

# HP-75D PORTABLE COMPUTER

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## Introduction

Hewlett-Packard introduces its first portable bar code reader to read major industrial bar codes: the HP-75D Portable Computer. The HP-75D Portable Computer is an enhanced version of the HP-75C introduced in 1982. Your customers can benefit from the HP-75D if they have applications that involve remote data collection and the transmission of data from remote locations.

Combine the HP-75D with a digital bar code wand, and you have a powerful solution for remote data collection applications. The HP-75D is compact and rugged for use in the factory or in the field. With its built-in BASIC language operating system, the HP-75D can easily be programmed to provide user prompts and messages, process data, or communicate with other computers.

Communicating with host computers is easy. Add the HP-75D Expansion Pod (U.S. only), and you gain the capabilities of electronic disc memory and a direct-connect modem. Other communication options include a portable acoustic coupler (U.S. only), the HP-IL/RS-232C Interface, and the HP-IL/HP-IB Interface.

## Overview



### THE HP-75D AT A GLANCE

Product Hardware	HP-IL Peripherals
Dimensions: 5" x 10" x 1-1/4"; weight: 26 ounces	HP 82162A portable 24-character thermal printer/plotter
Series 80 CMOS CPU	HP 82161A 128K portable digital cassette drive
Software plug-in ROM modules (3-32 KB max. 96 KB)	HP 82905B 80 column (full-page) impact printer (opt. 248)
Simple QWERTY touch-type keyboard	HP 7470A (opt. 003) two-pen plotter
Built-in 48KB system ROM	HP 82163A video interface
Built-in 16KB RAM/8KB plug-in	HP 82912A 9-inch monitor
Built-in hand-pulled card reader	HP 82913A 12-inch monitor
Redefinable keyboard	

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"Hidden" number pad and keyboard overlay	HP 2617A (opt. 048) alpha-numeric thermal printer
BASIC language built in: 108 statements/system commands	HP 2671G (opt. 048) graphics thermal printer
41 numeric functions including keyboard calculator mode	HP 82169A HP-IL/HP-IB converter
Built-in bar code wand interface	HP 82164A HP-IL/RS-232C converter
	HP 82938A HP-IL/Series 80 Interface
	HP 82165A HP-IL/GP-IO converter
	HP 82168A HP-IL accoustic coupler
	HP 82166B HP-IL converter prototyping kit (quantity 10)
	HP 82166C HP-IL kit

## Software

MEDIUM: MAGNETIC CARD (AKA SOLUTIONS BOOKS)

Finance Solutions (00075-13009)	Graphics Solutions (00075-13016)
Real Estate Solutions (00075-13010)	Games I Solutions (00075-13006)
Math I Solutions (00075-13003)	Games II Solutions (00075-13007)
Math II Solutions (00075-13004)	I/O Utilities Solutions (00075-13013)
Math III Solutions (00075-13005)	Test Statistics Solutions (0075-13012)
Electronics Solutions (00075-13008)	Statistics Solutions (0075-13011)
	Mass Media Duplication/ Privacy (00075-13015)

**MEDIUM: PLUG-IN MODULE (AKA APPLICATION PACS)**

Text Formatter Pac  
(00075-15019)

VisiCalc(r) Pac  
(00075-15014)

Math Pac  
(00075-15015)

Surveying Pac  
(00075-15012)

Data Communications Pac  
(00075-15035)

I/O ROM  
(00075-15001)

Bar Code Reader Module  
(82725A)

VisiCalc is a registered trademark of VisiCorp

## **Product Positioning**

### **POWERFUL PORTABLE COMPUTER FOR REMOTE DATA COLLECTION OR INFORMATION PROCESSING APPLICATIONS**

The HP-75D Portable Computer is designed for applications in which data is collected, processed and transmitted from remote locations. Bar code reading capability is provided with the HP 82725A Bar Code Reader Module and a compatible digital bar code wand such as the 92267A/B. The HP-75D reads seven major bar codes: Interleaved 2-of-5, Industrial 2-of-5, 3-of-9 Code, Code 11, UPC, EAN, and Codabar. Examples of applications where the HP-75D may be used include inventory control, work in process tracking, and field sales/service support.

The HP-75D is a fully-integrated, battery-powered computer weighting only 26 ounces and measuring 10 X 5 X 1-11/4 inches. Battery power and compact size allow the HP-75D to be used anywhere for fast, accurate data entry. Data can be entered from the keyboard or by scanning bar code with a digital bar code wand.

### **THE HP-75D STAND-ALONE SOLUTION**

For a great many portable computer applications, the HP-75D alone will provide the solution to customer needs:

## OPERATING SYSTEM

Featuring a CMOS version of the same CPU used by the HP-75D's desktop companion, the HP-86, the HP-75D contains the same level of information handling capability and accuracy of larger desktop computers.

Complementing the 8-bit parallel CPU, the HP-75D employs an extensive 48K byte ROM-based operating system. Major components of this operating system include:

BASIC-- A comprehensive high-level language interpreter is built-in to the HP-75D. With over 100 systems and BASIC commands and 41 numeric functions to choose from, this portable computer provides an extremely versatile and powerful instruction set for friendly user programming.

Text-- A text file capability is included with the HP-75D. While not a "word processor", the text file capability of the computer allows easy entry, editing, and storing of data. These text files can be easily recalled for viewing or printing to an external device.

Time/Data Functions-- A perpetual clock/calender in the HP-75D can record the time and date of a data entry automatically. A built-in appointment function can be used to execute programs or commands for unattended information processing or to provide audio alarm and prompting messages for data collection instructions.

Calculations-- Direct mathematical calculations may be performed on the HP-75D. Numerical values, arithmetic or logical operators, and numeric functions may be keyed-in or programmed to process and analyze data.

## MEMORY

Internal to the HP-75D is 16K bytes of CMOS RAM. Over 90% of this memory space is free for the user. For those users requiring more memory, a single 8K byte expansion module, the 82700A 8K Memory Module, may be "plugged-in" behind the battery compartment. Adding this module does not change the outside dimensions of the HP-75D.

Since the HP-75D is a totally CMOS battery-powered computer, the user memory is continuous. Data stored in memory will not be lost when the computer is turned off. Additionally, any number of files may be in memory at any one time. This multiple-file capability is only limited by the memory space available.

The HP 82718A Expansion Pod provides additional memory to store data and programs. The pod comes with either 32K or 64K bytes

of electronic disc RAM, which is indirectly addressable through built-in mass storage commands. Because CMOS RAM is provided in the pod, data and programs are retained even when the power is turned off. The pod has two industrial bar code decoder built-in: 3-of-9 code and Code 11.

#### KEYBOARD

A great deal of effort, human factors, and engineering went into the design of the HP-75D keyboard. The goal of compact package design did not compromise the need for a friendly, easy-to-use alphanumeric entry capability.

The HP-75D incorporates a "touch-type" keyboard with a staggered typewriter-like configuration. The 65 keys are spaced for ease of entry, and the tactile feel allows for fast, error-free data entry.

In addition to touch-type capability, over 190 keys or key combinations may be redefined. This feature permits immediate execution of commands or programs or immediate recall of typing aids as simply as pressing a specific, user-defined key combination.

#### DISPLAY

The single line LCD (liquid-crystal display) of the HP-75D displays 32 characters of a full 96-character line. The 256 character set of the HP-75D includes both upper and lower case characters (full ASCII) as well as many additional special characters. The use of true descenders enhances the readability of the display.

#### CARD READER

A feature unique to the HP-75D in the market for portable computers, is the built-in, hand-pulled card reader. Magnetic cards (1.3K bytes per card) are used to store programs, text files, data files, and key redefinitions. Information may be read from magnetic cards to the HP-75D or information may be written to the magnetic cards as a convenient, inexpensive off-line mass storage medium.

#### PLUG-IN PORTS

Three software plug-in ports are integral to the HP-75D. Each of these ports will allow up to 32K bytes (up to a maximum of 96K bytes for all three ports) of ROM-based software to be plugged in to the HP-75D. These software modules do not utilize any of the internal user memory space (RAM). The programs contained in the modules are immediately executable as they connect directly to the HP-75D internal bus.

## THE HP-75D SYSTEM SOLUTION

While the HP-75D is a fully integrated computer, expansion capability is required to take full advantage of the computer's capabilities. Expansion for the HP-75D is accomplished through a built-in HP-IL interface. The HP-IL interface allows a number of different peripheral configurations to suit the specific needs of your customer. The modular HP-IL peripheral approach allows your customers to select only those peripherals needed for their specific application. The HP-IL peripherals fall into two general categories:

Portable Peripherals - Intended for a portable system, these peripherals are compact, battery-powered devices useful in the portable or field environment. A typical portable briefcase system weighing around ten pounds would include:

HP-75D	Portable Computer
82700A	8K Memory Module
82161A	Digital Cassette Drive
82162A	Printer/Plotter
82718A	Expansion Pod
82168A	300-baud Acoustic Coupler (U.S. Only)
2225B	Thinkjet Printer

Desktop Peripherals - Intended for use at the base station or office environment, these larger, typically AC-powered devices, provide the convenience of traditional desktop systems. A desktop station might include:

HP-75D	Portable Computer
82700A	8K Memory Module
82161A	Digital Cassette Drive
82905B	Impact Printer
82163A	Video I/F
82192A	9" Video Monitor
HP 7470A	Graphics Plotter
Opt 003	

## THE HP-75D BAR CODE SYSTEM

Bar code data entry provides several advantages compared to keyboard entry:

- \* Faster data entry
- \* Improved accuracy
- \* Simplified end-user training

Data entered by bar code scanning is handled in the same way as keyboard-originated data. When reading bar code with the HP-75D, data can be displayed for verification and/or collected

in RAM memory to be processed or transferred to another computer.

Two products are required for reading bar code with the HP-75D Portable Computer: 1) HP 82725A Bar Code Reader Module and 2) HP 92267A or HP 92267B Digital Bar Code Wand.

#### HP 82725A Bar Code Reader Module

The HP 82725A Bar Code Reader Module is an 8K byte ROM module which conveniently plugs into one of the front ports of the HP-75D. The Bar Code Reader Module provides the software that decodes the scanned bar code from the serial data provided by the wand into ASCII data. The HP 82725A supports the following bar codes:

- \* 3 of 9 Code
- \* Interleaved 2 of 5
- \* Industrial 2 of 5
- \* Code 11
- \* Universal Product Code (UPC A or E)
- \* European Article Number (EAN 8 or 13)
- \* Codabar



Each type of bar code is decoded by its own string function. The bar code reader module will reliably decode bar code that:

- \* Has a minimum element width of 0.0075 inch
- \* Has a ratio of wide to narrow elements between 2:1 and 3:1
- \* Is read with a minimum scan speed of 3 inches/second and a maximum scan speed of 30 inches/second
- \* A maximum string length of 42 characters, including any check digit, can be decoded.

#### Digital Bar Code Wands HP 92267A and HP 92267B

Two types of wands are available for the HP-75D:

- \* HP 92267B: medium resolution "7.5 mils" wand (resolution 0.19mm, 0.0075 in) recommended for reading bar code labels produced on good quality dot matrix printers.
- \* HP 92267A: high resolution "5 mils" wand (resolution 0.13mm, 0.005 in) recommended for reading high density labels which are generally produced on specialized printers.

The HP 92267A and HP 92267B have the following features:



- Replaceable, sealed sapphire tip
- Rugged, lightweight case
- Push-to-read switch
- 0-45 degree scan angle
- 3-30 in./sec scan speed
- Wand dimensions of 5.2 in. x 0.9 in x 0.8 in.
- Strain-relieved coiled cord with maximum length of 28 in. (71 cm.) retracted and 72 in. (183 cm.) extended.

## THE HP-75D CUSTOM SOLUTION

For many applications, a specific, customized solution will be required by your customers. The HP-75D Customization Program has been designed to fulfill that need.

The HP-75D has been designed with customization in mind. The powerful built-in BASIC language, plug-in ports, card reader, and redefinable keyboard all contribute to easy customization for specific user applications.

## SOFTWARE DEVELOPMENT TOOLS

Software development tools are at the center of the customization program for the HP-75D. They increase the productivity associated with the development and testing of unique software solutions created by your customers or their consultants.

For BASIC language program development, the HP-75D itself is an excellent software development tool. The BASIC interpreter, built-in to the HP-75D, provides an extremely powerful and versatile programming environment. Additionally, an extensive set of editing keys and features allows easy modification and review of programs.

A plug-in module simulator is available to facilitate the development and field testing of software intended for ROM-based plug-in modules. BASIC language programs written with the HP-75D can be loaded into the simulator and executed in the same manner as a standard plug-in module. Once satisfied that the software is correct, ROM-based plug-in modules may be ordered by your customer.

## CUSTOM PRODUCTS

Custom products will allow your customer to truly tailor the HP-75D to meet specific needs. Your customer can choose the most cost-effective software media for his specific application and then add keyboard overlays to provide a customized human interface for the complete solution.

Custom Modules - Custom "plug-in" modules provide a software medium which not only conveniently stores programs but also

allows direct execution of those programs when plugged into the HP-75D. They will be available in either 8K, 16K, 24K, or 32K byte capacity.

Custom Magnetic Cards - Custom magnetic cards provide an inexpensive medium for your customers to store their programs and data. These custom cards are identical in size and capacity to the standard HP-75D magnetic cards. Mass recording of cards is offered by Hewlett-Packard using customer-supplied master cards. Magnetic card artwork will be done to customer specifications.

Custom Cassettes- Custom cassettes provide a versatile medium for customers wishing to store software for use with the HP-75D and the HP 82161A Digital Cassette Drive. Mass recording of cassettes is offered by Hewlett-Packard using customer-supplied master cassettes. Custom labeling is available with artwork produced to customer specifications.

Custom Overlays - Custom overlays provide a simple and easy way to professionally customize the HP-75D keyboard to indicate specific key redefinitions or user input instructions. Artwork and colors are produced to customer specifications.



## Feature/Benefits

- Feature: 8-Bit Series 80 CMOS CPU
- Advantage: - access to large-computer power
- Benefits: - quick, efficient information processing  
- numeric accuracy
- Feature: 48K-Byte BASIC Language Operating System
- Advantage: - built-in (no loading)  
- user memory undiminished
- Benefits: - user-friendly programming  
- quick mathematical calculations  
- efficient time management  
- built-in features free RAM for user applications (more than 90 percent of RAM available)
- Feature: 16K-Byte RAM Plus Optional 8K-Byte RAM Plug-In
- Advantage: - sufficient built-in memory (no loading) for serious applications  
- expand memory 8K bytes when needed
- Benefits: - large user memory for serious applications
- Feature: Hand-Pulled Card Reader
- Advantage: - built-in  
- ability to customize, expand applications  
- save battery
- Benefits: - convenient and inexpensive off-line storage of information/programs
- Feature: 3 Software Module Plug-In Ports
- Advantage: - 3 x 32K-Byte plug-in ROMs for maximum 96K-Byte ROM  
- ready to use when plugged in  
- user memory undiminished
- Feature: Built-in bar code wand interface
- Advantage: - data entry alternative
- Benefits: - fast, accurate data entry  
- reads major industrial bar codes

- ability to customize for many specific applications

Feature: Touch-Type QWERTY Keyboard

Advantage: 

- familiar format
- all letters & numbers are repeat keys
- minimize strikeovers and skips

Benefits: 

- easy, fast and accurate alpha entry

Feature: Battery Powered

Advantage: 

- rechargeable
- operable 30 hours in maximum power drain

Benefits: 

- use it anywhere

Feature: Built-In HP-IL Interface

Advantage: 

- communication with HP peripheral devices and other computers.

Benefits: 

- printing and mass storage input/output en route
- remote communication via telephone lines
- expand display capability at base station location
- printing and plotting at base station

Feature: Standard Interfaces

Advantage: 

- HP GPIO 82165A
- HP-IB 82169A
- HP RS232 82164A
- communication with standard peripherals

Benefits: 

- expand control of HP-IB instruments
- expand communication with HP Series 80 computers

## HP-75D Markets

There are three general classification of customers who have a need for the HP-750.

### REMOTE DATA COLLECTION

The HP-75D can be used to collect, process, and store data at remote sites for later transmission to a host mainframes. Some examples of remote data collection applications are:

- \* Order entry to record sales and control inventory.
- \* Inventory collection in factory warehouse.
- \* Work-in-process tracking on the assembly line.
- \* Tracking of laboratory samples through test process.

Battery-powered units allow data to be collected and processed in the field, in remote locations of the factory, or to be carried to different locations along the manufacturing line.

HP-75D users may enter information on the typewriter-like keyboard of the portable computer or by scanning bar code with the digital bar code wand. A compatible bar code wand can easily be connected to the HP-75D's built-in wand interface. Software that decodes the scanned bar code is available in an optional module that completes the HP-75D bar code system. Data can be displayed for verification and collected in RAM memory to be processed or transferred to another computer. The HP-75D can be programmed to provide audible and visual operator feedback and prompting.

Once collected, data can be transferred over standard phone lines using the portable HP 82168A Acoustic Coupler or HP 82718A Expansion Pod. Communicate with other HP computers and peripherals using the HP-IL/RS- 232C Interface (HP 82164A) or HP-IL/HP-IB Interface (HP 82169A).

#### TYPICAL SALES SITUATION:

**Need:** A manufacturing manager for an electronics company wants better control of inventory levels. Parts are kept in bins, each with its own identification number indicated by bar codes on the front of the container.

**Solution:** An HP-75D, and HP 82725A Bar Code Reader Module, and HP 92267B medium resolution bar code wand provides a portable bar code reading system. The HP 82700A Memory Module provides an additional 8K bytes of CMOS and the HP 82164A HP-IL/RS-232C Interface and the I/O ROM (00075-15001) can be used to transfer the collected information to an HP 3000.

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

This information can be stored in the HP-75D or immediately transmitted to a central computer such as the HP 3000. Several

data communications options provide easy, versatile methods of data transfer. When the inventory file is updated, timely reports, charts, and graphs can be generated. Such a system can save weeks over manual methods.

#### FIELD SALES OR SERVICE REPORTING

A second major market for the HP-75D consists of those firms that want to improve the productivity of field forces involved in a unique, specialized application. With custom plug-in software, the HP-75 can be tailored to perform specific applications such as data collection, processing, or transmission to other computers from remote sites.

The main purchase motivation for this market is the need to improve field organization productivity for a unique or specialized task. This need is fulfilled by the HP-75D as a very capable portable computer that may be easily customized to perform specific tasks.

#### TYPICAL SALES SITUATION:

**Need:** A field service organization for a copy machine company needs to improve service call productivity and speed up invoicing for repair work.

**Solution:** An HP-75D, an 82168A modem, and a 2225B Thinkjet printer is provided to service personnel. Two custom plug-in modules, developed by a consultant to the organization, are also provided.

Upon reaching the site of the machine needing repair, the repairman runs a diagnostic routine, that resides in the first custom module, on the HP-75D. Using the routine the repairman quickly assesses the failure. Upon completion of servicing the copy machine, the repairman runs an invoicing routine from the second custom module. This routine requests details of the repairs made and then transmits the details over the modem to the copy machine company's HP 3000 computer. The HP 3000 computer immediately initiates billing to the customer and at the same time returns this information to the HP-75D to be printed out on the printer for the customer's reference.

With the HP-75D Portable Computing System and custom modules, major accounts can develop dedicated portable computer applications improving organizational productivity.

#### ORIGINAL EQUIPMENT MANUFACTURER

The third major market for the HP-75D is to OEM's. The HP-75D provides a powerful, but relatively low-cost, general purpose controller. The ability to customize the HP-75D further enhances attractiveness to the OEM.

The main purchase motivation for this market is the need to utilize a general purpose controller as an alternative to a specialized design. The HP-75D fulfills this need as a truly powerful, compact, and relatively low cost general purpose computer. The customization capability further enhances HP-75D usefulness for this market segment.

**TYPICAL SALES SITUATION:**

**Need:** A medical equipment manufacturer required a small, low-cost controller for a patient monitoring system.

**Solution:** An HP-75D is incorporated into the equipment along with a custom plug-in module.

The medical equipment manufacturer sells the HP-75D as an integral part of the patient monitoring system. The custom module changes the HP-75D from a general purpose configuration to a specialized equipment controller.

## Questions and Answers

- Q. Can a program written for Series 80 run on the HP-75?
- A. Not directly. While the BASIC language interpreter on the HP-75 is about 80% compatible with Series 80, there are definite differences due to the HP-75 multiple file structure, single-line display orientation, and HP-IL interface commands. With some modification, Series 80 programs may be tailored for use on the HP-75.
- Q. Does the HP-75 support screen graphics?
- A. No. The design center for the HP-75 was for single-line display orientation. While the HP-75 does interface to video monitors and televisions via the 82163A/B Video Interface, only character generation is available.
- Q. When can a custom plug-in module be ordered and how long will it take to receive modules in quantity?
- A. The custom module process will be available for orders in early 1983. The current turnaround for custom modules is 10-12 weeks from receipt of code.
- Q. What additional hardware and software products are available to link the HP-75D to the rest of the asynchronous world, such as the HP 3000?
- A. Hardware: (at least one of the following)
- HP 82168A Acoustic Coupler (U.S. Only)
  - HP 82718A Expansion Pod (U.S. Only)
  - HP 82164A HP-IL/RS-232 Interface
  - HP 82169A HP-IL/HP-IB Interface
- Software: (at least one of the following)
- 00075-13013 I/O Utilities Solution Book
  - 00075-15001 I/O ROM
  - 00075-15035 Data Communications Pac (Modem Communications)
- Q. What is the maximum memory expansion for the HP-75D?
- A. With the HP 82700A Memory Module, the HP-75D can be expanded to a maximum of 24K bytes of directly addressable CMOS RAM. The HP 82718A Expansion Pod provides either 32K bytes or 64 bytes of additional electronic disc memory. With the HP 82700A and the HP 82718A, the total memory available for the HP-75D is 88K bytes.
- Q. What is the difference between the HP-75C and HP-75D?



- A. The HP-75D adds a bar code wand interface to the standard features of the HP-75C. Other than the capability to read bar code, the HP-75D has the same features and functions as the HP-75C.

The HP-75D is intended to replace the HP-75C. The bar code interface for the HP-75D does not change the dimensions of the product or its capabilities. The bar code software and wand are sold separately from the HP-75D so that customers who are interested in keyboard data entry only can purchase the product.

- Q. Can I retrofit an HP-75C with a bar code interface?
- A. No. The HP-75C would require major hardware changes to add the bar code capabilities.