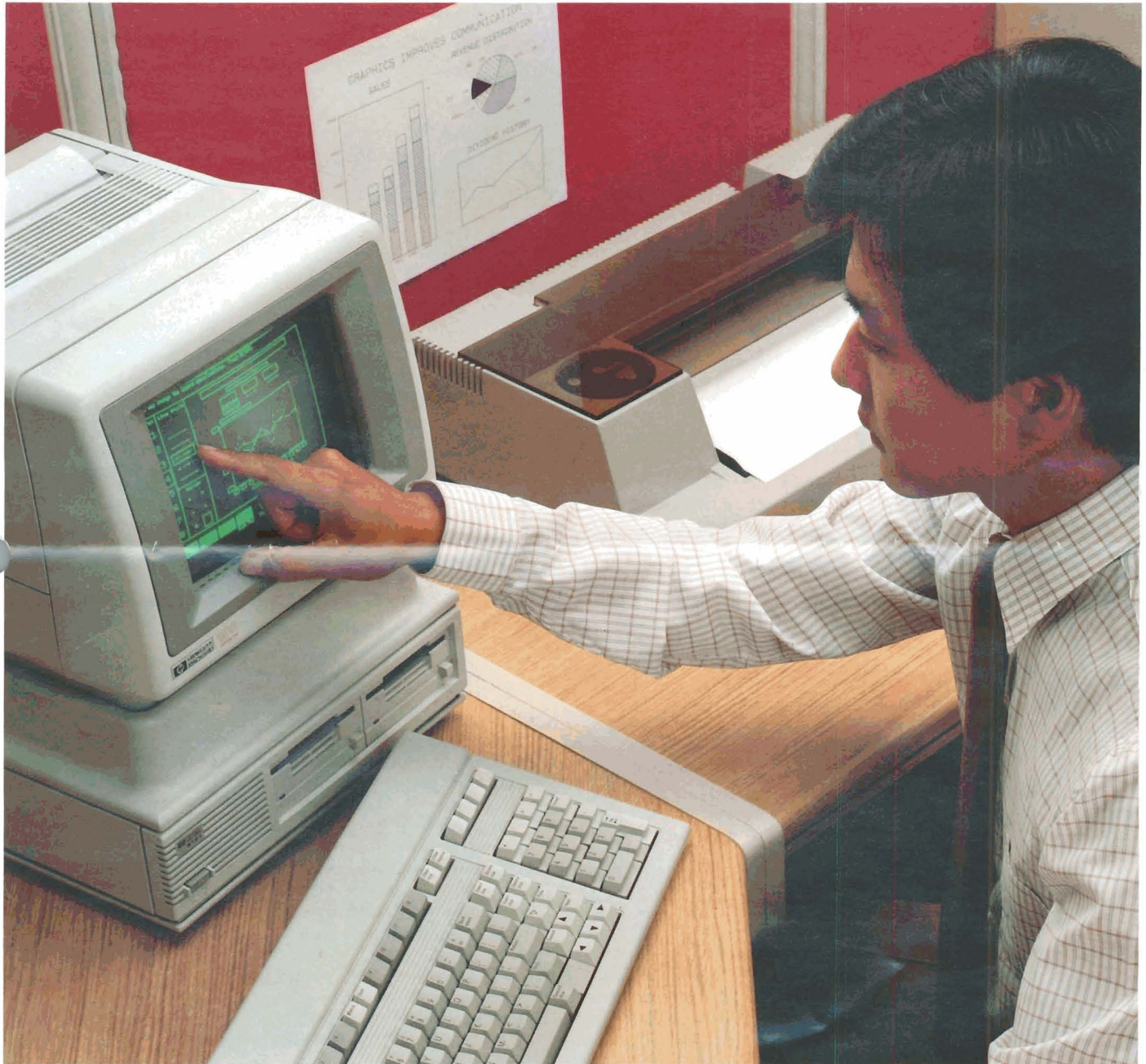




# MEASUREMENT COMPUTATION **news**

product advances from Hewlett-Packard

NOVEMBER/DECEMBER 1983

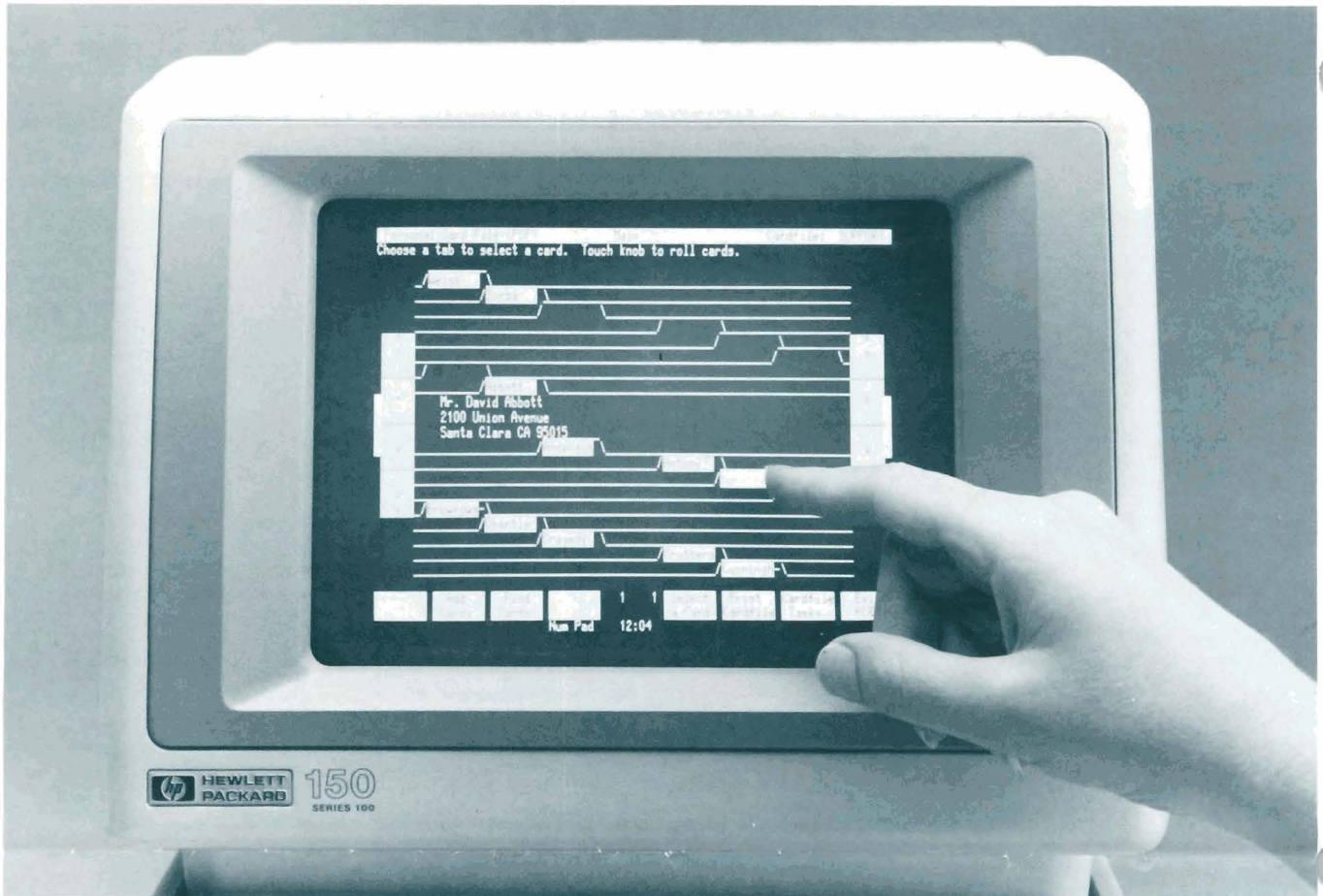


Hewlett-Packard introduces  
MS-DOS personal  
computer with  
touchscreen control

With a touch of your finger, you can now perform a wide range of computing functions using Hewlett-Packard's new HP 150 Personal Computer. HP's innovative HP Touch control lets you operate the HP 150 using the most natural and familiar pointing tool available—your fingertip.

HP Touch incorporates light-emitting diode (LED) technology to create horizontal and vertical light beams located in the screen's frame. When your fingertip (or a pen) touches a point on the screen, it interrupts the light beams, providing

*(continued on page 2)*



Personal Card File is one of the core software packages designed especially for use with the HP 150's touchscreen technology. To open the file you choose, you simply touch the appropriate tab on the screen.

## Powerful personal computer

(continued from page 1)

the computer with the coordinates of the point touched and telling it what to do next. With this method, you don't lose visual contact with the display, and, unlike use of a mouse pointer, you aren't limited to only lateral movements. You also have the option of using the eight screen-labeled softkeys, which can be dynamically changed from one application to another.

### Hundreds of programs available

The HP 150 uses the Intel 8088 16-bit microprocessor to run its MS™-DOS operating system. This means that it supports hundreds of popular software programs, including versions of VisiCalc™, WordStar®, and CONDOR™ File Data Base Manager that have been enhanced for use with the touchscreen and softkey features. System software called Personal Applications Manager (PAM) simplifies the interface with the operating system.

In addition to MS-DOS programs, the HP 150 runs other core software packages designed especially for use with the touchscreen technology. These include HP Graphics, Personal Card File, MemoMaker, SpellStar™, MailMerge™, MicroSoft's BASIC, and DSN/Link, which lets the HP 150 function as an intelligent workstation connected to an HP 3000 Computer. More than 30 software packages have also been developed by independent software vendors in categories such as financial analysis, data management, screen graphics, and accounting.

### Standard system includes many built-ins

The standard HP 150 system includes a keyboard, system processor unit with an 8088 microprocessor, bit-mapped graphics display monitor, 256K bytes of internal memory (expandable to 640K bytes), and a dual 3 1/2-inch flexible disc drive. Built-in features include a block-mode graphics terminal features set, datacommunications port, and support for a full system of peripheral devices. Even when combined with storage devices and printer, the HP 150 occupies only 2.1 square feet of desktop space—no more than an average in-basket. Built-in interfaces support a full system and communications without additional interface accessories. The optional integral printer, which fits inside the terminal display case, occupies no additional space. (The HP 150 is also compatible with other HP peripheral devices, including printers and plotters.) A Winchester hard disc option is also available. (See separate article in this issue for information about HP's new 5M-byte and 15M-byte Winchester disc drives.)

For more information, check **A** on the HP Reply Card.

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# Hewlett-Packard introduces X.25 cluster controller for improved worldwide networking capabilities

Hewlett-Packard has strengthened its commitment to provide enhanced worldwide networking capabilities with the introduction of the HP 2334A X.25 Cluster Controller. With this new controller, you can connect remote terminals to HP 3000 or HP 1000 Computers via an X.25 packet-switching network such as Telenet or Transpac. The connection is made using a standard modem line leased from the network. Terminals are linked to the HP 2334A using a four-port RS-232-C interface card, which supports point-to-point devices at data rates up to 9600 bps with no modem control required. Up to four of these cards can be installed in the HP 2334A.

### Only one datacom line required

Let's say, for example, that you have one central-site HP 3000 Computer and several remote sales offices and warehouses. At each remote site, you can connect as many as 16 RS-232-C devices to the X.25 public network using only one X.25 line. Each terminal connected to the HP 2334A operates independently of the others and can access any computer on the X.25 network.

In the past, users with asynchronous terminal connections had to get a special PAD (Packet Assembler Disassembler) service for terminals. Each terminal required its own physical

connection to the network at either 110, 300, or 1200 bps. In addition, printer connections were impossible, since most networks and X.25 software could not place outgoing calls to the PAD. Now, with the HP 2334A, printers are supported, and you need only one datacom line. Furthermore, network data transfer rates at speeds up to 19,200 bps are available.

### Key advantages

Using the HP 2334A with an X.25 public packet-switching network offers several advantages:

- Low-cost traffic rate for small or medium volumes of data
- Multicomputer or multiplexer access with only one datacom line
- International standards (X.25/X.29) for multivendor connections
- Worldwide interconnection between all local public X.25 networks.

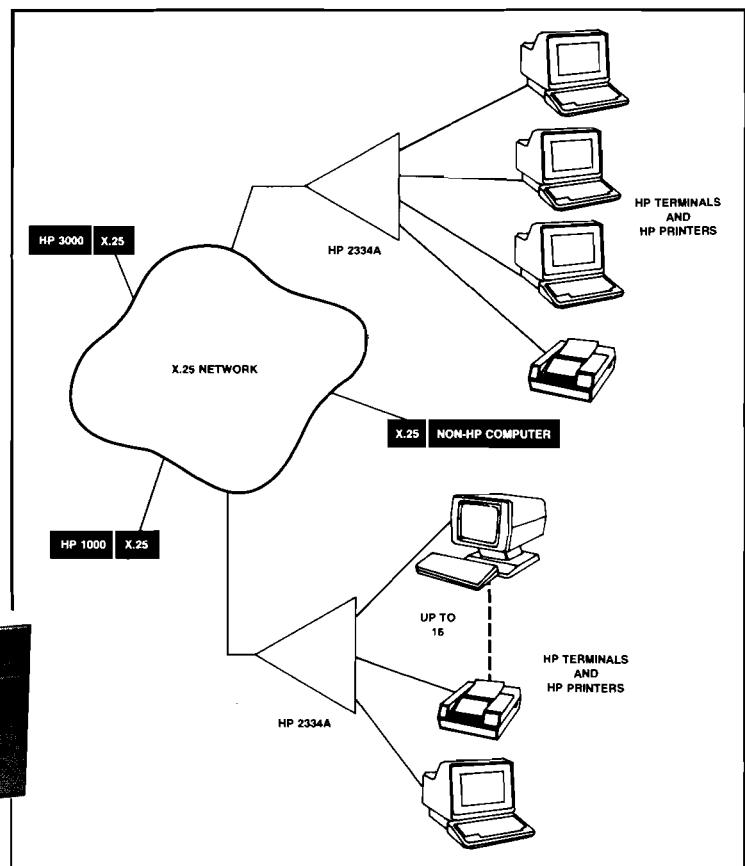
### Connection possibilities and network certification

With the HP 2334A, terminals can access multiple computers. The same X.25 interface on the computer can also be used for computer-to-computer and computer-to-terminal connections via the PAD.

Most public X.25 networks require product certification before they can be used on the networks. All HP products with an X.25 interface have been approved for use on existing X.25 networks. Check with your local HP representative for future certifications.

For more information, check **C** on the HP Reply Card.

With the HP 2334A X.25 Cluster Controller, you can connect remote terminals to HP 3000 or HP 1000 Computers via an X.25 packet-switching network.



# New Winchester family saves space and money

Hewlett-Packard's new family of 5M-byte and 15M-byte Winchester disc storage systems are designed to save desktop space by fitting conveniently beneath any of HP's small personal computers. When arranged in this way, the system takes up no more desktop space than a single integrated unit, but you have the flexibility to interchange mass storage devices as your needs change.

These new mass storage systems are available in three different configurations. The HP 9133V and HP 9133XV are 5M-byte and 15M-byte Winchester systems (4.8M-byte and 14.5M-byte actual formatted capacity), respectively. Each is combined with a 270K-byte, 3 1/2-inch flexible disc drive. The HP 9134XV is a 15M-byte stand-alone Winchester system. Each system measures just 5 inches by 12.8 inches by 11.2 inches. An added benefit is the lower cost of these new Winchester systems, reduced substantially from previous models. At the same time, HP has significantly reduced the price of its 3 1/2-inch flexible disc.

### System compatibility

These new Winchester systems make an excellent match for Hewlett-Packard's new HP 150 Personal Computer (featured on the cover of this issue), as well as other small personal computers. The HP 150's touch-sensitive screen (HP Touch) combines well with the speed and capacity of the new Winchester systems to provide an efficient, easy-to-use desk-top computer system.

The HP 150's Personal Application Manager operating system can use the increased memory of the 15M-byte Winchester to keep entire software libraries on disc, eliminating the need to reload frequently used programs and increasing the speed with which most programs can run. In addition, applications that require constant disc access, such as data base management and other types of business programs, can be

handled more effectively by using the wear-resistant, flying head technology of a Winchester system rather than the contacting head technology of flexible discs.

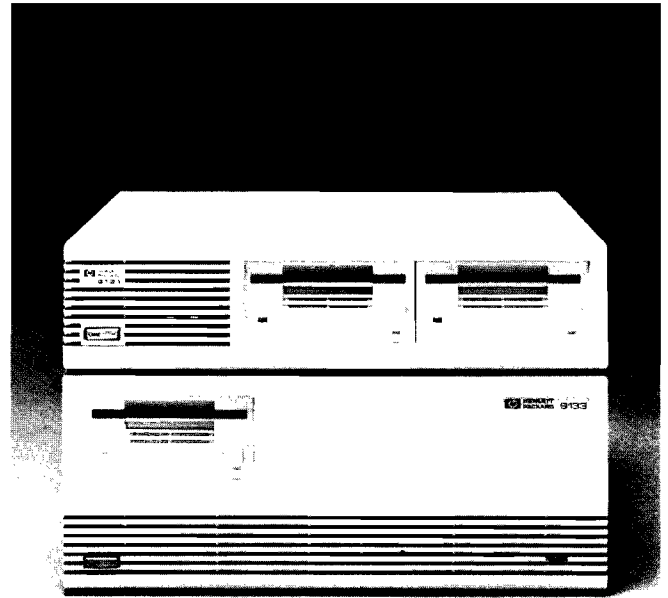
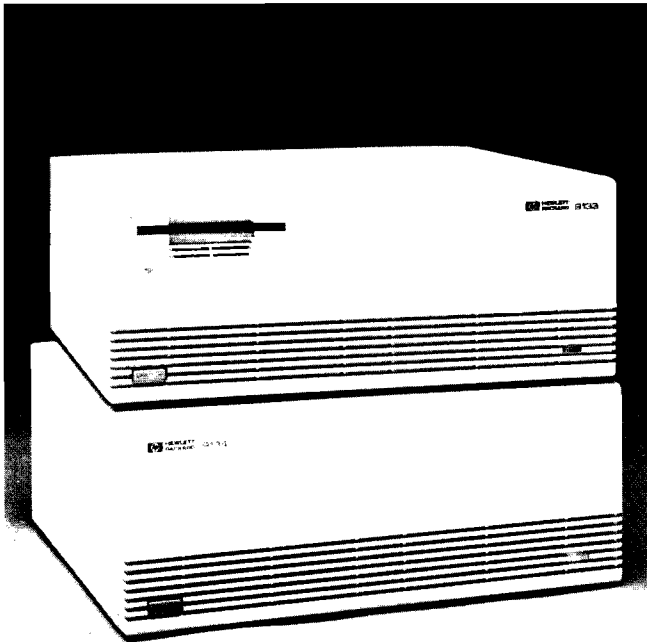
All three Winchester systems are also supported by Hewlett-Packard's Series 200, Model 16 Computer. The HP-86B, HP 120, and HP 125 Personal Computers support only the HP 9133V system.

### Reliability and protection features

All three Winchester drives are sealed to protect them from most contaminants, and they can survive sudden power surges characteristic of heavy industrial applications. The new Winchester drives are combined with the 3 1/2-inch rather than the 5 1/4-inch flexible disc drive because Hewlett-Packard has found the smaller disc to be more reliable. Warranty data on mechanism reliability shows the 3 1/2-inch disc to be nearly four times better than the larger disc, and maintenance costs are 33% to 50% lower than for comparable 5 1/4-inch products.

The flexible discs are protected from damage and loss by Hewlett-Packard's innovative Media Protection System. With this system, the media are packaged in a hard polymer jacket with an automatic shutter, which protects against contamination caused by fingerprints, smoke particles, and dust. The jacket also has a hard center, which firmly positions the disc to read and write accurately and reliably. In addition, disc life is maximized by HP's Media Monitor feature, which signals the user when a disc is ready to be replaced.

For more information, check **D** on the HP Reply Card.



These new Winchester disc storage systems fit conveniently beneath any of HP's small personal computers, including the new HP 150 (see story). Lower in cost than earlier models, HP's Winchester systems are available in either 5M-byte or 15M-byte configurations (shown left and right) with a 3 1/2-inch flexible disc drive.

# New 20-milliamp current-loop optocoupled units save space and facilitate design

New from Hewlett-Packard are a transmitter and receiver designed for use in 20-mA current-loop systems. Both optically isolated, the HCPL-4100 Transmitter and the HCPL-4200 Receiver give the designer complete transmit and receive functions with guaranteed specifications.

Replacing conventional 20-mA current-loop designs, which can use up to 10 components, the HCPL-4100 and HCPL-4200 fully integrate the circuitry required to interface between logic signals and the current loop. This feature saves you space and makes the design process easier.

### Powered by loop current

Innovative design features of the HCPL-4100 and HCPL-4200 help reduce equipment failure and data errors. In the HCPL-4100 Transmitter, the loop current is controlled by a silicon photo-IC that is optically driven by a gallium-arsenide LED. The photo-IC is powered by the loop current, thus isolating the loop from the equipment. This isolation breaks ground loops that can cause equipment failure and data errors. A second IC in the same package drives the LED and

provides industry-standard LSTTL data input for the HCPL-4100 Transmitter.

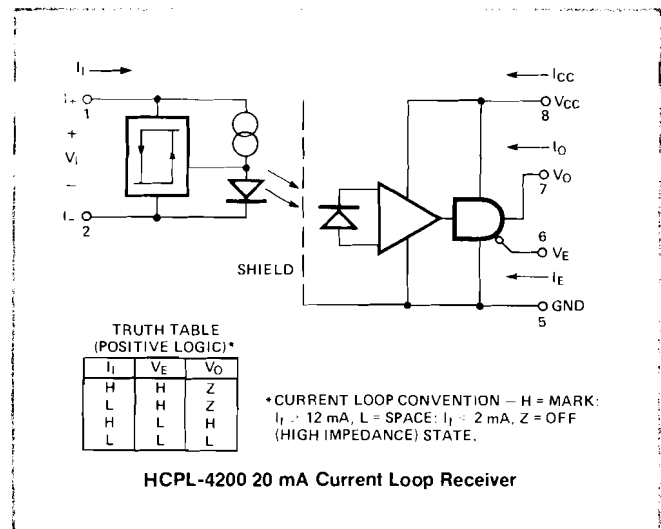
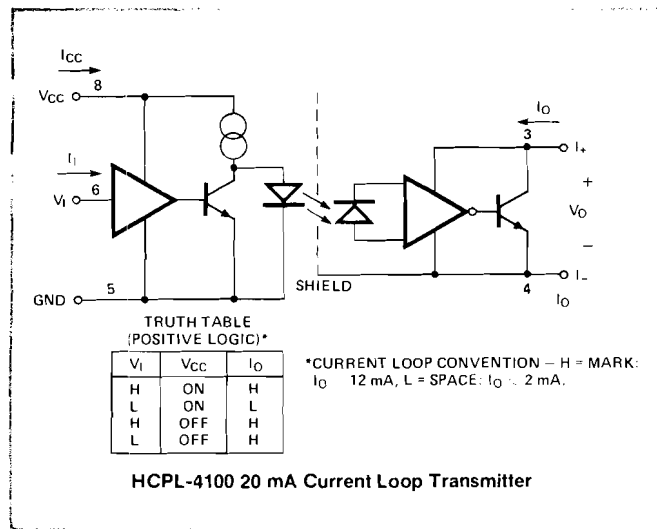
The HCPL-4200 Receiver, also powered by the loop current, optically isolates the 20-mA current from the receiver circuitry. The receiver's output is compatible with LSTTL and CMOS logic.

### Other key features

Both the HCPL-4100 and the HCPL-4200 have an internal shield that rejects common-mode interference of typically 10,000 V/ms at 25°C. Performance—both ac and dc—is guaranteed from 0° to 70°C. Other important features include precise thresholds with hysteresis for consistent, noise-free performance and a 19.2 kilobaud-plus speed capability.

Contained in eight-pin, dual in-line plastic packages, each of these products is recognized under the component program of Underwriters Laboratory, Inc. (file no. E55361).

For more information, check **E** on the HP Reply Card.



# Bar-code reader requires no program modification for industrial data-entry applications

Bar-code readers are becoming an increasingly popular alternative to keyboard data entry in industrial environments. Bar-code readers such as Hewlett-Packard's Model 92911A offer an efficient data-entry system for a variety of manufacturing applications, especially controlling stock and shipping data and tracking item and material movement.

Simplicity and ease of implementation are key advantages in using the HP 92911A Bar-Code Reader. This bar-code reader connects between a computer terminal and its keyboard (HP 2622A, HP 2623A, HP 2624B, or HP 2626A Terminal or the HP-125 Personal Computer), and receives its power directly from the terminal. As a result, the computer recog-

nizes no difference between the bar-code reader and the keyboard. This means that existing data-entry application programs need not be modified for the bar-code reader, nor do special steps have to be coded for it.

The HP 92911A is offered with two types of wands: medium-resolution and high-resolution. The standard version reads two popular codes, 3 of 9 and interleaved 2 of 5. Or, you may instead order the new Option 60, which allows you to use the 92911A to read CODABAR (USD 4), a code used in blood-bank and library applications.

For more information, check **F** on the HP Reply Card.

## Hewlett-Packard expands range and performance level of cavity generators

Hewlett-Packard's HP 8683D and 8684D Cavity-Tuned Signal Generators now include an internal doubler band to extend frequency range and provide doubled FM deviation. With frequency ranges of 2.3 - 13.0 GHz for the HP 8683D and 5.4 - 18 GHz for the HP 8684D, these generators are now suitable for satellite video modulations. Modulation rates for both models are dc to 10 MHz and deviation is  $\pm 10$  MHz in the doubled band.

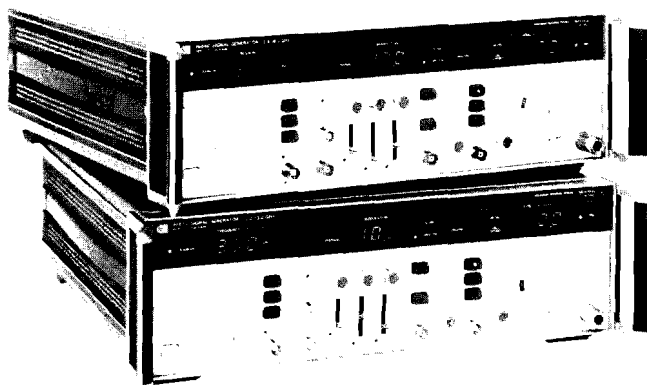
Both generators also feature high-performance pulse modulation in both the main and doubled bands for use in radar applications. Rise/fall times are  $< 10$  ns, and the on/off ratio is  $> 80$  dB. The internal pulse generator has pulse rates from 10 Hz to 1 MHz, pulse widths from 100 ns to 100 ms, and pulse delay control from 50 ns to 100 ms. Amplitude modulation is available to 70% depths, with rates to 10 kHz.

The HP 8683/4D are both derived from the portable, reliable HP 8683/4B models, which have a field MTBF (mean time before failure) exceeding 12,000 hours. Each unit weighs less than 18 kg (40 lbs).

Like their predecessors, a major advantage of these cavity-tuned generators is their excellent nonharmonic spurious characteristics at  $< -80$  dBc. Single-sideband phase noise is  $< 72$  dBc/Hz at 10 kHz offset in X-band. Cavity technology also allows a broadband noise floor from  $-135$  to  $-150$  dBc.

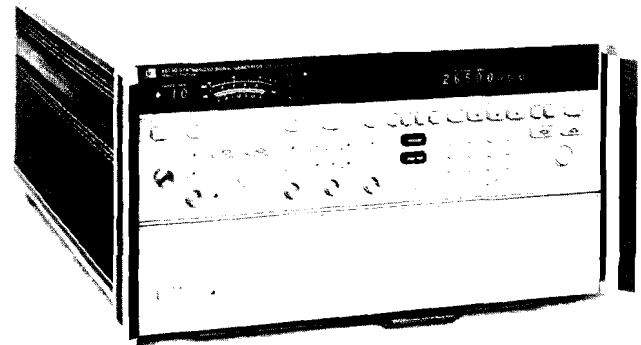
Output power in the doubled bands is calibrated from  $-3$  to  $-130$  dBm. Pulsed power is peak-leveled and can be corrected for connecting-cable loss versus frequency.

For more information, check **G** on the HP Reply Card.



The HP 8683/4D cavity generators have double FM deviation to allow satellite TV applications in  $K_u$  band.

## Two new synthesized signal generators provide precise signal simulation for broadband receiver testing



The HP 8673D is one of two new signal generators from Hewlett-Packard that can serve as a single broadband source for many different measurements in an automatic test system.

Hewlett-Packard's new HP 8673C and HP 8673D Synthesized Signal Generators are designed to serve as versatile microwave test sources for broadband receiving systems. Both generators feature YIG (yttrium-iron-garnet) tracking filters to reduce subharmonics and harmonics above 1.2 GHz to  $< -60$  dBc, a critical requirement for testing multiband receiving systems such as surveillance and warning receivers. The HP 8673C has a range of 50 MHz to 18.6 GHz, and the HP 8673D covers a range from 50 MHz to 26 GHz.

Both generators share a number of features:

- Predicted MTBF (mean time between failures) of 3,300 hours, based on field data and demonstration testing of the HP 8672A/8673A, from which both models are derived
- High-performance internal pulse modulator with  $< 40$  ns rise/fall times and  $> 80$  dB on-off ratio
- Output power at least  $+6$  dBm at 26 GHz (D model) and  $+2$  dBm at 18.6 GHz
- Leveled, calibrated output to  $-100$  dBm
- All functions programmable through the HP-IB (IEEE 488)
- Single-sideband phase noise  $< -80$  dBc/Hz (10 kHz offset at 10 GHz)
- Versatile signal simulations with CW, AM, FM, pulse, or any combination of these.

With the range of performance features offered by these two signal generators, you can now use a single broadband source to perform many different measurements in an automatic test system for RF and microwave applications.

For more information, check **H** on the HP Reply Card.

# New 30-amp dc power supply is HP-IB programmable

A new 200-watt programmable dc power supply has been added to the Hewlett-Packard family of system power supplies. Fully programmable via the HP-IB (IEEE 488), the HP 6033A System Power Supply offers ease of use, higher current output, protection against damage, and serviceability.

### Easy-to-use instruction set

The HP 6033A's extensive, user-friendly instruction set is easy to learn and use. Programming codes are self-documenting, making it easy to review and modify software. Output voltage and current, power-supply status, and other programmable features can be read back over the HP-IB.

To facilitate system design and troubleshooting, the HP 6033A can be controlled via the front panel, or local control can be blocked by the computer. System design can also be simplified by requesting programming error codes via the HP-IB.

### Wide range of voltage and current

Since the HP 6033A is an autoranging power supply, it can replace multiple conventional power supplies. It operates at 200 watts over a wide, continuous range of voltage and current—from 6.7V at 30A to 20V at 10A. An advanced, 20-kHz switching regulation technique enables the HP 6033A to operate with the same laboratory-grade performance through its complete operating range of 0 to 200 watts.

### Protection against damage

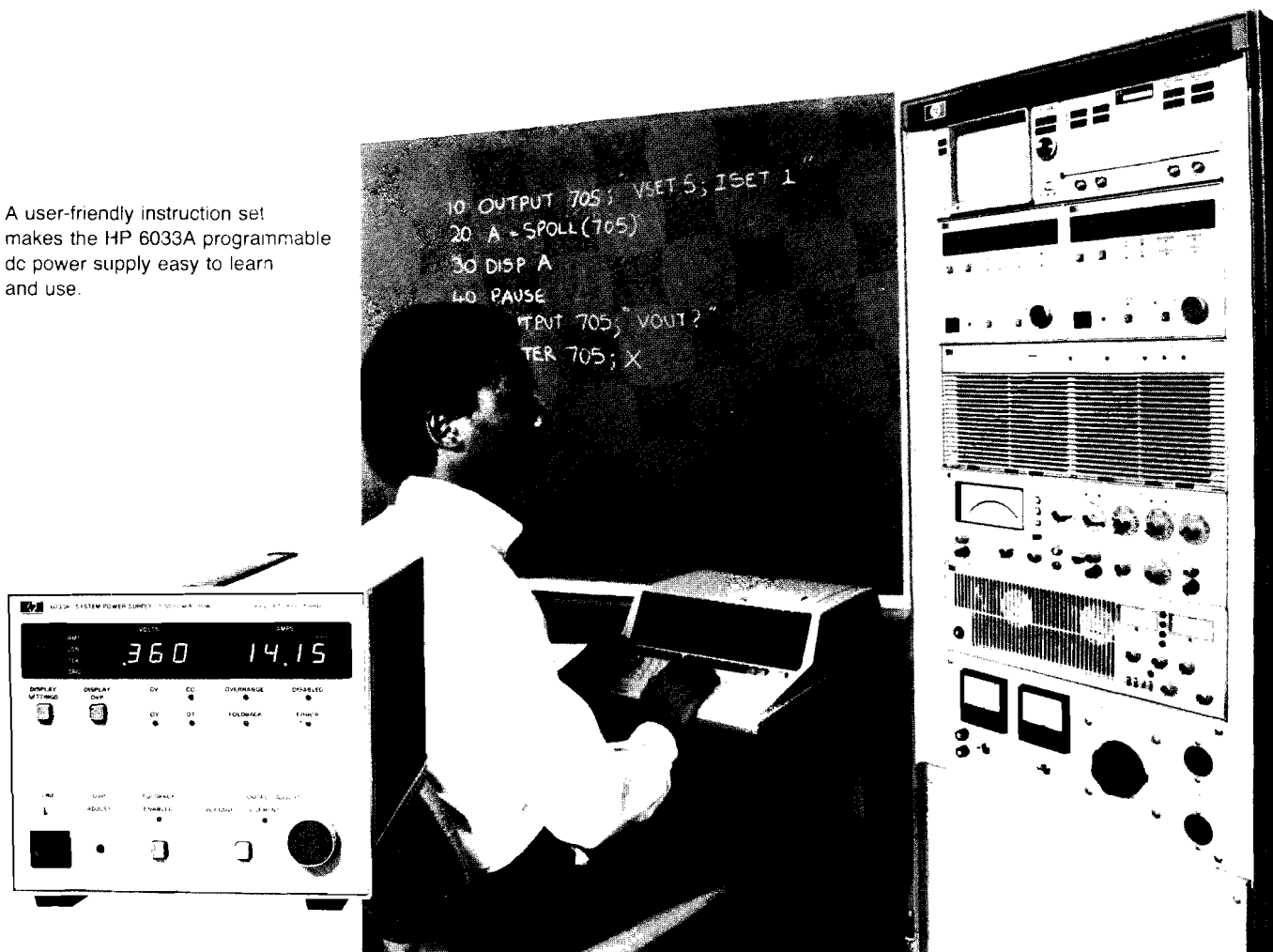
Protective features designed into the HP 6033A help prevent damage to both the load and the power supply. The built-in overvoltage protection circuitry can be reset using the HP-IB. The circuit's trip value can also be read back. Damage to test fixtures and loads from high currents can be avoided by using a new feature called CV/CC foldback, which can be enabled, disabled, and reset, all via the HP-IB. When low or high ac line or overtemperature conditions are detected, the HP 6033A is disabled until the condition is remedied. You can also program soft limits remotely to keep an operator from setting voltage and/or current above chosen values.

### Serviceability features

The microprocessor-based architecture of the HP 6033A provides both automatic and HP-IB-invokable self-testing and signature analysis stimulus. These features, combined with local control and accessible components and boards, make servicing simple and easy. A service-request signal provides interrupt capability for efficient system management. When the signal is enabled, many operating and fault parameters will trigger it, causing a computer interrupt.

For more information, check 1 on the HP Reply Card.

A user-friendly instruction set makes the HP 6033A programmable dc power supply easy to learn and use.





# Nonimpact printers for office or workstation feature laser printing technology

Enjoy the convenience of high-quality printing at your desk with one of Hewlett-Packard's new 12-page-per-minute laser printers. The HP Series 1200 Models 2687A and 2688A Laser Printers, designed especially for office and workstation environments, offer a high-quality alternative to daisywheel, impact matrix, thermal, or electrostatic printing devices. Both are designed to operate as peripheral devices for the HP 3000 Computer System.

Using standard cut-sheet paper (either 8 1/2 x 11-inch or 210 mm x 297 mm), both printers produce output at 12 pages per minute. Resolution of 300 dots per inch assures high-quality printing. Their compact size and quiet operation (noise level is less than 55 dBA) make them well suited for office environments.

### Text printer offers four fonts per page

With the HP 2687A Desktop Text Printer, you can select up to four character fonts per printed page. Of these, two are permanently resident in the machine, and two are user-changeable. The range of available fonts includes Script, Courier, Letter Gothic, Pica, and other popular faces.

Word processing features include horizontal cursor positioning, proportional spacing, automatic underlining, and page rotation for formatting flexibility. HP's word-processing software (HPWORD and TDP/3000) supports the HP 2687A.

### Generate documents at your workstation with text/graphics printer

The HP 2688A Text and Graphics Printer offers capabilities and features not typically found in office printers. When used in conjunction with HP's word-processing software, it becomes a powerful, easy-to-use document-generation device for printing charts, graphs, and diagrams. A maximum of 32



The HP 2687A Desktop Text Printer and the HP 2688A Text and Graphics Printer are designed for high-quality laser printing in office and workstation environments. Both printers offer 12 pages per minute and 300 dots per inch resolution.

character fonts can be combined on one page, enabling you to print logos, headings, bold and italic print, and signatures, in addition to running text. With the HP 2688A you can eliminate preprinted forms by storing them electronically and merging them with data for simultaneous printing. Other capabilities include page rotation and 2:1 or 4:1 reduction.

For more information, check **J** on the HP Reply Card.

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