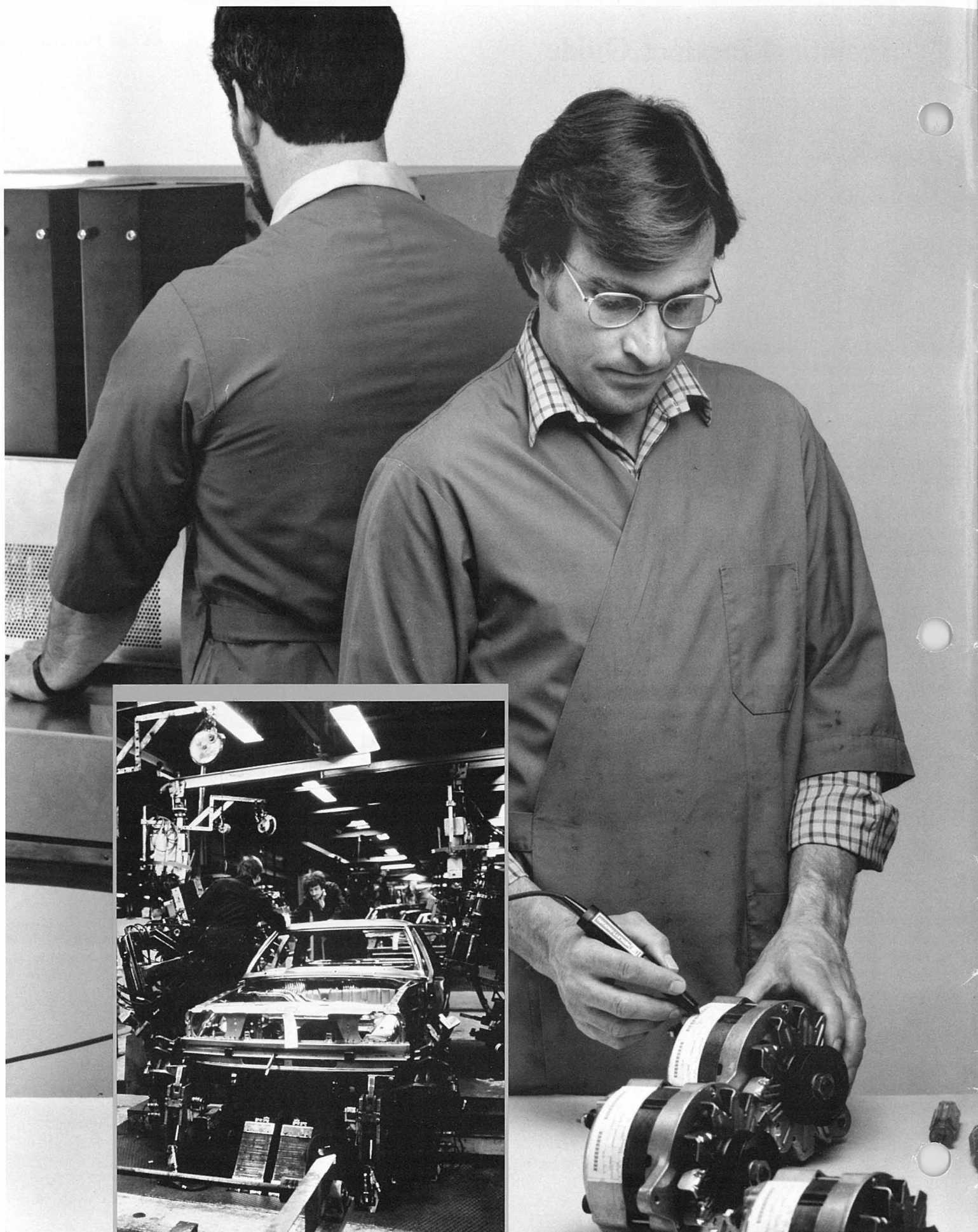


HP-75D

Technical Product Guide





Fast Answers and Accurate Analysis... HP-75D Portable Computer Applications

How could *your* organization profit by having the HP-75D portable computer system?

- Save time — Eliminate recording of information manually
- Improve accuracy — Eliminate errors caused by manual recording
- Increase timeliness — Process information on-the-spot or send it to a central computer for immediate readout
- Save money — Improve efficiency, reduce data processing costs, and eliminate problems related to the handling and storage of information that's recorded on paper

Whether it's answers now or analysis later, the HP-75D portable computer system can help you — and quickly justify its cost.

Some applications for which the HP-75 is well-suited include tracking work in process, field sales and service reporting, and inventory control.

Tracking Work in Process

An automobile manufacturer needs a system for tracking parts such as carburetors, transmissions, or alternators among others, throughout the assembly process to be certain that the correct parts are installed at final assembly. Another need is to reduce the effects of a recall if a batch defect is discovered later. Bar code labels, the HP-75D with bar code wand and HP 82725A Bar Code Reader Module or HP 82718A Expansion Pod* are all that are required.

Boost Productivity in Field Sales and Service

A field sales organization for a medical equipment manufacturer needs to improve sales productivity and speed



invoicing. The solution is to provide an HP-75D with HP 82718A Expansion Pod, and an HP 2225B ThinkJet printer as a briefcase system for sales personnel. Custom software, developed by a consultant, can also be supplied.

Before leaving the office, the salesperson can download information about the day's customers from a central computer to the HP-75D. Upon reaching the sales site, the salesperson can quickly compare goods on hand with quantities desired by the customer. Once the order is placed, an invoicing routine using prompts for detail on quantities, part numbers, and more can be run. Then, the information is simply transmitted via the Pod's integral direct-connect modem to the host computer. The computer immediately initiates billing to the customer

and, at the same time, returns this information to the HP-75D to be printed for the customer's reference — resulting in efficient use of the salesperson's time and quick turnaround on invoicing.

The same portable HP-75 system also can be used by field service personnel to improve organizational productivity.

Versatile Inventory Control

The HP-75D Portable Bar Code System saves time and money in inventory control.

A computer manufacturer needs to keep tight control of inventory. Parts are kept in bins, each with its own identification number indicated by bar codes on the front of the container.

To take inventory, the HP-75D's

*Available July, 1984

digital bar code wand is run across the bar code attached to the bin. Audible and visual prompting can be programmed into the HP-75 to suggest when to input information such as quantity, product identity, storage location, and more. Error-checking routines assure that errors are corrected as they are entered.

This information can be stored in the HP-75D or immediately transmitted to a central computer such as the HP 3000. Several data communications options provide easy, versatile methods of data transfer. When the inventory file is updated, timely reports, charts, and graphs can be generated. Such a system can save weeks over manual methods.

The Computer

The HP-75D has an 8-bit CMOS Series 80 personal computer CPU with built-in HP-IL and Digital Bar Code Wand interfaces. The HP-75 is ideal as a remote data collection and information processing tool whether operated from the keyboard or used with a bar code wand.

With an HP-75D and our Data Communications Pac, you can tie into host computer networks — whether they're personal workstation computers like the HP 150 or large computers like the HP 3000 — at your plant or office, or information sources like Dow Jones News/Retrieval®. And there's a host of other solutions.

If you prefer, you can write programs for your particular application with the programming power of HP BASIC (with more than 100 commands and 41 numeric functions).

And, if you need to control machinery or collect data from instruments,



take advantage of the many HP-75 interfacing options and I/O ROM.

You can expand your system as your needs grow too, because the HP-75D gives you easy interfacing options, and it can be connected to a wide range of peripheral devices.

Why Buy HP?

When you buy an HP portable computer you're buying a product that's part of a long tradition of giving customers innovative, reliable, and complete solutions to their computing problems.

HP provides the single-vendor solution. Your system will be easier to use, because all of its individual system elements were designed to work as one unit — including printers, plotters, mass storage, and other devices. Plus, you'll work with just one company if you want to

expand your system, or require service.

Put It Together And Take It Away

Together with the broad range of peripherals, enhancements, software solutions, interfacing potential, and HP support, the HP-75 provides a powerful, portable, and expandable computer system.

So put it together and take it away. Anywhere. To the production line for production control, quality control, or to track work in process. To receiving or the warehouse for inventory control. To the loading dock or on the road for distribution tracking. To the laboratory for lab sample tracking. To the field for sales and service reporting. Or back to the office for order processing. Uses are limited only by your imagination!

Hewlett-Packard

HP-75D Key Features

Built-in Beeper

for programmable acoustic alarms.

Battery Pack

with rechargeable nickel-cadmium batteries. Recharger included. 3-4 weeks of normal usage (min. 20 hour in RUN mode).

48K-Byte Operating System

with 167 keywords (104 BASIC, 41 numeric; time, alarms, appointments, etc.).

32-Character LCD

with scrolling to 96 characters.

HP-IL Interface

for battery-operated cassette drive, battery-operated printer, instrumentation control, video monitor, color graphics plotter, full-width printers, larger systems.

8K-Byte Memory Module Port

for additional user storage capacity.

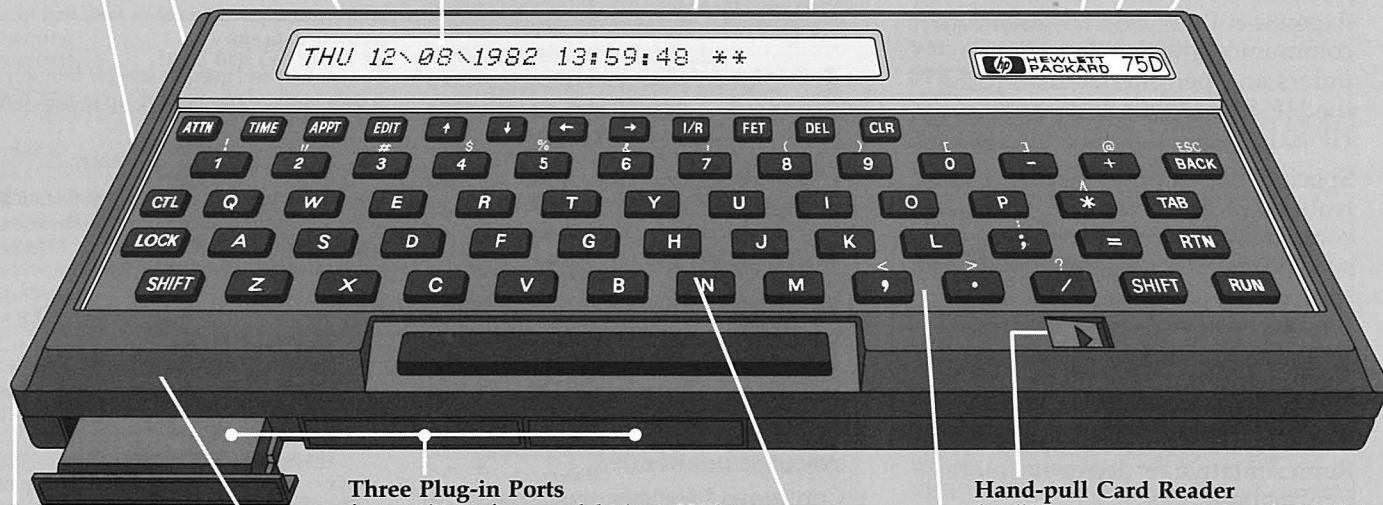
8-Bit CMOS CPU

16K-Byte User RAM

expandable to 24K bytes.

Built-in Digital Bar Code Wand Interface

for reading major industrial bar codes.



Continuous Memory

Three Plug-in Ports

for prewritten software modules (up to 32K bytes each). Modules provide permanent program storage and automatic execution.

Hand-pull Card Reader

for off-line storage on magnetic cards; 1.3K bytes per card, random entry of multi-track files, write/protect.

Touch-type QWERTY Keyboard

Redefinable Keyboard

redefinable at will or under program control, using Keyboard Overlays.

Compact and Lightweight

5" x 10" x 1.25" (12.7 cm x 25.4 cm x 3.2 cm) weighing 26 oz. (740 g).

Hewlett-Packard HP-75D Portable Computer

The HP-75D is a fully-integrated, battery-powered computer weighing only 26 ounces and measuring 10 x 5 x 1.25 inches. Use it anywhere for fast, accurate data entry. The information handling capability and accuracy of this powerful computer compares favorably with what you would expect of larger desktop computers. And data can be entered either from the keyboard or by scanning bar code with a digital bar code wand.

Data collected with the HP-75D can be processed at remote sites or transferred to another computer using the portable HP 82168A Acoustic Coupler or the HP 82718A Expansion Pod*. The HP-75D can communicate with other HP computers and peripherals also, using the HP 82164A HP-IL/RS-232C or HP 82169A HP-IL/HP-IB Interfaces.

Special built-in programming features mean the HP-75D can be completely customized to meet your specific needs. Developing dedicated solutions is exceptionally easy. Keys can be completely redefined. HP's Custom Products program is available when you want customized software modules, magnetic cards, or keyboard overlays. Ask an HP Sales Representative or dealer for more information.

- With the HP-75's multiple file structure, any number of files, up to available memory space, may be in memory at the same time. You can keep text and BASIC files, LEX, and VisiCalc worksheets.
- A built-in appointment function provides personal scheduling, audible alarm, and message options. A clock/calendar function lets you create or use clock/calen-

Features

- 8-Bit CMOS Series 80 Personal Computer CPU.
- Built-in 48K-Byte ROM BASIC language operating system.
- 16K-Byte RAM plus optional 8K-Byte RAM plug-in.
- 3 software module plug-in ports hold up to 32K bytes each.
- Built-in HP-IL Interface.
- Built-in Digital Bar Code Wand Interface.
- Built-in hand-pull card reader.
- Touch-type QWERTY keyboard.
- Battery power.
- Multiple file structure.

Benefits

- Fast and efficient data processing.
- Friendly programming; fast math calculations; efficient time management; more than 90 percent of RAM free for your applications. Has more than 100 system and BASIC commands, and 41 numeric functions to choose from.
- Plenty of memory.
- Customized problem-solving. Up to 96K of software ROM.
- Printing and mass storage anywhere; remote communication via telephone lines; expanded display capability.
- Saves money and a plug-in port because it's built-in, and gives you easy, fast, and accurate data entry.
- Convenient and inexpensive off-line storage of data and programs, with up to 1.3K bytes per card.
- Easy, fast, and accurate data entry.
- Use it anywhere. Three rechargeable nickel-cadmium batteries permit two to three weeks of normal use between charges or 20 to 30 hours of continuous operation.
- Instant access to most commonly used programs.

dar-dependent programs. Programs or commands may be executed unattended.

- Continuous Memory saves data and programs even when the HP-75 is turned off.
- The liquid-crystal display acts as a 32-character window on a 96-character line. You view the entire line by scrolling. The 256-character set includes both upper- and lower-case ASCII characters with true descenders, as well as several special characters.

Physical Specifications

DIMENSIONS . . . 12.7 cm (5 in) x 25.4 cm
(10 in) x 3.2 cm (1.25 in)

WEIGHT 737.1g (26 oz)

POWER REQUIREMENTS

Batteries NiCad Battery Pack
(HP 82001B)

Battery Current

(worst case;
without bar
code wand) 25 mA (RUN mode)
providing 20 to 30 hours
of RUN mode operation
(approximately 2 to
3 weeks between re-
chargings)
14 mA (STANDBY mode)
20 μ A (SLEEP mode)

(with wand) . . . 70 mA

OPERATING REQUIREMENTS

Operating
temperature . . . 0° to 45°C (32° to 113°F)

Recharging
temperature . . . 10° to 40°C (50° to 104°F)

Storage
temperature . . . -40° to 55°C
(-40° to 131°F)

Humidity 0 to 95% relative
humidity

DISPLAY (Liquid-crystal)

Character font . . . 5 x 9 dot matrix
Capacity 96 characters per line
Window size . . . 32 characters
Character set . . . 256 characters

CHARACTER RANGE

A-Z, a-z, 0-9, plus 27 special characters, with
or without underlining.

DYNAMIC RANGE

Real precision . . . -9.9999999999E499 to
-1E-499, 0, 1E-499 to
9.9999999999E499

Short precision . . . -9.9999E99 to -1E-99,
0, 1E-99 to 9.9999E99

Integer precision . . -99999 to 99999

Variable types . . . Numeric, String,
Numeric array

CLOCKS & TIMERS

Perpetual clock calendar, 12-hour or 24-hour
format. Time function returns time to the
nearest millisecond.

Accuracy range . . 15 seconds/month to 3
minutes/month

Adjustable clock
speed $\pm 10\%$

BEEPER

The beeper is programmable with parameters
for duration and tone. The frequency
range is approximately 1 to 1600 Hz.

REDEFINABLE

KEYS 194

MULTIPLE FILE STRUCTURE

The number of files in HP-75D memory is
limited only by the amount of available
RAM.

LANGUAGE

Extended HP BASIC (167 instructions)

ROM/RAM

Built-in operating
system ROM . . . 48KB

Three 32KB plug-in
ROMs for an additional
96KB ROM

Built-in user RAM . . . 16KB

Enhancement Memory Module
(HP 82700A) . . . 8KB

Maximum system RAM
(with Memory
Module) 24KB

INTERFACES

Built-in Hewlett-Packard Interface Loop (HP-IL)
Built-in Digital Bar Code Wand Interface

OFF-LINE MASS STORAGE

Built-in Card Reader, hand pulled

CONTINUOUS MEMORY

Retains data and programs even when the
computer is turned off.

THE HP-75D PORTABLE COMPUTER COMES COMPLETE WITH:

HP-75D Owner's Manual	Field Case
Reference Manual	Rechargeable Battery Pack
HP-75D Owner's Pac	AC Adapter/Recharger
Keyboard Overlay Kit	HP-IL Cables
Accessory Brochure	Card Holder
Service Card	

HP-75D Functions List

NUMERIC FUNCTIONS

ABS—Absolute value.

ACOS—Arccosine.

ANGLE—Arctangent of y/x.

ASIN—Arcsine.

ATN—Arctangent.

CEIL—Smallest integer $\geq x$.

COS—Cosine.

COT—Cotangent.

CSC—Cosecant.

DATE—Date in yyddd format.

DEG—Radian-to-degree conversion.

EPS—Smallest machine number.

ERRL—Line number of most recent error or
warning.

ERRN—Identification number of most recent
error or warning.

EXP— $e(x)$.

FLOOR—Largest integer $\leq x$.

FP—Fractional part.

INF—Largest machine number.

INT—Largest integer $\leq x$.

IP—Integer part.

LEN—String length.

LOG—Natural logarithm.

LOG10—Base 10 log.

MAX—If $x > y$ then x , else y .

MEM—Available memory in bytes.

MIN—If $x < y$ then x , else y .

MOD—Modulo.

NUM—Decimal code of the first character in
a string.

PI—3.14159265359.

POS—Position of a character in a string.

RAD—Degree-to-radian conversion.

RES—Numeric result.

RMD—Remainder.

RND—Random number.

SEC—Secant.

SGN—Sign of a number (+ or -).

SIN—Sine.

SQR—Positive square root.

TAN—Tangent.

TIME—Number of seconds since midnight.

VAL—Numeric value of a string.

STRING FUNCTIONS

CAT\$—Catalog entry of a file.

CHR\$—Character with decimal code MOD
(X,256).

DATE\$—Date in yy/mm/dd format.

KEY\$—Display character of currently de-
pressed key.

STR\$—Converts a numeric to a string.

TIMES\$—Time in hh:mm:ss format, using 24-
hour notation.

UPRC\$—Converts input string to uppercase
letters.

VER\$—Six-character string indicating the
operating system version.

TAB—Tabulator.

TIME MODE COMMANDS

ADJST—Displays ADJST template.

EXACT—Sets timing mark.

RESET—Clears EXACT marks and current
speed adjustment factor.

SET—Displays set-time template.

STATS—Displays STATS template.

BASIC STATEMENTS

ASSIGN #—Assigns file number to a file
name.

BEEP—Causes a tone to sound at specified
frequency and duration.

CALL—Calls a program from within another
program.

DATA—Numeric or string constants for use
by READ.

DEF FN—Defines user-defined function or
multi-line function.

DIM—Dimensions array.

DISP—Displays information.

DISP USING—Displays information according to IMAGE statement.
 END—Terminates program.
 END DEF—Defines end of multiline user-defined function.
 FOR...TO...STEP—Defines beginning of FOR-NEXT loop.
 GOSUB—Branches to a series of statements.
 GOTO—Unconditionally branches to a line number.
 IF...THEN...ELSE—Tests condition and branches.
 IMAGE—Specifies the output format for DISP USING and PRINT USING.
 INPUT—Allows input of data from the keyboard.
 INTEGER—Dimensions and reserves memory for integer precision numeric variables.
 LET—Assigns value to one or more variables.
 LET FN—Assigns a value to a function.
 NEXT—Defines end of FOR-NEXT loop.
 OFF ERROR—Disables user-defined error trapping.
 OFF TIMER #—Disables a program timer.
 ON ERROR—Initiates user-defined error trapping.
 ON TIMER #—Sets a program timer.
 ON...GOSUB—Computed GOSUB.
 ON...GOTO—Computed GOTO.
 OPTION BASE—Defines lower bound of all arrays in a program.
 POP—Bypasses a pending subroutine return.
 PRINT—Prints information.
 PRINT #—Stores data items in a data file.
 PRINT USING—Prints information according to IMAGE statement.
 PUT—Simulates pressing of corresponding key or keystroke combination.
 RANDOMIZE—Computes new random number seed.
 READ—Assigns values from DATA statements to variables.
 READ #—Retrieves data items from a data file.
 REAL—Dimensions and reserves memory for real variables.
 REM—Program remarks.
 RESTORE—Resets data pointer to a DATA statement.
 RESTORE #—Resets data pointer to line of data file.
 RETURN—Causes program to branch from subroutine to statement following the branching statement that referenced the subroutine.
 SHORT—Dimensions and reserves memory for short precision numeric variables.
 STOP—Halts program.
 WAIT—Interrupts program execution for a specified period of time.

SYSTEM COMMANDS

ALARM OFF—Ignores due appointments.
 ALARM ON—Restores normal handling of due appointments.
 ASSIGN IO—Assigns device codes to peripherals.
 AUTO—Begins automatic line numbering.
 BEEP OFF—Disables beeper.
 BEEP ON—Restores beeper operation.
 BYE—Turns computer off.
 CAT—Displays catalog entry of the specified file.
 CAT ALL—Accesses complete system catalog.
 CAT CARD—Displays catalog information recorded on card track.
 CLEAR LOOP—Resets all HP-IL devices to their initial states.
 CLEAR VARS—Clears values of variables.
 CONT—Continues program execution.
 COPY—Copies specified file in memory to specified destination.
 DEFAULT OFF—Cancels use of default values for improper mathematical expressions.
 DEFAULT ON—Restores use of default values for improper mathematical expressions.
 DEF KEY—Redefines key or keystroke combinations.
 DELAY—Specifies length of time computer will wait between display lines.
 DELETE—Deletes specified line(s).
 DISPLAY IS—Designates specified device as a system display device.
 EDIT—Moves file pointer to specified file.
 ENDLINE—Redefines the end-of-line.
 FETCH—Fetches specified line.
 FETCH KEY—Recalls current definition of specified key or keystroke combination.
 INITIALIZE—Prepares medium in mass storage device to store information.
 LIST—Lists one or more lines of specified file on the display.
 LIST IO—Lists device codes of assigned HP-IL devices on the display.
 LOCK—Locks computer against use without specified password.
 MARGIN—Sets margins.
 MERGE—Merges line(s) from specified file into current file.
 NAME—Renames current file and creates another workfile.
 OFF IO—Suspends HP-IL communication.
 OPTION ANGLE DEGREES—Sets trigonometric mode to degrees.
 OPTION ANGLE RADIANS—Sets trigonometric mode to radians.
 PACK—Packs medium on specified mass storage device.

PLIST—Lists line(s) of specified file on current system printer.
 PRINTER IS—Designates specified device as a printer device.
 PROTECT—Protects magnetic card from being overwritten.
 PURGE—Erases file from memory.
 PWIDTH—Sets line length for PRINT and PLIST instructions.
 RENAME...TO—Changes name of specified file in memory.
 RENUMBER—Renumbers specified portion of file.
 RESTORE IO—Restores HP-IL communication.
 RUN—Begins program execution.
 STANDBY OFF—Turns computer off after five minutes of inactivity.
 STANDBY ON—Sets the computer to stay on indefinitely.
 TRACE FLOW—Sets the computer to display source and destination line numbers of branch in program execution.
 TRACE VARS—Sets the computer to display line number and variable name.
 TRANSFORM—Transforms one type of file in memory into another.
 UNPROTECT—Removes write-protection from magnetic card.
 WIDTH—Sets line length for DISP and LIST instructions.

ARITHMETIC OPERATORS

+, -, *, /, ^, DIV or /

LOGICAL OPERATORS

AND, OR, EXOR, NOT

RELATIONAL OPERATORS

=, <> or #, >, ≥, <, ≤

HP 82700A 8K-BYTE MEMORY MODULE

This module gives you an additional 8K bytes of programmable memory. It easily plugs into the HP-75 to give you a maximum of 24K bytes of RAM.

HP-75 ACCESSORIES

Owner's Manual 00075-90001
 Reference Manual 00075-90004
 Rechargeable Battery Pack 82001B
 Reserve Power Pack 82004A*
 Recharger for Reserve Power Pack (110 volt) 82002A
 AC Adapter/Recharger 82059B
 Security Cradle 82701A
 Field Case 82703A
 30 Blank Magnetic Card Pac 82707A
 100 Blank Magnetic Card Pac 82708A
 Overlay Kit (quantity 5) 82710A
 Notebook Card Holder (quantity 5) 82715A
 Blank Overlay Kit (quantity 50) 82717A

*Requires an HP 82002A Recharger (110 volt).

Data Communications and Bar Code Products[†]

HP 82718A Expansion Pod*

Attach the HP 82718A Expansion Pod to your HP-75D and reap the rewards of a single integrated data communications package!

Data communications capability in the form of a 300-baud, direct-connect modem and 32K or 64K bytes of electronic disc is built into the pod.

Modem and electronic disc commands are built into the pod's 16K

†See software section for Data Communications Pac, and Instruments and Interfaces section for HP 82164A HP-IL/RS-232C Interface.

*Available July, 1984

byte ROM software. The direct-connect, serial, asynchronous, full-duplex modem is compatible with Bell 103/113 modems. Low-level modem commands allow user control of dialing, changing operating modes, and setting handshake protocol and parity. High-level commands are used to turn the modem on and off, transmit strings to and from the modem, and check the status of the modem.

Electronic disc uses RAM to emulate a flexible disc as a high-speed disc drive. Since there's no mechanical hard or floppy disc to slow you down, you get fast data transfer, and

data file access.

Electronic disc commands provide the ability to create, access and modify files, establish a hierarchical directory structure, and copy files into and out of the electronic disc. It's non-volatile, so your information is retained, even when the computer is turned off.

And to top it off, the pod has two industrial bar code decoders built in — 3 of 9 Code and Code 11. For five more decoders, simply slip the HP 82725A Bar Code Reader Module into one of the ports on the HP-75D.



HP 82718A

Expansion Pod Specifications

Dimensions (together

with HP-75D) . . . 16.51 cm (6.5 in) x
29.21 cm (11.5 in) x
5.72 cm (2.25 in)

Weight (together

with HP-75D) . . . 1.60 kg (3.53 lb)

POWER REQUIREMENTS (shared with HP-75D)

Batteries NiCad Battery Pack (HP 82001B)
Battery Current . . . 120 mA (Modem on)
20 mA (XMEM access)
10 mA (STANDBY mode)
100 μ A (SLEEP mode)

OPERATING REQUIREMENTS

Operating temperature . . . 0° to 45°C (32° to 113°F)
Storage temperature . . . -40° to 55°C (-40° to 131° F)
Humidity 0 to 95% relative humidity

Modem Specifications

TELEPHONE INTERFACE

Transmission
Mode serial, asynchronous, full duplex
Handshake XON/XOFF, ENQ/ACK, none
Modulation FSK
Baud Rate 300

Receive Frequencies

(Hz) 2025, 2225 (originate mode);
1070, 1270 (answer mode)

Data Bits 7 or 8

Start Bits 1

Stop Bits 1

Parity odd, even, always 1, always 0, or none

Modes originate and answer
Modem Compatibility . . . Bell 103/113

Dialing automatic or manual, pulse or tone

Ringer

Equivalence 0.8 Bell

JACKS

The following jacks may be used:
Two RJ11C

STATEMENTS AND FUNCTIONS

High-Level Modem Commands

The high-level modem software provides the ability to write BASIC programs that turn the modem on and off, transmit strings to and from the modem, and check the status of the modem. The strings can contain low-level modem commands to directly control the modem.

AVAIL?—Checks to see if there is data available in the modem.

CARRIER?—Checks to see if there is a carrier.

FRAME?—Checks to see if there is a framing error from the last MODIN\$.

HOOK?—Checks to see if modem is on-hook.

INITIALIZE ":MODM"—Resets the modem to its default state.

MODEM OFF—Turns modem off.

MODEM ON—Turns the modem on.

MODIN\$—Reads data from the modem.

MODOUT—Sends a string of data to the modem.

PARITY?—Checks to see if there is a parity error from the last MODIN\$.

READY?—Checks to see if the modem is ready to accept data.

Low-Level Modem Commands

The low-level modem software provides the ability to directly control the modem for operations such as dialing, changing modem operating modes, and setting handshake protocol and parity. All low-level modem commands are sent to the modem using the high-level MODOUT command.

ANSWER—Sets ANSWER mode.

BREAK—Sends a break.

COUNT—Sets ring count parameter.

DIAL—Dials a sequence of numbers.

ECHO—Causes all commands to be echoed.

FORMAT—Sets data format (parity).

GIVEBACK—Sets full or half duplex operation.

HANGUP—Hangs up the phone.

INITIALIZE—Resets the modem.

KONTROL—Sets serial handshake protocol.

LONG—Specifies long or short echoing of commands.

MODEM—Sets MODEM mode.

NEW—Specifies new command character.

(Continued)

ORIGINATE—Sets ORIGINATE mode.
 PICKUP—Picks up phone and sets VOICE mode.
 QUERY—Gets modem status.
 REDIAL—Redials last dialed number.
 TEST—Performs self test.
 UNLISTEN—Allows sending command character as if it were data.
 VOICE—Sets VOICE mode.
 XMIT—Dials a number without call progress reporting after dialing.
 ZAP—Clears modem buffers.

Modem Responses

The modem monitors the status of the phone line and notifies the HP-75D if the status changes with one of the following responses:
 ABORT—Command string aborted without executing.

BAD ANS—Bad carrier was received.
 BUSY—Busy signal detected.
 CONN LOST—Carrier lost from remote modem.
 CONNECT—Carrier acquired and connection made.
 FAIL—Modem failed self test.
 NO ANS—No answer after maximum number of rings.
 NO DIAL—No dial tone found.
 OK—Command string completed.
 RING—Ringback tone or pulse detected.
 RING IN—Incoming ring detected.

Electronic Disc Specifications

STATEMENTS AND FUNCTIONS

NOTE: XMEM is the four character device mnemonic for the electronic disc.

ASSIGN #—Opens a file in extended memory for READ # and PRINT #.
 CAT—Lists catalog information on specific files and directories in extended memory.
 CAT ALL ":XMEM"—Lists catalog information on all files and directories in extended memory.
 COPY—Copies files within and between extended memory, the HP-75D, and HP-IL.
 CREATE DIR—Creates a new directory in extended memory.
 DIR IS—Changes the current directory.
 INITIALIZE ":XMEM"—Resets extended memory.
 MAX XMEM—Returns the amount of RAM in extended memory.
 PRINT #—Writes data to the extended memory file.
 PURGE—Purges files in extended memory.
 PURGE DIR—Removes directory and child files.
 READ #—Reads data from extended memory file.
 REMOVE—Asks user before removing files.
 RENAME—Changes name and/or location of file.
 RESTORE #—Changes the data pointer.
 XCAT\$—Returns catalog of file in extended memory.
 XDIR\$—Returns catalog of current directory.
 XMEM—Returns amount of usable RAM in extended memory.

Bar Code Specifications

STATEMENTS AND FUNCTIONS

CDIGIT—Turns automatic check digit verification by the decoders on or off.
 CDV11—Verifies the check digit for code 11 labels that are entered from the keyboard.
 CDV39—Verifies the check digit for Code 3 of 9 labels that are entered from the keyboard.
 CODE11\$—Scans a single Code 11 label.
 CODE39\$—Scans a single Code 3 of 9 label.

HP 92267A and HP 92267B Digital Bar Code Wands

These wands were designed for use with the HP 82725A Bar Code Reader Module. Each has a rugged yet lightweight plastic case, push-to-read switch, and replaceable sealed sapphire tip. Power consumption is minimized in battery-powered applications since you control the switch. The sealed sapphire tip prevents collection of dust and dirt in the wand, resulting in consistently high performance.

The HP 92267A is a high resolution (0.13 mm, or 0.005 in) wand that's recommended for reading high density labels which are generally produced on specialized printers. The medium resolution (0.19 mm, or 0.0075 in) HP 92267B is recom-

HP 82725A Bar Code Reader Module*

The software that decodes scanned bar code comes packaged in this 8K-byte ROM module. Serial data is "read" by a bar code reader wand and converted by the Bar Code Reader Module into ASCII data. The HP-75D provides the power to process that data on the spot. Or you can send it to a text file, video monitor, or a host computer via modem and phone line. If you use a text file for your data, the file itself can be sent to a host computer or stored on a digital cassette.

The HP 82725A Bar Code Reader Module can decode the following bar codes:

- 3 of 9 Code (USD-3)
- Interleaved 2-of-5 Code (USD-1)

*If you have the HP 82718A Expansion Pod, the Module is not required to read 3 of 9 Code or Code 11.

Specifications

DIMENSIONS	. . . 23 mm (0.9 in) x 132 mm (5.2 in) x 20 mm (0.8 in)
WEIGHT 0.18 kg (0.4 pounds)
CORD LENGTH	. . . 71 cm (28 in) retracted 183 cm (72 in) extended
OPERATING REQUIREMENTS	
Operating temperature	. . . 0° to 55°C (32° to 131°F)
Storage temperature	. . . -40° to 75°C (-40° to 167°F)
Humidity 5 to 95% relative humidity

mended for reading bar code labels produced on good quality dot matrix printers.

Simply connect the appropriate wand directly to the HP-75D's built-in wand interface. Then execute the appropriate bar code command for the label, and scan bar code by

TYPICAL WAND READING CHARACTERISTICS

Parameter	Units	92267B	92267A
Minimum recommended nominal narrow element width	mm	.19	.13
	in	.0075	.005
Tilt angle	degrees	0-45	0-45
Scan speed	cm/sec	7.6-76	7.6-76
	in/sec	3-30	3-30
Wavelength	nm	700	820

moving the wand tip across its length. Data can be displayed for verification and collected in RAM to be processed or transferred to another computer. The HP-75D can be programmed to provide audible and visual operator feedback and prompting.

Specifications

STATEMENTS AND FUNCTIONS

CDIGIT—Turns automatic check digit verification by the decoders on or off.
CDV11—Verifies the check digit for Code 11 labels that are entered from the keyboard.
CDV25D—Verifies the check digit for Industrial 2 of 5 labels that are entered from the keyboard.
CDV25I—Verifies the check digit for Interleaved 2 of 5 labels that are entered from the keyboard.

CDV39—Verifies the check digit for Code 39 labels that are entered from the keyboard.
CODABAR\$—Scans a single CODABAR label.
CODE11\$—Scans a single Code 11 label.
CODE39\$—Scans a single Code 39 label.
EANCOD\$—Scans a single EAN label.
IND25\$—Scans a single Industrial 2 of 5 label.
INT25\$—Scans a single Interleaved 2 of 5 label.
UPCOD\$—Scans a single UPC label.

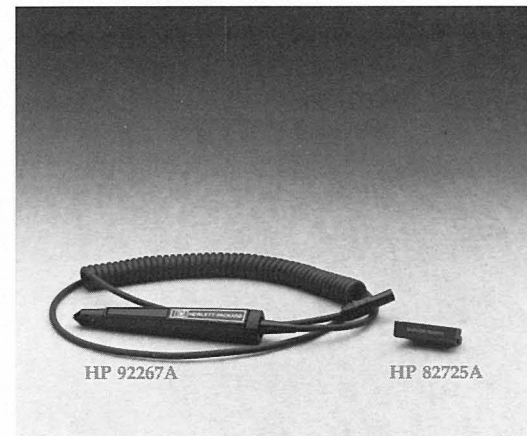
- Industrial 2-of-5 Code
- 2-of-7 Code (Codabar, or USD-4)
- Code 11 (USD-8)
- Universal Product Code (UPC A or E)
- European Article Number (EAN 8 or 13)

The Module was designed to be used with the HP 92267A or HP 92267B Bar Code Reader wand.

You can count on the Module to reliably decode bar code that has a minimum element width of 0.0075

inch, a ratio of wide to narrow elements between 2:1 and 3:1, and is read with a minimum scan speed of 3 inches per second and a maximum scan speed of 30 inches per second. A maximum string length of 42 characters can be decoded.

Two options are available to further ensure the accuracy of the decoders. They are check digit calculation and verification, and the LEN function which verifies the field length of the label scanned.



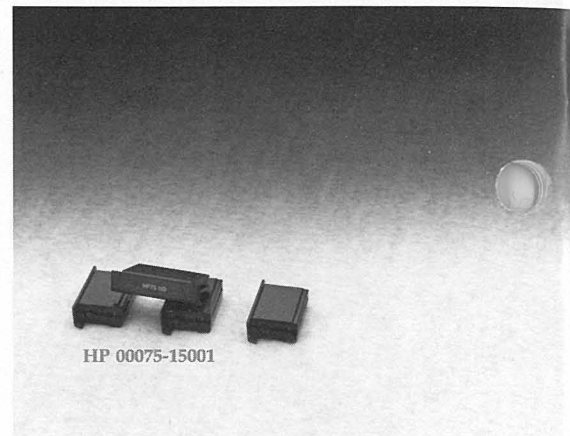
HP 00075-15001 I/O ROM

The Hewlett-Packard I/O ROM (read-only memory) enhances the BASIC language capability of the HP-75D with HP-IL controller and advanced programming commands. It can be used with any HP-IL talker or listener device. The major I/O statements provided by the ROM are OUTPUT, ENTER, SENDIO, ENTIO\$, and

SEND. Using these, and other I/O statements in BASIC programs, you can perform a wide variety of input/output tasks. For example:

- Interface your HP-75 with another computer using the built-in HP-IL interface, and send data from one computer to the other.
- Send data to another computer over telephone lines using a modem.

- Program the HP-75 to enter readings from an HP-IL digital voltmeter, then output the readings to an HP-IL printer.
- Write a program that remotely controls several HP-IL devices and triggers them to take readings. Then, the program can record the readings in program variables.



Specifications

I/O STATEMENTS

ADDRESS—Addresses all devices in the loop and returns a value equal to the number of devices.

ASSIGN LOOP—Causes two-character device codes to be assigned to each device in the loop.

AUTOLOOP—Assigns device codes to all devices in the loop at power on.

DEVADDR—Returns the HP-IL address of the specified device.

DEVAID\$—Returns the Accessory ID as a string.

DEVID\$—Returns the Device ID as a string.

DEVNAME\$—Returns the Device code of the specified device.

ENTER—Inputs bytes from the specified device; uses those bytes to build a number or string; places the result into a BASIC variable.

ENTIO\$—Sends HP-IL commands to specified devices; returns data as a character string.

IMAGE—Specifies format of ENTER or OUTPUT statements.

IOSIZE—Sets the size of the ENTER buffer to the specified value. Controls the maximum number of bytes to be read by a statement or function that causes input of data.

LOCAL—Returns HP-IL devices to local control.

LOCAL LOCKOUT—Locks out local control of HP-IL devices.

OUTPUT—Outputs bytes (string or numeric) to specified devices.

PPOLL—Returns the results of a parallel poll operation.

REMOTE—Sets specified devices to remote mode.

SEND—Sends HP-IL commands and/or data.

SEND?—Returns an integer value representing the position in the string of the character that was unsuccessfully sourced in the last SENDIO statement.

SENDIO—Sends HP-IL commands and/or data to specified devices.

SPOLL—Polls a device in the loop. Returns a number representing the first status byte sent by the polled device.

SPOLL\$—Polls a device in the loop. Returns a string of ASCII characters representing the status bytes set by the polled device.

TRIGGER—Sends the GET (Group Execute Trigger) command to trigger device operation.

I/O SUPPORT STATEMENTS AND FUNCTIONS

ASNLOOP\$—Assigns device codes to devices in the loop and returns a string.

DISPLAY\$—Returns a string listing the device codes of the currently assigned display devices, in order of ascending address.

ENABLE SRQ—Reenables ON SRQ after an ON SRQ execution.

ENDLINES\$—Returns the current endline sequence as a string.

ESC-I/R—Defaults to the ON state and sends escape sequences to control the cursor of the current DISPLAY IS device.

IOSIZE?—Returns the current IOSIZE as a number.

KEYBOARD\$—Returns the device code of the HP-IL device currently assigned as the keyboard.

KEYBOARD IS—Assigns device for keyboard entry.

LISTIO\$—Returns a string listing the device codes of all HP-IL devices in the loop in order of ascending address.

OFF SRQ—Turns off HP-IL service request response.

ON SRQ—Responds to HP-IL SRQ messages.

PRINTER\$—Returns a string listing the device codes of the currently assigned printer devices, in order of ascending address.

REASSIGN—Changes the device code of the specified device to new device code.

RIO—Reads data from the specified HP-IL register.

WIO—Writes data to an HP-IL register.

ADVANCED PROGRAMMING SUPPORT STATEMENTS AND FUNCTIONS

AAND\$—Performs a bit-by-bit logical AND on the bit patterns of the corresponding characters of two strings.

ADJUST—Sets the clock adjust factor to the specified value.

ADJUST\$—Returns a string representing the current adjust factor.

AOR\$—Performs a bit-by-bit logical OR on the bit patterns of the corresponding characters of two strings.

AROT\$—Rotates a string left or right by bit count.

ASC\$—Converts hexadecimal characters to ASCII decimal codes, then returns the string of ASCII characters.

ASCII\$—Returns a string of ASCII characters in the specified range.

ASHF\$—Shifts a string left or right by bit count.

AXOR\$—Performs a bit-by-bit logical EXOR on the bit patterns of the corresponding characters of two strings.

BINAND—Returns the 16-bit logical AND of two integers.

BINCMP—Returns the 16-bit binary complement of an integer.

BINEOR—Returns the 16-bit binary exclusive OR of two integers.

BINIOR—Returns the 16-bit binary inclusive OR of two integers.

BIT—Returns the value of a specified bit in an integer argument.

BREAK—Finds the next position of a character in a list.

BTD—Converts a binary string to a decimal number.

BUF\$—Returns the contents of a specified buffer.

CALL—Calls a basic program with parameters.

COPY:BCRD'—Recovers a bad card with missing tracks.

COUNT?—Returns the current number of characters in the DISP or PRINT buffer.

DEFKEY\$—Returns the current key definition.
 DELAY?—Returns the current delay setting.
 DO ERROR—Causes the specified error condition to occur.
 DTB\$—Rounds decimal number to the nearest 16-bit integer and returns the binary representation as a string.
 DTH\$—Rounds decimal number to the nearest 16-bit integer and returns the hexadecimal representation as a string.
 DTO\$—Rounds decimal number to the nearest 16-bit integer and returns the octal representation as a string.
 ESC\$—Returns a string of escape-character sequences.
 EXIT—Leaves a FOR-NEXT loop early.
 FILL\$—Places the middle string in a string of the specified size, and fills in on the left and right sides with the left and right strings, respectively.
 FIND—Finds the specified occurrence of a substring in a string, with a wild character.
 FLAG\$—Sets a specified bit to a specified value in a given string.
 FLAG?—Tests a specified bit in a string.
 GOSUBX—Performs a GOSUB to the line number derived from the numeric expression, or the line after that if that line does not exist.
 GOTOX—Performs a GOTO to the line number derived from the numeric expression, or the line after that if that line does not exist.
 HAND\$—Performs a bit-by-bit logical AND on the bit patterns of two corresponding characters of two hexadecimal strings.
 HEX\$—Returns a string of hexadecimal characters that represent the bit pattern specified by the ASCII string.
 HOR\$—Performs a bit-by-bit logical OR on the bit patterns of the corresponding characters of two hexadecimal strings.
 HROT\$—Rotates a hexadecimal string left or right by bit count.
 HSHF\$—Shifts a hexadecimal string left or right by bit count.
 HTD—Returns the decimal numeric value of a base 16 representation contained in a string argument.
 HXOR\$—Performs a bit-by-bit logical EXOR on the bit patterns of the corresponding characters of two hexadecimal strings.
 INSTALL—Copies a private file created by MCOPY from tape to RAM.
 LCD—Turns LCD on or off.
 LEFT\$—Returns the number of characters specified, starting from the left end of a string.
 LTRIM\$—Trims the listed characters off the left edge of a string until a character is

encountered that is not in the trim list.
 LWRC\$—Converts the characters "A" through "Z" to lowercase.
 MAP\$—Maps "from" characters into "to" characters in target string.
 MARGIN?—Returns the current right margin setting as a decimal number.
 MCOPY—Copies the entire contents of the master tape onto all of the destination tapes.
 MID\$—Returns specified number of characters from a given string, starting from the start position.
 NSCR\$—Removes the underscore bit from all characters in a string and returns the string without the underscoring.
 OTD—Returns the decimal numeric value of the octal representation contained in a string argument.
 PWIDTH?—Returns the current PWIDTH setting as a number.
 REPL\$—Replaces a substring in a target string with another.
 REV\$—Returns a reversed string.
 RIGHT\$—Returns the specified number of characters at the right end of a string.
 ROT\$—Rotates a string right or left by character count.
 RPT\$—Concatenates pattern the number of times specified by count and returns the resulting string.
 RTRIM\$—Trims trailing characters listed in the trim list.
 SHELL—Turns SHELL mode on or off. If SHELL mode is on, CALL 'filename' is automatically executed for any line that is a valid filename for a BASIC file.
 SKEY\$—Waits for a significant key, and then returns the character associated with any pressed key or keystroke combination, allowing "live" keyboard branching.
 SPAN—Scans target string and returns the position number of the first character found that is not in the list string.
 STATUS—Sets status of system flags.
 STATUS\$—Shows current system flag settings.
 SUB—Defines the beginning of the subprogram and the parameters expected by the subprogram.
 SUB\$—Returns the portion of a string bounded by the left and right positions.
 TCAT\$—Returns catalog entry for the specified file as a string.
 TEMPLATE\$—Returns a template string with protected fields.
 TIMEOUT—Sets timeout mode.
 TIMER?—Returns current timer interval setting.
 TOBASE\$—Converts decimal number to a specified base and returns results as a string.

TODEC—Returns decimal number in floating point format equivalent to the string representation in the specified base.
 USCR\$—Returns specified string, but with underscored characters.
 USERMSG—Sends a message to display and error buffer.
 VERIFY—Sets verify mode for card reader.
 WEND?—Returns the current window end column as a number.
 WIDTH?—Returns the current WIDTH setting as a number.
 WINDOW—Sets the start and end columns of the LCD window.
 WKEY\$—Waits for a key, then returns a character for any key that is pressed.
 WSIZE?—Returns a number representing the number of columns in the current window.
 WSTART?—Returns a number of the starting column of the current window.

FILE MANIPULATION SUPPORT STATEMENTS AND FUNCTIONS

ADVANCE#—Moves data item pointer forward in the file specified by file number.
 CAT#—Returns the file number of the nth ASSIGN# file.
 CLEAR ASSIGN#—Clears all ASSIGN# assignments, recovering space in memory.
 DELETE#—Deletes specified number of data items from specified ASSIGN# file.
 FILE\$—Returns the name of the ASSIGN# file specified by file number.
 INDEX#—Returns the current data pointer position in the specified file, in terms of the number of items from the beginning of the file.
 INSERT#—Inserts an item into the file in front of the item at the current data pointer position.
 ITEM#—Returns the pointer position in the current line.
 LASTLN?—Returns the line number of the last line in the specified file.
 LINE#—Returns the current line number in the specified ASSIGN# file.
 LINELEN#—Returns the number of items on the specified line, in the specified file.
 PRINT# . . . USING—"Prints" to an ASSIGN# file with USING format.
 REPLACE#—Replaces an item currently pointed to in the specified ASSIGN# file with the new item specified by value.
 SEARCH#—Moves item pointer in specified ASSIGN# file to the first occurrence of the specified value.
 SEEK#—Positions item pointer in the specified ASSIGN# file to the specified position.

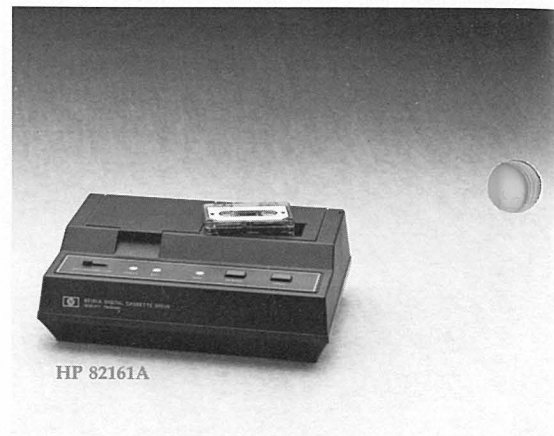
Hewlett-Packard Peripherals

HP 82161A Digital Cassette Drive

The HP 82161A battery-powered digital cassette drive provides convenient data-handling capability for the HP-75. With 128K bytes of on-line mass storage packed into each mini-cassette, you have the power for applications which previously required a larger computer. And you can access files quickly, thanks to variable record length, file-by-name organization, and a tape directory.

All tape movement is under micro-processor control, so you don't waste time. Average rewind time is under 30 seconds, read/write operations are executed at nine inches per second, and search speed is 30 inches per second. You get buffer space for temporary storage of directory information, making access even faster.

The HP 82161A can locate your files under program control.



HP 82161A

Physical Specifications

DIMENSIONS . . . 17.8 cm (7.0 in) x 13.2 cm
(5.2 in) x 6.1 cm (2.4 in)

WEIGHT 798 g (1.8 lbs)

POWER REQUIREMENTS

Batteries four-cell, 4.4 to 6 volt,
quick-charge, nickel-cad-
mium battery pack

Pack recharging
time 14 to 16 hours (Drive
turned on or off)

Usage ON—2 watts maximum
(motor off)
ON—3.5 watts
maximum (motor on)
STANDBY (on)—2.3
watts maximum (motor
off)
STANDBY (on)—3.8
watts maximum (motor
running)
STANDBY (off)—0 watts
maximum (motor off)

DATA FORMAT

Number of tracks . . 2
Density 335 bits per centimeter
(850 bits/inch)
Format 256 bytes per record (8
bits per byte)
Formatted capacity 512 records
(131,072 bytes)
Encoding method bi-phase/level-
phase encoding

DRIVE MECHANISM

Type two-motor, hub drive
Read/Write speed 23 cm (9 in) per sec
Search/Rewind
speed76 cm (30 in) per sec

INTERFACING

Type HP-IL (Hewlett-Packard
Interface Loop)

Default address on
power up undefined

Default address after
auto address
unconfigured . . . 2

OPERATING REQUIREMENTS

Operating
temperature . . . 10° to 40°C (50° to 104°F)
Charging
temperature . . . 15° to 40°C (59° to 104°F)
Storage temperature
without tape . . . -40° to 75°C (-40° to
167° F)

DIGITAL CASSETTE

Type Hewlett-Packard Mini-
Data Cassette
(HP 82176A)

Tape length 24 m (80 ft)

Temperature
limits 10° to 45°C (50° to 113°F)
Humidity (tape storage)
limits 20% to 80% relative
humidity

SPECIAL MODES

Standby



HP 82162A Thermal Printer/Plotter

The HP 82162A provides fast print-outs with 24-character lines. It's battery-powered, so you can produce hard copy in the field.

This HP-IL compatible printer/plotter automatically centers and justifies text to the left or right. It has numeric upper- and lowercase alpha, double-wide characters, and intensity control for optimum contrast and readability.

Physical Specifications

DIMENSIONS . . . 17.8 cm (7.0 in) x 13.2 cm (5.2 in) x 6.1 cm (2.4 in)

WEIGHT 808 g (1.8 lbs) (includes paper and battery)

CABLE LENGTH 86 cm (34 in)

POWER REQUIREMENTS

Battery four-cell, 4.4 to 6 volt, quick-charge, nickel-cadmium battery pack

Battery current (worst case) . . . 250 mA (idle), 5 A (printing)

Recharging time 14 to 16 hours (printer/plotter on or off)

Operating time . . . 3 to 6 hours

CHARACTER SETS

96 standard ASCII
127 modified-expanded ASCII

SPECIAL MODES

Standby, Parse, Bar code, Column, Double wide, Single wide, Graphics, 8-bit escape

PRINT FORMAT

24 standard characters, 12 double-wide characters, 168 dot-columns per line
Upper- and lowercase letters

Special-character generation
Plotting capabilities
101-character buffer

PRINTING

SPEED 24 characters/sec

OPERATING REQUIREMENTS

Operating temperature . . . 0° to 45°C (32° to 113°F)

Charging temperature . . . 15° to 40° C (59° to 104° F)

Storage temperature . . . -40° to 55°C (-40° to 131° F)

Humidity 10% to 90% (non-condensing) at 40° C

THERMAL PAPER

Width 5.7 cm (2.2 in)

Roll length 25 m (80 ft)

Colors blue, black

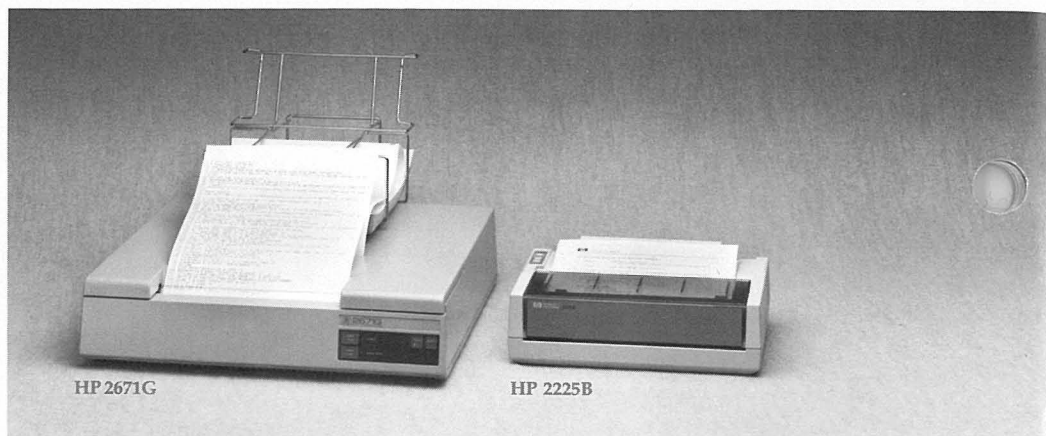
6 rolls/box

INTERFACE

Type HP-IL (Hewlett-Packard Interface Loop)

Startup conditions normal (inactive or active-listener, selected at power-on)

Default address . . undefined (normal startup) or 1 (active-listener startup)



HP 2671A/G Alphanumeric/Graphics Thermal Printers

The HP 2671A Alphanumeric Printer is quiet and fast — 120

characters per second with a smart, bidirectional print path. The 9 x 15 dot matrix provides excellent character definition. Highlight with an underlining feature, print standard English, or use Roman Extension for multilingual text.

sion for multilingual text.

In addition to all this, the HP 2671G offers high-resolution graphics capabilities for charts, tables, illustrations, and graphs.

Physical Specifications

DIMENSIONS . . . 10.5 cm (4.1 in) x
42.8 cm (16.9 in) x
42.4 cm (16.7 in)

WEIGHT 6.9 kg (16 lbs)

POWER REQUIREMENTS

Line voltage +5%, -10%
HP-IB built in
HP-IL Opt. 048
RS-232C Opt. 040
100, 120, 200 and 240 Vac, switch selectable
Frequency 47.5-66 Hz
Power
consumption . . . 15 watts maximum
non-printing
50 watts maximum
printing

OPERATING REQUIREMENTS

Operating
temperature 5° to 35°C (41° to 95°F)
Humidity 10% to 90% non-
condensing

PRINT FORMAT

Technique dot-matrix thermal
Speed 120 characters/sec
bidirectional; logic
seeking in text mode.

Character structure 9 x 15 dot-matrix

Print Pitch	Line length (characters)
16.20	132
10.00	80
Character Sets . . . 128 USASCII; Line drawing; Roman Extension (international characters, 8-bit mode)	

FORMS HANDLING

Form feed button
Margin control

FORMS SPECIFICATIONS

Thermal paper
width 21.6 cm (8.5 in)
Paper options include fan-folded, page
perforated; roll; or roll, page perforated

OTHER PRINTING FEATURES

Underlining character enhancement

OTHER

2671G raster graphics; Type; Unidirectional
raster graphics copy; 90 dots/in. horizontal
and vertical resolution; 720 dots across a
raster row.

HP 2225B ThinkJet Printer

The ThinkJet prints bidirectionally at 150 characters per second to produce 80-column pages of graphics or text in the office or in the field. With sound pressure at under 50 decibels, printer noise need never interrupt your train of thought again.

An inexpensive, disposable cartridge holds the print head and ink reservoir, and is capable of printing approximately 500 full pages before replacement. Ink is delivered to the paper on demand, and dries immediately.

The 11 x 12 dot-matrix format text mode has a logic-seeking feature to

find the fastest print route. Add a bold mode that won't slow printing speed to handle most of your near letter-quality needs. A ROMAN8 character set provides 216 printable characters to meet your multilingual printing needs. Print on single sheets or fanfold paper.

Physical Specifications

DIMENSIONS . . . 8.9 cm (3.5 in) x 29.2 cm
(11.5 in) x 20.6 cm (8.1 in)

WEIGHT 2.5 kg (5.5 lbs)

POWER REQUIREMENTS

Battery 6 cell, 4.4 to 6 volt,
quick-charge, nickel-
cadmium battery pack
(HP 82199A).

Battery current
(worst case) . . . 20 mA (idle)
1.5 A (printing)

Recharging
time 14 hours approximately
(battery either in or out)

Operating
time over 200 typical pages

OPERATING REQUIREMENTS

Operating
temperature 10° to 40° C (50° to 104° F)
Storage
temperature -20° to 60° C (-4° to
140° F)

Relative
humidity 10% to 90%

PRINT FORMAT

Technique Ink-jet dot matrix
Speed 150 characters/sec;
bidirectional; logic-
seeking in text mode

Text mode character
cell structure . . . 11 x 12 dot matrix

Graphics mode
resolution 96 x 96 or 192 x 96 dots/in
Characters per line 40, 71, 80, 142

Print Pitch (CPI)	Line length (characters)
12.0 Normal	80
6.0 Expanded	40
21.3 Compressed	142
10.7 Expanded- Compressed	71
Character Set . . . ROMAN8	
Printhead life . . . 500 typical pages	

PAPER FEED . . . Pin feed and friction

PRINT BUFFER . . One kilobyte



HP 7470A Graphics Plotter

The HP 7470A Graphics Plotter uses a two-pen system to produce high-quality color charts and graphs that fit in your briefcase and go with you anywhere. It works with paper or overhead transparency film for your professional presentations.

More than 40 HP-GL (Hewlett-Packard Graphics Language) instructions are built in, letting you program the plotter to perform a variety of complex operations, such as selecting pen velocity and defining your own characters. Text can be written in any direction, with or without slant, and in many sizes. Built-in symbol plotting and seven dashed-line fonts help you clarify complex relationships.

HP 82168A Acoustic Coupler (Modem)

With the battery-powered portable coupler, the HP-75 can talk to other computers over voice-quality telephone lines from remote locations. The 300-baud device meets the Bell 113 standard and can be used anywhere a conventional (G-type) telephone receiver is available.

The coupler is compatible with HP-IL (Hewlett-Packard Interface Loop) and can be turned on or off by a controller. Or, it automatically turns itself off after 10 minutes of inactivity. Mode changes are under software control, making communication easier.

Data Communications Pac software is the quickest and easiest way to operate the coupler with the HP-75. You also can use the combination of I/O Utilities Card (available in the HP-75 Utilities Solutions Book, 00075-13013) and Asynchronous

Physical Specifications

DIMENSIONS . . . 12.7 cm (5 in) x
43.2 cm (17 in) x
34.3 cm (13.5 in)

WEIGHT 6.1 kg (13.5 lbs)

POWER REQUIREMENTS

Line voltage +5%, -10%
RS-232C Opt. 001; HP-IB Opt. 002;
HP-IL Opt. 003

OPERATING REQUIREMENTS

Operating
temperature . . . 0° to 55°C (32° to 131°F)
Storage
temperature . . . -40° to 75°C (-40° to
167°F)

PLOTTING AREA

Y-axis 190 mm (7.5 in)
X-axis 273 mm (10.7 in)
metric setting
258 mm (10.2 in) English
setting

MEDIA SIZES

8½ x 11 in (ANSI A); 210 x 297 mm (ISO A4)

RESOLUTION

Smallest addressable
step size 0.025 mm (0.001 in)

REPEATABILITY

With a
given pen 0.1 mm (0.004 in)
From pen
to pen 0.2 mm (0.008 in)

PEN VELOCITY

Pen down maximum—38.1 cm/sec
(15 in/sec)
programmable—1 to 38
cm/sec in 1 cm/sec
increments

Pen up 50.8 cm/sec (20 in/sec)

ACCELERATION Approximately 2g

Physical Specifications

DIMENSIONS . . . 25.7 cm (10.1 in) x 9.7 cm
(3.8 in) x 5.7 cm (2.2 in)

WEIGHT 650 g (22.9 oz)

POWER REQUIREMENTS

2.2 to 4.8 Vdc
Recharger
Input 90 to 120 Vac, 50 to 60
Hz, 7 watts
Output 8 Vac, 3 watts maximum
Power
consumption . . . 440 mW

OPERATING REQUIREMENTS

Operating
temperature . . . 0° to 45°C (32° to 113°F)
Charging
temperature . . . 15° to 40° C (59° to 104° F)
Storage
temperature . . . -40° to 65°C (-40° to
149° F)

TELEPHONE INTERFACE

Data transmission
rate 300 baud

Input buffer
capacity 40 bytes

Output buffer
capacity 40 bytes

Compatibility . . . Bell-type 113 series
coupler

Transmit frequencies
(Hz) 1070, 1270 (originate
mode)

Receive frequencies
(Hz) 1070, 1270, (originate
mode)

Frequency stability
control crystal (parallel)

Receiver
sensitivity -45 dBm (nominal)

Transmit
level -15 dBm (nominal)

Modulation Frequency Shift Keyed
(FSK)

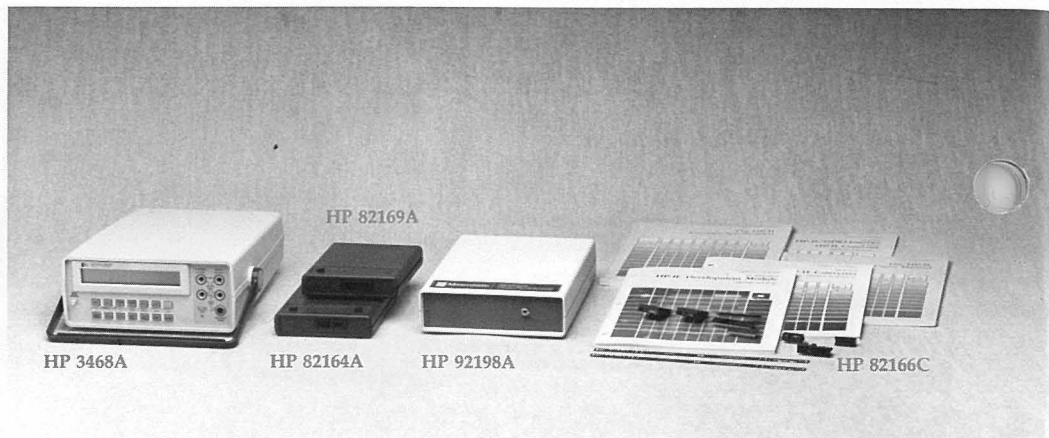
Carrier detect
delay 1.5 sec (average)

CONTROL PROTOCOLS

ENQ/ACK
XON/XOFF
NONE

Terminal Emulator Program. The terminal emulator program may be found in the HP 82168A Acoustic Coupler manual.

Hewlett-Packard Instruments and Interfaces



Instruments

HP 3468A Digital Multimeter*

HP's first HP-IL (Hewlett-Packard Interface Loop) instrument is a low-cost, autoranging digital multimeter for your HP-75 portable and bench applications. It electronically calibrates itself, measures ac and dc voltages and currents, and makes four-wire and two-wire resistance measurements.

The device has $5\frac{1}{2}$ to $3\frac{1}{2}$ digits, five functions, and a $1\text{-}\mu\text{V}$ sensitivity.

HP 3421A Data Acquisition/ Control Unit*

The Data Acquisition/Control Unit provides low-cost automated measurement and control for your portable and bench test needs. Scan and measure up to 30 differential channels or 56 single-ended channels of dc and ac voltage, resistance, temperature, and frequency; or read and write digital information and actuate control signals. It stores up to 30 analog readings in an internal buffer for later use by the computer.

HP 5384A/HP 5385A(Option 003) Frequency Counters*

Two electronic frequency counters provide low-cost measurement performance for your bench, field, and system applications. Measurement resolution of 9 digits per second and a liquid-crystal display assure you of highly readable results. High input sensitivity across a broad range of frequencies lets you solve a variety of frequency measurement problems using just one counter. And, extensive signal conditioning provides reliable measurements.

Interfaces

HP 82169A HP-IL/HP-IB Interface

The HP 82169A expands HP-75 control and communication capabilities by linking low-cost HP-IL (Hewlett-Packard Interface Loop) systems with high-performance HP-IB (IEEE 488) computers and lab equipment. It puts at your disposal a variety of peripherals, instruments, and computers, including more than 120 HP-IB-compatible devices made by HP and many more offered by other manufacturers.

With the HP-IL/HP-IB interface, you can operate HP-IB versions of the HP 7470A and HP 9872B plotters; operate and control power supplies and instruments such as the HP 1980 oscilloscope; and talk directly with HP-IB computers such as HP Series 100, 200, 1000, and 3000.

HP 82164A HP-IL/RS-232C Interface

The HP 82164A is a fully asynchronous bit-serial interface that lets an HP-IL (Hewlett-Packard Interface Loop) controller, such as an HP-75, talk to and work with computers, terminals, peripherals, and modems.

HP 82938A HP-IL/Series 80 Interface

With the HP 82938A, a Series 80 computer can act as a system controller or device in an HP-75/HP-IL (Hewlett-Packard Interface Loop) system. You can take advantage of Series 80 graphic capabilities to display information in easy-to-understand graphs and charts. Or, with Series 80 data communication products, you can pass information to larger computers.

HP 92198A Mountain Computer 80-Column Video Interface

You can use this interface to display data and listings from an HP-75/HP-IL system on a standard video monitor. Add an RF modulator and use it with a conventional TV set. View your electronic spreadsheet, word processing, and other applications in 24 row by 80 column format, or choose 20 rows by 40 columns. Characters also can be displayed in inverse video (dark characters on a light background).

HP 82166C HP-IL Interface Kit*

This prototyping kit contains four sets of components and all the documentation needed to design HP-IL (Hewlett-Packard Interface Loop) capabilities into microprocessor-based devices.

The kit includes:

- HP-IL Integrated Circuits. These general purpose ICs provide a convenient interface between most standard microprocessors and HP-IL.
- HP-IL Transformer Set. This component provides electrical isolation of devices on the loop, as well as voltage level conversion and impedance matching.
- HP-IL Panel Receptacle. It provides a foolproof mechanical method of connecting HP-IL devices.

These components may be purchased individually when design is completed.

*Not available at retail. Contact your nearest HP sales office for more information.

Hewlett-Packard

HP-75D Communications

Configuration Guide

The chart on the right provides information on how to configure software and hardware communications products. The software options (in the column at the far left) include two types of products: the Data Communications Pac, which has easy-to-use built-in programs; and other options, which are tools that require some programming. (The I/O Utilities requires a sophisticated understanding of frame level HP-IL protocol.) For one of these options, a data sheet is available that provides sample programs plus additional information. Other data sheets will become available at a later date.

For the most part, all cables and other equipment that are required are provided with the products when purchased. When other elements are needed for operation, they are listed. (A notation of N/A means a product is not supported by that particular hardware, and a ✓ means it is.)

Hardware Options	HP 82168A Acoustic Coupler	HP 82164A HP-IL/RS-232C Interface	HP 82718A Expansion Pod (Integral Direct-Connect Modem)	HP 82938A HP-IL/ Series 80 Interface
Software Options				
Data Communi- cations Pac 00075-15035	✓ Allows set-up files for main- frame protocol requirements.	✓ Can be used with RS-232C compatible modem or directly with an RS-232C main- frame. Allows set-up files for mainframe protocol requirements.	N/A	N/A
I/O ROM 00075-15001	✓	✓ Refer to data sheet (5954- 1142)* for an example using the HP 3000. Required: RS-232 cable may be required.	N/A	✓ Data sheet not available for I/O ROM. Programs written for I/O Utilities Solu- tions Book (00075-13013) may be used as an example, to be edited for I/O ROM commands. Required: • Series 80 personal computer • HP 82936A Series 80 ROM Drawer (for HP-85 only) • Series 80 I/O ROM or Plotter/Printer ROM
I/O Utilities Solutions Book 00075-13013	✓	✓ See same data sheet as I/O ROM above. Required: RS-232C cable may be required.	N/A	✓ Refer to data sheet (5953-5573) Required: Same as for I/O ROM above.
Expansion Pod software HP 82718A	N/A	N/A	✓ The 16K ROM software built into the Pod allows trans- mission of data to and from the modem, control of dialing, changing op- erating modes, and setting handshake pro- tocol and parity.	N/A

*Available June, 1984

Hewlett-Packard HP-75 Software

Data Communications Pac HP 00075-15035

Connect directly to a host computer or use a modem with the Data Communications Pac and an HP-75 for easy access to other computer systems or commercial time-sharing systems such as THE SOURCESM, Dow Jones News/Retrieval Service[®], and CompuServe.

You can obtain stock quotes, send or receive mail electronically, and access complete libraries of information anywhere, anytime.

Data Communications is a versatile package providing terminal emulation capability for the HP-75. Setup files allow the HP-75 and a modem to be configured for communication with a variety of host computers.

Special code words are used to provide flexible system configuration and to allow common log-on procedures to be stored and recalled from the program.

An editor is available to add, delete, change, or list code words in set-up files.

Other features allow:

- Incoming and outgoing data to be sent to the HP-75's liquid-crystal display, a printer, and/or a video interface.
- Storage of incoming information in a 500-character buffer for later review.
- Transfer to a host computer of text files written offline.
- Incoming information to be saved in the HP-75's text file for later viewing, editing, or printing.

THE SOURCESM is a service mark of Source Telecomputing Corp., a subsidiary of Reader's Digest Association.

Dow Jones News/Retrieval Service[®] is a registered trademark of Dow Jones & Company, Inc.

Specifications

CAPACITY

Approximately one page of information is stored in a buffer when using the LCD as the display device for the HP-75 Portable Computer.

Approximately six pages of text can be transferred between the HP-75 and a host computer system.

Additional four pages of text can be transferred using the HP 82700A 8K-byte Memory Module.

COMMAND SUMMARY

?—Help.
C—Change set-up file.
D—Dial.
E—Set-up file editor.
H—Hang up the phone.
L—Toggle LCD ON/OFF.
P—Toggle printer ON/OFF.
Q—Leave DataComm program.
S—Send special code word.
T—Terminal mode.
V—Toggle video ON/OFF.
X—Transfer text file.

Editor commands

A—Add code word.
C—Change code word.
D—Delete code word.
L—List set-up file.
Q—Leave editor.
?—Help.

LCD control modes

[I/R]—Toggle between scroll and line display mode.
[FET]—Toggle between terminal and buffer mode.

Additional Software

HP 00075-15014 VisiCalc[®]

Perform spreadsheet analysis anywhere with HP-75 VisiCalc Application Pac software. Simply plug the 32K-byte VisiCalc ROM module into your HP-75 Portable Computer to organize lists, file your data, evaluate alternative courses of action — and get your answers instantaneously.

Program capabilities let you: store multiple worksheets in memory simultaneously, and call data from another worksheet to be used in calculations; call up BASIC programs to create your own extension functions for specialized computation; redefine how HP-75 VisiCalc works; identify rows and columns with easy-to-remember names instead of letter/number coordinates; and get "what if" results quickly and easily with the Alternate Viewing Window.

Specifications

VISICALC COMMANDS

/D—Delete	/P—Print
/F—Format	/R—Replicate
/G—Global	/V—Video
/H—Header	/W—Width
/I—Insert	/- —Repeating labels
/M—Move	

All of the HP-75's numeric functions may be used in cell formulas, except: LEN, NUM, POS, and VAL. In addition, the following VisiCalc functions are provided:

AVERAGE(list)—Computes arithmetic mean or average of numeric parameters in the list.

ERROR—Results in an "Error" value that makes all expressions using the value display ERROR in the cell display.

MAXL(list)—Computes the maximum value in the list.

MEAN(list)—Computes arithmetic mean of values in the list.

MINL(list)—Computes the minimum value in the list.

NA—Results in a "Not Available" value that makes all expressions using the value display NA.

SUM(list)—Computes the sum of the values in the list.

VisiCalc[®] is a registered trademark of VisiCorp.

Text Formatter HP 00075-15019

With portable Text Formatter software and an HP-75, you have word processing power at your fingertips anytime, anyplace. Simply plug the 8K-byte Application Pac module into the computer to create memos, letters, reports, and other short documents quickly and easily.

Text Formatter is the perfect complement to the HP-75's built-in text editing capability. The text editor lets you input and modify text (weed out typos; search for words; insert or delete characters, words, or blocks of text). Text Formatter lets you control the appearance of the text (define paragraphs, set headings, number pages, and justify text).

You can store up to ten pages of text in the HP-75 with an HP 82700A 8K-Byte Memory Module.

Specifications

COMMAND SUMMARY

AD—Advance page
CE—Center mode
CO—Copy mode
DL—Distribution list
FI—Fill mode
JU—Justify mode
MA—Margins
ME—Merge
PA—Paragraph
PL—Page length
PN—Automatic page numbering
SK—Skip lines
SL—Slide
SP—Spacing
TA—Tab

Surveying Pac HP 00075-15012

This handy Application Pac software gives you one integrated program that handles your routine surveying calculations, such as traversing, inversing, coordinate geometry, curve layout, and radial staking. Plugged into the HP-75 Portable Computer, it permits convenient data entry in the field followed by quick, easy calculation in the field or back at the office.

The Surveying Pac has a unique system that lets you enter data in a variety of ways: by using bearings, north and south azimuths, angles left or right, and horizontal deflections left or right. You can choose any of these input modes independently of the output mode desired.

Its friendly, menu-driven system eliminates the need to memorize cumbersome commands or to use keyboard overlays. Descriptive prompts guide you through each function. And if a mistake is made, the system displays an error message and allows reentry of the data.

Specifications

COMMAND SUMMARY

Point Manipulation

Enter & Assign	Rotate
List	Translate
Clear	Scale
Duplicate	

Field Control

Enter & Reduce Field Notes
Slope Reduction
Side Shots
Computer Error of Closure
Angle Balance
Bowditch or Compass Rule Balance
Crandall's Rule Balance
Radial Stake Out

Coordinate Geometry

Traverse
Inverse
Bearing-Bearing Intersection
Bearing-Distance Intersection
Distance-Bearing Intersection
Distance-Distance Intersection
Inscribed Curve with Straight Tangents
Inscribed Curve with Curved Tangents
Inscribed Curve with Straight & Curved Tangents
Curve Inverse
Solve for a Curve Given Arc Length
Solve for a Curve Given Chord Length
Solve for a Curve Given Central Angle
Solve for a Curve Given Tangent Length
Compute Area (including curved sides)

Math Pac HP 00075-15015

The Math Pac is a powerful analytical tool for solving a wide range of mathematical problems. Its function set consists of a group of easy-to-learn BASIC commands that range from simple numeric and string

functions to a sophisticated polynomial rootfinder. With the 16K-byte module plugged into the HP-75, these commands are instantly available for your programs or for direct execution in the computer's calculator mode.

Functions include: Numeric and

base-conversions; explicit and implicit array redimensioning; real and complex matrix operations; input and output of arrays; complex functions; polynomial root finder; solution to $f(x)=0$; definite integrals; and fast Fourier transform.

Specifications

STATEMENTS AND FUNCTIONS

ABSUM—Sum of absolute values of elements in array.
ACOSH—Inverse hyperbolic cosine.
AMAX—Value of largest element in array.
AMIN—Value of smallest element in array.
ASINH—Inverse hyperbolic sine.
ATANH—Inverse hyperbolic tangent.
BSTR\$—Decimal to Binary/Hexadecimal/Octal conversion.
BVAL—Binary/Hexadecimal/Octal to decimal conversion.
CNORM—Largest sum of absolute values of elements in each column of array (column norm).
COSH—Hyperbolic cosine.
DET—Determinant of matrix.
DETL—Determinant of last matrix inverted in MAT INV statement or specified as first argument in MAT SYS statement.
DOT—Sum of products of corresponding elements of vectors (dot product or scalar product).
FACT—Factorial/Gamma function.
FNORM—Square root of sum of squares of elements in array (Frobenius norm or Euclidean norm).
FNROOT—Finds root of user-defined function.
INTEGRAL—Evaluates definite integrals of user-defined functions.
LBND—Lower bound of array subscripts.
LOGA—Base Y log of X.
LOG2—Base 2 log of X.
MAT—Assigns value of numeric expression or values of all elements of operand array to elements of result array.
MAT (+, -, *)—Performs specified arithmetic operations between two arrays.
MAT (* Scalar)—Multiplies an array by a scalar.
MAT CACOS—Complex inverse cosine.
MAT CACOSH—Complex inverse hyperbolic cosine.
MAT CADD—Complex number addition.

MAT CASIN—Complex inverse sine.
MAT CASINH—Complex inverse hyperbolic sine.
MAT CATANH—Complex inverse hyperbolic tangent.
MAT CATN—Complex inverse tangent.
MAT CCOS—Complex cosine.
MAT CCOSH—Complex hyperbolic cosine.
MAT CDET—Determinant of a complex matrix.
MAT CDIV—Complex number division.
MAT CEXP—Complex exponential.
MAT CIDN—Complex identity matrix.
MAT CINV—Inverse of a complex matrix.
MAT CLOG—Complex logarithm.
MAT CMMULT—Multiplication of complex arrays.
MAT CMULT—Complex number multiplication.
MAT CON—Assigns value 1 to all elements of array.
MAT CONJ—Conjugate of a complex number.
MAT CPOWER—Complex involution.
MAT CPTOR—Polar to rectangular conversion.
MAT CRECP—Reciprocal of a complex number.
MAT CROOT—All N complex Nth roots of a complex number (result implicitly redimensioned to $N \times 2$).
MAT CROSS—Finds cross product (vector product) of two 3-element vectors.
MAT CRTOP—Rectangular to polar conversion.
MAT CSIN—Complex sine.
MAT CSINH—Complex hyperbolic sine.
MAT CSQR—Complex square root.
MAT CSUB—Complex number subtraction.
MAT CSUM—Adds values of elements in each column of array.
MAT CSYS—Solution of a system of complex linear equations.
MAT CTAN—Complex tangent.
MAT CTANH—Complex hyperbolic tangent.
MAT CTRN—Conjugate transpose.
MAT DISP—Displays elements of arrays.

MAT DISP USING—Displays elements of arrays according to format string specified in this statement or in IMAGE statement whose statement number is specified.
MAT FDUR—Complex to complex Fast Fourier Transform.
MAT IDN—Assigns value 1 to all diagonal elements of matrix, and value 0 to all others.
MAT INPUT—Assigns values input from keyboard to elements of arrays.
MAT INV—Finds inverse of matrix.
MAT LUFACT—Performs LU factorization of a matrix.
MAT PRINT—Prints elements of arrays.
MAT PRINT USING—Prints elements of arrays according to format string specified in this statement or in IMAGE statement whose statement number is specified.
MAT PROOT—Finds all roots (real & complex) of a polynomial with real coefficients.
MAT READ—Assigns values listed in DATA statements to elements of arrays.
MAT RSUM—Adds values of elements in each row of array.
MAT SYS—Solves matrix equation $A_x = B$ for unknown array X, given any square matrix A and any other array B.
MAT TRN—Finds transpose of array.
MAT ZER—Assigns value 0 to all elements of array.
MAXAB—Largest absolute value of any element in array.
MINAB—Smallest absolute value of any element in an array.
REDIM—Changes working size of arrays to size specified.
RNDRM—Largest sum of absolute values of elements in each row of array.
ROUND—Round X at Nth digit.
SINH—Hyperbolic sine.
SUM—Sum of elements in array.
TANH—Hyperbolic tangent.
TRUNCATE—Truncate X at Nth digit.
UBND—Upper bound of array subscript.

Solutions Books

Easy-to-use HP-75 Solutions Books come complete with preprogrammed magnetic cards and documentation. These ready-to-use programs are also available on cassettes from the Users' Library.

- Math I (00075-13003)
- Math II (00075-13004)
- Math III (00075-13005)
- Finance (00075-13009)
- Games I (00075-13006)
- Games II (00075-13007)
- Real Estate (00075-13010)
- I/O Utilities (00075-13013)*
- Electronics (00075-13008)
- Test Statistics (00075-13012)
- Graphics (00075-13016)
- Mass Media Duplication/Privacy (00075-13015)
- Statistics (00075-13011)

Additional Solutions

Software Development Tools

By itself, the HP-75 has a built-in BASIC interpreter and a comprehensive set of editing functions that smooth and speed the development of BASIC language software. The HP 82713A Plug-In Module Simulator (PMS) is added to develop and field test BASIC language custom software and to reproduce it in plug-in modules. The 16K-byte medium consists of a device that simulates a plug-in ROM module, as well as a set of HP-75 BASIC commands on magnetic cards. BASIC language programs written on the HP-75 can be loaded into the PMS and run as if they were plug-in modules. When you're satisfied the custom program is viable, HP will reproduce it in as many custom modules as needed.

PMS has a built-in lithium battery that lets it retain its contents when unplugged.

HP-75 Custom Products

To solve your routine programming and data handling problems, you'll want to consider HP-75 Custom Product applications. Keys on the HP-75 are user-definable. Custom Keyboard Overlays make data entry quicker and easier. Up to three custom software modules can be plugged easily into the HP-75, providing as much as 96K bytes of custom ROM software. You can choose from a variety of inexpensive media for your special applications. For more information, contact your HP sales representative or dealer.

Users' Library Software

More than 100 programs in math, business, statistics, and engineering are included in the Users' Library "Catalog of Contributed Programs" for the HP-75. And the Users' Library welcomes more. The catalog contains information on how to buy and submit programs and on how to become a Library member. Program documentation includes individual program listings, and it's available with or without magnetic cards. You also can purchase programs on minicassettes for the HP-IL Digital Cassette Drive.

For more information about Library solutions, contact the Users' Library; 1000 N.E. Circle Blvd.; Corvallis, OR 97330

*Requires an understanding of frame level HP-IL protocol.

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Technical information covered in this brochure is subject to change without notice.

For additional information or a demonstration of Hewlett-Packard professional calculators and handheld computers, visit your nearest HP dealer. For the location and number of the dealer nearest you, call toll-free 1-800-FOR-HPPC (1-800-4772).

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