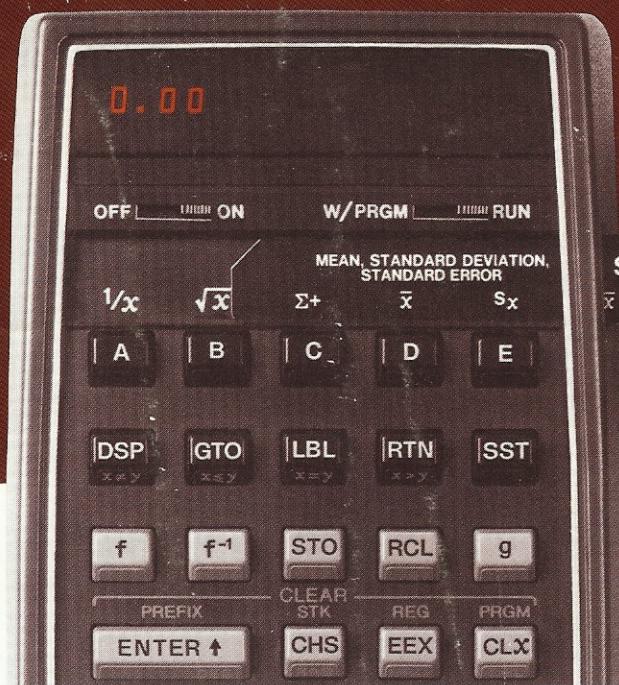


# HP-65

# KEY NOTE

for HP-65 owners

HEWLETT  PACKARD



STD 02A

## Inside the HP-65

It's unlikely that you've seen what's inside your calculator. And it's not too likely that you'll *ever* take it apart! So we took a photograph of the HP-65 partially assembled so that you could see the main internal parts.

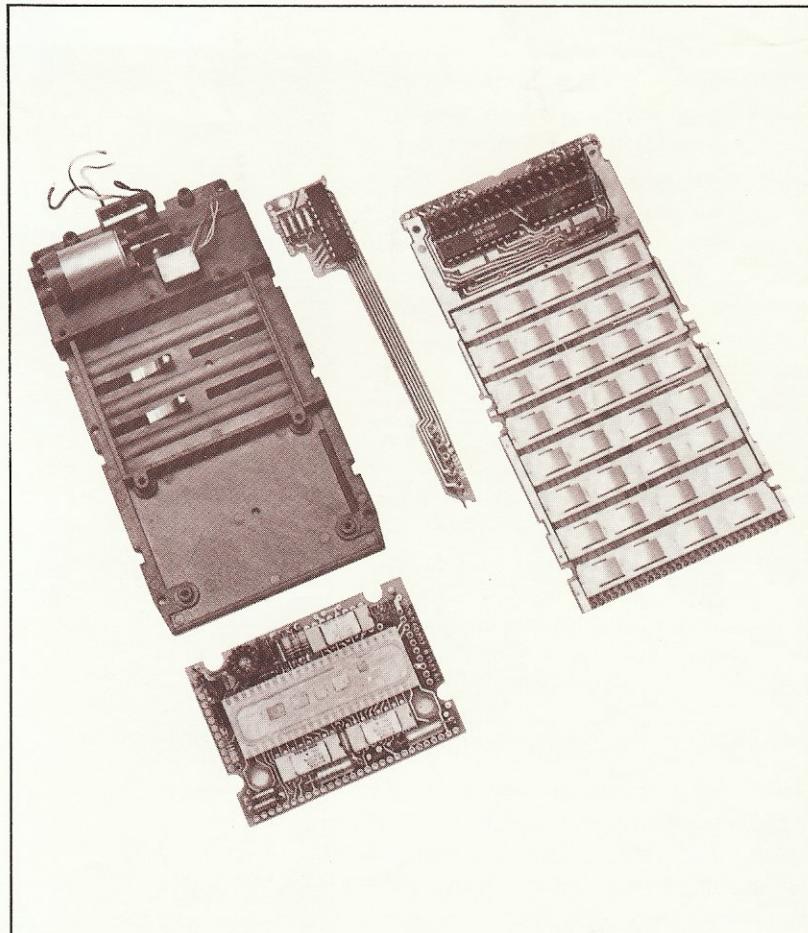
The piece on the right side of the photo is the keyboard printed-circuit assembly. The dark area across the top is the light-emitting diode (LED) assembly, which is underneath the display window on the front of your calculator. Running across the keyboard are eight rows of key switch strips. The metal humps on the switch strips are pressed down by the keys to make contact with printed traces underneath. The 35 keys on the keyboard are mounted directly above each "switch" and are held in place by a key retainer grid and the top case assembly.

In the center of the photo is the card reader board assembly. It is the interconnection between the read/write head, the electric motor, and the logic board assembly. Notice that a printed-circuit board, not just wires, is used to interconnect the top and bottom electronics.

On the left is the support plate assembly, with the card reader assembly mounted at the top area. You can see the motor at top left and the read/write head to the lower right of the motor. You are looking at the bottom side of the calculator. Notice the two battery connector springs in the center area of the support plate. You see these when you remove the battery pack from your HP-65.

*(Continued)*

Summer 1974  
Volume 1  
Number 1



At lower left is the logic board assembly. This contains the arithmetic logic unit and most of the other "brains" of the HP-65. It attaches to the support plate directly above it in the photo. It's hard to believe that this small assembly contains the equivalent of nearly 75,000 transistors. Just imagine the equivalent of *that* in vacuum tubes!!

Of course, there are several other small parts and, naturally, the bottom and top case assemblies. Essentially, however, the assemblies shown in the photo (plus the battery pack) are what make your HP-65 the remarkable device that it is.

## Users' Library Corner

In the time-crunch of our modern high-speed society, it seems that many of you are taking advantage of the time-saving benefits offered by the HP-65 Users' Library. In fact, there has been a tremendous response; orders continue coming in at an ever-increasing rate. It appears that the Library is an overwhelming success.

After all, think of the advantages of not having to develop all of your own programs. First, you save time—and therefore money. You don't have to research the application. You don't have to program the problem. And you don't have the onerous task of checking the program. And, last but not least, you save the time and trouble of completely documenting everything. What could be better?

Of course we don't advocate that you give up the pleasure of formulating your own programs. However, why spend time doing what someone has already done? Or why struggle through a problem that might be just a bit beyond your capabilities? All you have to do now is look in your catalog, find the program that will solve your problem, and send in your order.

### WHAT'S IN THE LIBRARY NOW??

All 210 programs from the six application pacs now available to HP-65 owners, and listed below, are available individually (less magnetic cards) from the Users' Library. This means that if you don't require all the programs in a pac, you can order from the Library only those that you need. Furthermore, as new

application pacs become available, the programs from them will be available through the Library. The application pacs now available are:

Math Pac 1  
Math Pac 2  
Stat Pac 1  
Surveying Pac 1  
E.E. Pac 1  
Medical Pac 1

There are also 39 contributor programs presently in the Library and listed in the *Catalog of Contributed Programs*. And the list is rapidly growing. There will be plenty more to report about in the next issue of **KEY NOTE**.

### NEW PROGRAMS

New program submittals are coming in for a full range of categories—and then

some! These will be in the next issue of the *Users' Library Catalog*, which probably will be released and mailed to you by early autumn.

With so many really fine submittals, it is hard to pick a few to list here. So don't feel slighted if we have not chosen yours. To give you an idea of the range, here are five new submittals. You can order any of these by the Library Program Number.

### 1. MOON ROCKET LANDING SIMULATOR (ORDER #00287A)

This program simulates landing a rocket on the moon. You are given an initial altitude, velocity, and fuel supply. By a series of rocket motor burns, you must try to land on the moon's surface at zero velocity before you run out of fuel.

*Author:* Jacob R. Jacobs, Mtn. View, California.



## 2. BIORHYTHMS (ORDER #00284A)

The biorhythm theory postulates that there are certain metabolic rhythms that have a constant cycle time in the human body and are known as inner clocks.

Two physicians, one a contemporary of Freud, concurrently described a 23-day cycle that correlated with physical vitality, endurance, and energy; and a 28-day cycle that corresponds to sensitivity, intuition, and cheerfulness. A third cycle was a 33-day cognitive or intellectual cycle that relates to mental alertness and judgment. All three cycles start up in a positive direction from birth or the beginning of independent life.

The days on which the median line is crossed are called critical days, especially for the physical and sensitivity cycles, and are days when accidents are most likely to occur. The high periods in the various cycles are the times when you should have the most energy and be most cheerful, outgoing, and mentally alert. The low times are regarded as the recuperative periods.

Although all cycles are said to start from zero at the time of birth, biorhythms have nothing to do with astrology.

This program allows one to calculate the values of these rhythms for any date, given a person's birthdate. All dates must be between 1 January 1901 and 31 December 1999.

*Author:* Grant J. Munsey, Sunnyvale, California

## 3. COMPLEX IMPEDANCE MATCHING (ORDER #00269A)

This program will match any complex impedance to any other complex impedance and will completely define the matching network.

*Author:* Joe C. Pinkel, Los Angeles, California

## 4. ANALYSIS OF VARIANCE (TWO-WAY) (ORDER #00331A)

The two-way analysis of variance tests both the row and column differences between population means of "r" row treatments and "c" column treatments.

*Author:* Elbert W. Huber, Jr., Monterey, California

## 5. SECTION PROPERTIES (AREA, Y-BAR, X-BAR, MOMENT OF INERTIA, ETC) (ORDER #00262A)

This program determines the area, the centroid, the moments of inertia, the product of inertia, the principal axis, and the properties of the principal axis for arbitrary sections of beams and columns. Exact solutions are given when the section can be broken into rectangular subsections. As an option, masses may be assumed to be concentrated at points, yielding an approximate solution.

*Author:* George F. Rhodes, Fullerton, California

If you've noticed that all of these contributors are from California, you're right. No, we aren't showing bias about our home state. It just so happens that these were the programs considered for publication. Then we noticed that all were from California. In the autumn issue of **KEY NOTE**, we hope to see some really fine contributions from some of the other states. Here's your chance to get even with those whiz kids from California!

## MOST POPULAR PROGRAMS (SO FAR)

Listed below are four programs that up to now have been requested more than the others. They show an interesting range of interests. Notice that two are actually "games." It seems you are fascinated with trying to outwit the "brain" in your HP-65. (It is a formidable opponent!) "Games" are interesting and they are a pleasant way to demonstrate the incredible talents of your pocket "computer." Try it! You'll find you will soon have a large audience. (Make sure the battery is charged before you start!)

1. GAME OF "21" (ORDER #00237A)
2. BAGELS—LOGIC GAME (ORDER #00219A)
3. NUMBER OF DAYS BETWEEN TWO DATES (ORDER #00243A)
4. AMORTIZATION SCHEDULE (ORDER #00228A)

## HOW TO ORDER PROGRAMS

Unless it is not possible, always use an order form to order programs from the HP-65 Users' Library. The forms came

with the first catalog. Also, there are additional forms in the back of the catalog. Always use the program number shown in the catalog. DO NOT use any other number, regardless of the source, to order programs.

Each program has a nominal charge of \$3.00; however, the minimum order is \$9.00, so you should always list at least three programs on your order.

Send *only* checks or money orders, payable to Hewlett-Packard Company. Be sure to include any state or local taxes.

## WHAT YOU GET WHEN YOU ORDER A PROGRAM

A lot of you have asked that question, so here is the answer.

Primarily, you get a photo copy of the original documentation from the submitter (see also, *When Contributing Programs*) which includes:

1. The Program Description—with equations, variables used, operating limits and warnings, sketches (when applicable), sample problem(s), sample solution(s), and references used.
2. Operating Instructions—that show, step by step, how the data is keyed in and how answers are generated.
3. A Program Form—that shows each step required to key in the program, including the associated program code and program comments. Register, label, and flag usage also are documented here.

With the information you get, it then takes only a few minutes to key in the program and permanently record it on a magnetic card. Then, don't forget to cut off the upper left corner of the card so that it cannot be accidentally erased. And before you write on the card, refer to the article on page 7.

## WHEN CONTRIBUTING PROGRAMS

At present, we have a rejection rate of approximately 33% for new program submittals. By far, the main reason for rejection is *unacceptable documentation*. Unacceptable usually means: (a) illegible, (b) incomplete, (c) will not copy on a reproducing machine (i.e., Xerox), (d) not on original HP-65 Users' Library forms, or (e) unsigned *Program Submittal* sheet.

*(Continued)*

The reason we enforce these high standards is to ensure that those who pay \$3.00 for a copy of these programs will receive readable and understandable documentation. Therefore, before you submit a program to the Library, read the HP-65 Users' Library Contributor's Guide for details, and use the forms supplied.

## Programming Tips

Some of you probably have discovered various new methods to use to program your HP-65. And some of you have written to tell us about new "clever" keystrokes and functions that were not in the *HP-65 Owner's Handbook*. Then, too, we find new ways to use this extraordinary calculator. Therefore, because we want you to get the maximum benefit from your HP-65, each **KEY NOTE** will include hints and tips you can use to polish and enhance your programming and programs.

### USING **DSZ** AS AN UP COUNTER

Generally, the **DSZ** key is used as a down counter, with storage register 8 initialized as a positive number  $n$  and **DSZ** used in a loop to count  $n$  operations. A less obvious use of **DSZ** is as an up counter. Initializing storage register 8 to zero and executing **DSZ** in a loop keeps track of the number of loops performed. Remember to use **CHS** to display a positive result when **DSZ** is used as an up counter.

### SAVE TWO PROGRAM STEPS

If you develop a program that insists on occupying 102 steps, and the first two steps are a label (say, **LBL A**), here's a way out of your dilemma. Merely delete **LBL A** at the beginning of your program. For example: If you press **LBL A** on the keyboard and it was the label you deleted at the top of memory, the program pointer will search for **LBL A**. When it doesn't find it, the program will start execution at the top of memory. However, there is one caution to observe before you use this programming tip. If the label you want to delete is called as a subroutine in your program, this trick cannot be used.

### SAVE ONE MEMORY LOCATION

The use of a subroutine call (A, B, C, D, or E) in place of GTO saves one memory location. If this technique is used, **R/S** should be used instead of **RTN** to return control to the keyboard.

### SAVE TIME WITH **R/S**

It is often very helpful to insert **R/S** statements while keying in programs to allow you to see results in the display as you progress through the routine during execution. This will avoid tedious searching through the entire routine when the final results of the program are incorrect. These **R/S** statements can be deleted later.

### HOW TO CUT DOWN LONG NUMBERS

In cases where you need a particular number (especially a repeating number), it may take less steps to generate the number through calculation. For example, it is more efficient to calculate a decimal fraction by integer division than to use one memory step for each digit. To illustrate, 2 **ENTER** 3 **÷** takes less memory than keying in .6666667.

## Video Tapes Available

If you're like many HP-65 owners, your new calculator is the first programmable computer you have ever operated. There are so many functions and abilities built into the HP-65 that it is quite understandable you could be somewhat overwhelmed at first; particularly if you're new to programming.

Hewlett-Packard wants you to receive all the benefits this powerful calculator has to offer. To assist you in getting the full potential out of your HP-65, HP has produced a series of video tapes, "Learning to Use the HP-65." Abstracts of the contents of the tapes are included below. To arrange for a free showing of the video tapes, contact your nearest HP Sales Office. The tapes are also available for viewing at the plant in Cupertino, Calif. If you want to purchase copies (specify reel-to-reel or cassette) of the video tapes, contact:

Hewlett-Packard Video Products  
1819 Page Mill Road  
Palo Alto, California 94304

**PART 1.** As the first tape in a three-part series on how to use the HP-65 programmable calculator, this tape is concerned with how to manage the basic data handling functions of the HP-65. Following a look at how to enter data and perform simple arithmetic, the tape demonstrates how the operational stack works, and shows how to manipulate data in the stack and use it to make more complicated calculations. Concluding segments describe the use of the **Last X** register and the other storage registers in the HP-65.

*In color. Time: 20 minutes. Stock No: 90217 \$140.00*

**PART 2.** As the second part in the series on operating the HP-65 programmable calculator, this tape concentrates on the built-in functions of the calculator. In particular, the use of the five functions involving angles and their inverses are demonstrated in all three angular modes. In fact, every function accessed by a gold or a blue prefix key is accounted for in this tape.

*In color. Time: 10 minutes. Stock No: 90218 \$140.00*

**PART 3.** This installment in the series takes a close look at how to operate the basic programming functions. An easily followed example shows how programs are written, keyed into, and executed on an HP-65, so you will be able to write your own elementary programs, key them into your calculator, and run them correctly. The tape also shows how to control all the editing features built into the unit and how to record and protect your programs. Finally, demonstrations are given which show how the flags, the conditionals, and the other advanced programming functions operate.

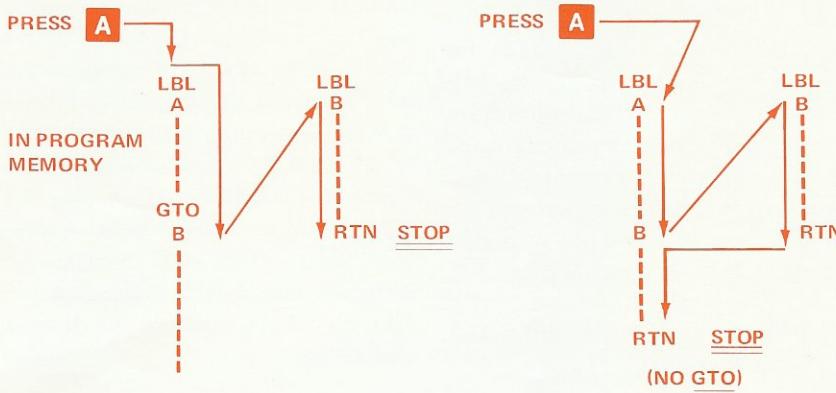
*In color. Time: 24 minutes. Stock No: 90219 \$140.00*

## Questions-and Some Answers

Here are some common questions received by Customer Service that also may be causing you trouble.

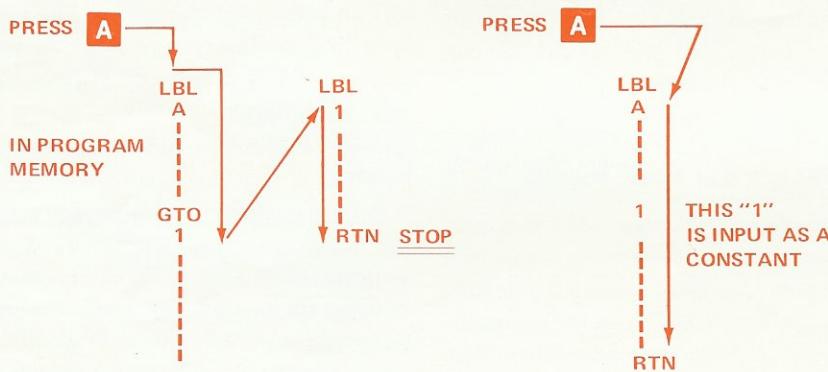
**Question:** When I call a subroutine, the program stops at the **RTN** of the subroutine. What's wrong?

**Answer:** You used a **GTO** before the subroutine call letter. The diagrams below show the flow of the program for the two situations:



**Question:** Can I use letters and numbers to call a subroutine?

**Answer:** No. You may branch to both lettered and numbered labels, but subroutines are restricted to letters. A number without a **GTO** will be interpreted as a constant:



**Question:** In single-stepping through the Diagnostic Programs, sometimes it takes two or three presses of **SST** for the display to change. Why?

**Answer:** Some functions with prefix keys take two positions in program memory (such as **f SIN**), so two **SST**'s are required to execute the function. A merged operation that occupies only one memory location (such as **9 LSTX**) takes only one **SST**.

**Question:** Occasionally I find in memory a "41" code that I didn't put there. What is it? How did it get there?

**Answer:** There are two internal pointers that keep track of where you are when executing a program. The primary pointer is "on" when you're executing a main program. If you call a subroutine, the primary pointer is left pointing at the next step after the subroutine call. The secondary pointer is turned "on" to execute the subroutine. If you stop in the subroutine before you press **RTN**, and single-step to

the call of the subroutine, you'll find the "41." This is the primary pointer; and when the subroutine is finished, it disappears and the primary pointer is turned back on.

**Question:** When I stop in the middle of a subroutine and restart the entire program, I get improper results. What happened?

**Answer:** The "41" was left in program memory from the previous execution. Therefore, if you do stop in a subroutine and wish to restart, you must *first* press **RTN** to correct the situation. The **RTN** clears and repositions the pointers at the top of memory.

**Question:** Sometimes when I press **R/S**, execution goes right through the first **RTN** it sees and stops at the second one. What should I do?

**Answer:** When this happens, you have used **R/S** to start a program that begins with a label and ends with a return. Your calculator is operating correctly; but read on.

Programs are executed from the keyboard or from within another program. And **RTN** has to satisfy two roles. One, it serves to stop a program called from the keyboard. Two, it serves as a signal to return to a previous program. In other words, in one case execution stops at a **RTN** and in the other case the **RTN** is a signal to transfer back to a program. The **A** thru **E** keys are used, either from the keyboard or from the program, to control the status of each **RTN**. However, **R/S** does not affect the status of **RTN**'s. Consequently, if a series of label-return programs are in memory and execution is started with **R/S**, then the HP-65 will pass through every other **RTN**. Therefore, we do not recommend that **R/S** be used to execute label-return programs.

Most programming can be done without the use of **R/S**. For beginners, it should be considered primarily a debugging aid to be used to execute a program a portion at a time. For instance, if you execute to a **R/S**, the **R/S** in the program will stop execution. If your program is stopped by a **R/S**, you can restart by pressing **R/S** from the keyboard. The **R/S** will not affect the status of the **RTN**. A suggestion is:

(Continued)

PAIR YOUR **R/S**'s. If you initiate execution with a **R/S** from the keyboard, then you must plan to have that execution terminated by a **R/S** in memory.

## We Get Letters-

The HP-65 has generated quite a lot of letters. Most are from happy owners and from owners who have a question or two about operating their calculator. Of course, we also get a few that are not complimentary. You have to expect that; and sometimes it is our own fault. But, all in all, the response to the HP-65 has been tremendous, to say the least, and we enjoy reading your letters about how wonderful your calculator is and how well you like it. And sometimes we get one of those one-in-a-thousand letters that really causes a stir at the factory. Here's one such letter that was received by the Customer Service Department. We thought you'd like it.

*"Theory—The Squeaky Wheel Gets Greased."*

*Fact—My third HP calculator is now on order.*

*Fact—I have now accounted for the sale of eight HP calculators.*

*Fact—The shipping date on my HP-65 is X August 1974.*

*Fact—That sure is a long time to wait.*

*Final Fact—You are a victim of your own efficiency.*

*Every time I write you with a request, you efficiently insure my request is honored and fulfilled.*

*Now I am spoiled; I will probably come unglued if I have to wait 3 months for my HP-65; and, I am therefore tempted to write requesting an earlier delivery date. But you have been so nice in the past, I won't risk losing your goodwill.*

*So, thank you for your past effort in my behalf. You people in Cupertino really do good work. However, in case (squeak) you're interested (squeak, squeak) my order number (squeak) is 6103-XXXXXX-XXX (squeak, squeak, squeak)."*

## Application Pac Corrections

Several errors have surfaced in our Application Pacs for the HP-65. Corrections are listed here so that you can correct your book or, in some cases, exchange an incorrect magnetic card for a correct one.

### MATH PAC 1, Math 1-23A, Page 52

Add the following note. NOTE: For the case when A, b, c are given, keys **f-1 SIN** are used to find angles B and C. The HP-65 always returns the principal values. But sometimes secondary values are required, and this program will not compute them. To compute secondary values, see Math 1-16A, page 41.

### MATH PAC 1, Math 1-35A and 1-37A, Pages 74 and 78

Note that register R<sub>9</sub> is available for temporary storage only.

### MATH PAC 2, Math 2-19A and Math 2-20A, Pages 42-45

Add the following note at bottom of pages 42 and 44. NOTE: This program uses register R<sub>9</sub>, so f(x) should not use R<sub>9</sub>. In particular, f(x) cannot involve trigonometric functions, polar/rectangular conversions, or comparison tests.

### STAT PAC 1, Stat 1-08A, Page 22

In paragraph (1), delete the sentence: "More than 10,000 random numbers may be generated before values are repeated."

In addition, if a different sequence of uniformly distributed pseudo random numbers is desired, choose a starting value u<sub>0</sub> such that 0 ≤ u<sub>0</sub> ≤ 1 and do:

1. U<sub>0</sub> **STO 1**
2. Skip step 3 and perform step 4.

### SURVEYING PAC 1

*Field Angle Traverse* (Surveying 1-01A, page 8) and *Sideshots* (Surveying 1-05A, page 22) were found to be incorrect for non-integer angles left. You can correct 1-01A by replacing the **+** in step 21 with **f D.MS+**. (See page 102.) You can correct 1-05A by replacing the **+** in Step 46 with **f D.MS+**. (See page 106.)

*Predetermined Area-Line Thru A Point*

(Surveying 1-31A, page 86) will yield incorrect answers if  $|AZ_{2-3} - AZ_{2-1}| > 180$ .

This can be corrected by exchanging the order of the absolute value function and the sine function, which are located between Steps 73 and 78. (See page 132.)

Corrected versions of these magnetic cards may have been shipped with your Surveying Pac 1. They are identified with a "B" instead of "A" in the program number in the upper right corner of the card. If you have "A" cards and want "B" cards, send the "A" version cards to APD Customer Service, 19310 Pruneridge Avenue, Cupertino, California 95014.

On page 85, the sample problem of *Azimuth of the Sun* (Surveying 1-30A) reads: "Hour difference in declination (ephemeris): 0°26'24". The value should be 26.4 seconds. Also, "Calculated north azimuth of sun" should be changed to 268°07'54".

### E.E. PAC 1, EE1-08A, Page 28

This program, *Minimum-Loss Pad Matching*, was incorrectly recorded. A 35 08 (**9 R↓**) code was accidentally substituted for a 31 (**f**) code at four steps past label E (page 116). New "B" version cards may be obtained by sending your "A" version card to APD Customer Service, 19310 Pruneridge Avenue, Cupertino, California 95014.

Other minor errata in E.E. Pac 1 are as follows:

Page 35—Line 12 of the *User Instruction Form* should be **STO 1** instead of **STO**

Page 38—In Example 1, C<sub>2</sub> = 2.20μF, not 220μF.

Page 38—In Example 2, C = 10μF, not 1μF.

Page 64—The equation at the top of the page should read:

$$\Theta = \frac{1.20083 \times 10^{-8}}{v} \text{ lf}$$

Page 65—Under line 3 of the *User Instruction Form*, "Frequency" should be f, Hz instead of f, MHz. Under line 7, "Frequency" should be f, Hz instead of f, MHz.

Page 111—Step 20 should be 35 00 g LST X instead of 35 00 g NOP.

Page 126—Step 5 should be 42 CHS instead of 43 CHS.

## Cards Hard to Remove??

Some owners have written to us to ask if there was a sure-fire method for removing the magnetic cards from the window. From our survey, we've found that most people do not have trouble removing the cards. Or maybe they have discovered the easiest, surest way to do it:

Notice the small ramp at the left center area of the card window? If you press just above the ramp you'll find it easy to remove a card. This technique releases pressure between the card and the ramp and allows the card to be pushed out of the window. Too much pressure will cause too much friction. Use a light touch. Once the technique is mastered you'll find it easy to remove a card.

## Extend the Usefulness of Your HP-80

More than 50 examples of how to solve frequently encountered real estate calculations using the HP-80 pocket calculator are explained in detail in the new *HP-80 Real Estate Applications* handbook. This 101-page book extends the usefulness of the HP-80 with sample problems suggested by some of the top real estate professionals.

If you own an HP-80, you no longer need to remember exact formulas or keep a large library of theory texts and data volumes. The calculator and the new handbook eliminate the need for many cumbersome and sometimes less precise financial tables. Simple step-by-step key-stroke procedures guide you through most financial calculations associated with real estate transactions.

The book, which sells for \$10.00, is designed to be a guide to more profitable real estate decisions. It covers such subjects as mortgages with balloon payments, appreciation and depreciation schedules, discounted cash flow analysis, and equity investment analysis.

If you own an HP-80 you will find that this book is a decided asset. (It also is a thoughtful gift for someone you know who owns an HP-80). To order one (or more), fill in the handy order form included with this newsletter.



## The Pen is Mightier—

If you have encountered difficulty in writing on the magnetic cards for your HP-65, here are some hints for you.

You *can* mark cards with a regular soft pencil. However, in time, the pencil markings will smudge and become illegible. If you want a temporary record, use a pencil. For a permanent and smudge-proof record, use a pen.

Not every pen will do a good job. However, we can tell you about some that we've used and therefore know that they do the job. They are listed below. These are merely recommendations and not endorsements for these products. Perhaps you have found other products and methods for marking cards. We'd like to hear about them.

One final word. The cards are not a porous material, so allow the ink to dry for at least 10 minutes. If you make a mistake, it is possible to erase with an ink-type eraser. However, use caution so you do not erase through the white coating on the cards.

Here are some products that have worked for us:

1. Sanford's *Sharpie*\*—A felt-tip type of pen. The number "49" appears on the pen, along with the words "Permanent, Waterproof, Smear-proof." Made by Sanford, Bellwood, Illinois 60104.

2. *Magic Marker*\*—A felt-tip type of pen. Markings on the pen are "Studio Fine Line, Permanent, Black F-100, and Model No. 87." Made by Magic Marker Corporation, Cherry Hill, New Jersey 08003.

3. *Uni-Mark*—A felt-tip type of pen. Markings on the pen are "Micropoint, UniMark, 960, Japan." Made by Micropoint of Japan, address unknown.

4. *Drawing Ink Fountain Pens*—These are pens found in any drawing, drafting, or graphics department. They use a special drawing ink (usually black) that reproduces extremely well in photographic or other copying processes.

\*Registered trademark.

## How Fast is the HP-65?

Several owners have asked us: "Just how fast is the HP-65? How long does it take to perform various cycles or functions?" Well, since there are many, many variables, it is not easy to precisely answer the question. However, we can tell you the results of some of our investigations.

(Continued)

Although microinstruction cycle times can vary as much as 293 to 339 milliseconds from one calculator to another, measurements on any given calculator can be used to give an idea of relative times required by various instructions. To time various functions, our Quality Assurance Department devised a method that used a looping technique and a stop-watch. Some of the more common execution times are tabulated below to give you an idea of the speed of the HP-65.

OPERATION	EXECUTION TIME (MILLISECONDS)
+	48
-	50
×	70
÷	110
g $x \leftrightarrow y$	17
g R↓	17
g R↑	17
g NOP	15
g $\pi$	56
g LST X	20
g ABS	53
g $1/x$	136
g $y^x$	350 to 750
g $n!$	205 to 1116

### Here's a Battery Tip

Here's a tip you can use to extend battery life when you are using your HP-65 in a long series of computations. Between actual calculations, press the decimal (.) key. Only the decimal point will be displayed. Therefore, battery drain will be exceptionally low. Then, when you want to continue calculating, merely press CLX and the display will return to 0.00.

#### HEWLETT-PACKARD COMPANY

Advanced Products Division  
19310 Pruneridge Avenue  
Cupertino, California 95014

#### HP-65 KEY NOTE

Summer 1974 Volume 1 • Number 1

Programming and operating tips, answers to questions, and information on new programs and developments. Published quarterly by Hewlett-Packard for owners of HP-65 Pocket Calculators.

*Reader comments or contributions are welcomed. Please send them to the above address.*

### New Application Book for HP-35

If you still own an HP-35 (or have passed it on to your son or daughter), you will be interested in a new \$10.00 handbook, *HP-35 Math Pac*. It shows the most efficient keystroke sequences for solving commonly encountered mathematical problems.

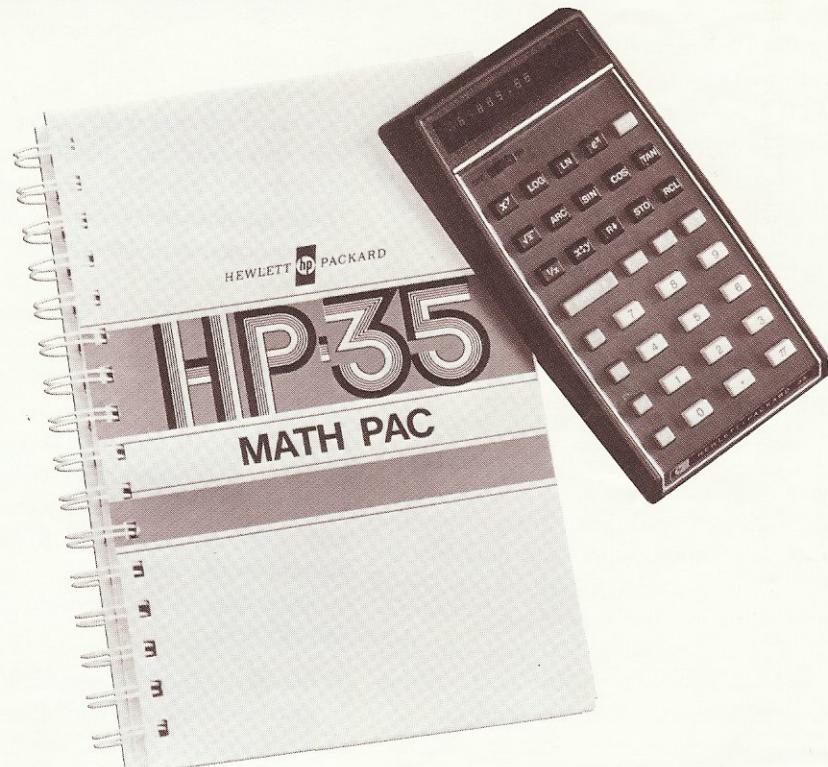
You no longer need to find your own solutions to problems. All you do is follow step-by-step keystroke procedures. These procedures can reduce calculation time by using the most efficient keystrokes; therefore, they minimize chances for error. A further advantage is the permanent record of these solutions provided by the book's sample cases and answers.

The 169-page book has seven major sections: Machine-Related Operations, Number Theory and Algebra, Geometry and Trigonometry, Statistics, Numerical Methods, Finance, and Miscellany. Because the book covers such a wide range of subjects, you and your HP-35 easily can extend your problem-solving capabilities into new areas of mathematics.

This book also makes a terrific gift for the owner of an HP-35. To order one (or more), fill in the handy order form included with this HP-65 KEY NOTE.

### Do's and Don't's of Magnetic Cards

The magnetic cards in your HP-65 Application Pacs are strips of magnetic tape (similar to the tape in hi-fi or audio cassettes) placed on a relatively rigid plastic-coated material. Just as a magnetic tape can be erased by passing it over a strong magnet, so can magnetic cards. The closer the proximity of the magnet to the card, the less strong the magnet has to be; the further away, the stronger. To give these general statements a frame of reference, magnetometers at airports are not very strong to start with and they are far away—so they are safe. On the other hand, carrying your cards in a shirt pocket containing a magnetized screwdriver is not safe, even if the cards are in their plastic case. The part of the program on the cards closest to the screwdriver blade may be erased. A good rule of thumb to follow is to keep any kind of magnetized material at least 1 to 2 feet away from your magnetic cards.



Scan Copyright ©  
The Museum of HP Calculators  
[www.hpmuseum.org](http://www.hpmuseum.org)

Original content used with permission.

Thank you for supporting the Museum of HP  
Calculators by purchasing this Scan!

Please do not make copies of this scan or  
make it available on file sharing services.