

Hewlett-Packard Transportable Computers

The Integral PC



- The built-in ThinkJet Printer rushes through printouts at 150 characters per second. But it does it so quietly that you can barely hear it.
- The 229 mm electroluminescent display gives you multiple 24 by 80 character windows, with 255 by 512 pixel, bit-mapped graphics resolution.
- The screen tilt allows you to adjust the viewing angle of display. And the amber display is easy on your eyes.
- HP Windows let you organize the display to maximize your productivity.



- Multi-tasking lets you get more done in less time because you don't have to wait for the computer to finish one project in order for you to start another.
- GraphicArt and other graphics software let you generate topnotch graphics quickly and easily.
- The built-in disc drive uses 3 1/2-inch, double-sided, double-density discs with a formatted memory capacity of 710K bytes.
- The 512K bytes of Random Access Memory gives you ample user memory for most applications, and is expandable to over 5M bytes with bus expanders.
- The Random Access Memory (RAM) Disc allows up to half of the user memory, or RAM to be allocated as RAM disc. RAM disc can be used as a built-in electronic disc for running applications at a faster rate than on conventional disc drives.
- The 256K bytes of Read Only Memory (ROM) stores the HP-UX operating system kernel, Personal Applications Manager (PAM), and HP Windows.
- PAM translates system commands into simple commands for easier use.
- HP Windows allows you to select window size and position.
- The complete system weighs only 11,4 kg and occupies only 930 cm².
- The optional HP Mouse lets you run applications faster and easier. Use it to move the cursor around the screen quickly and accurately with less effort.

A show of force

There's a lot of power here. Mini-computer power in fact. In a 11,4 kg package called the Integral PC. There's a sophistication to the Integral PC that isn't present in other personal computers.

It goes beyond just making the work easier. The Integral PC acts more as an assistant than as a tool.

The Integral PC can actually do some of the work on its own, while you take care of the other tasks at hand. With multi-tasking, you simply set some of your assignments in motion, and the Integral PC sees them through.

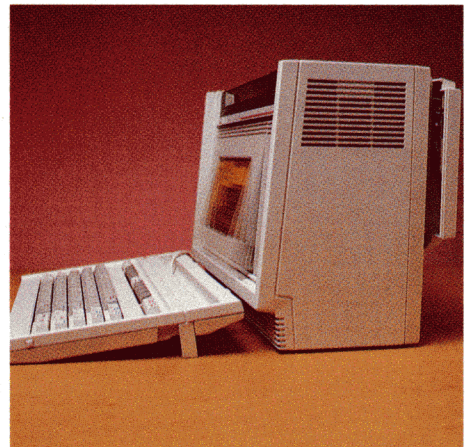
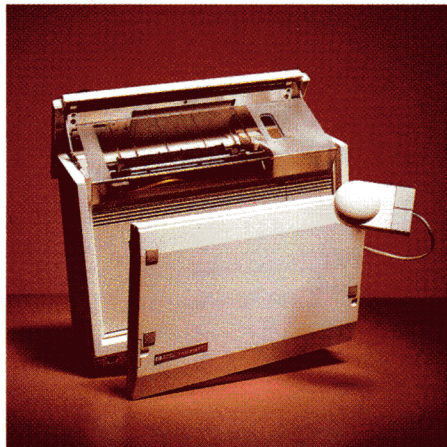
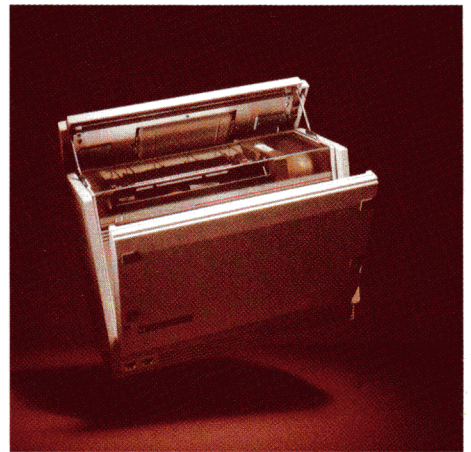
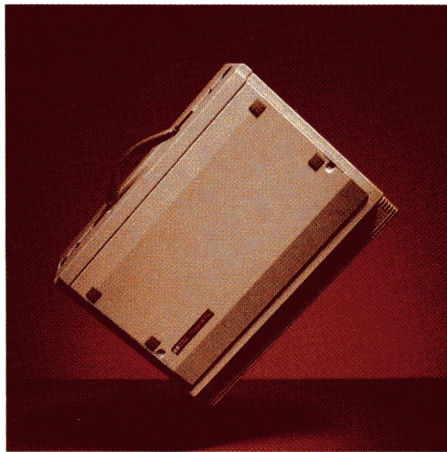
And the Integral PC with HP Windows can help you organize your projects while letting you keep an eye on each and every new development as it occurs.

That means you get more done in less time with less effort.

And that's just the start. There are possibilities for this computer that haven't yet been imagined.

But what else would you expect from the company that brought the business world the HP 3000, and with it, distributed computing.

The same company that put a full-fonction personal computer in a 4 kg package called the Portable PC from Hewlett-Packard.



Juggle your projects



Multi-tasking on the Integral PC is like having several terminals or personal computers constantly at your disposal.

While one job is being processed, you can turn to another. Recalculate a spreadsheet, compile a program, search a database and print a report. All at the same time, on the same computer.

The Integral PC.

Multi-tasking is possible because the Integral PC, with the HP-UX operating system, allows different operations to "share" microprocessor time. It's like having a minicomputer sitting on your desk.

With multi-tasking, you don't have to wait for the computer to finish printing, compiling, or searching in order to begin something else.

By minimizing time spent waiting for the computer, you increase your productivity. You haven't worked harder, just more efficiently.

And when you add HP Windows to multi-tasking, you have a powerful productivity combination that lets you keep tabs on your work to maximize effectiveness.

You decide each window size and position to best fit your needs and PAM makes it exceptionally easy to do.

For instance, with HP Windows you can watch data accumulate on instruments you're controlling while you document the results.

Now you're better organized, and, because of it, more productive.

The one box solution

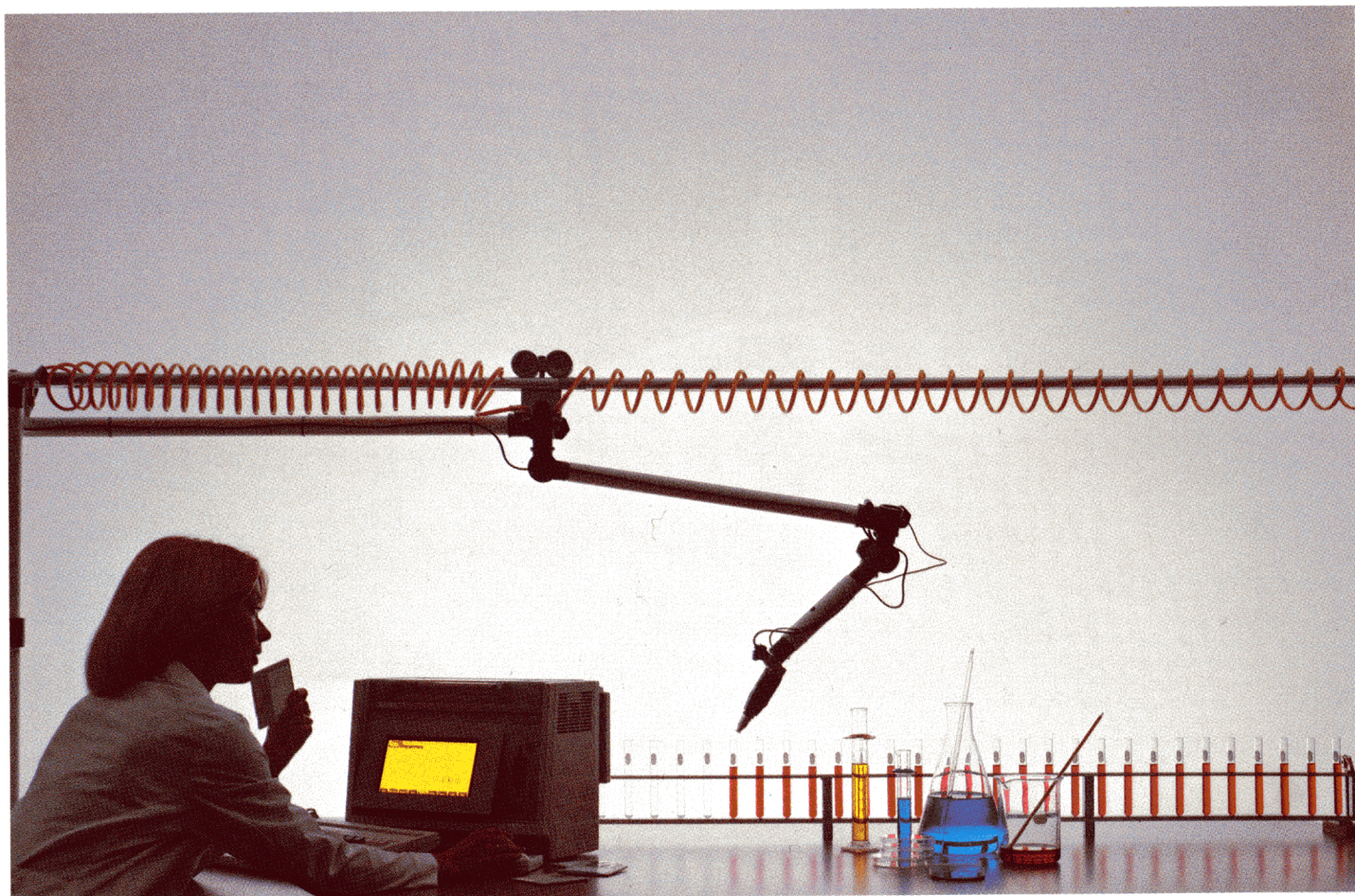


This is a powerful little package. For example, the Integral PC offers two microprocessors: a Motorola 68000, 16/32-bit microprocessor, plus a 16-bit graphics co-processor. Thus the Integral PC gives you increased responsiveness to your computing needs. Since the HP-UX operating system, HP Windows, and Personal Applications Manager (PAM) are all stored in Read Only Memory (ROM), start-up time is minimized and user memory is conserved.

You get 512K bytes of internal memory for temporary data storage and increased program execution speed. Plus a built-in disc drive that offers 710K bytes of formatted storage on a handy, 3 1/2-inch disc. And you can add up to 55M bytes of additional mass storage to meet your needs. The built-in ThinkJet Printer gives you permanent, high-quality printouts at 150 characters per second. Quietly.

Your window on the world is the amber 229 mm electroluminescent display. Studies have shown the amber screen to be easier on the eyes than other displays. And the Integral PC makes it even easier on you by incorporating a screen tilt. That way you can adjust the viewing angle to suit you perfectly at the flip of a switch. This whole package with its sleek European design takes up only 930 cm². You don't have a sprawling computer system, just one, neat, 11,4 kg package.

Situation under control



That's nice to hear whether you're programming applications or controlling instruments.

And the Integral PC offers both advanced programming features and powerful instrument control capabilities.

The Integral PC runs on the HP-UX operating system. HP-UX is based on the AT&T Bell Laboratories UNIXTM* System III operating system with Berkeley enhancements like csh and vi.

You've got access to an arsenal of programming languages. BASIC, and "C" for starters with more to come. And the UNIXTM programmer's tools can save you time and effort when locating and correcting bugs. Plus the Integral PC offers all the instrument control features of the HP-85B and HP-86B Personal Computers, and more.

Like multi-tasking, which allows you to use your Integral PC as an instrument controller and as a personal computer, at the same time.

* (Unix is a U.S. trademark of AT&T Bell Laboratories.)

You don't have to dedicate one computer just to data collection, computer-aided test, or instrument control. Depending on the activity levels, one Integral PC could do all of the above at once. And still serve as a personal computer.

You can use HP-UX Technical BASIC as an upgrade path for existing HP-85B and HP-86B Personal Computer programs, or to write your own. HP-UX Technical BASIC is a superset of ANSI BASIC with math, graphics, and instrumentation I/O command enhancements.

You've got two expansion ports in the back of the Integral PC plus an IEEE 488 HP-IB interface bus for hooking up instruments. And there's a bus expander to let you hook-up even more instruments and peripherals.

The Integral PC can also serve as an intelligent terminal to UNIXTM operating system-based computers. You can use the UNIXTM-to-UNIXTM copy program (*uucp*), or *mail* to talk to the UNIXTM community.

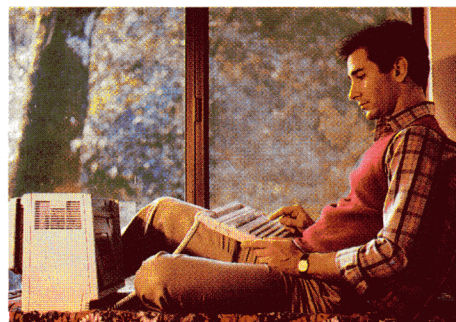
Using the Integral PC as an intelligent terminal, you can write source code on any computer running UNIXTM software. Then download it back to your Integral PC to compile and run. Or vice versa.

And that lends a degree of transportability to your minicomputer that it never had.

And with the Integral PC, you can be working on other projects while you're waiting for a response from your instrument or host computer. All of which makes the Integral PC the perfect upgrade for HP-85B and HP-86B users, and the entry-level member of the HP 9000 family of computers.



Additionally, there's the Device Independent Library (DIL)* which is accessible through HP-UX "C". DIL provides high-level language control of instruments through compiled languages. DIL saves you time when you're programming high performance computer-aided test solutions. Finally, real-time extensions available through HP-UX provide reliable interrupt handling and priority setting in a multi-tasking instrument control environment.



* Not available at introduction

100% solutions



The Integral PC offers more than any other computer in its price range. In addition to being a low cost instrument controller, the Integral PC is an excellent office partner.

Thanks to general business packages like Multiplan®, Microtrak™, TK!Solver™ and HP's own Memo-Maker to name but a few.

And there are also several vertical market software solutions available from independent vendors.

The Integral PC increases office productivity because it allows you to work on other projects while it spools a file to the printer. You can pull up a travel expense report in one window and copy it onto your monthly report.

Or have a bar chart in one window, a pie chart in another and write a report in a third window that talks about both charts.

You could even display your electronic mail in one window, your daily calendar in another and write a memo in yet another. You get the idea.

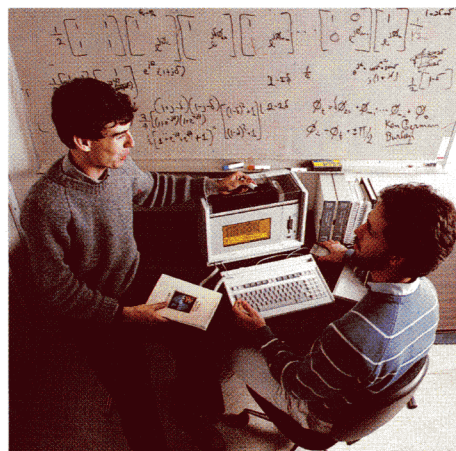
The Integral PC will serve as a terminal to almost any multi-user computer. The Datacomm software package, lets you communicate with any mainframe or minicomputer.

And with the Integral PC, you can be working on other projects while you're waiting for a response. So use it to write software or control instruments, but don't forget the business side of this computer. This computer has it.

Multiplan® is a trademark of Microsoft, Inc.
Microtrak™ is a trademark of SofTrak Systems.
TK!Solver™ is a trademark of Software Arts, Inc.
UNIX™ is a U.S. Trademark of AT&T Bell Laboratories.

Something for everyone

The Integral PC can offer everybody something that they can't get now out of their personal computer. Or at least more of it.



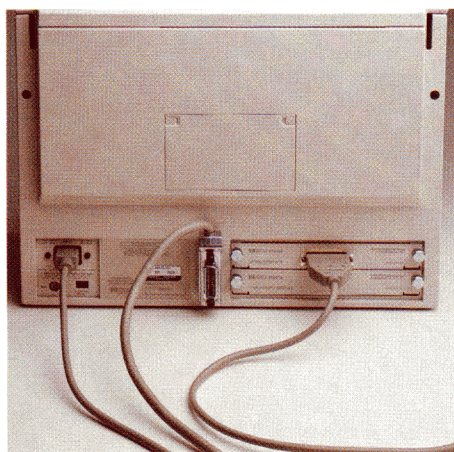
Take the power of your campus computer center wherever you have to go the Integral PC is perfect for the lab and classroom, because it can put the power of the UNIXTM operating system on any desk in the world – and then go home with you at night.

The Integral PC gives you the programming power of the UNIXTM operating system in a 11.4 kg package. Take it home at night or take it wherever you do your best work. And you'll do your best work. Because you can do things on the Integral PC that were never before thought possible on a personal computer. You're limited only by your own imagination.

Talk to your HP sales representative, to find the dealer nearest to you. They can put this computer to work for you.

You have all the instrument control features that you require, plus a full-time Personal Computer with the Integral PC. You can gather readings from a liquid chromatograph while you monitor temperature changes on a fermentation tank. And use the same Integral PC to control your inventories simultaneously. Plus there's so much more it can do – if you let it.

Hardware



Central Processing Unit/Microprocessor

Motorola 68000, 16/32-bit microprocessor running at 8 Megahertz clock rate.

Graphics Processing Unit (GPU)

16-bit graphics processor with 32K bytes of dedicated Random Access Memory (RAM).

Internal Memory

256K bytes of Read Only Memory (ROM).
512K bytes of RAM, expandable up to 1.5M bytes of RAM in the main system, or expandable up to 5.5M bytes of RAM with Bus expanders. Up to 1/2 of the total RAM may be allocated as RAM disc.

Mass Storage

Double-sided, double-density 3 1/2-inch microfloppy disc drive built in.
710 Kilobyte disc capacity (512 bytes per sector, 9 sectors per track, 80 tracks per surface, 2 recording surfaces per disc).
600 RPM rotational speed.
350 milliseconds average access time.

Display

229 mm electroluminescent display.
255 by 512 pixel, bit-mapped display.
24-line by 80-character standard window size (variable depending on front and window size).
Adjustable viewing angle (5 to 17 degrees in 2 degree steps).

Keyboard

Fully-spaced, 90-key, typewriter-style, full-travel keyboard.
Low profile, detachable.
Numeric keypad.
8 function keys.
Flexible key mapping.

Internal Printer

Built-in ThinkJet Personal Printer.
Ink-jet dot-matrix printing method.
150 characters per second (CPS) print speed.
1K byte buffer size.
Less than 50 decibels of sound pressure printing noise.
11 by 12 dot character matrix text print resolution.
96 by 96 dots per inch or 192 by 96 dots per inch graphics resolution.
12 characters per inch, 80 characters per line normal print pitch.
6 characters per inch, 40 characters per line expanded print pitch.
21.3 characters per inch, 142 characters per line compressed print pitch.
10.7 characters per inch, 71 characters per line expanded/compressed print pitch.
Boldface and underline print modes.
11 character sets in HP Roman 8, including Danish, Dutch, English, Finnish, French, German, Italian, Norwegian, Portuguese, Spanish and Swedish.
Pin-feed paper feed for fanfold paper.
Friction-feed paper feed for single sheets.
8-1/2 by 11-inch paper size.
216 mm by 279 mm papersize.

**Physical Characteristics**

21.25 cm deep by 32.5 cm high by 42.5 cm wide (8½ inches by 13 inches by 17 inches).

930 square cm footprint (1.00 square feet).

11.4 kilograms (25 pounds).

Input/Output

Hewlett-Packard Interface Bus (HP-IB, IEEE-488).

2 Expansion ports.

2 Hewlett-Packard Human Interface Loops (HP-HIL).

System Clock

1 millisecond resolution.

6–10 year lithium cell battery life

Accuracy within six minutes per year

System control capability (alarm functions).

Shock Resistance

30-g force on all six sides

Ergonomic Considerations

40 decibels of sound pressure in idle mode.

Slim keyboard design (30 mm width)

Selectable character fonts.

Environmental Constraints

–20° to 60° Celsius (–4° to 140° Fahrenheit) while in storage.

10° to 40° Celsius (50° to 103° Fahrenheit) while in operation.

8 to 80 percent relative humidity at

40° Celsius while in operation.

55 to 500 Hz vibration.

3-g maximum acceleration.

Electrical Interference

FCC Class B, VDE (Radio Protection Mark-0871B).

Safety Approvals

UL listed, CSA, TUV, SEV, KEMA, NEMKO, RKMC, and EI Finland certified and approved.

Software

Software built into read only memory

- **HP-UX/RO**

Hewlett-Packard's version of the UNIX™ software kernel required for running applications software.

- **Personal applications manager (PAM)**

System interface for HP-UX.

- **HP Windows**

Window manager for HP-UX.

Software included with product on disc.

- **Tutor**

Interactive "Getting Started" guide to using the Integral PC.

- **Utilities**

Easy-to-use tools for performing standard system functions.

- **HP-UX Commands**

32 standard UNIX™ commands including *csb*, a powerful UNIX™ "C" shell.

- **Standard Applications**

A collection of useful editors (*vi* and *ed*), fun games (Adventure, Mille and GraphicArt), plus several fonts.

- **Diagnostics**

Easy-to-use program to verify system integrity.

- **System disc**

For programming a collection of drivers including the HP Graphics Language (HPGL), Window driver, Real Time extensions, and a serial driver for connecting RS-232C printers.

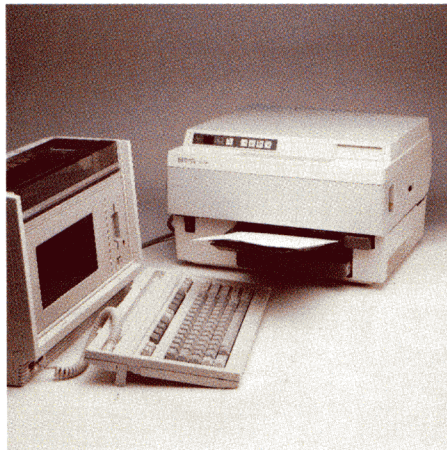


Optional peripherals



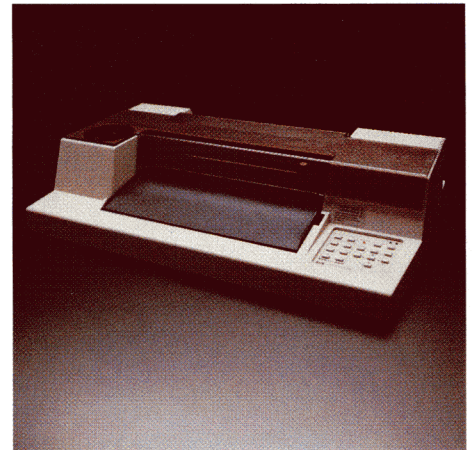
Disc Drives

- Single, 3 1/2-inch, double-sided, micro-floppy disc drive 710K byte capacity (HP 9122S).
- Dual 3 1/2-inch, double-sided, micro-floppy disc drive 710K byte capacity per drive (HP 9122D).
- 15M byte Winchester with single 3 1/2-inch microfloppy drive, 710K byte capacity for microfloppy drive (HP 9133D).
- 15M byte Winchester (HP 9134D).
- 24M byte Winchester (HP 7941).
- 24M byte Winchester with tape back-up (HP 7942).
- 55M byte Winchester (HP 7945).
- 55M byte Winchester with tape back-up (HP 7946).



Printers

- Daisy wheel printer with standard RS-232C Interface or Option 046 with HP-IB Interface (HP 2602A).
- Dot-Matrix printer with standard RS-232C Interface or Option 046 with HP-IB Interface (HP 2932A & HP 2934A).
- The LaserJet Professional PC Printer (HP 2686).



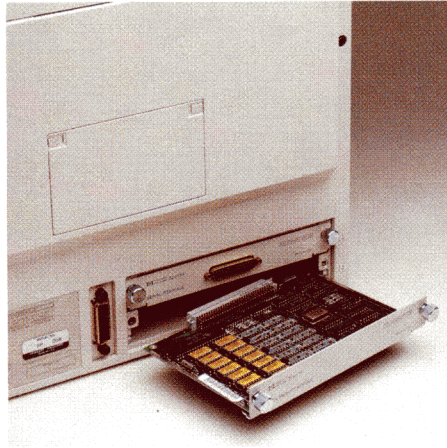
Graphics Plotters

- Two-pen Plotter option 001 with RS-232C Interface or option 002 with HP-IB Interface (HP 7470A).
- Six-pen Plotter option 001 with RS-232C Interface or option 002 with HP-IB Interface (HP 7475A).
- Eight-pen Plotter option 001 with RS-232C Interface or option 002 with HP-IB Interface (HP 7550).



Interfaces

- RS-232C Interface (HP 82919A).
- Current Loop Interface (HP 82920A).
- Binary Coded Decimal (BCD) interface (HP 82922A).
- General Purpose Input/Output (GPIO) interface (HP 82923A).
- GPIO/BCD (HP 82976A).
- Hewlett-Packard Interface Loop (HP-IL) (HP 82924A).
- Hewlett-Packard Interface Bus (HP-IB) (Cables recommended for use with the Integral PC.)
 - 3 meter right angle HP-IB cable (HP 92220R.)
 - 1 meter right angle HP-IB cable (HP 82977A).
 - 2 meter right angle HP-IB cable (HP 82977B).

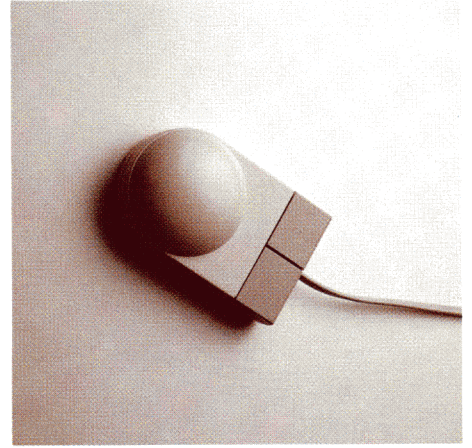


Memory expansion cards.

- 256K byte RAM card (HP 82925A).
- 512K byte RAM card (HP 82927A).

Accessories

- HP Mouse (HP 46060A).
- Bus Expander (HP 82904A).
- Briefcase cover (HP 92251F).
- Carrying case with strap (HP 13269Y).
- Instrument cable, female/female connectors (HP 82974B).
- Serial printer cable, female/female connectors (HP 82974C).
- Serial printer cable, female/male connectors (HP 82974D).
- Current loop cable, (HP 82975A)



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Warranty

Warranty is supplied with the
product and is available on request.

Hewlett-Packard reserves the
right to make changes in materials,
specifications or accessories
without notices.



**HEWLETT
PACKARD**