HP Computer Museum

www.hpmuseum.net

For research and education purposes only.
Your competition in today's marketplace is stiff. You need help whenever you can get it. We understand that, and we're here to help you.

Our Custom Products program addresses your specific business and technical problems. Your problems are unique, and you need unique solutions. The HP-41 Advanced Calculator, HP-71 Handheld Computer, and HP-75 Portable Computer, coupled with our HP Custom Products, can provide these solutions.

Custom Products offer a personal, tailor-made approach to traditional problems. If your organization has groups of people who perform identical jobs, you may be able to save time and money, as well as increase productivity, with customized products—meeting the competition all the way.

Your applications may be in design, planning, long-term, strategies, process and operation control, or sales. Whatever they may be, we can address many of your computational and information management needs with Hewlett-Packard's Custom Products program.

**The Program**

Let the Custom Products program serve you by developing dedicated solutions for you. Special HP-41, HP-71, and HP-75 built-in programming features make this exceptional ease keys can be completely redefined. Overlay designs identify your unique functions on the keyboard. Customized software modules can be plugged into special input/output ports. And a variety of peripherals can expand the capabilities of your system.

Custom software is available in Custom Modules, Custom Magnetic Cards, and Custom Bar Code. Add a Custom Keyboard Overlay or Custom Keyboard Touchpad, and the transition to a dedicated custom product is complete.

**The Viewport**

The HP-41 Handheld Computer takes over where the HP-41 leaves off. An enhanced BASIC operating system provides higher calculation speeds which are further improved by FORTH and assembler capabilities. For interfacing, HP-41 provides data transfer rates up to 5,000 bytes per second.

The HP-75 Portable Computer has the fastest BASIC operating system of our portable line to date. The larger touch-type keyboard makes this an excellent choice when you need to type in text information and then send it to a host computer over the telephone lines. The HP-75D has a built-in bar code word interface, making it an excellent tool for your bar code needs.

In the following pages you'll learn about the significant role the Independent Custom Consultant (ICC) plays in the process of acquiring Custom Products. You'll learn more about the customizing features of the HP-41, HP-71, and HP-75 as well as note some details about your Custom Product alternatives. And you'll look at examples of Custom Products applications. Finally, you'll see how the whole process works so that you'll be better able to make the right decision. It's an important one, and we're ready to help.

**The Independent Custom Consultant (ICC)**

The ICC is a trained expert who can help you save time and money—and get it right the first time. The role the ICC plays in the process is described below.

First, choose and contact an ICC (a list of ICC's is available from your HP Sales Representative), who can provide you with the information you need to decide if Custom Products are right for you.

The ICC can also provide you with a wide variety of services. To maximize computing effectiveness for you, ICC receive training that includes programming and procurement procedures on Hewlett-Packard's portable computing products. They have all the required software development tools.

Two levels of custom service are available. If you have written your own software and want it made into a Custom Product, you need only the first level. In this case, the ICC converts your software to ROM image code using software development tools and arranges with the factory to have your product manufactured.

The second level of service is more comprehensive. In this case, the ICC can write software, provide users' manuals, field test and debug the software, consult on hardware-related questions, help you with specifications and preparation of Custom Keyboard Overlays or Custom keyboard Touchpads (for HP-41 only), package your system into a custom case and more. Then, the ICC will arrange with the factory to have your Custom Products manufactured.

Here's how the process works:

![Diagram showing the process of custom service]

A. Dealer or sales representative contacted by customer.
B. Dealer or sales representative refers customer to ICC.
C. ICC/customer contact is made. ICC and customer establish business relationship.
D. ICC contacts factory to order Custom Products.
E. Dealer or Sales Representative informs of ongoing activity by factory.
Many companies have found that Custom Products provide just the solutions they need. Among them two firms, Paul Munroe Hydraulics, Inc. and our own Hewlett-Packard Loveland Instrument Division, clearly illustrate typical success stories.

**Custom Engineering**

Paul Munroe Hydraulics is a California-based firm competing in the field of fluid power engineering. Paul Munroe uses Custom Modules, Custom Keyboard Overlays, and Custom Magnetic Cards as aids in performing complex calculations in hydraulic fluid cylinder-sizing, fluid flow, and hydraulics transmission. Because many calculations are done in the field, the convenient size and portability of the HP-41, and easy access to Custom Products, make this the ideal solution. Hydraulic calculations that might otherwise require days to complete can be performed in a matter of hours. Programs stored in the Custom Modules not only save time, but also eliminate guesswork. Custom Overlays make relabeled keys easy to read, and allow easy operation in a single keystroke. Salespeople using custom cylinder-sizing programs find that Custom Magnetic Cards are an inexpensive and effective way to record and review catalog prices and inventory — whenever and wherever they're needed.

In addition, Paul Munroe relies on the HP-41 Custom Products program as an educational tool. With Custom Products, both accuracy and ease of operation make learning in the company-sponsored hydraulics courses a comfortable and enjoyable experience.

Paul Munroe even sells its Custom Products solution to other engineers and professionals in their field. In such diverse applications as hydraulic regulation of the height of a pitching mound in a baseball game, flow measurement of a Saudi Arabian oil pipeline, or cargo and ballast control of supertankers.

From attention to detail on the company's overlay logo to the 'fast track' turnaround on delivery of the products themselves, Paul Munroe has found that HP-41 Custom Products provide the competitive edge it needs in today's marketplace.

**Custom Products for Original Equipment Manufacturers**

Hewlett-Packard Loveland Instrument Division (LED), Loveland, Colorado, acts as an original equipment manufacturer in selling instruments it builds, such as the HP 3421A Data Acquisition/Control Unit and the HP 3468A Multimeter, in combination with Custom Products. With Custom ROM Modules and Custom Keyboard Touchpads, customers have the benefit of portability, accuracy, and redefinable keyboards. These systems provide customers with the portable tools they need to implement such operations as greenhouse temperature and humidity monitoring and control, solar energy temperature and pressure level adjustment, and floor temperature measurement. HP-41 Custom Products offer a way for LED to provide low-cost, battery-operated computation in a data acquisition system, enhancing sales to engineers and other professionals.
The HP-71 and HP-75 Custom Products program is available to meet the needs of companies seeking a BASIC language machine. The focus of the program is to provide tools useful in BASIC language applications such as information management, data collection and processing, and the transmission of data to other computers from remote sites. Choose the HP-73D when you need a larger keyboard and display and/or need to read major industrial bar codes. And pick the HP-71 when you need to combine BASIC, FORTRAN, or assembly language with advanced calculations.

**HP-73D Portable Computer—Boost Productivity in Inventory Control**

The HP-73D is ideal as a remote data collection and information processing tool whether operated from the keyboard or used with a bar code wand. Examples of applications for which the HP-73D is best suited include field service reporting, sales order entry, and inventory control. For instance, a warehouse requires an efficient, cost-effective method of inventory control. And the HP-73D easily fits the bill. Data such as inventory status from the previous day can be loaded into the HP-73D from a host mainframe such as an HP-3000, Series 80, or other personal computer. Then, inventory can be taken at a remote site via the HP-73D (with built-in bar code wand interface) either from the keyboard or by using a bar code wand. A Custom ROM Module and Custom Keyboard Overlay provide the specific custom solution that meets the needs of this warehouse.

The information then can be processed and stored at the remote site. When inventory is completed, or at any point during the process, the stored data can be transmitted to the host mainframe via the HP-PL/RS-232C interface or modem. When using the optional HP 82718A Expansion PDU, a built-in modem makes this even more efficient. It is then a simple matter to create reports, charts, graphs, and more.

With the HP-73D Portable Computing System and Custom Products, companies can develop dedicated portable computer applications to improve organizational productivity.

In the HP-71 and HP-75, Hewlett-Packard provides products to meet your needs, whether they be remote data collection and information processing or monitoring and controlling instruments.

*Available in July 1984.*
The HP-41 Advanced Calculator

A fully configured, customized HP-41 stores over 8,000 programs. It combines the speed, power, and accuracy of a computer with the portability, touch-sensitivity, and simplicity of a hand-held calculator.

There are two HP-41 models from which to choose—the HP-41CV and the HP-41CX. Both have 2,250 bytes of built-in memory or 319 registers. The HP-41CX also has 688 bytes, or 124 registers, of extended memory built-in (optional for the HP-41CV). Further expansion of the memory in either model, up to a maximum of 999 registers, is possible through the use of extended memory.

Other built-in features of the HP-41CX as compared to HP-41CV capabilities are:

**HP-41CV**

- Rear 15V size N batteries supply all the power you need. Whether you’re in the field or at your desk, or reading magnetic cards or bar code, the reliability of the HP-41 is enhanced by the simplicity of the power supply.

- The HP-41 uses 30% more memory, providing you with a consistent and efficient logic system that is fast and makes error recovery save by automatically clearing your last entry. And, an important advantage is that it also lets you see intermediate results.

- Magnetic Card reader/printer accessory to support card readers.

- 12-Chip Character LCD

- Built-in Time Module

- Continuous Memory

- *Alphanumeric Keyboard* available keypads, functions, and results.

- 24K-Byte Operating System

- 240 separate operations

- *Binary Code making creativity easy* reproduced on paper.

- *Bar Code* making creativity easy* reproduced on paper.

- *Non-Volatile Logic* making creativity easy* reproduced on paper.

- *58 Functions* making creativity easy* reproduced on paper.

- *Text-Edit Editing in 8,400 separate operations of extended function modules.

- *Binary Extended Operations Module* making creativity easy* reproduced on paper.

*Available in both HP-41CV and HP-41CX.*

The HP-41 liquid-crystal display is easy to read, and it eliminates those problems generally associated with glare. The display must act as a tenth digit or two-dimensional character window on a 24-character line, which may be scrolled from left to right.

Continuous Memory preserves everything from stored data to user-defined keyboard assignments even when your calculator is turned off.

With the Hewlett-Packard Interface Loop (HP-L), your HP-41 becomes a system that can print, plot, store, retrieve, and display information, as well as control instruments and peripherals.

Over 253 (HP-41CX) and 128 (HP-41CV) separate operations make in the HP-41 function library and 86 of those functions are on the keyboard. Custom Keyboard Overlays can personalize the HP-41, eliminating all irrelevant nomenclature. The Custom Keyboard Footpad fits over the keys covering the entire keyboard. It offers dust protection, provides labeling of the keyboard, and allows key functions to be redefined.

Or if you prefer, get the HP-41 (Opt. 001) Custom Calculator. Since it is an HP-41, its operation is unchanged. The difference is that the keys are not labeled. Four input/output ports and a HP-41 in the HP-L will add plug-in I/O modules, memory modules, and/or peripherals in combination within accepted configurations. Custom Modules may be added, providing media for permanent and private programme storage.
HP-41 Custom Products and Tools

Software Development System
- Used in developing Custom Modules for your own HP-41 Advanced Calculator
- Allows the use of a standard size keyboard for program development
- Allows the use of a large display for ease in editing
- Allows the programs you develop to be converted to ROM-image code
- Provides an emulator for use in field testing and debugging
- After programs are completed, simply copy them to a floppy disc and submit to an ICC for manufacture into Custom ROM Modules

Custom Keyboard Touchpads
- Provide relabeling of the entire keyboard
- Allow on-key and shifted key labels to be renamed
- Fit over the keys and cover entire keyboard to protect against dust; can be easily removed
- Available in choice of touchpad background color as well as printing color
- Available with special logos, trademarks, and other symbols

Custom Keyboard Overlays
- Provide relabeling of the shift function on the keyboard
- Fit between the keys on the keyboard; can be easily removed
- Available with choice of overlay background color and printing color
- Available with special logos, trademarks, and other symbols

HP-41CV or HP-41CX Opt. 003 Custom Calculator
- Comes with owner's documentation
- Nomenclature on top of the upper four (4) rows of keys has been deleted
- The USER and FROG keys are concealed with a removable plastic cover

Custom ROM Modules
- Provide 4k or 8k bytes of Read Only Memory (ROM) in a plug-in module
- Can provide automatic execution of programs and key reassignments
- Program is permanent; can't be erased
- Program is private; most private of any software
- Plug into any one of the four ports on the HP-41

Custom Magnetic Cards
- Inexpensive magnetic media
- Hold easily 200 instructions per card
- Provide the recording of special key assignments, programs, and data
- Professionally printed and labeled to your specifications
- Convenient for volume distribution
- Allow easy program and data modification for updates

Bar Code
- Provides coverage on paper that can be copied
- Extremely cost efficient, least expensive of any custom media
- Easy to use, duplicate, and distribute
- Can represent any operation that can be performed from the keyboard
- Preserves special key assignments, programs, and data
- Can be provided by a selected vendor
- Can be reproduced with HP 82184A Plotter Module
The HP-71 Handheld Computers

The HP-71 is one of the world's most powerful handheld BASIC computers that's optimized for calculations. It has a powerful 8K-byte operating system. You can use BASIC language, or override it with the FORTH and assembly languages.

In addition, the HP-71 has HP-II system expansion potential, can interface via RS-232C, HP-IB, GPO, and can be easily customized. CALC mode, an advanced calculator operating mode, is powerful, simple to use, and easy to edit. It gives you a full scientific function set and built-in statistics functions (also available in BASIC). Automatic parentheses matching, shared variables with BASIC mode, immediate execution of expressions as they are entered, and more. And the numeric keypad is a tremendous aid to quick, accurate numeric data entry.

The enhanced BASIC language gives you more than 240 functions, statements, and operators to simplify programming. Advanced statistics functions let you perform computations on up to 15 independent variables. A complete set of trig functions lets you solve complex equations. Add new BASIC keywords by using language extension files with the Pساط/Assembler ROM—and utilize the larger keyboard and display of the HP-150, Series 80, and other personal computers in program development. The 17.5K bytes of built-in user memory can be expanded to as much as 33K with up to four 4K-byte memory modules. Software programs you develop can be stored in Custom ROM Modules providing unique solutions to your problems. Up to four Custom ROM Modules of either 1k, 32k, 48k, or 64k bytes can be inserted into the four RAM/ROM ports on your HP-71. This gives you as much as 256K bytes of Custom ROM in addition to the 17.5K bytes of built-in RAM! Or choose any RAM/RROM combination to a maximum of four plug-ins. Almost every key on the HP-71 keyboard can be customized to suit your requirements. And HP-71 Custom Keyboard Overlays related these keys with your special functions.

An optional hand-held card reader allows inexpensive off-line storage of data and programs. HP can duplicate your Custom Magnetic Cards to store programs, text files, data files, and keyboard definitions.

For maximum customization potential, three volumes of internal design specifications are available from dealers and HP Sales Representatives. That means you can develop your own software, hardware, or interfaces. All this adds up to powerful, fast, accurate custom solutions—for you.
The HP-75 Portable Computer

Because of its compact size, rugged design, ease of program development, and communication program, the HP-75D is ideal for remote data collection and information processing applications. Enter volumes of data via the larger touch-type keyboard or read major industrial bar codes—with the HP-75D at the heart of your total HP solution.

A built-in bar code wand interface is the key that assures the fast, accurate entry of data. Add the 8K-byte HP 82725A Bar Code Reader Module and digital bar code wand to read 3 of 9 Code, interleaved 2 of 5, Industrial 2 of 5, Universal Product Code (A or E), European Article Code (8 or 13), Code 11, and Codabar.

Display data on the HP-75 for verification and collect it in RAM later in the office, or transfer it to another computer via direct interfacing or a telephone line. If you need to use high resolution bar code, you'll want the HP-92267A Bar Code Wand. Or choose the HP-92267B for medium resolution codes.

Add the HP 82728A Expansion Card* and get a 300 baud direct-connect auto-dial, auto-answer avonvansynchronous modem plus either 32K or 64K bytes of electronic disc memory. And you have a complete, powerful, totally portable tool.

The built-in, direct-connect modem introduces the accuracy of information sent over telephone lines. And electronic disc commands let you create, access and modify files, establish hierarchical directory structure, and copy files into and out of electronic disc. And since electronic disc memory is nonvolatile, user information is saved, even when the HP-75D is turned off.

If your application demands less of your entry, you'll find that the HP-75's slinger-corded "touch type" keyboard and larger keys allow fast data entry and accuracy of input. Over 190 keys/key combinations may be redefined for execution of commands, programs, or typing aids. But best of all, an HP-75 Custom Keyboard Overlay can be made to relate these keys for your specific applications.

Since the HP-75 is powered by rechargeable batteries, you can take it anywhere for computation and data collection.

We can duplicate your custom Magnetic Cards to store programs, data and data files, and keyboard redefinitions up to 1.3K bytes per card. Then you simply slip them through the built-in magnetic card reader!

Software programs you develop can be stored in 8K, 16K, 24K, or 32K-byte Custom ROM Modules, providing unique solutions to your problems. The benefit is permanent storage of your programs, privacy, and consistent results.

Using the Hewlett-Packard Interface Loop (HP-IL), your HP-75 becomes a system capable of printing, plotting, storing, retrieving, and displaying information as well as controlling instruments and peripherals.

Additional powerful HP-75 features are shown below.

*Available in July 1974
HP-71 and HP-75
Custom Products and Tools

Plug-In Module Simulator—HP-75

- Used in developing Custom Modules on your HP-75 Portable Computer
- Makes the development and field testing of software intended for ROM-based plug-in modules easy
- Write BASIC language programs with the HP-75 and load into the simulator for execution
- Provides 16K bytes of RAM that allow the temporary storage of files and programs
- Edit and update programs and data while they reside in the PMS, at your convenience
- Portable size makes it easy to use and store
- Use as many as three simulators at one time, providing up to 48K bytes of RAM
- After programs are completed, simply copy them to a cassette tape and submit to an ICC for manufacture into Custom ROM Modules

Plug-In Module Simulation Procedure—HP-71

Any Custom ROM Module developed for the HP-71 Handheld Computer can be simulated through one of the memory ports in the HP-71

Use the FORTH/Assembler ROM to utilize the larger keyboard and display of the HP 15C, Series 80, or other personal computers in software program development

See the HP-71B Plug-In Module Simulation Procedure sheet (available through an HP Sales Representative or ICC) for further information

Custom ROM Modules

- Provide 8K, 16K, 24K, or 32K (HP-75), and 16K, 32K, 48K, or 64K (HP-71) bytes of program storage in a plug-in module
- Can provide automatic execution of programs and key reassignments
- Program is permanent; can't be erased
- Program is private; most private of any software media
- Plug into any one of the three ports on the HP-75, or four ports on the HP-71
- May be used in quantities of one to three on the HP-75, and one to four on the HP-71

Custom Keypad Overlay

- Provide relabeling of any keys/key combinations on the keyboard
- Fits flat between the keys on the keyboard; can be easily removed
- Available with choice of overlay background color and printing color
- Available with special logos, trademarks, and other symbols

HP-71D Dpt. 001 Portable Computer
- Ten HP-71Ds and ten rechargeable Component Owners Manual, carrying cases, or HP-81 cables

Custom Magnetic Cards

- Inexpensive magnetic media
- Hold nearly 13K bytes of instructions per card
- Allow the recording of special key assignments together with a program
- Professionally printed and labeled
- Convenient for volume distribution
- Allows easy program and data modification
Custom Products—
How the Process Works

Your Custom Product Is Produced By Hewlett-Packard And Shipped To You
HP-41 and HP-71 Specifications

HP-41 Advanced Calculator

Dimensions .......................... 14.2 cm (5.6 in) × 7.9 cm (3.1 in) × 3.3 cm (1.3 in)
Weight .................................. 205 g (7.2 oz) with batteries

Power Requirements
Batteries ................................ 1.5V Alkaline batteries (replaceable by user)
Battery current
(worst case) .................. 20 mA (operating) 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% RH at 95%

Display
Capacity .......................... 10 digits, 12 alpha characters displayed (scroll to view 24); 12 annunciator words; each character position consists of 37 segments, including 3 punctuation segments.

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

Number Range
±1.0000000 × 10^−10 to ±9.999999 × 10^0, 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.

Memory Capacity
HP-41CX Resident Programmable: 443 storage registers (319 in RAM, 124 in extended memory), 2,237 program bytes in RAM (868 in extended memory).
Solid-state Mass Memory: 476 storage registers (3,332 program bytes).
HP-41CV Resident Programmable: 319 storage registers (2,237 program bytes).
Solid-state Mass Memory: 400 storage registers (4,200 program bytes).

Maximum overall solid-state mass memory for both models: 919 storage registers (2,237 program bytes; 4,200 mass memory bytes).

HP-71 Handheld Computer

Physical Specifications

Dimensions .......................... 19 cm (7.5 in) × 9.7 cm (3.8 in) × 2.5 cm (1.0 in)

Weight .................................. 340 g (12 oz) with batteries

Power Requirements
Batteries ................................ 41.5V, size AAA batteries (replaceable by user)
Battery current .................. 10 mA (operating) 75 μA (idle) 0.03 mA (off)

Average alkaline
battery life .................. 60 operating hours (battery life depends on use)

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

Display
Character font ........................ 6 × 8 dot matrix
Character set .......................... 96 characters per line
Window size .................. 22 characters (scroll to 96 characters)

Character Range
A–Z, a–z, 0–9, plus 65 special characters.

Number Range
Real precision .................. ±9.999999999 × 10−10 to ±1E−499, 0.1E−499 to ±9.999999999E−499 to ±9.999999999E−499

Integer precision .................. ±99999 to ±99999

Variable types .................. Numeric, String, Numeric array, String array

Numbers are shown with a maximum of 12 digits, or a 12-digit mantissa and a three-digit exponent. Calculations to 12-digit accuracy.

Clocks and Timers
Perpetual clock calendar. Time function returns time to the nearest hundredth of a second.

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

Adjustable clock speed: ±10%

Beeper
The beeper is programmable for parameters for duration and tone.

The frequency range is approximately 3 to 4200 Hz.

Redeﬁnable Keys: 159

Multiple File Structure
The number of files in HP-71 memory is limited only by the amount of available RAM. The HP-71 supports the following seven ﬁle types:

BASIC Contains BASIC programs
BIN Assembly language programs which can be executed as programs or subprograms
LEX Used to add new BASIC keywords
DATA Store numeric and string data
TEXT Used to transfer or receive ﬁles from other computers as string data
KEY Store and retrieve redifined key assignments
SEDATA Allows data to be sent to and from the HP-41

Language
English

ROM/RAM
Built-in operating system
ROM .................. 64K bytes
RAM .................. 64K bytes

Built-in user RAM .................. 17.5K bytes

Enhancement
Memory Module
HPS-82405A .................. 4K bytes

Maximum system RAM (with four Memory Modules) .................. 33.5K bytes

Interface
Optional HP-IL (Hewlett-Packard Interface Loop) (continued)
HP-71 and HP-75 Specifications

Off-Line Mass Storage
Optional Card Reader (HP #2401A)

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

HP-75 Portable Computer

Physical Specifications

Dimensions ........... 12.7 cm (5 in) × 25.4 cm (10 in) × 3.2 cm (1.25 in)
Weight ............... 737.1 g (26 oz)

Power Requirements

Battery Cells ...... 6 NICad Battery Pack (HP #0201B)
Battery Current (w/o case, w/o bar code wand) ........ 25 mA (RUN mode) providing 20 to 30 hours of RUN mode operation (approximately 2 to 3 weeks between recharging) 14 mA (STANDBY mode)
20 μA (SLEEP mode)

Operating Requirements

Operating temperature ........ 0° to 45°C (32° to 113°F)
Recharging temperature ........ 10° to 40°C (50° to 104°F)
Storage temperature ........ -40° to 55°C (-40° to 131°F)
Humidity ........... 0 to 95% relative humidity

Display

Liquid-crystal display
Character font ........ 5 × 9 dot matrix
Capacity .......... 96 characters per line
Window Size ......... 32 characters (scroll to 96 characters)
Character set ........ 256 characters
Character Range ......... A-Z, a-z, 0-9, plus 27 special characters, with or without underline

Number Range

Real precision ........ -9.99999999E99 to 1E499
Short precision ........ -9.999999 to -1E-99, 0, 1E-99 to 9.999999

Integer precision ........ -9999 to 9999
Variable types ........ Numeric, String, Numeric array

Clocks & Timers

Perpetual calendar, 12-hour or 24-hour format. Time function returns time to the nearest millisecond.
Accuracy range ........ 15 seconds/month to 3 minutes/month
Adjustable clock speed ........ +2.10%

Beeper

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

Redefinable Keys

194

Multiple File Structure

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

Language

Extended HP BASIC (167 instructions)

ROM/RAM

Built-in operating system ROM ........ 48K bytes
Three 32K byte plug-in ROMs for an additional 96K bytes ROM

Comparison Chart

<table>
<thead>
<tr>
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<th>HP-41</th>
<th>HP-71</th>
<th>HP-75</th>
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<tbody>
<tr>
<td>ETROMs</td>
<td>Yes*</td>
<td>No</td>
<td>No</td>
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<td>Maximum RAM (in K-bytes)</td>
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<td>33</td>
<td>24</td>
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<td>HP-L peripherals</td>
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<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Bar Code</td>
<td>Yes (HP code only)</td>
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<td>Yes</td>
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<td>Expansion Pod:</td>
<td>Mode</td>
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<td>No</td>
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<td></td>
<td>Modem</td>
<td>No</td>
<td>Direct- connect, auto-dial/auto-answer, asynchronous</td>
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<tr>
<td></td>
<td>Electronic Disc</td>
<td>No</td>
<td>32 or 64</td>
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<td>(in K byte)</td>
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<td>Custom Memory Cards</td>
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<td>Custom Overlays</td>
<td>Yes</td>
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<td>Custom Touchpads</td>
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<td>No</td>
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<td>Custom ROM Modules:</td>
<td>Size (in K-byte)</td>
<td>4, 8</td>
<td>BASIC: 16, 32, 48, 64, FORTRAN: 16, 32, 48</td>
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<tr>
<td></td>
<td>8, 16, 24, 32</td>
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* Available from third party vendor

NOTE: New enhancements for products are introduced often. Check with an HP Representative for the latest update.
Software Development System Specifications

Software Development System
The HP 82505 Software Development System (SDS) allows you to develop plug-in ROM software on your own HP-41 Advanced Calculator. The SDS complies HP-41 user-language programs and/or HP-41 Microcode Library functions (contained on a floppy disc in the HP 82505AC Consumables Kit) into HP-41 ROM-image code. The ROM-image code is then transferred to the emulator for testing and debugging. The emulator simulates the Custom ROM Module. Programs stored on the emulator are executed directly from the HP-41 leaving user memory untouched. A battery ensures that the information stored in the SDS memory is saved, even when the unit is disconnected from the calculator. Warning, error, and status information is displayed to assist the software developer in the debugging process. Realistic performance evaluations of your custom software can be performed with the SDS system.

Specifications

System Requirements
- Calculators:
  - HP-41CX or HP-41CX Advanced Calculator
  - HP-85 Personal Computer with HP 82903A 16K Memory Module (included with short-term rental of SDS).
  - HP 82505AC Consumables Kit
- Software Development System:
  - HP 82505ST (short-term rental of SDS)
  - OR
  - HP 82505LT (long-term lease of SDS)
- SDS consists of the following parts:
  - HP 82905A Emulator
  - HP 82939A Serial Interface (Opt.101)
  - HP 82939A 65-Pin Interface
  - HP 82930A 16K Memory Module
  - HP 82935A ROM Drawer
  - Input/Output ROM 80085-15003 Mass Storage ROM 80085-15001 Port Entender 82505-60014 Interface Cable 82505-60004
- Width Strap 9500-6847
- HP-85 Personal Computer (included only with short-term rental)
- Optional:
  - HP 82104A Card Reader
  - HP 82143A Printer/Plotter
- Dimensions: 13.34 cm x 42.18 cm x 38.10 cm (5.25 in x 17 in x 15 in)
- Weight: 7.14 Kg (16 lbs)

Operating Requirements
- Operating temperature: 0°C to 45°C (32°F to 113°F)
  - (–40°F to 120°F)
- Storage temperature:
  - (without Battery Pack): –40°C to 75°C
  - (with Battery Pack): –40°C to 55°C
- Charging temperature:
  - (Line Power on): 15°C to 40°C
  - (55°F to 104°F)
- Operating Humidity:
  - 5 to 93%
- Power AC line: 50-60 Hz ±10% 230V
- Battery:
  - Rechargeable nickel cadmium, 5 days minimum continuous operation at 25°C recharge time is 16 hours.
- Maximum Power: 65 VA

Microcode Listings
The consumables kit includes a floppy disc containing the Microcode Library. This library consists of 20 functions which will provide the user with added capabilities not available in the standard HP-41 system operations. Following is a list of these microcode functions:
- ALENC—Returns number of characters in ALPHA register to X-register.
- ANUM—Recalls a number from the ALPHA register to X-register.
- AROT—Depending on whether the value in the X-register is positive or negative, rotates ALPHA register to the left or to the right the number of positions equal to the number of characters in the X-register. AROT—Shifts the least significant character out of the ALPHÁ register and places it character code in the X-register.
- AUTOST—Executes a specified program in the Custom ROM when the HP-41 is turned on.
- CLEKEY—Clears all USER mode key assignments.
- GETKEY—Places the keycode of the next key pressed in the X-register.
- KEYSN—Automatically assigns the table of the keys in the Custom ROM to the HP-41.
- PKEYSN—Assigns the function in the ALPHÁ register to the keycode in the X-register.
- PCLIPS—Replaces programs in main memory with the one named in the ALPHÁ register.
- POSA—Looks in the ALPHÁ register for the character being specified in the X-register and places its position in the X-register.
- PRIVACY—Protects a Custom ROM from being examined while in program mode.
- PSIZE—Allocates the number of data registers specified in the X-register.
- RCLFLG—Recalls flags 00 through 43 to the X-register as ALPHA data.
- REGMOV—Copies a block of registers to a specific place in main memory.
- REGSWAP—Exchanges two blocks of registers.
- SIZEN—The number of allocated data registers is returned in the X-register.
- STOFLG—Restores HP-41 flags 00 through 43.
- XTO—Appends the character code in the X-register at the right-hand end of the string in the ALPHÁ register.
  - X/C/E/F-Sets flags 0 through 7 based on the value in the X-register and recalls the previous status of those flags to the X-register.
Plug-in Module Simulator Specifications

Plug-in Module Simulator

The HP 82713A Plug-in Module Simulator (PMS) provides ROM simulation capability for your HP-75 Portable Computer. The simulator and accompanying software provide a convenient method for field-testing and debugging ROM programs.

The simulator has two banks of 8K-byte CMOS memory and an integral lithium battery that retains the contents of the memory, even when it is not connected to the HP-75. Programs can be developed in each 8K-byte bank of memory. Four banks of PMS memory are required to develop a 32K-byte Custom ROM Module.

The simulator plugs directly into any of the front ports on the HP-75, and up to three can be used at one time. Circuitry built into the unit simulates a plug-in ROM module. Programs stored on the simulator can be executed directly from the HP-75, leaving user memory untouched. Files can be stored on the simulator on a temporary or permanent basis, so it can also be a useful, cost-effective storage medium for programs or files that need periodic updating.

Realistic performance evaluations of your software can be performed with the PMS. Comparisons can be made between the performance of programs run on the HP-75 and those run in the PMS. In addition, field-testing is made easier because of the compact size and portability of the PMS. If you are developing software for the manufacture of a Custom ROM Module, completed programs are copied from the PMS to a cassette tape and sent to HP.

Specifications

System Requirements
- Computer: HP-75
- No additional devices or software are required.

HP Part Number
- HP 82713A

Description
- Plug-in Module Simulator for the HP-75 Portable Computer

Dimensions
- Case: 2.8 cm x 11.9 cm x 16 cm (1.1 in x 4.7 in x 6.3 in)
- Plug (max. dim.): 2 cm x 4.3 cm x 9.4 cm (0.8 in x 1.7 in x 3.7 in)
- Cable: 45.7 cm long (18 in)
- Weight: 368.6 g (13 oz)

Operating Requirements
- Operating temperature: -20°C to 55°C (-4°F to 131°F)
- Storage temperature: -40°C to 75°C (-40°F to 167°F)

Operational Limitations
- The following operations should not be used on the PMS:
  - load, run, or use a plug-in ROM module or when the PMS is used as a plug-in module. These limitations represent the built-in security and privacy features of ROM-based software media.

ASSIGN #
EDIT
LIST
PLIST
PRINT
PURGE
READ
RENAME
Single Step
TRANSFORM

The following commands cannot be used without risking loss of files or unpredictable results:
MARGIN
VERS

Statements And Functions
BUILD—Initializes the designated bank of memory.
CAT—Lists files contained in a bank of memory.
CHECKSUM—Computes a value to ensure the integrity of the contents of a bank of memory.
COPY—Transfers files from the HP-75 to PMS memory or vice versa.
PRIVATE—Used to secure a file by designating it as 'private.'
PURGE—Deletes a file from memory.
ROMAVAIL—Computes amount of unused memory, in bytes, in a PMS memory bank.
ROMID—Assigns the ROM-ID number on a PMS memory bank.
ROMSIZE—Computes the amount of memory (in bytes) required to store an HP-75 file in a PMS memory bank.
HP 2252B ThinkJet Printer
- Disposable ink-jet printhead cartridge (prints about 350 pages per cartridge)
- Quiet operation
- Bidirectional printing at 80 or 142 characters/line; 150 characters/second (266 characters/second compressed)
- Dot-mode graphics
- Permanent copy
- Briefcase portable
- HP-IL, battery powered (prints about 200 pages between recharges)

HP 8216A/2A Printer/Plotter
- 24-character line
- Automatic centering and left/right justification
- Pane mode (automatically breaks lines at spaces)
- Briefcase portable
- Battery-powered

HP 8216A Bar Code Reader Module
- Supports major industrial bar codes
- Reads labels containing up to 42 characters
- Check digit verification option
- Bidirectional scanning

HP 8216A Digital Cassette Drive
- 128K user bytes
- File-by-name data structure
- Digitally-certified media
- Battery-powered

HP 8206A HP-IL Acoustic Coupler (Modem)
- Bell 113 compatibility
- Battery-powered
- Acoustic coupling
- Sends/receives at 300 baud

HP 8216A Graphics Plotter
- High-quality, hard copy graphics
- Uses plain paper or overhead transparencies
- English and special characters
- Text written in any direction, with or without slant, and in many sizes
- Two-pen capacity

HP 82012A 9" Video Monitor
- Expand display capability
- HP 9219A Mountain Computer Video Interface
- 24 rows by 40 columns or 20 rows by 40 columns
- Compatible with television sets or video monitors
- Inverse video

HP 8215A/2A Bar Code Reader Module
- Supports major industrial bar codes
- Reads labels containing up to 42 characters
- Check digit verification option
- Bidirectional scanning

HP 8216A Expansion Pad
- Direct-connect 300 baud, autodial/auto-answer, asynchronous modem
- 32K- or 64K-byte CMOS Electronic Disc RAM

HP 8216A HP-IL/LS/LS/5 Interface
- Compatibility with Series 80 personal computers
- Enables a Series 80 personal computer to be either a system controller or a device when on the HP-IL loop

HP 8216A HP-IL/HP-IB Interface
- Translates HP-IL data to HP-IB data or vice versa
- HP-IL on control HP-IB
- HP-IB on control HP-IL
- Power supply (AC Adapter) included

HP 8216A HP-IL/CPIO Interface
- Communicates with any 8- or 16-bit parallel bus structure
- Connect with power supply

HP 8216A HP-IL/RS-232 Interface
- Translates asynchronous RS-232C communication to HP-IL and vice versa
- Full or half duplex capability
- Automatically handles XON/XOFF or DSR/ACK software
- Selectable baud rates, parity options, stop bits and word lengths

*Available from Mountain Computer
**Available in July, 1984