T and QRS-G angles; 3) heart rate and 4) P-R, R-R, Q-T and Q-Tc intervals. Just by entering values in millimeters of height and width of deflections and of duration of intervals. All you need is a metric ruler! The program will tell you if the scalar values are normal or abnormal and when abnormal values are found which type of abnormality it is. **Necessary Accessories for HP-41:** HP-41CV or equivalent memory accessories

Steps: 622 HP-41 Bytes: 1747

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02763-41-1	$10	$18
FOR HP-71*	02763-71-8	N/A	$22

02764 Free-Standing Stairs (Fixed)

by A. Dujan, Belgrade, Yugoslavia

This program of analysing stairs having unsupported intermediate landings and subjected to symmetrical loading is presented for use by designers. The Stair shall terminate as a framework fixed at both ends. The structure is simplified to an indeterminate frame work and the analysis employs the principle of least work. **Necessary Accessories for HP-41:** Three memory modules

Steps: 464 HP-41 Bytes: 833

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02764-41-9	$10	$14
FOR HP-71*	02764-71-6	N/A	$16

02765 Universal Table Generator Max-Min-Zero-Plot

by V.L. Pangilinan, Norwalk, CA

This program is used to create numerical tables from the vast unlimited simple to complex f(x) equations that lie within the interval of convergence (I.O.C.) X (sub) 1 <– x <– x (sub) 2. This program also will locate points and their corresponding maximum, minimum and even zero f(x)=0 values in the order of their occurrences in a given f(x); do plottings of f(x) equations. A "must" program for structural/stress engineers who deal with points of maximum design values; mathematicians. Ten examples included! **Necessary Accessories for HP-41:** HP-41C/CV peripheral printer; quad module optional depending upon the registers used in the secondary program.

Steps: 268 HP-41 Bytes: 759

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02765-41-6	$10	$18
FOR HP-71*	02765-71-3	N/A	$22

02766 Dynamic Analysis - UBC Earthquake Force

by A. Dujan, Belgrade, Yugoslavia

The program is based on dynamic analysis of such a system with five degree of freedom as a maximum possible. The system can be: Bode System (cantilever with no action as a frame) and Moment Resisting Frame. Combination of two boundary systems is possible acting with some of itselves rigidities. Period of vibration of building shall be determined following the method and equations made by E.E. Sigaldv. **Necessary Accessories for HP-41:** Quad memory module or HP-41CV and X-Functions module

Steps: 837 HP-41 Bytes: 1764

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02766-41-4	$10	$18
FOR HP-71*	02766-71-1	N/A	$22

02767 Simultaneous Nonlinear Equations

by E.C. Schmidt, Milo, ME

This program will find a set of roots, for up to three unknowns, in a present range. The program uses a modified 1/2 method of find the roots, so it is slow. The program is set up so you can spot an inflection point and go around it. Note: You must input the equations as a subroutine. **Necessary Accessories for HP-41:** One or more memory modules

Steps: 344 HP-41 Bytes: 663

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02767-41-2	$10	$13
FOR HP-71*	02767-71-9	N/A	$14

02768 DOY and M-D

by W. Mier-Jedrzejowicz, London, England

First program converts date from MD (Month-Day) or MDY (also DM or DMY) format to DOY (Day of Year). Second program converts date from DOY (Day of Year) to M-D (Month-Day) or D-M format. Uses Time Module functions for increased speed. Checks for errors on input, allows for leap years. Uses only the stack registers. **Necessary Accessories for HP-41:** Time module or HP-41CX

Steps: 118 HP-41 Bytes: 216

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02768-41-0	$10	$12
FOR HP-71	NOT AVAIL		

02769 Transfer Function Analysis For Electronic Filters "MPPOLY"

by T.D. Schell, Port Hueneme, CA

MPPOLY, given a transfer function of a circuit (T(S) = Poly:a/Poly:b) and the operating frequency will find the output magnitude in volts and dB and the phase in degrees. Given a magnitude or phase, MPPOLY will find the frequency. Poly:a and Poly:b can be up to ninth degree polynomials. **Necessary Accessories for HP-41:** Three memory modules and Math Pac

Steps: 465 HP-41 Bytes: 1004

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02769-41-8	$10	$15
FOR HP-71	NOT AVAIL		

02770 ACME or Stub Thread Tolerance Diameters

by W.W. Lauer, Canton, OH

This program calculates all maximum and minimum tolerance diameters for class 2, 3, 4 or 5 general purpose ACME or stub ACME external (screw) and internal (nut) threads. Diameters may range from 1/4" to 5" and pitches from 1/16" to 1/2". Cross section, thread shear areas and maximum and minimum thread clearance (backlash) are calculated. **Necessary Accessories for HP-41:** None

Steps: 476 HP-41 Bytes: 1049

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02770-41-6	$10	$15
FOR HP-71*	02770-71-3	N/A	$18

02771 Differentiation

by M. Lipney, Springfield, OR

Program differentiates polynomials that are in a factored form. The function can have up to three factor groups with up to three terms in each group. The input consists of the number of factor groups, power and number of terms in each group, and the coefficient and power for each term. Program saves the trouble of multiplying out lengthy differentiated polynomials and also calculates the value of the function and its derivative at any point. **Necessary Accessories for HP-41:** None

Steps: 554 HP-41 Bytes: 1085

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02771-41-4	$10	$15
FOR HP-71*	02771-71-1	N/A	$18

02772 Printing HP-41 Program Bar Code With HP 82905B Printer

by C.A. Erickson, Princeton, NJ

Program will print HP-41 program bar code for any program in memory up to 1400 bytes in length using the HP 82905B 80 column printer. It runs without user intervention after typing in the name of the program to be printed. Printing of bar code of longer programs may require a few hours. **Necessary Accessories for HP-41:** HP-41C with X-Functions Module and quad memory modules. HP-IL interface, plotter modules, 82905B printer and Card Reader (or Wand).

Steps: 163 HP-41 Bytes: 366

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02772-41-2	$10	$12
FOR HP-71	NOT AVAIL		

02773 Vol Change in Horizontal, Vertical, Cyl., Spherical Vessel

by K.E. Hoepfner, Des Plaines, IL

Solves for change in volume in vertical, horizontal and spherical vessels with 2:1 elliptical, hemispherical and flat heads. Allows for volume correction factor entry. Very useful for process mass balance calculations and vessel volume determinations. Friendly and versatile. **Necessary Accessories for HP-41:** None

Steps: 211 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02773-41-0	$10	$12
FOR HP-71*	02773-71-7	N/A	$14

02774 Hangman (XF)

by R.G. Laughton, Footscray, Australia

A word guessing game for two players. First player hides a word (up to ten letters). Second player guesses what letters are in it. Each wrong guess adds a piece to diagrams of gallows and man in display. Tenth wrong guess results in hanging; guesser loses. Calculator plays appropriate tune for win or loss. **Necessary Accessories for HP-41:** One memory module and Extended Functions Module

Steps: 222 HP-41 Bytes: 438

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02774-41-8	$10	$12
FOR HP-71*	02774-71-5	N/A	$14

02775 Temperature Measurement System

by J.B. Gersbacher, Sacramento, CA

This program will make thermistor temperature sensor measurements in degrees Celsius or degrees Fahrenheit, and may be graphed or listed as a function of time. The user will be able to define the beginning, end and interval of the measurements. The system will power up and power down at the proper time. **Necessary Accessories for HP-41:** HP-41CV, HP-IL Module, Time Module, Printer, Multimeter, Thermistor Temperature Sensor (5000 OHM at 25 degrees Celsius).

Steps: 673 HP-41 Bytes: 1984

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02775-41-5	$10	$20
FOR HP-71	NOT AVAIL		

02776 Thermowell Design

by M.L. Ramsey, Abilene, TX

In many temperature measuring systems a thermowell is required to provide a pressure tight system. This program enables the user to determine if a standard thermowell will withstand the temperature, pressure, velocity and vibration conditions of his specific fluid. **Necessary Accessories for HP-41:** Two memory modules

Steps: 290 HP-41 Bytes: 0828

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02776-41-3	$10	$17
FOR HP-71*	02776-71-0	N/A	$20

02777 Tube Bend Data Program
by D.C. Peckham, Berea, KY

This program calculates tube bend data. Rotation angles are the total CCW rotation from the plane formed by the first bend as viewed from end "1". The number of bends allowed depends on available HP-41 memory. With one module, a tube with a maximum of 6 points may be calculated. For additional module, 16 more points may be added. **Necessary Accessories for HP-41:** One memory module required, two recommended.

Steps: 317 HP-41 Bytes: 595

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02777-41-1	$10	$13
FOR HP-71*	02777-71-8	N/A	$14

02778 High Temperature Stability Constants-Helgeson Theory
by T.R.P. Holm, Brooklyn Park, MN

Estimate equilibrium constants of aqueous complexation reactions from 25 degrees C (298 degrees K) to 300 degrees C. User inputs log K at 25 degrees C and standard enthalpy change at 25 degrees C. Program computes log K (T) at 25 degree intervals, fits results to a convenient function of T, and computes standard deviation of the curve fit. **Necessary Accessories for HP-41:** Math module (for curve fit only. Can be omitted.) One Memory Module if using Math modules.

Steps: 207 HP-41 Bytes: 433

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02778-41-9	$10	$12
FOR HP-71	NOT AVAIL		

02779 QUANT RI ANALYSIS WITHOUT ANALYTE IDENTIFICATION -(QRI)-
by W. Pinnick, State College, PA

A program to calculate the concentration of an unknown without identification by measurement of the refractive index change occuring in two HPLC solvents with different known refractive indices. It determines the unknown's concentration and it's refractive index by applying the concepts presented in "Analytical Chemistry" 55, 1599-1603 (1983). **Necessary Accessories for HP-41:** None, printer optional.

Steps: 108 HP-41 Bytes: 194

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02779-41-7	$10	$11
FOR HP-71*	02779-71-4	N/A	$12

02780 Lagrange Polynomial Equation Fitting
by J.P. Lawrence, Tigard, OR

Using the Lagrange interpolation method, this program will fit N pairs of (X, Y) data points into a N-1 polynomial. Program works for N between 1 and 64 inclusive. **Necessary Accessories for HP-41:** 1 Memory module N less than or equal to 16, 2 memory modules N less than or equal to 32, 3 memory modules N less than or equal to 48, QUAD module for N less than or equal to 64.

Steps: 203 HP-41 Bytes: 0315

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02780-41-5	$10	$12
FOR HP-71*	02780-71-2	N/A	$14

02781 High Temperature Stability Constants-Fuoss Theory
by T.R.P. Holm, Brooklyn Park, MN

Estimate equilibrium constants of aqueous complexation reactions from 25 to 200 degrees C. User inputs log K at 25 degrees C and charges of metal ion and ligand. Program computes log K (T) at 25 degree intervals, fits data to convenient function of T, and computes standard deviation of curve fit. **Necessary Accessories for HP-41:** Math Module for curve fitting only. Can be omitted.

Steps: 242 HP-41 Bytes: 477

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02781-41-3	$10	$13
FOR HP-71	NOT AVAIL		

02782 Telephone Call Monitor for the United Kingdom
by C. Goldman, London, England

Displays cost and duration of direct dialed calls from the United Kingdom taking account of the different types of inland and international calls. Program checks if call is being made during cheap/standard/peak times. Extended memory maintains all international dialing code and a large number of inland codes so that search can be made of dialing code to establish charge band. Daily cumulative totals held in memory and transferred periodically to magnetic card. **Necessary Accessories for HP-41:** Quad Memory, Time Module, X Functions. Card Reader optional for data transfer and permanent storage.

Steps: 620 HP-41 Bytes: 1490

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02782-41-1	$10	$19
FOR HP-71	NOT AVAIL		

02783 Land Application of Municipal Sludge
by K. Erichsen, Toledo, OH

LANDAPL determines application rates for sludge on agricultural land. Given sludge analysis, it selects which metal limits total application, and whether application rate is limited by nitrogen uptake or cadmium. It calculates the accumulation of organic nitrogen in soil in successive years, and corresponding decreases in allowable loading rate. It also calculates potassium and phosphorus from sludge available to crops. **Necessary Accessories for HP-41:** 3 Memory Modules

Steps: 484 HP-41 Bytes: 1177

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02783-41-9	$10	$16
FOR HP-71*	02783-71-6	N/A	$18

02784 Combinational Logic Analysis
by S. Fisher, Austin, TX

Program finds a minterm expansion of a given 2 to 5 input combinational logic network consisting of AND gates, OR gates, exclusive OR gates and inverters. The minterm expansion is easily translated to a truth table. **Necessary Accessories for HP-41:** None

Steps: 108 HP-41 Bytes: 169

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02784-41-7	$10	$11
FOR HP-71*	02784-71-4	N/A	$12

02785 Solving 2nd, 3rd and 4th degree equations by algorithm
by A. Helou, Sharjah, United Arab Emirates

This program solves quadratic, cubic and 4th degree equations by algorithm and determines all the real roots, if real roots are available otherwise it displays no real roots and stops. **Necessary Accessories for HP-41:** None

Steps: 475 HP-41 Bytes: 0796

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02785-41-4	$10	$14
FOR HP-71*	02785-71-1	N/A	$16

02786 Sea Passage - Printing Option
by M.A. Kalcic, Triestee, Italy

Intended as a printing option of program SEA PASSAGE: From stored positions computes and prints RL course, distance both in seamiles and int. nautical miles, accumulated distances sequentially from waypoint to waypoint. Also it computes same information from positions entered from the keyboard. **Necessary Accessories for HP-41:** Quad Memory Module with Extended Function/Memory. HP-IL Module and HP 82905B Printer. Program SEA PASSAGE.

Steps: 299 HP-41 Bytes: 572

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02786-41-2	$10	$21
FOR HP-71	NOT AVAIL		

02787 Heat Loss: Radiation vs. Convection
by D.R. MacQuarrie, Calgary, Canada

Calculate the radiation and convection heat loss components of any object under study. Inputs may be in Metric or Imperial units. Outputs may be both SI, and Imperial units if desired. This formula and program reduce complex relationships to simpler, more practical working levels. Suitable for energy loss calculations, retrofit payback analysis, design analysis, and Infrared Thermographic Inspections. **Necessary Accessories for HP-41:** One memory module or 41CV.

Steps: 218 HP-41 Bytes: 479

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02787-41-0	$10	$13
FOR HP-71*	02787-71-7	N/A	$14

02788 Enthalpy of 89 Elements and Their Oxides Above 298 Degrees K
by B.F. Carlson, Waltham, MA

This program is based on "Thermodynamic Properties of Elements and Oxides", by L.B. Pancratz (Bumines Bull. 672, 1982, 509 PP, avail. Sup Doc's for $17.00-1983). Four polynomial terms for each phase that the substance has are to be mnemonically transformed and with other data then stored on cards. 433 substances are available. Accuracy is NI10% at worst. Prompted and labeled; input in four temperature scales, output in Cal/Mol., Cal/Grm., and Cal/Cgl. Data for 29 substances included. **Necessary Accessories for HP-41:** Two memory modules; card reader very useful.

Steps: 416 HP-41 Bytes: 0809

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02788-41-8	$10	$16
FOR HP-71*	02788-71-5	N/A	$18

02789 Latitude - Longitude Distances
by J.E. Schiermeier, Cary, NC

This program provides conversions for distances on the surface of a sphere between points defined by latitude and longitude. It calculates shortest distance between two points, latitudinal and longitudinal distances, and coordinates of the second point given the position of the first point and latitudinal and longitudinal distances. Since longitudinal distances are dependent on latitude, the program also allows operations to be performed latitudinal then longitudinal and vice versa. **Necessary Accessories for HP-41:** None

Steps: 172 HP-41 Bytes: 321

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02789-41-6	$10	$12
FOR HP-71*	02789-71-3	N/A	$14

02790 Vector Operations
by J.E. Schiermeier, Cary, NC

This program performs operations on 3-dimensional vectors, either in rectangular or polar coordinates. Functions include: summation with later recall, multiplication by a scalar, calculation of the unit vector, changing the magnitude, dot product, angle between two vectors, projection of one vector on another, cross product and scalar triple product. Conversions between the rectangular and polar forms are also provided. All functions are assigned to keys, facilitating easier use. **Necessary Accessories for HP-41:** One memory module or the equivalent.

Steps: 292 HP-41 Bytes: 562

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02790-41-4	$10	$13
FOR HP-71*	02790-71-1	N/A	$14

02791 Room Modes Calculations
by T. Kraus, Cazadero, CA

The program calculates the eigentones (room modes) of a rectangular room or enclosure given width, length, and height, then sorts them in ascending order. **Necessary Accessories for HP-41:** One memory module

Steps: 119 HP-41 Bytes: 201

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02791-41-2	$10	$11
FOR HP-71*	02791-71-9	N/A	$12

02792 Advanced Bio-Pac

by P. Legros, Brussels, Belgium

This is a program on biorhythms on which you can calculate the biorhythms for any given date. The criticals, maxima and minima for the three physical, sensitive and cognitive bio-cycles; the exact and approximate double and treble coincidences of these bio-cycles; the periods during which your bio-rhythms are, separately, two by two, or all three together, positive or negative. A NEXT function (for the next coincidences and bio-periods), a DOW function, and M.DY/D.MY function are also provided, as well as many alph- numerical comments. ADV.BIO-PAC comprises some synthetic functions that are very clearly explained (7 pages). Printer version is also provided. **Necessary Accessories for HP-41:** Quad Ram & Printer

Steps: 1062 HP-41 Bytes: 2044

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02792-41-0	$10	$29
FOR HP-71*	02792-71-7	N/A	$36

02793 Undercut

by C. Manning, Canberra, Australia

When describing this game in Scientific American magazine, Douglas Hofstadter mentioned that he had programmed a computer to play it. Now it can be played on the HP-41. The program is a learning program (more exciting than Hexapawn) which, instead of learning a winning strategy, tries to predict human behavior on the basis of past experience. **Necessary Accessories for HP-41:** Two memory modules.

Steps: 160 HP-41 Bytes: 264

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02793-41-8	$10	$12
FOR HP-71*	02793-71-5	N/A	$14

02794 Prime

by T. Van Nguyen, Stockton, CA

This program checks whether an odd number is prime or not and generates a series of prime numbers starting from 2, or from any number. **Necessary Accessories for HP-41:** None, but a printer would be very useful.

Steps: 80 HP-41 Bytes: 194

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02794-41-6	$10	$12
FOR HP-71*	02794-71-3	N/A	$14

02795 Video Output Routines: Text-Writing and Special Effects

by R.E. Swanson, Portland, OR

Customize your video output with this collection of 17 routines: 1) Print strings (up to 24 characters). Tabbed, centered, or right-justified; with normal or inverse characters; in upper or lower case. 2) Make vertical dividers. 3) Make three types of frames ("boxes"). 4) Bring "posters" #1 and #2 into view alternately by random roll up/roll down. These are independent routines, but may be merged with the author's #02229C with the overall saving of code. Easy to use, either manually or as subroutines called by your program. **Necessary Accessories for HP-41:** HP-IL and X FUNCTIONS modules; Video Interface and Monitor. QUAD memory module if optional TIME module is used, else 2 single-density modules.

Steps: 540 HP-41 Bytes: 1134

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02795-41-3	$10	$15
FOR HP-71	NOT AVAIL		

02796 Stadia Reduction and Elevation Adjustment

by M. Quinlan, New Monmouth, NJ

Given the stadia interval, vertical angle, height of instrument and rod reading, the reduction program calculates horizontal distances, differences in elevations and elevations. The adjustment program, if used in conjunction with the reduction program, requires little or no input. When used alone, beginning elevation, horizontal distances, and differences in elevations are required as input. **Necessary Accessories for HP-41:** One memory module. Additional modules required as number of points increase.

Steps: 295 HP-41 Bytes: 634

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02796-41-1	$10	$13
FOR HP-71*	02796-71-8	N/A	$14

02797 Prime Factor Analyses

by A. Jahobsson, Uppi-Vasby, Sweden

Prime factors of arbitrary positive integers are selected. For $1<m<10$ 10 prime numbers are selected starting with the smallest. **Necessary Accessories for HP-41:** None

Steps: 84 HP-41 Bytes: 131

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02797-41-9	$10	$11
FOR HP-71*	02797-71-6	N/A	$12

02798 High School Debate Timer

by G. Steven, West Allis, WI

This program "knows" the sequence and duration of high school debates (8 minute constructives, 4 minute rebuttals, 3 minute cross examinations, and 5 minutes of prep time). When the program is run, it flashes the time remaining in the speech, cross-ex, or prep time every 2 or 3 seconds. The user advances it to the next speech by simply pressing any alpha character at the end of the speech. **Necessary Accessories for HP-41:** Timer Module

Steps: 170 HP-41 Bytes: 332

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02798-41-7	$10	$12
FOR HP-71	NOT AVAIL		

02799 Geometric Mean With Standard Error

by G. Steven, West Allis, WI

Calculates geometric mean and standard error for up to 300 numbers (using HP-41CV or Quad memory). The stack may be manipulated at will between inputs. I have included two versions of the program; one is more convenient to use with small sample sizes, the other for large samples. **Necessary Accessories for HP-41:** Memory modules for more than 44 samples

Steps: 71 HP-41 Bytes: 123

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02799-41-5	$10	$12
FOR HP-71*	02799-71-2	N/A	$14

02800 Slot Machine Simulator

by G. Steven, West Allis, WI

Enter a seed and initial bank, and wheels start spinning. Spinning wheels are shown by x's. Wheels stop spinning one at a time. Has 3 wheels of 16 symbols each for 40% combinations; pays off about 1 in 8 spins. Payoffs range from 3 to 1 up to 18 to 1. **Necessary Accessories for HP-41:** One memory module

Steps: 202 HP-41 Bytes: 359

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02800-41-1	$10	$12
FOR HP-71*	02800-71-8	N/A	$14

02801 Bin-Oct-Dec-Hex Conversions For Microcomputer Users

by G. Steven, West Allis, WI

Interconverts numbers between binary, octal, decimal, and hexadecimal. All outputs clearly labeled. Very fast; e.g., Dec to Hex in 4 secs; Hex to Dec in 5 secs. Uses 2 synthetic instructions, append 2 nulls and RCL M, to aid Hex to Dec conversions. Also finds distance between two 4-digit Hex addresses. This program uses synthetic functions. **Necessary Accessories for HP-41:** One memory module

Steps: 308 HP-41 Bytes: 625

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02801-41-9	$10	$13
FOR HP-71*	02801-71-6	N/A	$14

02802 Bowling Scoring For The Team Captain

by G. Steven, West Allis, WI

Each night, enter the three scores of each bowler on the team and whether they lost a beer frame. Data is accumulated for the entire season. Outputs high team series and high team game. For each bowler, gives grand total pins, games bowled, average, high series, high game, beer frames lost. Can add new bowler at any time. Will print if printer present. Only one memory module required if the print routines are deleted. Keeps track of any number of substitutes. **Necessary Accessories for HP-41:** Two memory modules and Card Reader. Printer optional.

Steps: 413 HP-41 Bytes: 911

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02802-41-7	$10	$15
FOR HP-71	NOT AVAIL		

02803 Storage Register Manager

by G. Steven, West Allis, WI

Sets up data file with one register per record. Once set up, can add, change, delete, or insert data. R00-R08 left for use by calling program. Can also be used as a stand-alone program from the USER mode keyboard. Has routines to pack/unpack data - comes with routines to pack (x, y) pairs into single x.y numbers ($0<=(x$ or $y)<=999.99$) change these routines to suit your needs. User friendly questions and prompts ensure against mistakes when changing, deleting or inserting. **Necessary Accessories for HP-41:** Minimum one memory module

Steps: 165 HP-41 Bytes: 0389

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02803-41-5	$10	$12
FOR HP-71*	02803-71-2	N/A	$14

02804 Heat Conduction by Fourier's Law

by S. Buller, Santa Barbara, CA

Program calculates any of the five variables: Q, the rate of heat flow; K, the thermal conductivity; A, the area normal to the heat flow; T, the temperature difference across the conductor; L, the length of the conductor, given the other four. Prompts and answer labels are in Watts-Metric or RTU- English units. Converts between Watts and BTU/HR or W/CMxK and STU/HRxFTxDEG F and BTU per hour per ft 2 per inch per Deg F. **Necessary Accessories for HP-41:** One memory module

Steps: 246 HP-41 Bytes: 659

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02804-41-3	$10	$13
FOR HP-71*	02804-71-0	N/A	$14

02805 Random Number Generator

by W.N. Carter, Richland, WA

Program routine generates a series of apparently random numbers between an upper and lower limit. Quantity of numbers produced is user controlled (999 maximum). The number series produced is easily changed with 3 "seed" numbers. Printer is nice but not required. Turns off when complete. **Necessary Accessories for HP-41:** Printer optional

Steps: 53 HP-41 Bytes: 124

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02805-41-0	$10	$11
FOR HP-71*	02805-71-7	N/A	$12

02806 Properties of the Circle

by W.N. Carter, Richland, WA

Automatically solves for radius R, arc angle A, arc length a, chord C, versin b, X-Y coordinate on arc plus sector and segment area. Solves RA, Ra, RC, Rb, RXY, Cb, AC, Ab, Aa combinations plus the X or Y coordinate. Will not solve for ab or Ca problems. Prompts, solves, displays answers and stores (9 registers). Positive, negative or angles > 360 deg. User friendly. **Necessary Accessories for HP-41:** Memory module - printer optional

Steps: 346 HP-41 Bytes: 541

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02806-41-8	$10	$13
FOR HP-71*	02806-71-5	N/A	$14

02807 Lin Alg With the Subroutines Sys Inv/Adj, and Out1, 2

by L. Dion, Chico, CA

The above three progams, operating together, perform the following operations involving the n x n matrix A in minimal time, provided det A is not equal to 0: 1) Evaluate det A up to dimension n = 11. 2) Solve the n x n system of equations Ax = b up to dimension n = 8. 3) Compute the inverse of the matrix A up to dimension n = 8. 4) Compute the adjoint of the matrix A up to dimension n = 8. **Necessary Accessories for HP-41:** None

Steps: 488 HP-41 Bytes: 766

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02807-41-6	$10	$16
FOR HP-71*	02807-71-3	N/A	$18

02808 Mannings Equation For Open Pipe Flow

by K.S. Freier, Albuquerque, NM

Program solves open pipe flow using Manning's equation. Solve for flow rate, depth of flow, or slope of a sewer pipe flowing only partially full. Also solves for flow rate, diameter, and slope of the flowing full peak capacity of the pipe. **Necessary Accessories for HP-41:** One memory module. Printer is optional.

Steps: 334 HP-41 Bytes: 519

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02808-41-4	$10	$13
FOR HP-71*	02808-71-1	N/A	$14

02809 Analytical Geometry of Circles

by G.M. Halpern MD, Honolulu, HI

This program is designed to solve 12 different types of problems involving construction of equations of Circles, given the following parameters as singles or in combination. 1) Coordinates of the centers. 2) Points that the circles pass through. 3) The equations of lines that are tangent to the circle. 4) The equations of the lines forming a triangle which is circumscribed by the circle. 5) A circle inscribed in a triangle. 6) A circle involved with a triangle whose vertices coordinates are known. Given the equation of a circle, the center coordinates and radius are calculated. Given D, E, and r get F and calculate the equation of the circle. **Necessary Accessories for HP-41:** Two memory modules and printer. Math Pac or a program to solve Linear Equations of order 2 & 3 optional.

Steps: 658 HP-41 Bytes: 1117

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02809-41-2	$10	$15
FOR HP-71	NOT AVAIL		

02810 Equilibrium Constants of Hydrothermal Reactions

by T.R.P. Holm, Brooklyn Park, MN

Program computes equilibrium constants of mineral dissolution reactions over the temperature range 298 to 473 degrees K. User inputs average heat capacities of aqueous ions and heat capacity power functions of minerals. Program fits equilibrium constants to convenient function of temperature and computes standard deviation as measure of goodness of fit. **Necessary Accessories for HP-41:** Two memory modules. Math module optional.

Steps: 353 HP-41 Bytes: 698

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02810-41-0	$10	$14
FOR HP-71*	02810-71-7	N/A	$16

02811 Focus Calculations

by A. Jahobsson, Uppl-Vasby, Sweden

This program solves the focus of any thick, thin or combination of lenses. **Necessary Accessories for HP-41:** One memory module

Steps: 192 HP-41 Bytes: 402

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02811-41-8	$10	$12
FOR HP-71*	02811-71-5	N/A	$14

02812 Assignment Problem For Minimizing Costs

by T. Langland, Phoenix, AZ

The assignment problem consists of having a set of jobs, a set of facilities to do each job, and a set of costs for each job-facility pair. The objective of this program is to assign one job to each facility in such a way as to achieve the minimum possible total cost. **Necessary Accessories for HP-41:** Minimum of two memory modules

Steps: 417 HP-41 Bytes: 703

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02812-41-6	$10	$14
FOR HP-71*	02812-71-3	N/A	$16

02813 Helical Torsion Spring Design

by W.W. Lauer, Canton, OH

Given the load, lever arm length, allowable bending stress, modulus of elasticity, deflection and coil I.D., this program calculates wire DIA, spring rate, length of active material, number of active coils, solid length of loaded and unloaded coils, loaded coil I.D. Angular location of arms, bending stress and weight of material in the active coils. It allows entry of standard wire sizes. It will adjust (at your discretion) either the coil diameter or the active material length to provide the proper arm relationship. **Necessary Accessories for HP-41:** One memory module

Steps: 268 HP-41 Bytes: 704

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02813-41-4	$10	$14
FOR HP-71*	02813-71-1	N/A	$16

02814 Power Screw Calculations

by W.W. Lauer, Canton, OH

This proram is useful in the design of screws to move loads. Knowing (or estimating) the screw nomenclature and the load to be moved, this program will calculate the torque required. It uses an interchangable solution thus if an available torque is known it will find the load that can be raised or lowered. Effects of thrust collars are included. Overhauling loads are detected. The efficiency of the system is also computed. **Necessary Accessories for HP-41:** None

Steps: 178 HP-41 Bytes: 416

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02814-41-2	$10	$12
FOR HP-71*	02814-71-9	N/A	$14

02815 Univariate Search Function Maximum Finder

by J.P. Lawrence, Tigard, OR

This program will find the maximum or minimum of a function by optimizing one variable at a time; then decreasing the amount the variables change, then optimizes each variable again. Using penalty functions (explained in the documentation) this program can also handle explicit and implicit constraints. Depending on the length of the function to be optimized, one memory module can handle up to about a 20-variable function. **Necessary Accessories for HP-41:** One memory module

Steps: 119 HP-41 Bytes: 246

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02815-41-9	$10	$13
FOR HP-71*	02815-71-6	N/A	$14

02816 Delta-Y Transformations

by J.M. Levy, Capital Federal, Argentina

Program transforms a Delta configuration to its Y equivalent and vice versa. Inputs and outputs may be either impedances or admittances in polar or rectangular form. These combinations make the program useful in 32 transformation cases! Program uses the HP-41C's alphanumeric capability to label inputs and outputs for each case. **Necessary Accessories for HP-41:** Math Pac ROM; X-Functions; One memory module

Steps: 277 HP-41 Bytes: 559

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02816-41-7	$10	$13
FOR HP-71	NOT AVAIL		

02817 Wilson Equation: Activity Coefficients For Binary Solutions

by J.A. Pita, Quito, Ecuador

This program finds the two parameters of Wilson's equation for binaries given the activity coefficients at one composition or those at infinite dilution. The solution involves a Newton-Raphson iteration. With the parameters found, any prediction of activity coefficient can be made. If the Wilson parameters are available, program aids in evaluation of infinite dilution activity coefficients or prediction of those corresponding to a given liquid composition. **Necessary Accessories for HP-41:** One memory module

Steps: 305 HP-41 Bytes: 436

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02817-41-5	$10	$12
FOR HP-71*	02817-71-2	N/A	$14

02818 Gain Pattern, Principal Planes For H-Plane Sectoral Horn

by R.M. Rhodes, Sunnyvale, CA

The program calculates gain of an H Plane Sectoral horn for both principal planes (E & H). Inputs include waveguide and horn dimensions as well as radio frequency. Output is gain in both principal planes as a function of polar angle theta (THT). Printer output is formatted and may be specified without a printer the output may be designated to be point by point. Graphical output is also available with a printer and extended functions/ memory. **Necessary Accessories for HP-41:** Two memory modules

Steps: 509 HP-41 Bytes: 959

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02818-41-3	$10	$15
FOR HP-71*	02818-71-0	N/A	$18

02819 Camera Lens Focus

by H.P. Rockwell, Indianapolis, IN

This is a time saving program for serious photographers meeting a wide variety of subjects at different magnifications. First it establishes the required magnification. Then it finds the image-object distance for the available lens if feasible. Or it suggests the supplemental lens required. It accounts for and reports two special cases with appropriate direction. **Necessary Accessories for HP-41:** Printer optional

Steps: 138 HP-41 Bytes: 346

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02819-41-1	$10	$12
FOR HP-71*	02819-71-8	N/A	$14

02820 Gas Property Using Redlick Kwong Equation of State

by L. Rojas, Canoga Park, CA

The program computes the thermodynamic property P, T, V, H and S Given two properties of the fluid except the combination H and S. The program uses the Redlick-Kwong equation of state. **Necessary Accessories for HP-41:** Thermal and Transport Pac, Quad Memory Module

Steps: 665 HP-41 Bytes: 1390

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02820-41-9	$10	$17
FOR HP-71	NOT AVAIL		

02821 Apparent Sidereal Time and Obliquity 2000.0

by C. Rusquellas, Buenos Aires, Argentina

Program similar to 01548C one, but including the new constant values for the equinox 2000.0; it gives, for any place, apparent and mean sidereal time and equation of equinoxes at +/-0.01 sec, Julian Day at +/-0.00001 of a day less than one second) and apparent obliquity at +/-0.1 arc second. It also gives the mean time from apparent or mean sidereal time. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 382 HP-41 Bytes: 767

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02821-41-7	$10	$14
FOR HP-71*	02821-71-4	N/A	$16

02822 Angles of Interception

by J.E. Schiermeier, Cary, NC

This program calculates the angles necessary for one projectile to intercept a target moving in 3 dimensions. The target is not under the influence of gravity, but the projectile may be. The interception point is either the closest point of the trajectory to the origin or the first point of less than a specified distance. An optional feature will check if the target will crash and let it crash if certain criteria are met. **Necessary Accessories for HP-41:** One memory module

Steps: 356 HP-41 Bytes: 622

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02822-41-5	$10	$13
FOR HP-71*	02822-71-2	N/A	$14

02823 Sequences and Series

by J.E. Schiermeier, Cary, NC

This program performs calculations dealing with arithmetic, geometric, and other sequences and series. For arithmetic and geometric sequences, the nth term, common difference or ratio, number of a term, any number of means, and sums, including convergent infinite geometric series, may be calculated. The program also finds the sum of a series defined y a user-input function and uses formulas for sums of powers 1 to 10 of successive integers. **Necessary Accessories for HP-41:** One memory module

Steps: 471 HP-41 Bytes: 769

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02823-41-3	$10	$14
FOR HP-71*	02823-71-0	N/A	$16

02824 Life (15 x 15)

by J.E. Schiermeier, Cary, NC

This program simulates the game of Life with 225 cells arranged in a 15 by 15 matrix. A cell continues living with 2 or 3 neighbors or is born with 3 neighbors. Any other number causes the cell to die or remain dead. The program also includes routines for individually creating or killing cells, displaying the matrix with labels, and moving the organism relative to the edges of the matrix. **Necessary Accessories for HP-41:** One memory module

Steps: 296 HP-41 Bytes: 475

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02824-41-1	$10	$13
FOR HP-71*	02824-71-8	N/A	$14

02825 Aperture Diffraction and Antenna Patterns

by G.H. Stumpff II, Dayton, OH

This program calculates the radiation (power) pattern of an aperture in a planar screen from the known fields over the aperture. Program is applicable to plane-wave diffraction or radiation by an aperture antenna. Program results can also be applied to radiation by an antenna excited by a physical current distribution. **Necessary Accessories for HP-41:** One memory module. Card reader strongly recommended.

Steps: 194 HP-41 Bytes: 345

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02825-41-8	$10	$17
FOR HP-71	NOT AVAIL		

02826 Symmetric Matrix Solution - Cholesky Modified Method

by N.S. Tanner, Elizabethton, TN

This program solves a set of linear simultaneous equations in matrix form. The matrix must be symmetric, as is typical of many linear systems of practical interest, but need not be positive definite. All input and output is alpha labeled for clarity. The size of the matrix which can be solved depends on the number of data storage registers available. An HP-41CV with SIZE = 283 can solve a 22x22 matrix. **Necessary Accessories for HP-41:** Memory modules or equivalent for larger than 5x5 matrix

Steps: 153 HP-41 Bytes: 242

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02826-41-6	$10	$12
FOR HP-71*	02826-71-3	N/A	$14

02827 Geometric Solution to Bent Plate Framing Connections

by S.E. Way, Voluntown, CT

This program can be used to solve the geometric solution to bent plate framing connections in structural steel structures. Very useful for structural steel detailers. All input/output in feet, inches and sixteenths. Fully prompting. **Necessary Accessories for HP-41:** Two memory modules

Steps: 398 HP-41 Bytes: 747

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02827-41-4	$10	$14
FOR HP-71*	02827-71-1	N/A	$16

02828 Partially Reinforced Masonry

by V. Winkel, Lakewood, CO

The program analyzes partially reinforced hollow unit masonry walls for vertical loads and/or forces normal to the wall surface. The program will be of use in the design of hollow unit walls for structures in seismic zones 0 and 1 of the "Uniform Building Code". Comprehensive output compares actual stresses with allowable stresses to determine the adequacy of the wall in question. **Necessary Accessories for HP-41:** HP-41CV or equal. Extended Function Module, HP-IL Module and HP-IL Thermal Printer

Steps: 579 HP-41 Bytes: 1391

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02828-41-2	$10	$17
FOR HP-71	NOT AVAIL		

02829 Radius Design

by S.L. Wright, Syracuse, NY

This program solves for a curb line radius at a specified radial distance from an intersection of two tangent centerlines. Roadway widths need not be the same. Also computes the side distances from the intersection to the beginning of curves on the centerlines. A subroutine may be used to change the radius to an even foot if desired, and all data is recomputed automatically. The subroutine may be used to solve a typical curb return intersection problem without the main body of the program. **Necessary Accessories for HP-41:** Printer optional

Steps: 227 HP-41 Bytes: 362

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02829-41-0	$10	$12
FOR HP-71*	02829-71-7	N/A	$14

02830 X, S And R Control Charts

by R. Zulker, Zion, IL

This program determines the average, standard deviation (root mean square) and range for samples of size 87 or less; automatically computes control limits, and plots values with outliers identified by an "invalid symbol." **Necessary Accessories for HP-41:** Quad memory module and printer

Steps: 667 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02830-41-8	$10	$17
FOR HP-71	NOT AVAIL		

02831 Determination of Antoine's Constants I

by M. Krajnc, Maribor, Yugoslavia
P. Glavic, Maribor, Yugoslavia

The vapor pressure of a component is a unique property of the component and is a direct function of a temperature. Vapor pressure and temperature are commonly related by means of the Antoine equation. Program calculates Antoine's constants with Dreisbach method for pure components over a relatively narrow temperature range (usually not over 100 degrees C) and vapor pressure at desired temperature. **Necessary Accessories for HP-41:** X-Function module. Printer optional.

Steps: 271 HP-41 Bytes: 550

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02831-41-6	$10	$13
FOR HP-71	NOT AVAIL		

02832 Determination of Antoine Constants

by M. Krajnc, Maribor, Yugoslavia

The program calculates Antoine constants for pure components by algebraic means. You can also calculate temperature at a desired vapor pressure or vapor pressure at desired temperature. If you input vapor pressure data in mmHg or atm or bar or Pa, and temperature in degrees C or K, you can print out the results in desired units. This method is more accurate then method I. **Necessary Accessories for HP-41:** Two memory modules and X-Function module. Printer optional.

Steps: 397 HP-41 Bytes: 837

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02832-41-4	$10	$14
FOR HP-71	NOT AVAIL		

02833 Design to Shear in Prestressed Concrete Beams

by F.R. Medina, Quito, Ecuador

This program finds the steel reinforcement for shear stress in prestressed concrete beams. The cable of the beam can be rectilinear or curved. The necessary inputs are: Mechanical properties of section, live and dead loads, prestressed force and strength of the materials. **Necessary Accessories for HP-41:** One memory module

Steps: 284 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02833-41-2	$10	$13
FOR HP-71*	02833-71-9	N/A	$14

02834 Biaxial Bending Concrete Columns Simplified Analysis

by F.R. Medina, Quito, Ecuador

This program analyzes rectangular columns under load and biaxial moments by Gouwen's Bending Simplified Theory. Given the section, steel, load and moments, the program determines if the section can resist or not. **Necessary Accessories for HP-41:** None

Steps: 568 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02834-41-0	$10	$15
FOR HP-71*	02834-71-7	N/A	$18

02835 Grinding Mill Power Draw

by M.T. Erickson, West Allis, Wiq

Program calculates the power draw of a grinding mill (either rod or ball mill) under various operating (wet or dry) and discharge configurations (grate or overflow). **Necessary Accessories for HP-41:** None

Steps: 342 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02835-41-7	$10	$14
FOR HP-71*	02835-71-4	N/A	$16

02836 Synthetic Speed Morse Code

by K. Sanker, Albany, OR

This non-compilling program can produce uniform code at about 20 words per minute. Modifications give various slower speeds. Code can be sent for messages in the alpha register or for unlimited length ASCII files. Full character set includes letters, numbers, and special symbols. The tones are synthetic, and a single other synthetic line is used. **Necessary Accessories for HP-41:** Fully configured main memory, X-Functions capacity and I/O device useful.

Steps: 144 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02836-41-5	$10	$15
FOR HP-71	NOT AVAIL		

02837 Open Channel Junction Structure Analysis

by R.E. Warren, Camarillo, CA

Program analyzes junctions, or transitions, of triangular, trapezoidal, and rectangular open channels with one or two side channels in confluence. Calculations are by common pressure plus momentum (P+M) iterative procedures. Input is prompted for and the program will output normal and critical depths if unknown for the two reaches of the main channel. Output includes up and downstream depths, velocities and energy grade lines, and specific force. Individual pressures and momentums can be recalled. Output includes notations of super- and subcritical flows, control up- or downstream, and the occurrence of an upstream hydraulic jump. **Necessary Accessories for HP-41:** Four memory modules. Printer recommended but not required because output stops at each answer.

Steps: 926 HP-41 Bytes: 1883

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02837-41-3	$10	$19
FOR HP-71*	02837-71-0	N/A	$22

02838 Travel Time Measurement and Analysis

by L. McKusick, Los Angeles, CA

Carry the HP-41 and document urban travel time, locations, odometer and vehicle information. Ten registers are filled per trip, thirteen trips can be stored before a dump to cards. The analysis routine prints data, finds speed and does a linear regression for any set of trips. **Necessary Accessories for HP-41:** Quad Memory, time module, printer and card reader.

Steps: 502 HP-41 Bytes: 1071

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02838-41-1	$10	$15
FOR HP-71	NOT AVAIL		

02839 Mineral-Water Equilibria

by T.R.P. Holm, Brooklyn Park, MN

Inputs are concentrations of 12 ions and pH. Program computes equilibria between free ions and 40 complexes and saturation indexes of 12 minerals. Easily expanded or modified. **Necessary Accessories for HP-41:** Three memory modules. Card reader optional.

Steps: 677 HP-41 Bytes: 1222

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02839-41-9	$10	$18
FOR HP-71*	02839-71-6	N/A	$22

02840 Convolution

by T.A. Nichols, Tullahoma, TN

Given the impulse response for a system and an input waveform, this program determines the output waveform by using the convolution integral. This integral is evaluated using the trapezoidal rule. **Necessary Accessories for HP-41:** None

Steps: 101 HP-41 Bytes: 207

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02840-41-7	$10	$11
FOR HP-71*	02840-71-4	N/A	$12

02841 Archeological Electrical Resistance Survey

by J.G. Davies, St Paul, MN

The program is for field use. It provides for entering each resistance measurement (with error correction) and completes the set of measurements by adding time, date, and name. It prints a data table and records data on cards. It plots raw data and/or "filtered data" to improve field interpretation of survey. **Necessary Accessories for HP-41:** X-Functions module, Time Module, Card Reader and Printer

Steps: 367 HP-41 Bytes: 760

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02841-41-5	$10	$14
FOR HP-71	NOT AVAIL		

02842 What If? Predicting the Impact of Changes on Cost of ICs

by J.R. Hines, Garland, TX

An integrated circuit cost prediction algorithm discussed in Semiconductor International is expanded to predict (1) cost after reliability testing ICs; (2) sensitivity of cost to the thirteen variables in the equation; and (3) perform "what if?" analysis for IC design and process changes. An HP-41C program is given which calculates cost and sensitivity for given die size, process type and package type, and performs "what if?" analysis usually done on electronic spreadsheets. Two ICs are followed from prototype design decisions to a mature product cost reduction decision. **Necessary Accessories for HP-41:** Quad memory equivalent. Additional code is discussed which requires the X-Functions module and X-Memory module. Printer optional.

Steps: HP-41 Bytes: 1370

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02842-41-3	$10	$26
FOR HP-71*	02842-71-0	N/A	$32

02843 Solutions For a System of Two Non-Linear Equations

by J.A. Pita, Quito, Ecuador

Given a system of two non-linear equations in two unknowns, this program finds the values of the unknowns using the Newton-Raphson's iterative procedure for nonlinear systems. The equations are entered as subroutines and the user must provide an initial guess for the unknowns. The display pauses after each iteration for showing the progress of convergence. **Necessary Accessories for HP-41:** None

Steps: 154 HP-41 Bytes: 217

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02843-41-1	$10	$11
FOR HP-71*	02843-71-8	N/A	$12

02844 Mastermind - An Exact Simulation

by S.B. Valine, Coleraine, MN

This program is an exact simulation of the Mastermind game by Invicta. The HP-41 picks a 4 color hidden code and the user has 10 opportunities to duplicate the code. The code is picked from 6 possible colors represented by the first letter of the color. For added difficulty, a seventh color is possible. For an easier game, the user can request no repeating colors in the code. For each guess, the HP-41 responds with the number of whites and blacks, white corresponding to a correct color in the wrong position and black, correct color in the correct position. **Necessary Accessories for HP-41:** One memory module and Extended Functions Module. Printer optional.

Steps: 203 HP-41 Bytes: 412

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02844-41-9	$10	$12
FOR HP-71	NOT AVAIL		

02845 7 Card Stud

by M.E. Wong, San Francisco, CA

This program plays a two player game of "Seven Card Stud". It uses the random card generator and a security system which prevents your opponent from viewing and altering your hand. It also allows for betting, calling, checking, folding, and raising. **Necessary Accessories for HP-41:** Three memory modules

Steps: 719 HP-41 Bytes: 1430

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02845-41-6	$10	$17
FOR HP-71*	02845-71-3	N/A	$20

02846 Draw Poker

by M.E. Wong, San Francisco, CA

This program plays a two player game of draw poker. You may choose up to five draws per game and can draw all five of your cards if you so desire. It also uses a unique security system which prevents your opponent from viewing and altering your hand. **Necessary Accessories for HP-41:** Three memory modules and Extended Functions Module

Steps: 547 HP-41 Bytes: 1672

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02846-41-4	$10	$16
FOR HP-71	NOT AVAIL		

02847 Gin Poker

by M.E. Wong, San Francisco, CA

This program plays a two player game of gin rummy and poker. It utilizes an efficient random card distributor and a unique security system which prevents your opponent from viewing and altering your hand. It also allows for card rearranging, card swapping from discards, and card exchanging from the card deck. **Necessary Accessories for HP-41:** Three memory modules and Extended Functions/Memory module

Steps: 593 HP-41 Bytes: 1193

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02847-41-2	$10	$16
FOR HP-71	NOT AVAIL		

02848 Ideal Gas Physics

by M. Stevens, Cincinnati, OH

One inputs the known quantities and the HP-41C calculates the unknown quantity. The gas constant is prompted for so that any unit system can be used. Also, the work, energy, heat and entropy change between two states can be calculated for constant pressure, volume or temperature transformations and adiabatic transformations. **Necessary Accessories for HP-41:** None

Steps: 231 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02848-41-0	$10	$12
FOR HP-71*	02848-71-7	N/A	$14

02849 Discounted Cash Flow

by E.C. Schmidt, Milo, ME

A procedure to establish a rate of return which can be applied to yearly cash flow so that the original investment is reduced to zero. The rate of return, by this method, is equivalent to the maximum interest rate (normally after taxes) at which money can be borrowed to finance a project. The program is set up for yearly inputs of cash flow at Startup and Shutdown of plant. **Necessary Accessories for HP-41:** One memory module

Steps: 354 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02849-41-8	$10	$13
FOR HP-71*	02849-71-5	N/A	$14

02850 Cumulative Binomial Distribution

by D. Vargo, Pago Pago, AS

Computes the probability distribution for both the binomial and the cumulative binomial distributions. Allows for any probability for success between zero and one for up to and including sixty-nine trials. **Necessary Accessories for HP-41:** None

Steps: 47 HP-41 Bytes: 70

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02850-41-6	$10	$11
FOR HP-71*	02850-71-3	N/A	$12

02851 Complex Determinant and Simultaneous 3x3 Equations

by E. Heying, Waterloo, IA

Program calculates the complex determinant of a 3x3 matrix with his simultaneous in rectangular form (X + j Y). Program calculates the value of the determinant and the answer is displayed, then calculates the values of the 3 unknown variables. Program functions without printer, but if one is available it will print the inputs and the answers. **Necessary Accessories for HP-41:** HP 82170A Quad Memory and HP 82180A Extended Functions Memory Module

Steps: 292 HP-41 Bytes: 623

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02851-41-4	$10	$14
FOR HP-71*	02851-71-1	N/A	$16

02852 Pipe Template

by W.N. Carter, Richland, WA

Program prints or displays coordinates for making a layout template for T or Y pipe connections; eccentric or concentric. Choice of decimal or fractional inch output. Template increments (degrees) are user determined. Alternate metric program listing included. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 205 HP-41 Bytes: 349

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02852-41-2	$10	$13
FOR HP-71*	02852-71-9	N/A	$14

02853 Shaft

by D. Geary, Albany, OR

"SHAFT" computes a diameter for any circular shaft subjected to stationary bending and torsional moments. For inputs of moment, torque, corrected endurance limit, yield strength, and a factor of safety, "SHAFT" computes both a diameter based on fatigue failure, and a dimater based on failure due to yielding. The program will work for both English and Metric units. The program will also prompt for either English or metric units for inputs. **Necessary Accessories for HP-41:** None

Steps: 111 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02853-41-0	$10	$12
FOR HP-71*	02853-71-7	N/A	$14

02854 Hydro

by A.R. Perks, Don Mills, Canada

This program carries out a general feasibility analysis of small hydroelectric power sites. Calculations include installed capacity, annual energy, cost, and revenue for small run-of-the river sites. Sites are assigned to one of five lists depending upon potential power. **Necessary Accessories for HP-41:** One memory module and a printer

Steps: 123 HP-41 Bytes: 420

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02854-41-8	$10	$12
FOR HP-71*	02854-71-5	N/A	$14

02855 Mail Order Analysis

by W.E. Hitchins, Los Angeles, CA

Here is a program that allows you to analyze the results and keep records of a mail order campaign. With an input of the appropriate parameters, you get a neatly tabulated printout including total mailing cost, percent return, cost per order, total fulfillment cost and profit or loss. Provision is made to allow you to compare the results of different mailing lists from different sources and each list is given a suitable heading automatically for later identification. **Necessary Accessories for HP-41:** One memory module. HP-IL; Extended Functions Module; HP 82162A Printer.

Steps: 307 HP-41 Bytes: 752

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02855-41-5	$10	$14
FOR HP-71	NOT AVAIL		

02856 Altitude Correction

by M.P. Leimer, Kansas City, MO

This program solves for the constants in three common air conditioning psychrometric heat transfer equations, for any altitude from 0 to 10, 000 feet above sea level. The only inputs required are the altitude, and the value of the constants at sea level. **Necessary Accessories for HP-41:** Printer optional

Steps: 177 HP-41 Bytes: 211

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02856-41-3	$10	$11
FOR HP-71*	02856-71-0	N/A	$12

02857 Combined Stress

by S.L. Stroh, Tampa, FL

Combined stress program determines the state of stress on the principal planes or an arbitrary plane through an element in a body subjected to several simultaneous loadings. The general case of a two-dimensional stress is considered, with the body subjected to two normal stresses and a shear stress. Program will compute principal normal stresses, maximum shear stress or the state of stress on an arbitrary user defined plane. **Necessary Accessories for HP-41:** Printer optional

Steps: 183 HP-41 Bytes: 367

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02857-41-1	$10	$12
FOR HP-71*	02857-71-8	N/A	$14

02858 Steel Column Base Plate Design

by R. Chang, Seattle, WA

Steel base plates are generally used under columns for distribution of column load over a sufficient area of the concrete pier or foundation. "BPLATE" calculates the base plate size, thickness and stresses in the concrete support for three column types (W-Shape, tubing, pipe) with or without moment and allows users to select preferable numbers while processing. **Necessary Accessories for HP-41:** Three memory modules

Steps: 662 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02858-41-9	$10	$16
FOR HP-71*	02858-71-6	N/A	$18

02859 Polygon Solutions

by B. Hoffmann, Buenos Aires, ARGENTINA

Given any two variables of any regular polygon this program calculates other thirteen variables very fast and accurate. It contains 76 problems which are combined by four routines that makes the calculator "intelligent". **Necessary Accessories for HP-41:** Quad Memory Module

Steps: 1276 HP-41 Bytes: 2029

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02859-41-7	$10	$20
FOR HP-71*	02859-71-4	N/A	$24

02860 "Shackle" Encode/Decode

by J.R.B. Cusack, Dhahran, Saudi Arabia

Using a random number algorithm and your chosen password, "SHACKLE" encodes and writes onto a magnetic card up to 180 characters of text; decodes such cards and displays the original text. Included are comprehensive edit and review features to ease text handling. **Necessary Accessories for HP-41:** Two memory modules, X-Functions Module and Card Reader

Steps: 411 HP-41 Bytes: 964

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02860-41-5	$10	$15
FOR HP-71	NOT AVAIL		

02861 Thermal Insulation Effectiveness

by G.H. Stumpff II, Dayton, OH

This program calculates the necessary heating/cooling rate of a room in order to maintain a constant temperature against heat loss/gain via thermal conduction through a window(s) or other insulating boundary with up to three different insulating layers. This enables an evaluation of the effectiveness of using different window materials or of using arbitrarily spaced double- paned windows. The program would also have other, engineering applications. **Necessary Accessories for HP-41:** Printer optional

Steps: 180 HP-41 Bytes: 304

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02861-41-3	$10	$12
FOR HP-71*	02861-71-0	N/A	$14

02862 Computing Ryznar and Langelier Indexes

by L.A. Arreola, Mexico City, MEXICO

This program computes Ryznar and Langelier indexes to estimate corrosive and scaling tendancies of water in a cooling tower. It estimates the amount of acid, sulfuric acid (66 degree Be), needed to make a no-difficutties water. The program only needs six inputs: CaC0sub3, Ca, total dissolved solids and sulfate concentrations, temperature at the water cooling tower interface and cycles of concentration. **Necessary Accessories for HP-41:** Two memory modules and printer. Card reader optional.

Steps: 304 HP-41 Bytes: 796

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02862-41-1	$10	$14
FOR HP-71*	02862-71-8	N/A	$16

02863 Computer Long Division

by P. Siconolfi, Rochester, NY

This program will print an entire long division problem illustrating all steps that would ordinarily be done by hand. Very easy to use, the only inputs required are divisor and dividend. Average printing time is 20 to 30 seconds. Excellent as an educational diagnostics/learning aid for students or teachers. **Necessary Accessories for HP-41:** One memory module and printer

Steps: 250 HP-41 Bytes: 458

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02863-41-9	$10	$13
FOR HP-71*	02863-71-6	N/A	$14

02864 Submarine Hunt

by G. Goodman, Stamford, CT

You are the captain of a destroyer with orders to seek out and destroy enemy submarines. The destroyer manuevers on a 10 x 10 grid and searches for the submarine via sonar. The closer you are to the submarine when you drop your depth charge the greater the chance you have of sinking it. However, if you are inept, the submarine might torpedo you. Two levels of play are available. **Necessary Accessories for HP-41:** One memory module

Steps: 282 HP-41 Bytes: 648

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02864-41-7	$10	$14
FOR HP-71*	02864-71-4	N/A	$16

02865 Boom Sprayer

by D. Vargo, Pago Pago, AS

Precise application of agricultural chemicals is both economically and ecologically desirable. Boom sprayer calculates the proper nozzle discharge rate, and suggests pressure corrections to obtain this rate, for broadcast and row crop spraying. It also calculates the dilution factor for tank mixing the chemical and displays the maximum acreage coverable per tankload. **Necessary Accessories for HP-41:** None

Steps: 61 HP-41 Bytes: 179

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02865-41-4	$10	$11
FOR HP-71*	02865-71-1	N/A	$12

02867 Gasscrubber Design Calculation

by K. Postma, Santa Fe Springs, CA

This program will calculate the required ID of Gas-Liquid separating scrubber in a vertical configuration based on SCFM, gas specific gravity or weight, liquid specific gravity, temperature and pressure. **Necessary Accessories for HP-41:** Printer optional

Steps: 93 HP-41 Bytes: 209

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02867-41-0	$10	$11
FOR HP-71*	02867-71-7	N/A	$12

02868 Wind Data Summary

by A.E. Helmers, Palmer, AK

Resultant (prevailing) wind direction, resultant run, resultant velocity, total run, mean velocity, and steadiness ratio are calculated for wind data obtained in the form of miles or kilometres of wind travel by eight cardinal and intercardinal directions for a time period of some hours (usually 24). **Necessary Accessories for HP-41:** Two memory modules

Steps: 228 HP-41 Bytes: 954

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02868-41-8	$10	$15
FOR HP-71*	02868-71-5	N/A	$18

02869 -Ang

by R. Belford, Nedlands, Australia

This program converts geographical coordinates, latitude and longitude, to A.M.G. coordinates, northing and easting. **Necessary Accessories for HP-41:** None

Steps: 206 HP-41 Bytes: 325

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02869-41-6	$10	$12
FOR HP-71*	02869-71-3	N/A	$14

02870 Lineal Distr of Seismic Force on All Stories of a Building

by F.R. Medina, Quito, Ecuador

For all seismic design it is necessary to obtain the horizontal forces in each story. Given the number of stories, the distributed load on each story, I, K, C, S and T Values as well as the areas and heights between stories, this program finds the forces acting in each story for seismic design purposes. **Necessary Accessories for HP-41:** None

Steps: 137 HP-41 Bytes: 267

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02870-41-4	$10	$12
FOR HP-71*	02870-71-1	N/A	$14

02871 Stiffness to Shear and Bending in Shear Walls

by F.R. Medina, Quito, Ecuador

In elements working to shear is indispensible for stiffness calculations, to considerate the shear. Given the shear wall dimensions (L, h, B) this program finds the stiffness k, k', a, b, b' and t. The wall must be of constant section. **Necessary Accessories for HP-41:** None

Steps: 70 HP-41 Bytes: 112

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02871-41-2	$10	$11
FOR HP-71*	02871-71-9	N/A	$12

02872 Prestressed Concrete Beams Simplified Design

by F.R. Medina, Quito, Ecuador

This program designs, according to simplified T.Y. Lin's theory, beams of Prestressed Concrete. The inputs are: dimensions of the beam, live load, beam's length, coating. The outputs are: Properties of the section, eccentricities, initial and final stresses on the upper and lower points of the beam. **Necessary Accessories for HP-41:** One memory module optional

Steps: 262 HP-41 Bytes: 474

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02872-41-0	$10	$13
FOR HP-71*	02872-71-7	N/A	$14

02873 Whichever Form (Rectilinear) Composite Section Properties

by F.R. Medina, Quito, Ecuador

This program finds the area A, centroid location C1 and C2, moment of inertia I, of whichever rectilinear form composite sections with or without holes (rectilinear) in a very easy manner. **Necessary Accessories for HP-41:** None

Steps: 96 HP-41 Bytes: 177

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02873-41-8	$10	$11
FOR HP-71*	02873-71-5	N/A	$12

02874 Caustic Soda Content - SG or Titration Method

by C. Chong, Kowloon, HONG KONG
O. Wong, Kowloon, HONG KONG

The package contains two programs. SG estimates %NaOH and %Nasub0 of a solution based on its specific gravity and temperature in degree celsius. It works for 0 to 30C and 0 to 50%NaOH. Average discrepancy' is 0.12% NaOH. TITR does data treatment for hydrochloric acid standardization using sodium carbonate and double indicator titration. Standard deviation is reported as appropriate. In both program runs, printer gives annotated hard copies. Program TITR uses synthetic functions but full documentation is given. **Necessary Accessories for HP-41:** Printer and one memory module. Time module optional. Wand or Card Reader necessary unless you can key in synthetic code.

Steps: 322 HP-41 Bytes: 0795

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02874-41-6	$10	$14
FOR HP-71	NOT AVAIL		

02875 Design of Anchorage Zone in Prestressed Concrete Beams

by F.R. Medina, Quito, Ecuador

This program computes the bending moments and the vertical reinforcement steel for the very important anchorage zone in prestressed concrete beams. The analysis considers vertical intervals indicated by the user. The program is based on Theory of Gergely and Sozen (illustrated by Khachaturian). The level loads number in the extreme of the beam can be near 50 with Quad Module. **Necessary Accessories for HP-41:** Two memory modules

Steps: 306 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02875-41-3	$10	$13
FOR HP-71*	02875-71-0	N/A	$14

02876 Two Phase Frictional Pressure Drop

by S. Hsu, Omaha, NE

Program uses Dukler's method to calculate frictional pressure drop in two phase flow. Hugh Mark's hold-up relationship is used. Input requires flowrate, density and viscosity of liquid and vapor. Plus roughness factor and diameter of pipe. Run time is less than one minute. **Necessary Accessories for HP-41:** None

Steps: 333 HP-41 Bytes: 620

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02876-41-1	$10	$13
FOR HP-71*	02876-71-8	N/A	$14

02877 Hewlett-Packard HP-41C/V Text Editor

by Desideri, Rome, Italy

This program handles up to 36 lines of text, each of 24 character length, the length of the HP-41 alpha-register. It simulates the line editors available on much larger mainframe computers. A few simple commands control the whole system, avoiding the annoyance of a "menu-driven" structure. The simulated file can be added to, edited, re-arranged, saved on card and much more. Ideal for smaller text processing. **Necessary Accessories for HP-41:** Quad memory. Card Reader advisable.

Steps: 377 HP-41 Bytes: 700

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02877-41-9	$10	$14
FOR HP-71*	02877-71-6	N/A	$16

02878 Long Continuous Beam (Up to 18 Spans)

by E. Bechis, Cipoletti, ARGENTINA

Program calculates moments on supports in continuous beams for the following type of load: concentrated (any amount); uniformly distributed on all the span length or on a particular portion (any amount); triangular (two per span). Depending on the complexity of the case could solve up to 18 spans plus two cantilever. Friendly for changing any data to solve other similar cases (it keeps datas). **Necessary Accessories for HP-41:** Two memory modules and printer

Steps: 673 HP-41 Bytes: 1156

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02878-41-7	$10	$16
FOR HP-71*	02878-71-4	N/A	$18

02879 Scorekeeper With Player Ranking

by R.K. McDonald, Milpitas, CA

Keeps score for any game for up to 10 players plus counting the number of rounds played. Displays last entry and total score when scores are entered or upon demand, at any time. Winner and player ranking may be obtained any time during or after the game, sorting time approx. 9 seconds. **Necessary Accessories for HP-41:** One memory module and Extended Functions Memory Module

Steps: 197 HP-41 Bytes: 362

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02879-41-5	$10	$12
FOR HP-71*	02879-71-2	N/A	$14

02880 Transmission Lines: Line Inductance & Line Capacitance Calc

by A.L.W. Ann, Halifax, Canada

This program will compute the transmission lines impedances in single or three phase of single circuit with one conductor or multiconductors (bundle-conductors) lines. The impedance calculation includes line inductance [H/M] and inductive reactance [ohm.mile], line capacitance [F/M] and capacitive reactance [ohm.mile], with or without earth effect taken into consideration. This program also takes care of the common tranmission line arrangements. **Necessary Accessories for HP-41:** One memory module

Steps: 338 HP-41 Bytes: 588

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02880-41-3	$10	$13
FOR HP-71*	02880-71-0	N/A	$14

02881 Gaussian Error Function/Probability Integral: erf(Z)

by P.R. Jemian, Auburn, AL

The Gaussian Error Function is commonly used in heat and mass transfer problems. Usually, this information is only presented in tabular or graphical form. This program calculates the value of erf(Z) for the absolute value of Z between 2 and 0.015 using the trapezoid method. Values with magnitude greater than 2 may be entered but run time is quite long. This program is designed to serve as a called function (similar to SIN or LN). **Necessary Accessories for HP-41:** None

Steps: 75 HP-41 Bytes: 111

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02881-41-1	$10	$11
FOR HP-71*	02881-71-8	N/A	$12

02882 Residential Hot Air Furnace Selection

by R. White, Englewood, OH

This program aids in the selection of new hot air furnaces for home heating. Fuels include natural gas, propane, and heating oil. The program estimates the annual costs of fuel and electrical power for the furnace air circulating fan. Using installed cost, it compares data with a second furnace and computes annual savings (or loss) and pay back period. When electrical power cost is included, some highly fuel efficient furnaces are not the best economic choice. **Necessary Accessories for HP-41:** One memory module

Steps: 95 HP-41 Bytes: 255

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02882-41-9	$10	$13
FOR HP-71*	02882-71-6	N/A	$14

02883 Real/Complex Matrix Multiplication

by A. Melimopoulos, Caracas, Venezuela

Given the matrices A(m x n) and B(n x p), this program calculates the multiplication matrix C(m x p), A x B = C. But with the particularity of that both matrices, A and B, can be real or complex matrices, with different size requirements in each case. The values m x n, n x p are the rows x columns value of the matrices for the same values m, n, and p. The size in the complex case would be the double size in the real case. **Necessary Accessories for HP-41:** One memory module

Steps: 217 HP-41 Bytes: 356

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02883-41-7	$10	$12
FOR HP-71*	02883-71-4	N/A	$14

02884 Hyperbolic Functions For Complex Variables

by A. Melimopoulos, Caracas, Venezuela

This program computes all the hyperbolic functions: Sinh, Cosh, Tanh, Asinh, Acosh, Atanh, of a complex variable in rectangular mode (Z = X + JY) and only uses two (2) registers. This program is very useful (and fast) as subroutines for electric transmission lines calculations programs. **Necessary Accessories for HP-41:** None

Steps: 105 HP-41 Bytes: 162

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02884-41-5	$10	$11
FOR HP-71*	02884-71-2	N/A	$12

02885 Cooling Tower

by S. Hsu, Omaha, NE

Program calculates a suggested air flowrate and number of transfer units for air-water cooling tower. Input requires: tower pressure, water flowrate, water inlet and outlet temperatures, and air wet-bulb temperature. When run with printer, enthalpy and enthalpy driving force are printed at 2-degree F water temperature intervals. **Necessary Accessories for HP-41:** None

Steps: 232 HP-41 Bytes: 538

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02885-41-2	$10	$13
FOR HP-71*	02885-71-9	N/A	$14

02886 Flight

by O. Ertem, Ankara, TURKEY

This program simulates a complete aircraft flight beginning with taking-off from a 10000 ft long runway. The aim is to land at a similar airfield in fog by using Instrument Landing System which is synthetically created in the display. The pilot has the chance to retract gear in order to decrease drag force and reduce fuel consumption. **Necessary Accessories for HP-41:** Three memory modules

Steps: 610 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02886-41-0	$10	$17
FOR HP-71*	02886-71-7	N/A	$20

02887 The Complete Bowling League Secretary Card Based Data System

by W. Pinnick, State College, PA

A complete bowling league secretary using card based data storage. A set of six programs for the complete automation of the duties of the league secretary. Keeps team and individual stats including highest game/series bowled as well as the league record highs scratch or handicapped for men, women, and teams. Computes average and handicaps. Will print the weekly standings after sorting team standings. **Necessary Accessories for HP-41:** Full memory, Card Reader, Ext. Funct. Module, Ext. Memory Module, Printer and HP-IL Loop

Steps: 795 HP-41 Bytes: 3664

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02887-41-8	$10	$30
FOR HP-71	NOT AVAIL		

02888 Hobbit

by D. Ristanovic, Belgrade, YUGOSLAVIA

In this adventure game program you are a Hobbit thief entering a maze. Your task is to find (and steal) the mighty Orb of Zot (which is somewhere in the maze masked as a warp) and to kill as many demons as possible (number of demons in the level of game you select). To fight with demons you must have an amulet. But don't use amulets too much - their energy supply is limited. If you stay too long, Wizard will return and eat you! **Necessary Accessories for HP-41:** Three memory modules. Card Reader optional.

Steps: 422 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02888-41-6	$10	$15
FOR HP-71*	02888-71-3	N/A	$18

02889 Analysis of Plane Linkage Mechanisms

by A.G. Thompson, Adelaide, SOUTH AUSTRALIA

LYNX is a set of subprograms for the kinematic analysis of plane linkages. A user-written calling program is required. The geometric positions, velocities and accelerations of points on the linkage are obtained by vectorial methods. The calculations are repeatable for a full motion cycle. Four detailed examples are included. **Necessary Accessories for HP-41:** Three memory modules for complete program including examples Only one memory module is required for the basic program and data

Steps: 634 HP-41 Bytes: 1023

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02889-41-4	$10	$20
FOR HP-71*	02889-71-1	N/A	$24

02890 Laser Battle

by M.E. Wong, San Francisco, CA

This program plays a laser battle game. The object is to build a laser cannon to destroy a group of invaders. You have many options including moving the laser cannon and sending a scout to use the invaders' laser cannon on them. There is even a bonus round. **Necessary Accessories for HP-41:** Two memory modules and Extended Functions Module

Steps: 333 HP-41 Bytes: 912

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02890-41-2	$10	$15
FOR HP-71	NOT AVAIL		

02891 Skier

by M.E. Wong, San Francisco, CA

This game is good for testing one's quickness and perception. The object is to pass thru two poles as often as the player can within a time limit of one hundred units. **Necessary Accessories for HP-41:** Extended Functions Module and Time Module

Steps: 206 HP-41 Bytes: 407

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02891-41-0	$10	$12
FOR HP-71	NOT AVAIL		

02892 Gold Rush

by M.E. Wong, San Francisco, CA

The object of this game is to find ten bags of gold hidden on a site of 81 squares. You are allowed an indefinite number of turns, but with few turns and correct choices as to where the bags of gold are hidden, you will receive a higher percentage score. With a printer, this program prints a 9x9 playing board. **Necessary Accessories for HP-41:** Two memory modules. Extended Functions Module

Steps: 434 HP-41 Bytes: 852

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02892-41-8	$10	$14
FOR HP-71*	02892-71-5	N/A	$16

02893 Time Counter

by M.E. Wong, San Francisco, CA

This program was especially designed for people who record music. It will conveniently add and subtract times, store all entries for verification, and display time remaining. It also allows for easy correction and for gap time. These functions are just some of the convenient operations in this revolutionary program. **Necessary Accessories for HP-41:** One memory module

Steps: 228 HP-41 Bytes: 438

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02893-41-6	$10	$12
FOR HP-71*	02893-71-3	N/A	$14

02894 Random Card Generator

by M.E. Wong, San Francisco, CA

This program duplicates a deck of cards. When executed, it places a random card in the alpha register. This program is helpful for card games where the card value and suit are needed. **Necessary Accessories for HP-41:** One memory module

Steps: 292 HP-41 Bytes: 485

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02894-41-4	$10	$11
FOR HP-71*	02894-71-1	N/A	$12

02895 Driver

by M.E. Wong, San Francisco, CA

This program plays a directional, reflex, and memory game. The object is to save lives by driving your lazer-proof vehicle and using it to shield people from an alien being with a vaporizer gun. Points are awarded, and there even is a bonus round where you can get additional points and additional lives. **Necessary Accessories for HP-41:** One memory module

Steps: 225 HP-41 Bytes: 552

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02895-41-1	$10	$13
FOR HP-71*	02895-71-8	N/A	$14

02896 Eliminator

by M.E. Wong, San Francisco, CA

This program plays a fast-paced number game. The object is to match digits with the calculator to prevent a 6 or 5 number string. If you're looking for a fun and challenging number game, this is the program for you. **Necessary Accessories for HP-41:** Extended Functions Module. One memory module.

Steps: 241 HP-41 Bytes: 468

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02896-41-9	$10	$13
FOR HP-71*	02896-71-6	N/A	$14

02897 Voltage Conversions For Sine Waves

by R.S. Garlick, River Grove, IL

Given any one of the four possible sine wave voltage types: AVERAGE, RMS (EFFECTIVE), PEAK, OR PEAK TO PEAK this program will calculate the remaining three values using the appropriate conversion value. **Necessary Accessories for HP-41:** None

Steps: 147 HP-41 Bytes: 268

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02897-41-7	$10	$12
FOR HP-71*	02897-71-4	N/A	$14

02898 Grade Computer II

by J.L. Gilby, Vancouver, Canada

This program carries the grades for two independent grade lines. The program then uses these two grade lines to compute grades for five separate points across a desired road section, as well as for a point directly above or below each grade control line, for a given typical section. The program does not require symmetrical sections and allows the user to vary the road width, superelevation, points where the grades are to be computed, intervals, and the depth below finished grade. **Necessary Accessories for HP-41:** Two memory modules. Card reader and printer optional.

Steps: 487 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02898-41-5	$10	$15
FOR HP-71	NOT AVAIL		

02899 Small Signal Transistor Amplifier Gain (BJT)

by K.D. Burnett, Orem, UT

This program will calculate the voltage, current, and power gain for a small-signal transistor BJT amplifier. Configurations are common emitter, common base, and common collector. The calculations are valid for midfrequency only. **Necessary Accessories for HP-41:** None

Steps: 256 HP-41 Bytes: 421

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02899-41-3	$10	$12
FOR HP-71*	02899-71-0	N/A	$14

02900 Fixed Interest Valuation

by G. Naughton, Wellington, New Zealand

Calculates the market value and accrued interest of fixed interest securities, for half yearly, quarterly or annual interest payments; interest in advance or arrears; when maturity is on, or not on, an interest anniversary data; cum or ex next interest payment. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 308 HP-41 Bytes: 545

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02900-41-9	$10	$13
FOR HP-71*	02900-71-6	N/A	$14

02901 Commercial Bills

by G. Naughton, Wellington, New Zealand

Calculates the present or future value, number of days or interest discount) rate of commercial bills or other instruments using a straight line discounting formula. **Necessary Accessories for HP-41:** Printer optional

Steps: 84 HP-41 Bytes: 160

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02901-41-7	$10	$11
FOR HP-71*	02901-71-4	N/A	$12

02902 Aircraft Drag-Estimation

by J.G. Kocsis, Mojave, CA

Computed: Thrust required vs. airspeed for any altitude from takeoff to supersonic cruise. Maximum mach-No.: 3. The 3-D Csubl is approximated by .67xCsubL-2D. Output block: CsubL, CsubD, gcompr, alpha, gincompr., D(=Tr), M, V, W and b for first loop (takeoff). **Necessary Accessories for HP-41:** Quad memory. Printer optional.

Steps: 406 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02902-41-5	$10	$14
FOR HP-71*	02902-71-2	N/A	$16

02903 Travel Computer

by R.W. Tataryn, College Place, WA

Program calculates: miles driven, percent of trip covered, miles to go, time elapsed, average m.p.h., e.t.a. (time and date), MPG, fuel needed to finish trip, and finally, cost to finish trip at present fuel economy. You initialize your H.P. at the beginning of the trip with the miles to destination, your odometer reading, and the average cost of fuel. Anytime during the trip, simply input odometer reading and fuel used. **Necessary Accessories for HP-41:** Time module

Steps: 140 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02903-41-3	$10	$12
FOR HP-71	NOT AVAIL		

02904 Byor

by D. Centeno, New York, NY

This program allows the user to calculate biorythms of persons whose birthdates lie beyond the range of the time module and to view the results (slope, amplitude, days of the week, etc.) without number juggling. This program differs from others in its extreme ease of operation. **Necessary Accessories for HP-41:** One memory module

Steps: 289 HP-41 Bytes: 624

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02904-41-1	$10	$13
FOR HP-71*	02904-71-8	N/A	$14

02905 Multivariable Nonlinear Function Maximum Finder

by J.P. Lawrence, Tigard, OR

Based on the "complex" method of M.J. Box, this sequential search program is effective in finding the global maximum of a non-linear function, without requiring the derivative. The program randomly scatters an initial set of points throughout a feasible region (specified by the user) then moves the points toward the maximum value of the function. The program requires 0-6 hours depending on the function and the accuracy required. **Necessary Accessories for HP-41:** Three memory modules

Steps: 608 HP-41 Bytes: 1072

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02905-41-8	$10	$16
FOR HP-71*	02905-71-5	N/A	$18

02906 The HP-16C Emulator

by E.M. Keefe, Ankeny, IA

With this set of routines, the HP-41C becomes a slow but sure computer science calculator (ala the HP-16C). It performs almost all of the functions of the HP-16C but is limited to word sizes of 32 bits or less. It does not do windows like the HP-16C. It will route output to a printer or video display. With full memory it is even programmable. **Necessary Accessories for HP-41:** Two memory modules and HP-IL Dev ROM

Steps: 689 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02906-41-6	$10	$16
FOR HP-71	NOT AVAIL		

02907 Latitude by Meridian Altitude

by J.W.C. Hermans, Wellington, New Zealand

The program calculates the latitude from the meridional altitude of the celestial bodies most commonly used by navigators except Polaris and stars below the pole. Inputs required are, Longitude, GMT Date and Time, Height of Eye, Observed altitude, name of body and whether bearing north or south. DR latitude is included to provide compatibility with other programs. It can be entered as 0 degrees. **Necessary Accessories for HP-41:** One memory module and Navigation Pac

Steps: 117 HP-41 Bytes: 220

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02907-41-4	$10	$12
FOR HP-71	NOT AVAIL		

02908 Bowling Scorekeeper

by M.E. Wong, San Francisco, CA

This program calculates bowling scores for 1 to 4 players. It was especially designed for random playing, so that player 1 does not have to precede player 2, player 2 does not have to precede player 3, etc. It even allows the scorekeeper to switch players between balls. **Necessary Accessories for HP-41:** One memory module

Steps: 285 HP-41 Bytes: 496

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02908-41-2	$10	$13
FOR HP-71*	02908-71-9	N/A	$14

02909 Solubility vs pH - A Least Square Fit

by W. Pinnick, State College, PA

A program to determine the dissociation constant and the intrinsic solubility of a monoprotic weak acid or base via least square fit to its pH - total solubility data. The program is applicable over the pH range where solubility is limited by the non-ionized species. Estimates of total solubility or of pH may be made given the other parameters. An adaptation and expansion of an HP-67/97 program. **Necessary Accessories for HP-41:** None

Steps: 209 HP-41 Bytes: 375

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02909-41-0	$10	$12
FOR HP-71*	02909-71-7	N/A	$14

02910 End Supported Beams

by W.G. Adair, Commerce, GA

Program solves loaded beam condition (partial uniform load) #14, Table III, from Formulas for Stress and Strain Handbook. Input of beam dimensions and loading conditions, program will solve for reactions, shear, moment, and deflection. **Necessary Accessories for HP-41:** One memory module. Card Reader optional.

Steps: 387 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02910-41-8	$10	$13
FOR HP-71*	02910-71-5	N/A	$14

02911 2-D Shock Angles With Variable Specific Heats

by D.K. Doty, Cahokia, IL

This program will calculate the angle of an oblique planar shock wave given the turning angle and the Mach number in front of the shock wave. The program can also calculate the turning angle or the Mach number using values for the remaining two variables. The ratio of specific heats can be specified and the shock wave can be either strong or weak. **Necessary Accessories for HP-41:** Extended Functions optional

Steps: 242 HP-41 Bytes: 440

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02911-41-6	$10	$12
FOR HP-71*	02911-71-3	N/A	$14

02912 Floating Floor Calculations

by T. Kraus, Cazadero, CA

The program calculates the static deflection, load and total number of isolation pads required for a user specified floating floor, and checks the low pass filter cut-off frequency for the mechanical system versus the excitation frequency on the floating floor. **Necessary Accessories for HP-41:** One memory module

Steps: 195 HP-41 Bytes: 547

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02912-41-4	$10	$13
FOR HP-71*	02912-71-1	N/A	$14

02913 The Cube by Three Points

by A. Melimopoulos, Caracas, Venezuela

This program computes the three dimensional position of a cube where three of it's edges, that converge to the same vertice, pass through three non-colineal points. **Necessary Accessories for HP-41:** One memory module

Steps: 431 HP-41 Bytes: 505

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02913-41-2	$10	$13
FOR HP-71*	02913-71-9	N/A	$14

02914 Complex Polynomial Evaluation

by A. Melimopoulos, Caracas, Venezuela

Given any complex or real X value, this program evaluates any polynomial of nth degree with complex or real coefficients. The program runs very fast because it uses the Horner's method of evaluation. **Necessary Accessories for HP-41:** None

Steps: 67 HP-41 Bytes: 114

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02914-41-0	$10	$11
FOR HP-71*	02914-71-7	N/A	$12

02915 Delta G1

by D. Centeno, New York, NY

This program was designed to be friendly and efficient in arriving at the solutions for various problems involving the state functions of entropy, enthalpy and free energy. A menu of equations is contained within it. **Necessary Accessories for HP-41:** One memory module

Steps: 215 HP-41 Bytes: 567

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02915-41-7	$10	$13
FOR HP-71*	02915-71-4	N/A	$14

02916 Solution of Complex Equations

by D. Ristanovic, Belgrade, YUGOSLAVIA

This program will solve any system of m complex equations with n unknowns. Size of the system is depending on the number of memory modules available. Input and output are very comfortable (numbers displayed as a+jb with a or jb ommited if zero, etc.). Program is pretty fast and quite accurate. Automatic matrix inversion is provided. As a subroutine you have a program that solves m real equations with n unknowns. This program can be used individually. **Necessary Accessories for HP-41:** Quad memory module. Printer optional.

Steps: 404 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02916-41-5	$10	$13
FOR HP-71*	02916-71-2	N/A	$14

02917 The Complex Quartic Equation

by A. Melimopoulos, Caracas, Venezuela

The program may be used as a subroutine for a "MULLER" iteration program when it tends to a complex root and runs very fast because there is a full use of the stack so the required SIZE is minimum. **Necessary Accessories for HP-41:** None

Steps: 67 HP-41 Bytes: 96

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02917-41-3	$10	$11
FOR HP-71*	02917-71-0	N/A	$12

02918 Design of Concrete Foundation Blocks

by W.G. Adair, Commerce, GA

Input of external forces, soil density, and internal friction factor, program will solve for concrete foundation blocks commonly used to support heavy machinery. Charts for soil bearing capacity and internal friction factor are included. **Necessary Accessories for HP-41:** None

Steps: 127 HP-41 Bytes: 210

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02918-41-1	$10	$11
FOR HP-71*	02918-71-8	N/A	$12

02919 Curb Return Design

by Skeith, Yucaipa, CA

This program calculates quarter delta elevations along the arc length of a curb return, by use of the Plane Method using equal tangents. **Necessary Accessories for HP-41:** Printer

Steps: 190 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02919-41-9	$10	$12
FOR HP-71*	02919-71-6	N/A	$14

02920 Complex Matrix

by F. Messeri, Rio De Janeiro, Brasil

This program solves Complex Number Determinants 2x2 through 4x4 and Complex Simultaneous Linear Equations 2x2 through 8x8. **Necessary Accessories for HP-41:** Memory module/Extended Functions Memory Module

Steps: 942 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02920-41-7	$10	$17
FOR HP-71	NOT AVAIL		

02921 Data File Statistics

by J.E. Schiermeier, Cary, NC

This program performs general statistics on all or part of a data file in extended memory. Input and output routines are implemented, and the program sorts in either ascending or descending order, calculates mean, standard deviation, median, and max and min values and range. It also searches for a particular value in the file or counts all the occurances within an interval. Using only one register for storage, the routines are easily adaptable for subroutines. **Necessary Accessories for HP-41:** One memory module and Extended Functions Memory Module

Steps: 347 HP-41 Bytes: 639

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02921-41-5	$10	$13
FOR HP-71	NOT AVAIL		

02922 Monthly Bill Reminder

by S.B. Valine, Coleraine, MN

An ASCII file in Extended Memory will help you keep track of your monthly bills: date due, description, amount, and if they have been paid. Total bills due and paid are calculated. With an HP-IL printer attached, a neat four-column tabulation of bill data along with totals is provided. If a Time Module control alarm is set, the calculator will review the file each night and alert you the next day should any bills come due. **Necessary Accessories for HP-41:** One Memory Module with HP-41C, Extended Functions Module, Time Module, or HP-41CX. HP-82162A Printer is optional.

Steps: 304 HP-41 Bytes: 648

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02922-41-3	$10	$13
FOR HP-71	NOT AVAIL		

02923 Rights Issue Calculations

by G. Naughton, Wellington, New Zealand

Calculates ex issue, rights, cum issue prices or dilution factors for rights issues of shares. **Necessary Accessories for HP-41:** Printer optional

Steps: 90 HP-41 Bytes: 167

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02923-41-1	$10	$11
FOR HP-71*	02923-71-8	N/A	$12

02924 Servometer Bellows Design

by S. Lepp, Verona, NJ

This program calculates the design equations for nickel bellows from The Servometer Corporation catalog. The inputs are the outside diameter, inside diameter, wall thickness, number of convolutions and length. The program calculates: spring rate, stroke, effective area, pressure rating, angle of bend, parallel offset displacement and maximum torque. **Necessary Accessories for HP-41:** None

Steps: 197 HP-41 Bytes: 340

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02924-41-9	$10	$12
FOR HP-71*	02924-71-6	N/A	$14

02925 Punching Shear For Rectangular Structural Tubing

by W.N. Carter, Richland, WA

Analyzes punching shear and allowable loads for simple T, K and Y connections in rectangular tubular structures then determines the welding requirements for the joint. Based on AWS D1.1-82 Structural Welding Code, Section 10, Tubular Structures. Documentation includes logic, formulas and problem worksheet. Does not consider fatigue or yield line analysis. **Necessary Accessories for HP-41:** Quad Memory. Printer and Card Reader optional.

Steps: 804 HP-41 Bytes: 1686

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02925-41-6	$10	$18
FOR HP-71	NOT AVAIL		

02926 CLMTD For Heat Exchangers In Series

by F.E. Moore, Newark, DE

Program calculates the corrected log mean temperature difference (CLMTD) for Tema "E" shells arranged in series. Given the terminal temperatures and a minimum acceptable value for the correction factor (F) to the true countercurrent log mean temperature difference (LMTD), the program will calculate the necessary number of shells in series, the value of F, LMTD, and CLMTD. **Necessary Accessories for HP-41:** None

Steps: 198 HP-41 Bytes: 378

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02926-41-4	$10	$12
FOR HP-71*	02926-71-1	N/A	$14

02927 Thermodynamic Processes of an Ideal Gas

by J.E. Schiermeier, Cary, NC

This program calculates the constant pressure, constant volume, isothermal, and adiabatic contractions or expansions of an ideal gas. The work done, change in internal energy, and total heat are displayed, and the efficiency of a cycle may be calculated. Pressure, volume, and temperature may be solved using each other. Two systems of units are provided, as well as monatomic, diatomic, and polyatomic gas defaults if the gamma ratio or heat capacities are not input. **Necessary Accessories for HP-41:** One memory module

Steps: 357 HP-41 Bytes: 610

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02927-41-2	$10	$13
FOR HP-71*	02927-71-9	N/A	$14

02928 Polynomial Arithmetic and Derivation

by J.E. Schiermeier, Cary, NC

This program performs arithmetic and derivation on polynomials whose only degree limit is number of available registers. Evaluation of a specific value, addition, subtraction, multiplication, division and synthetic division (both with remainder displayed), and derivation are provided. A handy feature permits the result of the previous calculation to be used as the first polynomial in the next calculation without having to re-enter the coefficients. All input prompts and output is clearly labeled. **Necessary Accessories for HP-41:** One memory module

Steps: 355 HP-41 Bytes: 668

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02928-41-0	$10	$13
FOR HP-71*	02928-71-7	N/A	$14

02929 Trip Computer

by J.E. Schiermeier, Cary, NC

This program provides data for automobile trips of any length. The user only needs to input distances as either odometer readings or increments to calculate current elapsed time, average speed, and distance, all with and without pauses. Hours until and data and time at given distance, average speed necessary for given distance at given time, and distance at a given time may also be calculated. Off-course pauses of time and distance are provided. **Necessary Accessories for HP-41:** One memory module and Time module

Steps: 290 HP-41 Bytes: 522

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02929-41-8	$10	$13
FOR HP-71	NOT AVAIL		

02930 Critical Path Method

by J.E. Schiermeier, Cary, NC

This program finds the critical path, early and late starts, and slack times for a project of jobs, given the prerequisites and duration of each job. Once a project is created, it remains in extended memory. Facilities for changing the durations are provided on subsequent runs, and files for more than one project may exist simultaneously in extended memory. **Necessary Accessories for HP-41:** Extended Functions Memory Module and One memory module

Steps: 422 HP-41 Bytes: 000755

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02930-41-6	$10	$14
FOR HP-71	NOT AVAIL		

02931 Pipe Properties

by B. Woolston, Vashon, WA

Given the size of steel pipe, the program calculates the pipe cross- sectional area, the area moment of inertia, the section modulus, the radius gyration, the weight per foot, the outside surface area, the inside surface area, the conduit area, and the weight of water per foot. **Necessary Accessories for HP-41:** None

Steps: 170 HP-41 Bytes: 310

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02931-41-4	$10	$12
FOR HP-71*	02931-71-1	N/A	$14

02932 Wear Equation

by N. Nanji, Ann Arbor, MI

This program will calculate the sixth variable for the other five values in the wear equation. It is useful for the design of machine components where an analytical approach to resisting wear is required. **Necessary Accessories for HP-41:** None

Steps: 76 HP-41 Bytes: 132

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02932-41-2	$10	$11
FOR HP-71*	02932-71-9	N/A	$12

02933 Linear Regression Through a Single Point

by P.R. Jemlan, Auburn, AL

The best straight line is often desired to pass through a known point (e.g. Young's Modulus of iron with 0.00% chromium added is approximately 30 * 10 6 psi.) The least squares approximation may not pass through the desired point. This program compensates the slope and y-intercept to pass the best straight line through the desired point using either a least squares fit - or- a least distances fit. **Necessary Accessories for HP-41:** None

Steps: 177 HP-41 Bytes: 281

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02933-41-0	$10	$12
FOR HP-71*	02933-71-7	N/A	$14

02934 Nevins's Scantling Rules For Wooden Yachts

by W.E. Hitchins, Los Angeles, CA

Nevin's boatyard at City Island, New York, was considered one of the best in the United States for many years. The late Henry B. Nevins left behind a major contribution to boatbuilding by working out all the different sizes of members and fastenings for a wooden boat's structure. If his rules are strictly adhered to, they will produce an excellently built wooden boat, not too heavy and not too light. This program makes all the necessary calculations based on Nevins's rules when only the diplacement, load waterline, ballast weight and number of keel bolts are entered. **Necessary Accessories for HP-41:** Quad Module, Extended Functions Module, Extended Memory Module and Printer.

Steps: 1405 HP-41 Bytes: 3960

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02934-41-8	$10	$29
FOR HP-71	NOT AVAIL		

02935 Debtors Ageing Analysis

by K.C. Ng, St Saviour, Jersey Channel Islnd

This program analyzes a list of outstanding sales invoices or a list of debtor balances according to their relative ages to the current data. Results are output onto printer in columnar format with summary of totals for each period analysed. The weighted average number of days the debts are outstanding or debtor turnover rate will also be calculated. **Necessary Accessories for HP-41:** Time Module and Printer

Steps: 154 HP-41 Bytes: 357

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02935-41-5	$10	$12
FOR HP-71	NOT AVAIL		

02936 AASHTO Tee Pier Analysis

by D.S. Chilton, Anchorage, AK

This program will analyze a single column bridge pier (fixed, expansion, or monolithic) in accordance with 1977 AASHTO Specifications (including interims thru 1983). Output consists of axial load, longitudinal and transverse moments (Groups 1 thru 7) at base of column (service or load factor). Will also analyze spread or pile supported footing. **Necessary Accessories for HP-41:** Three memory modules or Quad Chip. Printer optional.

Steps: 719 HP-41 Bytes: 1484

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02936-41-3	$10	$17
FOR HP-71*	02936-71-0	N/A	$20

02937 True Frequency Response For a General Transfer Function

by A. Melimopoulos, Caracas, Venezuela

This program computes the true frequency response of any transfer function given as the quotient of two polynomials Q(s)/P(s) of any order or as the product of any number of complex and real poles and zeros placed on any part of the s-plane, there is no limitations on it. The program outputs the gain in decibels and the phase or the real and imaginary parts for a Nyquist diagram. **Necessary Accessories for HP-41:** One memory module

Steps: 267 HP-41 Bytes: 476

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02937-41-1	$10	$13
FOR HP-71*	02937-71-8	N/A	$14

02938 Rotor Total Mass and Moments of Inertia (S.I. Units)

by A.G. Thompson, Adelaide, SOUTH AUSTRALIA

The polar and diametral moments of inertia for a disk rotor plus its total mass are calculated by dividing the rotor up into concentric rings and summing the values for each ring. The required input data includes the material density, number of rings and the disk thickness at each radius. **Necessary Accessories for HP-41:** One memory module

Steps: 196 HP-41 Bytes: 307

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02938-41-9	$10	$12
FOR HP-71*	02938-71-6	N/A	$14

02939 Tidal Current Plotting

by R.P. Anderson, Port Townsend, WA

Given the standard tidal current predictions for any primary or secondary current station from NOAA or Canada Hydrographic tables, this program will develop a full calendar day of graphical representation of current vs. time of day. The program will also correctly represent a modified wave form which occurs in certain types of "hydraulic channels". **Necessary Accessories for HP-41:** Quad Memory Module if used with HP-41C, Card Reader, 82162A HP-IL Printer.

Steps: 927 HP-41 Bytes: 1661

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02939-41-7	$10	$18
FOR HP-71	NOT AVAIL		

02940 Undercut

by A.U. Witkowski, New York, NY

This is a number game to be played against the HP-41CV. Both players choose a number from one to five. If the difference is not exactly one, each number is added to each player's respective scores. Otherwise, the player with the lower number adds both to his score. **Necessary Accessories for HP-41:** None

Steps: 143 HP-41 Bytes: 338

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02940-41-5	$10	$12
FOR HP-71*	02940-71-2	N/A	$14

02941 Molecular Weight and Percent Composition

by C.A. Erickson, Princeton, NJ

Program calculates the molecular weight and percent composition of chemical compounds containing up to seven elements. Elements may have atomic numbers from 1 through 92. For hydrates, water may be considered to be an element. **Necessary Accessories for HP-41:** Extended Function Memory Module

Steps: 122 HP-41 Bytes: 222

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02941-41-3	$10	$12
FOR HP-71	NOT AVAIL		

02942 Domino Grid Puzzle

by M.E. Wong, San Francisco, CA

This program generates a 7x8 board of domino numbers. Your task is to divide 56 numbers into 28 tiles, so that every domino tile is used. It even supplies you with a solution to the puzzle. **Necessary Accessories for HP-41:** Extended Functions Module and 2 Memory Modules

Steps: 387 HP-41 Bytes: 830

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02942-41-1	$10	$17
FOR HP-71*	02942-71-8	N/A	$20

02943 Cannon

by M.E. Wong, San Francisco, CA

This program plays a fun and exciting war game. The object is to hide from enemy cannon fire. There are three different rounds and a few interesting features. **Necessary Accessories for HP-41:** Extended Functions module and one memory module

Steps: 304 HP-41 Bytes: 550

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02943-41-9	$10	$13
FOR HP-71*	02943-71-6	N/A	$14

02944 Herreshoff's Rules for Wooden Yachts

by W.E. Hitchins, Los Angeles, CA

Even to this day, yachtsmen speak with awe about boats designed by Nathanael G Herreshoff ("the Wizard of Bristol") who wrote down his rules for the construction of wooden yachts in 1927. This program calculates Herreshoff's five fundamental factors from the dimensions of the yacht and then provides a printout of the sizes of all the material necessary for building the wooden boat. The program uses an ingenious trick with extended memory to allow for the fact that it would normally be too long for the capacity of the HP-41. **Necessary Accessories for HP-41:** Quad-Four module; Extended Functions module; Extended memory module; HP-IL Loop; HP82162A Printer

Steps: 1039 HP-41 Bytes: 2994

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02944-41-7	$10	$25
FOR HP-71	NOT AVAIL		

02945 Properties of Thin Cold Formed Steel Sections Coord Input

by G.A. Kateiva, Perth, Australia

Program calculates centroid, second moment of area, product of inertia for selected axis of up to five straight sided cold formed steel sections of uniform thickness. Input the center line corner coordinates starting at the edge. Corner curvatures ignored. Accuracy can be improved by reducing the flanges by the fillet radius. **Necessary Accessories for HP-41:** Quad memory module

Steps: 361 HP-41 Bytes: 667

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02945-41-4	$10	$13
FOR HP-71*	02945-71-1	N/A	$14

02946 Morse Code Transmission at Variable Speeds

by R.E. Swanson, Portland, OR

With two sets of Tone combinations (for dits and dahs) and two execution speeds to select from, you can prepare machine-perfect Morse code sequences and transmit them at 5 to >20 words/min. With a full-capacity system (2 X-Mem. modules), up to 86 words may be transmitted uninterrupted. Fully subroutinable, with seven entry points for user's programs to access. Includes two application programs: Day-of-Week and Random Characters. Uses synthetic programming techniques to massage the system's return stack, but no knowledge of synthetics is needed to operate these programs. **Necessary Accessories for HP-41:** Quad Mem., Extended Functions modules. Optional: X-Mem. and Time Modules; printer (82143A or 82162A) or Video Interface w/HP-IL module. Card reader or wand required for loading the main program

Steps: 817 HP-41 Bytes: 1645

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02946-41-2	$10	$22
FOR HP-71	NOT AVAIL		

02947 Gasmix

by L. Soley, Wauwatosa, WI

This is an interactive program that determines heat contents of any number of gaseous mixtures having various mass flows at various temperatures. Each gaseous mixture can contain varying amounts of C02, C0, N2, 02, S02, and H20. Finally the total heat content and the temperature of the combined gases is determined. **Necessary Accessories for HP-41:** None

Steps: 330 HP-41 Bytes: 695

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02947-41-0	$10	$14
FOR HP-71*	02947-71-7	N/A	$16

02948 Retirement Planning

by R.H. Byrd, Gainesville, FL

This program illustrates both guaranteed and current interest rates on cash values for fixed (or continuous) deposits paid to a qualified retirement plan such as IRA, SEP-IRA, Keough, pension, profit sharing and TSA. It can also be used for non-qualified plans such as annuities and deferred compensation. Input includes client name, company and product name, expense factors, monthly income factors (ages 60 to 70). **Necessary Accessories for HP-41:** Extended Function Module and Printer

Steps: 527 HP-41 Bytes: 1582

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02948-41-8	$10	$19
FOR HP-71	NOT AVAIL		

02949 Schedule by Constraints With Extended Memory

by J.E. Schiermeier, Cary, NC

For a set of events, this program finds the logically consistent sequence, given a matrix showing which events must necessarily precede others. The ordered list of events is returned, and the ordered matrix remains in a file in extended memory. By using extended memory for the matrix, the program is considerably shorter than #2442C, Schedule by Constraints, and a larger number of events may be handled. **Necessary Accessories for HP-41:** Extended Functions memory module

Steps: 220 HP-41 Bytes: 368

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02949-41-6	$10	$12
FOR HP-71	NOT AVAIL		

02950 Symmetrical Component or Phase Calculations

by I. Tsalyuk, Fountain Valley, CA

This program converts three unbalanced vectors Va, Vb, Vc (Voltage, current or vectorlike impedance and admittance) into zero-, positive- and negative sequence symmetrical components Vasub0, Vasub1, Vasub2 or inverse. Vectors may be expressed either in polar (Magnitude V at angle theta) or Complex a+jb forms and converted from one form to another. **Necessary Accessories for HP-41:** Program is designed to be used with or without a printer

Steps: 118 HP-41 Bytes: 301

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02950-41-4	$10	$13
FOR HP-71*	02950-71-1	N/A	$14

02951 VHF/UHF Path Data Calculation by Bullington and Rice Methods

by J.B. Osow, La Plata, Argentina

This program is designed to solve mobil-base and base-base VHF/UHF radio path using K. Bullington and P.L. Rice methods. Computes: distance to horizon, losses by: earth curvature, D1D2D3 beyond line of sight, plane earth, free space, knife edge and rounded obstacle, trees and actual net gain at receiver port. Prompts for all important parameters involved in a well engineering system. Stores them in X-Module for review purpose. **Necessary Accessories for HP-41:** Two memory modules and X-Module. Card Reader convenient.

Steps: 709 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02951-41-2	$10	$17
FOR HP-71	NOT AVAIL		

02952 Ft, In, 1/16ths Right Triangle and Arithmetic

by J.C. Leyerle, Aurora, CO

This program allows entry of dimensions in feet, inches, and sixteenths of an inch (FIS), and addition, subtraction, multiplication, and division using RPN logic. Also, right triangles are solved in FIS given any two sides, or an angle and a side. Format for FIS is aa.bbcc, where aa equals feet, bb equals inches (to 99), and cc equals sixteenths of an inch (to 99). **Necessary Accessories for HP-41:** None

Steps: 208 HP-41 Bytes: 343

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02952-41-0	$10	$12
FOR HP-71*	02952-71-7	N/A	$14

02953 Level Reduction With Optional Adjustment

by R. Belford, Nedlands, Australia

This program will reduce observations in a level traverse and, at the user's request, will store and then adjust the RL's of the change points only, not any intermediate shots. Intermediate shots are output immediately after input, while the change points are numbered in the final output. **Necessary Accessories for HP-41:** Memory Modules = Int 1+(n+4)/64

Steps: 145 HP-41 Bytes: 281

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02953-41-8	$10	$12
FOR HP-71*	02953-71-5	N/A	$14

02954 Earnings Per Share

by G. Naughton, Wellington, New Zealand

Calculates fully diluted earnings per share, incorporating provision for convertible notes, specified preference shares and share issue during period. **Necessary Accessories for HP-41:** Printer optional

Steps: 100 HP-41 Bytes: 220

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02954-41-6	$10	$11
FOR HP-71*	02954-71-3	N/A	$12

02955 Think a Dot

by P. Kokol, Maribor, Yugoslavia

This program simulates the one person game "Think a Dot". The user can choose any initial or end position. If he/she can't find the solution the calculator will do that for the user. Two algorithms are presented for this purpose. First probably finds (not always) the shortest solution, but requires more execution time. The second algorithm requires less time but the solution is not optimal. **Necessary Accessories for HP-41:** Two memory modules, X-Functions Module, X-Memory Module

Steps: 459 HP-41 Bytes: 851

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02955-41-3	$10	$14
FOR HP-71	NOT AVAIL		

02956 Factor of Safety

by A. Segall, Broomall, PA

This program calculates the factor of safety for two stress states: simple, normal and combined stress. When the load is steady a factor of safety is calculated for both ductile and brittle materials. For cyclic loading on shafts the maximum shear theory is used. **Necessary Accessories for HP-41:** None

Steps: 177 HP-41 Bytes: 311

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02956-41-1	$10	$12
FOR HP-71*	02956-71-8	N/A	$14

02957 Sequential Analysis of Negative Binomial Distribution Data

by D. Vargo, Pago Pago, AS

Sequential analysis serves to classify populations rather than to provide estimates of population parameters. It is particularly applicable to surveys - most notably, agricultural pest surveys. Such surveys are the first line of attack in minimizing losses by destructive pests. Many pest populations fit a negative binomial distribution making sequential analysis widely applicable and very useful. **Necessary Accessories for HP-41:** None

Steps: 127 HP-41 Bytes: 131

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02957-41-9	$10	$11
FOR HP-71*	02957-71-6	N/A	$12

02958 Steel Beam Web Opening Design

by R. Chiang, Seattle, WA

This program uses the elastic method to analyse and design steel beam web openings. The assumptions are: (1) Concrete doesn't take shear force. (2) Shear distributed by shear area to the top and bottom tees. Users are allowed to put and change stiffeners at three locations. **Necessary Accessories for HP-41:** Four Memory Modules

Steps: 1020 HP-41 Bytes: 1783

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02958-41-7	$10	$18
FOR HP-71*	02958-71-4	N/A	$22

02959 Intersection

by R.P. Harwig, APO New York, NY

This program is used in map reading to determine an unknown point in the UTM grid coordinate system given the location of two known points and the azimuths from those points to the unknown point. **Necessary Accessories for HP-41:** None

Steps: 114 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02959-41-5	$10	$11
FOR HP-71*	02959-71-2	N/A	$12

02960 Coordinate Inverse Traverse

by R. Belford, Nedlands, Australia

Coordinate inverse traverse calculates bearing and distance between two coordinated points. It stores the final of the two points so as to be used for calculating the bearing and distance to the next point without re-input of coordinates. It also calculates the area of the figure (only meaningful for closed traverses). **Necessary Accessories for HP-41:** None

Steps: 124 HP-41 Bytes: 241

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02960-41-3	$10	$12
FOR HP-71*	02960-71-0	N/A	$14

02961 Solar Coordinates

by K.G. Hart, Sherwood, MI

This program calculates the solar coordinate of Greenwich hour angle and declination. These coordinates are calculated to an accuracy of +.5 minute and can be utilized for position fixing to a point within 1/2 mile. **Necessary Accessories for HP-41:** None

Steps: 132 HP-41 Bytes: 270

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02961-41-1	$10	$12
FOR HP-71*	02961-71-8	N/A	$14

02962 Number Guessing Game

by R.F. Morgan, Rockville, MD

This program is both fun and educational, and with its varying levels of difficulty, it can be quite challenging. It is very user friendly, and anyone can play the game without ever refering to instructions. It also tells how many trials taken, and player can give up and see number. It is good for number concept for young children, as "TOO HIGH" and "TOO LOW" messages give number familiarity. **Necessary Accessories for HP-41:** Card reader helpful.

Steps: 98 HP-41 Bytes: 228

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02962-41-9	$10	$12
FOR HP-71*	02962-71-6	N/A	$14

02963 Tic-Tac-Toe

by D. Ristanovic, Belgrade, YUGOSLAVIA

This is probably the shortest tic-tac-toe program you are going to see: under 300 bytes. Still, it plays perfectly - HP-41 will apply all the tricks to win if you make a single mistake. I was so sure that the player cannot win that I did not include an "I LOSE" prompt! **Necessary Accessories for HP-41:** None

Steps: 142 HP-41 Bytes: 299

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02963-41-7	$10	$12
FOR HP-71*	02963-71-4	N/A	$14

02964 Rebars Calculation at Rectangular Concrete Sections

by R. Chang, Seattle, WA

When a rectangular concrete section is given and the design moment is calculated, the tension reinforcements can be computed by the ultimate strength method and restricted by ACI code provisions. This program is written for this purpose. **Necessary Accessories for HP-41:** None

Steps: 149 HP-41 Bytes: 278

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02964-41-5	$10	$12
FOR HP-71*	02964-71-2	N/A	$14

02965 Arithmetic Operations of Electrical Quantities

by I. Tsalyuk, Fountain Valley, CA

This program calculates: +, -,*, /,1/X, X**2, X**1/2, y**X for complex electrical quantities in rectangular and/or polar form. The result may be flag controlled by an outside program for chain calculations or converted between rectangular, polar and exponential form. Functions active in USER mode, automatically assigned to their own keys and uses no storage registers. **Necessary Accessories for HP-41:** Card reader optional

Steps: 142 HP-41 Bytes: 301

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02965-41-2	$10	$12
FOR HP-71*	02965-71-9	N/A	$14

02966 Inverse Gamma Function

by T.S. Hiers, Bala-Cynwyd, PA

Given gamma(x) in the range of 2 to 9E99, this program calculates the inverse, or x, to four decimal places. If x is an integer, subtract one to get the inverse factorial. Taking only 24 registers of program memory, it requires no data storage registers and allows recovery of the input value. **Necessary Accessories for HP-41:** None

Steps: 59 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02966-41-0	$10	$11
FOR HP-71*	02966-71-7	N/A	$12

02967 Exponencial Curve Fit

by E. Heying, Waterloo, IA

This program calculates the equation (as accurately as possible) of p data points (>1). It allows error recovery and x and y predictions (given x or y). Equation in the form y=ae

bx. **Necessary Accessories for HP-41:** None

Steps: 133 HP-41 Bytes: 212

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02967-41-8	$10	$11
FOR HP-71*	02967-71-5	N/A	$12

02968 Linear Regression

by E. Heying, Waterloo, IA

This program calculates the equation (approx) of 2 data points (2>0). It can correct errors and predict y given x and x given y. Equation in form y=mx+b. It calculates

12

2 (error) too. **Necessary Accessories for HP-41:** None

Steps: 128 HP-41 Bytes: 223

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02968-41-6	$10	$11
FOR HP-71*	02968-71-3	N/A	$12

02969 Complex Quadratic Equation

by E. Heying, Waterloo, IA

This program find the real or complex roots of a quadratic equation of the form Zx 2+Bx+C=0, for real or complex values of A, B,C. **Necessary Accessories for HP-41:** Mathematics Pac

Steps: 51 HP-41 Bytes: 90

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02969-41-4	$10	$11
FOR HP-71	NOT AVAIL		

02970 Extended Star Trek

by J. Warner, Chicago, IL

This is a greatly expanded version of program #41-01321. All the features of Advanced Star Trek, non-print version, are included, plus far more detailed alpha text and adjustable game level. New routines include: intruder alert, ion storm/meteor field, evasive and attack maneuvers, implosion and more. **Necessary Accessories for HP-41:** Quad Memory Module, Extended Functions Module and one Extended Memory Module

Steps: 2001 HP-41 Bytes: 2072

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02970-41-2	$10	$33
FOR HP-71	NOT AVAIL		

02971 Structural Frame Analysis

by R. Winkel, Columbia, MO

The program analyzes a frame of up to six spans for dead load plus alternate and adjacent live load conditions. Included in the resulting printout are maximum and minimum moments for beams and columns, dead and total load beam reactions. The program can also be used for total load conditions only. The program is separated into two parts. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK. **Necessary Accessories for HP-41:** HP-41CV or equivalent. Extended Functions Module, two Extended Memory Modules, HP-IL Module, Cassette Drive and Thermal Printer

Steps: 1411 HP-41 Bytes: 3255

	Order Program No.	Documentation Only	W/Media
FOR HP-41	02971-41-0	N/A	$20
FOR HP-71	NOT AVAIL		

02972 Street Consumption Research

by R. Belling, Jersey City, NJ

Program permits the user to keep simultaneous tallies of up to 3 kinds of events through 3 keys (e.g., C = Any adult, D = Cigar Smoker, E = Cigarette smoker passing by), and can record up to 5 groups of such tallies, each with prompted survey location (6 characters max.), date, beginning and end time. Applicable to street consumers passing demarcation line across sidewalk, or types of litter along a block. **Necessary Accessories for HP-41:** None

Steps: 112 HP-41 Bytes: 224

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02972-41-8	$10	$11
FOR HP-71*	02972-71-5	N/A	$12

02973 Comprehensive Acid-Base Analysis "AB"

by J.C. Meeroff, Coral Springs, FL

This program computes all acid-base parameters and gives the appropriate diagnosis for a given set of values. It also calculates the amount of acid or base needed for appropriate correction of abnormal values and computes the anion gap. The program requests input of any two of the five acid-base parameters (pH, CH +, PC0sub2 TCOsub2 and [HC0sub3], plus body temperature in centigrades, hemoglobin in g/dl, weight in Kg and [Na +], [K +] and [Cl -] in mEq/L. The program will adjust values for any given body temperature. **Necessary Accessories for HP-41:** HP-41CV or equivalent memory accessories

Steps: HP-41 Bytes: 613

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02973-41-6	$10	$19
FOR HP-71*	02973-71-3	N/A	$22

02974 Ionic Strength of Weak Acid Solution

by D. Vargo, Pago Pago, AS

In thermodynamic equations for non-ideal solutions and in accurate kinetic work involving charged reactants or acid-base catalysis, knowledge of the ionic strength is necessary. At a given concentration and pH, this program calculates ionic strength. It may also be used to display the fraction of each anionic species for neutral salts and weak acid solutions having monovalent cations. **Necessary Accessories for HP-41:** None

Steps: 128 HP-41 Bytes: 224

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02974-41-4	$10	$11
FOR HP-71*	02974-71-1	N/A	$12

02975 Over- determined System of Linear Equations

by J.E. Shisley, Pasadena, CA

Systems of equations with more equations than unknowns are solved by minimizing the least square of residuals. Program produces exact solution if system is consistent. Up to eight Unknowns with 11 equations, or more equations with fewer unknowns. Routine for matrix correction. Uses Math Pac, (or substitute your subroutine) to solve NXN system. **Necessary Accessories for HP-41:** Quad Memory, Math Application Pac

Steps: 232 HP-41 Bytes: 441

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02975-41-1	$10	$12
FOR HP-71	NOT AVAIL		

02976 Weight and Moment Calculations

by B. Johnson, Port Orchard, WA

This program calculates the vertical, longitudinal and transverse centers of gravity for adding or removing weights from a boat. Number of entries is unlimited. **Necessary Accessories for HP-41:** None

Steps: 142 HP-41 Bytes: 302

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02976-41-9	$10	$12
FOR HP-71*	02976-71-6	N/A	$14

02977 Xbarr

by S.C. Cochran, Lynchburg, VA

This program is designed to calculate group averages and ranges then calculating the grand average. It will provide outputs of the upper and lower control limits for both the average and range sections of a control chart. It will also provide an estimate of + 3 sigma. **Necessary Accessories for HP-41:** One memory module for the HP-41C. Printer Optional.

Steps: 242 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02977-41-7	$10	$13
FOR HP-71*	02977-71-4	N/A	$14

02978 Ring Loaded Symmetric to a Transverse Axis

by N.S. Tanner, Elizabethton, TN

This program solves for the bending moment, axial force and shear at any angular location around a circular ring subjected to a loading symmetric to a transverse axis. The loading consists of pairs of concentrated forces applied normal to the ring at any set of angular locations, and of resisting tangential shear resultants applied symmetrically along the circumference. **Necessary Accessories for HP-41:** One memory module or equivalent

Steps: 247 HP-41 Bytes: 377

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02978-41-5	$10	$12
FOR HP-71*	02978-71-2	N/A	$14

02979 Natural Gas Pipeline: Pressure and Temperature vs Length

by S. Hsu, Omaha, NE

Program incorporates Joule-Thomson effect to determine pressure-temperature- length relationship for long natural gas pipelines. Simplified Berthelot equation of state is used to obtain gas compressibility factor and Joule-Thomson coefficient. Input requires flowrate, specific gravity, heat capacity, initial pressure and temperature, pipe diameter and length, temperature of surroundings, and overall heat transfer coefficient between pipe and surroundings. **Necessary Accessories for HP-41:** Printer 82143A

Steps: 300 HP-41 Bytes: 614

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02979-41-3	$10	$13
FOR HP-71	NOT AVAIL		

02980 Breakeven Analysis

by E.M. Keefe, Ankeny, IA

BRKEVN presents an interchangeable solution for any of the 5 variables in the breakeven analysis problem. It differs from program HP Solutions Book "Business Stat/Marketing, Sales": top-row keys are used to represent the 5 variables: fixed cost, variable cost, price, units, profit. Integral units are used; the breakeven point may thus be bracketed by the number of units on either side of the breakeven point. **Necessary Accessories for HP-41:** None

Steps: 126 HP-41 Bytes: 224

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02980-41-1	$10	$11
FOR HP-71*	02980-71-8	N/A	$12

02981 Design of Structural Sections For Flexible Pavement

by R.D. McNew, San Luis Obispo, CA

Program calculates the structural layer thicknesses for asphalt concrete, aggregate base and aggregate subbase using the California Method for flexible pavement design. **Necessary Accessories for HP-41:** None

Steps: 121 HP-41 Bytes: 261

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02981-41-9	$10	$12
FOR HP-71*	02981-71-6	N/A	$14

02982 Elliptical-Stress

by A. Segall, Broomall, PA

This program solves cases 10a and 10b of table 37 in Roark: Elastic stresses and stress concentrations from a central elliptical hole in a member of rectangular cross section. The two loading conditions are axial tension and in plane bending. **Necessary Accessories for HP-41:** None

Steps: 182 HP-41 Bytes: 331

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02982-41-7	$10	$12
FOR HP-71*	02982-71-4	N/A	$14

02983 Hole-Stress

by A. Segall, Broomall, PA

This program solves for the elastic stresses and stress concentrations from an off-center hole in a member of rectangular cross section. The two loading conditions are axial tension and in plane bending. This is cases 8a and 8b of table 37 in Roark. **Necessary Accessories for HP-41:** None

Steps: 202 HP-41 Bytes: 338

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02983-41-5	$10	$12
FOR HP-71*	02983-71-2	N/A	$14

02984 Cone-Stress

by A. Segall, Broomall, PA

This program solves for the membrane stresses and deformations in a cone filled with a liquid of known density. Solutions are available for both above and below the fluid level. The cone has a tangential edge support. **Necessary Accessories for HP-41:** One memory module

Steps: 313 HP-41 Bytes: 396

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02984-41-3	$10	$12
FOR HP-71*	02984-71-0	N/A	$14

02985 Pressure Drop With Fully-Developed Flow

by N. Nanji, Ann Arbor, MI

Pressure drop with fully-developed flow is a function of the fluid density, friction factor, Pipe diameter, pipe length and fluid velocity. Given any five of the above variables, this program will calculate the sixth variable. **Necessary Accessories for HP-41:** None

Steps: 91 HP-41 Bytes: 154

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02985-41-0	$10	$11
FOR HP-71*	02985-71-7	N/A	$12

02986 Flow Rate as a Function of Pressure Drop

by N. Nanji, Ann Arbor, MI

Volumetric flowrate for fully-developed laminar flow in a horizontal pipe may be expressed as a function of pressure drop, pipe diameter, pipe length and the fluid viscosity. Given four of these values, the program calculates the fifth variable. A useful program for design of pipes where a constant pressure gradient can be expected. **Necessary Accessories for HP-41:** None

Steps: 78 HP-41 Bytes: 137

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02986-41-8	$10	$11
FOR HP-71*	02986-71-5	N/A	$12

02987 Head Loss in Turbulent Flow

by N. Nanji, Ann Arbor, MI

Head loss in turbulent flow is a function of the friction factor, pipe length, pipe diameter, and fluid velocity. Given four of the five variables, this program calculates the fifth for major and minor head loss. **Necessary Accessories for HP-41:** None

Steps: 80 HP-41 Bytes: 133

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02987-41-6	$10	$11
FOR HP-71*	02987-71-3	N/A	$12

02988 Conduit Outlet Protection (Rip Rap)

by L.M. Seaman, Leonardo, NJ

This program finds the required length of the apron, the width of the outlet end of the apron and the maximum size of stone to be used. Given: pipe discharge "Q", pipe diameter and tail water depth above the invert of the culvert. **Necessary Accessories for HP-41:** None

Steps: 104 HP-41 Bytes: 266

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02988-41-4	$10	$12
FOR HP-71*	02988-71-1	N/A	$14

02989 Composite Steel Beam and Concrete Slab

by R.D. Queiroz, Palos Verdes, CA

Design of composite beam per AISC specifications for unshored and shored construction. Considers partial composite action and condition where neutral axis lies within the concrete slab. Provides design information on trans- formed section modulus and moment of inertia, location of nuetral axis, number of stud anchors and concrete stress. Does not consider cover plates. Has editing features for reviewing and changing inputs. **Necessary Accessories for HP-41:** None

Steps: 495 HP-41 Bytes: 951

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02989-41-2	$10	$15
FOR HP-71*	02989-71-9	N/A	$18

02990 Dive Tables

by M.N. Starnbach, Cincinnati, OH

This program calculates no-decompression limits for the SCUBA diver. In addition, it calculates repetitive group designation, surface interval credit, and no-decompression limits for one repetitive dive. Program is based on U.S. Navy tables and supports dives to 140 feet. **Necessary Accessories for HP-41:** HP-41CV, Extended Functions/Memory Module and two Extended Memory Modules. Card reader very strongly recommended.

Steps: 168 HP-41 Bytes: 430

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02990-41-0	$10	$26
FOR HP-71	NOT AVAIL		

02991 Effectiveness of Heat Exchangers

by N. Nanji, Ann Arbor, MI
M. Engelsman, Ann Arbor, MI

Given the thermal capacitance of the two fluids, and the number of transfer units (NTU), this program calculates the effectiveness of six different kinds of heat exchangers, namely the parallel-flow, counter-flow, shell-and- tube with one shell and any multiple of two tube passes, shell-and-tube with two shell passes and any multiple of four tube passes, single-pass cross flow with both fluids mixed, and single-pass cross flow with one fluid mixed and the other unmixed. **Necessary Accessories for HP-41:** None

Steps: 216 HP-41 Bytes: 322

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02991-41-8	$10	$12
FOR HP-71*	02991-71-5	N/A	$14

02992 Gunning Fog Index

by D. Vargo, Pago Pago, AS

The Gunning Fog Index determines the reading difficulty of prose by measuring the length of sentences and counting the number of long words. Results correspond to reading grade levels in U.S. schools, although the index can be used by writers of English from other countries. **Necessary Accessories for HP-41:** None

Steps: 51 HP-41 Bytes: 146

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02992-41-6	$10	$11
FOR HP-71*	02992-71-3	N/A	$12

02993 Amplifier With Small Signal in the Low Frequency Transistor

by I.R. Aizcorbe, Madrid, Spain

With this program you can compute the performances of a low frequency transistor amplifier, gains and impedances, for different values of the components. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 300 HP-41 Bytes: 392

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02993-41-4	$10	$12
FOR HP-71*	02993-71-1	N/A	$14

02994 2-Way Anova No Reps With Row and Col Stx (Avg, S, Min, ...

by R. Zuiker, Zion, IL

Basically a 2-way ANOVA with no reps, this program features a full range of descriptive statistics (mean, sdev, min, max, range) for each row (up to 13) and column (no. unlimited) plus a rapid data entry/correction routine and ANOVA table complete with components of variance. **Necessary Accessories for HP-41:** Quad Memory Module and printer

Steps: 744 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02994-41-2	$10	$17
FOR HP-71	NOT AVAIL		

02995 Fit of Negative Binomial Distribution to Biological Data

by D. Vargo, Pago Pago, AS

Many biological phenomena closely follow a negative binomial distribution. For example, insect populations infesting a field or a forest compare closely to this distribution. This has made study of pest population distributions an important part of Integrated Pest Management programs for farmers, foresters and agricultural extension officers. **Necessary Accessories for HP-41:** None

Steps: 168 HP-41 Bytes: 245

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02995-41-9	$10	$12
FOR HP-71*	02995-71-6	N/A	$14

02996 View Manipulation and Projection

by D. Vargo, Pago Pago, AS

This program allows the manipulation of a three-dimensional object so it may be viewed from any desirable angle. By supplying the 3-D lattice coordinates, the program provides 2-D coordinates to render the 3-D object's image on paper (or a screen). **Necessary Accessories for HP-41:** None

Steps: 76 HP-41 Bytes: 128

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02996-41-7	$10	$11
FOR HP-71*	02996-71-4	N/A	$12

02997 Complex 41

by A. Melimopoulos, Caracas, Venezuela

This program converts your calculator into a complex one allowing you to handle four complex numbers in an automatic complex stack defined by the program and you are not limited to work in one mode (polar or rect.) the program allows you to work on both simultaneously. The program provides you the following functions: (+9, (-), (X), (/), S//, 1/x, Y**X, X**N, X**1/N, LOGn, N**X, LN, EXP(X), SIN, COS, TAN, SINH, COSH, TANH and their inverses, VIEW, STO, RCL, ENTER, RDN, CLX & X<>Y. All these functions are subroutines that work fast and accordingly with the complex stack. You can get out of the program and rtn back without altering the stack and see both parts of the number disp. **Necessary Accessories for HP-41:** None

Steps: 445 HP-41 Bytes: 725

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02997-41-5	$10	$14
FOR HP-71*	02997-71-2	N/A	$16

02998 Gauss Quadrature

by E. Heying, Waterloo, IA

This program will compute approximations for integrals over finite or infinite intervals by the sixpoint Gauss-Legendre quadrature method. **Necessary Accessories for HP-41:** Math Pac (by a slight modification - included - you can avoid having the Math Pac as a necessary accessory).

Steps: 110 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02998-41-3	$10	$12
FOR HP-71	NOT AVAIL		

02999 Timecard Calculator

by A.U. Witkowski, New York, NY

This program calculates total regular and overtime hours based on time-in and time-out inputs from a punched timecard. Either 40+ per week or 8+ per day may be considered overtime. Error key may be used for last set of time-ins and time-outs. Totals may be printed with or without a name of up to twenty-four letters. **Necessary Accessories for HP-41:** Printer optional

Steps: 150 HP-41 Bytes: 417

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	02999-41-1	$10	$12
FOR HP-71*	02999-71-8	N/A	$14

03002 Fast Delta to X and Y to Delta Complex Conversions

by A. Melimopoulos, Caracas, Venezuela

Given the three complex impedances of a Delta or Y load, this program rapidly calculates the equivalent impedances of the other type load. The complex impedances can be in rectangular or in polar form. The program prompts for all inputs. **Necessary Accessories for HP-41:** None

Steps: 152 HP-41 Bytes: 254

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03002-41-3	$10	$12
FOR HP-71*	03002-71-0	N/A	$14

03003 Polynomial Curve Fitting

by A.L.W. Ann, Halifax, Canada

This program will determine the coefficients of a(i) for i=0, 1,2 ... N, of the desired N-order polynomial curve fitting. It can handle polynomial equations up to order 1 less than or equal to N less than or equal to 13. This computation requires matrix pivoting as a subroutine (Math modules). For N=1 to 4 requires one memory module. **Necessary Accessories for HP-41:** Math module. Quad module for higher order N.

Steps: 174 HP-41 Bytes: 242

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03003-41-1	$10	$12
FOR HP-71	NOT AVAIL		

03004 Raytrace II:General Case

by C. Rusquellas, Buenos Aires, Argentina

Given an optical system conformed by a set of any type of revolution surfaces (spheric, conic or polinomics of any order) this program computes the exact trajectories of the equivalent to 93 rays, for an object at infinite distance and for any entrance angle. The table of the output coordinates of each ray, and the spot diagram, can be printed or shown on the TV screen, if TV interface is used. **Necessary Accessories for HP-41:** HP-41CV; X-Func Module; two X-Memory modules; HP-IL module; HP 82162A printer; HP 82163 Video Interface (optional).

Steps: 1206 HP-41 Bytes: 1987

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03004-41-9	$10	$21
FOR HP-71	NOT AVAIL		

03005 Fast Polynomial Multiplication

by A. Melimopoulos, Caracas, Venezuela

This program performs the multiplication of two polynomials of any degree and leaves the solution in memory so you can multiply it with other polynomials of any degree. This program uses a very fast algebra algorithm implemented on big computers. **Necessary Accessories for HP-41:** Memory modules for polynomials of high degree

Steps: 130 HP-41 Bytes: 198

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03005-41-6	$10	$11
FOR HP-71*	03005-71-3	N/A	$12

03006 Power Curve Fit

by E. Heying, Waterloo, IA

This program fits a set of data points (>0) to a power curve. It also finds the coefficient of regression, and calculates x-estimate from y and y-estimate from X. It makes full use of alphanumeric capabilities and local labels. **Necessary Accessories for HP-41:** None

Steps: 130 HP-41 Bytes: 209

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03006-41-4	$10	$11
FOR HP-71*	03006-71-1	N/A	$12

03007 External Ballistics - 3, Kick

by O.X. Dobnick, Milwaukee, WI

This program solves some of the more important factors such as MUZZLE ENERGY, TRAJECTORY, BULLET FLIGHT TIME, IMPULSE, RECOIL VELOCITY, RECOIL ENERGY (KICK), IMPULSE, RECOIL VELOCITY, and RECOIL ENERGY (KICK). Should be of interest to black powder shooters as computations can be made for black powder and for smokeless powders. **Necessary Accessories for HP-41:** None. Card Reader useful.

Steps: HP-41 Bytes: 111

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03007-41-2	$10	$11
FOR HP-71*	03007-71-9	N/A	$12

03008 Polynomial Products

by E.M. Keefe, Ankeny, IA

Input, with prompting, the coefficients of two algebraic expressions. Get the coefficients of the product as output: some "What if" capabilities are incorporated. **Necessary Accessories for HP-41:** Ext. Func. Module and one memory module

Steps: 193 HP-41 Bytes: 334

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03008-41-0	$10	$12
FOR HP-71	NOT AVAIL		

03009 Polynomial Division

by E.M. Keefe, Ankeny, IA

Poly% prompts for the coefficients of two algebraic expressions: a numerator and a denominator the output is the quotient and remainder's coefficients. The use of the top row keys gives some "What If" capabilities. **Necessary Accessories for HP-41:** One memory module and Extended Functions Module

Steps: 224 HP-41 Bytes: 389

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03009-41-8	$10	$12
FOR HP-71	NOT AVAIL		

03010 Full Evaluation of Geometric Progressions

by S. Diina, Grottaferrata, ITALY

When given n contiguous terms in a geometric progression, five quantities can then be defined: number of terms, value of 1-st and n-th term, ratio, and sum of all n terms. The program, given at least three of the above quantities, will print or display these with the remaining unknowns. The program can also be easily called as a subroutine by another program. All possible combinations of input with changing values have been tested. **Necessary Accessories for HP-41:** One memory module

Steps: 296 HP-41 Bytes: 431

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03010-41-6	$10	$12
FOR HP-71*	03010-71-3	N/A	$14

03011 Full Evaluation of Arithmetic Progressions

by S. Diina, Grottaferrata, ITALY

Given n contiguous terms of an arithmetic progression, five quantities are usually defined: number of terms, value of 1-st and n-th term, difference or ratio, and total sum of terms. The program asks for at least three of the above quantities, and then prints or displays these with the remaining unknowns. The program can also be easily called as a subroutine by another program. All possible combinations of input with different values have been tested. **Necessary Accessories for HP-41:** None

Steps: 247 HP-41 Bytes: 368

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03011-41-4	$10	$12
FOR HP-71*	03011-71-1	N/A	$14

03012 Least Squares Polynomial Regression

by S. Diina, Grottaferrata, ITALY

Up to 14 points may be interpolated by this program, using the least squares method. Given N, the program asks sequentially for N 2-dimensional points, computes and stores elements for NP+1 simultaneous equations, and then outputs coefficients of the N degree regression polynomial. Via an entry point, may be called as a subroutine by another program. Projections of X computed, either by keyboard or by program. Compact (uses PVT routine in Math Pac I), printer compatible, requires (N 2+2N*15) 61 regs. **Necessary Accessories for HP-41:** Math Pac, Memory Modules as needed

Steps: 173 HP-41 Bytes: 300

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03012-41-2	$10	$12
FOR HP-71	NOT AVAIL		

03013 Tally Opinionaires and Report Writer

by R.E. Swanson, Portland, OR

This program facilitates tallying of options chosen by respondents to objective items, processes the data, and writes reports. Specifications: –Capacity? Up to 54 items. –Number of options per item? Up to six. –Subgroups possible? Yes, if X-Functions ROM exists. –Weight factors? Yes, either default or user-defined. –Reports? Fractional Distribution (with or without statistics), and t-Test for Two Means. The tally section uses 7 synthetic TONES, but alternate TONES are suggested so the program may be readily keyed in. **Necessary Accessories for HP-41:** Quad memory module; X-Functions module (only if respondents are separated into two or more subgroups). Printer helpful.

Steps: 873 HP-41 Bytes: 1869

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03013-41-0	$10	$18
FOR HP-71	NOT AVAIL		

03014 Seven Card Stud/Baseball Poker

by M.E. Wong, San Francisco, CA

This program plays a two player game of both seven card stud and baseball poker. It uses a security system to prevent your opponent from viewing your hand. It also allows betting, and it keeps track of the two players' banks and game pot. **Necessary Accessories for HP-41:** Extended Functions

Steps: 818 HP-41 Bytes: 1661

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03014-41-8	$10	$18
FOR HP-71	NOT AVAIL		

03015 Treasure Search

by M.E. Wong, San Francisco, CA

This program, with its "arcade-like displays", plays an interesting search game. The object is to get to a treasure box. But be careful; the treasure has three guards to protect it, and it's booby trapped. As the player, each man that you send out in search of the treasure is armed with five bombs which can eliminate all three of the guards. Since this program uses the display as a game board, no paper and pen is needed. **Necessary Accessories for HP-41:** Extended Functions Module

Steps: 492 HP-41 Bytes: 984

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03015-41-5	$10	$15
FOR HP-71	NOT AVAIL		

03016 Conversion From Upper Case to Lower Case Letters

by M.E. Wong, San Francisco, CA

This program converts upper case alphabets in an ASCII file in extended memory to lower case alphabets. Also, with this program is a small editor program that allows easier inserting and deleting of ASCII characters than the HP-41CX text editor. It also enables the user to add non-keyboard characters into an ASCII file. **Necessary Accessories for HP-41:** HP-41CX. An 82162A Printer would be useful.

Steps: 185 HP-41 Bytes: 332

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03016-41-3	$10	$14
FOR HP-71*	03016-71-0	N/A	$16

03017 Magnetic Variation in Australia

by P. Gustafson, Canberra, Australia

This program calculates magnetic declination (variation of the compass) from an output of Latitude and Longitude. The program can be used as a subroutine for navigation programs. **Necessary Accessories for HP-41:** One memory module

Steps: 184 HP-41 Bytes: 459

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03017-41-1	$10	$13
FOR HP-71*	03017-71-8	N/A	$14

03018 INCR

by M. Ludwig, Oberkorn, Luxemburg

This program calculates all the other exposure times of increased photos knowing one status that works: you must find out one exp. time by a manual test. **Necessary Accessories for HP-41:** None

Steps: 74 HP-41 Bytes: 205

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03018-41-9	$10	$11
FOR HP-71*	03018-71-6	N/A	$12

03019 Newton

by M. Ludwig, Oberkorn, Luxemburg

This program calculates the coefficients of any polynome knowing it under the following form: (aX+b) n the solution is:A(n)X n+A(n-1)X (n-1)+.....+A(1)X+A(o)=o **Necessary Accessories for HP-41:** None

Steps: 66 HP-41 Bytes: 122

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03019-41-7	$10	$11
FOR HP-71*	03019-71-4	N/A	$12

03020 Vieta

by M. Ludwig, Oberkorn, Luxemburg

This program calculates the coefficients of any polynome if you know all the real roots. It makes use of the theoreme de VIETA. **Necessary Accessories for HP-41:** None

Steps: 93 HP-41 Bytes: 164

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03020-41-5	$10	$11
FOR HP-71*	03020-71-2	N/A	$12

03021 Chemistry Quantitative Analysis

by M. Ludwig, Oberkorn, Luxemburg

Having a solution of a substance A in the solvent B in a certain concentration you calculate all the other concentration units with this program. **Necessary Accessories for HP-41:** None

Steps: 118 HP-41 Bytes: 274

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03021-41-3	$10	$12
FOR HP-71*	03021-71-0	N/A	$14

03022 PR?

by M. Ludwig, Oberkorn, Luxemburg

Using a special list this program divides all numbers in the corresponding prime numbers. This program runs rather fast. **Necessary Accessories for HP-41:** None

Steps: 101 HP-41 Bytes: 161

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03022-41-1	$10	$13
FOR HP-71*	03022-71-8	N/A	$14

03023 FAC

by M. Ludwig, Oberkorn, Luxemburg

This program is an extension of the FACT function of the HP-41. This program gives good approximations for great numbers, even greater than 69. The program has two possibilities: -FA is correct up to the 5th position behind the decimal point -FAC is correct up to the 7th position behind the decimal point. Both routines only work in the stack. **Necessary Accessories for HP-41:** None

Steps: 72 HP-41 Bytes: 104

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03023-41-9	$10	$11
FOR HP-71*	03023-71-6	N/A	$12

03024 ROM

by M. Ludwig, Oberkorn, Luxemburg

This program gives an approximation of the derivation, at a certain point, of any function. dy — =F'(x) is calculated at Xo using the Romberg method. dx **Necessary Accessories for HP-41:** None

Steps: 113 HP-41 Bytes: 197

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03024-41-7	$10	$11
FOR HP-71*	03024-71-4	N/A	$12

03025 Ten Kilometer Runner's Tally

by S.R. Tenney, Corvallis, OR

Organizers of community running events may store up to 262 runner's initials, entry #s and finishing times. By use of extended memory and Text Editor, runner's initials are stored before the race. With Stopwatch mode times are stored in registers corresponding to entry number. After the race is complete results are printed out on a thermal printer in neat readable format. This is actually a package of 4 programs; 1) for entering initials, 2) for setting up stopwatch mode and storing respective finishing times into data registers, 3) for formatting and printing out the results, 4) appending program for adding initials of who decide to enter the race at last minute. **Necessary Accessories for HP-41:** HP-41C with Quad memory module, Extended Functions/Ex Memory module, Timer module and a thermal printer.

Steps: 137 HP-41 Bytes: 349

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03025-41-4	$10	$13
FOR HP-71	NOT AVAIL		

03026 Critical Path Method With Progress

by J.E. Schiermeier, Cary, NC

This program finds the critical path, early and late starts, finishes, and slack times for a project of jobs in progress. The user enters the information for the completed jobs and those in progress, and the data for the future jobs is calculated. The user may also manually schedule starting times for future jobs. Once a project is created, it remains in extended memory. Facilities for updating the progress of the project are also provided. **Necessary Accessories for HP-41:** Two memory modules and Extended Functions Memory Module

Steps: 532 HP-41 Bytes: 969

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03026-41-2	$10	$15
FOR HP-71	NOT AVAIL		

03027 Critical Path Method With Costs

by J.E. Schiermeier, Cary, NC

This program finds the critical path, early and late starts, and slack times for a project of jobs. Each job has two associated costs: initial for the first time unit, and operating for every time unit. These costs are tallied by time unit for the entire project. The user may also manually schedule starting times. Once a project is created, it remains in extended memory. Facilities for changing single parameters on subsequent runs are provided. **Necessary Accessories for HP-41:** Two memory modules and Extended Functions/Memory Module

Steps: 638 HP-41 Bytes: 1198

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03027-41-0	$10	$16
FOR HP-71	NOT AVAIL		

03028 Logarithmic Curve Fit

by E. Heying, Waterloo, IA

This program fits a set of data points (>0) to a roughly logarithmic curve of form y=a+b/nx and finds the coefficient of regression (R 7). It predicts x' from y and y' from X. Full use of alphanumeric capabilities and local labels. **Necessary Accessories for HP-41:** None

Steps: 132 HP-41 Bytes: 212

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03028-41-8	$10	$11
FOR HP-71*	03028-71-5	N/A	$12

03029 Area of n Sided Polygon

by E. Heying, Waterloo, IA

This program finds the area of an n-sided figure (n>/3). N can be up to 147 with an HP-41CV, CX or C with Quad memory module. **Necessary Accessories for HP-41:** Extended Functions Memory Module - if unavailable program code may be altered to eliminate its necessity.

Steps: 79 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03029-41-6	$10	$11
FOR HP-71	NOT AVAIL		

03030 External Ballistics - 1, Drop

by O.X. Dobnick, Milwaukee, WI

This program computes flight time, G, trajectory, and drop. The only input data necessary are terminal velocity, muzzle velocity, ballistic coefficient, and distance. These computations are entirely valid for small arms projectiles to more than 1000 yards. **Necessary Accessories for HP-41:** None

Steps: 136 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03030-41-4	$10	$12
FOR HP-71*	03030-71-1	N/A	$14

03031 Belt Calculations

by B. Hoffmann, Buenos Aires, ARGENTINA

This program calculates the length of a belt between two pulleys, given the two diameters and the distance between them. It also calculates belt length for a cross engagement. **Necessary Accessories for HP-41:** Printer optional

Steps: 76 HP-41 Bytes: 118

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03031-41-2	$10	$11
FOR HP-71*	03031-71-9	N/A	$12

03032 Fourth-Order Newton-Cotes Integration

by U. Hollerbach, Fairbanks, AK

The N-th order Newton-Cotes formula uses an N-th order polynomial to approximate a function. The Trapezoidal rule and Simpson's rule are the first- and second-order Newton-Cotes formulas, respectively. This program uses the fourth-order Newton-Cotes rule, also known as Boole's rule, to numerically integrate functions which are either known explicitly or at a discrete number of evenly spaced points. This formula provides better convergence than either the Trapezoidal rule or Simpson's rule. **Necessary Accessories for HP-41:** None

Steps: 79 HP-41 Bytes: 137

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03032-41-0	$10	$11
FOR HP-71*	03032-71-7	N/A	$12

03033 Great Circle Distance/Bearing

by A. Koppenhaver, Annapolis, MD

This program computes the great circle distance and true bearings between two points on the earth given the coordinates. Conversely, given a point on the earth, and the distance and bearing to a second point, the program calculates the latitude/longitude of the second point and the bearing from the second point to the first. **Necessary Accessories for HP-41:** One memory module

Steps: 254 HP-41 Bytes: 422

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03033-41-8	$10	$12
FOR HP-71*	03033-71-5	N/A	$14

03034 Epact & Golden Number

by W.E. Hitchins, Los Angeles, CA

The epact has been solved! From the "involved" tables originally devised by Luigi Lilio, designer of the Gregorian calendar, now comes an HP-41 program to calculate the epact for any year from 1 A.D. to 9999 A.D. Before 1583, theDionysian formula is used while after that, Lilio's. Also included is the golden number for any year in the Christian era (in Roman or Arabic numerals). The epact - the age of the moon on January 1 - is used to calculate the date of Easter and other holidays of the Christian church and can even be used to calculate Chinese New Year and the Vietnamese Tet holiday. **Necessary Accessories for HP-41:** Printer optional

Steps: 134 HP-41 Bytes: 236

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03034-41-6	$10	$12
FOR HP-71*	03034-71-3	N/A	$14

03035 Ledger

by R.S. Nowak, London, Canada

This ledger program provides you with a simple, neat and concise list of your revenues and expenditures. Just simply input the name of the person or firm the transaction was with, the date, and the amount of money involved. Then accumulate all the information on magnetic cards. Simply load the information back into the calculator and a hard copy of your transactions, with a statement about gross revenue will be made out to you. **Necessary Accessories for HP-41:** One memory module, card reader and printer.

Steps: 178 HP-41 Bytes: 462

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03035-41-3	$10	$13
FOR HP-71	NOT AVAIL		

03036 Statistics for One Variable

by P. Legros, Brussels, Belgium
P. Maryssael, Brussels, Belgium

For one variable, with or without replication, all corrections being possible, this program computes: the mean, the moments, the skewness and kurtosis, the standard deviations (for a population or a cross-section), the coefficient of variation, and finally, the histogram (for 1 to n intervals according to the user's choice) and the sums. The program works with or without a printer. **Necessary Accessories for HP-41:** One memory module

Steps: 306 HP-41 Bytes: 537

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03036-41-1	$10	$13
FOR HP-71*	03036-71-8	N/A	$14

03037 F1 Race (or 'Formula One Grand Prix')

by P. Legros, Brussels, Belgium
P. Maryssael, Brussels, Belgium

Up to five contestants race on one of 11 different tracks available. Players take turns inputting direction and acceleration. Calculator updates the velocity/position of each racer and checks for collision. The road-hog colliding with another racer or leaving the track is penalized by having to go back to his start position. The crashed-into racer is penalized by having his velocity reduced to zero. The calculator indicates the ID codes of the racers that cross the finish line, as well as the end of the race when they all have crossed it. The program works with or without a printer. An X-Function version is provided for those who have the X-function module. **Necessary Accessories for HP-41:** QUADram (+ Printer) (+ X-Function Module)

Steps: 792 HP-41 Bytes: 1533

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03037-41-9	$10	$17
FOR HP-71	NOT AVAIL		

03038 Casino Blackjack

by B. Chinn, Portland, OR

This program was designed to simulate as closely as possible player vs dealer one-on-one blackjack. Play options include: Tournament style "face-off", choice of decks between 1 and 24.999 inclusive, insurance when offered by the dealer, down for double on 11/ on any, splitting pairs limited only to available size, shuffle deck(s) at any time and non-execution of errors. **Necessary Accessories for HP-41:** Three memory modules

Steps: 737 HP-41 Bytes: 1462

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03038-41-7	$10	$17
FOR HP-71*	03038-71-4	N/A	$20

03039 2-D Beam Analysis

by R.A. Kleiber, Bettendorf, IO

Uses the Finite Element Method to compute displacements at nodes and forces in each beam element. Nodes can have fixed or elastic restraints to ground. Additional load cases permitted. Point loads or moments may be applied to nodes. Documentation shows how to convert distributed loads to equivalent nodal forces and moments. Elements must be colinear. 6 nodes, 5 elements maximum. **Necessary Accessories for HP-41:** HP-41CV or Quad Memory Module

Steps: 873 HP-41 Bytes: 1471

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03039-41-5	$10	$19
FOR HP-71*	03039-71-2	N/A	$22

03040 MTI Radar Response-Blind Speeds

by R.M. Rhodes, Sunnyvale, CA

The program computes the response in DB, of a radar with up to 15 discrete pulse repetition intervals (PRI's). The response is limited between 0 and -20 DB., since blindspeeds are primarily of interest. With printer formatted output as well as a plot is output. Minimum doppler velocity, maximum doppler velocity and increment between are user choices. Provision is made for extending formatted output and plots in doppler velocity. **Necessary Accessories for HP-41:** Full Memory

Steps: 221 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03040-41-3	$10	$13
FOR HP-71*	03040-71-0	N/A	$14

03041 Single-Line Spectroscopic Binary

by R.L. Marcialis, Tucson, AZ

This program generates synthetic radial velocity curves for single-line spectroscopic binary stars, given a set of orbital elements. Once a crude orbital determination has been made graphically, any orbital parameter may be varied. A theoretical curve which more closely fits the observations is readily obtained through trial-and-error. **Necessary Accessories for HP-41:** None

Steps: 72 HP-41 Bytes:

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03041-41-1	$10	$11
FOR HP-71*	03041-71-8	N/A	$12

03042 Chlorophyll Content From Absorption Spectra in 80% Acetone

by S.C. Morris, Gosford, Australia

The program converts optical density reading of chlorophyll extracts in 80% acetone, obtained using a spectrophotometer into total chlorophyll, chlorophyll a, chlorophyll b and the ratio of a/b for micro g/cm 2 or micro g/gm of original tissue using equations of Arnon (1949). Full alpha prompts are used and options include provision for sloping baseline, labelling of each sample (if printer present) and calculation of total chlorophyll from 652 nm OD values as a check on accuracy. **Necessary Accessories for HP-41:** Printer desirable

Steps: 182 HP-41 Bytes: 454

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03042-41-9	$10	$13
FOR HP-71*	03042-71-6	N/A	$14

03043 Chlorophyll Content From Absorbtion Spectra in DMF

by S.C. Morris, Gosford, Australia

This program uses the equations of Moran (1982) to convert optical density (OD) values from chlorophyll extracts in dimethylformamide (DMF) obtained using a spectrophotometer, into chlorophyll contents expressed as either microgram/gm or microgram/gm 2. The program includes full alpha prompting. Optional features include provision for a sloping baseline, labelling each sample (if printer present) and calculation of protochlorophyll content from OD values at 625 nm. **Necessary Accessories for HP-41:** Printer desirable

Steps: 255 HP-41 Bytes: 553

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03043-41-7	$10	$13
FOR HP-71*	03043-71-4	N/A	$14

03044 K LSD Test For Significant Difference Comparisons of Means

by S.C. Morris, Gosford, Australia

This program calculates a k-LSD interval to use in comparing significant differences between means. It uses alpha prompts for mean comparison parameters and for the input of t values from k-LSD tables. The program is a comparison program for the "Analysis of Variance with Factorial and Transforming Options" (ANOV). **Necessary Accessories for HP-41:** Full memory with ANOV program. Printer optional.

Steps: 163 HP-41 Bytes: 324

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-41	03044-41-5	$10	$13
FOR HP-71*	03044-71-2	N/A	$14

03045 Analysis of Variance With Factorial and Transforming Options

by S.C. Morris, Gosford, Australia

Analysis can be as a one way factorial (up to 76 treatments) or a two-way factorial (up to 8x9), data can be as replicates or blocks and can also be transformed (arcsine, square root, log). Full alpha prompting occurs for analysis conditions and data inputs. Besides outputs of F values, degrees of freedom and error mean squares, the averages of all treatments are also calculated and displayed. A companion program "K LSD TEST" will calculate significant differences between means using the k LSD rule. **Necessary Accessories for HP-41:** Full memory. Printer optional.

Steps: 740 HP-41 Bytes: 1447

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03045-41-2	$10	$17
FOR HP-71*	03045-71-9	N/A	$20

03046 Cash Payroll Denominations and Totals

by J.R. Akerson, Warm Springs, OR

The program determines the needed denominations to make cash payroll per department, totals each department and gives grand total of all department payroll. **Necessary Accessories for HP-41:** Printer optional

Steps: 172 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03046-41-0	$10	$12
FOR HP-71*	03046-71-7	N/A	$14

03047 Right Triangles and Bevels

by K. Min, Sunnyvale, CA

A program for the solution for the right-triangles and their corresponding bevels. **Necessary Accessories for HP-41:** None

Steps: 211 HP-41 Bytes: 455

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03047-41-8	$10	$13
FOR HP-71*	03047-71-5	N/A	$14

03048 Eccentrically Loaded Column Base Plate

by D.S. Chilton, Anchorage, AK

This program will analyze an eccentrically loaded column base plate. The output consists of the limit of compression, gross tension in the bolts, design bolt tension (incl. shear transfered thru failure plane), compressive stress in concrete, and the required plate thickness. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 439 HP-41 Bytes: 834

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03048-41-6	$10	$14
FOR HP-71*	03048-71-3	N/A	$16

03049 Filter Approximations

by A. Melimopoulos, Caracas, Venezuela

This program gives you the Butterworth and Chebyshev functions for any low-pass, high-pass and band-reject filter approximation. You just need to know the pass-band frequencies, the maximum attenuation and the order; if you don't know the order, you should know the stop-band frequencies and the minimum attenuation. If for the requirements you have, the theorical order is, let say, n=2.1 this program can find (as an option) the second order approximation but the poles are calculated with n=2.1; this is a special technique used in the program. Full alphanumeric capabilities are used. **Necessary Accessories for HP-41:** One memory module and Math Pac

Steps: 323 HP-41 Bytes: 531

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03049-41-4	$10	$13
FOR HP-71	NOT AVAIL		

03050 The Sphere by Four Points

by A. Melimopoulos, Caracas, Venezuela

Given a set of four points, this program calculates the radius and the coordinates of the center of a sphere that contains these points. **Necessary Accessories for HP-41:** None

Steps: 215 HP-41 Bytes: 286

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03050-41-2	$10	$12
FOR HP-71*	03050-71-9	N/A	$14

03051 Traveller Character/Planet Generator W/Trade Classifications

by B. Chinn, Portland, OR

This program will: 1) Generate a random universal personality profile for Traveller* PC's or NPC's, 2) Generate a random universal planetary profile, determining Starport type thru low level, tech level as well as the types of bases (if any) present as per rules, 3) Determine the generated planet's trade classification including "Terra-Prime" and "Terra-Norm", 4) roll 1d6, 5) roll 2d6 and sum, 6) roll 2d6 and combine. *Traveller is a trademark of Games Designer Workshop. **Necessary Accessories for HP-41:** Two memory modules

Steps: 558 HP-41 Bytes: 916

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03051-41-0	$10	$15
FOR HP-71*	03051-71-7	N/A	$18

03052 Electronic Dice Plus

by B. Chinn, Portland, OR

Die rolling for RPG's and Wargames. Includes d3, d4, d6, d8, d10, d12, d16, d20, d30, dx(l-X), percentile die, roll y number of dx, count the number of times dx is rolled, roll a number between x and y inclusive and generate a bell curve averaged number between the numbers in x and y inclusive. And, especially for Advanced Dungeons and Dragons*: initiative rolls for player/monster, indoor encounter distance and outdoor encounter distance. *Advanced Dungeons and Dragons is a trademark of TSR. **Necessary Accessories for HP-41:** None

Steps: 202 HP-41 Bytes: 0404

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03052-41-8	$10	$12
FOR HP-71*	03052-71-5	N/A	$14

03053 Jumble Scrambler

by B. Chinn, Portland, OR

Do you like to do jumbled words but run into tough ones more often than not? This program will help to eliminate that problem for up to six lettered words. The program will display all possible combinations of the letters for your perusal. Note - after the program data has been loaded the program may be cut down to 86 steps of 133 bytes. **Necessary Accessories for HP-41:** One memory module and Extended Functions/Extended Memory Module

Steps: 172 HP-41 Bytes: 367

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03053-41-6	$10	$13
FOR HP-71	NOT AVAIL		

03054 Jumble Electronic Scrachpad

by B. Chinn, Portland, OR

This program will enable your calculator to take the place of a scratchpad for the rearrangement of letters or symbols of a jumbled word, up to twenty-two characters in length. **Necessary Accessories for HP-41:** Extended Functions/Extended Memory Module

Steps: 129 HP-41 Bytes: 196

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03054-41-4	$10	$11
FOR HP-71	NOT AVAIL		

03055 Trial-and-Error Resistor Paralleling, 8-Position, Feature

by B.F. Carlson, Waltham, MA

Eight keys correspond to resistor trial positions for loading and checking the inserted values; 5 others: insert "infinity" individually, insert-check a reference "desired value", calculate the exact next resistor that produces the D.V., calculate % error from the D.V., calculate resultant resistance, and reset the program. Works with +/, zero, and infinity, readout ENG 7 E+/99, fully prompted and labelled, speed sluggish but acceptable, makes any-precision, any-value resistors effectively from a very restricted stock. **Necessary Accessories for HP-41:** One memory module

Steps: 240 HP-41 Bytes: 555

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03055-41-1	$10	$13
FOR HP-71*	03055-71-8	N/A	$14

03056 Alpha Count

by P.L. Graves, Palos Verdes Estates, CA

This program converts the letters "A" thru "Z" inclusive with their respective point values into a numerical sum. It is useful for the game Scrabble and other applications requiring a numerical value for a group of letters (up to 24 characters long). Only extended functions and the stack are used. No data registers used! Point values for each letter are stored in x-memory for future use. **Necessary Accessories for HP-41:** Extended Function/Memory Module or HP-41CX

Steps: 80 HP-41 Bytes: 161

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03056-41-9	$10	$11
FOR HP-71	NOT AVAIL		

03057 Flow Measurements With Pipe Elbow Taps

by I. Romano, Porto Torres, Italy

Pipe elbows with correctly installed pressure connections may be used to determine rate of flow by measuring the differential pressure created by the centrifugal forces occuring when fluid is flowing through the elbow. After entering all known parameters in metric units, program computes flow entering differential pressure or vice versa; it also computes necessary elbow radius entering both flow and differential pressure. Above computes may be made both for 45 degree and 22.5 degree taps position. **Necessary Accessories for HP-41:** None

Steps: 181 HP-41 Bytes: 300

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03057-41-7	$10	$13
FOR HP-71*	03057-71-4	N/A	$14

03058 Overdetermined Systems

by I. Romano, Porto Torres, Italy

Program solves an overdetermined simultaneous system of linear equations with least squares method; every equation can have up to four unknowns and number of equations must be equal or greater than four. If whole memory is available in HP-41C, program can compute up to fifteen equations with two memory modules, up to twenty seven equations with three memory modules and up to thirty seven equations with four memory modules. Connecting a printer, program prints also all useful data. **Necessary Accessories for HP-41:** Up to four memory modules, Ext. Func/mem module 82180A; to print data: HP-IL mod. 82160A and printer 82162A.

Steps: 328 HP-41 Bytes: 608

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03058-41-5	$10	$13
FOR HP-71	NOT AVAIL		

03059 Parabolic Intersections

by A. Melimopoulos, Caracas, Venezuela

Given two parabolas in the form: AX2+ BX+C this program will determine the coordinates of the intersections if they exist. **Necessary Accessories for HP-41:** None

Steps: 69 HP-41 Bytes: 121

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03059-41-3	$10	$11
FOR HP-71*	03059-71-0	N/A	$12

03060 Three Points Circle

by A. Melimopoulos, Caracas, Venezuela

Given a set of three non-colineal points, this program finds the equation of the circle that contains these points. **Necessary Accessories for HP-41:** None

Steps: 124 HP-41 Bytes: 177

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03060-41-1	$10	$11
FOR HP-71*	03060-71-8	N/A	$12

03061 Factorization of Polynomials

by A. Melimopoulos, Caracas, Venezuela

This program performs the factorization of any polynomial of any degree into the product of polynomials of the form: (X2+PX+Q) or (X+Q). The running time depends on the precision you want and the type of polynomials, but the program runs very fast because it uses a new modification of Bairstow's algorithm. **Necessary Accessories for HP-41:** For a degree superior to 10, one memory module is needed

Steps: 157 HP-41 Bytes: 234

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03061-41-9	$10	$14
FOR HP-71*	03061-71-6	N/A	$16

03062 Combinational and Variational Calculations

by A. Melimopoulos, Caracas, Venezuela

This program can find the N combinations of a number M or the N variations of a number M, and it doesn't matter the limit (x</69) of the FACT function in the calculator. **Necessary Accessories for HP-41:** None

Steps: 31 HP-41 Bytes: 55

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03062-41-7	$10	$11
FOR HP-71*	03062-71-4	N/A	$12

03063 Heating Rate Calculator

by S. Buller, Santa Barbara, CA

Program calculates heating or cooling time, power required or temperature of a body, given its mass, specific heat, initial temperature, and two of: time; power; end temperature. Will also stepwise iterate and solve for total time with inputs of varying specific heat over various temperature ranges. Prompts and answers have metric units displayed. Very user friendly. **Necessary Accessories for HP-41:** None

Steps: 144 HP-41 Bytes: 0367

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03063-41-5	$10	$12
FOR HP-71*	03063-71-2	N/A	$14

03064 Enlightened Fraction of Moon

by I. Romano, Porto Torres, Italy

Entering date (year, month and day numbers), program computes the value of enlightened fraction of the moon in the form of a number between 0 and 1 (zero is for new moon, 1 is for full moon). Program is valid from March 1st, year zero (1 B.C.). **Necessary Accessories for HP-41:** None

Steps: 147 HP-41 Bytes: 270

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03064-41-3	$10	$12
FOR HP-71*	03064-71-0	N/A	$14

03065 Earthwork Directly From Topo or Cross Section Surveys

by L.A. Lee, Omaha, NB

This program calculates cut and fill quantities from a topographic map having existing and proposed contours or from cross section surveys which use the same cross sections and base line for both existing and proposed grades. This program eliminates the need to plot and plainimeter cross sections, and will handle a job of any size. **Necessary Accessories for HP-41:** Four memory modules or quad memory. Printer optional.

Steps: 691 HP-41 Bytes: 1820

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03065-41-0	$10	$17
FOR HP-71*	03065-71-7	N/A	$20

03066 Bearing Capacity From Penetration Testing "BRG"

by E.D. Zisman, Oradell, NJ

The program is based on a largely empirical but widely used relationship between "N" (the standard penetration test value) and the bearing capacity. The equations are essentially the Meyerhof equations with a depth correction factor as presented in Ref. 1. The program prompts for values of N, D & B (the footing width) and solves for the allowable bearing capacity in kips per sq. ft. A general plot of verticle stress beneath the footing is included as a guide. **Necessary Accessories for HP-41:** Printer and card reader optional

Steps: 134 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03066-41-8	$10	$12
FOR HP-71*	03066-71-5	N/A	$14

03067 R and T of a Thin Absorbing Film on an Absorbing Substrate

by B. Edgerton, Madison Heights, MI

The optical parameters describing a thin absorbing film on an absorbing substrate immersed in a transparent medium are supplied by the user. The program calculates the reflection from the front, the transmission, and the reflection from the back for an infinite substrate and for a finite thick substrate immersed in the transparent medium. Normal incidence is assumed. All index and absorption coefficients are assumed to be constant with wavelength. **Necessary Accessories for HP-41:** Card Reader and Printer

Steps: 423 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03067-41-6	$10	$15
FOR HP-71	NOT AVAIL		

03068 Mixture Rules for Benedict Webb Rubin Equation

by F.E. Moore, Newark, DE

This program calculates pseudocritical constants of gas mixtures, namely, the pseudocritical temperature, pseudocritical pressure, pseudocritical specific volume, the mixture molecular weight, the pseudocritcal Pitzer Factor, and the gas constant of the mixture. The mixing rates are those recommended for use with the Benedict-Webb-Rubin equation, as modified by Lee and Kesler. The input required is component critical temperature, critical pressure, molecular weight, Pitzer Factor, and flowrate. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 211 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03068-41-4	$10	$12
FOR HP-71*	03068-71-1	N/A	$14

03069 SCS Runoff Equation

by K.S. Freier, Albuquerque, NM

Program computes SCS runoff equation variables. Solve for Q in inches, when CN and P are known; solve for P in inches when Q and CN are known; solve for CN when Q and P are known. **Necessary Accessories for HP-41:** None

Steps: 171 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03069-41-2	$10	$12
FOR HP-71*	03069-71-9	N/A	$14

03070 Auto

by S.J. Breese, Monee, IL

This program should aid one over the negotiations for a new car with the salesperson. The calculator will keep a running total of the "window" price (with and without sales tax) and the dealer cost. Seperate discount rates can be applied to the base and accessory prices. A printout can be called for to summarize all cost and discounts. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 195 HP-41 Bytes: 0508

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03070-41-0	$10	$13
FOR HP-71*	03070-71-7	N/A	$14

03071 Demo of Unique HP-41C Features

by R.L. Nungester, Spokane, WA

This program shows off the unique features of the HP-41C calculator. The beeper, alphanumeric display capabilities, annunciators, scrolling, and flying goose are demonstrated. A "billboard display" refers to other highlights such as user-defined keys, peripherals, and Users' Library. A great way to show your HP-41C to a friend! **Necessary Accessories for HP-41:** One memory module

Steps: 116 HP-41 Bytes: 581

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03071-41-8	$10	$13
FOR HP-71*	03071-71-5	N/A	$14

03072 SEG - Segmental Spiral

by D.R. Coulter, Victoria, Canada

Calculates data for a connecting spiral between two curves. Unlike Barnett's solution (equivalent spiral angle), this program examines the connecting spiral as a part or segment (hence the name) of a larger simple spiral, tangential at one end (Dc=0), the larger radius (smaller Dc) at a distance 'l' and the smaller radius (larger Dc) at a further distance 'La' (the connecting spiral length). Imperial or Metric options. **Necessary Accessories for HP-41:** Printer recommended

Steps: 270 HP-41 Bytes: 427

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03072-41-6	$10	$12
FOR HP-71*	03072-71-3	N/A	$14

03073 Antenna Gain Off-Mainbeam

by A. Koppenhaver, Annapolis, MD

This program is useful as an approximation of off-axis antenna gain when actual pattern measurements are not available. The range of applicability is for antennas with mainbeam gains between 0 and 70 dBi. Given the mainbeam gain of an antenna, the program predicts the gain in any direction in terms of the angle between the mainbeam axis and the direction considered. **Necessary Accessories for HP-41:** Printer optional

Steps: 65 HP-41 Bytes: 122

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03073-41-4	$10	$11
FOR HP-71*	03073-71-1	N/A	$12

03074 Runaway Criteria For a Fixed Bed Tubular Reactor

by G.G. Chase, Akron, OH

Program calculates runaway criteria for a tubular fixed bed reactor based on a pseudo-first-order chemical reaction and the one-dimensional pseudo- homogeneous model. It determines the runaway and non-runaway reactant partial pressure limits and maximum temperature increase for a given tube radius. For a given inlet partial pressure it determines the non-runaway tube radius. **Necessary Accessories for HP-41:** None

Steps: 228 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03074-41-2	$10	$13
FOR HP-71*	03074-71-9	N/A	$14

03075 Device Independent "Format" Commands

by J.W. Montgomery, Grosse Pointe Woods, Mlq

This selection consists of routines which emulate the HP-IL "FMT" command, and extend device formatting to support both the 82143 and 82162 printers, and optionally the 82163 video interface. **Necessary Accessories for HP-41:** Two memory modules and Extended Functions Module

Steps: 34 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03075-41-9	$10	$14
FOR HP-71	NOT AVAIL		

03076 Race II

by M. Ludwig, Oberkorn, Luxemburg

This program calculates the roots of a quadratic equation and gives the solution under a form with only integer numbers. The solution can be real or complex and when you want you can also get the solution under a decimal form (with a point). **Necessary Accessories for HP-41:** None

Steps: 236 HP-41 Bytes: 368

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03076-41-7	$10	$12
FOR HP-71*	03076-71-4	N/A	$14

03077 Linear Optimization

by J.P. Lawrence, Tigard, OR

Using the simplex method of linear optimization, this program can minimize or maximize up to 10 linear equations. The program checks for unbounded and inconsistent equations and generates slack and artificial variables as required for >=, =, or <= type equations. Documentation includes a subroutine to list the matrix at points in the program and instructions on how to adapt to run on the HP-41CV with an Extended Functions module. **Necessary Accessories for HP-41:** HP-41CX

Steps: 579 HP-41 Bytes: 1035

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03077-41-5	$10	$16
FOR HP-71	NOT AVAIL		

03078 The Skeet Shooter

by P.N. Blake, Wailuku, HI

The Skeet Shooter is an easy to learn, yet challenging, game of skill and chance for one to five players. The action begins by a momentary, random view of one of the nine target/target boundaries that are placed at a random display location. Points are earned by quickly deciding which boundary the target resides in, (left, right, or center), and by pressing the appropriate key within the very short time that the target is displayed. **Necessary Accessories for HP-41:** Quad memory module and Extended Functions module

Steps: 450 HP-41 Bytes: 903

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03078-41-3	$10	$16
FOR HP-71	NOT AVAIL		

03079 Synthetic Programmer

by J.L.A. Chilla, Capital Federal, Argentina

This program makes synthetic programming friendly. User only has to key in decimal codes and the calculator does the rest. It tells him how many dummy bytes to insert and positions itself at the beginning of the program under development. **Necessary Accessories for HP-41:** Extended Functions memory module

Steps: 139 HP-41 Bytes: 265

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03079-41-1	$10	$12
FOR HP-71	NOT AVAIL		

03080 LIN6R

by T.S. Hiers, Bala-Cynwyd, PA

Using only six registers, LIN6R delivers the linear regression coefficients, linear estimates of both x and y, the coefficient of determination and the correlation coefficient. Modular in design, this program can easily be shortened to include only those functions you need. It also permits interchanging the dependent and independent variables (without re-entering any data) and subsequent recalculation of any coefficients and estimates. **Necessary Accessories for HP-41:** None

Steps: 132 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03080-41-9	$10	$11
FOR HP-71*	03080-71-6	N/A	$12

03081 Aeronautical Radionavigation Frequencies (ARF)

by A. Koppenhaver, Annapolis, MD

The NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management (revison Jan 1984) specifies the authorized operating frequencies for Air Navigation systems in the common Civil/Military National Airspace System. This HP-41 program calculates the S-band TACAN-DME frequencies, the VHF VOR/ILS frequencies and the UHF Glide-Scope frequencies for any of the 1 through 126 "X" or "Y" channel number inputs. All of the 734 frequency assignments authorized by the NTIA manual can be identified. **Necessary Accessories for HP-41:** One memory module

Steps: 225 HP-41 Bytes: 444

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03081-41-7	$10	$12
FOR HP-71*	03081-71-4	N/A	$14

03082 Test-Figure-Program

by K. Rosenhagen, Blender-Einste, W. Germany

This program calculates the test figure of a number using the Module-11- Algorithm. **Necessary Accessories for HP-41:** None

Steps: 60 HP-41 Bytes: 117

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03082-41-5	$10	$11
FOR HP-71*	03082-71-2	N/A	$12

03083 Statistics For Two Variables

by P. Legros, Brussels, Belgium
P. Maryssael, Brussels, Belgium

For two variables, with or without replications, all corrections being possible, this program computes for each of them, the moments, the skewness and kurtosis, the standard deviations (for a population and a cross-section) and the coefficient of variation. It also computes the covariances and the correlation coefficient as well as the sums of square, cubic, fourth-power data points and the sum of data points multiplication. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 271 HP-41 Bytes: 474

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03083-41-3	$10	$13
FOR HP-71*	03083-71-0	N/A	$14

03084 Vector Calculator

by G.R. Guillemette, Worchester, MA

This program simulates the RPN system of calculations but with 3 D vector operations. The simulated four register stack has three numbers per stack register. This allows for 3D vector addition, subtraction, scalar multiplication, unit vector, angle between vectors, cross product, and dot product. The regular RPN functions x<>Y, CHS, R , RDN, STO, RCL, and LASTX have extended capabilities for 3D. **Necessary Accessories for HP-41:** Extended Function module

Steps: 288 HP-41 Bytes: 603

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03084-41-1	$10	$13
FOR HP-71	NOT AVAIL		

03085 Metric Unit Conversions

by R.S. Nowak, London, Canada

This program converts metric (S.I.) units to their more common British or American counterpart and visa versa. The conversions considered in the program are: centimetres-inches; meters-feet; kilometres-miles; kilograms- pounds; lites-U.S. gallons; degrees centigrade-degrees fahrenheit and kilojoules-B.T.U.'s. The program was also structured in such a way that it is very easy to add other desired conversion routines. **Necessary Accessories for HP-41:** None

Steps: 86 HP-41 Bytes: 252

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03085-41-8	$10	$12
FOR HP-71*	03085-71-5	N/A	$14

03086 Natural Channel Standard Step Backwater and Hyd Properties

by R.E. Dehlin, Boise, ID

Program computes Standard Step Backwater and hydraulic properties for natural channels. Trial depths are computed by Newtons Method. Conveyance is computed and totaled for sub-sections of the cross section having a constant "n" value. Conveyance is recomputed for each trial depth. Also computes hydraulic properties for a single cross-section. **Necessary Accessories for HP-41:** Card reader, printer helpful.

Steps: 717 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03086-41-6	$10	$18
FOR HP-71	NOT AVAIL		

03087 Circular and Trapezoidal Channel Water Surface Profile Comps

by C.R. Stevens, Phoenix, AZ

Determine water surface profiles in circular, trapezoidal, rectangular, or triangular channels using either the direct step or standard step method. Trapezoidal channels may have unequal side slopes and roughness (Manning's "n") can very from part to part of the cross-section. Friction losses are based on average friction slope, as determined by the Manning equation. Engineering or SI units. When using standard step method, transition, form and bend losses can be included. Normal and critical depth computations are included. **Necessary Accessories for HP-41:** One memory module. Printer recommended but optional.

Steps: 476 HP-41 Bytes: 729

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03087-41-4	$10	$14
FOR HP-71*	03087-71-1	N/A	$16

03088 Home Budget

by J.C. Mann, Albuquerque, NM

Simple, straightforward program to track expected/actual home budget. Program uses thermal printer to print income, debits, and balance. Change amounts and the new balance is printed. Program is set up for two semi-monthly paychecks, but can be easily used for weekly or monthly budgeting. Accommodates up to 25 debit items and four income items. **Necessary Accessories for HP-41:** Thermal Printer and "permanent" data storage medium (mag cards, extended functions, or cassette drive)

Steps: 262 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03088-41-2	$10	$18
FOR HP-71	NOT AVAIL		

03089 Individual Retirement Arrangement (IRA) Withdrawal Planning

by T. Holmes, San Carlos, CA

Program assumes two funds (ie. one IRA account and one non IRA account). A withdrawal strategy for an IRA account depends on tax rates, living expenses, initial amounts, interest rates, and inflation rates. These factors can be varied to determine how they affect the life and value of both funds. A 1982 joint tax rate table is internally generated; or a manual tax rate input is prompted. Non penalized withdrawals are assumed. **Necessary Accessories for HP-41:** None

Steps: 359 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03089-41-0	$10	$14
FOR HP-71*	03089-71-7	N/A	$16

03090 Vessel Stability Calculation

by K. Chuang, Taipei, Taiwan

Program can be used for most kinds of vessels to load any cargo (especially for grain loading). User given weights of cargo, fuel, water, stores and height of the center of gravity of cargo components and tanks above keel, Inertial moment of each tank; Volumetric Heeling Moment, Vertical Shifting Moment. Program computes Displacement, KG, GM, Grain Heeling Moment, Correction for Grain Vertical Shifting Moment and Angle of Heel. **Necessary Accessories for HP-41:** Two memory modules

Steps: 284 HP-41 Bytes: 762

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03090-41-8	$10	$14
FOR HP-71*	03090-71-5	N/A	$16

03091 Equilibrium Constant, Rate Coefficient, Vapor Pressure

by F.G. Helfferich, University Park, PA

Multipurpose program to calculate (a) equilibrium constant of chemical reaction from thermochemical data and temperature; (b) reaction rate coefficient from activation energy, temperature, and rate coefficient value at another temperature; (c) vapor pressure from molar heat of vaporization, temperature, and vapor pressure at another temperature. Program is based on Van't Hoff, Arrhenius, and Clausius-Clapeyron equations and accepts kJ/mol or kcal/mol as units for energy input values. **Necessary Accessories for HP-41:** None

Steps: 92 HP-41 Bytes: 258

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03091-41-6	$10	$12
FOR HP-71*	03091-71-3	N/A	$14

03092 Weight Control and Calorie Calculations

by D. Palombo, West Seneca, NY

Program calculates one's ideal weight based on sex, height and frame (wrist size). Also, calculates calories/day required to maintain ideal weight for moderately active person (normal). Program prompts for food (items) and amounts to provide total calorie intake; also prompts for daily activities to determine calories expended. Program concludes by noting if using will gain or lose (at what rate) weight. **Necessary Accessories for HP-41:** 82143A Peripheral Printer

Steps: 401 HP-41 Bytes: 978

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03092-41-4	$10	$15
FOR HP-71	NOT AVAIL		

03093 Manhole Invert Calculations

by M.J. Holstine, Charleston, WV

Program calculates the slope between the inverts of two manholes and checks/ corrects this slope against a given minimum slope. The program maintains 3 feet of earth cover above the crown of a given pipe size, calculates the pipe inverts at manholes based on the pipe's slope, and provides a 0.1 foot drop through all manholes for construction ease. **Necessary Accessories for HP-41:** None

Steps: 85 HP-41 Bytes: 209

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03093-41-2	$10	$11
FOR HP-71*	03093-71-9	N/A	$12

03094 Low Level Flight Planning

by R.J. Welzel, Havelock, NC

This program calculates true heading, magnetic heading, point to point true heading, distance, point to point distance, estimated time enroute, estimated time of arrival, fuel required, fuel remaining, total distance, total time and total fuel given aircraft true airspeed, angle of bank in turns, fuel flow and initial fuel weight, and navigation checkpoint latitude, longitude, altitude (elevation) and magnetic variation. The program calculates headings and distances using great circle navigation equations. **Necessary Accessories for HP-41:** HP-41CX or equivalent

Steps: 538 HP-41 Bytes: 1173

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03094-41-0	$10	$16
FOR HP-71	NOT AVAIL		

03095 Flood Estimate (10-yr., 24-hr)

by D.N. Tiffany, Sheridan, WY

The program calculates design flood volume and peak flow resulting from runoff generated by the 10-yr., 24-hr. precipitation event. Procedures utilized are those recommended by the SCS and BOR for the design of small reservoirs. Data input cards are provided for three different storm distributions, the SCS types I and II, and the BOR general storm. **Necessary Accessories for HP-41:** A card reader is recommended.

Steps: 419 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03095-41-7	$10	$20
FOR HP-71*	03095-71-4	N/A	$24

03096 Partial Cylinder Volume

by J.D. Gavlak, Cleveland, OH

This program determines partial volumes of cylinder with horizontal axis with only the cylinder diameter length and depth of fluid known. Its accuracy is within 1/2%. Anyone needing to know partial volumes of horizontal cylinders could use this solution in lieu of tables or other complex calculations. **Necessary Accessories for HP-41:** None

Steps: 84 HP-41 Bytes: 157

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03096-41-5	$10	$11
FOR HP-71*	03096-71-2	N/A	$12

03097 Rigidity and UBC Shear Distribution Structural Analysis

by V.L. Pangilinan, Norwalk, CA

This super program calculates center of rigidity, sum of rigidities along xx and yy, rotational stiffness, relative rigidities and respective direct shears, torsional rigidities and respective torsional shears per U.B.C. (Uniform Bldg Code). Maximizing register usage, with a quad module, up to 67 elements may be handled by this program, more than enough for any super- structure or even power plant. The output comes in an automated clean cut tabular form. A 'must' for Structural/Stress Engineers! **Necessary Accessories for HP-41:** Quad module or equivalent (HP-41CX). Printer/plotter optional.

Steps: 552 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03097-41-3	$10	$16
FOR HP-71	NOT AVAIL		

03098 2D Curve Fitting

by P. Legros, Brussels, Belgium
P. Maryssael, Brussels, Belgium

After entering two or three data points (the third one the certitude coefficient of the first two data points), this program allows you to fit 7 types of curves: LIN (Y=a+bX), INV I (Y=a+b/X), INV II (1/X=a+b/X), LOG (Y=a+bLNX), EXP (Y=aE bX), PWR (Y=aX b), all corrections being possible. The program also computes the correlation coefficient (R 2) and the residual variance (SR) which is used when computing estimated X and Y. Furthermore, you can list the various sums. The program is provided with numerous ALPHA messages for user-friendliness. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 463 HP-41 Bytes: 876

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03098-41-1	$10	$14
FOR HP-71*	03098-71-8	N/A	$16

03099 Frequency Dependent Rejection Plused 'FDRP'

by A. Koppenhaver, Annapolis, MD

Frequency dependent rejection (FDR), one of the terms used in calculating the interference-to-noise ratio, is an important consideration in many EMC analyses. FDR denotes the attenuation to off-tuned signals imposed by the combination of receiver selectivity and the fall-off of the emission spectrum of signals. This program may be used to estimate FDR when the interference signal consists of low-duty-cycle pulses, such as those emitted by ordinary radar systems. **Necessary Accessories for HP-41:** Printer optional

Steps: 105 HP-41 Bytes: 180

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03099-41-9	$10	$11
FOR HP-71*	03099-71-6	N/A	$12

03100 Lin

by M.H. Crothers, Urbana, IL

LIN calculates polynomial roots for orders 2<-N<-8 using approximation cycles of the S. Lin method. The process stops after convergence to nine places and a quadratic portion is processed for two more roots. Any odd real root is evaluated in the last step. **Necessary Accessories for HP-41:** HP 82180A X Functions/Memory is used but not required if SIZE 040 is set as initial state.

Steps: 199 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03100-41-5	$10	$14
FOR HP-71	NOT AVAIL		

03101 Single, Double and Triple Simpson/Trapezoidal Integration

by S. Diina, Grottaferrata, ITALY

Single, double and triple integrals of an explicitly known function may be numerically approximated by this program, using either Simpson's rule or the trapezoidal rule. Inputs are: an integrand function; domain bounds (constants, or functions themselves); numbers of sample points, which control accuracy. Program design and functions similar to Math Pac INTG routine. Running time optimized. **Necessary Accessories for HP-41:** One memory module

Steps: 245 HP-41 Bytes: 405

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03101-41-3	$10	$12
FOR HP-71*	03101-71-0	N/A	$14

03102 Sorting Program

by W.W. Lauer, Canton, OH

This bubble sorting program permits the user to sort numerical values in increasing or decreasing order. Input values are stored by a labeled prompting routine. No preliminary limits need be given. All data may be reviewed and corrected before sorting. Review of stored data or output of sorted data may be labeled with the register number or not as the user chooses. **Necessary Accessories for HP-41:** One or more memory modules required depending on the quantity of data to be sorted.

Steps: 173 HP-41 Bytes: 457

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03102-41-1	$10	$13
FOR HP-71*	03102-71-8	N/A	$14

03103 Distance

by R.P. Harwig, APO New York, NY

This program is used in map reading to determine the distance between two points on a map given their grid coordinates in the UTM (Universal Transverse Mercator) grid coordinate system. **Necessary Accessories for HP-41:** None

Steps: 50 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03103-41-9	$10	$11
FOR HP-71*	03103-71-6	N/A	$12

03104 Volume by Average End Area Method

by M.D. Gregory, Gibsons, Canada

Program assumes a survey or design exists with cross-sections described by distance/elevation co-ordinate pairs and a section stationing. At each section the program prompts for the stationing then for successive distance/ elevation pairs. Output is station label, section area, volume output is station label, section area, volume increment (between sections) and final volume. **Necessary Accessories for HP-41:** Thermal Printer optional

Steps: 131 HP-41 Bytes: 247

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03104-41-7	$10	$12
FOR HP-71*	03104-71-4	N/A	$14

03105 Optimum Path Finder

by J.P. Lawrence, Tigard, OR

Using dynamic programming, this program will find a minimum or maximum path between two stages. The program handles up to 6 stages and 5 points per stage on a single run; the documentation explains how to break up a problem so it can be solved with several runs of the program. The program includes a subroutine which is used to correct data input errors. **Necessary Accessories for HP-41:** HP-41CV with Extended Functions module. Extended Memory modules helpful.

Steps: 530 HP-41 Bytes: 908

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03105-41-4	$10	$15
FOR HP-71	NOT AVAIL		

03106 Radar Range Equation (RRE)

by A. Koppenhaver, Annapolis, MD

Radar range problems involve eight variables including emitter power (P), antenna gain (G), frequency of operation (f), target cross section (J), noise temperature (T), distance in meters (R), receiver bandwidth (B), and receiver signal-to-noise ratio (S/N). This program allows the user to determine any one of the eight variables when the remaining seven are known. **Necessary Accessories for HP-41:** Printer optional

Steps: 159 HP-41 Bytes: 258

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03106-41-2	$10	$12
FOR HP-71*	03106-71-9	N/A	$14

03107 Base Conversions

by E. Heying, Waterloo, IA

This program converts a number (up to 26 digits or letters or both) in any base (2-36) to bases (2-36). Full use of Alphanumeric capabilities. **Necessary Accessories for HP-41:** Extended Functions Module

Steps: 79 HP-41 Bytes: 155

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03107-41-0	$10	$11
FOR HP-71	NOT AVAIL		

03108 Steady Shear Data Analy For Weissenberg R17 Rheogoneometer

by J.B. Hacker, Vancouver, Canada

A data analysis program for the weissenberg R17 Rheogoneometer in steady shear mode, cone and plate configuration. This program takes instrument constants and up to 20 sets of gearbox, torque, and normal force data and outputs either shear rate, shear stress, and viscosity or shear rate, viscosity and first normal stress difference, if normal force data is supplied. With minor modifications, the program can be adapted to other models such as the R16 and R18. **Necessary Accessories for HP-41:** HP 82143A Printer

Steps: 484 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03108-41-8	$10	$17
FOR HP-71	NOT AVAIL		

03109 Trip Record

by R.C. James, Dallas, TX

Enter highway number, mileage between cities, and cities as you choose your trip route from a map. Enter automobile operational data (M.P.G.), (M.P.H.), (Gas Cost-$/Gal.) after trip has been routed. Output includes input data plus accumulated mileage and miles to go are printed following each city on strip chart. **Necessary Accessories for HP-41:** Two memory modules, printer and card reader

Steps: 175 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03109-41-6	$10	$13
FOR HP-71	NOT AVAIL		

03110 SDOF

by G.E. Kechter, Northbrook, IL

This program calculates the maximum displacement of a single-degree-of- freedom, spring-mass-dashpot system subjected to a triangular or damped sinusoidal loading. The program assumes linear acceleration during each time step. Displacement at the end of each time step can be displayed. **Necessary Accessories for HP-41:** None

Steps: 284 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03110-41-4	$10	$13
FOR HP-71*	03110-71-1	N/A	$14

03111 Finite-Difference Heat Transfer For Internal Turbulent Flow

by I.E. Alvarado, Manhattan, KS

Using a finite-difference algorithm this program calculates the discrete temperature distribution and the associated heat transfer rate for smooth circular tubes with steady water flow and constant surface temperature. Properties of saturated water in the 7 to 137 C temperature range are included. Required input data: water inlet temperature and mass-flow rate, pipe surface temperature and dimensions, grid spacing length, and desired iteration error, S.I. units only. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 299 HP-41 Bytes: 599

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03111-41-2	$10	$13
FOR HP-71*	03111-71-9	N/A	$14

03112 Comparator Characteristics

by P. Allum, Vancouver, Canada

Program can generate values for the comparator characteristics (Inverting and Non-inverting comparators) given the values of RI, RF, V ref, VZ1 and VZ2 or it can generate the original values, given the characteristics Vo+, Vo-, UTP and LTP. **Necessary Accessories for HP-41:** One memory module

Steps: 365 HP-41 Bytes: 618

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03112-41-0	$10	$13
FOR HP-71*	03112-71-7	N/A	$14

03113 Aerobics Point Counter

by Z. Urbanovits, Downsview, Canada

This program calculates and accumulates aerobic points earned for fitness exercises: running, cycling and swimming. **Necessary Accessories for HP-41:** Two memory modules and X-Function module. Printer optional.

Steps: 518 HP-41 Bytes: 1127

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03113-41-8	$10	$15
FOR HP-71	NOT AVAIL		

03114 Welding Bevel Calculations For Steel Plate and Pipe

by S. Madden, Brussels, Belgium

This program provides solution of the weight of weld metal, outside bevel opening and inside bevel opening for the following types of bevel preparations on steel plate and pipe: 1. Single V, 2. Double V, 3. Compound Double V, 4. Compound Single V. English or Metric units are accommodated. **Necessary Accessories for HP-41:** HP-41C + one memory module or HP-41CV

Steps: 273 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03114-41-6	$10	$13
FOR HP-71*	03114-71-3	N/A	$14

03115 A.A.S.H.T.O. Simple Beam Live Load Analysis

by D.S. Chilton, Anchorage, AK

Computes maximum shear, maximum moment with simultaneous shear (ideal for prestressed girder design) at any point in a simple beam as per A.A.S.H.T.O. HS-15 (44) or HS-20 (44) live load (including impact). Truck, lane and Alternate Military loadings are considered. Features: (1) absolute max shear/moment (2) envelope plotting. **Necessary Accessories for HP-41:** Three memory modules

Steps: 664 HP-41 Bytes: 1357

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03115-41-3	$10	$17
FOR HP-71*	03115-71-0	N/A	$20

03116 File Manager

by A.B. Kopelove, Ft Collins, CO

A "shell" program for use with files or lists in extended memory. Both text and data files are handled. The A-E keys perform operations on whole FILES: add/goto, directory, clear, delete, and copy FILE. The a-e keys operate on RECORDS or data REGISTERS within a file: add record/data, recall file, insert record, delete record/data, and edit record/register. Easy to use instructions are by single keystroke. The edit modes work by record number or text string search. **Necessary Accessories for HP-41:** Extended Functions module. Printer optional.

Steps: 195 HP-41 Bytes: 401

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03116-41-1	$10	$12
FOR HP-71	NOT AVAIL		

03117 Glue-Laminated Beam Review - Straight Curved or Tapered Beam

by W.H. Kirkgaard, Clarksburg, CA

This program makes possible the rapid investigation of symmetrical glue- laminated beams. The beams may be either straight, curved, tapered, or curved and tapered in profile. A routine within the program eliminates the necessity of consulting and interpolating in tables for beams of non-uniform depth. **Necessary Accessories for HP-41:** None

Steps: 199 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03117-41-9	$10	$12
FOR HP-71*	03117-71-6	N/A	$14

03118 Control Valve Sizing Liquid, Gas and Steam

by Desideri, Rome, Italy

Program calculates the sizing coefficient (CV) for control valve. Metric or English, volumetric or weight units, in Liquid, gas or steam service, critical or subcritical flow, noise in gas and steam service when normal trim valves are used. If reducers are required, it calculates the "R" (Subcritical flow) or "CFR" (Critical Flow). The valve CV is recalculated considering these two factors. Flow velocity (liquid flow) or noise (steam and gas flow) are calculated. NO BAR CODE IS AVAILABLE WITH THIS PROGRAM. **Necessary Accessories for HP-41:** Quad memory module with HP-41C

Steps: HP-41 Bytes: 1009

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03118-41-7	$10	$20
FOR HP-71*	03118-71-4	N/A	$24

03119 ASCII File Viewing and Editing on the 41-CX

by E. Zonneveld, Thunder Bay, Canada

Program uses many functions exclusive to the HP-41CX. ASCII files can be viewed by "SST" and "BST" through records in EXTENDED MEMORY. The 41CX text editor can be invoked at any time to manipulate a file. Program prompts for alpha input, searches for character string and displays entire record containing string. File resizing is completely automated. Ideal for phone, address and general record keeping files. Additional routines included for mass file printing and file creation. **Necessary Accessories for HP-41:** HP-41CX. Printer optional.

Steps: 75 HP-41 Bytes: 0148

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03119-41-5	$10	$12
FOR HP-71	NOT AVAIL		

03120 Masonry Lintel Design (Lintel)

by W. Hancock, Las Vegas, NV

This program uses the Working Stress Method to analyze a given masonry lintel. Material properties, reinforcing, applied moment and shear, and whether special inspection is used, are the inputs used in determining the maximum allowable bending moment for the section. Actual bending stresses, shear stress, and bond stress are also calculated. If shear reinforcing is required, the program will calculated the required spacing for the user's given stirrup size. U-stirrup size. U-stirrup and hook options also given. **Necessary Accessories for HP-41:** HP-41C; 82170A Quad memory module; 82162A or 82143A Printer

Steps: 1073 HP-41 Bytes: 2002

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03120-41-3	$10	$19
FOR HP-71	NOT AVAIL		

03121 Earthwork

by D. Wilson, Medford, OR

This program is designed to compute the end area based on the coordinate end area method using cross section data taken at a station. The program displays or prints the end area and volume between stations. The program uses alpha prompts to input data and allows the data entered to be corrected. **Necessary Accessories for HP-41:** Three memory modules. Printer optional but suggested

Steps: 468 HP-41 Bytes: 1015

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03121-41-1	$10	$15
FOR HP-71*	03121-71-8	N/A	$18

03122 Hydrology For Small Watersheds

by D. Wilson, Medford, OR

This program is designed to solve for the peak runoff in cfs for a given 24 hour storm frequency, storm rainfall and curve number for watersheds less than 2000 acres. The program uses the methodology developed by USDA SCS for estimating peak runoff from small watersheds. **Necessary Accessories for HP-41:** Two memory modules and card reader. Printer optional.

Steps: 325 HP-41 Bytes: 868

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03122-41-9	$10	$18
FOR HP-71	NOT AVAIL		

03123 Tank Volume, Spherical/Horizon Tl Cylind Tanks Given Liq Dep

by R. McAuley, Murfreesboro, TN

Program generates tables of volumes of liquid in spherical horizontal cylindrical flat-ended and hemispherical-ended tanks in gallons or liters, given tank diameter, length and beginning and ending liquid depth and liquid level change increment in inches or centimeters. The author derived the equations for cylindrical tank volumes and, to his knowledge, there are no equivalent equations or programs. **Necessary Accessories for HP-41:** Extended Functions module or HP-41CX. Printer desirable but not necessary.

Steps: 320 HP-41 Bytes: 825

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03123-41-7	$10	$14
FOR HP-71	NOT AVAIL		

03124 Leslie's Random Recapture Test

by D. Vargo, Pago Pago, AS

Animal surveys often rely upon marking techniques for estimating population densities. A critical assumption when using these techniques is that the processes of capturing and marking animals will not affect their subsequent catchability. The validity of this assumption is determined by Leslie's Random Recapture Test. **Necessary Accessories for HP-41:** None

Steps: 163 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03124-41-5	$10	$12
FOR HP-71*	03124-71-2	N/A	$14

03125 Dictionary/Data Base

by D.M. Green, Oak Park, IL

This program maintains a data base consisting of up to 55 records. Each record contains two fields, each of which can hold 12 characters. The program has a "SEARCH" function which allows it to be an electronic dictionary. Given one string, it can search all records for a match and show the second field. For example, a record might hold an English word and its Spanish translation. By specifying the English, the program will print the Spanish. You can INSERT or DELETE records from the Data Base, SAVE and LOAD Data, and SORT by any field. You can also LIST the entire Data Base. **Necessary Accessories for HP-41:** Quad RAM and Card Reader

Steps: 492 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03125-41-2	$10	$15
FOR HP-71	NOT AVAIL		

03126 Quantum Mechanical Addition of Angular Momenta

by S.H. Tedder, Tulsa, OK

Angular momentum (AM) addition always takes up a chapter in physics texts on quantum mechanics, and represents perhaps the most difficult and tedious topic for the beginning student. Now the HP-41 can do the addition automatically. Utility routines are provided for calculation of many quantities useful in AM addition, including the 3-j, 6-j, and 9-j symbols. Students of advanced physics, spectroscopists, nuclear physicists and chemical physicists will find this program of unique interest. **Necessary Accessories for HP-41:** CV or Quad Memory

Steps: 1138 HP-41 Bytes: 1932

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03126-41-0	$10	$19
FOR HP-71*	03126-71-7	N/A	$22

03127 Amortization Schedule With Pay-Ahead Option

by E. Heying, Waterloo, IA

This program is helpful to persons wishing to pay ahead on their mortgage principle. The program assumes monthly payments are made, then prompts for an optional principle payment each month. The program is set up on a yearly basis, so the user has complete control of output. COMP mode allows users to vary interest rates, terms, and amounts borrowed to see the effect on the monthly payment. **Necessary Accessories for HP-41:** Two memory modules and X-Functions. Printer desirable.

Steps: 384 HP-41 Bytes: 890

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03127-41-8	$10	$14
FOR HP-71	NOT AVAIL		

03128 Concrete Deep Beam Analysis and Design

by R. Chang, Seattle, WA

As the span-depth ration of a member without web reinforcement decreases, its shear strength increases above the shear causing diagonal tension cracking. To provide the adequate shear reinforcement, ACI 318-83 section 11.8 gives us a series of analysis method. This program is written for both analysis and design purposes. **Necessary Accessories for HP-41:** Two memory modules

Steps: 365 HP-41 Bytes: 793

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03128-41-6	$10	$14
FOR HP-71*	03128-71-3	N/A	$16

03129 Perforated Metals

by A. Shulman, Buenos Aires, Argentina

The present program is applied in the manufacturing and marketing of Perforated Metals, according to standards and specifications given by the Industrial Perforators Association, from Milwaukee, Wisconsin, U.S.A. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 276 HP-41 Bytes: 798

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03129-41-4	$10	$14
FOR HP-71*	03129-71-1	N/A	$16

03130 IORISK

by E. Parenteau, Newberg, OR

This program performs a technical analysis of a stock, using the method presented by Michael Zahorchak in "The Art of Low-Risk Investing". The method compares the 5-, 15- and 40-week moving averages of the stock's price to find buy, sell, and hold signals. **Necessary Accessories for HP-41:** None

Steps: 288 HP-41 Bytes: 602

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03130-41-2	$10	$13
FOR HP-71*	03130-71-9	N/A	$14

03131 Most Probable Position using the 'Least Square Method'

by P.R. Van Quekelberghe, Breskens, Netherlands

This program calculates the observer's Most Probable Position (MPP), using the 'Least Square Method'. Required inputs: Course, speed and DR of the vessel. Height of eye of the observer. Date and GMT for the MPP. And, for each observation: GMT and sextant height. Output: MPPLatitude and MPPlongitude. At least 2 observations must be taken. **Necessary Accessories for HP-41:** One memory module and HP-41 Navigation module

Steps: 199 HP-41 Bytes: 355

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03131-41-0	$10	$12
FOR HP-71	NOT AVAIL		

03132 Single or Compound Curve Offsets

by D.R. Coulter, Victoria, Canada

This program can be used for intersection design utilizing either a single or a compound curve. Road widths, taper angles, various radii and offsets are taken into consideration for different skews. Minimum and maximum offsets from the intersection can be calculated for compound curves. **Necessary Accessories for HP-41:** HP-41C would require one memory module. Card reader and printer optional.

Steps: 382 HP-41 Bytes: 667

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03132-41-8	$10	$13
FOR HP-71*	03132-71-5	N/A	$14

03133 Ultrabeam

by R.A. Kleiber, Bettendorf, IO

Analyzes continuous beams via the Finite Element Method. Beams may be determinate or indeterminate. Nodal displacements and element forces output. Maximum of 12 nodes/11 elements. Rigid or elastic restraints. Additional loadings without starting over. Documentation shows how to convert distributed loading to equivalent nodal forces and moments. Also does Axial/Torsion analysis as separate case. Problem data easily saved and restarted from extended memory or optional magnetic cards. **Necessary Accessories for HP-41:** HP-41CV or Quad Memory, Extended Functions Module with one Extended Memory Module. Card Reader optional.

Steps: 1042 HP-41 Bytes: 1824

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03133-41-6	$10	$20
FOR HP-71	NOT AVAIL		

03134 Project Planning and Scheduling (PERT Method)

by G. Goodman, Stamford, CT

This program uses PERT methods to calculate the project length and schedule statistics (early start, late start, total float & free float) for each of the activities comprising the project. Extended memory is used to store the activity data. An editing capability allows the user to review or change this data to update the schedule as activities are completed or slippages occur. Maximum project size is 108 activities, more with additional extended memory modules. A utility program is included to transfer project files to/ from cards. **Necessary Accessories for HP-41:** One memory Module (minimum), Printer, and Extended Functions Module

Steps: 299 HP-41 Bytes: 574

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03134-41-4	$10	$14
FOR HP-71	NOT AVAIL		

03135 SUPER CURVE: Horizontal curve with any combination of spiral

by D.R. Coulter, Victoria, Canada

Program solves horizontal curves with any combination of spirals. Stationing is output in standard format (ie 12+34.567). Coordinates can be solved for all transition points, as well as, for any point on the alignment. The curve may be defined by Degree of curve or radius. **Necessary Accessories for HP-41:** Quad memory module or HP-41CV/CX. Printer recommended.

Steps: 647 HP-41 Bytes: 1120

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03135-41-1	$10	$15
FOR HP-71*	03135-71-8	N/A	$18

03136 Cogo Plus

by J. Chisolm, Tucson, AZ

This program will store and recall coordinates by point number in large data files on the cassette. The usual file size is 500 coordinate points. This is a designer's program and consists of three main parts: Traverse, Intersection, and Horizontal Curve Solutions. The HP Survey Pac Manual and keyboard overlays can be used. Bearings are printed in the same format as used on plans and plats. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC. **Necessary Accessories for HP-41:** HP-41CV, IL Module, Cassette Drive, HP 82162A Printer

Steps: 1183 HP-41 Bytes: 2373

	Order Program No.	Documentation Only	W/Media
FOR HP-41	03136-41-9	N/A	$20
FOR HP-71	NOT AVAIL		

03137 Arabic Roman Conversions

by P.J. Volpe, Killeen, TX

A program that will determine the roman numeral from any 1-4 digit arabic number, or determine a 1-4 digit number from any roman numeral of 15 or less numerals. **Necessary Accessories for HP-41:** Extended Memory

Steps: 185 HP-41 Bytes: 379

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03137-41-7	$10	$12
FOR HP-71	NOT AVAIL		

03138 Bar Graphs With the HP 82905B Printer

by C.A. Erickson, Princeton, NJ

The program prints vertical bar graphs of 2 to 16 bars using the HP 82905B printer. Numeric scale values are calculated and printed on the left. The user can specify the height of the graph. The width of each bar (0.3 inch) is fixed. A title may be printed at the top and the bars may be labelled at the bottom of the graph. Synthetic programming is used to send data to the printer. **Necessary Accessories for HP-41:** IL module and 82905B printer with HP-41CX. HP-41C requires memory and extended function memory modules in addition.

Steps: 281 HP-41 Bytes: 686

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03138-41-5	$10	$14
FOR HP-71	NOT AVAIL		

03139 Radar Displayed Pulse Count 'RDPC'

by A. Koppenhaver, Annapolis, MD

This program is used to estimate the electromagnetic compatibility (EMC) of a specified radar at a selected site. It utilizes an accepted performance criterion as the basis for assessing the EMC of the prospective radar installation. The radar characteristics and electromagnetic environment are analyzed to determine the pulse interference (displayed pulse counts... DPC on the PPI display). The DPC is then compared to the performance degradation threshold (DPC=100 pulses per scan) to determine compatibility. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 178 HP-41 Bytes: 338

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03139-41-3	$10	$12
FOR HP-71*	03139-71-0	N/A	$14

03140 Resection

by R.P. Harwig, APO New York, NY

This program is used in map reading to determine the location of an unknown point in the UTM (Universal Transverse Mercator) grid coordinate system given the grid coordinates of two known points and the azimuths from the unknown point to those 2 points. **Necessary Accessories for HP-41:** None

Steps: 108 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03140-41-1	$10	$11
FOR HP-71*	03140-71-8	N/A	$12

03141 Vertical Design Extended

by W. Jutte, Macgregor, Australia

Program calculates levels at regular intervals, with the possibility to calculate at those intervals up to 10 sidepoints. Input is the chainage, curvelength and height for the points of intersection. No of PI's dependent on SIZE of extended memory. Options: design line only, crossfall or camber, 10 points per chainage max. NO BAR CODE IS AVAILABLE WITH THIS PROGRAM. **Necessary Accessories for HP-41:** A minimum of two memory modules, Extended Functions module and printer

Steps: 467 HP-41 Bytes: 1007

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03141-41-9	$10	$15
FOR HP-71	NOT AVAIL		

03142 Small Livestock From Birth to Slaughter

by A. Smith, Mhangura, Zimbabwe

This program takes an initial date and calculates three periods for changes in diet:environment outputs are labeled and are displayed or printed twice for convenience. Suitable for rabbits and poultry. **Necessary Accessories for HP-41:** Printer useful

Steps: 353 HP-41 Bytes: 729

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03142-41-7	$10	$14
FOR HP-71*	03142-71-4	N/A	$16

03143 Accounts Simplified for Small Organizations

by J.G. Davies, St Paul, MN

Accounting Simplified can handle about 400 entries per period (not necessarily year) in not over 37 accounts. Monthly a printed list shows total in each account and also gain/loss and date. To trace transactions a printed list of accounts shows the amount of each entry and its identifying check number or date. A routine is included for start-up. Rules for simplified accounting are given. **Necessary Accessories for HP-41:** Printer, Cassette Drive, and HP-41CX or HP-41CV with X-functions and two X-memory modules.

Steps: 576 HP-41 Bytes: 1442

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03143-41-5	$10	$17
FOR HP-71	NOT AVAIL		

03144 I.V. Label-Generating Programs

by P.J. Hudson, Laurel, DE

The programs (handheld computer programs for generating labels for selected I.V. (intervaneous) admixtures) were developed based on a hospital pharmacy model preparing large and/or small-volume I.V. admixtures for anywhere from zero to 42 patients daily. The program's objectives are to 1) reduce the time spent and errors occurring in the typing of labels; 2) supplement existing manual systems, and 3) serve as a back-up for existing computerized systems. **Necessary Accessories for HP-41:** A manual system for maintaining I.V. profiles; Printer; Card Reader; Maximum Memory

Steps: 936 HP-41 Bytes: 4248

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03144-41-3	$10	$45
FOR HP-71	NOT AVAIL		

03145 Heatsink Selection and Performance Evaluation

by H.R. Harwell, Fort Worth, TX

Program calculates the expected performance of finned-type, vertically mounted heatsink with a single heat dissipating device mounted symmetrically using natural convection and radiation heat transfer modes. User can select desired steady-state device temperatures at specified heat dissipation rates for various styles of user or manufacturer defined heatsink geometeries. User can select variable ambient conditions, heatsink materials, finishes and surface conditions which may influence performance or determine degradation of performance when encountered. **Necessary Accessories for HP-41:** Extended Functions/Memory module, two Extended memory modules, HP-IL Module and HP-IL Printer

Steps: 1764 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03145-41-0	$10	$34
FOR HP-71	NOT AVAIL		

03146 The Caves (Revisited...)

by P. Legros, Brussels, Belgium
P. Maryssael, Brussels, Belgium

"The Caves (Revisited...)", a 266 register long program, is an adventure game in which the player moves about a series of 68 (0 to 67) interconnected caves to pick up nine items to total 1200 points without dying from the various hazards, which can be avoided thanks to some special items. It is based on James R. Surber's "THE CAVES" (00900C). **Necessary Accessories for HP-41:** Four memory modules or equivalent

Steps: 616 HP-41 Bytes: 1568

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03146-41-8	$10	$17
FOR HP-71*	03146-71-5	N/A	$20

03147 Escape

by M.E. Wong, San Francisco, CA

You are a secret agent on the fifth floor of a five story building. Surrounded by armed men, you must jump over enemy fire, shoot at the enemies, and use your martial art skills so that you can get out of the building. This program makes use of the alpha register which makes it comparable to a regular coin-op game. It's loads of fun and full of excitement. **Necessary Accessories for HP-41:** Extended Functions module

Steps: 697 HP-41 Bytes: 1271

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03147-41-6	$10	$16
FOR HP-71	NOT AVAIL		

03148 Thermal RC Calculator--Temp. of Mass Heated Thru a Conductor

by S. Buller, Santa Barbara, CA

Relaxation formula solves for time constant and temperature or elapsed time (given time or temperature) of a body of given mass and specific heat, being heated or cooled through a thermal conductor which is attached to a constant temperature heat sink. Length, area and thermal conductivity of the conductor are input, or will solve for length or area if the other parameters are input. Prompts and answers are labeled with metric units. **Necessary Accessories for HP-41:** None

Steps: 164 HP-41 Bytes: 354

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03148-41-4	$10	$12
FOR HP-71*	03148-71-1	N/A	$14

03149 Decision Data For Stock Investments in a Company

by C.B. Nines, Palo Alto, CA

Given updated files, program produces a one page report on common data and two page decision data reports on each company. They include selected ratios, eight pair of 5-yr and 10-yr simple linear regressions and two multiple linear regressions, growth rates for calculated dependent variables, projections, stock sale price and price earning ratio at end of year 5 required to earn specified before tax return. **Necessary Accessories for HP-41:** Digital cassette drive, HP82905B Printer, HP-IL Module, HP Extended Functions/Memory module, and 2 HP extension modules

Steps: 5052 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Media
FOR HP-41	03149-41-2	N/A	$20
FOR HP-71	NOT AVAIL		

03150 Simplex Method For Linear Programming

by J.E. Schiermeier, Cary, NC

This program uses the simplex method to solve linear programming problems, finding either the minimum or the maximum. If a solution exists, the volumes, surpluses, inputed costs, slack, and the limit are all displayed. Besides inequalities, the program has facilities to also deal with equalities. The only limit on the number of variables or constraints is the amount of available memory. All inputs and outputs are individually labeled, making the program easy to use. **Necessary Accessories for HP-41:** Two memory modules

Steps: 439 HP-41 Bytes: 701

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03150-41-0	$10	$14
FOR HP-71*	03150-71-7	N/A	$16

03151 Discontinuity Stress in Cylinders With Spherical Heads

by R.P. Newton, Anaheim, CA

This program solves for the discontinuity stress at any position in cylinders with partially spherical heads. It then goes on to solve for the positions and values of the maximum and minimum discontinuity stresses in the cylinders and sums them with membrane stresses. **Necessary Accessories for HP-41:** Quad memory module

Steps: 458 HP-41 Bytes: 756

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03151-41-8	$10	$14
FOR HP-71*	03151-71-5	N/A	$16

03152 Dairy Ration to Meet Energy, Protein and Mineral Needs

by T. Adams, East Lansing, MI
M.S. Pasineau, East Lansing, MI

This program calculates the amounts of grain, forage, protein, calcium and phosphorous needed to meet a cow's nutritional requirements based on her milk production, its fat content and her body weight. Data and calculations can be in either English or metric units. Feed data need to be entered only once for a series of calculations for different animals using the same nutrient and mineral sources. **Necessary Accessories for HP-41:** Three memory modules

Steps: 632 HP-41 Bytes: 1532

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03152-41-6	$10	$17
FOR HP-71*	03152-71-3	N/A	$20

03153 Spreadsheet/Cashflow Program

by L.F. Coffey, Coral Gables, FL

Program provides a small spreadsheet for the HP-41C with up to 40 rows and up to 9 columns (limited to about 150 elements), with capability for a comprehensive analysis of a cash-flow profile generated by the spreadsheet (including graphical presentations). A spreadsheet can be stored indefinitely in Extended Memory or can be transferred to magnetic cards. **Necessary Accessories for HP-41:** HP-41C and Quad memory. Full capabilities need Extended Functions/Memory module. Printer and Card Reader desirable.

Steps: 867 HP-41 Bytes: 4788

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03153-41-4	$10	$20
FOR HP-71	NOT AVAIL		

03154 Morse Simulator (Learning Routines)

by P. Legros, Brussels, Belgium
P. Maryssael, Brussels, Belgium

This program, made up of three learning routines, simulates a Morse Transceiver. Up to 44 different characters (A thru Z, 0 thru 9, and eight punctuational symbols) can be generated, i.e. toned and optionally displayed. This program uses standard tones but can be optimized and made to better comply with the international morse code conventions by replacing them by synthetic ones. All the synthetic functions, the use of which is OPTIONAL, are clearly explained (8 pages). **Necessary Accessories for HP-41:** Two memory modules, Extended Functions module. Card Reader optional.

Steps: 380 HP-41 Bytes: 827

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03154-41-2	$10	$14
FOR HP-71	NOT AVAIL		

03155 Centrifugal Pump Model

by G.S. Buck, Baton Rouge, LA

Centrifugal Pump Model (CPMOD) calculates the internal pressures, temperatures, leakage and thrust in a single stage overhung centrifugal pump. CPMOD can simulate these parameters for pumps with API flush plans 11 or 13. **Necessary Accessories for HP-41:** Quad memory module and Extended Function module

Steps: 798 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03155-41-9	$10	$21
FOR HP-71	NOT AVAIL		

03156 Weather Forecaster

by A.C. Loscalzo, Lake Hiawatha, NJ

This program produces 12 hour weather forecasts including predicted high and low temperatures. The user enters month, time, temperature, barometer, and cloud information. The program is based on a unique combination of two scientifically valid but independent single station analysis systems. The program is regionalized for 5 geographic areas. THIS PROGRAM MUST BE SOLD RECORDED ON 3.5 DISC OR CASSETTE. NO BAR CODE IS AVAILABLE FOR THIS PROGRAM. **Necessary Accessories for HP-41:** HP-41CV or HP-41C with four memory modules or 1 Quad memory module

Steps: 849 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03156-41-7	N/A	$20
FOR HP-71*	03156-71-4	N/A	$20

03157 Trapezoidal Open Channel Flow Program

by D. Wilson, Medford, OR

This program uses Mannings equation to solve for the following parameters for trapezoidal, triangular and rectangular channel sections- Q, flowrate in cfs- V, velocity in fps-b, bottom width in ft.- d, depth of flow in ft.- b & d, bottom width and depth of flow in ft.- S, bed slope in ft/ft. The program also calculates the flow condition and most efficient section if desired. **Necessary Accessories for HP-41:** Four memory modules. Printer optional.

Steps: 929 HP-41 Bytes: 1722

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03157-41-5	$10	$18
FOR HP-71*	03157-71-2	N/A	$22

03158 Vibrating Body Supports

by G.L. de Lacroix, Saint Malo, France

In design or modification work, this program obtains the best support positions in order to uncouple the vibrational modes and, as much as possible, to isolate a vibrating body from another which should be steady and quiet. Examples: Supports for engine-clutch-gearbox complete assembly, in certain electrical assemblies, etc. **Necessary Accessories for HP-41:** Four memory modules or Quad memory module. Useful accessories would be: Card Reader; Printer (HP 82143A) or HP-IL Module and Printer (HP 82162A).

Steps: 871 HP-41 Bytes: 1904

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03158-41-3	$10	$19
FOR HP-71	NOT AVAIL		

03159 Solar Angles, Solar Time, and Clear Day Solar Radiation

by W.C. du Pont, Tempe, AZ

Program calculates solar angles, solar time, and clear day solar radiation intensities using techniques presented in ASHRAE Handbook of Fundamentals. Specifically, the program calculates the day of the year, declination, sunrise hour angle, day length, time of sunrise and sunset, equation of time, apparent solar time, solar altitude, solar azimuth, incident angle, normal beam solar radiation, diffuse sky solar radiation, ground reflected solar radiation, and total solar radiation. It automatically prompts for required input data. **Necessary Accessories for HP-41:** Quad memory module, Extended Functions memory module, Time module and Card Reader.

Steps: 751 HP-41 Bytes: 1568

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03159-41-1	$10	$27
FOR HP-71	NOT AVAIL		

03160 Cards

by P. Heidrich, Rheinstetten 2, West Germany

This program generates two cards between two and ace. Now you can enter your bet and the calculator generates a third card. If it is between the first two cards you win the bet. If the difference between the first two cards is 2, 3 or 4 your bet will be multiplied with 10, 5 or 2 if you win. **Necessary Accessories for HP-41:** One memory module and printer

Steps: 241 HP-41 Bytes: 541

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03160-41-9	$10	$13
FOR HP-71	NOT AVAIL		

03161 HP 82143A Bar Graphs

by F.D. Thola, Annapolis, MD

This program constructs non-contiguous bar graphs with bars having positive or negative values. Negative value bars are printed down from a zero X axis. Y axis values may be selected with any minimum value and any positive maximum value. Features include labeling options for bar values and bar titles. Good for comparing multiple sets of data or graphically displaying such quantities as temperature, market prices, sales, income, etc. **Necessary Accessories for HP-41:** Extended Functions/Memory Module, HP-82143A Printer

Steps: 168 HP-41 Bytes: 334

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03161-41-7	$10	$12
FOR HP-71	NOT AVAIL		

03162 Intersections of Lines, Circles, and Conics; and Distances

by J.C. Budd, Austin, TX

This program calculates the intersection points between lines; line and circle; circle and circle; line and ellipse; line and hyperbola; line and parabola and calculates perpendicular distance from a point to a line in the cartesian coordinate system. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 579 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03162-41-5	$10	$15
FOR HP-71*	03162-71-2	N/A	$18

03163 Steel Base Plate Design

by R. Balogh, Houston, TX

"Steel Base Plate Design" ("BPL") reduces known design quantities to elementary stresses, calculates the allowable material stresses, and determines the minimum required plate thickness for a base plate subject to a given combination of applied forces. "BPL" provides the user with a rapid means of converging on an acceptable solution for virtually all geometrically concentric steel base plate design problems. **Necessary Accessories for HP-41:** None

Steps: 625 HP-41 Bytes: 1318

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03163-41-3	$10	$16
FOR HP-71*	03163-71-0	N/A	$18

03164 Concrete Beam Design/Review for Strength Design

by W.H. Kirkgaard, Clarksburg, CA

This program aids in the design or review of reinforced concrete beams. When material strengths and beam dimensions are input the area of reinforcing steel for a balanced design is then displayed. The designer may then enter either the applied bending moment or the amount of reinforcing steel. Then the required area of reinforcing steel or the allowable bending moment is displayed along with the shear capacity. Computations are performed in compliance with ACI codes. **Necessary Accessories for HP-41:** None

Steps: 172 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03164-41-1	$10	$12
FOR HP-71*	03164-71-8	N/A	$14

03165 Recoil

by P.O. Barkley, Sheridan, IN

Based upon Powder Charge, Bullet weight, Muzzle Velocity and gun weight program calculates recoil velocity in FPS and Recoil Energy in FT.LBs. **Necessary Accessories for HP-41:** None

Steps: 41 HP-41 Bytes: 114

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03165-41-8	$10	$11
FOR HP-71*	03165-71-5	N/A	$12

03166 6502 Disassembler

by P. Heidrich, Rheinstetten 2, West Germany

The program generates 6502 microprocessor mnemonics for a given machine code input in hexadecimal format and prints the mnemonic. **Necessary Accessories for HP-41:** Two memory modules, X-Function module, Printer, Cassette Drive

Steps: 558 HP-41 Bytes: 1158

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03166-41-6	$10	$16
FOR HP-71*	03166-71-3	N/A	$18

03168 6800 Disassembler

by P. Heidrich, Rheinstetten 2, West Germany

The program generates 6800 microprocessor mnemonics for a given machine code input in hexadecimal format and prints the mnemonic. **Necessary Accessories for HP-41:** Three memory modules, X-Function Module and Printer

Steps: 613 HP-41 Bytes: 1449

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03168-41-2	$10	$17
FOR HP-71*	03168-71-9	N/A	$20

03169 Vector Operations

by P. Heidrich, Rheinstetten 2, West Germany

The program enables you to store 5 three-dimensional vectors and you can execute the following operations: dot product, cross product, addition, subtraction, angle between two vectors, magnitude, area of two vectors, volume of three vectors, new entry of a vector, unit vector, scalor triple product, transformation cartesian-polar and vice versa. **Necessary Accessories for HP-41:** Two memory modules. Printer optional.

Steps: 417 HP-41 Bytes: 869

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03169-41-0	$10	$14
FOR HP-71*	03169-71-7	N/A	$16

03170 Bug and Spiders

by P. Heidrich, Rheinstetten 2, West Germany

A bug is climbing in a cube and the player must try to lead the bug from one corner to the opposite corner of the cube. But spiders are sitting at five points in the cube and wait to eat the bug. If the player leads the bug to a point outside of the cube, he falls down and the game is over. **Necessary Accessories for HP-41:** None

Steps: 152 HP-41 Bytes: 269

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03170-41-8	$10	$12
FOR HP-71*	03170-71-5	N/A	$14

03171 Game of Life

by P. Heidrich, Rheinstetten 2, West Germany

This is a program for Conway's "Game of Life". It generates subsequent generations of organisms on a 10x10 grid. The organisms die or reproduce according to a simple rule. The program is very quick, it needs only 2 and a half minutes to print one generation. **Necessary Accessories for HP-41:** Memory Module and Printer

Steps: 206 HP-41 Bytes: 378

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03171-41-6	$10	$12
FOR HP-71*	03171-71-3	N/A	$14

03172 Senso

by P. Heidrich, Rheinstetten 2, West Germany

The program generates a succession of tones which becomes longer and longer from round to round. The player must play the tones in the same order in which the calculator had played the tones. At the beginning of the game the player can choose the number of different tones which are used. **Necessary Accessories for HP-41:** None

Steps: 115 HP-41 Bytes: 303

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03172-41-4	$10	$12
FOR HP-71*	03172-71-1	N/A	$14

03173 Queen

by P. Heidrich, Rheinstetten 2, West Germany

At the beginning of the game the player must position the queen on the 8. row and/or 8. column of the chessboard. Now the calculator moves the queen only to the left, down or diagonally to the left. After this you can do the same. The player who moves the queen first to the square in the first row and first column has won the game. **Necessary Accessories for HP-41:** One memory module. Printer optional.

Steps: 274 HP-41 Bytes: 517

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03173-41-2	$10	$13
FOR HP-71*	03173-71-9	N/A	$14

03174 30 Chips

by P. Heidrich, Rheinstetten 2, West Germany

From 30 chips takes the player and the calculator alternating at least one, and maximum six. The player who takes the last chip has won the game. **Necessary Accessories for HP-41:** None

Steps: 81 HP-41 Bytes: 200

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03174-41-0	$10	$11
FOR HP-71*	03174-71-7	N/A	$12

03175 Grand Master Mind

by T. Rice, Spokane, WA

This program plays the part of codemaker for Grand MasterMind by generating a secret code and giving three types of clues for the player's four-position guess. Each position consists of a one-digit integer and one-digit decimal. Clues are given for the correct pair in the right position, correct pair in the wrong position, and a correct integer or decimal in the right position. This version of MasterMind has the complication of using pairs of colors and shapes and using integers and decimals in the display. The object of the game is to correctly guess the four pairs in the hidden code in as few guesses as possible using the clues given by the computer. **Necessary Accessories for HP-41:** Two memory modules. Printer helpful.

Steps: 553 HP-41 Bytes: 1048

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03175-41-7	$10	$15
FOR HP-71*	03175-71-4	N/A	$18

03176 Orbital Elements Given Semimajor Axis, Eccentricity and Mass

by M.G. Compton, Shreveport, LA

Given the semimajor axis, eccentricity, and mass the program computes the semiminor axis, aphelion radius, perihelion radius, velocity at apogee, velocity at perigee, angular momentum, total energy and period of an orbiting body. **Necessary Accessories for HP-41:** None

Steps: 119 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03176-41-5	$10	$11
FOR HP-71*	03176-71-2	N/A	$12

03177 Code Oscillator

by S.R. Aberle, Sunnyvale, CA

This program simulates a code oscillator, and can be used to assist in the learning of International Morse Code. Text, entered from the keyboard or read from a text file, is translated directly into code. Random code generation of word groups is also available, and the random code can optionally be saved in a text file. The sending speed is adjustable from less than 5 to well over 20 WPM. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 4600

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03177-71-0	$10	$18

03178 ROWCOL

by Users' Library, , Corvallis, OR

LEX file provides a keyword that allows easy conversion between row- and column-oriented graphics. Sample use: converting graphics data for HP 82905B printer, column-oriented, into graphics data for ThinkJet printer, row-oriented. (Included in LEX Pac 03191-71). THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 119

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03178-71-8	N/A	$12

03179 Life:A

by Users' Library, , Corvallis, OR

This LEX file allows you to create a very fast next-generation for John Conway's "Life" game. Computation time for a 24 by 80 board (useful if output is going to a standard terminal) is typically under two seconds. (Included in LEX Pac 03191-71).THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 457

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03179-71-6	N/A	$12

03180 Banner

by Users' Library, , Corvallis, OR

This LEX file creates a string function to provide banner-type representations of characters in the built-in or alternate character sets. This allows easy printing of banners (posters) using large characters. (Included in LEX Pac 03191-71.) THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 202

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03180-71-4	N/A	$12

03181 Running Clock Display

by Users' Library, , Corvallis, OR

LEX file provides an optional running clock display in the right-hand part of display. Clock does not interfere with normal operation of the computer, but does reduce the size of the display. (Included in LEX Pac 03191-71.) THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 328

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03181-71-2	N/A	$12

03182 Text File Utilities (TEXTUTIL)

by Users' Library, , Corvallis, OR

The LEX file TEXTUTIL contains five new keywords, and an extension to the mainframe LIST. The five new keywords are: FILESZR - a function that returns the number of records in the specified text file. SEARCH - a function that searches through a TEXT file for the specified string, returning information as to if and where the string was found. DELETE# - a statement that allows a TEXT file record to be deleted. INSERT# - a statement that allows a record to be inserted into a TEXT file. REPLACE# - a statement that allows a TEXT file to be replaced. (Included in LEX Pac 03191-71.) THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 1512

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03182-71-0	N/A	$16

03183 Character Set LEX File Generator

by Users' Library, , Corvallis, OR

LEX files may implement character sets, but such files are hard to create. This program constructs a LEX file from the current character set (as returned by CHARSET$). The new LEX file adds a new keyword which activates the character set. The LEX file may be saved on an external device or even burned into a ROM, in which case there is no RAM overhead. (Included in LEX Pac 03191-71.) THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 1300

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03183-71-8	N/A	$20

03184 Customization Utilities (CUSTUTIL)

by Users' Library, , Corvallis, OR

CUSTUTIL LEX file provides six keywords helpful in customizing the user interface: INLINE gives an enhanced input capability allowing you to determine the cursor position and type and which keys terminate. MSG$ allows for localization of error messages and user input, making it possible for a Basic program to be translated into any language automatically. KEYWAIT$ puts 71 in a low power state waiting for a key to be hit, then returns key name. SCROLL scrolls the message in the display the specified number of characters. KEYNAM$ returns keyname given keycode. KEYNUM returns keycode given keyname. (Included in LEX Pac 03191-71) PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 1007

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03184-71-6	N/A	$12

03185 Extended Showport

by Users' Library, , Corvallis, OR

SHOWPORT in operating release 1BBBB only gives information on RAM which has been freed with FREEPORT. This LEX file extends SHOWPORT so it gives information on all RAM. (Included in LEX Pac 03191-71.) THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 151

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03185-71-3	N/A	$12

03186 Simple and Enhanced Key Redefinition

by Users' Library, , Corvallis, OR

KEYDEF allows keys to be redefined with a minimum of keystrokes. Through a system of friendly prompts, the user can redefine keys, or simply scroll through the current keyboard redefinitions in the "keys" file. It provides a simple and easy-to-use interface for imbedding escape sequences in an assignment string. (Included in LEX Pac 03191-71.) THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** CUSTUTIL LEX file

Steps: HP-71 Bytes: 3214

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03186-71-1	N/A	$20

03187 ROMAN 8 Character Set Lexfile

by Users' Library, , Corvallis, OR

This LEX file allows a user to easily define the alternate character set as the ROMAN 8 (extended) character set. (Included in LEX Pac 03191-71.) THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 850

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03187-71-9	N/A	$12

03188 4th Order Runge-Kutta For O.D.E.

by D.N. Peterson, Lillooet, Canada

Approximate solution of one O.D.E. using a 4th order Runge-Kutta method. Can select: step size; which values to be printed; and stopping valve. Solution printed and computer turned off at end of problem. Enter O.D.E. and leave - the program does the rest. **Necessary Accessories for HP-71:** Printer (24 character).

Steps: HP-71 Bytes: 604

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03188-71-7	$10	$14

03189 Integration of Functions

by D.N. Peterson, Lillooet, Canada

Calculates definite integrals of functions of one variable using a 16 point gaussian quadrature method. Can be called as a subprogram. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 479

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03189-71-5	$10	$12

03190 4th Order Runge-Kutta for N-O.D.E.'s

by D.N. Peterson, Lillooet, Canada

Solves a system of N-O.D.E.'s by a 4th order runge-kutta method. User selects: step-size, number of iterations per printout, and stopping value. Enter your system of O.D.E.'s and leave - program does the rest. Ideal for phase plane analysis data. **Necessary Accessories for HP-71:** HP 82480A Math Pac and Printer

Steps: HP-71 Bytes: 1310

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03190-71-3	$10	$14

03191 LEX File Utilities Pac

by Users' Library, , Corvallis, OR

This program includes the following individual programs: 03178-71, 03179-71, 03180-71, 03181-71, 03182-71, 03183-71, 03184-71, 03185-71, 03186-71, and 03187-71. Please read the individual abstracts for a complete description. THIS PROGRAM MUST BE SOLD RECORDED ON EITHER CARDS, CASSETTE, OR HP-IL DISC. **Necessary Accessories for HP-71:** As stated in the individual abstracts.

Steps: HP-71 Bytes: 18000

	Order Program No.	Documentation Only	W/Media
FOR HP-41	NOT AVAIL		
FOR HP-71	03191-71-1	N/A	$75

03192 SEMITEXT

by P. Harmon, Vancouver, WA

The program SEMITEXT provides most of the features found in screen oriented word processors. The program is a line oriented editor which allows the user to see text files as they are edited and change them on a CRT. Supported operations include string searching, line copying, line deleting and undeleting, file merging, and outputting lines from the file being edited to another file in RAM. THIS PROGRAM MUST BE SOLD RECORDED ON CARDS, CASSETTE, OR HP-IL DISC. **Necessary Accessories for HP-71:** 80 Column Video Interface & Display, HP-IL module, TEXTUTIL (U/L Program 03182-71-0) or EDLEX file (available in FORTH ROM). ThinkJet printer is supported.

Steps: HP-71 Bytes: 8100

	Order Program No.	Documentation Only	W/Media
FOR HP-41	NOT AVAIL		
FOR HP-71	03192-71-9	N/A	$38

03193 HP-41 to HP-71 Mass Storage Program Conversion

by W.C. Wickes, Corvallis, OR

This program will read an HP-41 program from magnetic tape or diskette converting it into an HP-71 text file suitable for translation by the HP-41 Translator Pac program TRANS41. With two mass storage devices, you can translate all of the programs on a diskette or cassette automatically. TAPE41 identifies HP-41 modules required for each program. Recognizes the Card Reader, Printer, HP-IL Module, Wand, Time Module, X-Functions ROM, Autostart ROM, and synthetic register access. Extend this list to any other HP-41 module using the HP-71 text editor (included in the HP-41 Translator Pac) to add program and function names from the module to NAME41. **Necessary Accessories for HP-71:** HP-71 and HP-41C/CV/CX, HP-IL Module (82401A) for HP-71. One or two HP-IL mass storage devices. Printer optional.

Steps: HP-71 Bytes: 9100

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03193-71-7	$10	$24

03194 Keyboard Is

by Users' Library, , Corvallis, OR

The Keyboard Is statement assigns the HP-150 to act as a remote keyboard for the HP-71 through the HP-IL RS232 interface Part #82164A. THIS PROGRAM MUST BE SOLD RECORDED ON CARDS, CASSETTE, OR HP-IL DISC. **Necessary Accessories for HP-71:** 82164A HP-IL/RS232 Interface

Steps: HP-71 Bytes: 1400

	Order Program No.	Documentation Only	W/Media
FOR HP-41	NOT AVAIL		
FOR HP-71	03194-71-5	N/A	$20

03197 Navigation Computations

by R.W. Meals, Redlands, CA

Program designed for preflight and inflight use. Gives accurate readouts for all of the basic navigation problems faced by the pilot whether flying light aircraft or operating international heavy jets. **Necessary Accessories for HP-41:** Minimum of three memory modules or HP-41CV. Printer helpful but not required.

Steps: 731 HP-41 Bytes: 1511

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03197-41-1	$10	$19
FOR HP-71*	03197-71-8	N/A	$22

03198 PVT Data For Ideal and Real Multicomponent Mixtures

by P.N. Vo, Blacksburg, VA

Using Redlich-Kwong equation of state, the program has been designed to compute P, V, n, R, T as unknowns for *A pure idea gas and ideal-gas multicomponent solutions. *A pure Redlich-Kwong gas. *An ideal multicomponent (ideal) solution. *A real (Redlich Kwong) multicomponent solution of up to 18 gaseous component (for P, V, T as unknowns only). **Necessary Accessories for HP-41:** Two memory modules minimum

Steps: 516 HP-41 Bytes: 868

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03198-41-9	$10	$14
FOR HP-71*	03198-71-6	N/A	$16

03199 Bubble and Dew Point Calculations

by P.N. Vo, Blacksburg, VA

Employing the Antoine equation, this program computes the bubble point temperature and pressure and the corresponding vapor composition. It also computes the dew point temperature and pressure and the corresponding condensate composition for ideal multi-component mixtures. The vapor pressure and temperature can be calculated for any substance. The user does not need to look up for constants. **Necessary Accessories for HP-41:** Two memory modules minimum

Steps: 408 HP-41 Bytes: 875

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03199-41-7	$10	$14
FOR HP-71*	03199-71-4	N/A	$16

03200 Temperature Drift of Resistances

by A. Melimopoulos, Caracas, Venezuela

Given the thermal coefficient of a resistor and the temperature variation, this program will calculate the resistance drift of the resistor. If you don't know the thermal coefficient rated to the temperature you want, the program extrapolates it from the nominal coefficient supplied by the manufacturer rated to any temperature. Also, if you want to know the thermal coefficient for the temperature variation or the nominal resistor value for a specified resistance drift the program will find it. **Necessary Accessories for HP-41:** None

Steps: 63 HP-41 Bytes: 119

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03200-41-3	$10	$11
FOR HP-71*	03200-71-0	N/A	$12

03201 Thermocouple Correction

by G.G. Chase, Akron, OH

Thermocouples in protruding wells used to measure fluid temperatures may need readings corrected due to heat conduction from the wall and heat transfer to the fluid. This program estimates the true temperature based on the physical properties of the system. If the heat transfer coefficient is not known, it is estimated for a cylindrical well in a horizontal position. Program may easily be modified for heat transfered coefficients of specific fluids or other geometries. **Necessary Accessories for HP-41:** None

Steps: 230 HP-41 Bytes: 510

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03201-41-1	$10	$13
FOR HP-71*	03201-71-8	N/A	$14

03202 EDM (Electronic Distance Meter)

by M.J. Martin, Burley, ID

When used with a total station, this program computes horizontal distance, height of instrument, elevation of point, station, and distance out from centerline station. Instrument may be on centerline or a parallel offset line either right or left of centerline. Backsight may be ahead or back. Zenith and horizontal angles are input as read from the instrument. **Necessary Accessories for HP-41:** None

Steps: HP-41 Bytes: 215

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03202-41-9	$10	$13
FOR HP-71*	03202-71-6	N/A	$14

03203 Loads on Pipe in Trench

by J.E. Cowgill, Dallas, TX

Program calculates loads on pipes in trenches considering earth loads and live loads. Also calculates the maximum depth of cover for pipes in a trench, given the pipe supporting strength, type of soil and bedding condition. **Necessary Accessories for HP-41:** Extended functions module; printer would be helpful.

Steps: 159 HP-41 Bytes: 354

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03203-41-7	$10	$12
FOR HP-71*	03203-71-4	N/A	$14

03204 Wind and Horizontal Loads on Porticos

by J. Centafont, Levittown, PA

Program calculates for the columns end moments in porticos when it is possible using a simplified and approximated calculation. This preceeding result may not be exact when it is confronted with the value to be exactly calculated by CROSS method. **Necessary Accessories for HP-41:** None

Steps: 154 HP-41 Bytes: 323

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03204-41-5	$10	$11
FOR HP-71*	03204-71-2	N/A	$12

03205 Sequential Multiplication of Real/Complex Matrices

by A. Melimopoulos, Caracas, Venezuela

Given the matrices A(mxn) and B(nxp), this program calculates the multiplication matrix C(mxp), A x B = C. The values m, n and p are the rows x columns value of the matrices. This program shows the solution as an option and prompts for another matrix and computes the sequential multiplication with the last solution performing in this way the sequential product of any number of matrices. The matrix elements can be real or complex. **Necessary Accessories for HP-41:** One memory module

Steps: 293 HP-41 Bytes: 468

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03205-41-2	$10	$13
FOR HP-71*	03205-71-9	N/A	$14

03206 Butterworth Filters

by A. Melimopoulos, Caracas, Venezuela

This program gives you the Butterworth function for any low-pass, high-pass, band-pass and band-reject filter approximation. You just need to know the pass-band frequencies, the maximum attenuation and the order; if you don't know the order, you should know the stop-band frequencies and the maximum attenuation. If for the requirements you have, the theoretical order is, N=4.1, this program can find (as an option) the fourth order approximation but the poles are calculated with N=4.1; this is a special technique used in the program. The full alphanumeric capabilities of the calculator are used. **Necessary Accessories for HP-41:** One memory module

Steps: 256 HP-41 Bytes: 430

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03206-41-0	$10	$12
FOR HP-71*	03206-71-7	N/A	$14

03207 Fast Division of Polynomials

by A. Melimopoulos, Caracas, Venezuela

This program calculates the division of two polynomials of degree N (numerator) and M (denominator) where N>M and displays the quotient and the remainder of the division performed. This program runs very fast and the size requirement is minimum. The full alphanumeric capabilities of the calculator are used. **Necessary Accessories for HP-41:** None

Steps: 95 HP-41 Bytes: 152

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03207-41-8	$10	$11
FOR HP-71*	03207-71-5	N/A	$12

03208 Exponential Conversion

by J. Centafont, Levittown, PA

Similar in nature to the SCI and ENG format, this program allows complete control of the display format. Any number can be converted to any desired exponent with corresponding mantissa. Great for conversion from one metric unit to another (as this cannot be done with the ENG function). Efficient formatting, excellent readability makes this program simple to use and extremely useful. **Necessary Accessories for HP-41:** None

Steps: 110 HP-41 Bytes: 174

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03208-41-6	$10	$11
FOR HP-71*	03208-71-3	N/A	$12

03209 Almost Linear System of Equations

by J.E. Shisley, Pasadena, CA

This program solves a system of equations which is dominated by large linear terms, and smaller non-linear functions. Will solve for maximum of 12 unknowns. It can also be used to invert a matrix, solve a linear system of 12 unknowns, and to perturb system of linear equations to examine slight changes in the coefficients. User must write function sub-routine. **Necessary Accessories for HP-41:** CV, CX, or Quad Memory

Steps: 393 HP-41 Bytes: 655

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03209-41-4	$10	$14
FOR HP-71*	03209-71-1	N/A	$16

03210 Numerical Solutions to Initial and Boundary Value Problems

by J.E. Shisley, Pasadena, CA

Up to fourth order Initial Value Problem is solved as a system using Standard Runge-Kutta starter, Adams-Bashforth predictor, and Adams-Moulton corrector. Two types of Boundary Value Problems are solved using shooting method. Type one, initial value is known and initial slope is unknown. Type two, initial value is unknown and initial slope is known. User must write subroutine for derivatives. **Necessary Accessories for HP-41:** Quad memory/CV/CX, patience and fresh batteries!

Steps: HP-41 Bytes: 1387

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03210-41-2	$10	$18
FOR HP-71*	03210-71-9	N/A	$22

03211 Relative Mass

by J. Armstrong, Merced, CA

This program uses rest mass, observed or relative mass, and velocity. Given any two, the program will generate the third. Alpha input and output is used to increase usability. **Necessary Accessories for HP-41:** None

Steps: 75 HP-41 Bytes: 142

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03211-41-0	$10	$11
FOR HP-71*	03211-71-7	N/A	$12

03212 "GENCOR" Generalized Correlation

by B.C. Duff, Fairbanks, AK

The program calculates B, B(sub)o, B(sub)1, dB/dT, dBo/dT(sub)R, Bij's, delta h/RT, delta S/R, delta H, delta S, dBij/dT, BPC/RTC and Z. No unit conversions are necessary, the user is prompted for the units desired by the program, and the program makes the conversions. In its present form the program will work only for a one or two component mixture. **Necessary Accessories for HP-41:** Petroleum Fluids Pac

Steps: 327 HP-41 Bytes: 842

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03212-41-8	$10	$14
FOR HP-71*	03212-71-5	N/A	$16

03213 Reduction of Steel Band Measurements (2nd Version)

by B. Pons, Taren Point, Australia

This program reduces observed steel band measurements to horizontal distances. The corrections applied are: temperature, tension (or pull), sag (for any number of bays), and slope. Units are SI units. A non-steel band can be used, if its coefficient of linear expansion and its cross-sectional area are known. **Necessary Accessories for HP-41:** None

Steps: HP-41 Bytes: 500

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03213-41-6	$10	$13
FOR HP-71*	03213-71-3	N/A	$14

03214 Isotropic Plate Bending Analysis

by J.F. Unsworth, Squamish, Canada

Program calculates deflection and bending moments in isotropic simply supported plates. Solution by method of Levy using single fourier series expansion. Bending moment solutions do not converge as rapidly as deflection solutions and require greater number of terms in series. Plates bending under uniformly distributed load are treated. **Necessary Accessories for HP-41:** HP-41 Math Pac or user-written subroutines for hyperbolic functions

Steps: 269 HP-41 Bytes: 364

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03214-41-4	$10	$12
FOR HP-71*	03214-71-1	N/A	$14

03215 Uniformly Loaded Beam - Moment, Shear, Deflection Calc

by R. Chang, Seattle, WA

After any computer beam analysis, one can usually get the output with end moments for each member. With this information, it is very convenient to have "UNIFBM" compute the moment, shear and reflection at any selected section along the uniformly loaded beam. It can also calculate the amount and location of the max. moment. **Necessary Accessories for HP-41:** None

Steps: 205 HP-41 Bytes: 355

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03215-41-1	$10	$12
FOR HP-71*	03215-71-8	N/A	$14

03216 The Game of Isola

by D. Ristanovic, Belgrade, YUGOSLAVIA

Play a game of Isola against Mac. Your task is to try to isolate Mac's pawn. In each move you can move your pawn on any of the neighbour squares and destroy any of the remaining squares. The same goes for Mac. If your pawn cannot move - Mac wins. Otherwise, if you manage to isolate Mac's pawn - you win. But this is not going to happen too often! **Necessary Accessories for HP-41:** One memory module

Steps: HP-41 Bytes: 339

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03216-41-9	$10	$13
FOR HP-71*	03216-71-6	N/A	$14

03217 Armchair Admiral

by G. Ferry, Corvallis, OR

This is the game of 'BATTLESHIP', pitting one HP-71B against another. With this program, the user must set up his/her own 'board' while the computer fires his/her shots. The documentation describes rules and interface protocol so that another HP-IL controller could be used to play. The user is encouraged to write his/her own firing algorithm. **Necessary Accessories for HP-71:** HP-IL Interface, additional HP-71B with HP-IL Interface, Video monitor.

Steps: HP-71 Bytes: 600

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03217-71-4	$10	$26

03218 Galilean Ephemeris For Jupiter

by S.E. Johnson, Rochester, NH

This program displays or plots the positions of the four Galilean satellites of Jupiter. For a given date and time, it will show one or all four moons. A single chart or series of charts at a given interval may be shown. Charts may be displayed or plotted. A program and instructions are supplied to update the program's ephemeris to provide perpetual accuracy. **Necessary Accessories for HP-71:** None. 82401A HP-IL Module and 82162A Thermal Printer/Plotter required for plotted output.

Steps: HP-71 Bytes: 6618

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03218-71-2	$10	$20

03219 Psychrometric Properties

by R.A. Bennett, Decatur, GA

Given pressure, dry-bulb temperature, and either vapor pressure, relative humidity or wet-bulb temperature, this program calculates wet-bulb temperature, relative humidity, vapor pressure, humidity ratio, dew-point temperature, enthalpy, and specific volume. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 5934

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03219-71-0	$10	$20

03220 Compleat Composite Beam

by S. Dusterwald, Las Vegas, NV

Lightweight or regular weight concrete, with or without steel deck, computes stud capacity reductions for light-weight concrete and deck rib geometry. Shored or unshored, slab one or two sides. One huge data file with ASCII directory file provides 20 second access to data for any of the 187 wide flange shapes. Handles cover plates and other elements welded to steel section. Shear requirements N1, N2. All section properties, steel and concrete stresses, all deflections. THIS PROGRAM MUST BE SOLD RECORDED ON 3.5 DISC OR CASSETTE ONLY. **Necessary Accessories for HP-41:** HP-41CV, HP-IL Module (82160A), Extended Functions Module (82180A), Extended Memory Module (82181A), Digital Cassette Drive (82161A), Peripheral Printer (82143A)

Steps: 1555 HP-41 Bytes: 003150

	Order Program No.	Documentation Only	W/Media
FOR HP-41	03220-41-1	N/A	$20
FOR HP-71	NOT AVAIL		

03221 Calendar Functions: Numeric

by R.W. Stallings, Albuquerque, NM

CALFCN adds ten BASIC keywords to HP-71B BASIC. Keywords are for numeric functions. Keywords added are as follows: DAY# DAY DOW DOY JC JDN MONTH SETTODAY TODAY YEAR. These functions permit date arithmetic in BASIC and CALC modes. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 2.6k

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03221-71-6	$10	$14

03222 Voltage Plot of Sin/Cos Source

by R. Ball Jr, Auburn, AL

This program allows the user to define a sinusoidal A.C. voltage source in terms of amplitude, phase angle, etc., for the purpose of plotting the volt- age as a function of time. The program also allows for a D.C. source or constant to be present with the A.C. source. The program gives the user several options of outputs including parameters of the wave such as frequency, period, RMS(effective) voltage, and others. **Necessary Accessories for HP-41:** 82106A Memory Module

Steps: 254 HP-41 Bytes: 0624

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03222-41-7	$10	$13
FOR HP-71	NOT AVAIL		

03223 'Friday'; An Appointment Reminder

by J. Gleason, Sunnyvale, CA

This program retrieves stored messages for appointments at one-half hour and one hour intervals. To minimize power consumption, it utilizes a unique capability of the HP-71B: it can be turned off and will automatically awaken and resume program execution at the end of a timed interval. At 1 to 15 minutes before the hour or the half-hour, the HP-71B wakes up, checks the appointment schedule, notifies the user, then goes back to sleep. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 2600

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03223-71-2	$10	$14

03224 Orifice Flow

by K.S. Freier, Albuquerque, NM

This program computes all variables for the orifice flow equation. Solve for Q, C, area, diameter, or H. Circular, square or rectangular shaped orifice can be used. **Necessary Accessories for HP-41:** One memory module, printer is optional.

Steps: 216 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03224-41-3	$10	$12
FOR HP-71*	03224-71-0	N/A	$14

03228 Chromatographic Figures of Merit - CFOM

by W. Pinnick, State College, PA

A program to calculate Chromatographic Figures of Merit (CFOM) for ideal and skewed peaks as described in "Analytical Chemistry", vol. 55, pp 730-737 (April 1983). Output includes number of plates (observed or maximum). Percent relative system efficiency, the first four statistical moments, the skew and excess, the time of gaussian peak, the deviation of the gaussian and the exponential tailing factor. **Necessary Accessories for HP-41:** One memory module, printer optional.

Steps: 362 HP-41 Bytes: 000754

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03228-41-4	$10	$14
FOR HP-71*	03228-71-1	N/A	$16

03229 Questionaire or Interview Response Tabulation 99x260x5

by R. Belling, Jersey City, NJ

Frequencies of responses are accumulated for up to 99 questionaires of up to 260 questions, each with up to 5 possible answers or no response. Output is 6 counts per question separated within one display or sequential display of percentages. Also for recording structured interview response without paperwork. PROGRAM SOLD ON CASSETTE ONLY. **Necessary Accessories for HP-41:** None. HP-41C may require extra memory modules.

Steps: 180 HP-41 Bytes: 000364

	Order Program No.	Documentation Only	W/Media
FOR HP-41	03229-41-2	N/A	$20
FOR HP-71	NOT AVAIL		

03230 Vertical Design

by W. Jutte, Macgregor, Australia

This program calculates levels at regular intervals, with the possibility to calculate at those intervals up to ten sidepoints. Input is the chainage, curvelength and height for maximum 63 points of intersection. Data can be recorded on and reloaded from cards. Options: design line only; crossfall or camber; ten points per chainage maximum. **Necessary Accessories for HP-41:** Four memory modules or quad memory module.

Steps: 514 HP-41 Bytes: 001120

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03230-41-0	$10	$15
FOR HP-71*	03230-71-7	N/A	$18

03231 Chebyshev Filters

by A. Melimopoulos, Caracas, Venezuela

This program gives the Chebyshev function for any low-pass, high-pass, band-pass and band-reject filter approximation. You supply the pass-band frequencies, maximum attenuation and the order. If order is unknown, you should know the stop-band frequencies and the minimum attenuation. If, for your requirements, the theoretical order is, N=5.1; this program can find (as an option) the fifth order approximation, but the poles are calculated with N=5.1; this is a special technique used in this program. The full alphanumeric capabilities of the calculator are used. **Necessary Accessories for HP-41:** One memory module and Math Pac (00041-15003).

Steps: 269 HP-41 Bytes: 000448

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03231-41-8	$10	$12
FOR HP-71	NOT AVAIL		

03232 External Ballistics - 2: Trajectory

by O.X. Dobnick, Mitwaukee, WI

This program computes TRAJECTORIES to 100 yards for pistol or 1000 yards for rifle. Only DROPS are required for trajectory calculation. DROPS may be obtained from use of EXTERNAL BALLISTICS - 1, DROP or other similar programs or other sources. **Necessary Accessories for HP-41:** None, however, a card reader would be useful.

Steps: 71 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03232-41-6	$10	$11
FOR HP-71*	03232-71-3	N/A	$12

03233 Bolts in Shear: Version 3.2

by T.W. Sibert, Stone Mountain, GA

This program calculates the shear forces on a group of up to ten fasteners. It allows adding, changing the position of, and deleting of fasteners in the group, changing of applied force parameters, reviewing of the fastener's and force's location, saving and loading of problems to/from data cards (with a card reader), and features a HELP routine. It is extremely versatile and is entirely menu driven. Video interfaces and printers are supported. **Necessary Accessories for HP-41:** Quad memory module, and card reader to access Save & Load features.

Steps: 782 HP-41 Bytes: 001772

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03233-41-4	$10	$18
FOR HP-71	NOT AVAIL		

03234 Multiple-Input (Feedforward) Biquad Filter Design

by K.K. Ang, Halifax, Canada

This program computes element values for any of the six standard Multi-Input (Feedforward) Biquad filters, namely, Low-Pass, High-Pass, Band-Pass, Band-Reject (Notch, Low-Pass Notch or High-Pass Notch), All-Pass and Gain-Equalizer. Inputs are capacitance C, gain K, pole-frequency WO, pole-quality factor Q, and zero frequency WZ or zero-quality factor QZ (if required). The program then prints out a list of elements which form the required filter. **Necessary Accessories for HP-41:** None, printer is optional.

Steps: 113 HP-41 Bytes: 000241

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03234-41-2	$10	$12
FOR HP-71*	03234-71-9	N/A	$14

03235 Chlorophyll Estimation From Reflectance Spectra of Potatoes

by S.C. Morris, Gosford, Australia

This program converts percent reflectance values for potato tubers at 675 and 650 nm (700 nm set at 100%) obtained using a spectrophotometer and reflectance attachment into chlorophyll content. The values given are for total chlorophyll, chlorophyll a, chlorophyll b, and the ratio of a/b. The conversion equations were obtained by correlating percent reflectance to 19 mm diameter discs of peel (approx. 2mm thick) with extracted chlorophyll content. Equations used are from Arnon (1949). Full alpha prompts and labeling are included. **Necessary Accessories for HP-41:** None

Steps: 71 HP-41 Bytes: 000190

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03235-41-9	$10	$11
FOR HP-71*	03235-71-6	N/A	$12

03236 Maximum Number of Rectangles in a Circle

by R.K. McDonald, Milpitas, CA

Input diameter of circle, the rectangle's X and Y dimensions as prompted and the program computes four possible arrays, selecting the one that yields maximum number of die you may expect on your wafer, and the row and column count. The program also computes the best die array and count for step and repeat reticle for normal optical systems and Ultratech Steppers. Program is fully prompted. **Necessary Accessories for HP-41:** HP-41CV with Extended Function or HP-41CX

Steps: 411 HP-41 Bytes: 000640

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03236-41-7	$10	$13
FOR HP-71	NOT AVAIL		

03237 Straight Lines and Points

by P. Maryssael, Brussels, Belgium

Given one or two points and one or two straight lines, this program computes the equation of the straight line passing by the two points; the scalar product of the two points; the euclidian, maxi-, taxi-, nth distances between the two points; norm of a point, the angle made by the vector of that point and the X-axis; intersection between, angle made by the two straight lines. Also computes the equation of the straight line making an angle theta, that you give, with the first of the two given points. You can also exchange the two straight lines and the two points. The program is printer compatible. **Necessary Accessories for HP-41:** One memory module, printer is optional.

Steps: 496 HP-41 Bytes: 000804

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03237-41-5	$10	$14
FOR HP-71*	03237-71-2	N/A	$16

03238 Weir Flow

by K.S. Freier, Albuquerque, NM

This program computes all variables for the Weir Flow equation. Solves for Q, C, L or H. **Necessary Accessories for HP-41:** Printer is optional.

Steps: 99 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03238-41-3	$10	$11
FOR HP-71*	03238-71-0	N/A	$12

03239 Fast Sorting Program

by W.W. Lauer, Canton, OH

This sorting program is relatively fast and requires only three more registers than values to be numerically sorted. It requires an HP-41CX since it uses "X<NN?" and "REGMOVE". It sucessfully uses "REGMOVE" with overlapping registers even though the instruction book supplied with the HP-41CX states blocks cannot overlap. (Ref. Volume 2 Page 201) Input and output are fully prompted. **Necessary Accessories for HP-41:** HP-41CX

Steps: 110 HP-41 Bytes: 000198

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03239-41-1	$10	$11
FOR HP-71	NOT AVAIL		

03240 Center of Gravity and Moment of Inertia for Rotated Members

by J.D. Gavlak, Cleveland, OH

This program calculates I for any enclosed area or member rotated about its C.G. Given the coordinates of each corner, the program will calculate the X and Y of the area, then translate the coordinates relative to the C.G. and prompt the user for a rotation angle. The I of the rotated area will be calculated and another angle will be requested, thus numerous angles can be tested for maximum and minimum I's. **Necessary Accessories for HP-41:** None

Steps: 234 HP-41 Bytes: 000448

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03240-41-9	$10	$12
FOR HP-71*	03240-71-6	N/A	$14

03241 Azimuth and Elevation for Satellite Antennas

by R. Hamilton, Cahokia, IL

This program uses the antenna site latitude and longitude and the assigned orbital position of the satellite to compute the pointing elevation and azimuth angles for the earth station antenna. Also available, if desired, are the satellite elevation above the local horizontal plane and the slant range from the satellite to the earth station. **Necessary Accessories for HP-41:** None

Steps: 60 HP-41 Bytes: 000108

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03241-41-7	$10	$11
FOR HP-71*	03241-71-4	N/A	$12

03242 Solubility vs pH: Amphoteric and Zwitterionic Compounds

by W. Pinnick, State College, PA

A least square fit to pH - solubility data applicable to amphoteric compounds whose solubility is limited by that of the neutral or zwitterionic species. The regression coefficient, the limiting solubility of the neutral species, and the two pKa's are determined. The pH and solubility at the isoelectric point is also determined and its percent ionic character. The solubility at a given pH may be estimated as may the two pH's which give a desired solubility. **Necessary Accessories for HP-41:** None, printer/plotter optional.

Steps: 307 HP-41 Bytes: 000500

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03242-41-5	$10	$13
FOR HP-71*	03242-71-2	N/A	$14

03243 Solubility vs. PH: Divalent Acids Or Bases

by W. Pinnick, State College, PA

A least square fit to pH - solubility data that is applicable to divalent acids or bases whose solubility is limited by the solubility of the free acid or base. The regression coefficients, limiting solubility, and the two pKa's or pKb's are determined. Solubility at a given pH or the pH required to achieve a desired solubility may be estimated. The pKw for water may be estimated from the water temperature. **Necessary Accessories for HP-41:** None, printer/plotter optional.

Steps: 327 HP-41 Bytes: 000589

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03243-41-3	$10	$13
FOR HP-71*	03243-71-0	N/A	$14

03244 Transmission Lines Calculations Using Lumped Parameters

by A.L.W. Ann, Halifax, Canada

This program will compute the phasors values of J sending, power angle, I sending, and load angle. The given parameters are; J receiving (as reference), I receiving or MVA rating or MW rating and power factor (minus sign for lagging and plus sign for leading), and the characteristic of the transmission lines Y and Z values. This program is applicable for PI and T circuit representation of the transmission lines. The voltages are given in line-line voltages. **Necessary Accessories for HP-41:** None

Steps: 203 HP-41 Bytes: 000350

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03244-41-1	$10	$12
FOR HP-71*	03244-71-8	N/A	$14*

03245 Psychrometric Chart

by T.L. Liston, San Jose, CA

This program computes moist air states at elevations from -2, 000 feet to +32, 000 feet. Any two inputs (except wet bulb + enthalpy) chosen from among dry bulb, wet bulb, dew point, enthalpy and/or relative humidity(in addition to altitude) yields a computation of all other properties, including boiling temperature, dry bulb, wet bulb, dew point, enthalpy, relative humidity, weight ratio in lb/lb and in grains/lb, vapor pressure, specific density and density altitude. **Necessary Accessories for HP-41:** Quad Memory Module

Steps: 957 HP-41 Bytes: 002048

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03245-41-8	$10	$20
FOR HP-71*	03245-71-5	N/A	$24

03246 HP-41/HP-2225B Program Bar Code

by D.R. Renninger, West Mifflin, PA

This program prints HP-41 program bar code on the HP-2225B ThinkJet Printer. **Necessary Accessories for HP-41:** HP-82170A Quad Memory Module, HP-82160A HP-IL Interface Module, HP-82184A Plotter Module, HP-00041-15043 HP-IL Development Module, HP-2225B ThinkJet Printer.

Steps: 200 HP-41 Bytes: 000395

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03246-41-6	$10	$12
FOR HP-71	NOT AVAIL		

03247 Phasor Operations for AC Circuit Analysis

by C. Camadella, Troy, NY

This program adds, subtracts, multiplies, and divides phasors of the form R/O using the same keystrokes as operations with conventional numbers. If key assignments are used, string operations are possible. Nested operations, however, are not possible. **Necessary Accessories for HP-41:** None

Steps: 67 HP-41 Bytes: 133

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03247-41-4	$10	$11
FOR HP-71*	03247-71-1	N/A	$12

03248 Nuclear Magnetic Resonance

by M. Donoghue, Dunedin, New Zealand

This program solves for free proton nmr; magnetic dipole potential energy (spin up or spin down), spin up/spin down energy changes and associated frequency of photon emission/absorption and proton precession, given a measured change of precession frequency in an nmr experiment, the magnetic field change is calculated. **Necessary Accessories for HP-41:** None

Steps: 71 HP-41 Bytes: 236

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03248-41-2	$10	$12
FOR HP-71*	03248-71-9	N/A	$14

03249 Telephone Directory

by G. Goodman, Stamford, CT

This is a telephone directory program. Phone numbers may be quickly retrieved by indexing on the first few letters of the first or last name. All names and phone numbers can be reviewed. The names and phone numbers are stored in extended memory. **Necessary Accessories for HP-41:** Extended Functions Memory Module

Steps: 76 HP-41 Bytes: 000171

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03249-41-0	$10	$11
FOR HP-71	NOT AVAIL		

03250 Ship's Stability Calculation

by J.S. Grant, Paraparaumu, New Zealand

This program calculates a ship's final GM, Trim and final draft. By displaying the vessel's final displacement, the appropriate stability data can be extracted from the ship's tables and entered when requested by the program. Adjustments to tanks, cargo spaces, etc., can be made if desired without the need to re-enter all other data and the new GM, Trim and Draft obtained. **Necessary Accessories for HP-41:** None

Steps: 262 HP-41 Bytes: 000850

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03250-41-8	$10	$14
FOR HP-71*	03250-71-5	N/A	$16

03251 Greenhouse Heatloss

by E.M. Keefe, Ankeny, IA

Given any eight of the quantities in the formula for heat loss (in BTU/HRS) the "GRNHS" program will solve for the ninth. Top run keys are used to facilitate sensitivity analysis. This program prompts for all inputs. **Necessary Accessories for HP-41:** One memory module

Steps: 272 HP-41 Bytes: 472

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03251-41-6	$10	$13
FOR HP-71*	03251-71-3	N/A	$14

03252 Chemical Fertilizer Mixing

by E.M. Keefe, Ankeny, IA

Program "mix" finds the average percent of nitrogen, potassium phosphorous in a blend of chemical fertilizers. Prompted entry with easy correctability. **Necessary Accessories for HP-41:** None

Steps: 69 HP-41 Bytes: 000142

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03252-41-4	$10	$11
FOR HP-71*	03252-71-1	N/A	$12

03253 Horn

by M. Ludwig, Oberkorn, Luxemburg

This program uses the Taylor formula for giving a complete Horner scheme. Formula: F(x)=F(A)+F'(A)(x-A)+F''(A)(x-A)2+.....+Fn-1(A)(x-A)n-1

————————————————— FACT (2) FACT (n-1) A=number of your choice. **Necessary Accessories for HP-41:** None

Steps: 85 HP-41 Bytes: 000197

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03253-41-2	$10	$11
FOR HP-71*	03253-71-9	N/A	$12

03254 Horner

by M. Ludwig, Oberkorn, Luxemburg

In the neighborhood of a certain point each function can be written as a polynome. This program gives the whole Horner Scheme and the coefficients of Taylor. The program, Horn, can be used when you want a Taylor development of a polynome. **Necessary Accessories for HP-41:** None

Steps: 107 HP-41 Bytes: 000164

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03254-41-0	$10	$11
FOR HP-71*	03254-71-7	N/A	$12

03255 Forest Management Costs

by R.A. Phillips, Morgantown, WV
J.V. Perumperal, Morgantown, WV
C. Swick, Morgantown, WV

A general cost model, developed by Gonsior, tests the sensitivity of total on-site forest management cost and the harvesting components of cost to alternative silvicultural utilization and other forest management objectives. **Necessary Accessories for HP-41:** Two memory modules or quad memory.

Steps: 358 HP-41 Bytes: 000764

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03255-41-7	$10	$14
FOR HP-71*	03255-71-4	N/A	$16

03256 K-Means Algorithm

by W.B. Reese, Knoxville, TN

This program assigns vectors of up to eight dimensions into up to eight cluster domains (pattern classes) based on minimization of the squared euclidean distances from all vectors in a cluster domain to the cluster center, using the K-means algorithm. The results are useful in pattern recognition for artificial intelligence. **Necessary Accessories for HP-41:** Extended memory module.

Steps: 365 HP-41 Bytes: 000622

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03256-41-5	$10	$13
FOR HP-71	NOT AVAIL		

03257 Anke-Simultaneous Equation System

by K. Rosenhagen, Blender-Einste, W. Germany

This program solves a simultaneous equation system up to 14th degree. The program contains features to solve matrices stored in X-Memory and to save matrices. **Necessary Accessories for HP-41:** HP 82180A Extended Function Memory Module, one memory module (minimum).

Steps: 374 HP-41 Bytes: 000710

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03257-41-3	$10	$14
FOR HP-71	NOT AVAIL		

03258 Menstruation Calendar

by K. Rosenhagen, Blender-Einste, W. Germany

This program calculates, under the input of the longest period, the shortest period and the last menstruation date, the fertile days and the date of the next menstruation using the Knaus-Ogino method. **Necessary Accessories for HP-41:** One memory module, card reader.

Steps: 225 HP-41 Bytes: 000423

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03258-41-1	$10	$12
FOR HP-71	NOT AVAIL		

03259 Bernoulli and Euler Numbers and Polynomials

by J.E. Shisley, Pasadena, CA

Bernoulli and Euler numbers are generated using recursion formula given X, BN(X) and/or EN(X) calculated. Program description includes useful information for applying BN, EN for series and asymptotic expansions, Euler-Maclaurin expansions, etc. **Necessary Accessories for HP-41:** None

Steps: 90 HP-41 Bytes: 000494

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03259-41-9	$10	$13
FOR HP-71*	03259-71-6	N/A	$14

03260 Circle and Pie Graph Chart Calculations
by A. Smith, Mhangura, Zimbabwe

This program uses only the stack. Given one of the following calculates all of the other three. Radius, diameter, circumference or area. It also calculates the information for sector of a circle given either percentage, portion or angle. Uses only the stack with all outputs labeled. **Necessary Accessories for HP-41:** None

Steps: 87 HP-41 Bytes: 000219

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03260-41-7	$10	$11
FOR HP-71*	03260-71-4	N/A	$12

03261 Shells of Constant Strength
by J.F. Unsworth, Squamish, Canada

This program determines the shape of the shell of revolution such that the membrane stresses are of the same magnitude at every point on the shell. Plain concrete domes supporting their own weight without additional load are considered. Differential equations of stress resultants solved by numerical integration. Units must be consistent. **Necessary Accessories for HP-41:** None

Steps: 208 HP-41 Bytes: 000307

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03261-41-5	$10	$12
FOR HP-71*	03261-71-2	N/A	$14

03262 Multicomponent Distillation Calculations
by J. Campos, Satelite, Mexico

This program calculates mole fraction and number of moles of a component in a distillate and bottoms, percent recovery of light key in distillate and heavy key in bottoms, minimum number of theoretical plates, minimum reflux ratio, optimal reflux ratio, number of theoretical plates, and number of plates below and above feed plate. Given feed composition and relative volatilities, and the especified mole fractions of the keys in the distillate and bottoms. BAR CODE IS NOT AVAILABLE WITH THIS PROGRAM. **Necessary Accessories for HP-41:** Four memory modules or quad memory module and Math I module.

Steps: 693 HP-41 Bytes: 001261

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03262-41-3	$10	$16
FOR HP-71	NOT AVAIL		

03263 Depth of Field RR #1
by R. Richardson, Toronto, Canada

This program calculates depth of field based on a circle of confusion on the negative of 1/1000 of the focal length. **Necessary Accessories for HP-41:** None

Steps: 49 HP-41 Bytes: 000105

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03263-41-1	$10	$11
FOR HP-71*	03263-71-8	N/A	$12

03264 Fast Hyperbolics
by A. Melimopoulos, Caracas, Venezuela

This fast and short program (only 43 steps) calculates the SINH, COSH, TANH, SECH, COSECH, COTANH, and their inverses. It is designed as separate subroutines. This program is very accurate because it uses the E^X-1 and LN1+X functions. **Necessary Accessories for HP-41:** None

Steps: 43 HP-41 Bytes: 000079

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03264-41-9	$10	$11
FOR HP-71*	03264-71-6	N/A	$12

03265 Log Skidder Loading Predictions
by R.A. Phillips, Morgantown, WV

A traction model developed by Wismer and Luth predicts the tractive capability of an off-road vehicle taking both vehicle and terrain conditions into consideration. **Necessary Accessories for HP-41:** One memory module or quad memory module.

Steps: 289 HP-41 Bytes: 000632

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03265-41-6	$10	$13
FOR HP-71*	03265-71-3	N/A	$14

03266 Linear Circuits Response
by C. Rusquellas, Buenos Aires, Argentina

Given a linear circuit, defined by the Laplace transform of the transference function (frequency domain) H(p) = N(p)/D(p), where N(p) and D(p) are polynomials in p, and given an excitation function of any type, defined by the user, this program computes, prints and plots (or displays, if printer is not used) the response in the time domain. To do it, the program computes the numerical inverse Laplace transform, and the convolution integral with the user defined function. **Necessary Accessories for HP-41:** Quad memory module or HP-41CV; Extended Function module; one or more Extended Memory modules. HP-IL Module and HP82162A Printer are optional, but useful.

Steps: 477 HP-41 Bytes: 000837

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03266-41-4	$10	$14
FOR HP-71	NOT AVAIL		

03267 Growth and Decay
by J. Armstrong, Merced, CA

This program can predict the size or mass of a species or element knowing original size or mass, and time. It can also predict the time required to reach a size or mass. Exponential growth and decay is used for both. **Necessary Accessories for HP-41:** None

Steps: 65 HP-41 Bytes: 000156

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03267-41-2	$10	$11
FOR HP-71*	03267-71-9	N/A	$12

03268 Real Interest of Bonds
by K. Rosenhagen, Blender-Einste, W. Germany

This program calculates the real interest of bonds, taking into account the quotation, the nominal interest and the remaining term. **Necessary Accessories for HP-41:** None

Steps: 117 HP-41 Bytes: 000178

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03268-41-0	$10	$11
FOR HP-71*	03268-71-7	N/A	$12

03269 Tank-Hunting 2
by K. Rosenhagen, Blender-Einste, W. Germany

The calculator generates an object which wants to destroy your base. Three different objects can be generated: Tank, Super-Tank, and Missile. Your job is to destroy these objects. **Necessary Accessories for HP-41:** One memory module.

Steps: 371 HP-41 Bytes: 000718

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03269-41-8	$10	$14
FOR HP-71*	03269-71-5	N/A	$16

03270 Area Calculation From Coordinates with Distance Control
by K. Rosenhagen, Blender-Einste, W. Germany

This program calculates the area of a polygon under the input of the corner's coordinates. Further the distance between two coordinates becomes calculated. **Necessary Accessories for HP-41:** None

Steps: 94 HP-41 Bytes: 000147

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03270-41-6	$10	$11
FOR HP-71*	03270-71-3	N/A	$12

03271 HPLC Capacity Factors vs. PH (Diprotic/Amphoteric Species)
by W. Pinnick, State College, PA

The pH dependence of the HPLC retention time of an amphoteric or diprotic species expressed as it's capacity factor k is related to it's two pKa's and three species capacity factors. Given the fully protonated and deprotonated factors, the remaining factor and two pKa's are determined from the pH - k data via least square regression. The regression coefficient is determined. The k at a given pH or the pH(s) needed for a given k may be estimated. **Necessary Accessories for HP-41:** None; printer/plotter optional.

Steps: 305 HP-41 Bytes: 000495

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03271-41-4	$10	$13
FOR HP-71*	03271-71-1	N/A	$14

03272 Laray Viscometer Data Interpretation
by T.E. Foye, Holland, MI

Laray viscometer weight/time data can be fit to any of three models; Power Law, Bingham, or Casson. It includes temperature compensation (with printer), a rod and collar factor. It can handle data from two, three, or four drop procedures, and can be used with or without a printer. **Necessary Accessories for HP-41:** HP-41C with two memory modules; card reader, printer optional.

Steps: 362 HP-41 Bytes: 000838

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03272-41-2	$10	$14
FOR HP-71*	03272-71-9	N/A	$16

03273 HPLC Capacity Factors vs. PH (Monoprotic Acids or Bases)
by W. Pinnick, State College, PA

The pH dependence of the HPLC retention time of a monoprotic weak acid or base, expressed as capacity factor, k, is related to its pK and the capacity factors of its protonated and deprotonated species. This program calculates the pK, the two species capacity factors, and the correlation coefficient for the pH k data set via least square regression. Estimates of the capacity factor given the pH or of the pH given the capacity factor may be made. **Necessary Accessories for HP-41:** None.

Steps: 216 HP-41 Bytes: 000344

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03273-41-0	$10	$12
FOR HP-71*	03273-71-7	N/A	$14

03274 Cauer Element Solutions
by M.H. Crothers, Urbana, IL

Program "CAU B" computes the values of elements in the Cauer-Ladder Electrical Network from the given Z(s) impedance or Y(s) admittance function. The same program will produce element values for two different networks according to their classification as "direct" frequency or "inverse" frequency types. The greatest order (N) is nine as the program is written. **Necessary Accessories for HP-41:** None.

Steps: 77 HP-41 Bytes: 000129

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03274-41-8	$10	$11
FOR HP-71*	03274-71-5	N/A	$12

03275 Cauer Network Functions
by M.H. Crothers, Urbana, IL

Program "CAU F" computes the coefficients on the impedance (or admittance) function from the list of element values given for a Cauer-Ladder Network. This program is the reverse of "CAU B" program where element values are computed from the given function. Both of these programs share a common basic computational feature which operates upon terms interwoven into a stack. The greatest order (N) is nine as the program is written. **Necessary Accessories for HP-41:** None.

Steps: 75 HP-41 Bytes: 000123

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03275-41-5	$10	$11
FOR HP-71*	03275-71-2	N/A	$12

03276 Tidal Prediction Curve
by P.R. Van Quekelberghe, Breskens, Netherlands

This program produces a 24-hour tidal curve using Harmonic Constants from British Admiralty Tide Tables. **Necessary Accessories for HP-41:** HP-41c, one Ram, a printer.

Steps: 183 HP-41 Bytes: 000343

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03276-41-3	$10	$12
FOR HP-71	NOT AVAIL		

03277 Coriolis Force on ULCC's
by P.R. Van Quekelberghe, Breskens, Netherlands

This program calculates the conolis force on Ultra Large Crude Carriers (ULCC'S) and the drift and set caused by this force. The program is designed for ease of operation by including ship's length and length x beam in the program steps. **Necessary Accessories for HP-41:** None

Steps: 62 HP-41 Bytes: 000159

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03277-41-1	$10	$11
FOR HP-71*	03277-71-8	N/A	$12

03278 Halley's Comet

by R. Desjardin, Huntngtn Station, NY

Given only the date, the position in the sky of Halley's Comet is computed. The position is given in right ascension and declination using hours- minutes-seconds and degrees-minutes-seconds format. **Necessary Accessories for HP-41:** Time Module (00041-903959

Steps: 284 HP-41 Bytes: 000458

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03278-41-9	$10	$13
FOR HP-71	NOT AVAIL		

03279 Super Curve: Horizontal Curve With Any Combination of Spiral

by D.R. Coulter, Victoria, Canada

This program solves horizontal curve geometry with any combination of spirals. Stationing is output in standard format (ie: 123+45.678). Coordinates can be solved for all of the transition points as well as for any point on the alignment, defined by station. Increment for auto-output of stationing and coordinates pairs is included. Imperial or Metric inputs for curvature accepted. **Necessary Accessories for HP-41:** None

Steps: 688 HP-41 Bytes: 001187

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03279-41-7	$10	$16
FOR HP-71*	03279-71-4	N/A	$18

03280 Graph Chess

by P.J. Volpe, Killeen, TX

This seven part program displays or stores chess games in progress suitable for: mailing, chess club, problemist, duplication. Included are: Promotion, En-passant, two editors, multiple entry of moves; automated board set, capture, turn, castling, or manual board set. Separate move and data register blocks make for easy mailing. Block decreases in size per capture. Instructions contain: piece code, location, conversion map in, square number, algebric, descriptive notations. **Necessary Accessories for HP-41:** One memory module and printer. Card reader, extended memory optional.

Steps: 754 HP-41 Bytes: 001771

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03280-41-5	$10	$19
FOR HP-71	NOT AVAIL		

03281 Storm Sewer Collection System Design

by A.D. De Haan, St Rose, LA

This program will compute the required drainage structure size of a storm sewer collection system of any size, based on the rational method. The drainage structures can be open channels, box culverts, circular pipes and arch pipes. The computations are based on the Manning equation with a given "n" factor. The Newton method of computing an unknown factor is included. **Necessary Accessories for HP-41:** Quad ram; printer would be helpful.

Steps: 635 HP-41 Bytes: 001272

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03281-41-3	$10	$17
FOR HP-71*	03281-71-0	N/A	$20

03282 Simplex Method

by E.L. Fuchs, Santiago, Chile

This program uses the simplex method to solve the linear program min Z=CX, subject to AX=B, X not negative. If needed, the program will solve first phase I problem to find a feasible solution. Size of problems that can be solved depend on the amount of memory available. **Necessary Accessories for HP-41:** Two memory modules; printer optional.

Steps: 432 HP-41 Bytes: 000697

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03282-41-1	$10	$14
FOR HP-71*	03282-71-8	N/A	$16

03283 More Appealing Printout of an ASCII File

by M.E. Wong, San Francisco, CA

Have you ever printed out an ASCII file and had the printer cut off a few of your words because it only prints twenty-four characters per horizontal line? If you have, this is the program for you. It remedies that problem, and also included is a short editor program which enables easier insertion and deletion of ASCII characters than the HP-41CX text editor. **Necessary Accessories for HP-41:** HP-41CX and printer.

Steps: 125 HP-41 Bytes: 000245

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03283-41-9	$10	$12
FOR HP-71	NOT AVAIL		

03284 Overturning Load on Combined Footings

by M.A. Abel, Los Angeles, CA

This program calculates area, neutral axis, and moment of inertia of any number of combined footing areas and the total load and center of gravity of any number of point loads applied to the footing. When wind or siesmic overturning moment is entered, program will display soil bearing at desired points along the footing. Results displayed in three columns: vertical loads only; vertical plus overturning; and vertical minus overturning. **Necessary Accessories for HP-41:** Printer optional.

Steps: 118 HP-41 Bytes: 000360

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03284-41-7	$10	$12
FOR HP-71*	03284-71-4	N/A	$14

03285 Fast Unpaired Pooled-T-Test Variances Assumed Equal "Pool T"

by J.C. Meeroff, Coral Springs, FL

This program calculates the unpaired "t" test, the confidence interval of the difference between the means, and the critical "t" for any given alpha. It tests the null hypothesis for 1-tailed and 2-tailed probabilities. You enter grouped data as mean, SD and N, and provide the desired alpha and percent confidence level. The program will automatically compute the pooled T test and will give the probability decision without the need for looking at the "t" distribution table. **Necessary Accessories for HP-41:** HP-41CV or equivalent memory capacity; Extended functions module optional.

Steps: 403 HP-41 Bytes: 000811

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03285-41-4	$10	$15
FOR HP-71*	03285-71-1	N/A	$18

03286 Lotto Number Generator

by W. Jutte, Macgregor, Australia

This program will generate random numbers using the current time for 6 of 39, 6 of 40, or system games of lotto. For 6 of 39 and 6 of 40, the number of games has to be given, and for the system entry, the number of the system. The program can, if required, be rerun as many times as possible, without reloading. If no longer needed, it will automatically be removed from the program memory. No duplicate numbers per game. **Necessary Accessories for HP-41:** HP-41CX; printer is optional.

Steps: 199 HP-41 Bytes: 000416

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03286-41-2	$10	$12
FOR HP-71	NOT AVAIL		

03287 Elli

by M. Ludwig, Oberkorn, Luxemburg

This program calculates the elliptical integrales of the three orders. **Necessary Accessories for HP-41:** None

Steps: 105 HP-41 Bytes: 000160

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03287-41-0	$10	$11
FOR HP-71*	03287-71-7	N/A	$12

03288 Gam

by M. Ludwig, Oberkorn, Luxemburg

This program calculates gamma (r) of X with a great precision and only in the stack. **Necessary Accessories for HP-41:** None

Steps: 78 HP-41 Bytes: 000124

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03288-41-8	$10	$11
FOR HP-71*	03288-71-5	N/A	$12

03289 Num

by M. Ludwig, Oberkorn, Luxemburg

Key in a number and the computer types out the number in words. For example, input is 2258, the display will read two, two, five, eight. **Necessary Accessories for HP-41:** None

Steps: 203 HP-41 Bytes: 000497

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03289-41-6	$10	$13
FOR HP-71*	03289-71-3	N/A	$14

03290 Wall Street - 1929

by P. Legros, Brussels, Belgium

When beginning the game, you have an initial capital of $90, 000.00 in twenty shares of nine kinds. Try to make a maximum profit in "n" days (specified by the user) by selling and buying shares. The shares quotation is determined every day and can be recalled at any moment. By selling and buying shares, you may earn cash money that you can reinvest in other shares. This program is printer compatible. **Necessary Accessories for HP-41:** Two memory modules; printer optional.

Steps: 500 HP-41 Bytes: 001118

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03290-41-4	$10	$15
FOR HP-71*	03290-71-1	N/A	$18

03291 Set/Offset Curves From Centerline B.C., Direct

by D.F. Davis, San Lorenzo, CA

This program provides calculations for offset points on circular curves, direct from the centerline B.C. Deflection angles and long chords are calculated for centerline. Offsets for left and right sides calculated automatically. Angles are displayed in azimuth form, (clockwise reading circle). Ideal for staking offset lines on curbs, flowers, storm drains, and radial lot corners. **Necessary Accessories for HP-41:** One memory module for HP-41C.

Steps: 250 HP-41 Bytes: 000476

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03291-41-2	$10	$13
FOR HP-71*	03291-71-9	N/A	$14

03292 Parallel Spiral Curve Offset Chain Distance Corrections

by R.R. Holland, Cedar Rapids, IA

This program is written to calculate chaining distance corrections for parallel spiral curves. The results are that the offset points are at right angles to any cooresponding point on the center-line spiral. ie: Offset hub stakes for paving grades and alignment. **Necessary Accessories for HP-41:** Printer optional.

Steps: 48 HP-41 Bytes: 000133

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03292-41-0	$10	$11
FOR HP-71*	03292-71-7	N/A	$12

03293 Drive Belt Calculations

by W.W. Lauer, Canton, OH

This program will calculate the unknown value after having been given any three of the following four values: belt length, larger pulley diameter, small pulley diameter, center to center distance between pulleys. **Necessary Accessories for HP-41:** 00041-15029 Math Pac I (uses "SOL")

Steps: 169 HP-41 Bytes: 000366

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03293-41-8	$10	$12
FOR HP-71	NOT AVAIL		

03294 Equilibrium Constant/Vapor Pressure Evaluation

by A. Melimopoulos, Caracas, Venezuela

This program calculates any of the following variables: K (equilibrium constant), increment of Enthalpy or temperature range when the others are given. The same occurs with the vapor pressure evaluation, the program calculates any of the following variables: P (vapor pressure), increment of Enthalpy or temperature range when the others are given. **Necessary Accessories for HP-41:** None

Steps: 78 HP-41 Bytes: 000160

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03294-41-6	$10	$11
FOR HP-71*	03294-71-3	N/A	$12

03295 Oblique Shock Properties

by O. Ertem, Ankara, TURKEY

This program can calculate shock angle, deflection angle or inlet Mach No. starting from the known variables. It is also able to evaluate exit Mach. No., pressure, density, temperature ratios across the shock and the maximum deflection angle for a certain Mach No. **Necessary Accessories for HP-41:** None

Steps: 251 HP-41 Bytes: 000399

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03295-41-3	$10	$12
FOR HP-71*	03295-71-0	N/A	$14

03296 Assessing Significance in a Fourfold Table "2x2"

by J.C. Meeroff, Coral Springs, FL

This program analyzes any statistical evidence presented in the form of a fourfold contingency table. It advises which test is the most appropriate for a given sample size and characteristic. It computes the Fisher-Irwin's Exact Test, the Pearson's Chi Square Test, the Yates' Chi Square, the Pearson's Z Square Test, and the Yate's Z Square test. It also evaluates statistical significance for any given alpha level. There is no need for rearrangement of rotation of data. Just enter it as you have it, the computer will do the test. This program can also be used to perform the median test. **Necessary Accessories for HP-41:** Requires HP-41CV or equivalent memory capacity.

Steps: 739 HP-41 Bytes: 001519

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03296-41-1	$10	$17
FOR HP-71*	03296-71-8	N/A	$20

03297 Column Operations and Data Retrieve

by E. Bechis, Cipoletti, ARGENTINA

Set of programs which gives the HP-41 the power to deal easily with datas that can be framed in a matrix of files and columns: this is any operation among the columns, add up the column elements, input datas file by file or column, by column, classify files automatically or numerically using the elements of a column, search for an element in a column and show the file which contains it, and other features. **Necessary Accessories for HP-41:** One memory module; printer useful.

Steps: 670 HP-41 Bytes: 001379

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03297-41-9	$10	$18
FOR HP-71*	03297-71-6	N/A	$22

03298 Land Mobile Area Propagation Model

by F.C. Jensen, Sacramento, CA

This program provides propagation estimates for land mobile service in 140-900 Mh3 range, using an adaptation of the Longley-Rice and Okamura models. **Necessary Accessories for HP-41:** 82162A Thermal Printer is desireable.

Steps: 220 HP-41 Bytes: 000493

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03298-41-7	$10	$13
FOR HP-71*	03298-71-4	N/A	$14

03299 Gravity

by M.G. Compton, Shreveport, LA

This program computes the artificial gravity on a circular space station or centrifuge. The weight of an object at altitude, the acceleration of gravity at altitude, the neutral point and attraction of two bodies or particles. **Necessary Accessories for HP-41:** None

Steps: 86 HP-41 Bytes: 001391

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03299-41-5	$10	$11
FOR HP-71*	03299-71-2	N/A	$12

03300 Azimuth

by R.P. Harwig, APO New York, NY

This program is used in map reading to determine an azimuth between two points on a map given their grid coordinates in the UTM (Universal Transverse Mercator) grid coordinate system. **Necessary Accessories for HP-41:** None

Steps: 53 HP-41 Bytes: 000109

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03300-41-1	$10	$11
FOR HP-71*	03300-71-8	N/A	$12

03301 Intermodulation Analysis

by F.C. Jensen, Sacramento, CA

This program computes potential intermodulation products between n transmitters for m receivers, for a specified bandwidth centered on each receive frequency, and to a specified intermodulation order. **Necessary Accessories for HP-41:** 82162A Thermal Printer

Steps: 255 HP-41 Bytes: 000485

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03301-41-9	$10	$13
FOR HP-71	NOT AVAIL		

03302 Layout Program for Curves, Simple Spirals, Segment Spirals

by D.R. Coulter, Victoria, Canada

This program calculates the layout data for a circular curve, a simple spiral, or a segmental (connecting) spiral. Layout may be from either end, using any setup, backsight, and foresight station. Output consists of the deflection and chord from the setup and the chord from the previous foresight. Degree of curve or radius input accepted. Stationing is in standard format (ie: 12+34.567). Auto-increment of foresight data output is included. **Necessary Accessories for HP-41:** One memory module. Printer is recommended.

Steps: 413 HP-41 Bytes: 000672

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03302-41-7	$10	$13
FOR HP-71*	03302-71-4	N/A	$14

03303 Relki

by M.D. Hoefert, Geneva, Switzerland

This program calculates the relativistic parameters of elementary particles for which the mass is given in Mev. If one of the following parameters: Momentum "P", Gamma, Kinetic Energy "T" or Total Energy "E", are known, the others are calculated using the technique of interchangable solutions. **Necessary Accessories for HP-41:** None

Steps: 112 HP-41 Bytes: 000232

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03303-41-5	$10	$12
FOR HP-71*	03303-71-2	N/A	$14

03304 Atten

by M.D. Hoefert, Geneva, Switzerland

This program calculates the attenuation of radiation by shielding which generally is described by an exponential function. It makes use of the technique of interchangeable solutions and allows for a multiple choice of parameters due to a special input/output subroutine. The latter prompts for input without stopping program with direct return to beginning of ATTEN after final result has been displayed for a new calculation. **Necessary Accessories for HP-41:** None

Steps: 86 HP-41 Bytes: 000219

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03304-41-3	$10	$12
FOR HP-71*	03304-71-0	N/A	$14

03305 Assessing Significance in Unpaired Small Samples (UNP-T)

by J.C. Meeroff, Coral Springs, FL

This program assesses the significance of differences between means using the "t" test for unpaired data. The program accepts either grouped or ungrouped data. It first tests for homogeneity of variances using the "f" test and then it calculates the "t" statistics using either the Gossett Test or the Behrens-Fisher Test. The program calculates both the 1-Tailed and the 2-Tailed probabilities and the confidence interval of the difference between means. Full use of the alpha numeric capabilities makes this program easy to understand and use. **Necessary Accessories for HP-41:** HP-41CV or equivalent memory capacity. Extended functions module and printer are helpful.

Steps: 751 HP-41 Bytes: 001608

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03305-41-0	$10	$16
FOR HP-71*	03305-71-7	N/A	$18

03306 Beam Element Analysis

by R. Zullo, Mayfield Heights, OH

This program uses the Direct Stiffness Method to solve simple or complex beams. Computes at each joint(s) of element(s) deflection, rotation, shear force and bending moment with the option to compute at every location of element(s). Also the program searches for a maximum bending moment between joints when load(s) exist, and its location from the left joint. Reactions are calculated for static stability. **Necessary Accessories for HP-71:** Math Rom (for matrix operation), HP-2225B HP-IL Printer, HP 82401A HP-IL Interface. Three memory modules can be optional.

Steps: HP-71 Bytes: 011618

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03306-71-5	$10	$28

03308 Magic Card

by L. Lie, Skoedstrup, Denmark

In this game, the HP-41C(V) is a conjurer. Ask one of your friends to draw a card (no jokers). Before the HP-41C(V) can guess the cards, it has to have some information first. It is very simple to give the correct answers. You convert the drawn card into a value of binary code. When all six questions have been answered, the HPC(V) converts the flags to the value and color of the cards. **Necessary Accessories for HP-41:** None.

Steps: HP-41 Bytes: 000280

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03308-41-4	$10	$12
FOR HP-71*	03308-71-1	N/A	$14

03309 Converter

by R.I. Ervin, Spokane, WA

A basic language/key definition program to easily facilitate a full range of conversions. Unit abbreviations can be specified to assure correct conversion usage. Values supplied in variable name form for use in other programs. Additional data cards available or can be created. **Necessary Accessories for HP-71:** Card reader with cards.

Steps: HP-71 Bytes: 008000

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03309-71-9	$10	$20

03314 Multi Width ASCII File Printout on HP 82143A and HP 82162A

by J. Wickenberg, Molndal, Sweden

Printing an ASCII file usually means that record having more than twenty-four characters are cut or at least printed on several lines. This program prints the ASCII file content in twenty-four character long "slices" which can be put together presenting a clear chart of the content. "Multi Width" is foolproof and easy to use. **Necessary Accessories for HP-41:** HP 41CX or Extended Functions Module and one Memory Module, Printer.

Steps: 166 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03314-41-2	$10	$12
FOR HP-71	NOT AVAIL		

03315 Volume By Average End Area Method

by M.D. Gregory, Gibsons, Canada

This HP-71 program assumes a survey or design exists with cross sections described by distance/elevation co-ordinate pairs and a section stationing. At each section, the program prompts for the stationing (input in standard format) then for successive distance/elevation pairs. For each section an output summary is given of the stationing, section area, and the average end area volume (between sections). Finally, the total volume is given. **Necessary Accessories for HP-71:** HP 82401A HP-IL Interface. HP 82162A Thermal Printer & HP 2225B ThinkJet Printer optional (to verify operation of program).

Steps: HP-71 Bytes: 01159

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03315-71-6	$10	$14

03316 Structural Section Properties

by C.E. Coad, Mobile, AL

This program calculates structural section properties about 2-axis from an input of flat plates, structural sections, round and rectangular tubes and miscellaneous shapes (described by x-y coordinates). From applied moments about the x and y axis, you may calculate the stress at any x, y coordinate. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 05371

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03316-71-4	$10	$20

03317 Gunning's Verbal Fog Index

by R. Belling, Jersey City, NJ

In a text sample, easy words, difficult words, and sentence terminators are tallied by pressing user assigned keys which give a tone feedback to pace data entry. After the first sentence terminator beyond the minimum sample of 100 words, the Fog Index is displayed and, optionally, average sentence length and percentage of difficult words. The index approximates USA high school grade level required to understand the text. **Necessary Accessories for HP-41:** None

Steps: 51 HP-41 Bytes: 000126

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03317-41-5	$10	$11
FOR HP-71*	03317-71-2	N/A	$12

03318 Portal Frame

by A. Pellei, Valley Stream, NY

FRM-C: This program considers bending and axial and shear deformations. Castigliano's Theorem is used to find the three unknown: M1, FX1, and FY1. The 3x3 simultaneous equations are solved by the Gauss-Jordan Elemination Routine. Reactions are printed. **Necessary Accessories for HP-41:** HP-41CV (or equivalent memory), card reader, printer.

Steps: 1960 HP-41 Bytes: 003549

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03318-41-3	$10	$26
FOR HP-71	NOT AVAIL		

03319 Memo and Expense Note Pad

by G. Goodman, Stamford, CT

This is a useful program for keeping short memos (up to 24 characters long) and for keeping a record of expenses by category, such as food, hotel, gas, etc., during a trip. Expenditures can be accumulated by category or entered into new categories at any time. Each item can be retrieved by indexing on the first part of the item name or all items can be reviewed. All data is stored in extended memory. **Necessary Accessories for HP-41:** Extended Functions Module, Extended Memory Module

Steps: 65 HP-41 Bytes: 000127

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03319-41-1	$10	$11
FOR HP-71	NOT AVAIL		

03320 Unknown Interest Solver and Table of Intereat Factors

by A. Razvan, Blacksburg, VA

This program calculates any of the eight compund interest factors (F/P, P/F, A/F, F/A, A/P, P/A, A/G, P/G), given the interest, period, and the known present worth or any other value as such. Also, the program uses the SOLVE routine in the Math Pac and determines the unknown interest rate of any number of functions (N) added together. The program uses (3*N)+15 registers. The program prompts for proper size. **Necessary Accessories for HP-41:** Math Pac (Copy of Solve & *FN routines in active memory).

Steps: 308 HP-41 Bytes: 000637

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03320-41-9	$10	$13
FOR HP-71	NOT AVAIL		

03321 Parts Per Million

by E.M. Keefe, Ankeny, IA

This program allows you to figure the parts per million of diluted solutions of chemical fertilizer. The program will also solve, interchangeably, for any of the other three variables of the formula (ounces of fertilizer blend)/(# of gallons) * (percent of chemical in blend) * 75=PPM. **Necessary Accessories for HP-41:** None

Steps: 115 HP-41 Bytes: 000210

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03321-41-7	$10	$11
FOR HP-71*	03321-71-4	N/A	$12

03322 Settlement of Clay Layer Due To Point Surface Loads

by S. Auffinger, Belmont, MA

This program calculetes vertical stresses in a homogeneous soil mass caused by one or more point loads on the surface. The information is then used to compute the settlement of e normally consolidated clay layer affected by these loads. A good approximation for spread footings that are small relative to the depth of analysis. Analysis of more than 28 loads requires additional memory modules. **Necessary Accessories for HP-41:** None required; additional memory optional.

Steps: 229 HP-41 Bytes: 000392

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03322-41-5	$10	$12
FOR HP-71*	03322-71-2	N/A	$14

03323 Kolmogorov-Smirnov Two-Sample Test

by D. Basker, Bet Dagan, Israel

This program calculates D(max), the two-tailed maximum deviation between two cumulative frequencies, for up to 26 groups. If both total frequencies are not greater than 25, program calculates D(max) as an integer; of one or both total frequencies ere greater than 25, the program calculates D(max) as a decimal fraction, and gives its significance limits. **Necessary Accessories for HP-41:** One memory module, Extended Functions Module.

Steps: 234 HP-41 Bytes: 000476

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03323-41-3	$10	$13
FOR HP-71	NOT AVAIL		

03324 Fit To and Sequential Analysis of Poisson Distribution Data

by D. Vargo, Pago Pago, AS

This program is extremely useful in integrated pest management. Insect counts, for instance, at low population densities will often follow a poisson distribution. Sequential analysis of this distribution can aid in rapid determination of the extent and severity of a crop pest infestation. **Necessary Accessories for HP-41:** None

Steps: 190 HP-41 Bytes: 000307

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03324-41-1	$10	$12
FOR HP-71*	03324-71-8	N/A	$14

03325 Sequential Analysis of Binomial Distribution Data

by D. Vargo, Pago Pago, AS

This program is a powerful tool in helping to minimize losses caused by pests in agriculture and forestry. The binomial distribution is applicable when each observation of a damage survey is recorded merely as pests present or absent. Given four simple parameters, this program determines decision lines, operating characteristic curve and average sample number curve. **Necessary Accessories for HP-41:** None

Steps: 129 HP-41 Bytes: 000191

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03325-41-8	$10	$11
FOR HP-71*	03325-71-5	N/A	$12

03326 Kovats and McReynolds Indices

by W. Pinnick, State College, PA

A tool to help the serious gas chromatographer compare GC columns by calculating their Kovats Indices and McReynolds Constants from the observed retention times of methane, an alkane mix, and either a five or seven component McReynolds probe mixture. May be used to identify "mystery" columns and to characterize new columns and phases. **Necessary Accessories for HP-41:** None; printer optional.

Steps: 164 HP-41 Bytes: 000416

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03326-41-6	$10	$12
FOR HP-71*	03326-71-3	N/A	$14

03327 Compute Cuts and Fills and Print Cutsheet

by E.R. Duncan, Langhorne, PA

This program accepts as input: Project Title, beginning station, beginning grade elevation, slope, stations of points staked, stake elevations. Program computes: Grades at station of points staked, cut or fill in decimal form; also in feet, inches and fractional inches. Prints all data in tabular form. **Necessary Accessories for HP-71:** HP-IL and printer (8.5 inch wide). HP-2225B ThinkJet Printer optional.

Steps: HP-71 Bytes: 001564

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03327-71-1	$10	$14

03326 Enzyme Kinetics: Two-Substrate Reaction

by D. Vargo, Pago Pago, AS

Given the concentrations of the "variable" and "fixed" substrates, and the initial velocities, this program determines the slope, intercept and correlation coefficient of each line of a two-substrate primary plot, then goes on to calculate the kinetic parameters Vmax, Ka, Kb, and Kia for an enzyme-catalyzed two-substrate reaction. **Necessary Accessories for HP-41:** None

Steps: 156 HP-41 Bytes: 000254

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03328-41-2	$10	$12
FOR HP-71*	03328-71-9	N/A	$14

03329 Base Conversions Extended

by B. Hoffmann, Buenos Aires, ARGENTINA

This program converts any positive integer in any base (2 to 16) to any other integer in bases 2 to 16. Numbers up to 24 digits in base 2. Maximum range in base 16: 2540BE3FF or 9999999999 in base 10. This is a short, accurate and fast routine. **Necessary Accessories for HP-41:** Extended Functions Module

Steps: 158 HP-41 Bytes: 000315

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03329-41-0	$10	$12
FOR HP-71	NOT AVAIL		

03330 Circle Interchangeable Solutiona

by S. Diina, Grottaferrata, ITALY

This program provides interchangeable solutions between secfor angle, redius, arc length, chord length and sector area of a circle. At least two inputs must be made to solve for the remaining unknowns. Additionally, the area of section between arc and chord will be computed. May be conveniently called as a subroutine by another program via an entry point. **Necessary Accessories for HP-41:** None

Steps: 184 HP-41 Bytes: 000294

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03330-41-8	$10	$12
FOR HP-71*	03330-71-5	N/A	$14

03331 Statiatics For One or Two Variables

by F.J. Salido M., Mexico City, Mexico

This program computes the arithmetic, geometric, harmonic and quadratic mean, as well as the standard deviation for one, (grouped data), or two variables. It also calculates the lineer regression for the two veriables and, on its besis, estimates values of x or y. In case of mistake, corrections are possible. All additions to the program are easily acheived. **Necessary Accessories for HP-41:** One memory module.

Steps: 246 HP-41 Bytes: 000478

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03331-41-6	$10	$13
FOR HP-71*	03331-71-3	N/A	$14

03332 Conditional Probabilities By Baye's Rule

by D.N. Peterson, Lillooet, Canada

This is e two part program. Part one creates database files. Part two uses database file and positive/negative test results to compute conditional probabilities by Baye's Rule. Examples presented from: bacterial speciation; antibody identification in blood banking; diagnosis of cardiovascular diseases. **Necessary Accessories for HP-71:** None. A 24 column printer would be useful.

Steps: HP-71 Bytes: 002389

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03332-71-1	$10	$16

03333 Wire Rope Incipient Scrub

by B. Evetts, Coral Gables, FL

This program calculates the angle at which rope scrub would occur on e grooved single layer winch. The four required inputs are rope diameter, rope diameter tolerance, winch tread diameter and groove pitch. The program assumes rope diameter includes half of the tolerance. **Necessary Accessories for HP-41:** None

Steps: HP-41 Bytes: 000142

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03333-41-2	$10	$11
FOR HP-71*	03333-71-9	N/A	$12

03334 Curve Fitting With Confidence Intervals

by B.C. McBeath, Arlington, VA

This program fits a set of x, y, data pairs to any of four selected curves; straight line, exponential, log, and power curves. The program also estimates the mean and the upper and lower bounds for a confidence interval selected by the user, plus regression coefficient. Limits are for 3 to 50 data pairs, and for some curves, only positive values may be usad. Entered deta and results are printed. **Necessary Accessories for HP-41:** Printer; (HP 82143A Peripheral Printer)

Steps: 534 HP-41 Bytes: 001075

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03334-41-0	$10	$15
FOR HP-71	NOT AVAIL		

03335 Mass Storage Time and Date

by S. Diina, Grottaferrata, ITALY

The file system established by the HP 82160A HP-IL Module on a mass storage device does not allow recording the time and date of creation of a file, along with its name, type and length. However, directory space reserved for this type of information does exist and is currently used by other controllers. Now, with the WRT function provided by this program, you can easily store time and other date of a new file, and retrieve this information with the functions FLTIME and FLDATE. **Necessary Accessories for HP-41:** Extended I/O or HP-IL Development Module; HP-IL Module; Mass storage device. Time Module useful.

Steps: 351 HP-41 Bytes: 000631

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03335-41-7	$10	$14
FOR HP-71	NOT AVAIL		

03336 Extended Mass Storage Directory

by S. Diina, Grottaferrata, ITALY

This utility extends the directory information provided by the DIR function in the HP 82160A HP-IL Module. For each entry in the directory space, a line is supplied with the following information: recorded file name, file condition (deleted or not), starting track address, records reserved, and file length in registers. Output is directed to a printer or video interface. Documentation analyzes the directory structure established by the HP 82160A. **Necessary Accessories for HP-41:** Extended I/O or HP-IL Development Module; HP-IL Module; mass storage device; printer or video interface.

Steps: 209 HP-41 Bytes: 000413

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03336-41-5	$10	$13
FOR HP-71	NOT AVAIL		

03337 Linear Least Square Fit With Confidence Limits Plot

by W. Pinnick, State College, PA

This program accepts a set of data pairs and performs the linear least square fit to the data. Then the data set is plotted, the least square fit line drawn, and the selected upper and lower confidence interval curves are drawn as well. Axes are labeled, the plot is tilled, and the equation is printed with slope, intercept, and their respective standard deviations and the confidence interval used. **Necessary Accessories for HP-41:** HP-82180A Extended Functions, HP-82184A Plotter Module, HP-82160A HP-IL Module; HP-IL compatible printer such as an HP-7470.

Steps: 303 HP-41 Bytes: 000633

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03337-41-3	$10	$13
FOR HP-71	NOT AVAIL		

03339 The Square Challenger

by M.E. Wong, San Francisco, CA

This program plays a number game where the object is to fill in 12 squares with an integer from 1 to 9 and have all the sums of the rows, columns, and diagonals equal to the totals located on the edges. If you have difficulty, the calculator will also aid you in solving the puzzle. **Necessary Accessories for HP-41:** Printer optional.

Steps: 545 HP-41 Bytes: 001432

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03339-41-9	$10	$18
FOR HP-71	NOT AVAIL		

03341 Gram-Schmidt Orthogonalization of Matrices

by D.N. Peterson, Lillooet, Canada

This program accepts a matrix (square or rectangular) and orthogonalizes its columns. The user has the option of normalizing orthogonalized columns. Both orthogonalization and normalization algorithms can be called as sub-programs. Orthogonalized matrix is printed out column by column. **Necessary Accessories for HP-71:** HP-71B Math Pac Rom (HP 82480A) and 24 column printer.

Steps: HP-71 Bytes: 001739

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03341-71-2	$10	$14

03342 Two-Independent : One-Dependent Variable Linear Regression

by P.R. Jemian, Auburn, AL

Multiple Linear Regression is used to fit data trios (X1, X2, Y) to a linear model. Both equation models and coefficients are displayed for the entire model as well as the individual interactions: Y vs X1, Y vs X2, X1 vs X2. Data may be added or removed at any time to obtain a new fit. Program requires 98 registers total memory: 71 program/27 data. **Necessary Accessories for HP-41:** One Memory Module, Quad Module or HP-41CV/CX. Printer helpful but not required.

Steps: 300 HP-41 Bytes: 000492

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03342-41-3	$10	$13
FOR HP-71	NOT AVAIL		

03343 Matrix Mathematics

by G.M. Halpern MD, Honolulu, HI

This program is a series of sub-routines, used with the HP-71B Math Pac, to solve problems of matrix addition, multiplication, scalar multiplication, identity, transpose, systems of solution, inverse, determinant, inner (DOT) product, and subtraction. Matrices can be of any order and dimension. Addition end multiplication will handle two, three or four matrices. Program is designed to use a video monitor and printer. However, if a printer is not available or desired, delete lines 340 and 1320 of the program and the video monitor will display the inpute and outputs. **Necessary Accessories for HP-71:** HP-71B Math Pac. video monitor. Printer useful but not required.

Steps: HP-71 Bytes: 003842

	Order Program No.	Documentation Only	W/Carde
FOR HP-41	NOT AVAIL		
FOR HP-71	03343-71-8	$10	$18

03344 Simultaneous Non-Linear Equations (Newton-Raphson)

by D.N. Peterson, Lillooet, Canada

This program solves 1-99 simultaneous linear and non-linear equations by a Newton-Raphson algorithm. Derivatives calculated by second order central difference algorithm. Both gradient and Newton-Raphson algorithms can be called as sub-programs. Problems include one from acid-base biochemistry. **Necessary Accessories for HP-71:** HP-71B Math Pac Rom (HP 82480A).

Steps: HP-71 Bytes: 003061

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03344-71-6	$10	$16

03345 Traverse Sailing

by E.A. Bush, Cleveland, OH

Using traverse sailing techniques, this progrem computes the net course and distance made good from initial point to final point after tacking through a number of courses and distances. **Necessary Accessories for HP-41:** None.

Steps: 31 HP-41 Bytes: 000079

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03345-41-6	$10	$11
FOR HP-71*	03345-71-3	N/A	$12

03346 Accurate Normal Distribution

by J.P. Pobanz, Cincinnati, OH

This program finds the area under the normal curve accurate to eight places for a wide range of Z values. The answer is the area under the normal curve to the left of the inputted Z value. **Necessary Accessories for HP-41:** Card reader or bar code reader helpful.

Steps: 57 HP-41 Bytes: 000091

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03346-41-4	$10	$11
FOR HP-71*	03346-71-1	N/A	$12

03347 Accurate Binomial Distribution

by J.P. Pobanz, Cincinnati, OH

This program accurately finds the area and the accumulatad area under the binomial distribution curve given the parameters x, N, and p. The answers ere accurate to at least eight places. **Necessary Accessories for HP-41:** None.

Steps: 50 HP-41 Bytes: 000086

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03347-41-2	$10	$11
FOR HP-71*	03347-71-9	N/A	$12

03348 Foster Network Elements

by M.H. Crothers, Urbana, IL

This dual program solves for the network element values in Foster Reactance Networks of either "Z" or "Y" types. Input data asks for finite pole and zero frequencies plus the particular frequency and the corresponding scale value of impedance or admittance at that frequency. **Necessary Accessories for HP-41:** None.

Steps: 223 HP-41 Bytes: 000430

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03348-41-0	$10	$12
FOR HP-71*	03348-71-7	N/A	$14

03349 Structural Pac Supplement-Sec. Prop. with Point Storage

by S.L. Stroh, Tampa, FL

This program extends the versatility of the Section Property program in the Structural Pac by adding the capability of saving the coordinate pairs in memory and traversing the section with point numbers rather than entering each coordinate. This facilitates changes in the section since only the revised coordinates need be re-entered for a new problem. Program also provides utilities to save and load coordinate pairs on magnetic cards and can read cards created by U/L program #02592-41-1. **Necessary Accessories for HP-41:** Structural Pac, two memory modules. Printer, card reader, U/L program #02592-41-1 optional.

Steps: 524 HP-41 Bytes: 000859

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03349-41-8	$10	$14
FOR HP-71	NOT AVAIL		

03350 Random Number Generator For Various Product Distributions

by D.N. Peterson, Lillooet, Canada

This program is a set of five sub-programs which each generate an array of random numbers according to user specified parameters. Distributions include: Uniform, Exponential, Normal (Gaussian), Chi-Square and Poisson. **Necessary Accessories for HP-71:** None.

Steps: HP-71 Bytes: 001253

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03350-71-3	$10	$12

03351 Continuous Printout of Text Files on a Tape

by J.R. Gorson, Arlington, VA

This program provides for a continuous printout of all designated text (ASCII) files on a tape in a digital cassette drive. **Necessary Accessories for HP-41:** HP-41CX, HP-IL Module, Digital Cassette Drive, Thermal Printer.

Steps: 89 HP-41 Bytes: 000166

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03351-41-4	$10	$11
FOR HP-71	NOT AVAIL		

03353 Numerical Inversion of the Laplaca Transform

by F.R. Fluhr, Oxon Hill, MD

This program numerically calculates the Inverse Laplace Transform of a given Laplace Transform Function. The Laplace Transform Function must be programmed into the main program. Non-linear and transcendental Laplace Transform Functions can be accommodated. **Necessary Accessories for HP-41:** Printer; card reader is helpful.

Steps: 87 HP-41 Bytes: 000664

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03353-41-0	$10	$12
FOR HP-71	NOT AVAIL		

03354 Solving Four Cases of Oblique Triangles

by G.M. Halpern MD, Honolulu, HI

This program solves all four cases of oblique triangles. They are Cases I, II, III & IV. Case I - Given 1 side and 2 angles. Case II - Given 2 sides and the angle opposite one of them; sometimes there is a second solution. Case III - Given 2 sides and the included angle. Case IV - Given 3 sides. Solution is automatic once the three known elements are entered and the proper label is activated. In the case of the 2nd solution, the operator must decide if there is one and key the proper label. This procedure is explained in detail in the program text. **Necessary Accessories for HP-71:** Printer, video monitor.

Steps: HP-71 Bytes: 005286

	Order Program No.	Documentation Only	W/Csrds
FOR HP-41	NOT AVAIL		
FOR HP-71	03354-71-5	$10	$20

03355 Quick and Easy Triangle Solver

by J. Campos, Satelite, Mexico

This program computes three unknown elements and area given (SSS, SAS, etc.) and three known elements. The program tells you if no such triangle exist and gives two solutions to SSA case, if two exist. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 001210

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03355-71-2	$10	$12

03356 Tubing Erosional Velocity Calculations

by P. Grimmer, New Orleans, LA

Tubing size or maximum flowrates can be determined from erosional velocity considerations using calculations presented in API RP 14E. Inputs and outputs are in conventional oilfield (ie. English) units. Both oil and gas-condensate wells are covered by this program. **Necessary Accessories for HP-71:** None. 24 and/or 80 column printer; video interface are useful.

Steps: HP-71 Bytes: 2136

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03356-71-0	$10	$16

03357 Text Editor For The HP-71B

by P. Grimmer, New Orleans, LA

This is a comprehensive TEXT file editing program including Copy, Delete, Edit, Fetch, Input, List, Move, Name (string replacement), Print, Sort, and Uppercase commands. Each line of the TEXT file is read into an array for easy manipulation. Simple control characters can be used to provide total printing control (HP2225B Printer), including margins, tabs, centering, bold, underline, doublespace, etc. **Necessary Accessories for HP-71:** None.

Steps: HP-71 Bytes: 008321

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03357-71-6	$10	$62

03356 Music Record and Playback on the HP-71B

by P. Grimmer, New Orleans, LA

This program enables the user to create, edit, "playback", "record" and print songs on the HP-71B. Five full octaves are available and loudness and number of beats can be set for each note. Notee are input and edited as strings using letters such as "C" for the note "C". Sharps (and flats) are available as lowercase letters (e.g. "a" is A shrp). Playback tempo is user-controlled also. **Necessary Accessories for HP-71:** None.

Steps: HP-71 Bytes: 002918

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03356-71-6	$10	$18

03359 Properties of Petroleum Fluids

by P. Grimmer, New Orleans, LA

This program utilizes equations presented in the HP-41C "Petroleum Fluids Pac" to calculate physical properties for oil, gas, and water found in petroleum reservoirs and on the surface. All inputs, outputs and calculations are contained in subprograms to facilitate use by other programs. The program operates in "oilfield units" (ie. English units) and all inputs and outputs are unit labelled. Available calculations include compressibilities, viscosity, formation volume factors, etc. **Necessary Accessories for HP-71:** None.

Steps: HP-71 Bytes: 007174

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03359-71-4	$10	$62

03360 Input/Output Subprograms for the HP-71

by P. Grimmer, New Orleans, LA

This is a series of input/output subprograms which provide well-formatted inputs and outputs for most, if not all, system configurations. The first one sets the PRINTER IS device based upon the current HP-IL set-up (accommodating a no-loop situation). All subsequent I/O requirements including titles are then printed using the capabilities of the print device. **Necessary Accessories for HP-71:** None.

Steps: HP-71 Bytes: 001344

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03360-71-2	$10	$14

03361 Time of Concentration for Surface Water Run-Off

by D. Vargo, Pago Pago, AS

This program quickly calculates time of concentration in either Imperial Units or SI Units using the methods of Bransby-Williams and Kiepich. The input variables are the size, shape and topography of the rainfall catchment. Output is given as minutes. **Necessary Accessories for HP-41:** None.

Steps: 64 HP-41 Bytes: 000143

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03361-41-3	$10	$11
FOR HP-71*	03361-71-0	N/A	$12

03362 Fit To and Sequential Analysis of Normal Distribution Data

by D. Vargo, Pago Pago, AS

This program fits data to the normal distribution and determines sequential analysis parameters such as the decision lina equations, operating characteristic curve and average sample number curve. **Necessary Accessories for HP-41:** Nona

Steps: 182 HP-41 Bytes: 000287

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03382-41-1	$10	$12
FOR HP-71*	03362-71-8	N/A	$14

03363 Area Under the Normal Curve

by J.P. Pobanz, Cincinnati, OH

This program very accurately calculates the area under the normal curve to the left of the given Z value. The results are accurate to at least eight places over a very wide range of Z values. **Necessary Accessories for HP-41:** None.

Steps: 57 HP-41 Bytes: 000091

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03363-41-9	$10	$11
FOR HP-71*	03363-71-6	N/A	$12

03364 Temperature Profile

by M.P. Cimini, Lanus, Argentina

This program calculates the temperature as a function of time for some points of a solid (either cylindrical or plane face) which is put into contact with a substance with another temperature and/or is exposed to a constant heat flux on one of its faces. **Necessary Accessories for HP-41:** One memory module, Extended Functions/Memory Module.

Steps: 326 HP-41 Bytes: 000574

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03364-41-7	$10	$13
FOR HP-71	NOT AVAIL		

03365 Retaining Wall Concrete Block

by M.M. Beck, Los Angeles,

This program computes and designs retaining walls of any height using standard concrete block. Design includes concrete block sizes to use, steel reinforcing required, foundation design, soil pressure resultants, lateral resistance of soil, footing keys (if required), and footing reinforcing steel needed. **Necessary Accessories for HP-41:** Requires HP-41CX or equivalent memory capability.

Steps: 676 HP-41 Bytes: 001456

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03365-41-4	$10	$18
FOR HP-71*	03365-71-1	N/A	$22

03366 HP-2225B Printer Mode Controls "PRINTSET"

by G.M. Halpern MD, Honolulu, HI

This program has twelve different ways of controlling the printer. Initiating the program by [RUN] sets PERFORATION SKIP and WRAP-AROUND MODES. The rest of the program is menu driven. Configuration of the type can be NORMAL, EXPANDED, COMPRESSED and EXPANDED-COMPRESSED. The type can be in BOLD or NOT-BOLD density. On [RUN] the MENU appears, showing 11 numbers. The first six have to do with the type configuration and BOLD and NOT-BOLD. Seven to nine control DISPLAY AND PRINTER interplay. Ten turns off PERFORATION SKIP and eleven ends the program. **Necessary Accessories for HP-71:** H P-2225B Ink Jet Printer and video monitor.

Steps: HP-71 Bytes: 001675

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03366-71-9	$10	$14

03366 Thermodynamics Assistant: Calculations Based on Steam Tables

by P.R. Rodriguez, Bothell, WA

Introductory thermodynamics classes often make great use of steam tables. This package of three subroutines automates the repetitive calculations most often used in reading the steam tables. Linear interpolation is provided for estimation of non-listed table values. The quality of a saturated mixture "X" can be calculated given vapor and fluid specific volumes, internal energy, enthalpy, or entropy. Conversely, the specific volume, internal energy, enthalpy, or entropy can be calculated given "X" and the specific fluid and vapor contributions. **Necessary Accessories for HP-41:** None.

Steps: 66 HP-41 Bytes: 000138

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03368-41-8	$10	$11
FOR HP-71*	03368-71-5	N/A	$12

03369 Retirement With Inflation

by S. Lepp, Verona, NJ

This program computes the savings required to finance a retirement that keeps pace with rising costs caused by inflation. The following are calculated: starting income at some future time, size of the savings fund, monthly deposits required to finance the Plan, monthly withdrawals during retirement. The user inputs: desired income, number of years before and after retirement, percent interest after taxes, percent inflation. **Necessary Accessories for HP-41:** None.

Steps: 274 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03369-41-6	$10	$14
FOR HP-71*	03369-71-3	N/A	$16

03372 Horizon, Drop, and Refraction

by R.C. Wyckoff, Tujunga, CA

For any spherical body, program computes for any altitude above surface, the slant range to horizon, range over surface, and subtended angle at center of body (dip of horizon). Constants for all solar system planets are given. Provision is made for iterative operation. For terrestrial altitude observations of celestial bodies, program computes angular correction for atmospheric refraction, dip of horizon, height of observer above sea level, and with sextant zero index correction input, the total correction to be applied to the observed celestial altitude, or zenith distance. **Necessary Accessories for HP-41:** None.

Steps: 84 HP-41 Bytes: 000126

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03372-41-0	$10	$11
FOR HP-71*	03372-71-7	N/A	$12

03373 One Hop Microwave System Analysis

by R. Hamilton, Cahokia, IL

This program uses transmitter power, frequency and waveguide loss to compute signal levels through a one hop microwave link. Receiver input signal level is displayed in dbm, as is the signal level at each interface point in the system (ie. transmit dish output ERP at the beginning of the free space path). After initialization, program modules can be called from other programs to determine various system gains and losses as subroutines. Manufacturers data on waveguide loss characteristics required. **Necessary Accessories for HP-41:** None.

Steps: 92 HP-41 Bytes: 000149

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03373-41-8	$10	$12
FOR HP-71*	03373-71-5	N/A	$14

03374 Dimensional Analysis

by M. Patterson, McPherson, KS

This program computes tha Buckingham Pi Theorem for solution of flow problems. Input is simply the variables involved in the analysis-the dimensions of 23 common Fluids Dynamics variables are stored in a file. Output is dimensionless variables. User controls output with choice of: 1) Force or Mass system for dimensions; 2) Independent variablea when valid and; 3) Dependent variable power. Dimension file maintenance includes adding, deleting, and viewing variables. Program accommodates up to 24 variables per analysis. **Necessary Accessories for HP-41:** CV memory capability, X Functions module, Math I module.

Steps: 766 HP-41 Bytes: 002215

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03374-41-6	$10	$21
FOR HP-71	NOT AVAIL		

03375 Power Plant Condenaer Hydraulic Horsepower Calculation

by D.A. Pfister, Fargo, ND

This program calculates the hydraulic horsepower for a power plant condenser. Inputs are: water temperature, water velocity, tube length, tube diameter, flow rate and cleanliness. One or two pass condensers can be analyzed. **Necessary Accessories for HP-41:** None

Steps: 179 HP-41 Bytes: 000574

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03375-41-3	$10	$13
FOR HP-71*	03375-71-0	N/A	$14

03378 Matrix Operations On Fractions

by A. Turcotte, Price, Canada

This progrem was mainly designed to aid in the application of the simplex algorithm. It can also be used for any matrix factorization such as the determination of a system of simultaneous equations and the inversion of a matrix. It applies the factorization in the matrix; therefore you must decide upon which element the factorization will be applied. The computation and display are completed using fractions. **Necessary Accessories for HP-41:** None

Steps: 463 HP-41 Bytes: 000879

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03376-41-1	$10	$13
FOR HP-71*	03376-71-8	N/A	$14

03377 Fourth Order Runge-Kutta For 1-99 Simultsneous O.D.E.'s

by D.N. Peterson, Lillooet, Canada

This program solves 1-99 simultaneous O.D.E.'s by fourth order Runge-Kutta Algorithm. User selects step size and specifies number of iterations per printed-out result. Program stops at user specified end value. **Necessary Accessories for HP-71:** HP-82480A Meth Pac; printer.

Steps: HP-71 Bytes: 002546

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03377-71-6	$10	$14

03378 Bode Gain-Phase Calculations

by M.H. Crothers, Urbana, IL

This program employs data of the real component (gain or attenuation) to compute values of the imaginary component (phase) for network response functions. The raal component is approximated by straight line sections between data points; the slopes of these sections and then incremental changes in slopes are used in the method presented by H. W. Bode. **Necessary Accessories for HP-41:** None

Steps: 245 HP-41 Bytes: 000410

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03378-41-7	$10	$12
FOR HP-71*	03378-71-4	N/A	$14

03379 Single Stage Reciprocating Compressor Operating Curves

by H.A. Hain, Green Valley, AZ

This program calculates data points for a Suction Pressure-ordinate vs. Discharge Pressure-absissa with curves of constant horsepower and constant capacity (thumb print curves). Ten separate single acting compressors or five double cating compressors. **Necessary Accessories for HP-41:** HP-41CX; Petroleum Fluids Pac.

Steps: 496 HP-41 Bytes: 000994

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03379-41-5	$10	$15
FOR HP-71	NOT AVAIL		

03381 Aberations end Ray Trace

by R. Noble, San Ysidro, CA

This three part program traces a marginal ray end a principal rey through an optical system, one surface at a time. The optical system is rotationally symmetric, therefore there is no loss of generality in choosing the incident direction to lie in the Y, Z plane. The position of the mean and the standard deviation are calculeted and all coordinates can be printed. The number of surfeces used is dependent upon the available memory. **Necessary Accessories for HP-41:** 41-CV or 41-C with Quad Memory; Extended Functions; Printer useful.

Steps: HP-41 Bytes: 000818

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03381-41-1	$10	$18
FOR HP-71	NOT AVAIL		

03384 Matrix Arithmetic

by J. Piaszczynski, Montreal, Canada

Matrices need to be entered only once and must be compatible. Dimensions of a result matrix C are calculated automatically. Viewing of all matrices is provided. Program performs: A*B, A+B, scelar operations (*, +,-) on A, B, or C. A and B matrices can be exchanged or C moved to A, this makes chain operations, powers of A and operations where A and B is a constant matrix easy. **Necessary Accessories for HP-41:** For HP-41C; one memory module, X Functions/Memory Module.

Steps: 272 HP-41 Bytes: 000460

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03384-41-5	$10	$13
FOR HP-71	NOT AVAIL		

03385 Pull Chart

by L.D. Thomas, Pocatello, ID

This program computes the distance that a given amount of material should be pulled or spread on the roadway, based on the number of courses and windrows to be used in construction of this section of roadway. When used in conjunction with a printer (HP 82143A) the program will generate end print the actual pull chart. **Necessary Accessories for HP-41:** One memory module.

Steps: 227 HP-41 Bytes: 000534

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03385-41-2	$10	$13
FOR HP-71*	03385-71-9	N/A	$14

03386 Natural Gaa Well Testing Programs

by B. Blyth, Cherryvale, KS

This is e group of programs that perform the following calculations for natural gas wells: convert surface to bottom hole pressures using the Cullender end Smith method; calculate permeability and skin factor from multirate flow tests, and convert reading from circular gas measurement charts to pressures and times for Horner plots and performs the calculations to get permeability and skin factor from Horner plot information. Gas properties are computed from gas gravity. Provisions for the nonhydrocarbon components: CO2, N2, and H2S. Units input and output may either be SI or English. **Necessary Accessories for HP-41:** Petroleum Fluids Pac, Extended Functions Module, one Extended Memory Module, printer; tape drive recommended.

Steps: HP-41 Bytes: 000441

	Order Progrem No.	Documentation Only	W/Cards
FOR HP-41	03386-41-0	$10	$34
FOR HP-71	NOT AVAIL		

03387 Interpolation With Cubic Splines

by D.N. Peterson, Lillooet, Canada

This program accepts a series of data pairs and points at which interpoletion values ere desired, and returns interpolated values by cubic spline algorithm. Program can also be called as a subprogram. **Necessary Accessories for HP-71:** HP-71B Math Pac.

Steps: HP-71 Bytes: 001990

	Order Program No.	Documentstion Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03387-71-5	$10	$14

03388 Arrhenius Activation Energy

by D.N. Peterson, Lillooet, Canada

This program takes as input a series of paired temperature (in celcius) and rate constant data, and returns the Arrhenius Activation Energy in calories per mole. Pre-exponential factor and coefficient of determination are also calculated. **Necessary Accessories for HP-71:** HP-71B Math Pac.

Steps: HP-71 Bytes: 000661

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03388-71-3	$10	$14

03389 Kinetics I: Initial Reaction Rate

by D.N. Peterson, Lillooet, Canada

This program accepts time-substrate concentration data peirs and calculates tha initial rate of the reaction by en integreted rate expression. Can also be called as a subprogram. **Necessary Accessories for HP-71:** HP-71B Math Pac.

Steps: HP-71 Bytes: 000883

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03389-71-1	$10	$14

03390 Human Heat Stress II

by T. Adams, East Lansing, MI

This program calculates "Wet Bulb Globe Temperature" (WBGT) with or without radiant heating, a mean metabolic heat load and a mean WBGT for successive periods of work and heat stress, respectively, and predicts required ratios of work and rest for "safe exposures" to e specified thermal environment for specific levels of metabolic heat production. It supplements the program entitled, "Human Heat Stress", (00755-41), which calculates a "Heat Stress Index". Used together, they provide useful information about environmental heat stress as well es guidelines for its amelioration. **Necessary Accessories for HP-41:** Three memory modules.

Steps: 551 HP-41 Bytes: 001390

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03390-41-2	$10	$15
FOR HP-71*	03390-71-9	N/A	$18

03391 Zener Suppressed Voltmeter

by H.P. Rockwell, Indianapolis, IN

Conventional mechanical suppression of the zero on a linear electrical measuring instrument requiras: a)springs of a high aspect ratio; b)complete disassembly of and reclocking of springs; c)elimination of the normal zero corrector; d)possible cramping of the upper end of the scale. With this technique anyone can suppress the standard meter by simply following the program. Usually, the few network components can be mounted within the meter or on e deck connected to the rear terminals. **Necessary Accessories for HP-41:** None

Steps: 97 HP-41 Bytes: 000193

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03391-41-0	$10	$13
FOR HP-71*	03391-71-7	N/A	$14

03392 Large Numbers: Factorials, Combinations, and Binomials

by D. Basker, Bet Dagan, Israel

This three program package calculates: a) factorials of small ($N<69$) and large ($N>69$) numbers in arithmatic or logarithmic form; these can be used (b) to calculate combinations and/or permutations, and these, in turn, for (c) binomials and/or cumulative binomials or large numbers. **Necessary Accessories for HP-41:** One memory module, extended module.

Steps: 201 HP-41 Bytes: 000426

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03392-41-8	$10	$13
FOR HP-71*	03392-71-5	N/A	$14

03393 Tacan Point to Point Navigation

by R.J. Welzel, Havelock, NC

This program calculates the no wind heading and distance solution given a current TACAN (or VORTAC) radial and DME and a new radial and DME. **Necessary Accessories for HP-41:** None

Steps: 68 HP-41 Bytes: 000126

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03393-41-6	$10	$11
FOR HP-71*	03393-71-3	N/A	$12

03394 Roots of Cubic Equations

by F.Y. Tajaddodi, Norwalk, CA

This program computes the real and complex rootss of cubic equations. The program runs fast because it uses Cardano solution with exact equations. **Necessary Accessories for HP-41:** ThinkJet of thermal printer is desirable.

Steps: 256 HP-41 Bytes: 000352

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03394-41-4	$10	$12
FOR HP-71*	03394-71-1	N/A	$14

03396 Foster Network Elements R-C & R-L

by M.H. Crothers, Urbana, IL

This program computes element values when given the impedance (or admittance) function data. The input requires the number and frequencies of real nonzero zeros, the number and frequencies of poles, the magnitude of Z (or Y) at some particular frequency. The program will work any of the four types possible with R-C or R-L elements. Full identification and value are given for each network element. Absent elements are noted with values of ZERO or INF. to mark their special case. **Necessary Accessories for HP-41:** None

Steps: 295 HP-41 Bytes: 0590

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03396-41-9	$10	$13
FOR HP-71*	03396-71-6	N/A	$14

03397 Treatment Component Sum of Squares

by D. Vargo, Pago Pago, AS

Planned component comparisons of treatments offers a powerful method to evaluate specific effects of treatment components. This program uses comperison coeficients to calculate sum of squares for treatment components. These can be used to calculate F-values of each component for e more detailed analysis of variance. It is convenient, though not essential, if the comparisons are orthogonal, (i.e. independent). **Necessary Accessories for HP-41:** None

Steps: 85 HP-41 Bytes: 000175

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03397-41-7	$10	$11
FOR HP-71*	03397-71-4	N/A	$12

03398 Tilt and Angular Limits of a Phased Array

by R.M. Rhodes, Sunnyvale, CA

The tilt angle of a phased array antanna is computed by requiring equalization of angular coverage. This program inputs the angle of the array face from true north, the desired range of azimuth and desired elevation limits. The output is tilt angle and array scan limits in spherical coordinates and sine spece. **Necessary Accesaories for HP-41:** None

Steps: 146 HP-41 Bytes: 000294

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03398-41-5	$10	$12
FOR HP-71*	03398-71-2	N/A	$14

03399 JOLLY-SEBER STOCHASTIC METHOD FOR POPULATION PARAMETERS

by D. Vargo, Pago Pago, AS

Marking, releasing and recapturing individual animals is a common method of estimating animal populations. This program determines the total population, number of marked animals at large, and their survival rate. It will also estimate the number of new animals for animals marked on a series of two or mora occasions. **Necessary Accessories for HP-41:** None

Steps: 216 HP-41 Bytes: 000357

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03399-41-3	$10	$12
FOR HP-71*	03399-71-0	N/A	$14

03400 Coal Fired Boiler Efficiency

by D.A. Pfister, Fargo, ND

This program computes the Dry-Gas Loss, Moisture Loss, Moisture in Combustion Air Loss, Incomplete Combustion Loss, Radiation and Unaccounted for Loss and the Overall Gross Efficiency of a coal fired boiler from Ultimate and Flue Gas (Orsat) Analysis Data. **Necassary Accessories for HP-41:** None

Steps: 211 HP-41 Bytes: 000447

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03400-41-9	$10	$12
FOR HP-71*	03400-71-6	N/A	$14

03401 Super Detective

by T. Langland, Phoenix, AZ

There has been a robbery! A very expensive diamond was stolen from a nine room museum. Five people were wandering around the museum and you may question them about what they were doing, and they will tell you which room they were in at that time, who they were with and who they saw. The problem is that sometimes they might lie (especially the real thief). You must find out who the guilty suspect is and at what time he stole the diamond. **Necessary Accessories for HP-41:** Quad memory module.

Steps: 661 HP-41 Bytes: 001524

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03401-41-7	$10	$17
FOR HP-71*	03401-71-4	N/A	$20

03402 Super Reverse and XOR

by D. Ristanovic, Belgrade, YUGOSLAVIA

This package consists of two programs: Super Reverse and XOR. Although based on completely different algorithms, these programs have one thing in common; the HP-41 will teach you to play and, while doing so, will win many times. Prove that humans are superior to computers when playing games of logic. **Necessary Accessories for HP-41:** One memory module for Super Raverse.

Steps: 323 HP-41 Bytes: 000589

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03402-41-5	$10	$13
FOR HP-71*	03402-71-2	N/A	$14

03403 Radiation Analysis By Change In Quantum Level

by P. Vranjes, Sunnyvale, CA

This program calculates wavelength, frequency and energy of photon emitted when an electron drops from initial quantum energy level to a final, lower quantum energy level. Initial quantum level and final quantum level must be known values. The units are displayed beside the answers. **Necessary Accessories for HP-41:** None

Steps: 42 HP-41 Bytes: 000105

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03403-41-3	$10	$11
FOR HP-71*	03403-71-0	N/A	$12

03404 Psycho Logic

by D. Ristanovic, Belgrade, YUGOSLAVIA

This program is a difficult game of skill and concentration which will work on improving your IQ. You start at Level One, having a chance to graduate to Level Five after some years (or decades) of hard work. After that you can read the explanation on how to add new levels and make the game even harder. **Necessary Accessories for HP-41:** Two memory modules; card reader recommended.

Steps: 194 HP-41 Bytes: 000394

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03404-41-1	$10	$13
FOR HP-71	NOT AVAIL		

03405 Barometric Distribution Law Calculations Using Boltzmann's

by D. Jeruzalmi, Cincinnati, OH

BARLAW will compute the final pressure, initial pressure, temperatura, and height of any system which obeys the Barometric Distribution Law. The program prompts for four of the five variables amd then computes the fifth variable. **Necessary Accesaories for HP-41:** None

Steps: 130 HP-41 Bytes: 0207

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03405-41-8	$10	$11
FOR HP-71*	03405-71-5	N/A	$12

03406 Derivative Calculations

by D. Jeruzalmi, Cincinnati, OH

This program calculates the relative maximum and minimum points and inflection points as well as roots on a specified closed interval. The program can be left running and will display any points located as they are found. When the program stops, one can review all the located information. **Necessary Accessoriaa for HP-41:** One memory module.

Steps: 300 HP-41 Bytes: 000562

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03406-41-6	$10	$13
FOR HP-71*	03406-71-3	N/A	$14

03407 Rainfall Intensity - Duration - Frequency Curves

by R.M. Steele, Columbia, SC

This program calculates rainfall intensity (In/Hr) for the 2, 5, 10, 25, 50 and 100 year (return period) storms through the duration (minutes) of 5, 10, 15 and 30 minutes. NOAA Technical Memorandum NWS HYDRO-35 Isopluvial Maps are included to obtain the six input precipitation velues. **Necessary Accessories for HP-41:** Printer required.

Steps: 263 HP-41 Bytes: 000705

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03407-41-4	$10	$14
FOR HP-71*	03407-71-1	N/A	$16

03408 Gravitational Parameters

by R.C. Wyckoff, Tujunga, CA

This program computes, for all planetary bodies, the acceleration of gravity, equatorial, meen, or for any geodetic or geocentric latitude. Also computes the acceleretion as a function of radial distance from the center of the primary, as well as the altitude of an isochronus satellite. Supplementel subroutines compute the radius of an ellipsoid and the difference between surface and center oriented latitude, as well as the mean redius of an ellipsoid. **Necessary Accessories for HP-41:** None

Steps: 251 HP-41 Bytes: 000352

	Order Program No.	Documentation Only	W/Cerds
FOR HP-41	03408-41-2	$10	$14
FOR HP-71*	03408-71-9	N/A	$16

03409 Telephone Directory

by A. Jahobsson, Uppi-Vasby, Sweden

This program may be used as a telephone end address directory with the addresses stored in an ASCII file. **Necessary Accessories for HP-41:** Extended Functions Memory Module

Steps: 117 HP-41 Bytes: 000274

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03409-41-0	$10	$12
FOR HP-71	NOT AVAIL		

03410 Analysis of Inverted V Bracings

by J.C. Shah, Gujarat, India

This program computes the axial forces in the bracings due to horizontal shear which arises from wind, earthquake, belt tension, etc. Vertical and horizontal end reactions are also calculated. This program is useful for lateral analysis of steel towers and frames. **Necessary Accessories for HP-41:** None

Steps: 117 HP-41 Bytes: 000259

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03410-41-8	$10	$11
FOR HP-71*	03410-71-5	N/A	$12

03411 Counter Weight Calculation for Luffing Machines

by J.C. Shah, Gujarat, India

This program calculates the counter weight of luffing machines like stacker reclaimer. stacker, pylon scraper, reclaimer, etc. Counter weight is required for balancing the weight on aither side of pivot point; a point of rotation. The program computes moments at pivot point due to luffing units of mechine for various luffing conditions, considering pivot point as origin. These moment values are also useful for calculating hydraulic cyclinder pressures. **Necessary Acceseories for HP-41:** None

Steps: 189 HP-41 Bytes: 000329

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03411-41-8	$10	$12
FOR HP-71*	03411-71-3	N/A	$14

03412 Robust Linear Regression Analysis

by W. Pinnick, State College, PA

This program performs a linear regression analysis and then repeats the regression, weighting each data point in the manner you prescribe to effectively weight "outliers" lass than points fitting the line better. Weighting routines are included which will, 1) reject outliers completely (weight 0) while retaining all other points (weight 1) or, 2) weight each point inversly to its distance off the line (three options included). The fit is repeated until maximum regression coefficient is obtained. **Necessary Accessories for HP-41:** None; printer optional.

Steps: 220 HP-41 Bytes: 000447

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03412-41-4	$10	$12
FOR HP-71*	03412-71-1	N/A	$14

03413 Calloway Golf Handicap System

by W. Pinnick, State College, PA

The Calloway method of handicapping golf scores becomes a snap with this program. Enter the par only once, then compute either the nine or eighteen hole Calloway for as many golfers as desired. Output includes total strokas and total under the 2X par limit, the number of holes to subtract, the adjustment factor, and, of course, the final handicap and net scoras. **Necessary Accessories for HP-41:** HP 82180A Extended Functions Module.

Steps: 240 HP-41 Bytes: 000543

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03413-41-2	$10	$13
FOR HP-71	NOT AVAIL		

03415 Analysis of the Latin Square Design

by D. Vargo, Pago Pago, AS

This program performs a complete analysis of variance of the Latin Square Design. There may be up to ten treatments (and each square repeated up to eight times). Data entry is quick and simple, and errors are eesily erased with the touch of e button. Output includes all sums of squares, their degrees of freedom, the appropriate mean squares, and "F"-values for rows, columns and treatments. **Necessary Accessories for HP-41:** None

Steps: 278 HP-41 Bytes: 000514

	Order Program No.	Documentation Only	W/Cerds
FOR HP-41	03415-41-7	$10	$13
FOR HP-71*	03415-71-4	N/A	$14

03416 Failure Theories (Brittle and Ductile)

by E. Zonneveld, Thunder Bay, Canada

This program calculates the most popular brittle and/or ductile failure theories. Coulomb-Mohr, modified-Mohr, maximum-normal, maximum-shear and distortion-energy theories are supported. Input is material properties and principal stresses or Mohr circle routine included will reduce applied stresses to principle stresses. The program may be shortened is a machine design pac is available. **Necessary Accessories for HP-41:** One memory module, printer.

Steps: 246 HP-41 Bytes: 000430

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03416-41-5	$10	$12
FOR HP-71*	03416-71-2	N/A	$14

03417 Acoustic Design

by M. Chisholm, Chicago, IL

A "what if" program; menu driven, fully readdressable, input protected and crashproof, for use in the design and/or modification of microphone- loudspeaker systems and/or their acoustic environments. Given room dimensions or area/volume figures and reverberation time or surface absorption coefficients, the program constructs a mathematical model of a room into which any sound source may be inserted, and its performance analyzed as to presence, clarity, and level at any given distance. **Necessary Accessories for HP-41:** None.

Steps: 822 HP-41 Bytes: 001961

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03417-41-3	$10	$19
FOR HP-71*	03417-71-0	N/A	$22

03418 Mystery

by D. Hayes, Wichita, KS

This is an intriguing game of deduction which is loosely besed on a popular board game. When your calculator tells you that someone has been killed at 'Badd Manor', it's up to you to determine "whodunnit?", "how?" and "where?", by a process of elemination. But don't make too many accusations, or you're next! This is an easy game to understand and play, but never too easy to win. **Necessary Accessories for HP-41:** Extended Functions/Memory Module, one memory module.

Steps: 343 HP-41 Bytes: 000750

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03418-41-1	$10	$13
FOR HP-71	NOT AVAIL		

03419 Nonparametric Multiple Comparison

by D. Basker, Bet Dagan, Israel

This program compares several nonparametric distributions simultaneously by the Dwass and Gabriel procedure; sorting them into heterogenous and nonheterogenous sets. All distributions are required to be of the same size, and greater than eight. The program accomodates up to twenty distributions with up to twenty six groupings. **Necessary Accessories for HP-41:** Extended functions module; memory module (s).

Steps: 214 HP-41 Bytes: 000390

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03419-41-9	$10	$12
FOR HP-71	NOT AVAIL		

03420 Combining Data From Fourfold Table "COM"

by J.C. Meeroff, Coral Springs, FL

This program calculates measures of homogeneity and association using both the method which combines the logarithms of odds ratios and the Mantel- Haenszel method. For any number of 2x2 tables, the program calculates the Yates Chi square total, the Chi square homogeneity, the Chi square association and the mean odds ratio. It tests the null hypothesis for 1-tailed and 2-tailed probabilities without the need for looking at the Chi square distribution table. **Necessary Accessories for HP-41:** HP-41 CV or equivalent memory capacity; extended functions module.

Steps: 508 HP-41 Bytes: 001166

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03420-41-7	$10	$16
FOR HP-71*	03420-71-4	N/A	$18

03422 Flange Tap Orifice Calculations for Natural Gas

by P.J. Grimmer, New Orleans, LA

Flowrate, orifice size, or differential at one point or over a range can be found using this program. Program adheres to AGA Report #3 standards except for supercompressibility which is calculated via techniques presented in the HP-41 PETROLEUM FLUIDS PAC. Input/output has been programmed to handle virtually any HP-IL configuration including no HP-IL. It works particularly well with an 80 column printer such as the HP2225B. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 008483

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03422-71-0	$10	$24

03423 Mass Storage Utilities for the HP-71

by P.J. Grimmer, New Orleans, LA

This program provides complete control of an HP-IL disc or cassette drive. Included are alphabetical catalog listing, location of directory and files including pruged files, restoration of purged files, making any file unprivate, change volume label, print and/or edit any record byte by byte, available space on medium, duplication to one or more additional drives, byte by byte comparison of two media and more. **Necessary Accessories for HP-71:** Disc drive or cassette drive.

Steps: HP-71 Bytes: 011838

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03423-71-8	$10	$28

03424 Data Transfer: HP-71 to IBM PC

by P.J. Grimmer, New Orleans, LA

This program allows the user to overcome the operating system differences between the IBM PC and the HP-71 to allow data transfer from TEXT and DATA files and/or keyboard input on the HP-71 to the IBM PC (or PC/XT). Programs are provided for both machines. Transfer is via HP-IL and requires the HP82973A Portable-Desktop Link to be installed in the PC. Built-in help is included. **Necessary Accessories for HP-71:** HPIL, HP82973A Portable-Desktop Link, IBM PC or PC/XT.

Steps: HP-71 Bytes: 001844

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03424-71-6	$10	$14

03425 Gas Pipeline Hydraulics

by P.J. Grimmer, New Orleans, LA

This program uses either the Weymouth or Panhandle equation to solve gas pipeline hydreulics. Solutions can be found for flowrate, pipe size, upstream pressure, or downstream pressure. Input data can be re-used for subsequent runs with either correlation. I/O is optimized in a series of subprograms (which can be called from other programs) for a wide variety of loop configurations, or no loop at all. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 003652

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03425-71-3	$10	$16

03426 Duct Pressure Drop

by E. Nicolaysen, Larchmont, NY

This program, written in Basic, computes the pressure drop in round or rectangular air duct systems using the Colebrook equation to determine the Darcy friction factor in the ducts. The fitting losses are determined from calculated velocity pressures and ASHRAE or SMACNA loss coefficients, or obtained directly from manufacturer's data. The pressure losses for each duct-section is totaled to enable the user to determine the worst path for fan sizing. **Necessary Accessories for HP-71:** HP2225 Printer, HP92198 Video Interface and Video Monitor.

Steps: HP-71 Bytes: 005192

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03426-71-1	$10	$18

03427 Inverse Characters for the HP-71

by M.W. Malsberger, Sugarland, TX

This LEX file designates the alternate character set as the graphic inverse (whita characters on a black field) of tha standard HP-71 cheracter set. The use of invarse characters can add interest and visual impact to printed or displeyed output. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 000900

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03427-71-9	$10	$12

03428 LEX File to Resize HP71 Command Stack

by J.R. Baker, Charles Town, WV

This LEX file provides one keyword, CMDSTK, to allow changing the size of the HP71 Command Stack from 1 to 16. **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 000148

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03428-71-7	$10	$12

03429 13T and E13T Foxboro Target Flowmeters

by I. Romano, Porto Torres, Italy

This program executes computes, both in English or in metric units, for Foxboro 13T and E13T Target Flowmeters. You can compute force on target and pressure loss entering flow transmitter, or you can choose the beat size for a new transmitter if you know maximum flow. Program uses some empirical equations developed to accomodate the various experimental data, so computes can be done in any flow condition (laminar, transitional and turbulent). **Necessary Accessories for HP-71:** None

Steps: HP-71 Bytes: 003767

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03429-71-5	$10	$16

03434 Least Squares Circle Fitting

by P. DeBlois, St Georges, Canada

This program allows one to estimate from n points, the center's coordinates (Xc, Yc) of the circle and the radius (R) which fulfill the least squares principle. Also, it is possible to force the circle to go through by specific points. **Necessary Accessories for HP-41:** Math module.

Steps: 277 HP-41 Bytes: 000477

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03434-41-8	$10	$13
FOR HP-71	NOT AVAIL		

03435 Days Between Dates

by K. Rosenhagen, Blender-Einste, W. Germany

This program calculates the days between two dates. The user may base the calculation on 360 or 365/6 days per year. Only the stack is used for the calculation. **Necessary Accessories for HP-41:** None.

Steps: 115 HP-41 Bytes: 000173

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03435-41-5	$10	$11
FOR HP-71*	03435-71-2	N/A	$12

03436 Rectangular Solar Coordinates

by G. Radons, Heidelberg, West Germany

The rectangular solar coordinates necessary for the calculation of ephemerides of planets, and other bodies of the solar system, are calculated. The program is valid for the years 1801 through 2099. **Necessary Accessories for HP-41:** One memory module.

Steps: 400 HP-41 Bytes: 000702

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03436-41-3	$10	$14
FOR HP-71*	03436-71-0	N/A	$16

03437 Section Breakdown

by S Holmes, Montrose, CO

This program allows the user to breakdown a section of land by the MANUAL OF INSTRUCTIONS FOR THE SURVEY OF THE PUBLIC LANDS OF THE UNITED STATES (1973) RULES. The user is required to enter the four section corners of a section by coordinates and any quarter corners found. Missing quarter corners and center of the section are found along with any sixteenth corners desired. This program is a real time saver for office or field. **Necessary Accessories for HP-41:** None

Steps: 362 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03437-41-1	$10	$14
FOR HP-71*	03437-71-8	N/A	$16

03438 Steel Frame Drift

by R.D. Queiroz, Palos Verdes, CA

This program computes drift, column shears, and percentages of drift due to columns and girders at any storey of a moment resisting steel frame with lateral loads applied at girder levels. Input storey heights and shears above, at and below the storey in question, and moments of inertia of storey columns and of girders at top and bottom of storey. It assumes that points of contraflexure occur at midspan and midheight of girders and columns respectively except when columns are pinned at one end. Flexural deformations only are considered. **Necessary Accessories for HP-41:** None.

Steps: 512 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03438-41-9	$10	$13
FOR HP-71*	03438-71-6	N/A	$14

03439 Tapered Girder

by M.A. Abel, Los Angeles, CA

For a tapered or trapeziodal girder with uniform load and any number of point loads, this program displays bending moment, depth, moment of inertia, section modulus, and bending stress at selected points on span. If stress is not acceptable, elements of profile may be revised. Reenter series of points sufficient to locate maximum stress. Special value where profile or loading is not symmetrical and lengthy hand calculations are required to locate point of maximum stress. **Necessary Accessories for HP-41:** Printer is optional.

Steps: 278 HP-41 Bytes: 000508

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03439-41-7	$10	$12
FOR HP-71*	03439-71-4	N/A	$14

03440 Kendall's Independence Test

by D. Vargo, Pago Pago, AS

A popular nonparametric competitor of Spearman's Rank Correlation, Kendall's Test For Independence not only tests for association, but also provides a coefficient of correlation (Kendall's Tau, T). A table is included for up to 40 data pairs at 5 levels of significance, and the program determines a large sample aproximation which uses the upper tail probabilities for the standard normal distribution. Appropriate hypotheses tests are explained in the documentation. **Necessary Accessories for HP-41:** None.

Steps: 238 HP-41 Bytes: 000362

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03440-41-5	$10	$12
FOR HP-71*	03440-71-2	N/A	$14

03441 Besselian Day Numbers

by G. Radons, Heidelberg, West Germany

The Besselian day numbers are calculated with sufficient accuracy for the calculation of aphemerides of astronomical objects. The program is useful for astronomical observers who do not have an astronomical yearbook which tabulates those numbers. **Necessary Accessories for HP-41:** One memory module.

Steps: 382 HP-41 Bytes: 000738

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03441-41-3	$10	$14
FOR HP-71*	03441-71-0	N/A	$16

03444 Plug

by K. Dickerson, Golden, CO

The plug flow technique is very efficient but it is limited to cementations of small volumes and where the mud in the hole is of low density. The technique calls for Reynold's numbers of 100 or less, no cement slurry retarders or thinners, and for the cement to be in contact with the mud (no spacer). It can be demonstrated in laboratory experiments that a thickened plug or ball of flocculated cement and mud is formed in the annulus which, when aided by bouyancy, pushes the mud from the hole. **Necessary Accessories for HP-41:** None.

Steps: 96 HP-41 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03444-41-7	$10	$13
FOR HP-71*	03444-71-4	N/A	$14

03445 Dollar Unit Sample Selection With Extended Sample Option

by T. Dingwell, Corner Brook, Canada

This program helps to select monetary items (checks, receipts, receivable balances, etc.) for audit, based on their dollar value. This avoids the problems associated with dealing with items of different sizes. The program uses the confidence level and the basic precision (accuracy) of the required results in order to randomly select a set of samples. Note that no assumption es to the pattern or distribution of errors among the items is required. **Necessary Accessories for HP-41:** None.

Steps: 81 HP-41 Bytes: 000185

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03445-41-4	$10	$11
FOR HP-71*	03445-71-1	N/A	$12

03446 Real Factors to Polynomials

by M.H. Crothers, Urbana, IL

Program HELP 1 accepts input of real factors (x+Ak) and KO constant and computes the polynomial coefficients. Order N should not exceed N=15. **Necessary Accessories for HP-41:** None

Steps: 106 HP-41 Bytes: 000192

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03446-41-2	$10	$11
FOR HP-71*	03446-71-9	N/A	$12

03447 ThinkJet PRPlot-A Four Function Plotting Program

by W. Pinnick, State College, PA

A PRPLOT type routine for the HP 2225B ThinkJet Printer. Up to four data points may be plotted on a single row, each with its own plot symbol. A 122 character plot field is used with both X and Y axes labeled with scales and units. A title is printer centered on the page. Axis labels are centered on their respective axes. **Necessary Accessories for HP-41:** HP 82160A HP-IL Module, HP 82180A Extended Functions/Memory Module, HP 2225B ThinkJet Printer, or equivalent.

Steps: 444 HP-41 Bytes: 000975

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03447-41-0	$10	$15
FOR HP-71	NOT AVAIL		

03448 Maths

by O. Sjoflot, Trondheim, Norway

This program is a powerful tool for evaluating integrals, and finding roots of equations (zeros of functions). The integrals, both continuous and discrete, are found using Simpson's method. The Solve routine uses a combination of the Regula Falsi method and a Sign Search method to obtain its results. Both routines are fairly general, so most of the normally encountered functions should be fully covered. **Necessary Accessories for HP-41:** Two memory modules.

Steps: 460 HP-41 Bytes: 000895

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03448-41-8	$10	$14
FOR HP-71	NOT AVAIL		

03449 Rolodex

by E. Young, Cambridge, MA

This program allows easy access to names and numbers stored in an extended memory text file. With a single key, the user can choose to view, add, delete, or update entries. **Necessary Accessories for HP-41:** HP-41CX or HP-41CV with Extended Functions Module.

Steps: 261 HP-41 Bytes: 000095

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03449-41-6	$10	$13
FOR HP-71	NOT AVAIL		

03450 ANOVA: Split-Plot and Split-Split-Plot Designs

by D. Vargo, Pago Pago, AS

The Split-Plot and the Split-Split-Plot designs are frequently used for factorial experiments in which factor combinations cannot be handled alike or when increased precision is desired in estimating certain effects. By simply entering the levels of each factor, number of replicates and the observations, the program produces a complete Anova table. The program prompts for all input date and labels all output. **Necessary Accessories for HP-41:** None.

Steps: 526 HP-41 Bytes: 000882

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03450-41-4	$10	$14
FOR HP-71*	03450-71-1	N/A	$16

03451 PNLN

by L. Grosenbaugh, Gainesville, FL
B. Swindel, Gainesville, FL

This program uses data-based moments to compute X, Y coordinates of the curve N*P.D.F. for univariate normal or log-normal distribution, given N, maan X(or mean 1nX), variance of X (or of 1nX)—all outputs of STATS— and desired lower limit, upper limit and increment of X. Coordinates may be plotted on the same sheet and use the same scale as the histogram of observed measurements. **Necessary Accessories for HP-41:** Two memory modules.

Steps: 119 HP-41 Bytes: 000354

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03451-41-2	$10	$12
FOR HP-71*	03451-71-9	N/A	$14

03452 "Geoprop" Sections In Forth

by C.I. Dinsmore, Seattle, WA

This is a FORTH program conversion of the HP-41 Structural Analysis Pac section properties program. Extremely fast execution provides the solution for the centroid, centroid properties, original properties, and principal properties. Sub sections and holes may be added or deleted. Properties for a specified axis are computed. **Necessary Accessories for HP-71:** HP-41 Translator Pac, mass storage; printer or video display optional.

Steps: HP-71 Bytes: 008816

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03452-71-7	$10	$24

03453 Calkster Cogo

by T. Falconer, Sebastopol, CA

This is a menu driven coordinate geometry program. Stores up to 750 points in multiple, HP-41 compatable, SDATA files. Includes traverse, inverse, intersections, radial stakeout, points on curve, adjust angles, balance traverse, and area. **Necessary Accessories for HP-71:** None.

Steps: HP-71 Bytes: 004277

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03453-71-5	$10	$18

03454 Laser Cevity Design

by P. Staver, Livermore, CA

This program calculates beam parameters of a geussian fundamental mode (TEM 00) laser beam propegating in or out of a laser resonator consisting of two concave or convex spherical mirrors. The calculator checks cavity stability, computes the mode radius at points inside or outside the cavity, the confocal beam parameter, and the beam divergence. The calculator also computes the wavefront curvature, and the transmission in percent of a circular aperture placed anywhere along the propagation path of the laser beam. **Necessary Accessories for HP-41:** One memory module; printer optional.

Steps: 218 HP-41 Bytes: 000346

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03454-41-6	$10	$12
FOR HP-71*	03454-71-3	N/A	$14

03455 PBEGA

by L. Grosenbaugh, Gainesville, FL
B. Swindel, Gainesville, FL

This program derives exponential parameters A, B by the method of moments and computes X, Y coordinates on curve N*P.D.F. when user specifies either a beta or a gamma P.D.F. and N, minimum, mean, maximum, variance (all output by STATS), along with desired upper plotting limit (gamma only) and desired increment of X. Coordinates may be plotted on same sheet and use the same scale as the histogram of observed measurements. **Necessary Accessories for HP-41:** Two memory modules.

Steps: 291 HP-41 Bytes: 000617

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03455-41-3	$10	$13
FOR HP-71*	03455-71-0	N/A	$14

03458 STATS

by L. Grosenbaugh, Gainesville, FL
B. Swindel, Gainesville, FL

This program provides for input, checking, correction, sorting and processing of N unsorted variables, or for processing of N sorted variables. The sort is an insertion sort, preserving order among ties. Processing includes computation of variance, mean, minimum, maximum, and four intervening measurements bounding percentiles. Other programs need these statistics to derive location and shape parameters used in computing X, Y coordinates for appropriate normal, log-normal, beta, gamma, and Weibull p.d.f.'s. **Necessary Accessories for HP-41:** Extended functions module, two memory modules.

Steps: 234 HP-41 Bytes: 000534

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03456-41-1	$10	$13
FOR HP-71	NOT AVAIL		

03457 Low Pass To Band Pass Transformations

by M.H. Crothers, Urbana, IL

Poles are selected upon the complex s plane so that they would produce a Low Pass F(s) response of desired shape and with bandwidth B as normalized to 1 unit scale. The program LP BP transforms each s plane pole to a pair of z plane poles so that the Band Pass F(z) response will have corresponding bandwidth B relative to 1 unit center frequency. The program than multiplies by some selected Scaling Frequency ws to place these Band Pass poles at the proper frequencies. Results are offered in rectangular or polar forms. The program also computes coefficients in the quadratic function form. **Necessary Accessories for HP-41:** None.

Steps: 96 HP-41 Bytes: 000147

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03457-41-9	$10	$11
FOR HP-71*	03457-71-6	N/A	$12

03458 Gulf Coast Seismic Time-Depth Correlation

by B. Holliday, Corpus Christi, TX

This seismic correlation program was developed to handle the following three applications: 1) Generation of a time-depth table from a series of velocity maps. 2) Generation of a time-depth table from a velocity survey having checkpoints at seeming random depths. 3) Direct conversion of a time to a depth or a depth to a time from any series of time-depth or velocity- depth data, with or without a printer attached. **Necessary Accessories for HP-71:** None for direct conversion; a printer and an HP-IL interface for a printed table.

Steps: 2490 HP-71 Bytes:

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03458-71-4	$10	$30

03459 Diary

by O. Pilloud, Geneva, Switzerland

This is a program to manage appointments and 'things to be done or remembered' on a day to day basis. Two sets of entries can be kept simultaneously (ie: work and home). Entries can be examined, modified, postponed, deleted, logged (in a special log file), searched, or reviewed 'n' days in advance. **Necessary Accessories for HP-71:** Printer, Text Editor module or Forth Assembler module or Text File Utilities (TEXTUTIL). USERS' LIBRARY #03182-71.

Steps: 1 HP-71 Bytes: 001292

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03459-71-2	$10	$12

03460 Catalog and File Listing Utilities

by P.J. Grimmer, New Orleans, LA

This file contains three utility subprograms: 1) a program and key file printer for the HP 2225B printer that time and date stamps the listing, which has wraparound and perforation skip among other features; 2) a sub to clear the display screen and list the RAM catalog (col. 1-32) as well as available memory; and, 3) a time, date, and volume labeled tape/disc directory on the HP 2225B printer. **Necessary Accessories for HP-71:** For two of the subs, an HP 2225B printer.

Steps: HP-71 Bytes: 001500

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03460-71-0	$10	$12

03461 Formulation Analysis

by M.W. Malsberger, Sugarland, TX

This is a utility program for formulators, chemists, or others who routinely deal with batch operations. This program computes percentages from amounts used, scales a batch to given size, recomputes percentages after drop, add, or change of components, and allows computation of unit cost given material prices. This program has been extensively tested in use. **Necessary Accessories for HP-71:** Math Pac

Steps: HP-71 Bytes: 002026

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03461-71-8	$10	$14

03464 Landmine-Forth

by S. Rhoads, Corvallis, OR

Landmine-Forth is played on a 13 by 7 grid on a video monitor. The object is to maneuver yourself around the grid without landing on the hiddan mines. Current move, number of adjacent mines, and the number of mines you specified for the grid, are updated and displayed after each move. The program is written in FORTH and includes a full listing of the program source code, with comments. **Necessary Accessories for HP-71:** Forth/Assembler or Translator Rom (specify when ordering), HP-IL, 80 column video interface.

Steps: HP-71 Bytes: 004152

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03464-71-2	$10	$18

03465 Round Culvert Headwater

by R.E. Dehlin, Boise, ID

This program computes inlet and outlet headwater for round culverts with standard inlet conditions. Procedure is based on "Hydraulic Charts For The Selection Of Highway Culverts" by FHWA and other publications. Culvert flow is divided into two types; inlet control and outlet control. Headwater is computed for each value. The higher headwater is then added to the invert elevation to determine the headwater elevation. Constants are stored on data cards for each standard inlet conditions. **Necessary Accessories for HP-41:** Card reader, printer.

Steps: 492 HP-41 Bytes: 001302

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03465-41-2	$10	$20
FOR HP-71	NOT AVAIL		

03488 POLFIT: Least Squares Polynomial Fit

by T. Hall, Merritt Island, FL

This program fits a polynomial to user-supplied data by the method of least squares. Either weighted or unweighted data is accomodated. Data may be entered by keyboard or read from a data file. The program also provides a means of transferring data into a file opened or created by the program. Polynomials are evaluated based on coefficients computed by the program or arbitrarily selected. Chi squered, RMS error and correlation coefficient are also computed. **Necessary Accessories for HP-71:** Math Pac, HP 82480A

Steps: HP-71 Bytes: 004599

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03466-71-7	$10	$16

03488 Natural Channel Flow

by R.E. Dehlin, Boise, ID

This program uses Manning's Formula to compute discharge, depth, conveyance, stage/discharge data and other hydraulic properties for an irregular cross section. Distances and elevations with up to three decimal places may be used. **Necessary Accessories for HP-41:** Card reader, printer.

Steps: 660 HP-41 Bytes: 001252

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03466-41-6	$10	$17
FOR HP-71	NOT AVAIL		

03469 Box Culvert Headwater

by R.E. Dehlin, Boise, ID

This program computes inlet and outlet headwater for box culverts with standard inlet conditions. Procedure is based on "Hydraulic Charts For The Selection Of Highway Culverts" by FHWA and other publications. Culvert flow is divided into two types, inlet control and outlet control. Headwater is computed for each value. The higher headwater is then added to the invert elevation to determine the headwater elevation. Constants are stored on date cards for each standard inlet conditions. **Necessary Accessories for HP-41:** Card reader, printer.

Steps: 400 HP-41 Bytes: 001190

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	03469-41-4	$10	$19
FOR HP-71	NOT AVAIL		

03470 HP-71 Text File Printer

by P.J. Grimmer, New Orleans, LA

This program gives you more print control than virtually any word processor on much larger computers. Features include: automatic wordwrap, headers, footers, margins, centering, page numbering, bold, underline, and even, user-defined characters, all using simple commands embedded in the TEXT file, using any text editor (e.g. /U is underline). Although designed for the HP 2225B printer, many functions work on the HP 82182A. The TEXT file can be in RAM or on tape/disc. **Necessary Accessories for HP-71:** 24 or 80 column HP-type printer.

Steps: HP-71 Bytes: 008500

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03470-71-9	$10	$28

03471 Direct Execution of HP-41 Mass Storage Files By The HP-71

by P.J. Grimmer, New Orleans, LA

This is an extension of program 03193-71. It does all that one does plus: optonal condensed listing highlighting functions not supported by the Translator Pac, optional direct load to TRANS41 for conversion to a filetype readable in FORTH (with optional load to FTH41RAM), it's in subprogram form that resets system setting and destroys variables used by the program while not affecting any current variables and more. **Necessary Accessories for HP-71:** Tape/disc drive for TEXT conversion. Translator Pac required to convert then run.

Steps: HP-71 Bytes: 012000

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03471-71-7	$10	$36

03472 Trivia Quiz

by P. Manney, Medina, OH

This program consists of three separate programs. MAKEQUIZ to contruct and edit multiple-choice questions with up to four answers. These are stored in DATA files in memory or on cards. QUIZ to test yourself and keep score. You must answer quickly for a higher score. QUES1 is a sample file of questions to get started. **Necessary Accessories for HP-71:** Card reader.

Steps: HP-71 Bytes: 002184

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	NOT AVAIL		
FOR HP-71	03472-71-5	$10	$24

09114 HP-41 TO HP 9114A Utility

by Users' Library, , Corvallis, OR

This program allows an HP-41C/CV/CX to fully utilize the 630K bytes of storage available on an HP 9114A 3.5" Flexible Disc Drive. All legal file types can be created. **Necessary Accessories for HP-41:** Extended I/O Module; 2 Memory Modules; HP-IL Module; HP 9114A Disc Drive

Steps: 370 HP-41 Bytes: 903

	Order Program No.	Documentation Only	W/Cards
FOR HP-41	09114-41-0	N/A	$15
FOR HP-71	NOT AVAIL		

Additional Software

HP-41

Solutions Books

HP-41 Solutions Books provide complete step-by-step keystroke listings and bar code, to help provide you with answers to your general or specific problems.

Business

Business Stat/Marketing/Sales (00041-90094)
- Forecasting Using Exponential Smoothing
- Monthly Seasonal Variation Factors Based on Centered Moving Averages
- Multiple Linear Regression
- Nominal, Inverse Normal, T and F Distributions
- Basic Statistics for Two Variables
- Moving Average
- Compertz Curve Trend Analysis
- Break-Even Analysis
- Experience (Learning) Curve for Manufacturing Cost
- Price Elasticity of Demand

Home Construction Estimating (00041-90096) *
- Concrete Volume
- Linear to Board Feet Conversion and Costing
- Framing Board Feet
- Lumber Estimate
- Shingle Estimate
- Wall & Ceiling Areas Estimate
- Wallpaper Estimate
- Drywall and Insulation Estimate
- Sheathing and Subfloor Estimate
- Painting Estimate
- Wood Floor Estimate

Lending, Saving and Leasing (00041-90086) *
- Constant Payment to Principal Loan
- Rule of 78's
- Amortization Schedule
- Add-On to APR With Odd Days
- Savings Plan (requires one memory module)
- Interest Conversions
- Lease With Additional Payments in Advance
- Skipped Payments
- Compounding Periods Different From Payment Periods
- Compound Interest Solutions (requires one memory module)

Real Estate (00041-90136) *
- Ellwood Income Valuation for Income Property
- Appraisal
- Wrap-Around Mortgage
- Amount of Equity at Any Time
- Mortgage Yield
- Mortgage Pricing
- Real Estate Investment Analysis for Property and Land
- Residential Analysis (Rent or Buy)
- Variable Analysis of Real Estate Investment
- Internal Rate of Return
- Income Property Analysis

Small Business (00041-90137)
- Payroll
- Invoicing
- Account Posting
- Tabulator
- Retail Inventory Monitor
- Estimating Inventory
- Inventory Ordering
- Order Point Calculation
- Working Capital Needs—Bardahl Formula
- Depreciation Schedules
- Break-Even Analysis

Computation

Geometry (00041-90084) *
- Sine Plate Solutions
- V Notches and Long Radii
- Internal and External Tapers
- Points of Tangency With Circles and Arcs
- Line-Line Intersection
- Points on a Straight Line
- Grid of Points: Calculate All Points
- Grid of Points: Calculate Discrete Points
- Tangent Circle to Two Straight Lines With a Given Radius
- Distance Between Lines in Space

High-Level Math (00041-90083) *
- Sine, Cosine, Exponential Integrals
- Eigenvalues/vectors of 3rd Order Systems
- Eigenvalues for 3rd Order Systems
- Chebyshev, Legendre, Hermite, and Laguerre Polynomials
- Sixteeen-Point Guassian Quadrature
- Gamma Function
- Bessel Functions, Error Function
- Characteristic Equation of 4 × 4 Matrix
- 4 × 4 Matrix Operations

Test Statistics (00041-90082) *
- One Sample Test Statistics for the Mean
- Test Statistics for the Correlation Coefficient
- Differences Among Proportions
- Behrens-Fisher Statistics
- Kruskal-Wallis Statistic
- Mean-Square Successive Difference
- The Run Test for Randomness
- Intraclass Correlation Coefficient
- Fisher's Exact Test for a 2 × 2 Contingency Table
- Bartlett's Chi-Square Statistic
- Mann-Whitney Statistic
- Kendall's Coefficient of Concordance

Engineering

Antennas (00041-90093)
- Loaded Vertical Antennas
- Loaded Dipole Antennas
- Gain of a Horizontal Rhombic Antenna at Zero Azimuth
- Azimuth Pattern of Cylindrical Array of Antennas
- Colinear Antenna Gain and Pattern
- Beam Pattern for Uniform Array
- Radar Antenna Beamwidth and Gain
- Antennas
- Parabolic Antenna Calculations
- RF Path Loss, dB
- Antenna Gain or Power of a Remote Transmitter
- Planar Phased Array Radar Beam Positions
- Shortwave Transmission Path Calculations

Chemical Engineering (00041-90100) *
- Straight Fin Efficiency
- Conservation of Energy
- Hydrocarbon Combustion
- Heat Transfer Through Composite Cynlinders and Walls
- Von Kármán Analogy for Heat and Mass Transfer
- Equations of State
- Reversible Polytropic Process for an Ideal Gas
- Conduit Flow
- Fluid Transport Numbers
- Single State Equilibrium Flash Calculation
- Weak Acid/Base Titration Curve

Civil Engineering (00041-90089) *
- Steel Column Formula
- Reinforced Concrete Beams
- Stress in Thick-Walled Cylinders
- Properties of Special Sections
- Compressive Buckling
- Vectors
- Beams Fixed at Both Ends
- Simply Supported Beams
- Cantilever Beams
- Bolt Torque

Control Systems (00041-90092) *
- Frequency Response of a Transfer Function
- Bode of Transfer Function that Has Each Pole and Zero Given
- Bode of Third-Order Over Fourth-Order Transfer Function
- Bode of Third-Order Over Third-Order Times s^n Transfer Function
- Routh Test for Continuous and Discrete Time System Stability
- Convert Frequency Response—Open Loop, Closed Loop
- Aid to Root Locus Plots I—Real Poles
- Aid to Root Locus Plots II—Complex Poles
- Classical Control Gains
- First Order Regulator
- Second Order Regulator

Electrical Engineering (00041-90088) *
- RC Timing
- Frequency Response of a Transfer Function
- Transistor Amplifier Performance
- Class A Transistor Amplifier Bias Optimization
- Active Filter Design
- Butterworth Filter Design
- Chebyshev Filter Design
- Bode Plot of Butterworth and Chebyshev Filters
- Transmission Line Calculations
- Transmission Line Impedance

Fluid Dynamcis and Hydraulics (00041-90139) *
- Conduit Flow
- Flow With a Free Surface
- Pipe Slide-Rule
- Forces at Bends and Fittings
- Valve Sizing
- Pipe Network Analysis
- Restriction Metering Orifice Calculations
- Energy Equation for Steady Flow
- Compressible Flow in Variable Area Ducts
- Flood Routing and Hydrographs

Heating, Ventilating & Air Conditioning (00041- 90140) *
- Overall Heat Transfer Coefficients
- Insulation Break Even Analysis
- Air Flow in Circular Ducts
- Air Duct Conversion
- Black Body Thermal Radiation
- Psychrometric Properties
- Heat Exchangers
- Decibel Addition and Subtraction
- Temperature Conversions

*** Translatable—for information regarding translated Solutions Books contact the Users' Library.**

Mechanical Engineering (00041-90090) *
- Gear Forces
- Stress on an Element
- Equations of State (also listed in Chem. Engr. Sol Bk.)
- Soderberg's Equation for Fatigue
- Spring Constant
- Progression of a Slider Crank
- Free Vibrations
- Interference Fits
- Linear or Angular Deformation
- Constant Acceleration

Solar Engineering (00041-90138) *
- Heat Transfer Through Composite Cylinders and Walls
- Conduit Flow
- Black Body Thermal Radiation
- Solar-Beam Irradiation
- Sun Altitude, Azimuth, Solar Pond Absorption
- Energy Equivalence—Fuels and Prices
- Solar Panel Array
- Heat Exchangers
- Economic Breakeven for Solar Equipment
- View Factor

Other

Calendars (00041-90145)
- Calendar Date/Julian Date Conversion
- Day of Year—Day of Week
- Number of Weekdays Between Two Dates
- In What Year is a Given Date an M-Day?
- Number of M-Days Between Two Dates, and the N^{th} M-Day of the Month
- Holidays
- Religious Holidays
- Chinese Years to/from Gregorian Years
- New Moon and Full Moon Day of Month
- Calendar Printout

Chemistry (00041-90102) *
- pH of Weak Acid/Base Solutions
- Acid-Base Equilibrium (Diprotic)
- Van der Waals Gas Law
- Beer's Law and Absorptivity Calculations
- Activity Coefficients from Potentiometric Data
- Crystallographic to Cartesian Coordinate Transformations
- Kinetics Using Lineweaver-Burk or Hofstee Plots
- Mixture Viscosities
- Equations of State
- Weak Acid/Base Titration Curve

Games (00041-90099) *
- Hexapawn
- Wari
- Hunt the Wumpus
- 3D Tic Tac Toe
- Planet Lander
- Orbital Lander
- Flip Flop
- Robot Trap
- Scatter
- Simon

Games II (00041-90443)
- Caves
- 5 × 5 Chess
- Pinball
- Truck
- Flipo
- Code Crack
- Adventure

Optometry I (00041-90143) *
- Aniseikonia
- Crossed Prism Resultant
- Oblique Cylinder Sums
- Acuity Demand from Letter Size and Working Distance
- Contact Lens/Telescope Calculations
- Needed Magnification, Add, and Working
- Distance
- Effective, Equivalent, and Neutralizing Power
- Positional Effective Power
- Pratt, Sheard, and Percival Methods of Near RX
- Four Accommodative RX's and Their Average

Optometry II (00041-90144) *
- Back Vertex Power of PMMA Contact Lens
- Effective Power of Spectacle Lenses at Corneal Plane
- Residual Cylinder Induced at Tear/Cornea Interface by Contact Lens
- Cylinder Induced by Toric Contact Lens
- Contact Lens Power Necessary to Correct Ametropia
- Toric Contact Lens Parameters
- Tabb Contact Lens of 1st Approximation
- May-Grant Contact Lens of 1st Approximation
- Roggenkamp Specifications for Prism Ballast Front Toric or Prism Ballast Contact Lens
- Brungart I & II

Physics (00041-90142) *
- Black Body Thermal Radiation
- Black Hole Characteristics
- Special Relativity Conversions
- Three-Dimensional Special Relativity
- Einstein's Twin Paradox
- Delta-V Orbit Simulator
- Equations of Motion
- Isotope Overlap Corrections
- Semi-Empirical Nuclear Mass Formula
- Clebsch-Gordon Coefficients and 3j Symbols Evaluation
- 32-P Remaining on MM.DDYYYY Given

Surveying (00041-90141)
- Spiral Curve Layout
- Two Instrument Radial Survey
- EDM Slope Reduction
- Stadia Reduction
- Three Wire Leveling
- Azimuth of the Sun
- Taping Reduction
- Triangle Solutions
- Traverse for Auto Adjust Routines

Time Module Solutions I (00041-90395)
- Appointment Calendar
- World Time Converter
- Exercise Monitor
- Automobile Trip Computer and Speed Calibration
- Four-Channel Controller
- Logbook
- "Playback" Programmable Timer
- *Random Seed Generator

Structural Design (cassette-based) † **(00041-90441)**
- Steel columns and beams
- Moment Magnification Factor for columns
- Biaxial concrete column analysis for rectangular columns
- Biaxial concrete column analysis for circular columns
- Concrete beams
- Masonry shearwall
- Tiltup concrete wall design for tiltup and cast-in-place slender walls
- Rigidity of concrete or masonry walls and piers
- Reinforcing bar development, required development for tension and compression
- Truss analysis by method of joints
- Appendix A—Tables
- Appendix B—Structural Design Directory
- Appendix C—Data File Contents

*** Translatable—for information regarding translated Solutions Books contact the Users' Library.**
† Cassette-based; does not include bar code.

Application Pacs

HP-41 Applications Pacs come complete with detailed manual and plug-in application module that increases the versatality of your HP Handheld Computer.

Aviation (00041-15018)
(For pre-flight use.)
- Flight Management
- General Aircraft Weight and Balance
- Flight Plan
- Determining In-Flight Winds
- Position by One or Two VORS
- Mach Number and True Airspeed

Circuit Analysis (00041-15006)
- General Network Analysis
- Ladder Network Analysis

Clinical Lab and Nuclear Medicine (00041-15024)
- Beer's Law
- Body Surface Area
- Creatinine Clearance
- Blood Acid-Base Status
- Oxygen Saturation and Content
- Red Cell Indices
- Total Blood Volume
- Thyroid Uptake
- Radioactive Decay Correction
- Radioimmunoassay
- Basic Statistics
- Chi-square Evaluation and Distribution
- t Statistics
- t Distribution

Financial Decisions (00041-15004)
- Compound Interest Solutions
- Internal Rate of Return
- Modified Internal Rate of Return (FMRR)
- Net Present Value
- Loan Amortization Schedules
- Depreciation Schedules
- Bond Price and Yield
- Days Between Dates

Games (00041-15022)
- Submarine Hunt
- Space War
- Super Bagels
- Hangman
- Pinball
- Craps
- Biorhythms
- Random Number Generator

Home Management (00041-15023)
- Home Budgeting
- Travel Expense Record
- Stock Portfolio Evaluation
- Checking Account Reconciliation

- Your Financial Calculator
- Accumulated Interest and Remaining Balance
- Home Owner's Equity Analysis
- The Rent or Buy Decision
- Tax Free Individual Retirement Account (IRA) or Keogh Planning
- The True Cost of an Insurance Policy

Machine Design (00041-15020)
- Circular Cams
- Generation of a Four Bar Linkage
- Progression of Four Bar System
- Progression of Slider Crank
- Gear Forces
- Standard External Involute Spur Gears
- Helical Spring Design
- Forced Oscillator with Arbitrary Function
- Coordinate Transformation
- Points on a Circle
- Circle by Three Points
- Unit Conversions

Mathematics (00041-15003)
- Matrix Operations
- Solution to f(x) = 0 on an Interval
- Polynomial Solutions/Evaluation
- Numerical Integration
- Differential Equations
- Fourier Series
- Complex Operations
- Hyberbolics
- Triangle Solutions
- Coordinate Transformations

Navigation (00041-15017)
- Great-Circle Course and Distance
- Great-Circle Position
- Rhumb-Line Course and Distance
- Rhumb-Line Position
- Great-Circle Plotting and Voyage Planning
- Dead Reckoning
- Sight Reduction
- Perpetual Almanac-Stars, Sun, Planets, Moon
- Almanac Interpolator
- Sight Reduction Table
- Calendar Functions
- Greenwich Sidereal Time
- Star Almanac
- Fundamental Arguments
- Astronomical Coordinate Conversion
- Longitude to Latitude
- Input/Output Routines

Petroleum Fluids Pac (00041-15039)
- Z Factor
- Gas Isothermal Compressibility
- Gas Formation Volume Factor
- Gas Viscosity
- Pseudocritical Temperature and Pressure From Gas Gravity
- Gas Properties From Composition
- Oil Isothermal Compressibility
- Oil Formation Volume Factor
- Oil Viscosity
- Gas-Oil Ratio
- Bubble Point Pressure
- Two-Phase Formation Volume Factor
- Water Isothermal Compressibility
- Water Formation Volume Factor
- Water Viscosity
- Gas-Water Ratio
- Rock Compressibility
- Total Isothermal Compressibility

Includes unit management systems subroutines.

Real Estate (00041-15016)
- Compound Interest and Loan Amortization
- Internal Rate of Return
- Modified Internal Rate of Return
- Net Present Value
- Depreciation Schedules
- Income Property Analysis
- Graduated Payment Mortgage
- Wrap-Around Mortgage
- Home Owner's Equity Analysis
- The Rent or Buy Decision
- Price and Yield of a Mortgage Traded at a Discount/Premium
- APR of a Loan With Fees
- Present Value of an Increasing/Decreasing Annuity

Securities (00041-15026)
- Bond/Note Price and Yield
- Routines for Option Writers Using the Black-Scholes Evaluation Method
- Warranty and Option Hedging
- Yield on Call Option Sales
- Butterfly Options
- Bull Spread Option Strategy
- Convertible Bond Investment Analysis
- Stock Portfolio Valuation
- Bond Speculation Using Margin
- Convertible Security Analysis

Standard Applications Module (00041-15001)
- RPN Primer
- Calendar Functions
- Word Guessing Game
- Arithmetic Teacher
- Hexadecimal-Decimal Converter
- Financial Calculations
- Root Finder
- Curve Fitting
- Vector Operations
- Blackjack

Statistics (00041-15002)
- Basic Statistics for Two Variables
- Moments, Skewness and Kurtosis
- Analysis of Variance (One Way)
- Analysis of Variance (Two Way)
- Analysis of Covariance (One Way)
- Curve Fitting (Linear, Exponential, Logarithmic and Power Curve)
- Multiple Linear Regression
- Polynomial Regression
- t Statistics
- Chi-Square Evaluation
- Contingency Table
- Spearman's Rank Correlation Coefficient
- Normal and Inverse Normal Distribution
- Chi-Square Distribution

Stress Analysis for Mechanical Engineers (00041-15027)
- Section Properties
- Beams
- Simply Supported Continuous Beams
- Columns
- Mohr Circle Analysis
- Strain Gage Data Reduction
- Soderberg's Equation for Fatigue
- RPN Vector Calculator

Structural Analysis for Civil Engineers (00041-15021)
- Section Properties
- Beams
- Simply Supported Continuous Beams
- Settling of Continuous Beams
- Continuous Frame Analysis
- Steel Column Formula
- RPN Vector Calculator
- Reinforced Concrete Beams
- Reinforced Concrete Columns
- Effective Moment of Inertia for Concrete Sections

Surveying (00041-15005)
- Traverse, Inverse and Sideshots
- Compass Rule Adjustment
- Transit Rule Adjustment
- Intersections
- Curve Solutions
- Horizontal Curve Layout
- Vertical Curves and Grades
- Resection
- Predetermined Area
- Volume by Average End Area
- Volume of a Borrow Pit
- Coordinate Transformation

Thermal and Transport Science (00041-15019)
- Equations of State
- Polytropic Processes for Ideal Gas
- Isentropic Flow for Ideal Gases
- Conduit Flow
- Energy Equation for Steady Flow
- Heat Exchangers
- Black Body Thermal Radiation

Includes unit management system subroutines.

Contact your local dealer for pricing information and product availabilty. For the name of the dealer nearest you, call toll free: (800)367-4772.

HP-71

Solutions Books

HP-71 Solutions Books provide complete step-by-step keystroke listings to help provide you with answers to your general or specific problems.

Games (00071-90065)
- Code Crack
- Craps
- Hangman
- Blackjack
- Hamurabi
- Space War

Utilities (00071-90066)
- General System Utilities
- Time and Date Utilities
- Conversion Utilities
- HP-IL Utilities
- Variable Cross Reference
- System Catalog

Math (00071-90064)
- Vector Operations
- Numerical Integration
- Solution to F(x) = 0 on an Interval
- Matrix Operations
- Fast Fourier Transform
- Polynomial Solutions

Software Developers' Handbook (00071-90097) *

The Software Developers' Handbook includes the following routines & Lex files for those interested in developing software. (Price includes media; please specify media type).

- User Environment Preservation
- Input Routines
- Output Routines
- Internal Calculations
- HPAF File Standard
- String Functions
- Graphics
- Forth Utilities

***Contact the Users' Library for ordering information.**

Application Pacs

HP-71 Applications Pacs come complete with detailed manual and plug-in application module that increases the versatility of your HP-71 Handheld Computer.

AC Steady State Circuit Analysis (82481A)
- Construct and analyze circuit models using:
  - Resistors
  - Capacitors
  - Inductors
  - Transmission lines
  - Voltage controlled current sources
  - Open or shorted stubs
- Print or display AC voltage gain, phase and group delay at any node in circuit at any frequency using linear or logarithmic frequency instruments
- Simulate and analyze circuits such as:
  - Passive filters
  - Active filters
  - Operational amplifiers
  - Transistor amplifiers
- Solve a circuit with up to 72 branches and 24 nodes (three memory modules required)

Surveying (82483A)
- File management routines:
  - Assign
  - List coordinates
  - Clear coordinates
  - Duplicate points
  - Balance traverse and adjustment
  - Rotate points
  - Translate points
  - Scale coordinates
- Coordinate geometry routines:
  - Start
  - Lines
  - Curves
  - Radial stakeout
  - Area/traverse computations
- Store up to 550 points without additional memory

Text Editor (82485A)
- Format text output:
  - Text input and output
  - Fill and justify lines
  - Copy and center lines
  - Test for end of page
  - Start paragraphs
  - Set margins
  - Page length
  - Line spacing
  - Skipping lines
  - Page number
  - Merge files
  - Use distribution list

Curve Fitting (82484A)
- Fit a general (and possibly non-linear) model function with up to 20 unknowns
- Determine local minima or maxima to a general real valued function with up to 20 variables
- Matrix editor
- Built-in library of 84 possible model functions:
  - 46 general models
  - Polynomials up to degree 19
  - Linear models up to order 19
- Direct-execution menus
- Call user-written model and provide gradient approximation automatically

Finance (82482A)
- Time value of money calculations:
  - n, i, PV, PMT, FV
- Uneven cash flow analysis:
  - NPV, IRR
- Amortization schedules
- Depreciation:
  - ACRS
  - Straight line
  - Declining balance
  - Sum-of-year digits
- HELP file

Math (82480A)
- Real and complex math operations:
  - Inversion
  - System solution
  - Transpose
  - Conjugate transpose
  - Determinant
  - Arithmetic
  - Norms
  - Inner product
- Numeric functions:
  - Hyperbolics and inverses
  - GAMMA function

IEEE NEIGHBOR
Scaling functions
- Base conversions:
  Binary, octal, decimal, hexadecimal
- Implicit and explicit redimensioning of arrays
- Solve
- Integrate
- Finite Fourier Transform

Data Communications (82488A)
- Send incoming and outgoing data to HP-71 LCD, printer, and/or video interface
- Transfer text files to host computer
- Store incoming data into a text file
- 500 character input buffer
- Code-word creating capability
- Command files
- Access most operations with a single key

HP-41 Translator (82490A)
- Run thousands of HP-41 programs on the HP-71
- RPN calculator capability on HP-71
- Emulator system with 147 HP-41 functions built in
- HP-71 Text Editor program
- TRANS41 translating program
- READ41 for automatic program transfer
- KEYS41 key file
- 13 BASIC keywords for access to FORTH and HP-41 systems, and HP-71 text files
- Built-in 71 FORTH language system

AMPI Statistics (82489A)
- Means and Moments
- Histogram
- Multiple Linear Regression
- Paired t-Test
- Unpaired t-Test
- One-way ANOVA
- Two-way ANOVA
- Contingency Table
- Mann-Whitney U Test
- Kruskul-Wallis Test
- Student's t-Distribution
- F-Distribution
- Chi-Square Distribution
- Normal Distribution
- Weibull-Distribution
- Exponential Distribution
- Binomial Distribution
- Poisson Distribution

FORTH/Assembler ROM (82441A)
- Enhances FORTH 1983 Standard
- Provides Assembler
- Includes Text Editor
- Contains KEYBOARD IS

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HP-75
Software

B000 Applied Sciences

Assembler for 8080 and Other Microprocessors 00119

B200 Computer Science

Assembler for 8080 and Other Microprocessors 00119

Autoloop 00104

Cassette Tape Analysis and Catalog 00156

Computer Science Calculator 03383

Find 00196

Formatting Jigs ".LETHEAD" and "LETWRITE" 00131

Input/Output Via a 2382A Terminal 00202

Logical Mapping For Digital Circuits 00123

RPN Caluculator Emulator 00092

B204 Base Conversions and Arithmetic

Computer Science Calculator 03383

B208 Input/Output Applications

CAT$ Function For Cassette (TCAT$) 00129

Compare Files Utility 03312

Input-Output Applications 00136

PLOTROM-8K Plug-In Rom Equivalent To 85 Printer/Plotter Rom 03371

Printing on the HP 82143 Printer 00157

Prtplot 03310

RIO/WIO 00100

Sysgen 00113

Termcom 03370

Terminal Emulator 00168

B209 Utilities

Polyplot-A polynomial Plotting Program for HP-75/HP 2225B 03463

D050 Accounting

Fuel Efficiency, Performance and Maintenance Monitor 00120

D054 Payroll Accounting

Bills and Coins For Payrolls 00204

D150 Forecasting/Planning

Program Evaluation and Review Technique (PERT) 00093

D450 Lending/Savings

Net Present Value/Internal Rate of Return/Duration for Inv 00169

F000 Diversions

Address 00089

Electronic Keyboard 00095

F100 Games

Fox and Hounds 00145

Opening Bridge Bids 00130

Star Fleet Wars 00141

Star Trek 75 00146

The Game of Nim 03367

F102 Board and Table Games

Bingo 00090

Cribbage Hand Counter 03307

Gomoku 00149

Hex Board Plotter 00178

Penny Slide Game 00182

F106 Word and Number Games

Animals 03226

Mastermind: Numbers 00105

F106 Word and Number Games-Con't

Word Mastermind 00102

Word Search Puzzles 00150

F200 Hobbies

Automotive Engine Calculations 00135

Substitution Cryptogram Solution Aid 03352

F204 Amateur Radio

Code Oscillator 00101

F206 Biorythms

Biorhythm Plot 00114

H000 Educational (Programs that teach)

Animals 03226

Arithmetic Game For Children 00127

Einstein Distortions 00151

J000 Engineering

Design of Concrete Mixes 03382

Electric and Potential Field Caused by Charged Circular Ring 00193

Oscilloscope 00116

Settling Velocity 03430

J050 Aeronautical/Aerospace Engineering

Geometric Design For Supersonic Ramjet Engines 00177

J254 Process Control

Drain Orifice Used as a Steam Trap 00142

Flow Measurements With Nozzle and Venturi Tubes 00161

Flow Measurements With Pipe Elbow Taps 00191

Flow Measurements With Quadrant-Edge Orifice 00159

Flow Measurements With Restriction Devices 00158

Print/Record/Recall Data for Flow Measure with Restriction 00162

Rectangular Venturi Tubes 00173

Segmental Orifice 00190

Settling Velocity 03430

Throttling Orifices 00160

J300 Civil Engineering

Design of Concrete Mixes 03382

Pricing of Forms For Reinforced Concrete Members 00181

J302 Environmental Engineering

Flow Measurements With Pipe Elbow Taps 00191

J304 Hydraulics

Segmental Orifice 00190

J306 Soil Mechanics

BISHOP-Simplified Bishop Analysis for Mohr Coulomb Materials 00132

JANBU-Simple Janbu Analysis for Mohr Coulomb Materials 00134

Sarma Non-Vertical Slice Method of Slope Stability Analysis 00198

Sarma Non-Vertical Slice Method of Stability Analysis 00108

Slope Stability Analysis - Planar Failure (PLNF) 03225

J308 Structural Engineering

"UL2CON"/Concrete Column, Biaxial Bending 00153

Cantilevel Under Concentrated or Distributed Load 00194

General Beam Analysis 00124

Interaction Diagram for Reinforced Concrete Sections 00147

J308 Structural Engineering-Con't

MODE 03380

Maxima Positive and Negative Moments Under Moving Loads 00189

Piles Group Calculation 00195

Unifilar Statically Indeterminate Structures 00111

J350 Drafting/Design

Intersection and Developments of a Cone and Cylinder 00128

J360 Electrical/Electronic Engineering

Analysis of a Balanced Polyphase Induction Motor 00143

Numerical Inversion of the Laplace Transform 00188

Programmable Controller Simulator 00118

J364 Circuits

Algebra of Complex Numbers 00140

Analysis of Current and Voltage Dividers 00144

Interpretation of EE Units 00139

Logical Mapping For Digital Circuits 00123

J366 Computers

Computer Science Calculator 03383

J370 Fields and Waves

Electric and Potential Field Caused by Charged Circular Ring 00193

J372 Transmission Lines

Transmission Lines: Short Lines Calculations 03313

J400 Energy Conservation and Management

Fuel Efficiency, Performance and Maintenance Monitor 00120

J500 Geotechnical Engineering

BISHOP-Simplified Bishop Analysis for Mohr Coulomb Materials 00132

HP-41 Cassette Data File Operations 00167

JANBU-Simple Janbu Analysis for Mohr Coulomb Materials 00134

Slope Stability Analysis - Planar Failure (PLNF) 03225

J552 Operations Research

Fuel Efficiency, Performance and Maintenance Monitor 00120

J600 Mechanical Engineering

Spring 03462

J604 Design and Analysis

Spring 03462

J610 Fluid Dynamics

Flow Measurements With Pipe Elbow Taps 00191

Pressure Drop and Velocity In Single-Phase & Two-Phase Flow 00174

Segmental Orifice 00190

L050 Complex Variables

Complex RPN Calculator 00164

L100 Conversions

Computer Science Calculator 03383

L200 Extended Precision

Double Precision Math Routine 00117

L250 Integration

Runge-Kutta Error Control Integration For N Simult Diff Eqs 00166

L300 Interpolation

Fitline 03432

L302 Approximation
Fitline 03432
Multiple Linear Regressions 00170
Multiple Power Regressions 00176
Regressions 00171

L350 Linear Systems/Matrices
Determinant 00185
Linear Equations With Positive-Definite Symmetric Matrix 00165
Linear Equations With Positive-Definite Symmetric Matrix 00201
Matrix Inversion 00197

L352 Simultaneous Equations
Overdetermined System 00163
Simultaneous Non-Linear Equations (Broyden's Method) 00200
System of Equations Program, Regarded as a Subroutine Prgm 00155

L400 Number Theory
Euler Phi Function 00205

L450 Polynomials
Closed Form Solutions of Polynomial Equations of Order 3 00184
Polyplot-A polynomial Plotting Program for HP-75/HP 2225B 03463
Solving 4th, 3rd, and 2nd Degree Equations 00154

L602 Algebra
Logical Mapping For Digital Circuits 00123

L650 Trigonometry/Analytic Geometry
Area and Perimeter of Polygon 00175
Especial Curve Fitting Minimum RAM Requirement:2152 00148

P000 Misc. Technical Applications

Oscilloscope 00116

P202 Date/Calendar
CALPT - Calendar Printout (82950B) 00121
CALPT/CALPRT-Calendar printout for the 82905B or 82162A 00133

P300 Marine Navigation
LORAN-C Position Determination 00109
Navigation 00186

P304 Yachting
LORAN-C Position Determination 00109

P500 Special Information Applications
HELP 00180
IO Communications With LIF1 Files on Cassette 00110
PCF/FMT75/ADDENV-Personal Card File 03340
PEEK*POKE 00179
PLOTROM-8K Plug-In Rom Equivalent To 85 Printer/Plotter Rom 03371
Termcom 03370

P502 Data Bases/Files (non-programs)
PCF/FMT75/ADDENV-Personal Card File 03340

P600 Subroutine Packages
Multiple Sorting Routines 00192
PCF/FMT75/ADDENV-Personal Card File 03340
Template and Create 03431
Video Monitor Cursor Control, Text-Writing, and Box Routines 00152

R000 Probability and Statistics

Frequency Distribution with Bar Chart 00183

R100 Analysis of Variance
Triple Lattice Analysis of Variance 03227

R200 Curve Fit/Regression/Correlation
37 Curve Fit 00112
Fitline 03432
Multi-Function Curvefit 00203
Polynomial Curvefit 00137

R700 Probability Distribution
Noncentral & Central F & Beta Distributions & Their Inverses 00122

R800 Quality Assurance/Reliability
Concrete Statistical Analysis (CNSTS) 00115

T200 Astronomy
Astronomical Coordinate Conversions 00126
Computes on Moon (name: MOON3) 00187
Sunrise/Sunset, Azimuth and Time Noon 00125

T400 Chemistry
Atomic Weight Table 00103

T440 Chromatography
McReynolds and Kovats Indices 03338

T900 Physics
Quantum Wave 00138

T920 Nuclear and Atomic Physics
Atomic Weight Table 00103
Calculate Atomic Decay 03311

Aberle, S.R. 00101

Ann, A.L.W. 00194 03313

Bennett, R.A. 00154 00177 00204 00181

Brengman, F.E. 00202 03311 03310

Brundage, T. 00093

Chipman, J.S. 00122 00136

Comstock, J.M. 03462 03380

Delange, A.J. 00156

Dinsmore, C.I. 00153 00124

Dixon, D.E. 00115

Dombroske, G.G. 00114

Donnelly, J. 00103

Duffin, M.T. 00169

Dyar, T.G. 00120

Eitelman, J.W. 00112

Esposito, A.G. 00123

Ferman, J.W. 03432

Fluhr, F.R. 00188

Fortner, G.L. 00118

Gilby, J.L. 00134 00132 00133 00198 00121 03340

Ginsburg, S. 00184 00165 00201 00147 00185

Guard, F.L. 00130

Heiss, P. 00163 00158 03227 00142 00160 00162 00159 00161

Helou, A. 03382

Henry, P.S. 00102

Herlocker Jr, J. F. 00141

Hoek, E.D. 00108 00198

Hornberger, M.J. 00089 00129

Keefe, E.M. 00145 00146

Kokol, P. 00182

Marchand, J.L. 00183

McCord, C. 00139 00143 00140 00150 00144 00149 00151

McGinty, C. 00135

Mock, W.I. 00116

Monedero, J.G. 03431

Mourao, P.d.S. 00189 00193 00148 00155 00111 00195 00197 00138

Myland, J. 00117

Oldham, K. 00117

Pearce, G.F. 00128

Pearson, D.L.D. 00127 00126

Piccardi, S. 00196 03226 00157

Pinnick, W. 03338 03463

Rojas, L. 00203 00166 00137

Romano, I. 00191 00190 00174 00171 00176 00173 00170 00175 00186 00192 00187 03430

Saul, K. 03383

Shudde, R.H. 00109

Stearns, J. 00092

Sutton, J. 00113

Swadener, P. 00090

Swanson, R.E. 00152

Thomas, S.J. 00205 03312

Thurmond, R. 00119

Tyhurst, T.R. 03307 03367 03352 00200 00164

Users' Library 00100 00179 00168 00104 00180 00167

Valier, L. 00125

Vivequin, P. 00131 00110

Walen, J. 00178

Wilgress, C. 00105

Wyllie, D. 03225

00089 Address

by M.J. Hornberger, Corvallis, OR

Creates an address file that allows the insertion and deletion of names, and alphabetizes automatically. Prints names three across, for printing labels. **Necessary Accessories for HP-75:** None, but printer helpful

Steps: HP-75 Bytes: 2500

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00089-75-1	$10	$14

00090 Bingo

by P. Swadener, Corvallis, OR

This program prints BINGO cards for players, calls BINGO games, and checks player's cards with the master card. The program is designed to run with or without a printer (but a printer is required to print cards). The 24 column printer is assumed, but the program will also work with the 80 column printer. **Necessary Accessories for HP-75:** None, but printer helpful

Steps: HP-75 Bytes: 16K

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00090-75-9	$10	$14

00092 RPN Caluculator Emulator

by J. Stearns, Corvallis, OR

RPNCALC is a BASIC program that emulates an RPN scientific calculator. The calculator contains the following functions: stack manipulations; clearing operations; various display modes; storage registers; register arithmetic; arithmetic operations; trig, exponential, and percent functions; factorial, pi, permutations, and combinations. It is not programmable and does not contain statistic functions. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 6000

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00092-75-5	$10	$20

00093 Program Evaluation end Review Technique (PERT)

by T. Brundage, Corvallis, OR

PERT is an example of a network model used for planning and controlling projects with well-defined activities and events. This program will handle a network of up to 100 nodes. The nodes may be data files (in BASIC) for input and editing purposes. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 10787

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00093-75-3	$10	$18

00100 RIO/WIO

by Users' Library, , Corvallis, OR

The LEX file RIOWIO allows you to directly reed and write to the HP-IL IC in the HP-75. By directly reading and writing to the registers in the HP-IL IC, you can have greater control of the HP-IL operations, you can simulate an arbitrary device, or you can practice writing the essembler code to the HP-IL IC without worrying about all the details of driving a processor. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 000117

	Order Progrem No.	Documentation Only	Documentation W/Media
FOR HP-75	00100-75-6	N/A	$20

00101 Code Oscillator

by S.R. Aberle, Sunnyvale, CA

This program simulates a code oscillator and can be used to assist in the learning of International Morse Code. Text, entered from the keyboard or read from a text file, is translated directly into code. Random code generation of word groups is also available, and the random code can optionally ba seved in e text file. The sending speed is adjustable from less than five to well over twenty words per minute. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 9K

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00101-75-4	$10	$14

00102 Word Mastermind

by P.S. Henry, Berkeley, CA

Word Mastermind is a game similiar to regular Mastermind except played with words. A word is chosen, either by a player or from a randomly accessed file. The player then tries to guess the word based on clues; A black peg- indicates that a letter in the guess is correct, and in the correct location. A white peg- indicates that a letter in the guess is correct, but in the wrong location. **Necessary Accessories for HP-75:** None; printer optional.

Steps: HP-75 Bytes: 002954

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00102-75-2	$10	$14

00103 Atomic Weight Table

by J. Donnelly, Corvallis, OR

This LEX file provides a function for use in calculations and programs which returns the atomic weight for each of the 103 elements found in a typical periodic table of the elements. **Necessary Accessories for HP-75:** None.

Steps: HP-75 Bytes: 001327

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00103-75-0	$10	$14

00104 Autoloop

by Users' Library, , Corvallis, OR

This program greatly simplifies the process of assigning peripheral devices. All you have to do is turn on the HP-75. **Necessary Accessories for HP-75:** None

Steps: 646 HP-75 Bytes: 4879

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00104-75-8	$10	$18

00105 Mastermind: Numbers

by C. Wilgress, Ottawa, Canada

This program is a computerized version of MasterMind yet the colors have been replaced by numbers (from 1 to 6). The user has eight chances to guess the hidden number, chosen by the computer. He may also input a 'g' for give up if he cannot do so. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 2139

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00105-75-5	$10	$14

00108 Sarma Non-Vertical Slice Method of Stability Analysis

by E.D. Hoek, Vancouver, Canada

This analysis is a very powerful general method of limit equilibrium analysis which can be used to determine the factor of safety against sliding of soil or rock slopes of a variety of shapes. Circular, non-circular or active-passive wedge failure mechanisms can be analysed and a unique feature of the method is that the non-vertical slice boundaries allow the incorporation of specific structural featuras such es faults or bedding surfaces. An improved iteration technique is included in this revised version of the program. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 12319

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00108-75-9	$10	$20

00109 LORAN-C Position Determination

by R.H. Shudde, Carmel, CA

This program will provide a latitude and longitude position determination from LORAN-C Stations. Additional options include indicated time delay prediction, calibration and computation of the geodesic (spheroid earth) heading and distance between two locations. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 12657

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00109-75-7	$10	$22

00110 IO Communications With LIF1 Files on Cassette

by P. Vivequin, Wellington, New Zealand

These two programs (one each for the HP-41 and HP-75) provides a quick method of transfering the contents of a block of registers resident in the HP-41 main memory or the contents of a BASIC data file in HP-75 memory, to a LIF1 file on the 82161A Digital Cassette Drive. Data transfer routines in each program allow both read and write capabilities for immediate processing of data. **Necessary Accessories for HP-75:** Digital Cassette Drive 82161A

Steps: HP-75 Bytes: 0534

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00110-75-5	$10	$12

00111 Unifilar Statically Indeterminate Structures

by P.d.S. Mourao, Belo Horizonte, Brasil

Treats unifilar, one span structures, statically indaterminate, finding reactions and at desired point normal force, shear force, and moment. **Necessary Accessories for HP-75:** None

Steps: 235 HP-75 Bytes: 10083

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00111-75-3	$10	$24

00112 37 Curve Fit

by J.W. Eitelman, Kokomo, IN

This program will find the bast fitting equation, constants, and coefficients of fit thet represents the entered X and Y data. It chooses from a list of 37 curves consisting of polynomials to the third degree, roots, power, geometric, logarithmic, exponential, and distributions. It will also fit any selected curve and provides an easy method of viewing the results. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 9560

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00112-75-1	$10	$24

00113 Sysgen

by J. Sutton, Philadelphia, PA

This program creates a program capable of generating automatic I/O assignments regardless of device(s) physical position on the loop. Also, not all devices supported need be present every time. SYSGEN is user-friendly and requires a minimal HPIL knowledge. The created program is automatic and requires no user intervention. **Necessary Accessories for HP-75:** HPIO Utilities (00075-12022)

Steps: HP-75 Bytes: 6K

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00113-75-9	$10	$20

00114 Biorhythm Plot

by G.G. Dombroske, Rosemead, CA

Bioplot is a simultaneous plotting program for use with the HP82162A Thermal Printer which plots the Intellectual, Emotional and Physical Biorythm cycles for a specified number of months, given the user's birthdate, the desired starting date and the number of months to be plotted. **Necessary Accessories for HP-75:** HP82162A Thermal Printer

Steps: HP-75 Bytes: 1891

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00114-75-7	$10	$14

00115 Concrete Statisticel Analysis (CNSTS)

by D.E. Dixon, Liburn, GA

This program (CNSTS) creates a data file, allows for checking and correcting this file, and, using the data, computes statistical parameters. The program is designed after requirements given in the American Concrete Institute (ACI) Building Code (ACI 318) and allows the engineer to evaluate the quality of the concrete for a given project along with its variability and probability of being unacceptable or not meeting the ACI criteria. **Necessary Accessories for HP-75:** 82162A Thermal Printer

Steps: HP-75 Bytes: 6450

	Order Program No.	Documentation Only	Documentation W/Cards
FOR HP-75	00115-75-4	$10	$20

00116 Oscilloscope

by W.I. Mock, Bellingham, WA

Oscilloscope is a program which computes and displays information for the user who utilizes the B&K Oscilloscope for measuring waveforms in electronic equipment. The program could also be used as a training aid in the use of oscilloscopes. The program applies to any of the B&K Oscilloscopes which use 19 Sweep time/CM switch settings and 11 Volts/CM switch settings of the 1-2-5 configuration, but could be modified to apply to other oscilloscopes as well. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 7774

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00116-75-2	$10	$22

00117 Double Precision Math Routine

by J. Myland, Peterborough, Canada
K. Oldham, Peterborough, Canada

This program is used to add, subtract, multiply, divide and extract square roots in double-precision. It can stand alone and accept numbers of up to 24 digits as keyboard inputs. Alternatively it can be merged with a user program and called as a subroutine to operate from the user's program. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 4312

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00117-75-0	$10	$24

00116 Programmable Controller Simulator

by G.L. Fortner, Beaverton, OR

This program simulates an industrial type programmable controller and permits the testing of motor and equipment control logic written in a boolean algebra format. The program is formatted for 50 lines of boolean logic and 100 I/O addresses. The program offers on delay and off delay timers, coils, latching coils, maintained contacts, momentary contacts, and a key file to simplify writing boolean equations. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 7969

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00118-75-8	$10	$20

00119 Assembler for 8080 and Other Microprocessors

by R. Thurmond, Whittier, CA

Translates 8080 Assembly Language (mnemonics) into Machine Language (op-codes). Easily modified to handle other microprocessors. Allows chaining of source files for programs of arbitrary length. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 8676

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00119-75-6	$10	$26

00120 Fuel Efficiency, Performance and Maintenance Monitor

by T.G. Dyar, West Hartford, CT

Inputs are date, odometer reading and gallons at each fill-up. Outputs are fill-up MPG, a seasonally weighted pseudo-moving average MPG, a poor performance warning when appropriate and an estimate of the next fill-up odometer reading. A maintenance reminder is also generated when either its scheduled date or odometer reading is reached. Program algorithms automatically adapt to each vehicle's fill-up pattern and tank size. **Necessary Accessories for HP-75:** None, but extra blank lines that do not effect the 75C display are included to optimize video and printer output.

Steps: HP-75 Bytes: 1466

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00120-75-4	$10	$12

00121 CALPT - Calendar Printout (82905B)

by J.L. Gilby, Vancouver, Canada

This program gives any number of printouts of a calendar for eny year between 1900 and 2099 using the 82905B Impact printer. **Necessary Accessories for HP-75:** 82905B Impact Printer

Steps: HP-75 Bytes: 3351

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00121-75-2	$10	$12

00122 Noncentral & Central F & Beta Distributions & Their Inverses

by J.S. Chipman, Minneapolis, MN

Computes values and critical points of noncentral (and central) F and Beta distributions. Organized into two calling and five called subroutines, incuding a root-finder and subroutines computing the complete and incomplete Beta function. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 5234

	Order Progrem No.	Documentation Only	W/Cards
FOR HP-75	00122-75-0	$10	$22

00123 Logical Mapping For Digital Circuits

by A.G. Esposito, Coram, NY

This program produces Karnaugh maps for a digital circuit the user inputs by defining all circuit elements by using circuit nodes as their inputs and outputs. Elements permitted are 2-input gates, latches, counters, and flip flops. Up to 13 elements may be used though they may represent more or less, but circuits as in node bit streams and their arguments may be stored to permit the user to create a Library of circuit modules. **Necessary Accessories for HP-75:** Printer or Video interfacing most helpful

Steps: HP-75 Bytes: 13995

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00123-75-8	$10	$28

00124 General Beam Analysis

by C.I. Dinsmore, Seattle, WA

This program will do an elastic analysis of single span or multiple span beams. Using the 75C data file creation feature, data files for each span are created to store the geometry and losds, this allows the program to store the solved moments at the supports of the continuous beam. With the data in the file any span may be analyzed for shear, moment, slope and deflection. **Necessary Accessories for HP-75:** Printer, and video optional.

Steps: HP-75 Bytes: 13897

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00124-75-6	$10	$16

00125 Sunrise/Sunset, Azimuth and Time Noon

by L. Valier, Honolulu, HI

This program finds the local times of Sunrise/Set and Azmith of the Sun at these times. Also finds time of noon (when sun on the meridian). It uses a Long Term Almanac for the Sun developed by HP for the HP 67/97 and is similar to my program #4039D in RPN for the HP 67/97. It would be useful at archeological sites to test if any structures line up with positions on horizon of Sunrise/Set. **Necessary Accessories for HP-75:** Printer and monitor optional

Steps: HP-75 Bytes: 1676

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00125-75-3	$10	$12

00126 Astronomical Coordinate Conversiona

by D.L.D. Pearson, Pueblo, CO

Easily and quickly convert between equatorial and altitude-azimuth coordinate systems. Any latitude and longitude. User supplied default values for latitude and longitude and machine supplied time and data values speed routine conversions. Any date from 1974 through 2000. Provision for the user to easily alter program for detes outside this renge. Also computes local mean sidereal time. A must for Dobsonian telescope users. Very user friandly. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 6406

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00126-75-1	$10	$20

00127 Arithmetic Game For Children

by D.L.D. Pearson, Pueblo, CO

This program generates random problems, ten to a game. Problems can be addition, subtraction, multiplication, or a combination of all three. Three difficulty levels accomodate ages 5 to adult. Simple graphics, sounds and appropriate random messages in response to user answers. Interesting scoring system. Parsing display subroutine useful in many programming applications. Game improves arithmetic speed and accuracy. Educational and fun and helps children learn to communicate with a computer. Fun for adults too. **Necessary Accessories for HP-75:** Video interface with monitor or television

Steps: HP-75 Bytes: 13520

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00127-75-9	$10	$30

00128 Intersection and Developments of a Cone and Cylinder

by G.F. Pearce, Waterloo, CANADA

A frequently occurring problem in engineering graphics is to determine the intersection of a cone and cylinder. Applications exist in heating, ventilating and air-conditioning systems and in the process industries. This program solves this problem for any right circular cone completely intersected by a horizontal cylinder of any radius. Three output options are available in this computer aided design (CAD). Option 1 is an engineering drawing. Option 2 is an engineering drawing plus a table of coordinates. Option 3 is a numerical display of the coordinates. **Necessary Accessories for HP-75:** None but an HP 7470A Option 003 Plotter is required for the Engineering drawing and a printer would be convenient for the numerical output.

Steps: HP-75 Bytes: 2751

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00128-75-7	$10	$18

00129 CAT$ Function For Caasette (TCAT$)

by M.J. Hornberger, Corvallis, OR
R. Young, Corvallis, OR

This LEX file gives the user the TCAT$ function, which does CAT$ of cassette files. The user specifies the device name and number of file wanted, and the function returns the catalog listing for that file. If no catalog entry exists for the number given, the null string is returned. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** HP 82181A Digital Cassette Drive

Steps: HP-75 Bytes: 250

	Order Program No.	Documentation Only	W/Media
FOR HP-75	00129-75-5	N/A	$20

00130 Opening Bridge Bids

by F.L. Guard, Los Altos, CA

This program tests the player's skill in determining opening bids based on the Standard American Bidding System. The program generates and displays a random bridge hand and determinas the correct opening bid. If the player's input bid is correct the process is repeated; if not, the player is given additional chances to input the correct bid. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 5190

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00130-75-3	$10	$16

00131 Formatting Jigs ".LETHEAD" and "LETWRITE"

by P. Vivequin, Wellington, New Zealend

A combination of two programs: the first produces formatted letterhead files, automatically generating escape sequences for various print modes, centering address lines, left and right justifying such info as phone numbers, etc. The second program constitutes a "letter-writing JIG", formatting letters on the letterheads produced by the first program. As a "bonus", a third program is also included to format program listings. **Necessary Accessories for HP-75:** 00075-15019 Text Formatter ROM, and HP 82905B Printer

Steps: HP-75 Bytes: 1588

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00131-75-1	$10	$16

00132 BISHOP-Simplified Bishop Analysis for Mohr Coulomb Materials

by J.L. Gilby, Vancouver, Canada

This program uses Bishop's simplified method of slices solution for the calculation of the factor of safety of a slope in which failure follows a circular path. The program is designed to be used with the basic HP-75C, however, two routines have been included to print input/output data to either the 82162A Thermal Printer or 82905B Impact Printer using the MERGE function. **Necessary Accessories for HP-75:** None; HP-82162A or HP-82905B Printer optional.

Steps: HP-75 Bytes: 1932

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00132-75-9	$10	$14

00133 CALPT/CALPRT-Calendar printout for the 82905B or 82162A

by J.L. Gilby, Vancouver, Canada

These two programs give neat printouts of calendars for any year between 1900 and 2099 using either the 82905B Impact Printer (CALPT) or the 82162A Thermal Printer (CALPRT). **Necessary Accessories for HP-75:** Either the 82905B Impact Printer or 82162A Thermal Printer.

Steps: HP-75 Bytes: 3351

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00133-75-7	$10	$14

00134 JANBU-Simple Janbu Analysis for Mohr Coulomb Materials

by J.L. Gilby, Vancouver, Canada

This program uses Janbu's simple solution for the calculation of the factor of safety of a slope in which failure follows a non-circular path. The program is designed to be used with the basic HP-75C. However, two routines have been included to print input/output data to either the 82162A Thermal Printer or the 82905B Impact Printer using the MERGE function. **Necessary Accessories for HP-75:** None; HP 82162A or HP 82905B printers optional.

Steps: HP-75 Bytes: 1928

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00134-75-5	$10	$14

00135 Automotive Engine Calculations

by C. McGinty, Coeur d'Alene, ID

Program calculates engine parameters dealing with displacement, port size, # cylinders, airflow, valve lift and clearance volumes and their effect on gas speeds, piston speeds and compression ratio. Calculations are presented in menu form end prompted inputs. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 4229

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00135-75-2	$10	$14

00136 Input-Output Applications

by J.S. Chipman, Minneapolis, MN

Many data manipulations, especially plotting, can be done just as or more easily with the HP-41 as with the HP-75. This program codes and transfers a data file in the HP-75 into an HP-41 data file on cassette drive. This file can then be read into the HP-41's memory by the [READR] or [READRX] function. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC. **Necessary Accessories for HP-75:** HP 82161A Digital Cassette Drive, HP-75 I/O Utilities LEX file

Steps: HP-75 Bytes: 7825

	Order Program No.	Documentation Only	W/Media
FOR HP-75	00136-75-0	N/A	$20

00137 Polynomial Curvefit

by L. Rojas, Canoga Park, CA

Computes the polynomial curvefit coefficients for input data, ie: Xi and Yi. The data may be typed in via the program or pre-typed in a file that the program may retrieve. The polynomial curvefit order is limited to memory capacity and desired accuracy. A large order may have large run-off errors. The order is also limited to N-1 data set input. **Necessary Accessories for HP-75:** None

Steps: 680 HP-75 Bytes: 4560

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00137-75-8	$10	$14

00138 Quantum Wave

by P.d.S. Mourao, Belo Horizonte, Brasil

In quantum physics domain, develops Schroedinger's eigenfunctions in sequence by electronic integration, monitoring the execution in such a way that determines, if existent, the discrete value of relative particle energy between two input limits, in a step potential region. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 3128

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00138-75-6	$10	$14

00139 Interpretation of EE Units

by C. McCord, Corvallis, OR

This program provides practice in the selection of powers of ten in scientific notation. Initial values of inductance and capacitance are generated, and tha user must then answer questions about a series resonant circuit with these components. The problems are selected so that all answers are simple powers of ten, and the emphasis is upon the relationship between the units of frequency, time, impedence, admittance, current, potential difference and power. **Necessary Accessories for HP-75:** Video Display and Printer recommended

Steps: HP-75 Bytes: 2579

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00139-75-4	$10	$14

00140 Algebra of Complex Numbers

by C. McCord, Corvallis, OR

This program provides practice with algebra of complex numbers. Problems are used to illustrate the use of complex numbers in common equations relating to AC power in RLC circuits. **Necessary Accessories for HP-75:** A display or printer is recommended but not required.

Steps: HP-75 Bytes: 7585

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00140-75-2	$10	$22

00141 Star Fleet Wars

by J.F. Herlocker Jr, Ledyard, CT

This game allows a player to assume the role of a starship captain. Phasers, photon torpedoes and anti-matter probes are employed to battle alien vessels using a narrative-style system. **Necessary Accessories for HP-75:** Memory module

Steps: HP-75 Bytes: 18977

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00141-75-0	$10	$36

00142 Drain Orifice Used as e Steam Trap

by P. Heiss, Makati, Philippines

The drain orifice is a thin metallic plate with a concentric hole in it, used instead of conventional steam trap. It has a number of features that enable it to save energy effectively, to be easily maintained and to operate efficiently. Entering the various known parameters, program computes and displays hole diameter of orifice and amount of live steam loss together with condensate. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1509

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00142-75-8	$10	$12

00143 Analysis of a Balanced Polyphase Induction Motor

by C. McCord, Corvallis, OR

This program aids in the analysis of a balanced polyphase induction motor. Machine design parameters or no-load test DATA must be supplied and the program will calculate the current, efficiency, torque, losses, electric power in, and the mechanical power out as a function of speed. **Necessary Accessories for HP-75:** Video monitor recommended

Steps: HP-75 Bytes: 5601

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00143-75-6	$10	$18

00144 Analysis of Current and Voltage Dividers

by C. McCord, Corvallis, OR

This program provides practice in the analysis of voltage and current divider circuits. Both resistive and RCL networks are used, in series and parallel, and the user must calculate impedance, acceptance, resistance, reactance, conductance, susceptance, and voltage and current in the sample circuits. **Necessary Accessories for HP-75:** A video display is recommended for use with this program.

Steps: HP-75 Bytes: 5797

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00144-75-4	$10	$18

00145 Fox and Hounds

by E.M. Keefe, Ankeny, IA

One tox (the 75C) and three hounds (you) are placed on an eleven position playing field. Your task is to move the hounds in order to pin the fox in and not leave it any moves. If the fox slips by, it wins. The fox gets foxier with each successive game. Game may be played on the 75C alone, but includes capability of using a video display as well. **Necessary Accessories for HP-75:** Video interface and TV monitor if you wish to use the video display option.

Steps: HP-75 Bytes: 10488

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00145-75-1	$10	$16

00146 Star Trek 75

by E.M. Keefe, Ankeny, IA

You are the commander of the Enterprise. Rid the galaxy of Klingon battle cruisers in 40 star years. Use phofon torpedoes and phasers and warp speeds to get the job done. But beware of random space storms and the Klingons who wait in ambush. A classic game for any computer. Adapted from a similiar game for the HP 2000 and HP 9830. Now play it on the HP 75C. **Necessary Accessories for HP-75:** Video Interface & TV monitor or HP 82905B Printer for video with user modification to program.

Steps: HP-75 Bytes: 8416

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00146-75-9	$10	$24

00147 Interaction Diagram for Reinforced Concrete Sections

by S. Ginsburg, Lawrence, KS

This program generates 41 points belonging to the interaction diagram of rectangular reinforced concrete sections. The user provides width and depth, coordinates of steel layers, number of bars, bar size for each layer, and material properties. The program uses closed-form solutions for the concentric load capacity and balanced condition. A numerical solution is used for pure bending. Twenty points are generated on each branch of the interaction diagram. **Necessary Accessories for HP-75:** Current version uses a printer, but with minor modifications, none is required. Plotter is recommended.

Steps: HP-75 Bytes: 1354

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00147-75-7	$10	$16

00148 Especial Curve Fitting Minimum RAM Requirement:2152

by P.d.S. Mourao, Belo Horizonte, Brasil

We call it especial because the curve generated edheres closely to almost any set of data; and, at segment limits, has a common tangent that bisects the polygonal. Inflection points in 3rd degree curve segments are developed if required by curve convenient progress. Input only points' coordinates. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1345

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00148-75-5	$10	$14

00149 Gomoku

by C. McCord, Corvallis, OR

Gomoku is a very old, yet very simple Japanese game played on a 9x9 board. The object is to occupy five adjacent squares in a straight line anywhere on the board. The line may be horizontal, vertical or diagonal. Program does character graphics to display device if present. Otherwise displays moves in LCD display. **Necessary Accessories for HP-75:** HP 82163A or HP 92198 recommended

Steps: HP-75 Bytes: 6596

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00149-75-3	$10	$20

00150 Word Search Puzzles

by C. McCord, Corvallis, OR

This program produces Word Search Puzzles on an external printer. It allows puzzle dimensions of up to 16X32. User inputs the puzzle size and hidden words. Multiple copies and an answer key will be produced if requested. Word Search puzzles hide words running horizontally, vertically or along either diagonal and reading in either direction (as right to left or lower right to upper left, etc.) among random letters. **Necessary Accessories for HP-75:** Printer

Steps: HP-75 Bytes: 7704

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00150-75-1	$10	$20

00151 Einstein Distortions

by C. McCord, Corvallis, OR

Calculates and tabulates relativistic effects on a "twin" who is flying by in a rocket ship, as a function of (percent of speed of light) his velocity (speed). Changes in twin's height, weight, age are noted. **Necessary Accessories for HP-75:** Display device or printer recommended

Steps: HP-75 Bytes: 3576

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00151-75-9	$10	$16

00152 Video Monitor Cursor Control, Text-Writing, and Box Routines

by R.E. Swanson, Portland, OR

There are 30 routines in this collection which are designed to automate 1) the sending of escape sequences to the monitor (position cursor, scroll through display memory, clear display); 2) the printing of text, using (a) Normal or Inverse mode, (b) Left justify (tab), Centered, or Right-justify modes; 3) special effects, including (a) 3 types of frames, (b) Random Roll Up/Down of 2 posters stored in display memory, and (c) making vertical dividers. These routines may be executed manually (with or without the aid of redefined keys), and as subroutines which are called from a user's program in the same file. **Necessary Accessories for HP-75:** HP 82163 Video Interface; Video Monitor or TV

Steps: HP-75 Bytes: 7651

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00152-75-7	$10	$22

00153 "UL2CON"/Concrete Column, Biaxial Bending

by C.I. Dinsmore, Seattle, WA

UL2CON computes the ultimate capacity for a given rectangular concrete section with a given axial load and moments about two perpendicular axes. The section may contain 50 reinforcing bars. The method of analysis is based on the ultimate strength design method following A.C.I. 318-77. The program generates data for an ultimate moment capacity "moment interaction diagram". **Necessary Accessories for HP-75:** 8K Module increases capacity. A printer is very desirable. A video display is nice but not required.

Steps: HP-75 Bytes: 6170

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00153-75-5	$10	$20

00154 Solving 4th, 3rd, and 2nd Degree Equations

by R.A. Bennett, Decatur, GA

This program determines all real roots for the 4th, 3rd and 2nd degree equations. It may also display the imaginary values for the coefficients of the two quadratic equations, into which the 4th degree equation may be factorized. This program is based on solving 4th, 3rd, and 2nd degree equations by algorithm. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 2702

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00154-75-3	$10	$14

00155 System of Equations Program, Regarded as a Subroutine Prgm

by P.d.S. Mourao, Belo Horizonte, Brasil

Matrices processing is a vastly explored field. Here a compact, 'N' equations linear system resolution is presented for use of other programs that need only the 'N' simple system solved by a memory saving auxiliary progrsm. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1163

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00155-75-0	$10	$20

00156 Cassette Tape Analysis and Catalog

by A.J. Delange, McLean, VA

Produces a printed catalog of HP-75C and HP-41C/V cassette tapes. Prints file name, type, size, creation date (75C) and location on tape. Shows location of controller inserted 'spacer' records and 'empty' files. Gives room left on cassette and percentage of cassette wasted by spacer and empty records. Tells how many files were allocated at initialization. Useful in determining when to pack. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISK. **Necessary Accessories for HP-75:** HP 82161A Digital Cassette Drive, 00075-13013 I/O Utilities Solutions Book, HP 82162A Thermal Printer or HP 82905B Impact Printer or 'Centronics' parallel printer with HP 82165A or 66A Interface.

Steps: HP-75 Bytes: 4662

	Order Program No.	Documentation Only	W/Media
FOR HP-75	00156-75-8	N/A	$20

00157 Printing on the HP 82143 Printer

by S. Piccardi, Milano, Italy

Two programs (one for HP-41 and one for HP-75) provide easy printing of text or BASIC files on the HP 82143 HP-41 dedicated printer, via the cassette drive. Line numbers may be stripped off. Program does not affect sorgent file, nor does it renumber printed output. **Necessary Accessories for HP-75:** HP-41, HP 82143 Thermal Printer, HP 82160 HP-IL Module, HP 82180 Extended Functions Module, HP 82161 Digital Cassette Drive

Steps: HP-75 Bytes: 1196

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00157-75-6	$10	$14

00158 Flow Measurements With Restriction Devices

by P. Heiss, Makati, Philippines

According to A.G.A./A.S.M.E., program executes 7 different types of calculations on flange-taps orifice, flow nozzle and Venturi tubes for flow measurements. For each device you can compute flow entering differential pressure or vice versa; for new orifices you can compute bore diameter entering all other data. Program works in metric units and you can choose flow measura units (kg/h, m 3/h, Nm 3/h), according to fluid involved. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 5414

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00158-75-4	$10	$18

00159 Flow Measurements With Quadrant-Edge Orifice

by P. Heiss, Makati, Philippines

According to data from Royal Dutch Shell Laborstory (Delft) program axecutes 3 different types of calculations on quadrant-edge orifice for flow meesurements of viscous liquids. After entering all common and constant data, you can compute flow entering differential pressure or vice versa, and compute bore diameter entering all other data. Program works in metric units and you can choose meesura unit of flow (kg/h or m 3/h). **Necessary Accessories for HP-75:** None for computations only

Steps: HP-75 Bytes: 3404

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00159-75-2	$10	$18

00160 Throttling Orifices

by P. Heiss, Makati, Philippines

Program computes bore diameter of sharp-edged concentric orifices for throttling service on gas/vapor or liquid. For gas/vapor, program executes computations at critical or non-critical conditions according to data; so, if conditions are critical, flow can't increase when downstream pressure decreases. For liquid or gas/vapor in non-critical conditions, flow is not so steady but you can settle pressure drop towards flow. All parameters are in metric units. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1681

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00160-75-0	$10	$14

00161 Flow Measurements With Nozzle and Venturi Tubes

by P. Heiss, Makati, Philippines

According to A.G.A./A.S.M.E., program computes throat diameter of nozzle and Venturi tubes for flow measurements. The program works in metric units and you can choose flow measure units (kg/h, m 3/h, Nm 3/h), according to fluid involved. All useful date are stored in a data file to record or print them with other programs. **Necessary Accessories for HP-75:** None for compute only

Steps: HP-75 Bytes: 2500

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00161-75-8	$10	$14

00162 Print/Record/Recall Data for Flow Measure with Restriction

by P. Heiss, Makati, Philippines

Three programs that allow you to print, record and recall data from one or more of the following programs: 75-00158-2, 75-00159-0, or 75-00161-6. **Necessary Accessories for HP-75:** Thermal Printer HP 82162A; Digital Cassette Drive HP 82161A, and one or more of the programs mentioned in the abstract.

Steps: HP-75 Bytes: 3011

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00162-75-6	$10	$16

00163 Overdetermined System

by P. Heiss, Makati, Philippines

Program solves an overdetermined simultaneous system of linear equations with least squares method. Every equation can have up to 4 unknowns and number of equations must be equal or greater than 4. Maximum number of equations is limited only by available memory. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 2648

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00163-75-4	$10	$14

00164 Complex RPN Calculator

by T.R. Tyhurst, Georgetown, Canada

This program acts as an RPN calculator with full complex number capabilities. Most standard scientific functions are available to act on complex numbers, including hyperbolic and trigonometric functions. Display format is controlable, and ten storage registers are provided. Functions are executed by either a dedicated keystroke or by entering the command name from the alphabetic keyboard. Constant memory feature is also provided. **Necessary Accessories for HP-75:** HP 00075-15015 Math Pac

Steps: HP-75 Bytes: 4801

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00164-75-2	$10	$18

00165 Linear Equations With Positive-Definite Symmetric Matrix

by S. Ginsburg, Lawrence, KS

This program solves a system of linear equations with a positive definite symmetric coefficient matrix. The user inputs the lower triangle only. The program uses Cholesky's algorithm to create a lower triangle matrix, solves for an auxiliary vector of the transformation, and then solves by direct elimination for the unknowns. The decomposed matrix is stored in the original system matrix. The auxiliary vector and the solution vector are stored in the original coefficient vector. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1603

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00165-75-9	$10	$14

00166 Runge-Kutta Error Control Integration For N Simult Diff Eqs

by L. Rojas, Canoga Park, CA

This program is a fourth order Runge-Kutta Fehlberg method with a fifth order error control estimate to solve an arbitrary number of ordinary differential equation(s), or Nth order differential equation. The step size is determined by the program to maximize accuracy with the minimum and maximum step size by the user. The accuracy tolerance is set by the user. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 4535

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00166-75-7	$10	$16

00167 HP-41 Cassette Data File Operations

by Users' Library, , Corvallis, OR

This program reads, writes, and creates data files on the HP 82161A which are compatible with the HP-41. It allows the same type of manipulations provided by the WRTRX, READRX, and CREATE commands. The SENDID and ENTID$ commands are used to control the cassette drive, and a short LEX file performs the conversion between tape formats and HP-75 internal formats. The LEX file also provides two functions (chrib$, num16) which are 16 bit versions of the HP-75 functions CHR$ and NUM. THIS PROGRAM MUST BE SOLD RECORDED ON CASSETTE/HP-IL DISC. **Necessary Accessories for HP-75:** HP-82161A Digital Cassette Drive, 00075-13013 I/O Utilities Solutions Book

Steps: HP-75 Bytes: 6828

	Order Program No.	Documentation Only	W/Media
FOR HP-75	00167-75-5	N/A	$20

00168 Terminal Emulator

by Users' Library, , Corvallis, OR

This program allows the user of an HP-82168A HP-IL Acoustic Modem to talk with almost any 300 baud host computer using standard telephone lines, and a "G" type receiver. **Necessary Accessories for HP-75:** 00075-13013 I/O Utilities Solutions Book, HP-82168A HP-IL Acoustic Modem (Optional: HP-IL TV Interface, HP-82905B Impact Printer, or HP-82162A Thermal Printer)

Steps: HP-75 Bytes: 2545

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00168-75-3	$10	$14

00169 Net Present Value/Internal Rate of Return/Duration for Inv

by M.T. Duffin, Indianapolis, IN

This menu driven program will calculate the net present value, internal rate of return, duration and modified internal rate of return for even or uneven cash flows. Cash flows may be entered in groups (should consecutive periods of common cash flows exist) or individually. Simple editing commands permit easy examination or alteration of cash flow data. Data may be input via the keyboard or from datasets created during previous program runs. **Necessary Accessories for HP-75:** HP 82162A Printer Optional

Steps: HP-75 Bytes: 8020

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00169-75-1	$10	$20

00170 Multiple Linear Regressions

by I. Romano, Porto Torres, Italy

This program computes the various coefficients of a system of multiple linear equations of following form: y = asub1.xsub1 + asub2.xsub2 + ... + asubn.xsubn + c Program asks number of unknown a (n number), total number of equations and all x and y values for every equation. At the end it displays constant c, coefficients asub1 to asubn, determination coefficient Rsub2 and standard estimation error. You can then compute y entering x values, using computed data. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 2091

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00170-75-9	$10	$14

00171 Regressions

by I. Romano, Porto Torres, Italy

This program can be used to interpolate a set of given points (xi, yi), i=1, 2, ..., n, with one of the following curves: 1)- Linear y = a + b.x 2)- Exponential y = a.e b.x (a>0) 3)- Logarithmic y = a + b.lnx 4)- Power y = a.x b (a>0) Program computes for every curve values of a, b and the determination coefficient R 2. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1326

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00171-75-7	$10	$12

00173 Rectangular Venturi Tubes

by I. Romano, Porto Torres, Italy

On existing rectangular Venturi tubes, and after entering all common and constant data, program computes and displays the developed differential pressure giving the flow in Nm3/h or in kg/h, or vice versa. Messages are displayed as to whether or not Reynolds number and pipe and throat dimensions are correct. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 2069

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00173-75-3	$10	$14

00174 Pressure Drop and Velocity in Single-Phase & Two-Phase Flow

by I. Romano, Porto Torres, Italy

This program computes pressure drop and velocity in any circular pipe for either gas or liquid (single-phase), or for gas-liquid mixture (two-phase flow) in horizontal circular pipe. It also displays, for every fluid, if it is in laminar (viscous) or turbulent condition. Program is developed from Lockhart-Martinelli works as explained in the magazine 'Chemical Engineering', 9/7/81, pgs 121-125. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1810

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00174-75-1	$10	$14

00175 Area and Perimeter of Polygon

by I. Romano, Porto Torres, Italy

This program finds area and perimeter of any polygon given the coordinates of its vertices. Program asks number of vertices (greater than 2) and their x, y coordinates. Input must be in perimetric order (clockwise or counter-clockwise). **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 751

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00175-75-8	$10	$12

00176 Multiple Power Regressions

by I. Romano, Porto Torres, Italy

This program computes the various coefficients of a power equation of following form, using the least squares method: y=a1.x+a2.x 2+a3.x 3+ ... + an.x n+c . Program asks equation degree (n number), total number of points to enter, and x and y values for every point. At the end it displays coefficients a1 / an, constant value c, determination coefficient R 2 and standard estimation error. You can then compute y, entering an x value, using computed data. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1842

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00176-75-6	$10	$14

00177 Geometric Design For Supersonic Ramjet Engines

by R.A. Bennett, Decatur, GA

This program determines the properties of air and or the hydrocarbon burnt gases at various station references in the Ramjet Engine. It designs and dimensions the inlet diffuser, fuel injection system and fuel mixing chamber, the flame holder, the combustion chamber and the exit nozzle. It also determines the net thrust, the horse power, the fuel consumption/ horsepower/hr. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 8529

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00177-75-4	$10	$20

00178 Hex Board Plotter

by J. Walen, Fasanstigen 2, Sweden

The game of Hex is played on a diamond-shaped board made up of hexagons. It is difficult to draw by hand. The program plots a Hex-board (or several, if there is room on the paper), using an HP 7470A plotter. Many can be plotted rapidly for play using a pen instead of removable pieces. The number of hexagons and their size can be determined by the user. **Necessary Accessories for HP-75:** HP 7470A Plotter

Steps: HP-75 Bytes: 2934

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00178-75-2	$10	$14

00179 PEEK*POKE

by Users' Library, , Corvallis, OR

PEEKPOKE is a LEX file which contains hex and ASCII versions of the functions PEEK and POKE. These functions allow the user to look at and modify any location in the 75 RAM, and to look at any location in 75 ROM. The LEX file also contains EXEC, which allows the user to call any location as a subroutine, passing values to the CPU registers and returning the resulting values of the CPU registers, in hex or ASCII. THIS PROGRAM MUST BE SOLD RECORDED. **Necesaary Accessorias for HP-75:** None

Steps: HP-75 Bytes: 1280

	Order Program No.	Documentation Only	W/Media
FOR HP-75	00179-75-0	N/A	$20

00180 HELP

by Users' Library, , Corvallis, OR

HELP is a LEX file which displays the revision code, ROM number, type, and calling form of all keywords in all ROMs plugged into the HP-75. For numeric and string functions, it also shows the types of the parameters expected by the function. It will also display this information for a given keyword. THIS PROGRAM MUST BE SOLD RECORDED. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 768

	Order Program No.	Documentation Only	W/Media
FOR HP-75	00180-75-8	N/A	$20

00181 Pricing of Forms For Reinforced Concrete Members

by R.A. Bennett, Decatur, GA

This program allows the user to price forms in place for: 1-Beams and Girders, 2-box culverts, square or rectangular, 3-columns, square or rectangular, 4-flat slabs, 5-spread footings, 6-foundation walls, 7-pile caps, square or rectangular, and, 8-stairs. It also allows the user to schedule the formwork and to order the required material. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 4689

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00181-75-6	$10	$16

00182 Penny Slide Game

by P. Kokol, Maribor, Yugoslavia

This program enables you to play the game of Penny-Slide against the computer or an other player. Before any game tha computer randomly distributes eight pennies on 32 cells long board. The computer is very hard to beat. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 7470

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00182-75-4	$10	$22

00183 Frequency Distribution with Bar Chart

by J.L. Marchand, Elkhart, IN

The program accepts inputs for the number of cells desired, the starting point of tha first cell, and the cell width. It will then allow you to enter your data points and receive a percent frequency by cell and give a bar chart of the percentage for each cell. **Necesaary Accessories for HP-75:** HP 82162A Thermal Printer

Steps: HP-75 Bytes: 16k

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00183-75-2	$10	$16

00184 Closed Form Solutions of Polynomial Equations of Order 3

by S. Ginsburg, Lawrence, KS

This progrem find the roots of cubic equations. Both real and imaginery roots are determined. The program can be used as a subroutine withln appication softwre, or as a separate program. **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1148

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00184-75-0	$10	$12

00185 Determinant

by S. Ginsburg, Lawrence, KS

This program calculates the determinant of a matrix. The user provides the elements of the matrix. The program transforms the given matrix into a triangular one, and computes the value of the determinaln. **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 4422

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00185-75-7	$10	$12

00186 Navigation

by I. Romano, Porto Torres, Italy

Entering geographical coordinates of two points on earth surface, program computes: 1)-Minimum distance in nautical miles between the two points, on maximum circumference. 2)-Route angle to travel from the first point to the second point. Program is valid for any point on earth surface. **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 952

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00186-75-5	$10	$12

00187 Computes on Moon (name: MOON3)

by I. Romano, Porto Torres, Italy

Program executes following computes: 1)-Entering year, month, day and hour, program displays relative enlightened fraction of moon; minimum date is March 1st, year zero (1 B.C.). 2)-Entering year, program displays date and magnitude of nearest shadow eclipse of moon; minimum year is year zero (1 B.C.). 3)-Entering year and month, program displays the date of relative new moon, pressing RTN it computes next new moon dates; minimum date is January of year -4712 (4713 B.C.). **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 2725

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00187-75-3	$10	$14

00188 Numerical Inversion of the Laplace Transform

by F.R. Fluhr, Oxon Hill, MD

This program numerically obtains the Inverse Laplace Transform. The transform is basically for non-oscillatory systems, but these systems can be accomodated using the time re-setting technique described in the reference. Time re-setting allow for extensions to the length of the time period. Non-linear systems are also accomodated. **Necesaary Accessories for HP-75:** A "TV" or "monitor" is useful. A HP 82162A printer is desirable.

Steps: HP-75 Bytes: 2485

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00188-75-1	$10	$14

00189 Maxima Positive and Negative Moments Under Moving Loads

by P.d.S. Mourao, Belo Horizonte, Brasil

A train of 'M' loads runs over a 'N' spans continuous frame, end both maximum negative momant in any support, and maximum postive moment in any span, are calculated by the program. Although M=20 and N=11 are tha normal upper limits, these can easily be incresed to being limited only by available memory. Distributed loads are also considered. **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 7328

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00189-75-9	$10	$18

00190 Segmental Orifice

by I. Romano, Porto Torres, Italy

Segmental orifices are used in horizontal pipes for measuring flow of wet steam, liquids containing granular solids, oils containing water, and so on. After entering all known parameters in metric units, program computes flow for liquid or gas/vapor entering differential pressure or vice varea, and computes new orifices entering all data. Program also controls if orifice/ pipe area ratio and Reynolds number are correct and displays minimum readable flow concerning minimum Raynolds number. **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 2590

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00190-75-7	$10	$14

00191 Flow Measurements With Pipe Elbow Taps

by I. Romano, Porto Torres, Italy

Pipe elbows with correctly installed pressure connections may be used to determine rate of flow by measuring the differential pressure created by the centrifugal forces occurring when fluid is flowing through the elbow. After entering all known parameters in metric units, program computes flow entering differential pressure or vice versa; it also computes necessary elbow radius entering both flow and differential pressure. Above computes may be made both for 45 degree and 22.5 degree taps position. **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1380

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00191-75-5	$10	$12

00192 Multiple Sorting Routines

by I. Romano, Porto Torres, Italy

This program contains the following 6 sorting algorithms: 1)-Insertion; 2)-Binary insertion; 3)-Selection; 4)-Bubble sort; 5)-Shaker sort; 6)-Heap sort. Entering a series of numbers (10 as example in program) they are sorted by each of them and at the end you can see for every algorithm all number of comparisons, number of exchanges end time spent. So, for your own use in programs, you can choose what algorithm it's better to use. **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 3548

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00192-75-3	$10	$16

00193 Electric end Potential Field Caused by Cherged Circular Ring

by P.d.S. Mourao, Belo Horizonte, Brasil

Caused by a charged circular ring, the electric field and the potential anywhere are expressed by believed unintegrable functions. The program performs the integrations using the time saving technique of third degree segments curve fitting. This method, developed by the author, can be used in a variety of applications. **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 2722

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00193-75-1	$10	$18

00194 Cantilevel Under Concentrated or Distributed Load

by A.L.W. Ann, Halifax, Canada

This program accepts as input: E Young's modulus, I Geometrical moment of inertia, a Distance of concentrated load from support or b length of distributed load, P load or W distributed load, and x distance of a point of interest from the support. The program will compute deflection, angle of deflection, bending moment and shearing load. **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1135

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00194-75-9	$10	$12

00195 Piles Group Calculation

by P.d.S. Mourao, Belo Horizonte, Brasil

A pile group supports a rigid block that is subjected to generalized loading compresing 3 component forces Rx, Ry, Rz and 3 component moments Mx, My, Mz. The program computes the elastic center, to which is transferred the origin of coordinates, calculates and displays piles reactions, and regenerates the loading from the forces and piles' parameters, displaying its components for verification. **Necesaary Accessories for HP-75:** None

Steps: HP-75 Bytes: 5950

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00195-75-6	$10	$22

00196 Find
by S. Piccardi, Milano, Italy

FIND is a string matching program. Patterns are specified as a subclass of "regular expressions". FIND can be used interactively, or as a subroutine. It can output to a printer, or to a file for further processing. The write-up features powerful applications, including a negated matching program and a cross-referencing progam for BASIC files. FIND is a general purpose tool, and it is fully described as such. Text replacement program included. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 3969

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00196-75-4	$10	$16

00197 Matrix Inversion
by P.d.S. Mourao, Belo Horizonte, Brasil

This program was made because not everyone has got the Math Pac. Only available memory limits the size of the matrix to be inverted, and sparsity can be ample with only non-null diagonal. It is split in a calling and a subroutine program, this usable by any program. Typical run duration: 235 s. for n=7 matrix. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 6000

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00197-75-2	$10	$16

00198 Sarma Non-Vertical Slice Method of Slope Stability Analysis
by J.L. Gilby, Vancouver, Canada
E.D. Hoek, Vancouver, Canada

Powerful general method of limit equilibrium analysis which can be used to determine the factor safety against sliding of soil or rock slopes of a variety of shapes. Circular, non-circular or active-passive wedge failure mechanisms can be analysed. A unique feature of the method is that the non-vertical slice boundaries allow the incorporation of specific structural features (faults or bedding surfaces). External forces may be applied to each slice and water pressures are automatically incorporated if a phreatic surface is specified. Includes sub-programs for a number of Hewlett-Packard printers and a plotter (HP 7407A, HP 8905B, HP 2225B & HP 82162A). **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 11795

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00198-75-0	$10	$32

00200 Simultaneous Non-Linear Equations (Broyden's Method)
by T.R. Tyhurst, Georgetown, Canada

This program uses Broyden's method (a quasi-Newton algorithm) to solve a system of up to nine non-linear equations in nine equations. The equations are input into the program, and after initial guesses and the desired tolerance are entered, the program seeks a convergent solution. The rate of convergence is generally quadratic. **Necessary Accessories for HP-75:** HP 00075-15015 Math Pac

Steps: HP-75 Bytes: 4500

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00200-75-4	$10	$16

00201 Linear Equations With Positive-Definite Symmetric Matrix
by S. Ginsburg, Lawrence, KS

This program solves a system of linear equations with a positive definite symmetric coefficient matrix. The user inputs the lower triangle only. The program uses Cholesky's algorithm to create a lower triangle matrix, solves for an auxiliary vector of the transformation, and then solves by direct elimination for the unknowns. The decomposed matrix is stored in the original system matrix, the auxillary vector and the solution vector are stored in the original coefficient vector. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 6102

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00201-75-2	$10	$14

00202 Input/Output Via a 2382A Terminal
by F.E. Brengman, Golden, CO

This AUTOST program should be used with HP-75 I/O to initialize an HP 2382A terminal connected via a RS232C interface with a modem bypass cable. The configuration used is: 9600 baud, even parity, 1 step bit, and x on/x off. **Necessary Accessories for HP-75:** HP-75 I/O, 2382A Terminal, and HP-IL to RS232C Interface

Steps: HP-75 Bytes: 2268

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00202-75-0	$10	$16

00203 Multi-Function Curvefit
by L. Rojas, Canoga Park, CA

Determines the coefficients of a user defined equation, of up 15 functions, that will curvefit the input data of up to 3 variables, X(I), Y(I) and Z(I), by the least square method. The progrem will create the data file and function file interactively which can then be later reused. The program will also computa new values of the equation using the coefficienta. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 6105

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00203-75-8	$10	$16

00204 Bills and Coins For Payrolls
by R.A. Bennett, Decatur, GA

This program allows accountants to add payrolls, and to determine the number and value of bills or coins due for each individual in the payroll, and for the payroll. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1180

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	00204-75-6	$10	$12

00205 Euler Phi Function
by S.J. Thomas, Hollywood, FL

This program rapidly computes the Euler Phi Function value of a positive integer N -- that is, the number of positive integers less than N which are relatively prime to N. (Integers are relatively prime if their greatest common factor is 1.) Both a stand-alone "friendly" version and a user-defined function version, which can be used in your own program, are provided. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1000

	Ordar Program No.	Documentation Only	W/Cards
FOR HP-75	00205-75-3	$10	$14

03225 Slope Stability Analysis - Planar Failure (PLNF)
by D. Wyllie, Vancouver, Canada

This program computes the Factor of Safety of a slope in which the failure surface consists of a plane surface. This surface may be optionally termin- ated in a vertical tension crack. Variables that are included in the analysis are the slope geometry, two external forces, Mohr-Coulomb strength parameters, and two alternative ground water table configurations. A sensitivity analysis is also includad as an option. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 4055

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03225-75-8	$10	$16

03226 Animals
by S. Piccardi, Milano, Italy

Thia program is a great child (and adult) entertainment and educational tool. It has the ability to learn facts about animals and to question the user about these facts with a simple yes-or-no questioning pattern. A global database is maintained which can be saved on mass storage media, thus allowing multiple session intaraction. Globel databases can be interchanged as well. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 1144

	Order Program No.	Documantation Only	W/Cards
FOR HP-75	03226-75-6	$10	$12

03227 Triple Lattice Analysis of Variance
by P. Heiss, Makati, Philippines

This program performs complete analysis of variance of a Triple Lattice experimental design with optional Duncan Multiple Range testing. **Necessary Accessories for HP-75:** Video Monitor, Thermal Printer

Steps: HP-75 Bytes: 8600

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03227-75-4	$10	$24

03307 Cribbage Hand Counter
by T.R. Tyhurst, Georgetown, Canada

This program will count the total number of points in a given cribbage hand. The program prompts for the four cards of the hand, then prompts the user for the starter. The hand and starter is then redisplayed along with the number of points the hand is worth, according to the rules of cribbage. If requested, the program will provide a detailed analysis of the scoring of the hand, showing points in fifteens, runs, flushes, pairs and nibs. The program is aimed, primarily, at those learning to play the game. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 002422

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03307-75-4	$10	$14

03310 Prtplot
by F.E. Brengman, Golden, CO

This subprogram takes the numeric values passed in array A(500) and plots them on an HP-2225B Think Jet Printer. **Necessary Accessories for HP-75:** HP-75 I/O Rom, HP-2225B Printer.

Steps: HP-75 Bytes: 001997

	Order Program No.	Documantation Only	W/Cards
FOR HP-75	03310-75-8	$10	$14

03311 Calculate Atomic Decay
by F.E. Brengman, Golden, CO

This program calculates fifty-two weeks of atomic decay. **Necessary Accessories for HP-75:** HP-2225B Think Jet printer, HP-75 I/O Rom. b

Steps: HP-75 Bytes: 002586

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03311-75-6	$10	$16

03312 Compare Files Utility
by S.J. Thomas, Hollywood, FL

This program is useful when several copies or versions of a BASIC program or TEXT file exist by providing the ability to perform a line-by-line comparison of the files. Corresponding lines of the two files which are either missing or not identical are printed/displayed. **Necessary Accessories for HP-75:** HP-75 I/O Rom; Printer or display device recommended.

Steps: HP-75 Bytes: 002035

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03312-75-4	$10	$14

03313 Transmission Lines: Short Lines Calculations
by A.L.W. Ann, Halifax, Canada

This program will compute two unknown variablas, given at least six known valuas of the transmission line parameters. This program is suitable tor transmission lines of less than 80 km. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 001122

	Order Program No.	Documentation Only	W/Carda
FOR HP-75	03313-75-2	$10	$12

03338 McReynolds and Kovats Indices

by W. Pinnick, State College, PA

A tool to help the serious gas chromatographer compare GC columns by calculating their Kovats Indices and McReynolds constants from the observed retention times of methane, an alkane standards mix, and a five component McReynolds probe mix. Program includes a phase library and a library comparison routine. Phases may be added to the library or the user can create his own library as desired. **Necessary Accessories for HP-75:** Math Rom and printer

Steps: HP-75 Bytes: 003977

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03338-75-9	$10	$16

03340 PCF/FMT75/ADDENV-Personal Card File

by J.L. Gilby, Vancouver, Canada

These three cassette based programs are useful utilities for letter writing and personal card files. PCF seves address files to be created, amended, listed or printed. Files contain name, address, phone numbers, notes. FMT75 calls FORMAT75 the Text Formatter program, prompts for address file from PCF and merges it to the main file to be formatted and prints your address as well as the addressee at the head of your letter. ADDENV uses the HP 7470A plotter to print addresses on envelopes (8.5 inches or 210mm wide). Again, it uses files created by PCF. MUST BE SOLD RECORDED ON CASSETTE ONLY. **Necessary Accessories for HP-75:** Cassette or Disc Drive, Video Interface, Printer (HP 82905B or Inkjet), I/O Rom, Text Formatter Rom, HP 7470A Plotter (for ADDENV only).

Steps: HP-75 Bytes: 001766

	Order Program No.	Documentation Only	W/Media
FOR HP-75	03340-75-5	N/A	$20

03352 Substitution Cryptogram Solution Aid

by T.R. Tyhurst, Georgetown, Canada

This program provides a workspace environment to aid in the solution of simple substitution cryptograms (where one character of the cipher represents one character in the plaintext). The functions provided permit loading the cipher, performing frequency analyses, loading and saving developed keys, and saving the plaintext version. All functions are provided on an "editor" level to permit easy viewing of the cipher with the corresponding plaintext. **Necessary Accessories for HP-75:** HP 82163A 32-column Video Interface, 00075-15015 Math Pac.

Steps: HP-75 Bytes: 008600

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03352-75-0	$10	$18

03367 The Game of Nim

by T.R. Tyhurst, Georgetown, Canada

This program will play a version of the game of Nim. In Nim, one has a number of sticks in a number of rows. Players take turns removing eny number of sticks from any one row. The object is to be the player who takes the last stick. The program lets you design custom versions of the game, or lets you play the standard one. The program keeps track of the number of games won by the computer and by the user. **Necessary Accessories for HP-75:** HP 82163A Video Interface with TV or monitor; HP-00075-15015 Math Pac.

Steps: HP-75 Bytes: 002324

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03367-75-8	$10	$14

03370 Termcom

by R. Young, Corvallis, OR

A powerful, flexible terminal emulator which supports RS232 Modems/Couplers and the HPIL Coupler. Features answer and originate modes, manu control, auto configuration and log-in, file transfer in both (with or without line number preservation), and user controlled LCD scroll rate, buffer size when not used with CRT. MUST BE SOLD RECORDED ON CASSETTE OR 3.5 DISC. **Necessary Accessories for HP-75:** HP-IL Acoustic Coupler (HP 82168A) or HP-IL RS232 Interface (HP 82164A) and Modem, Plug-In Module Simulator (PMS) (HP 82713A)

Steps: HP-75 Bytes: 013000

	Order Program No.	Documentation Only	W/Media
FOR HP-75	03370-75-2	N/A	$20

03371 PLOTROM-8K Plug-In Rom Equivalent To 85 Printer/Plotter Rom

by R. Young, Corvallis, OR

This ROM (which must be loaded into a PMS to operate) brings the capabilities of the HP-85 Printer/Plotter ROM to the HP-75. This includes scaling, labeling, moving, drawing, pen selection, axes, framing, character control, and digitizing. **Necessary Accessories for HP-75:** Plug-In Module Simulator (PMS) HP-82713A and Plotter (works best with 7470A HP-IL).

Steps: HP-75 Bytes: 000500

	Order Program No.	Documentation Only	W/Media
FOR HP-75	03371-75-0	N/A	$20

03380 MODE

by J.M. Comstock, Boulder Creek, CA

This program computes the first five natural frequencies and their mode shapes for single span beams with ten different end fixities. Coefficients published by Blevins were verified using Timoshenkos' Derivations of the transenderital equations for numerical computing of the natural frequency and mode shape. **Necessary Accessories for HP-75:** None.

Steps: HP-75 Bytes: 15K

	Order Program No.	Documentation Only	W/Media
FOR HP-75	03380-75-1	N/A	$34

03382 Design of Concrete Mixes

by A. Helou, Sharjah, United Arab Emirates

This program determines the concrete mix batch quantities in English and in metric units. The water and cement ratios and the percentages of voids in the mixes for various types of structures and degrees of exposure and for air-entrained and non-air-entrained cements. It also determines the required everage strengths for various classes of operations, control standards and allowable percentages of falling below lower limits. **Necessary Accessories for HP-75:** None.

Steps: HP-75 Bytes: 013847

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03382-75-7	$10	$26

03383 Computer Science Calculator

by K. Saul, Corvallis, OR

This program performs most of the arithmetic and logic functions of the HP-16C on positive integers. The user can select word lengths of 4, 8, 16, or 32 bits and perform base conversions between binary, octal, decimal, and hexadecimal. Arithmetic functions are +, -, *, and /, and logical functions are AND, OR, XOR, NOT, and NEG. Other features include temporary ("view only") base conversions and an overflow indicator. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 003600

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03383-75-5	$10	$16

03430 Settling Velocity

by I. Romano, Porto Torres, Italy

This program computes the settling terminal velocity for unrestricted particles and for hindered conditions in the various flow regimes (Stokes, intermediate and Newton). The program works with either English or metric units. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 001435

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03430-75-4	$10	$12

03431 Template and Create

by J.G. Monedero, Madrid, Spain

This program is a subroutine which imitates the effects of a HP-75C template. It can also be used es an input screen subroutine for a small data base management program. The attached "creata" program must be previously used to establish and store the parameters for tha screen template. **Necessary Accessories for HP-75:** None

Steps: HP-75 Bytes: 06000

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03431-75-2	$10	$14

03432 Fitline

by J.W. Feiman, Minneapolis, MN

FITLINE selects the functional t(y)=a+bu(x)+cv(x) that best fits a set of x, y data. The t(y) choices are y, l/y, lny and the u(x), v(x) choices are x, l/x, lnx, x2, 1/x2, ln2x; u=v necessarily. The r2 for the 18 t, u and the 45 t, u, v combinations are displayed sequentially. The a, b, c, and their standard deviations are displeyed for the best functional. The user may also choose a particular functional and y(x) values may be calculated from the derived functional. **Necessary Accessories for HP-75:** I/O Rom, Math Rom; video interfece and/or printer helpful.

Steps: HP-75 Bytes: 003060

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03432-75-0	$10	$16

03462 Spring

by J.M. Comstock, Boulder Creek, CA

This program designs seven different mechanical springs; helical (extension) tension, helical compression, helical torsion, ring springs, belleville washer, torsion bar, and torsion tube. Stress concentration factors are computed and taken into account by the code. Where applicable, fluctuating loadings are considered and allowable load increase computed after the user inputs endurance limit values. The code input is in sufficient detail to make a drawing or specify the spring for procurement. **Necessary Accessories for HP-75:** HP 82182A printer/HP 82095B printer. HP 82161A cassette drive, HP 82700B 8K memory module are helpful.

Steps: HP-75 Bytes: 011500

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03462-75-7	$10	$28

03463 Polyplot-A polynomial Plotting Program for HP-75/HP 2225B

by W. Pinnick, State College, PA

This program is a FAST dot matrix plot routine for the HP 2225B ThinkJet printer. Plot includes title, subtitle, X and Y axis labels, X and Y scales printed along the bottom and left with both major and minor scale divisions plotted on the plot perimeters. A 560 x 500 dot plot (96 dots/inch each axis) takes about six minutes for a second degree polynomial. **Necessary Accessories for HP-75:** HP 2225B or equivalent faster printer. 75-15001 I/O Rom and the 75-15015 Math Rom.

Steps: HP-75 Bytes: 002750

	Order Program No.	Documentation Only	W/Cards
FOR HP-75	03463-75-5	$10	$14

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HP-75

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- Trapezoidal Rule For Integration
- Romberg Rule For Integration
- Simpson's Rule For Integration
- Newton-Cotes Rule For Integration
- Trapezoidal Rule For Ordinary Differential Equations
- Runge-Kutta
- Contraction Mapping

Math III (00075-13005)
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- Fast Fourier Series/Triconometric Interpolation
- Attenuated Fourier Series
- Spherical Harmonics
- Elliptic Integrals
- Bessel Functions: Asymtotic Expansion
- Bessel Functions: Backward Recurrence
- Gamma Function
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- Lease vs. Purchase
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- Present Value Of An Arithmetic Gradient Series

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- Seller's Cost And Net Equity
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- Simple Linear Regression
- Permutations And Combinations

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- Fisher's Exact Probability
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