

# HEWLETT-PACKARD

## The Portable PLUS Personal Computer

### The portable that's easy to take, easy to use

With the Portable PLUS from Hewlett-Packard, you can have it all—the power of a desktop computer and the convenience of a portable specifically designed to fit your mobile workstyle. And, along with power and convenience, the system gives you full computer flexibility in a durable package that takes the abuse portables must endure.

Managers and professionals in marketing, finance, administration, data processing, sales, and others whose schedules keep them on the move, will discover this new computer is a hardworking traveling companion. Take it with you to meetings, on a plane, or anywhere you need to work away from your desk. On out-of-town trips it helps you keep up with your workload. And for finishing that urgent report, the Portable PLUS easily goes home with you.

Indicative of the system's power is the fact that it runs top-selling applications software faster than many desktops, supports a sophisticated built-in electronic disc, and accommodates your special applications in its large, expandable memory (up to 896K RAM or 3Mb ROM). In addition, the Portable PLUS can be customized with the ROM-based programs you need and use daily.

The system extends the usefulness and productivity of your office personal and mainframe computers via convenient communication and data exchange capabilities. And like your personal computer, it features a full-size keyboard and 25-line by 80-character display. Still, with all this power, it's only about the size of a three-ring binder and weighs less than 10 pounds.

### Convenience PLUS

To enhance its convenience, the Portable PLUS features a ROM software offering that allows you to tailor the machine to specific needs. ROM-based software permits instant accessibility to applications



and ensures that you always have the right software installed. You can't lose it or accidentally erase it. In a typical configuration, the Portable PLUS accommodates six to eight of your favorite programs in ROM (12 128K byte ROMs per software drawer).

### Disc on a chip

One of the system's advanced features is its electronic disc, or "disc on a chip." This expandable memory provides enough continuous, built-in storage for numerous memos, worksheets, data bases, and applications—in short, anything you would typically store on a floppy. It gives you convenient, reliable mass storage that is always available. And it also makes the system highly portable by eliminating the need to carry mechanical discs when you travel.

### Instant access

Like the electronic disc, the system's plug-in ROM software lets you access programs up to 10 times faster than with a mechanical disc. You will be able to select, load, make minor changes, and restore a program like 1-2-3™ from Lotus™ in less than 30 seconds.

Another aspect of the Portable PLUS's instant access feature is continuous memory. With this you can suspend a job at any point, then later resume exactly where you left off. If you stop in the middle of a project, the computer saves your work in continuous memory and is ready to pick up again at that point whenever you are. There is no time-consuming program reloading or scrolling through files.

### PAM

An additional convenience feature is PAM, the Personal Applications Manager, which eliminates the need to learn complicated DOS commands. Its easy-to-use menu displays the installed software programs and helps you switch tasks quickly—from word processing to data bases to spreadsheets and back.

### Small, lightweight

The Portable PLUS complements the mobile professional's workstyle. Its small size and weight mean you can slip it into a briefcase and carry it wherever you go. It also means you can use the system unobtrusively in almost any situation—while waiting for a plane, traveling, or on a sales call.

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## Battery-powered

Since the Portable PLUS is battery-powered, you're not tied to an electrical outlet. You work wherever it's convenient. A built-in, rechargeable lead/acid gel-cell battery pack powers the system for up to 20 hours. This long-lasting battery has even dissipation so you get a constant power flow. The system continuously displays the percentage of battery life remaining. When power is low, you can plug in the recharger and continue operation. You're always confident that your data is secure. The system alerts you when power drops to 20%, then automatically enters a protect mode at 5% and directs the remaining power to the electronic disc to preserve your data for up to a week. To further conserve battery power, the system turns itself off automatically after a user-specified period of inactivity of from 30 seconds to 30 minutes.

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## Flexibility PLUS

The Portable PLUS offers you extensive flexibility in terms of ROM-based applications, memory expansion, peripherals, and communications. This means you can customize the system to your exact requirements.

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### Application software

Numerous software packages are available for the Portable PLUS in the form of both Disc-based and ROM-based media. You can choose from ROM-based applications such as Microsoft® Word, 123™ from Lotus™, MemoMaker/Time Management, and communications to personalize your computer. Available disc-based software includes computer languages, data base management, entertainment, financial applications, and others.

Additionally, your own custom software may be installed in the system using ROMs or EPROMs, which can contain either programs or data. Custom ROMs offer numerous opportunities to adapt the system to business applications, thereby giving you the option of tailoring it to your particular specifications. For more information about customizing the Portable PLUS, contact your local Hewlett-Packard sales office.

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## Communications

The Portable PLUS makes it fast and easy to tie into your office computer system to access information, run remote applications, and download data for off-line analysis. The following communications options are available.

- The PC 2622™ ROM-based software provides HP 2622 (full block mode) and DEC VT 102 terminal emulation, automated file transfer with error checking, and command file support.
- The Portable-Desktop link makes it possible for the Portable PLUS to share programs, data, and peripherals with HP Touchscreen or IBM PC/compatible personal computers. With this option, your desktop disc drives and printer become extended peripherals to the Portable PLUS.
- The 300/1200 bps internal modem cuts long distance telephone costs for data communication up to 75% (compared to a 300 bps modem). Remote data bases such as *The Source* and *Dow Jones News/Retrieval*, as well as other personal computers and mainframes, can be accessed.

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## Expandable memory

All memory in the Portable PLUS is continuous and can be easily allocated as desired between user memory and electronic disc. Memory can be expanded up to a total of 896K bytes (in 128K byte increments). Exact expansion possibilities depend on the ROM software configuration. Configurations and maximum memory capacities for ROM and RAM are indicated in the chart.

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## Battery-powered peripherals

To enhance the Portable PLUS's versatility, the battery-powered ThinkJet printer

and the HP 9114A disc drive are available. These components, along with the computer, fit into a carrying case and weigh less than 20 pounds total. Yet they give you the full function of a desktop system with complete portability.

The HP 9114A disc is especially useful when you need additional memory or access to disc-based applications. This is a double-sided 3.5-inch microfloppy with 710K byte capacity.

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## Video interface (available Fall '85)

This feature offers the capability to connect the system to a monochrome video monitor for extended use in the office. A special "freeze frame" feature maintains a display on the monitor while the Portable PLUS's display continues to operate normally. This is very convenient for comparing two spreadsheets, for example, without taking time to make a hard copy.

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## Durability PLUS

A portable computer is bound to take some hard knocks. But the Portable PLUS is up to the challenge. Primary contributors to its durability are its electronic disc and plug-in ROM software, which are much less sensitive to adverse environmental hazards than mechanical components. Moreover, the Portable PLUS is designed throughout to withstand shocks even greater than normally expected. In tests, the system was dropped on all sides onto concrete from heights ranging from 6 to 24 inches and still operated perfectly. It also passed rigorous temperature, humidity, vibration, and other environmental tests without damage.

Configuration		Maximum Capacity	
Software drawer	Memory drawer	32K or 128K Byte ROMs	RAM
0	2	0	896KB
1	1	12	512KB
2	0	24	128KB

# Hardware

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## Central Processing Unit

16-bit 80C86 CMOS microprocessor operating at 5.33 MHz.

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## Operating System

MS-DOS 2.11.

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## Memory

128K bytes continuous user memory, expandable to 896K bytes.  
192K bytes system ROM (expandable).  
16K bytes of display memory RAM.

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## Expansion Capabilities

Two expansion slots for user-installable accessories:  
128K RAM Memory Drawer (can hold 384K bytes total); 12-socket ROM Software Drawer. Internal expansion sockets for Modem and Video Monitor Interface.

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## Built-in Mass Storage

Electronic Disc (48K bytes; expands to 816K bytes).

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## Built-in Software

PAM, the Personal Applications Manager.  
HPLINK, for portable-portable and portable-desktop communications.  
TERM, a character-mode terminal program.  
SECURE, a password protection utility.  
PACK, a pack E-Disc utility.  
EDLIN, a low-level MS-DOS line editor.  
Self-diagnostics.

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## Display

Flat panel liquid crystal display; anti-glare; variable tilt and contrast.

**Alphanumerics:** 80 columns by 25 lines.

**Graphics:** 480 × 200 pixels; square pixels: .48mm × .48mm.

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## Character Set

Roman8, extended character set, multiple character fonts.

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## Full-Size Keyboard

75 sculptured keys, eight screen-labeled function keys, embedded numeric keypad, flexible key mapping.

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## I/O Ports

Built-in HP-IL, built-in RS-232 (9 pin).

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## Modem (optional)

300/1200 bps; direct connect; pulse and tone dial; Hayes command compatible.  
Auto answer/auto dial.

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## Video Monitor Interface (optional)

Requires composite video monitor; compatible with most popular monochrome monitors. (Available Fall '85).

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## System Clock

From Jan. 1, 1980 to December 31, 2039; 0.1 second resolution; ± 2 minutes per month accuracy; alarm functions; alarm resolution: 1 minute.

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## Physical Characteristics

**Size:** 13 inches wide × 10 inches deep × 3 inches high (330mm × 254 mm × 76 mm).

**Weight:** Under 9 pounds (4.1 kilograms) without expansion drawers. Under 10 pounds with maximum configuration.

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## Terminal Character Attributes

Inverse video, underline, blinking, half-bright (characters, not background), and all combinations.

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## Power Supply

Three permanently-installed, sealed, lead-acid, gel D-cell batteries; AC battery recharger.

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## Battery Life

**Continuous Use:** 20 hours on full charge. (Under normal operating conditions.)

**Typical Use:** 2 weeks.

**Shelf Life:** 6 months on full charge.

**Service Life:** 5 years.

**Low Battery Life:** 1 month from time of low-level indicator (20% charge); 1 week from automatic shut-off (5% charge).

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## Durability Specifications

**Operating Temperature:** 0° to 50° C (32° to 122° F).

**Storage Temperature:** -25° to 55° C (-13° to 131° F).

**Relative Humidity:** 5% to 95% (including condensing).

**Vibration:** 3g's maximum; 5 to 500 Hz.

**Drop:** 24" on concrete (100 g's on all six sides).

**Electrostatic Discharge:** 15Kv without data loss; 25Kv with no hard failures.

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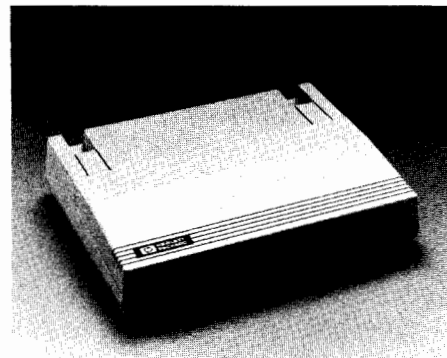
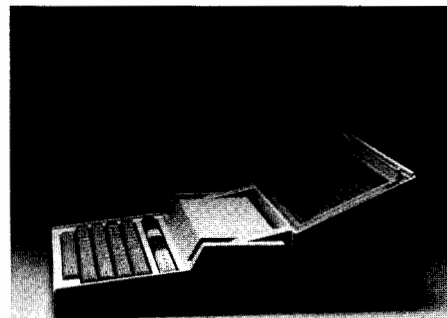
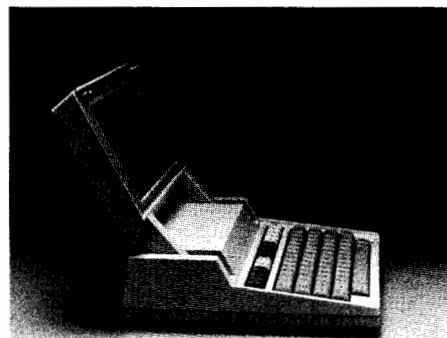
## Electrical Interference

FCC Class B part 15, subpart J, and part 68; VDE 0871 and VFG 1046/84 Level B, certified and approved. Meets proposed RTCA (docket 160B) airline requirements.

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## Safety Approvals

UL Listed and TUV certified and approved.



## Software

### Plug-in ROM Software

#### 1-2-3 from Lotus

An important tool for making business decisions. Offers combined powers of information management, spreadsheet analysis, and business graphics. Uses two ROMs.

#### PC 2622

Top-of-the-line terminal emulation of HP 2622 (block mode) or DEC VT 102 terminals. Supports automated file transfer with error checking using CRC-CCITT or XMODEM protocols. Command language included. Uses one ROM.

#### Microsoft Word

A powerful full-function word processing program. Supports multiple on-screen character fonts (bold, underline, italics, strike through, superscript, subscript), extensive formatting and automatic footnoting. Provides full support of the HP LaserJet Printer. Uses two ROMs.

#### MemoMaker/Time Management

Combines easy-to-use time management functions plus MemoMaker word processing capabilities. Features an appointment list, prioritized "to do" list, address list, phone list (supports auto dial), search capability, archive functions, and a command interpreter to execute other programs and MS™-DOS commands without exiting the program. Uses one ROM.

### Disc-Based software

Given the level of compatibility between the Portable PLUS and other Hewlett-Packard portables and the Touchscreen family of computers, many distributed and listed applications are currently available. Refer to *Your Source for Software Solutions* (5953-7935D) for a current list of supported ROM-based and disc-based software applications for the Portable PLUS.

Additional applications are planned for availability in the near future.

## Peripherals

### Mass Storage

The principal mass storage device for the Portable PLUS is the HP 9114A portable disc drive. However, via the Portable-Desktop link, the disc drives of the HP Touchscreen II Personal Computers or the IBM/compatibles can be used as well. In addition, via the HP 82169A HP-IL to HP-IB interface, most HP disc drives are supported.

#### HP 9114A Portable Disc Drive

**Media Type:** Double-sided 3 1/2-inch microfloppy disc media (HP 92192A).

**Memory Capacity:** 710K bytes formatted memory capacity. 512 bytes per sector. 9 sectors per track. 80 tracks per surface. 2 recording faces per disc.

**Power Supply:** User-installable 6-volt lead/acid battery pack. Battery recharger/eliminator.

**Input/Output:** Hewlett-Packard Interface Loop (HP-IL).

**Transfer Rate:** 6K bytes per second maximum sustained transfer rate.

**Access Time:** 497 milliseconds average access time.

**Rotation Speed:** 600 revolutions per minute.

**Physical Characteristics:** 11-1/2 inches wide × 8 inches deep × 3 inches high (29.2 cm × 20.6 cm × 7.5 cm). 5 pounds, 9 ounces (2.53 Kilograms).

### Printers

#### ThinkJet, Personal Printer

Battery-operated, dot-matrix printer with HP-IL interface (HP 2225B).

#### Dot-Matrix Serial Printer

Letter quality, with RS-232C interface (HP 2934A).

#### Dot-Matrix Serial Printer

With RS-232C interface (HP 2932A).

#### LaserJet Professional PC Printer

(HP 2686A).

#### Daisywheel Printer

With RS-232C interface (HP 2602A).

Also, through the Portable-Desktop Link, any compatible HP 150 or IBM-compatible printer can be used.

### Plotters

Two-pen graphics plotter (HP 7470A, options 001, 002, or 003\*).

Six-pen graphics plotter (HP 7475A, options 001 or 002\*).

*\*Option 001 has RS-232 interface; option 002 with HP-IB interface requires HP 82169A converter; option 003 has HP-IL interface.*

### Interfaces

The HP 82164A HP-IL to RS-232 Interface converter.

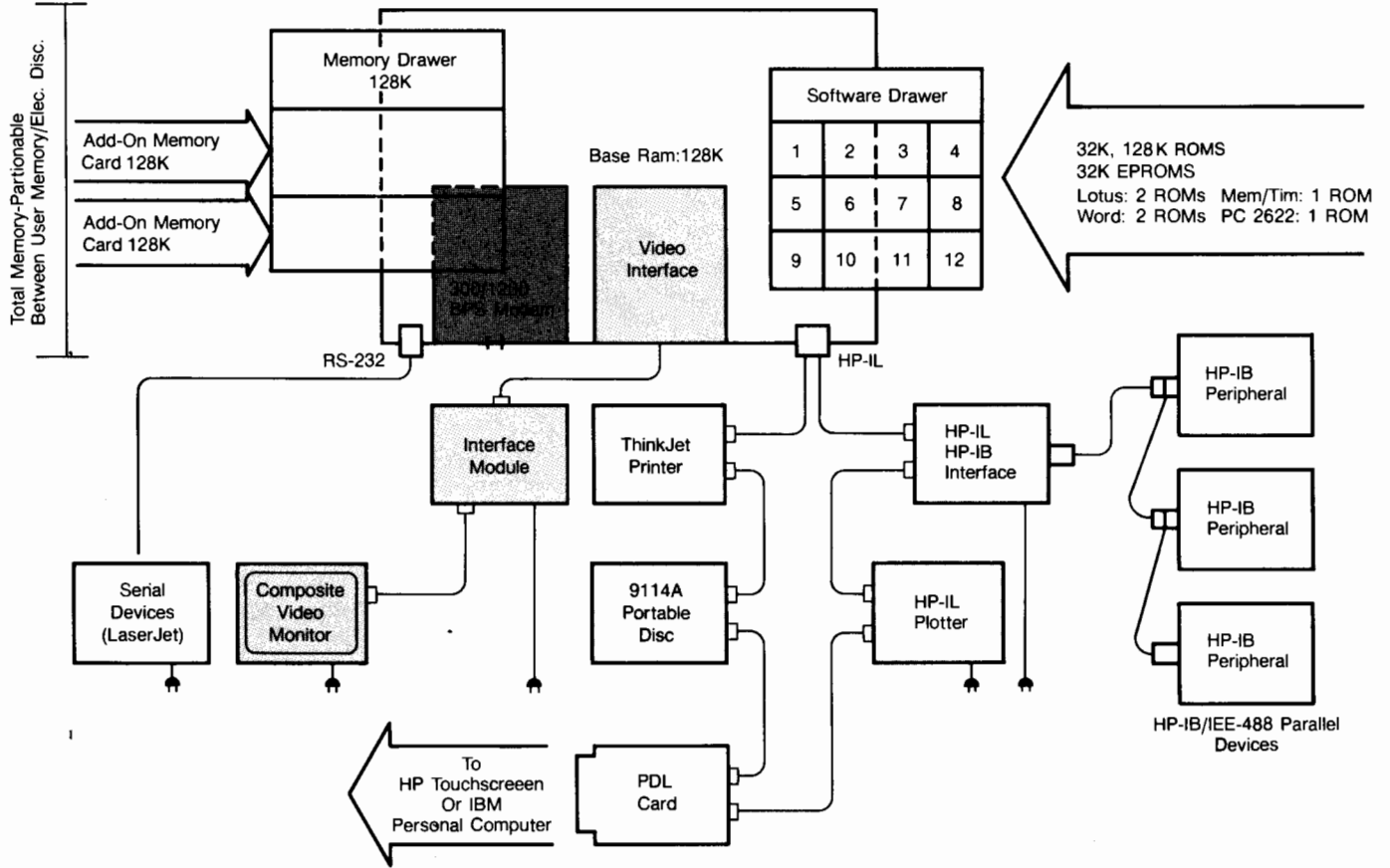
The HP 82169A HP-IL to HP-IB Interface converter.

### Portable/Desktop Communications

Parallel Printer/HP-IL interface card to tie in the Portable PLUS with HP Touchscreen Personal Computers (HP 45643A). HP-IL interface card to tie in the Portable PLUS with the IBM PC (HP 82973A).

### Accessories

Portable Acoustic Coupler	HP 92205D
0.5-meter HP-IL Cable	HP 82167A
1-meter HP-IL Cable	HP 82167B
System Carrying Case	HP 13269V
Leather Carrying Case	HP 13269U
Attache Case	HP13269W
Vinyl Replacement Case	HP 13269K
RS-232 Printer/Plotter Cable	HP 92221P
RS-232 Modem Cable	HP 92221M
Female Cable Converter	HP 92222F
HP-IL to HP-IB Converter	HP 82169A
HP-IL to RS-232 Converter	HP 82164A
European Recharger (220V AC)	HP 82066B
UK Recharger (240V AC)	HP 82067B
Australian Recharger	HP 82068B



**The Portable PLUS configuration guide**

*As indicated by this diagram, the Portable PLUS offers numerous possibilities for tailoring the system to specific applications and operating environments. As a result of this flexibility, you can start with a base unit and add the options you want to create a custom solution.*

USA:

Hewlett-Packard  
Personal Computer Group  
10520 Ridgeview Court  
Cupertino, CA 95014  
For your local dealer call:  
(800) FOR-HPPC

Canada:

Hewlett-Packard (Canada) Ltd.  
Marketing Department  
6877 Goreway Dr.  
Mississauga, Ontario  
Canada, L4V 1M8  
(800) 387-3867



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## For More Information

Contact your local Hewlett-Packard sales office or call 800-FOR HPPC for the location of your nearest Hewlett-Packard dealer.

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