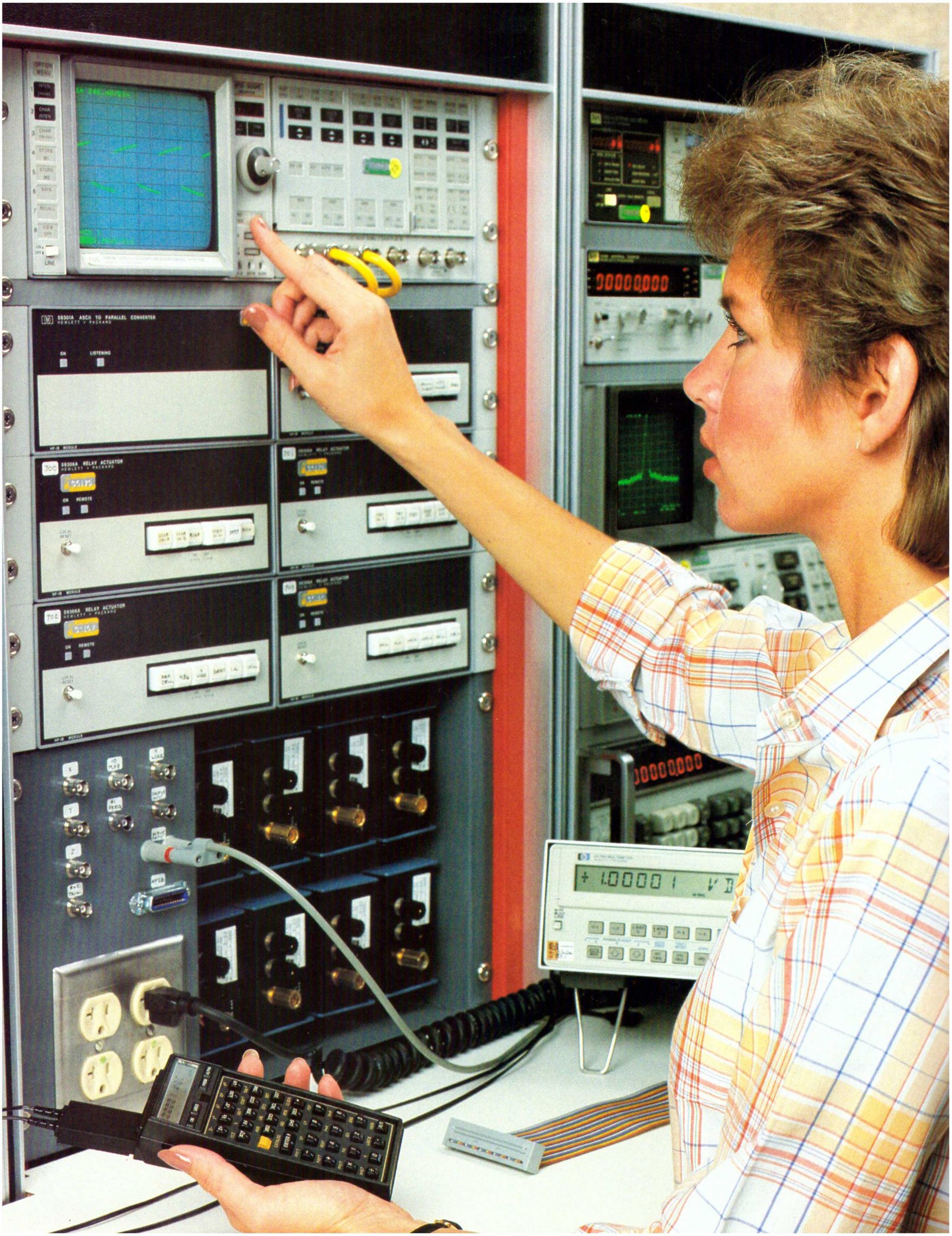
Series 40
Advanced Programmable Calculators

HEWLETT PACKARD

Hewlett-Packard Series 40 Advanced Calculators

Table of Contents


59301A ASCII TO PARALLEL CONVERTER
HEWLETT • PACKARD
ON
LISTENING
700
59306A RELAY ACTUATOR
HEWLETT • PACKARD
ON
REMOTE
702
59306A RELAY ACTUATOR
HEWLETT • PACKARD
ON
REMOTE
+ 1.00001 V D

You, Series 40, and Software— A Powerful Team

Whether you're performing arithmetic calculations, analyzing data or controlling a system, HP's Series 40 Advanced Calculators can adapt to your task. By itself, your Series 40 Advanced Calculator could easily provide all the computing power you'll ever need. Yet it's also the heart of expandable computer systems for scientific, engineering, and business applications. By adding peripherals, modules, software, and HP-IL (Hewlett-Packard Interface Loop) interfacing, you can expand the Series 40 capabilities to those of a low-cost computer system — and still take advantage of its user-friendly operation.

From the Classroom into Orbit.

Did you realize that the advanced calculator that gets you through your classes is the same one that NASA relies on to land the space shuttles if the main computers fail? From your classroom problems to complex instrument control, a Series 40 Advanced Calculator grows as your needs grow.

If your needs are in the classroom, in orbit, or somewhere in between, take your Series 40 Advanced Calculator along and be confident that you have the right tool for the job. Maximum portability is guaranteed by the size and battery-powered capabilities of the HP-41. Tuck it in your pocket or equipment case, and you're ready to go. No need to worry about an AC outlet for your HP-41 — four small, disposable batteries will assure you of about nine months of operation under average conditions. And, choose between two HP-41 models — the HP-41CV with 2,237 bytes of main memory, or the HP-41CX with 3,105 bytes of main and extended memory. Built into the HP-41CX are the Time and Extended Functions/Memory modules, a text-file editing function, and 19 other functions.

Enhanced Problem Solving.

No matter where you are, your problem solving is enhanced by the four input/output (I/O) ports that allow you to plug in software modules or peripherals. Choose from HP-written application pacs with plug-in modules, and Solutions Books with bar code and keystroke listings. Application areas include statistics, math, navigation, real estate, and financial decisions. Thousands of user-written programs are available from the Users' Library. Or, you can write your own programs.

Since the HP-41CX has the Time and Extended Functions/Memory modules built in, all four I/O ports are free for peripherals and application software modules. Up to 6.4K bytes of memory are available as two Extended Memory modules are added to the system. The Time and Extended Functions/Memory modules are available as options for the HP-41CV.

A Friendly Tool.

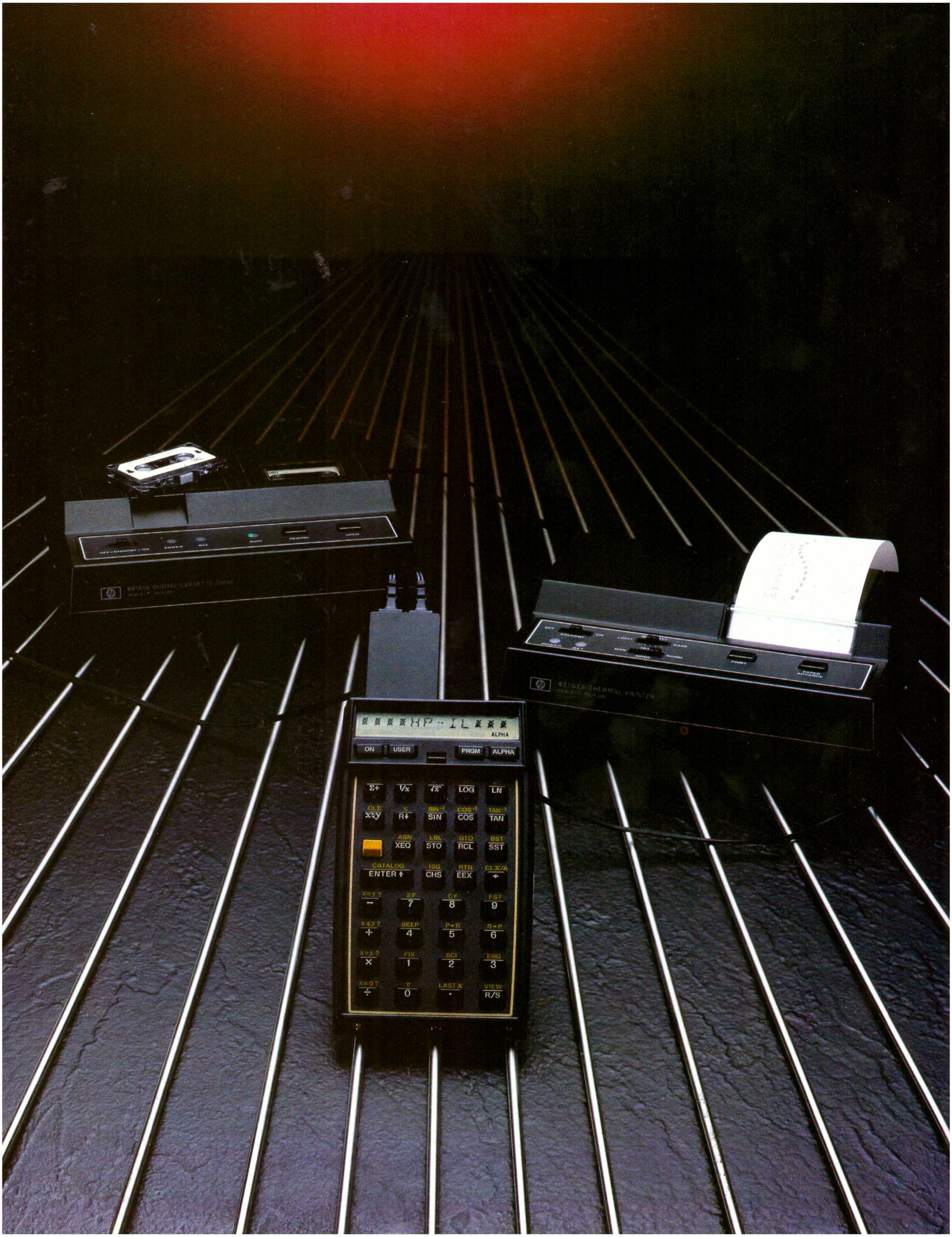
The Series 40 Advanced Calculator is versatile, too. Its user-friendly operation means you won't have to learn a programming language to get your job done. RPN (Reverse Polish Notation) logic allows you to solve your most complicated calculations with ease. And you'll see the intermediate results of each operation and recover from errors easily.

The user-definable, alphanumeric keyboard lets you assign any program or function to almost any key. Name and label your programs, functions, and results using the alphanumeric keyboard feature. Your HP-41 will prompt you with words and phrases.

A text-file editor built into the HP-41CX lets you store character strings to identify, modify, and manipulate data faster and easier. The amount of information you can store is limited only by the amount of available memory. Use the text-file editor to have itineraries, reminders, phone numbers, lists and other messages right at your fingertips. It's easy to create, read, update and erase text files, too.

Switch between Normal, User and Alpha keyboards — you'll never be far from the HP-41's original power or your own customized calculator. And continuous memory will preserve everything from your stored data to your keyboard assignments, even when your HP-41 is turned off.

(cont. on page 4)

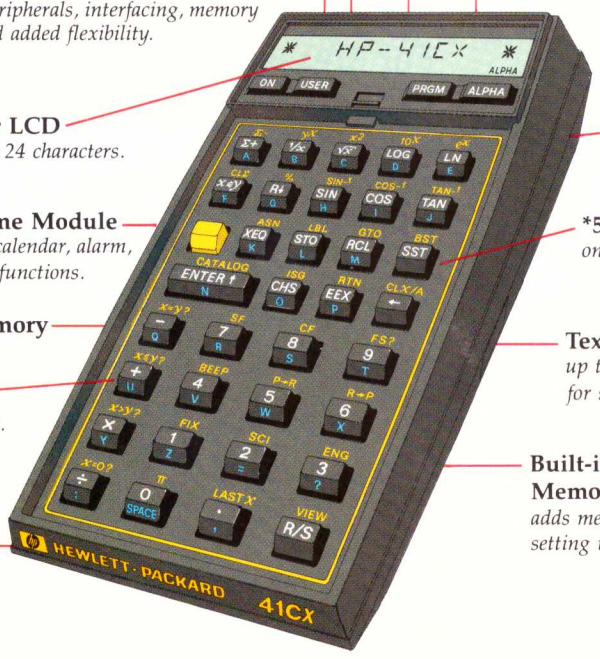

ALPHA
ON
USER
PRGM
ALPHA
Σ+
1/x
√x
LOG
LN
CLΣ
x≷y
%
R↓
SIN⁻¹
SIN
COS⁻¹
COS
TAN⁻¹
TAN
ASN
XEQ
LBL
STO
GTO
RCL
BST
SST
CATALOG
ENTER↑
ISG
CHS
RTN
EEX
CLX/A
x=y?
SF
CF
FS?
x≤y?
BEEP
P→R
R→P
x>y?
FIX
SCI
ENG
x=0?
π
LAST x
VIEW
R/S

A Growing System.

In addition to being a versatile calculator, your HP-41 can analyze data effectively and control your instruments. By plugging the HP-IL Module into one of the I/O ports, you can expand your Series 40 Advanced Calculator into a flexible computing system that lets you add up to 30 peripheral devices. Simplify your job by adding such peripherals as a printer, digital cassette drive, or video interface for VHF TV or monitor viewing. Various interfaces allow connection to larger computers, peripherals and other devices.

Slip the HP-IL Module into one of four I/O ports and connect your HP-41 to an HP 3468A Digital Multimeter. With the Time Module's automatic on and off feature, you can take as many readings as you need without even being present. Your results can be recorded on cassette tape, using the HP 82161A Cassette Drive, for future analysis. With the aid of your battery-powered Series 40 Advanced Calculator and the unique time capabilities available, you're solving the problem without being tied to your equipment.

Calculate, analyze, monitor, or control. Your Series 40 Advanced Calculator will do it all — anywhere.



***HP-IL Interfacing**
capability for battery-operated cassette drive, battery-operated printer, instrumentation control, video monitor, color graphics plotter, full-width printers, larger systems, acoustic coupler (modem).

***Magnetic Card**
reading capability, inexpensive, convenient distribution.

***Bar Code**
reading capability easily reproduced on paper.

***Four Plug-in Ports**
for software modules, peripherals, interfacing, memory expansion modules, and added flexibility.

***12-Character LCD**
with scrolling to 24 characters.

***RPN Logic**

Built-in Time Module
provides time, calendar, alarm, and stopwatch functions.

***58 Functions**
on the keyboard.

***Continuous Memory**

Text-File Editor
up to 254 ASCII characters per record for storing information.

***Alphanumeric Keyboard**
name and label programs, functions, and results.

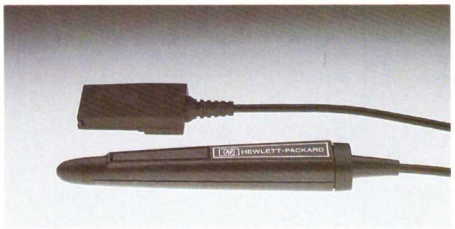
Built-in Extended Functions/ Memory Module
adds memory, power, and flexibility in setting up and manipulating programs.

24K-Byte Operating System
over 200 separate operations. (41CV—12K-byte operating system, 128 separate operations.)

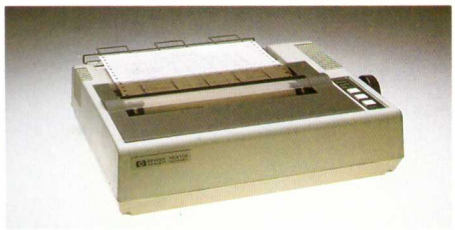
**Applies to both HP-41CX and HP-41CV.*

Hewlett-Packard
HP-41 Hardware Overview

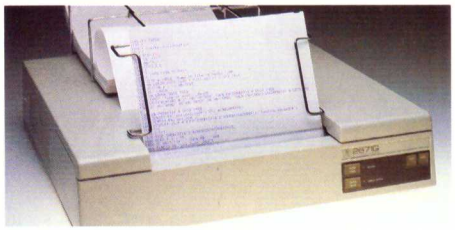
For Reading and Storing Information:

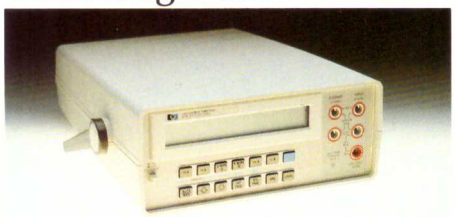


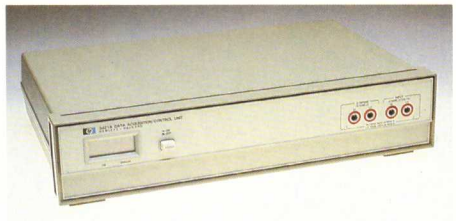
For Putting it Down on Paper:



For Measuring and Gathering Data:



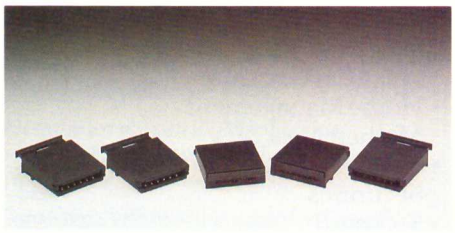




For Drawing Your Own Conclusions:

For Building HP-IL Into Your Product:

For Enhancing Your Performance:

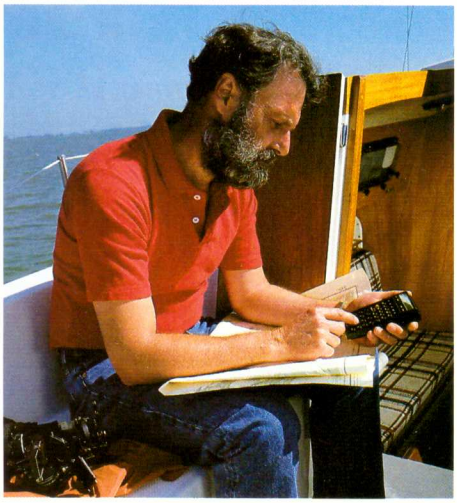


For Communicating with Other Computers and Peripherals

Hewlett-Packard
HP-41 Software Overview

For Business Applications:

For Scientific Applications:



For Engineering Applications:

Entertainment:

For more software information, see Users' Library page 30.

Hewlett-Packard
Series 40 Advanced Calculators

Series 40 Advanced Calculators combine the speed, power, and accuracy of computers with the portability, touch-key simplicity, and low cost of handheld calculators.

Take Your Choice.

There are two HP-41 models from which to choose — the HP-41CX and the HP-41CV. The two models differ in the amount of extended memory, as well as in functionality and expandability.

The HP-41CV, with 128 built-in functions, is powerful enough for many applications. The addition of Extended Functions/Memory and Extended Memory modules lets you expand when your needs grow.

The HP-41CX offers the most functions and greatest expandability of the HP-41 family. With 20 additional functions for enhanced programming (see functions list, p. 10), the HP- 41CX has the power and flexibility to solve most complex problems. The built-in Time and Extended Functions/Memory modules leave the four I/O ports open for other peripherals and software plug-ins. Text-file editing is an added built-in feature in the HP-41CX.

Series 40 Memory Capabilities

	HP-41CV	HP-41CX
Main memory		
Bytes	2,237	2,237
Registers	319	319
Extended memory		
Bytes	868 (optional)	868
Registers	124 (optional)	124
Extended Memory Modules*		
Bytes	1,666	1,666
Data registers	238	238
Maximum memory		
Bytes	6,437	6,437
Data registers	919	919

Features	Benefits
• Advanced calculator power.	Solves complex problems quickly, anywhere.
• Battery powered.	Offers maximum portability. Optional battery pack may be recharged easily.
• Four I/O ports.	Potential for plug-in ROM software, peripherals, interfacing, and more, to provide problem-solving versatility.
• RPN.	Consistent, effective logic system. Friendly. Saves time in calculations.
• User-definable keyboard.	Assigns any program or function to almost any key. Customizes the keyboard to the user's needs. Toggle selection of either User or Normal keyboards for customized key performance or original key functions.
• Continuous Memory.	Entire contents of memory, including key assignments, are preserved even when the HP-41 is turned off. No reloading of programs necessary.
• Alphanumeric keyboard.	Names and labels programs, functions, and results. Prompts in words for easy interpretation.
• Software.	Pre-tested solutions assure fast, accurate results. Plug-in ROM modules, magnetic cards, cassettes, and bar code available.
• Custom Products.	HP can manufacture your own software as plug-in modules, magnetic cards, or cassettes; you choose the key labels.

You can further expand the memory with non-volatile extended memory modules to give either model a maximum of 919 registers.**

HP-41 Features.

- **RPN.** Reverse Polish Notation provides a consistent and efficient logic system. RPN is fast, eliminating the need for equals and parenthetical keystrokes. Error recovery is simplified by automatic storage of the last entry. It also lets you see your intermediate results.
- **Four input/output ports.** Plug in ROM software modules or add to existing memory capacity with plug-in memory modules. The HP-IL Interface Module plugs in to allow connection to peripheral devices. A Plotter Module provides plotting and bar code capabilities for the HP-41 with the HP 7470A Plotter; a Time Module expands your system with time information and time-controlled operations. The Extended I/O Module enhances the HP-41's control of the HP-IL loop. Customize your applications with plug-in Custom Modules that

(cont. on next page)

*Add a maximum of two.

**All information in the extended memory is organized in program, data or text files. The functions necessary for accessing these files are available in the Extended Functions/Memory Module and in the HP-41CX.

provide your own means of permanent and private program storage. The Time and Extended Functions/Memory modules are built right into the HP-41CX, leaving all four ports open for other special-function plug-ins.

- **Software.** A broad range of available software provides immediate, accurate solutions. HP-written application pacs with plug-in modules, Solutions Books with keystroke listings and bar code, and Users' Library programs are just a few of the software options available.
- **Expandable.** Maximium memory is 6.4K bytes with two extended memory modules. Interfacing capabilities allow the use of various printers, plotters, monitors, mass storage devices, acoustic couplers, instruments, and access to the power of larger computers.
- **Redefinable keyboard.** Over 200 separate operations (over 128 in the HP-41CV) reside in the HP-41CX function library, with 58 of these right on the keyboard. Each key may be redefined. Or, choose an operation from an application pac or program and assign it to almost any key.
- **Continuous Memory.** Preserve everything from stored data to user-defined keyboard assignments while the HP-41 is turned off. Enter frequently needed calculations once, and then perform them as often as necessary, without having to reenter the program.
- **Built-in operating system.** 24K-byte operating system (12K in the HP-41CV) allows for immediate solutions to complex problems.
- **Portable.** Four 1.5V N-sized, alkaline batteries supply all the power you'll need. Carry the HP-41 in your pocket or briefcase. There will always be room for it on your desk or workstation.
- **Liquid-crystal display.** The display is easy to read and helps to eliminate glare problems from sunlight and other sources. Low power consumption minimizes battery drain. The display allows you to view ten digits or twelve alpha characters. Automatic scrolling shows you up to 24 alpha characters.

HP-41 Specifications

DIMENSIONS . . .14.2 cm (5.6 in) x 7.9 cm (3.1 in) x 3.3 cm (1.3 in)

WEIGHT . . . . . .205 g (7.2 oz) with batteries

POWER

Batteries . . . . . .four 1.5V, size N batteries (replaceable by user)

Battery Current (worst case) . . .20 mA (operating)
2 mA (idle)
50 µA (off)

Average alkaline battery life . . . .up to 6 months (battery life depends upon use, less when a peripheral device without its own power source is in use)

OPERATING REQUIREMENTS

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

Storage temperature . . . –20° to 65°C (–4° to 149° F)

Humidity . . . . . .40°C at 95%

DISPLAY

Capacity . . . . . .10 digits; 12 alpha characters displayed (scroll to view 24); 12 annunciator words; each character position consists of 17 segments, including 3 punctuation segments.

CHARACTER RANGE

A-Z, a-e, 0-9, plus 37 special characters, some of which can be obtained only by using optional plug-in peripherals.

DYNAMIC RANGE

$\pm 1.0000000 \times 10^{-99}$ to $\pm 9.9999999 \times 10^{99}$, plus zero.

Numbers are shown with a maximum of ten digits, or an 8-digit mantissa and a 2-digit exponent.

Displayed numbers are rounded to the last displayed digit, calculations are performed internally with at least ten digits.

SERIES 40 ADVANCED CALCULATORS COME COMPLETE WITH:

- The appropriate owner's documentation:
  HP-41CX Owner's Manual (Vol. I and Vol. II)
  HP-41CX Pocket Operating Guide
  HP-41CV Owner's Handbook and Programming Guide
  HP-41CV Guide for the Experienced User
  HP-41CV Quick Reference Card
- And the following:
  Tough, pliable carrying case
  Four type N batteries
  Overlay packet
  Users' Library subscription card

HP-41 FUNCTIONS LIST

■—Shift key.
+—Addition operator.
−—Subtraction operator.
*—Multiplication operator.
/—Division operator.
1/X—Reciprocal.
10↑X—Common antilogarithm.
ABS—Absolute value.
ACOS—Arc (inverse) cosine.
ADV—Advance paper.
AOFF—Alpha mode off.
AON—Alpha mode on.
APPEND—Append characters (–).
ARCL—Alpha recall.
ASHF—Alpha shift left.
ASIN—Arc (inverse) sine.
ASN—Assign.
ASTO—Store Alpha data in register.
ATAN—Arc (inverse) tangent.
AVIEW—Alpha view.
BEEP—Beeper.
CAT—Catalog.
CF—Clear flag.
CHS—Change sign.
CLA—Clear Alpha register.
CLD—Clear display.
CLP—Clear program.
CLRG—Clear register.
CLΣ —Clear statistics registers.
CLST—Clear stack registers.
CLX—Clear X-register.
COPY—Copy program from module or peripheral into program memory.
COS—Cosine.
D—R—Degrees to radians conversion.
DEC—Octal to decimal conversion.
DEG—Degrees mode.
DEL—Delete program memory lines.
DSE—Decrement, skip if equal.
EEX—Enter exponent.
END—End program.
ENG—Engineering notation.
ENTER↑—Enter number in X-register into Y-register.
E↑X—Natural antilogarithm.
E↑X − 1—Natural antilogarithm for arguments close to zero.
FACT—Factorial.
FC?—"Flag clear" test.
FC?C—"Flag clear" test and clear.
FIX—Fixed point display.
FRC—Fractional portion of number.
FS?—"Flag set" test.
FS?C—"Flag set" test and clear.
GRAD—Grads mode.
GTO—Go to label.
HMS—Decimal hours to hours, minutes, seconds conversion.
HMS+—Hours, minutes, seconds addition.
HMS−—Hours, minutes, seconds subtraction.
HR—Hours, minutes, seconds to decimal hours conversion.
INT—Integer portion of number.
ISG—Increment, skip if greater.
LASTX—Recalls LAST X register contents to X-register.
LBL—Program label.
LN—Natural logarithm.
LN1+X—Natural logarithm for arguments close to one.
LOG—Common logarithm.
MEAN—Mean.
MOD—Modulo (remainder).
OCT—Decimal to octal conversion.
OFF—Power off.
ON—Power on (continuous) function.
P—R—Polar to rectangular conversion.
PACK—Pack program memory.
%—Percent.
%CH—Percent of change.
PI—Pi (3.141592654).
PROMPT—Prompt.
PSE—Pause.
R↑—Roll up stack.
R—D—Radians to degrees conversion.
R—P—Rectangular to polar conversion.
R/S—Run or stop a program.
RAD—Radians mode.
RCL—Recall data from register into X-register.
RDN—Roll down stack.
RND—Round.
RTN—Return.
SCI—Scientific notation.
SDEV—Standard deviation.
SF—Set flag.
Σ+—Accumulations for statistics.
Σ−—Accumulation correction.
ΣREG—Statistical register block specification.
SIGN—Sign of x.
SIN—Sine.
SIZE—Size of data storage register allocation.
SQRT—Square root.
ST+—Storage register addition.
ST−—Storage register subtraction.
ST*—Storage register multiplication.
ST/—Storage register division.
STO—Store numeric data in register.
STOP—Stops program execution.
TAN—Tangent.
TONE—Tone.
VIEW—View register contents.
X=0?—"X=0?" conditional test.
X≠0?—"X≠0?" conditional test.
X<0?—"X<0?" conditional test.
X<=?—"X≤0?" conditional test.
X>0?—"X>0?" conditional test.
X=Y?—"X=Y?" conditional test.
X≠Y?—"X≠Y?" conditional test.
X<Y?—"X<Y?" conditional test.
X<=Y?—"X≤Y?" conditional test.
X>Y?—"X>Y?" conditional test.
X<>—Exchange X- and any register.
X<>Y—Exchange X- and Y- registers.
XEQ—Execute.
X↑2—Square.
Y↑X—Exponential.

Functions Unique to the HP-41CX

ASROOM—Number of bytes left in working ASCII file.
CLALMA—Clear alarm by Alpha register.
CLALMX—Clear alarm by X-register.
CLRALMS—Clear all alarms.
CLRGX—Clear a specified block of registers.
ED—Text Editor.
EMDIRX—Access extended memory directory.
EMROOM—Number of unused registers in extended memory.
ΣREG?—Return number of first statistics register to X.
GETKEYX—Return ASCII code to X-register and keycode to Y-register.
RCLALM—Recall alarm.
RESZFL—Resize ASCII or data file.
SWPT—Activates stopwatch and sets pointers.
CAT6—Lists all user key assignments in order of key code.
X=NN?—conditional test.
X≠NN?—conditional test.
X<NN?—conditional test.
X≤NN?—conditional test.
X>NN?—conditional test.
X≥NN?—conditional test.

Calculator Modes

USER—User mode key.
PRGM—Switches into/out of Program mode.
ALPHA—Switches into/out of Alpha mode.

Editing

←—Correction key.
GTO.—Go to the line number of Alpha label.
GTO..—Go to end of program memory.
BST—Back step.
SST—Single step.

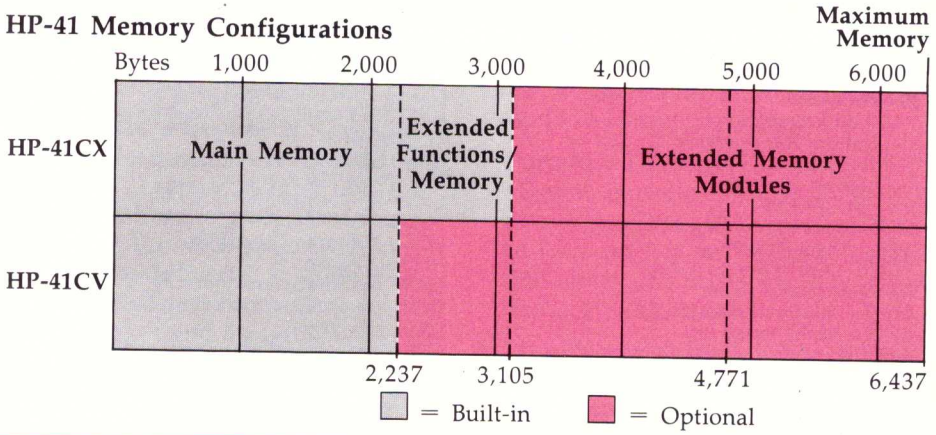
SERIES 40 ACCESSORIES

- HP-41CX Owner's Manual
  Vol. I Basic Operation (00041-90474)
  Vol. II Operation in Detail (00041-90492)
- HP-41CX Pocket Operating Guide (00041-90475)
- HP-41CV Owner's Manual (00041-90313)
- HP-41CV Guide for the Experienced User (00041-90259)
- HP-41 Overlay Kit (82152A)
- HP-41 Module Holders (2) (82151A)
- Multipurpose Rechargeable Battery Pack (82120A)
- AC Adapter/Recharger (for HP 82143A and HP 82120A) (82059D)
- HP-41 50 Blank Overlays (82172A)
- "Creating Your Own Bar Code" Manual (82153-90019)
- Vinyl Case (Card Reader) (82111A)
- Program Pad (00097-13154)

Hewlett-Packard Enhancements

HP- 41 Extended Memory Modules

Make your HP-41 even more versatile with Extension Modules. By adding one HP 82180A Extended Functions/ Memory Module (built into the HP-41CX) and two HP 82181A Extended Memory Modules, you can give your HP-41 a maximum of 4.2K bytes of non-volatile mass memory.* The Extended Functions/Memory Module also increases the HP-41 programming set.



Physical Specifications

DIMENSIONS . . .3.2 cm (1.3 in) x 1.0 cm (0.4 in) x 2.9 cm (1.2 in)

OPERATING REQUIREMENTS

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

Storage temperature . . . −20° to 65°C (−4° to 149° F)

Extended Functions/Memory Module Functions List

PROGRAMMABLE FUNCTIONS

PASN—Programmable ASN function.
CLKEYS—Clear all key assignments.
PCLPS—Delete named program and all following it from main memory.
PSIZE—Programmable SIZE function.
SIZE?—Return number of data storage registers to X-register.
GETKEY—Return keycode for pressed key.
REGMOVE—Copy contents of a block of registers.
REGSWAP—Swap contents of two blocks of registers.
RCLFLAG—Recall flag-status data to the X-register.
STOFLAG—Restore flag status.
X<>F—X-register exchange with flag 00-07 status.
ATOX—Convert left-most ALPHA character to numeric character code.
XTOA—Convert X-register to its equivalent character and append to ALPHA register.
ALENG—Return number of characters in ALPHA register.
ANUM—Value of an ALPHA-formatted number.
POSA—Position of ALPHA character.
AROT—Rotate contents of ALPHA register.
APPCHR—Append contents of ALPHA register at the end of current register.
APPREC—Append contents of ALPHA register as a new record at the end of current file.
ARCLREC—Append record from current file to main memory.
CRFLAS—Create text (ASCII) file.
CRFLD—Create data file.
DELCHR—Delete characters in file.
DELREC—Delete record in current file.
EMDIR—Directory of extended memory files.
FLSIZE—Return number of registers in file.
GETAS—Copy text (ASCII) file from mass storage.
GETP—Replace last program in main memory.
GETR—Copy data file to main memory registers.
GETREC—Copy record from current file to main memory.
GETRX—Copy current data-file registers to X-register.
GETSUB—Copy program into main memory.
GETX—Copy current register in current file to X-register.
INSCHR—Insert contents of ALPHA register into text (ASCII) file.
INSREC—Insert contents of ALPHA register as a new record.
PURFL—Purge file.
RCLPT—Recall pointer value of current file.
RCLPTA—Recall pointer value of named file.
SAVEAS—Copy text (ASCII) file to mass storage.

*No more than one HP 82180A Extended Functions/Memory Module or two HP 82181A Extended Memory Modules should be plugged into an HP-41CV. The HP 82180A is required when using the HP 82181A.

Hewlett-Packard Interface Loop

The Hewlett-Packard Interface Loop (HP-IL) is a bit-serial interface designed for low cost, battery-operable systems. HP-IL lets you use your HP-41 as system controller, capable of transmitting and receiving data, and performing a wide variety of information management and instrument control functions. In this system, devices are connected by two-wire cables leading from the output port of one device to the input port of the next, until all devices form a closed loop. This loop structure provides a unique capability through auto address assignment, device capability identification, power ON/OFF control and error checking.

Several HP-IL peripherals support STANDBY mode, allowing you to power the peripherals on or off, under program control, to conserve battery life. The power ON/OFF feature lets you use an HP-IL system for remote applications.

HP 82160A HP-IL Interface Module

The HP-IL Interface Module plugs into any one of the four ports in the HP-41, connecting your handheld computer with an ever-growing family of HP-IL peripherals and instruments. The module gives your HP-41 simultaneous control of up to 30 devices on the loop. There are three function sets supplied by the HP-IL Module: printer, mass storage, and general input/output (I/O).

Features	Benefits
• Battery powered.	Completely field portable.
• Simple connector system.	Keyed cables for easy, error-free connection.
• Auto addressing.	Devices can be connected in any order.
• Manual addressing.	Control of two similar devices can be determined programmatically.
• Device-powered loop.	Each device powers its section of loop, allowing 30 devices and up to 10 meters between devices (up to 100 meters with twisted, shielded pairs).
• Automatic error checking.	Assures that the message sent was received correctly.
• Bit-serial, loop structure.	Allows automatic error checking.
• STANDBY mode.	Conserves battery life as programs control power up/power down.

Physical Specifications

DIMENSIONS . . .2.8 cm (1.1 in) x 1.2 cm (0.5 in) x 0.4 cm (0.2 in)

WEIGHT . . . . . .42.5 g (1.5 oz)

CABLE LENGTH
(two attached cables) . . . . . .80 cm each (31 in each)

OPERATING REQUIREMENTS
Operating temperature . . .0° to 45°C (32° to 113°F)
Storage temperature . . . −40° to 75°C (−40° to 167° F)

DATA TRANSFER RATE
5,000 bytes per second
(HP-41—150 bytes per second)

HP-IL Module Functions List

PRINTER OPERATIONS

ACA—Accumulate ALPHA register into print buffer.
ACCHR—Accumulate character into print buffer.
ACCOL—Accumulate column into print buffer.
ACSPEC—Accumulate special character into print buffer.
ACX—Accumulate X-register into print buffer.
ADV—Advance paper, print the print buffer right-justified.
BLDSPEC—Build special character.
FMT—Accumulate format specifier into print buffer.
LIST—List program lines.
PRA—Print ALPHA register.
PRAXIS—Print y-axis.
PRBUF—Print buffer left-justified.
PRFLAGS—Print flags and other status information.
PRKEYS—Print reassigned keys.
PRP—Print program.
PRPLOT—Plot function interactively.
PRPLOTP—Plot function noninteractively.
PRREG—Print registers.
PRREGX—Print registers as directed by X.
PRΣ—Print statistics registers.
PRSTK—Print stack.
PRX—Print X-register.
REGPLOT—Plot single line using data in registers.
SKPCHR—Skip characters, accumulate in print buffer.
SKPCOL—Skip columns, accumulate in print buffer.
STKPLOT—Plot single line using data in stack.

HP 82160A HP-IL Interface Module (cont.)

MASS STORAGE OPERATIONS

CREATE—Create new file with zero values.
DIR—Display or print a directory of stored files.
NEWM—Initialize medium.
PURGE—Remove file from medium.
READA—Read "write-all" file.
READK—Read key-assignment file and reassign keys.
READP—Copy program file, replacing last program in memory.
READR—Copy data file into Series 40 registers.
READRX—Copy part of data file according to X-register.
READS—Read status file and set Series 40 status.
READSUB—Copy program file after last program in memory.
RENAME—Rename stored file.
SEC—Secure a stored file.
SEEKR—Position medium to specified file data register.
UNSEC—Unsecure a stored file.
VERIFY—Verify that a stored file can be read.
WRTA—Store "write-all" file onto medium.
WRTK—Store key assignments onto medium.
WRTP—Store program onto medium.
WRTPV—Store program onto medium and make file private.
WRTR—Copy all storage registers into data file.
WRTRX—Copy some storage registers according to X-register.
WRTS—Store Series 40 status onto medium.
ZERO—Fill data file with zero values.

INTERFACE CONTROL OPERATIONS

AUTOIO—Set interface to Auto mode.
FINDID—Find address of selected device.
INA—Input ALPHA string from selected device.
IND—Input decimal number from selected device.
INSTAT—Input status information from selected device.
LISTEN—Set device as a listener, or remove all listeners.
LOCAL—Set selected device to local mode.
MANIO—Set interface to Manual mode.
OUTA—Output ALPHA string to selected device.
PWRDN—Set all devices to low power state.
PWRUP—Set all devices to operating power state.
REMOTE—Set selected device to remote mode.
SELECT—Select device as primary device.
STOPIO—Stop I/O communication in loop.
TRIGGER—Trigger all devices set to respond.

HP 82182A Time Module

(Built into the HP-41CX, optional for the HP-41CV.)

The Time Module expands your HP-41 system with time information and time-controlled operations. Using the quartz-crystal controlled Time Module, your HP-41 can become the heart of a time-based system controller, an alarm clock, an appointment reminder, a calendar, a timer, or even an advanced stopwatch.

Physical Specifications

DIMENSIONS . . .3.2 cm (1.3 in) x 1.0 cm (0.4 in) x 2.9 cm (1.2 in)

OPERATING REQUIREMENTS

Operating temperature . . .0° to 45°C (32° to 113°F)
Storage temperature . . . −20° to 65°C (−4° to 149° F)

Time Module Functions List

REAL TIME AND DATE

ADATE—Append number to ALPHA register as a date.
ATIME—Append number to ALPHA register as a time.
ATIME24—Append number to ALPHA register in a 24-hour time format.
CLK12—Switch to 12-hour time display format.
CLK24—Switch to 24-hour time display format.
CLKTD—Switch clock to time and date display.
CLOCK—Display the clock.
CORRECT—Set time and adjust accuracy factor.
DATE—Place number for current date in X-register.
DMY—Switch date format to Day-Month-Year.
MDY—Switch date format to Month-Day-Year.
RCLAF—Recall clock accuracy factor.
SETAF—Set clock accuracy factor.
SETDATE—Set clock date.
SETIME—Set clock time.
TIME—Place current time number in X-register.
T+X—Adjust clock time by specified factor.
■ON—Display the clock.

CALENDAR FUNCTIONS

DATE+—Calculate new date from date and number of days.
DDAYS—Calculate days difference between two dates.
DOW—Replace a date number with a Day-of-Week number.

STOPWATCH

RCLSW—Place stopwatch time in X-register.
RUNSW—Run stopwatch.
SETSW—Set stopwatch to specified starting time.
STOPSW—Stop running stopwatch.
SW—Set the calculator to Stopwatch mode.

ALARMS

XYZALM—Set alarm.
ALMCAT—Provide listing of alarms.
ALMNOW—Activate past due label alarms.

HP 82184A Plotter Module

The 8K-byte Plotter Module fits easily into one of the HP-41's four ports to give you bar code generation and plotting capabilities. The Plotter Module enables you to use your Series 40 calculator with the HP 7470A Graphics Plotter. It also enables your HP-41 to print Series 40 bar code using the HP 82162A Thermal Printer/Plotter or the HP 7470A Graphics Plotter. Take advantage of ready-to-go bar code generation programs or write your own.

The Plotter Module also helps you produce high-quality plots on HP's low cost HP 7470A Graphics Plotter. This module contains 52 plotter functions to help you design your own programs. There is also a utility plotting program that enables you to produce framed, labeled plots, such as line and bar charts, without having to learn specific plotter functions.

Physical Specifications

DIMENSIONS . . .3.2 cm (1.3 in) x 1.0 cm (0.4 in) x 2.9 cm (1.2 in)

OPERATING REQUIREMENTS

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

Storage temperature . . . −20° to 65°C (−4° to 149° F)

HP 82184A Plotter Module Functions List

GENERAL PLOTTING FUNCTIONS

CLIPUU—Specifies plot bounds in user units.
CSIZE—Sets character space height.
CSIZEO—Sets character space height, aspect ratio, and slant.
DGTIZE—Identifies coordinates of current pen position.
DRAW—Draws line to point (x,y).
FRAME—Frames active plotting area.
GCLEAR—Advances page on plotters that have a page feed mechanism.
IDRAW—Draws line to a point x and y units from current point.
IMOVE—Moves pen to a point x and y units from current point.
LABEL—Prints contents of the ALPHA register.
LDIR—Sets angle of rotation for printing labels.
LIMIT—Sets graphics limits in millimeters.
LOCATD—Sets plot bounds by digitizing two opposite corners.
LOCATE—Sets plot bounds in graphics units.
LORG—Sets label origin position.
LTYPE—Selects line type.
LTYPEO—Selects line type and length of repeat pattern.
LXAXIS—Draws and labels x-axis.
LYAXIS—Draws and labels y-axis.
MOVE—Moves pen to point (x,y).
PCLBUF—Clears I/O buffer.
PDIR—Rotates axes for incremental and relative plotting.
PEN—Selects pen.
PENDN—Lowers pen.
PENUP—Lifts pen.
SCALE—Sets user scale.
SETGU—Switches module to graphics units mode.
SETUU—Switches module to user units mode.
TICLEN—Sets tick lengths.
UNCLIP—Resets plot bounds to graphic limits.
WHERE—Enters coordinates of last point and current pen status.
XAXIS—Draws x-axis.
XAXISO—Draws x-axis with ticks.
YAXIS—Draws y-axis.
YAXISO—Draws y-axis with ticks.
IPLOT—Moves or draws to a point x and y units from current point.
PLOT—Moves or draws to point (x,y).
PLREGX—Moves or draws to series of coordinate points stored in data registers.
RPLOT—Moves or draws a point (x,y) relative to an assumed origin.
BC—Plots a row of Series 40 bar code.
BCA—Creates bit pattern for Alpha-Replace bar code.
BCAA—Creates bit pattern for Alpha-Append bar code.
BCCKSM—Computes checksum of bit pattern in ALPHA register.
BCO—
Plotter Option: Plots bar code row having user-specified leading and trailing bars.
Printer Option: Prints a row of Series 40 bar code on HP 82162A Thermal Printer/Plotter.
BCP—Generates bit pattern for program row.
BCREGX—Generates bit pattern from data in a series of storage registers.
BCSIZE—Calibrates module to pen width and sets HP or non-HP bar code type.
BCX—Creates bit pattern for nonsequenced bar code.
BCXS—Creates a bit pattern for sequenced bar code.

UTILITY PLOTTING FUNCTIONS

NEWPLOT—Initializes module for generating a plot.
PLANOT—Annotates plot according to NEWPLOT and REPLOT parameters.
PLINIT—Initializes module for plotting from NEWPLOT and REPLOT parameters.
PLTUXY—Generates a function or data plot according to NEWPLOT and REPLOT parameters.
REPLOT—Prompts for plot generation or parameter editing.
X?—Prompts for next x-coordinate.
Y?—Prompts for next y-coordinate.

HP 82183A Extended I/O Module

The HP 82183A provides easy-to-use I/O functions that enhance the HP-41's control of the HP-IL loop. This 4K-byte module provides 59 functions that extend the I/O capabilities beyond those provided by the HP 82160A HP-IL Module. These functions enhance mass storage, character manipulation, HP-IL control and advanced control of the HP-41 and devices on the loop.

Physical Specifications

DIMENSIONS . . .3.2 cm (1.3 in) x 1.0 cm (0.4 in) x 2.9 cm (1.2 in)

OPERATING REQUIREMENTS

Operating temperature . . .0° to 45°C (32° to 13°F)

Storage temperature . . . −20° to 65°C (−4° to 149° F)

Extended I/O Module Functions List

MASS STORAGE OPERATIONS

COPYFL—Copies nonprivate file (named in ALPHA) from master device to device addressed by number in X.

DIRX—Returns to ALPHA file name whose position in primary medium's directory is specified by number in X.

FLLENG—Places in X the length of the file specified in ALPHA.

FLTYPE—For file named in ALPHA, places in X a two-character ALPHA string representing file type.

MCOPY—Copies contents of master medium onto all other media.

MCOPYPV—Same as MCOPY, except all HP-41 program files are made private.

MVERIFY—Checks each mass storage device to verify number of records specified in X can be read without error.

CHARACTER MANIPULATION FUNCTIONS

ALENGIO—Places in X the length of current ALPHA string.

ANUMDEL—Returns to X the value of a number represented by a string of numerical characters in ALPHA register.

ATOXL—Removes first character from ALPHA and places in X the corresponding character code.

ATOXR—Places character code of last character of ALPHA string into X and deletes that character from string.

ATOXX—Places number in X with code for character in ALPHA position indicated by that number.

X<>FIO—Exchanges value in X with decimal equivalent of binary value represented by flags 00 through 07.

XTOAL—Adds to left of first non-null character in ALPHA the character corresponding to character code in X.

XTOAR—Appends to end of current string in ALPHA the character corresponding to character code in X.

YTOAX—Replaces character in ALPHA with another character specified by character code in Y.

HP-IL CONTROL FUNCTIONS

AID—Places in X the accessory ID of primary device.

CLRDEV—Resets primary device to its initial state.

CLRLOOP—Simultaneously clears all devices on loop.

DEVL—Sends to primary device the Device-Dependent Listener command number specified in X.

DEVT—Sends to primary device the Device-Dependent Talker command number specified in X.

FINDAID—Uses accessory ID to locate device of specific class or type.

ID—Returns to ALPHA a string containing ID of primary device.

POLL—Sends Identify message around loop and indicates loop's response by displaying a number from 0 to 255.

POLLD—Disables parallel poll response of primary device.

POLLE—Enables primary device to respond to a parallel poll.

POLLUNC—Disables parallel poll responses of all devices.

RCLSEL—Returns HP-IL address specified by most recent execution of SELECT.

SRQ?—Tests loop for service request by sending HP-IL Identify message.

STAT—Reads up to 23 bytes of status from primary device and stores these bytes as character string in ALPHA.

XFER—Until End of Transmission message received, transfers data from primary device to the device specified by the HP-IL address in X.

XFERC—Transfers data from primary device to device specified by HP-IL address in X.

XFERCL—Transfers data from primary device to device specified by address in X.

XFERE—Transfers number of bytes specified by address in X.

XFERN—Transfers number of bytes specified in Y from primary device to device at address specified by value in X.

ADVANCED CONTROL FUNCTIONS

ADROFF—Disables the automatic loop addressing and talker/listener commands used by data transfer functions.

ADRON—Enables the automatic loop addressing and talker/listener commands used by data transfer functions.

HP 82183A Extended I/O Module (cont.)

DDL—Sends Device-Dependent Listener command message specified by value in X to all active listeners.

INAC—Replaces contents of ALPHA with string of bytes from primary device.

INACL—Replaces ALPHA contents with a dummy "D" character and a string of bytes from primary device.

INAE—Replaces ALPHA contents with string of bytes from primary device.

INAN—Replaces ALPHA contents with a string of up to 23 bytes from primary device, and terminates string with dummy "D" character.

INP—Causes primary deyice to send to HP-41 a series of bytes that the HP-41 can translate into a program.

INXB—Directs primary device to send one byte of data to X.

LOCK—If primary device has remote override switch (for manually placing device into Local mode), disables this switch.

NLOOP—Places value in X indicating number of devices currently on HP-IL, excluding HP-41 itself.

NOTREM—Returns devices having Remote and Local modes to Local mode control, and disables not-remote-enabled state.

OUTAC—Sends all but first non-null character in ALPHA string to device.

OUTACL—Sends string in ALPHA—minus first non-null character—to primary device.

OUTAE—Sends ALPHA string—minus first non-null character—to primary device.

OUTAN—Transmits to primary device up to 23 ALPHA characters, as specified by value in X.

OUTP—Sends from HP-41 to primary device the program containing the global label in ALPHA.

OUTXB—Sends to primary device the eight-bit byte equivalent of decimal byte value in X.

DDT—Sends Device-Dependent Talker message specified by value in X to currently active talker.

LAD—Switches to listener the device specified by HP-IL address in X.

SEND—Sends to primary device the command message specified by command number in X.

TAD—Switches to talker the device specified by HP-IL address in X.

UNL—Removes all currently addressed listeners from listener status.

UNT—Removes current talker from talker status.

HP Automatic Start and Cassette Duplication Module (00041-15042)

The automatic start feature provides a means of writing "fool-proof" HP-41 programs. With the automatic start module installed, the HP-41 goes through a special sequence when it is turned on. This sequence lets you write programs that automatically set status, configure memory, access peripherals, or prompt the user. The mass copy feature provides an easy-to-use means of duplicating programs and data. The information on one HP 82161A Digital Cassette Drive can be copied on to as many as 29 other cassettes.

HP-41 Development Module (00041-15043)

Adding a second HP-41 to the HP-IL loop becomes a possibility with the aid of the HP-41 Development Module. In Scope mode, a second HP-41 can be used for displaying the mnemonics of HP-IL messages as they travel around the loop. Giving direct access to the HP-IL integrated circuit, the Development Module allows you to change the contents of any control register and poll certain status bits. Characters can be inserted at, or removed from, any position in the Alpha register.

Features	Benefits
• Alpha register functions.	Add or remove characters from any position in the Alpha register.
• I/O buffer.	Circumvents the loss of characters with byte values of zero.
• Direct access to HP-IL integrated circuit.	Change the contents of any control register and poll certain status bits.

Hewlett-Packard Series 40 Peripherals

HP 82104A Card Reader

The HP-41 Card Reader is a valuable peripheral that lets you save programs and data on small magnetic cards. This "smart" Card Reader keeps track of cards as they are read and it even prompts you for the next card. A security feature permits a program to be run, but not reviewed or altered through normal operations. An added bonus is that it also accepts program cards from the HP-67 and HP-97 calculators, automatically making the necessary translations into HP-41 code. (The HP-41C may require additional memory modules for translations and program execution.)

Features	Benefits
• Powered by HP-41's batteries.	Allows small size, total portability.
• 224-byte magnetic cards.	Programs and data easily modified. Cards easily stored. Easy to write contents on card's face. Inexpensive to duplicate.
• Uses one HP-41 port.	Leaves other ports free for peripherals, modules, application ROMs and HP-IL interfacing.
• Reads both HP-67/97 and HP-41 magnetic cards.	Over 6,000 Users' Library programs available.
• Writes contents of HP-41 registers onto cards.	Can record programs and data on space-saving magnetic cards for inexpensive off-line mass storage.
• Fits inside the HP-41 carrying case.	Compact, convenient, protected.

Physical Specifications

DIMENSIONS . . .7.4 cm (3.0 in) x 7.9 cm (3.2 in) x 3.6 cm (1.4 in)

WEIGHT . . . . . .92 g (3.2 oz)

COMPATIBILITY

Plugs into the HP-41, also reads HP-67/97 magnetic cards.

OPERATING REQUIREMENTS

Voltages . . . . . .regulated 6 Vdc supplied by HP-41. Unregulated 6 Vdc supplied by HP-41 batteries.

Current . . . . . .2 mA maximum (no card inserted)
200 mA maximum (card inserted, motor off)
500 mA maximum (card inserted, motor on)

Operating temperature . . .10° to 45°C (50° to 113°F)

Storage temperature . . . −40° to 75°C (−40° to 167° F)

SERIES 40 MAGNETIC CARDS

DIMENSIONS . . .7.11 cm (2.8 in) x 1.14 cm (0.45 in) x 0.003 cm (0.008 in)

WEIGHT . . . . . .0.258 g (0.001 oz) per card

00097-13141—40 Card Pac with holder
00097-13143—120 Card Pac with 3 holders
00097-13206—1000 Card Pac without holder

STORAGE CAPACITY . . . .16 registers (112 bytes) per track
2 tracks per card

READ/WRITING SPEED . . . . . .6.35 cm/sec (2.5 in/sec)

HP 82104A Card Reader Functions List

HP-41 FUNCTIONS

MRG—Merge program from card.
RDTA—Read data card.
RDTAX—Read data card as directed by X.
RSUB—Read subroutine.
VER—Verify track.
WALL—Write all.
WDTA—Write data card.
WDTAX—Write data card as directed by X.
WPRV—Write private program card.
WSTS—Write status card.

HP-67/97 COMPATIBLE FUNCTIONS

7CLREG—Clear registers.
7DSP0 through 7DSP9—Display 0 through 9 decimal places.
7DSZ—Decrement and skip on zero.
7DSZI—Decrement and skip on zero indirect.
7ENG—Engineering notation.
7FIX—Fixed notation.
7GSBI—Go to subroutine indirect.
7GTOI—Go to label indirect.
7ISZ—Increment and skip on zero.
7ISZI—Increment and skip on zero indirect.
7P<>S—Exchange primary and secondary register contents.
PRREG—Print registers.
7PRSTK—Print stack.
7PRTZ—Print X.
7RCLΣ—Recall contents of statistics registers.
7SCI—Scientific notation.

HP 82153A Optical Wand

The HP 82153A Optical Wand makes using the HP-41 even faster and easier. Plug the Wand into one of the HP-41 ports, and load programs and data into memory by passing the Wand across a printed page of bar code. The Wand translates the information into HP-41 programs and data, and then loads it into the HP-41. Bar code is an inexpensive distribution medium for programs and data. Store your bar code sheets in a three-ring binder if you choose. And share your programs quickly and easily—just photocopy and distribute. To make your own bar code, refer to the Plotter Module on page 14.

Features	Benefits
• Reads special HP-41 bar code.	Makes low cost and high reliability possible.
• Plugs into and powered by the HP-41.	Economical data entry and processing. Portable.
• Inexpensive bar code.	Minimizes software distribution expense.

Physical Specifications

DIMENSIONS . . .13.0 cm (5.1 in) x 2.3 cm (0.9 in)

WEIGHT . . . . . .55 g (1.9 oz)

CABLE LENGTH . .81.3 cm (32 in)

INTERFACE

Plugs into the HP-41 calculator, reads HP-41 bar code only.

OPERATING REQUIREMENTS

Voltages . . . . . .regulated 6 Vdc supplied by the HP-41. Unregulated 6 Vdc supplied by HP-41 batteries.

Current . . . . . .2 μA maximum (read switch off, computer off) 65 mA maximum (read switch on, computer on)

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

Storage temperature . . . −20° to 65°C (−4° to 149° F)

OPERATING LIMITS

Scan Angle . . . . .within 25° of perpendicular (10° to 20° optimum)

Scan Speed . . . . .7.6 to 76 cm/sec (3 to 30 in/sec)

Subject to electro-magnetic interference.

HP 82153A Wand

FUNCTIONS LIST

WNDDTA—Scan one row of data bar code.
WNDDTX—Scan and store data bar code as directed by X.
WNDLNK—Scan and execute bar coded subroutine.
WNDSUB—Scan bar coded subroutine.
WNDSCN—Scan row of specialized bar code.
WNDTST—Scan bar code to test for correct reads.

HP 82143A Printer/Plotter

The HP 82143A Printer/Plotter is a whisper-quiet, battery-operable thermal printer that easily plugs into the HP-41. It gives you numeric, upper- and lowercase alpha, double-wide characters, plotting capability and intensity control for optimum contrast and readability. It even lets you define your own "special" characters. Portable and lightweight, the Printer/Plotter operates on batteries. The batteries can be recharged with the HP 82059D AC Recharger that is included with the product. The Printer/Plotter is a valuable aid in editing programs, checking long calculations, or presenting results in graphics form.

Features	Benefits
• Battery powered.	Allows complete portability.
• 24-character print line size.	Makes smaller print possible.
• Single- and double-wide characters.	Highlight output.
• Automatic right and left justification and centering.	Format control.
• 128-character set.	More precise communication.

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
Upper- and lowercase letters
Special-character generation
Plotting capabilities
43-character buffer

SPECIAL MODES

Parse, Column, Double wide, Single wide, Graphics

PRINT FORMAT

24 standard characters, 12 double-wide characters, 168 dot-columns per line

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

Plugs into the HP-41 calculator, unique.

HP 82143A Printer FUNCTIONS LIST

ACA—Accumulate ALPHA register.
ACCHR—Accumulate character.
ACCOL—Accumulate column.
ACSPEC—Accumulate special character.
ACX—Accumulate X-register.
ADV—Advance paper.
BLDSPEC—Build special character.
LIST—List program lines.
PRA—Print ALPHA register.
PRAXIS—Print axis.
PRBUF—Print buffer.
PRFLAGS—Print flags and status information.
PRKEYS—Print reassigned keys.
PRP—Print program.
PRPLOT—Plot function interactively.
PRPLOTP—Plot function noninteractively.
PRREG—Print registers.
PRREGX—Print registers as directed by X.
PRΣ—Print statistics registers.
PRSTK—Print stack.
PRX—Print X-register.
REGPLOT—Plot single line using data in registers.
SKPCHR—Skip characters, accumulate in print buffer.
SKPCOL—Skip columns, accumulate in print buffer.
STKPLOT—Plot single line using data in stack.

Hewlett-Packard HP-IL Peripherals

HP 82161A Digital Cassette Drive

The Digital Cassette Drive uses a digital-quality mini-cassette, capable of storing up to 128K bytes of information. Files can be located easily by name on the cassette drive. Rewind time is under 30 seconds and read/write operations are executed at nine inches per second, with search speed at 30 inches per second. All tape movement is under microprocessor control, unlike the more common audio cassette drives that must be operated manually. Buffer space is provided in the drive for temporary storage of directory information to help minimize access time and tape motion. The HP 82161A can locate files when under program control. It also features STANDBY mode, enabling an HP-IL controller to turn the drive on or off remotely. This unique feature helps extend system battery life and allows for system operation in remote applications.

Features	Benefits
• Battery powered.	Take it anywhere.
• 128K bytes per cassette.	More than 58 times the RAM capacity of the HP-41CV.
• Variable record length, file-by-name organization, tape directory.	Access data quickly and easily; save file space.
• Internal buffer space.	Minimizes tape motion, access time.
• STANDBY mode.	HP-IL controller can turn drive on or off from a remote location; conserves battery power.

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-cadmium 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/centimeter (850 bits/in)

Format . . . . . 256 bytes/record (8 bits/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 centimeters (9 in) per sec

Search/Rewind speed . . . . . .76 centimeters (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 printouts 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. Additionally, it supports STANDBY mode that lets any HP-IL controller on the loop manage its power consumption.

Features	Benefits
• Battery powered.	Take it anywhere.
• Automatic centering and left or right justification.	Provides formattting control; saves time.
• 24 characters per line.	Makes smaller print possible.
• Both single- and double-wide characters.	Allows highlighting of output.
• 128-character set.	Allows more precise communication.
• STANDBY mode.	HP-IL controller can turn printer on or off from remote location; conserves battery power.

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 start-up) or 1 (active-listener startup)

HP 82905B
Impact Printer

Operating bidirectionally at 80 characters per second, this 80-column printer produces full-page forms quickly and legibly.

It has a standard 128-character set with upper- and lowercase letters and true descenders. And you can choose from five print modes. The text mode of this dot-matrix printer has a logic-seeking feature that finds the shortest route. Programmable line spacing, in increments of 1/72 inch, lets you print superscripts and subscripts. A Roman character set allows multilingual printing.

Features	Benefits
• Up to 132 characters per line.	Full-page printouts available.
• Operates bidirectionally.	Produces forms quickly.
• Programmable page length for single or multipart forms.	Greater control over output.
• Adjustable tractor feed.	Use with all types of computer forms.
• Roman character set.	Allows printing in several languages.

The HP 82905B prints single or multipart forms (up to three parts, each with a maximum thickness of 0.3 mm). Its adjustable tractor feed can be used with all types of computer forms with widths between 10.2 cm (4 in) and 25.5 cm (10 in).

Programmable page length lets you define page size and skip perforations.

Physical Specifications

DIMENSIONS . . .10.7 cm (4.2 in) x 37.4 cm (14.7 in) x 30.5 cm (12.0 in)

WEIGHT . . . . . .5.5 kg (12 lbs)

POWER REQUIREMENTS

Power source . . . .HP-IB: Opt. 002, 003, 004 (100Vac)
HP-IL: Opt. 248, 348, 448 (120Vac)
RS-232: Opt. 240, 340, 440 (220 Vac)

Frequency . . . . . 50/60 Hz

Power consumption . . .100 VA maximum

OPERATING REQUIREMENTS

Operating temperature . . . .5° to 35°C (41° to 95°F)

Humidity . . . . . .10% to 90% noncondensing

PRINT FORMAT

Technique . . . . . dot-matrix impact.

Speed . . . . . .80 characters/sec bidirectional; logic-seeking in text mode.

Text mode character cell structure . . .9 x 9 dot-matrix

Graphics mode character structure . . . . . 72 x 60 or 72 x 120 dots/in

Characters per line 40, 66, 80, 132

Line feed rate . . . . .5 lines/sec

Print Pitch (CPI)		Line Length (characters)
10.00.	normal	80
5.00. . .	normal expanded . . .	40
16.50. . . .	compressed	132
8.25. . . .	compressed—expanded	66
10.00. . .	normal emphasized . . .	80

Character Set . . . .96 USASCII
Roman Extension 46

FORMS HANDLING

Forms tractors

Programmable page length

Automatic perforation skip

Variable vertical line spacing . . . . . .1/6 in standard; programmable to various line densities.

FORMS SPECIFICATIONS

Paper width range . . . . . .10.2 cm (4 in) to 25.4 cm (10 in)

Paper thickness . . .0.3 mm (0.01 in) maximum

Multipart forms . . .original plus 2 copies

PRINT BUFFER

One line, or up to 132 characters

HP 2671A/G Alphanumeric/Graphics Thermal Printers

The HP 2671A Alphanumeric Printer is both 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.

Features	Benefits
• High throughput.	Rapid printing.
• Quiet.	Useable in quiet areas.
• 9 x 15 dot matrix.	Excellent character definition.
• Choice of paper available.	Use fan-fold forms or roll paper.
• Choice of print modes.	Multilingual output.

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-232 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% noncondensing

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 7470A Graphics Plotter

The HP 7470A Graphics Plotter uses a two-pen system to produce high-quality color charts and graphs. 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 with simple commands 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.

Features	Benefits
• High-quality graphics.	Achieve more precise results.
• 1000 points in a one-inch line (.001 in or .025 cm).	Fine resolution of lines and curves.
• Lines plotted up to 15 inches (38 cm) per second.	Generate plots in minutes.
• Two built-in pen stalls; snap in additional pens as needed.	Print with two or more colors.
• Five internal character sets.	Eliminates need for software-generated characters.

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
−10%, +5%
HP-IB Opt. 002
HP-IL Opt. 003
RS-232 Opt. 001
100, 120, 220 and 240 Vac, switch selectable.
Frequency . . . . . 48/66 Hz
Power consumption . . .25 watts maximum

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 2 Gs

HP 82168A Acoustic Coupler (Modem)

With the portable coupler, the HP-41 and 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 battery-powered device is compatible with HP-IL (Hewlett-Packard Interface Loop). It 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.

The HP-41 Extended I/O Module, an HP-41 and HP 82168A Acoustic Coupler are all that are necessary for Series 40 operation of this battery-powered modem.

Data Communications Pac software is the quickest and easiest way to operate the coupler with Series 70 computers. You also can use the combination of I/O Utilities Card (available in the HP-75 Utilities Solutions Book, 00075-13013) and Asynchronous Terminal Emulator Program. The terminal emulator program may be found in the HP 82168A Acoustic Coupler manual.

For additional data communications information, see the HP 82164A RS-232C Interface, page 27.

Features	Benefits
• Portable, carry in briefcase.	Can be used from any conventional (G-type) phone receiver. Send or receive data while away from the office.
• Operates at 300 baud.	Compatible with most public and private data bases.
• Automatic power off.	Minimal power drain.
• HP-IL command controlled.	Fully automatic operation.

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

Hewlett-Packard HP-IL Instruments

HP 3468A Digital Multimeter*

HP's first HP-IL (Hewlett-Packard Interface Loop) instrument is a low-cost, autoranging digital multimeter for your 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 5½ to 3½ digits, five functions, and a 1-μV sensitivity.

Features	Benefits
• 5½ digit precision.	Accurate measurements for high performance needs.
• 1 μV dc and ac resolution; 300 volts maximum.	High sensitivity to detect small changes.
• HP-IL interface.	Low-cost automatic measurements.
• 5½ to 3½ digits of resolution; auto zero ON or OFF; speeds of 32 to 2.7 rps.	Selectable speed vs. accuracy for measurement flexibility.
• Electronic calibration and self-test.	Low-cost calibration, assures proper functioning.
• Pushbutton front panel.	Easy-to-change functions, low cost, and high reliability.
• Optional battery pack.	Portability and isolation.

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 different 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.

Features	Benefits
• Battery power.	Take it anywhere.
• Display shows channels closed, digital states, and self-test conditions.	See what's happening at a glance.
• Electronic calibration and self-test.	High reliability and repeatable answers.
• Built-in 300,000 count A/D with 1 μV sensitivity and good noise rejection.	Measure transducers with confidence.
• Front terminals are in parallel with the scanner's common bus.	Measure dc volts, ac volts, ohms, frequency or thermocouples conveniently on the bench.
• Switch from HP-IL to HP-IB or HP-IL/HP-IB interfaces.	Choose between low battery power and high computer performance.

*Not available for purchase at retail outlets. For detailed specifications, contact your local HP sales office.

Hewlett-Packard HP-IL Interfaces

HP 82164A RS-232C Interface

The HP 82164A RS-232C Interface translates HP-IL signals into RS-232C signals and vice versa. It is designed to allow the interconnection of HP-IL systems with RS-232C devices. The interface operates in an asynchronous mode providing 5-, 6-, 7-, or 8-bit data formats with one or two stop bits and odd, even, zero, one, and no parity modes. A configuration control block allows the user to change the signals at the connector from a terminal (DTE) configuration to a modem (DCE) configuration so a host computer can be emulated.

HP 82169A HP-IB Interface

The HP 82169A expands Series 40 and Series 70 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 a variety of peripherals, instruments, and computers at your disposal, including more than 120 HP-IB-compatible devices made by HP and many more offered by other manufacturers.

With the HP-IB interface, you can operate HP-IB versions of the HP 82905B printer and the HP 7470A plotter; operate and control power supplies and instruments such as the HP 1980 oscilloscope; and talk directly with HP-IB computers such as HP Series 80, 100, 200, even the HP 1000 and 3000.

HP 82938A Series 80 Interface

With the HP 82938A, a Series 80 computer can act as a system controller or device in a Series 40 or Series 70 HP-IL system. You can take advantage of Series 80 graphics capabilities to display information from Series 40 or Series 70 computers in easy-to-understand graphs and charts. Or, with Series 80 data communications products, you can pass information to larger computers.

HP 82165A GPIO Interface

Use your HP-IL system to control equipment operating with parallel bus structures. The GPIO interface contains the port buffering and a built-in power supply that operates from an HP standard ac adapter which is supplied with the interface. Interface to computers for data collection, to specialized devices in production or lab environments, and to other devices.

HP 92198A Mountain Computer 80-Column Video Interface

You can use this interface to display data and listings from a Series 40 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 can also be displayed in inverse video (dark characters on a light background).

HP 82166C HP-IL Interface Kit*

The HP-IL Interface Kit provides the special components necessary for building HP-IL into your product. Three components are key to implementing the HP-IL interface standard: the HP-IL integrated circuits, the HP-IL transformer set, and the HP-IL panel receptacle. Included are complete component-level documentation, four complete sets of parts for prototype evaluation, and HP-IL development software for use on Series 40 and Series 70 systems. Components may be purchased individually when design is completed.

* Not available for purchase at retail outlets. To order an HP 82166C HP-IL Interface Kit, contact your local HP sales office.

Hewlett-Packard Series 40 Software

Series 40 Application Pacs come complete with detailed manuals and plug-in application modules that increase the versatility of your Series 40 Advanced Calculator.

Aviation (00041-15018)
(For pre-flight use.)
- Fight Management
- General Aircraft Weight and Balance
- Flight Plan
- Determining In-Flight Winds
- Position by One or Two VORS
- Mach Number and True Airspeed

Circuit Analysis (00041-15006)
- General Network Analysis
- Ladder Network Analysis

Clinical Lab and Nuclear Medicine (00041-15024)
- Beer's Law
- Body Surface Area
- Creatinine Clearance
- Blood Acid-Base Status
- Oxygen Saturation and Content
- Red Cell Indices
- Total Blood Volume
- Thyroid Uptake
- Radioactive Decay Correction
- Radioimmunoassay
- Basic Statistics
- Chi-square Evaluation and Distribution
- t Statistics
- t Distribution

Financial Decisions (00041-15004)
- Compound Interest Solutions
- Internal Rate of Return
- Modified Internal Rate of Return (FMRR)
- Net Present Value
- Loan Amortization Schedules
- Depreciation Schedules
- Bond Price and Yield
- Days Between Dates

Games (00041-15022)
- Submarine Hunt
- Space War
- Super Bagels
- Hangman
- Pinball
- Craps
- Biorhythms
- Random Number Generator

Home Management (00041-15023)
- Home Budgeting
- Travel Expense Record
- Stock Portfolio Evaluation
- Checking Account Reconciliation
- Your Financial Calculator
- Accumulated Interest and Remaining Balance
- Home Owner's Equity Analysis
- The Rent or Buy Decision
- Tax Free Individual Retirement Account (IRA) or Keogh Planning
- The True Cost of an Insurance Policy

Machine Design (00041-15020)
- Circular Cams
- Generation of a Four Bar Linkage
- Progression of Four Bar System
- Progression of Slider Crank
- Gear Forces
- Standard External Involute Spur Gears
- Helical Spring Design
- Forced Oscillator with Arbitrary Function
- Coordinate Transformation
- Points on a Circle
- Circle by Three Points
- Unit Conversions

Mathematics (00041-15003)
- Matrix Operations
- Solution to $f(x) = 0$ on an Interval
- Polynomial Solutions/Evaluation
- Numerical Integration
- Differential Equations
- Fourier Series
- Complex Operations
- Hyberbolics
- Triangle Solutions
- Coordinate Transformations

Navigation (00041-15017)
- Great-Circle Course and Distance
- Great-Circle Position
- Rhumb-Line Course and Distance
- Rhumb-Line Position
- Great-Circle Plotting and Voyage Planning
- Dead Reckoning
- Sight Reduction
- Perpetual Almanac-Stars, Sun, Planets, Moon
- Almanac Interpolator
- Sight Reduction Table
- Calendar Functions
- Greenwich Sidereal Time
- Star Almanac
- Fundamental Arguments
- Astronomical Coordinate Conversion
- Longitude to Latitude
- Input/Output Routines

Petroleum Fluids Pac (00041-15039)
- Z Factor
- Gas Isothermal Compressibility
- Gas Formation Volume Factor
- Gas Viscosity
- Pseudocritical Temperature and Pressure From Gas Gravity
- Gas Properties From Composition
- Oil Isothermal Compressibility
- Oil Formation Volume Factor
- Oil Viscosity
- Gas-Oil Ratio
- Bubble Point Pressure
- Two-Phase Formation Volume Factor
- Water Isothermal Compressibility
- Water Formation Volume Factor
- Water Viscosity
- Gas-Water Ratio
- Rock Compressibility
- Total Isothermal Compressibility

Includes unit management systems subroutines.

Real Estate (00041-15016)
- Compound Interest and Loan Amortization

- Internal Rate of Return
- Modified Internal Rate of Return
- Net Present Value
- Depreciation Schedules
- Income Property Analysis
- Graduated Payment Mortgage
- Wrap-Around Mortgage
- Home Owner's Equity Analysis
- The Rent or Buy Decision
- Price and Yield of a Mortgage Traded at a Discount/Premium
- APR of a Loan With Fees
- Present Value of an Increasing/Decreasing Annuity

Securities (00041-15026)
- Bond/Note Price and Yield
- Routines for Option Writers Using the Black-Scholes Evaluation Method
- Warranty and Option Hedging
- Yield on Call Option Sales
- Butterfly Options
- Bull Spread Option Strategy
- Convertible Bond Investment Analysis
- Stock Portfolio Valuation
- Bond Speculation Using Margin
- Convertible Security Analysis

Standard Applications Module (00041-15001)
- RPN Primer
- Calendar Functions
- Word Guessing Game
- Arithmetic Teacher
- Hexadecimal - Decimal Converter
- Financial Calculations
- Root Finder
- Curve Fitting
- Vector Operations
- Blackjack

Statistics (00041-15002)
- Basic Statistics for Two Variables
- Moments, Skewness and Kurtosis
- Analysis of Variance (One Way)
- Analysis of Variance (Two Way)
- Analysis of Covariance (One Way)
- Curve Fitting (Linear, Exponential, Logarithmic and Power Curve)
- Multiple Linear Regression
- Polynomial Regression
- t Statistics
- Chi-Square Evaluation
- Contingency Table
- Spearman's Rank Correlation Coefficient
- Normal and Inverse Normal Distribution
- Chi-Square Distribution

Stress Analysis for Mechanical Engineers (00041-15027)
- Section Properties
- Beams
- Simply Supported Continuous Beams
- Columns
- Mohr Circle Analysis
- Strain Gage Data Reduction
- Soderberg's Equation for Fatigue
- RPN Vector Calculator

Structural Analysis for Civil Engineers (00041-15021)
- Section Properties
- Beams
- Simply Supported Continuous Beams
- Settling of Continuous Beams
- Continuous Frame Analysis
- Steel Column Formula
- RPN Vector Calculator
- Reinforced Concrete Beams
- Reinforced Concrete Columns
- Effective Moment of Inertia for Concrete Sections

Surveying (00041-15005)
- Traverse, Inverse and Sideshots
- Compass Rule Adjustment
- Transit Rule Adjustment
- Intersections
- Curve Solutions
- Horizontal Curve Layout
- Vertical Curves and Grades
- Resection
- Predetermined Area
- Volume by Average End Area
- Volume of a Borrow Pit
- Coordinate Transformation

Thermal and Transport Science (00041-15019)
- Equations of State
- Polytropic Processes for Ideal Gas
- Isentropic Flow for Ideal Gases
- Conduit Flow
- Energy Equation for Steady Flow
- Heat Exchangers
- Black Body Thermal Radiation

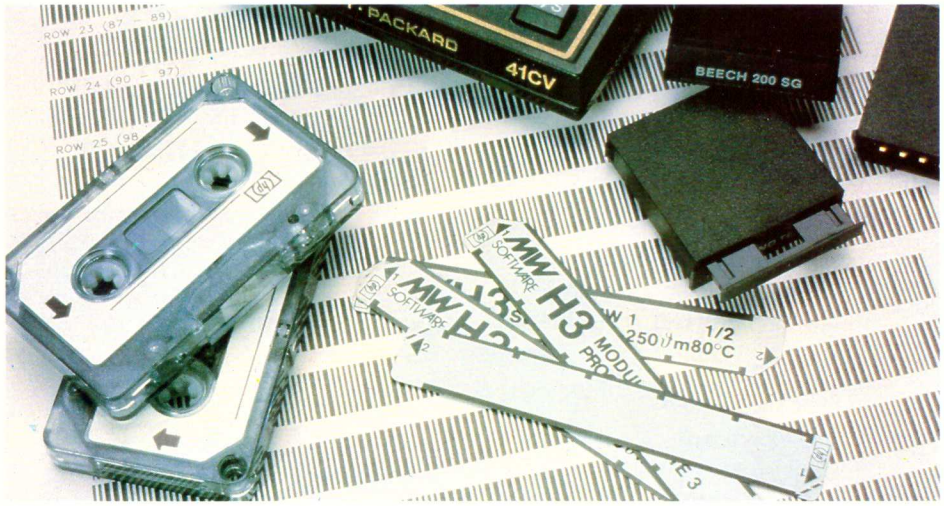
Includes unit management system subroutines.

Series 40 Solutions Books

Series 40 Solutions Books provide complete step-by-step keystroke listings to help equip you with answers to your general or specialized programs. Printed bar code comes with Solutions Books. Magnetic cards and mini data cassettes are also available.

- Antennas (00041-90093)
- Business Statistics/Marketing Sales (00041-90094)
- Calendars (00041-90145)
- Chemical Engineering (00041-90100)
- Chemistry (00041-90102)
- Civil Engineering (00041-90089)
- Control Systems (00041-90092)
- Electrical Engineering (00041-90088)
- Fluid Dynamics & Hydraulics (00041-90139)
- Games I (00041-90099)
- Games II (00041-90443)
- Geometry (00041-90084)
- Heating, Ventilating & Air Conditioning (00041-90140)
- High-Level Math (00041-90083)
- Home Construction Estimating (00041-90096)
- Lending, Savings, & Leasing (00041-90086)
- Mechanical Engineering (00041-90090)

- Optometry I (General) (00041-90143)
- Optometry II (Contact Lens) (00041-90144)
- Physics (00041-90142)
- Real Estate (00041-90136)
- Small Business (00041-90137)
- Solar Engineering (00041-90138)
- Structural Design (cassette based) (00041-90441)
- Surveying (00041-90141)
- 1982 Taxes (00041-90455)
- Test Statistics (00041-90082)
- Time Module Solutions I (00041-90395)
- *Series 40 Software Catalog*



Users' Library Software

The Users' Library is another source of software solutions for Series 40 owners. Library members have contributed thousands of programs for Series 40, spanning such applications as civil engineering, surveying, business and navigation.

Each program has been thoroughly reviewed by the Library's technical staff and is accompanied by in-depth documentation, ensuring you of tested software solutions. You can expect complete program descriptions that explain any special operating procedures, warnings, or limits; sample problems and examples as appropriate; instructions on how to run the program; and step-by-step listings of program keystrokes.

Users' Library Series 40 program documentation includes individual program listings and HP bar code. Pre-recorded magnetic cards are available for an additional charge. You can also purchase programs on mini-cassettes for the HP-IL Digital Cassette Drive. When you subscribe to the Library, you will receive the *Series 40 Software Catalog*, special discounts, two HP-41 Solutions Books*, and special promotions.

For more information about available Users' Library programs, see your nearest HP dealer or HP sales representative.

Series 40 Custom Products

The HP Custom Advanced Calculator springs from the successful marriage of customer-generated software, HP's Custom Products Program and the powerful HP-41.

How do you customize the HP-41 to fit your special needs? Hewlett-Packard offers several options, all designed to tailor your problem-solving system to your professional demands. Use Custom Modules, Custom Magnetic Cards, and Custom Bar Code for program storage and Custom Keyboard Overlays and Touchpads for keyboard personalization. The right custom option puts power and portability to work for you, swiftly transforming questions into answers and problems into solutions.

For more information on Custom Products, contact your HP sales representative.

*Offer excludes Structural Design.

Comparison Chart

Use the comparison chart below to help choose between the HP-41CV and HP-41CX. Additional features and functions are listed on the adjacent page.

	HP-41CV	HP-41CX
Memory		
Built-in memory (bytes)	2,237	2,237
Built-in extended memory (bytes)		868
Maximum extended memory (bytes)	4,200	4,200
Maximum memory (bytes)	6,437	6,437
System Features		
Alpha/display/keyboard	■	■
Text-file editor		■
Clock, stopwatch, and alarms	S	■
Calendar functions	S	■
Programming Features		
Alpha program labels	■	■
Alpha string manipulation	■	■
Audible tones	■	■
Conditional tests	14	20
Flags	56	56
Indexed looping (DSE, ISG)	■	■
Indirect parameter specification	■	■
Insert/Delete editing	■	■
Levels of subroutines	6	6
Numeric program labels	100	100
Single-character program labels	56	56
Alpha/X-reg/flags transfers byte	S	■

Peripherals & Add-ons

Dedicated and HP-IL peripherals and add-ons.

Software

Application Pacs, Solutions Books, and thousands of Users' Library programs.

Custom software

Choice of software: custom ROMs, cassettes, mag cards, bar code.

Redefinable keyboard

Fully redefinable.

Batteries

Disposable and Rechargeable.

Key

■ Built-in feature or function

S Application Pacs, Solutions Books, and thousands of Users' Library programs

Series 40 Features and Functions

The features and functions listed below apply to both the HP-41CV and HP-41CX.

Business Features

Amortization	S
Beginning/end of period selection	S
Bond:	
yield-to-maturity	S
price	S
Net present value (NPV) and internal rate of return (IRR)	S

Scientific Features

Boolean operators (NOT, OR, AND, XOR)	S
Complex functions	S
Decimal angle ⟷ angle in degrees (hrs/min/sec)	■
Degrees ⟷ radians	■
Engineering notation	■
Hyperbolics and inverses	S
Integrate (numerical integration)	S
Matrix operations	S
Number base arithmetic (binary, octal, decimal, hexadecimal)	S
Rectangular ⟷ polar coordinates	■
Scientific notation	■
Solve (root finder)	S
Trigonometric functions	■

Statistical Features

Correlation coefficient	S
Factorial function	■
Gamma function	S
Linear regression or estimate	S
Mean/standard deviation (1- or 2-variable)	■
Percent	■
Percent change	■
Permutations and combinations	S
Random number generator	S
Weighted mean	S
$n, \Sigma x, \Sigma x^2, \Sigma y, \Sigma y^2, \Sigma xy$	■

General Arithmetic Features

Absolute value	■
Storage register arithmetic	■
$+, -, /, \times, \sqrt{x}, 1/x$, CHS	■
Ln x, e^x	■
y^x, Log x, 10^x, x^2, π	■

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 (1-800-367-4772).

United States:
Hewlett-Packard
Portable Computer Division
1000 N.E. Circle Blvd.
Corvallis, Oregon 97330

Canada:
Hewlett-Packard (Canada) Ltd.
6877 Goreway Drive
Mississauga, Ontario
L4V1M8

Europe, North Africa, Middle East:
Hewlett-Packard S.A.
150, Route du Nant-d'Avril
P.O. Box CH-1217 Meyrin 2
Geneva, Switzerland

Other Countries:
Hewlett-Packard Intercontinental
3495 Deer Creek Road
Palo Alto, California 94304
U.S.A.

Hewlett-Packard Corporate Offices
3000 Hanover Street
Palo Alto, California 94304
U.S.A.

HEWLETT PACKARD

Printed in U.S.A. 10/83
5953-5579