



MEASUREMENT COMPUTATION **NEWS**

product advances from Hewlett-Packard

SEPTEMBER/OCTOBER 1983



Hewlett-Packard unveils
new benchtop plotter; drops
price on current model

A new low-priced, high-performance plotter, the HP 7475A Six-Pen Graphics Plotter, was recently introduced by Hewlett-Packard. At the same time, the price of the smaller HP 7470A Plotter was greatly reduced.

The HP 7475A is believed to be priced far below competitive plotters with comparable features. The HP 7470A two-pen model has been reduced in price by 30% through economies

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New benchtop plotter

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of scale made possible by a high sales volume. Compatible with all HP computers and many non-HP computers, the new six-pen HP 7475A accepts 8-1/2 x 11-inch (A4/A) and 11 x 17-inch (A3/B) paper and 8-1/2 x 11-inch overhead transparency film. It can produce pie, bar, and line charts, technical drawings, maps, and other visual presentations of data.

Key features

The HP 7475A features an addressable resolution of 0.025 mm (0.001 inch), providing smoothness in lines, curves, and arcs. The high-speed unit plots at 38.1 cm/s (15 in/s) and has a pen acceleration of 2 g. This means you can produce an excellent plot in a short time.

The HP 7475A offers high-quality, built-in character genera-

tion (including ISO European character sets and Katakana), area fill commands, and an internal demonstration plot.

Pens for the HP 7475A are selected from the six-pen carousel through either front-panel controls or programmable commands. Hewlett-Packard offers a range of pen colors for use on paper or overhead transparencies. The pens are automatically capped to prevent dry-out.

The HP 7475A is equipped with one of two standard interfaces: either the HP-IB (IEEE 488) or RS-232-C/V.24. An optional eavesdrop cable enables you to operate the HP 7475A in series with a terminal when using the RS-232-C interface, thus requiring only one serial computer port.

This lightweight, portable unit is 568 mm (22.4 inches) wide by 367 mm (14.5 inches) deep by 127 mm (5 inches) high.

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

New HP 9000 products offer enhanced graphics and performance plus networking capabilities

Recent product-line expansions for the HP 9000 Series 500 Computer offer multiple CPU capacity, enhanced graphics features, and new networking capabilities. Introduced in November 1982, the Series 500 provides individual scientists and engineers the opportunity to have their own personal 32-bit mainframes at affordable prices.

Three performance levels

Plug-in central processing units (CPUs) enable the HP 9000 to achieve three performance levels. You can upgrade the single-CPU version introduced in November simply by installing one or two additional CPU boards. A key advantage of this capability is that you do not have to rewrite your software to use these additional CPUs.

New graphics products

A pair of graphics display products for Series 500 computers provides medium-to-high performance for both display and design applications. A new color CRT display is available for the integrated workstation version of the Series 500 (Model 9020A/R). Interconnection between the Series 500 and a standard 19-inch color video monitor is provided by the new HP 97062A Color Video Interface.

Networking capabilities

Three new networking products allow the Series 500 to communicate with other Series 500 computers and other mainframes. The LAN 9000 Local Area Network offers four network services via an Ethernet*-compatible, 10M-byte/s link: remote file access, interprocess communication, network file transfer, and remote process management.

A reliable link to other mainframes is offered by the Remote Job Entry (RJE) software for the Series 500. Providing emulation of the IBM 2780 and IBM 3780 RJE Terminals, this package is useful for sending and receiving data files or submitting jobs to be run on a larger mainframe.

Shared Resource Management (SRM), available on other Hewlett-Packard desktop computers for some time, has now been added to the Series 500 family. It provides a convenient way to link several Series 500 computers in a star network with other HP desktop computers.

The LAN 9000 and RJE products are supported on the Series 500's HP-UX (UNIX)** Operating System. SRM is supported only on the BASIC Language System.



This new color CRT display for the HP 9000 Series 500 Computers offers medium-to-high performance for both display and design applications.

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

*Ethernet is a product of Xerox Corporation.

**UNIX is a U.S. trademark of Bell Laboratories.

Hewlett-Packard introduces CAD system for mechanical engineers

A versatile, two-dimensional drafting system from Hewlett-Packard lets you create mechanical drawings quickly and easily. Suitable for either creating new documentation or making drawing revisions, HP-DRAFT can be applied to tasks such as assembly and proposal drawings, layouts, and schematics.

Besides the HP-DRAFT software, a typical HP-DRAFT workstation consists of an HP 9836 Desktop Computer with your choice of 12-inch color or monochrome or 19-inch color display, a graphics tablet, a disc drive, and a large-format plotter. Multiple HP-DRAFT workstations can be connected via a network, using Hewlett-Packard's Shared Resource Management (SRM) System.

Easy to learn; easy to use

HP-DRAFT software can be learned quickly and is easy to use. Because its operation closely resembles traditional drafting methods, an experienced draftsman can become proficient after only one to three weeks of using HP-DRAFT.

The user interacts with HP-DRAFT via an electronic stylus and menu commands from a graphics tablet. The software supports input methods such as coordinate input and standard graphic object definitions. Commands can be used to

perform functions such as linear movement, object rotation, mirroring about an axis, object assembly, parts list creation, automatic hatching, and dimensioning.

Saves time

With HP-DRAFT, time spent doing repetitive, routine drafting can be significantly reduced. Benchmarks have consistently shown that using HP-DRAFT is four to six times faster than manual drafting for a broad range of applications.

Drawings can be modified rapidly and easily. Any portion of a drawing can be stretched orthogonally or at any angle using just five simple keystrokes. A detailing function automatically copies any selected portion of the drawing and places it elsewhere at a different scale.

New projects can be started on the system immediately with a function sketch. Then as the projects develop, geometrical analysis, component design, and detailing of parts can be performed. Upon completion, the engineer or designer can produce assembly drawings with all related data including parts lists.

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

Low-cost workstation terminal features rugged design

Looking for a low-cost, compact, easy-to-use data collection terminal that is also rugged and reliable? The 3081A Workstation Terminal could be just what you need.

The HP 3081A is suitable for a range of applications in which small fields of data must be available to an on-line system in vast quantities: in industrial environments such as automobile manufacturing plants and aircraft maintenance operations, in laboratories, libraries, videotape clubs, and mail-order houses.

Compact and rugged

The HP 3081A takes up minimal space on a workbench, counter, or desk. When space is at a premium, you can order a bracket to mount the terminal on a flat surface (wall or bench).

Completely sealed, the HP 3081A is protected against dust, regardless of particle size, and can be hosed down or washed with soap and water. In fact, it can withstand accidental immersion in water or even survive exposure to most chemical vapors and droplets.

Bar-code capabilities

The HP 3081A can read the two most popular industrial bar codes (3 of 9 and Interleaved 2 of 5). You can choose from six bar-code readers (two general-purpose wands, two industrial wands, and two industrial slot readers). Data accuracy is further enhanced by an optional check digit and/or a field length verification. Black-on-black security labels can be used with the bar-code slot reader, offering an alternative to the magnetic-stripe technique for personnel identification.

Keyboard and display features

A numeric keyboard and five function keys (10 with shift) are standard with the HP 3081A. An optional alphanumeric keyboard is also available. Providing audible and tactile feedback, the keyboard lets you enter small quantities of information, a feature that is especially helpful when you encounter a defective bar code.

Data is entered directly by the person doing the job, thus eliminating the need for batch-data-entry operators. This method also improves accuracy and maintains the data base in real time.

The easy-to-read, one-line display can send prompting messages and allow review of the input data. Its 32 alphanumeric characters offer excellent readability in either bright or dim light.

Other key features

With a mean time between failures of about 12 years, the HP 3081A is easy to maintain and service.

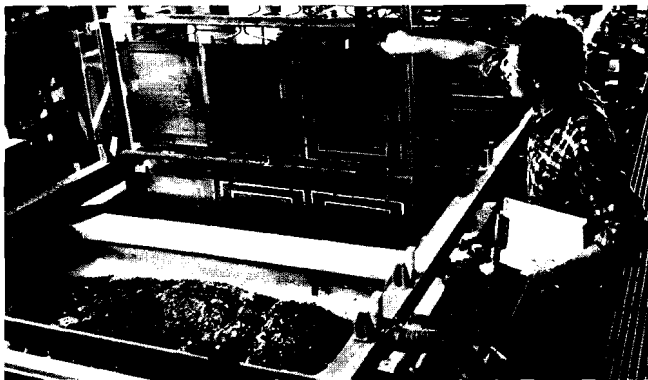
The HP 3081A uses high noise immunity current-loop datacom, an asset in factory environments. For point-to-point applications, you can use the HP 92922A four-channel RS-232-C-to-current loop adapter, which also supplies dc power to the terminals. For larger-scale applications, you can connect up to 32 terminals to the HP 2333A Multipoint Cluster Controller.

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

Measurement and control software handles real-time automation processes

New from Hewlett-Packard is HP Control/1000, a measurement and control software package that makes process control and machine automation faster, easier, and more economical. Designed for medium- and large-scale industrial automation environments, Control/1000 provides the flexibility needed to customize a wide range of automation systems. It is best suited for applications such as pilot plant control, large machinery sequencing, engine test-cell monitoring, and chemical process automation.

Use of Control/1000 requires a direct integration of the powerful HP 1000 A600 Computer and the HP 2250 Measurement and Control System. The A600, designed for use in process and industrial automation applications, is embedded in the front end of the HP 2250 for local control of its measurement and control hardware. This configuration replaces the customized L-Series central processing unit and the MCL/50 Language System in the HP 2250. Easy-to-use subroutines that



Control 1000, an applications-oriented tool, makes real-time process control and machine automation faster, easier, and more economical.

can be called from your application programs have taken the place of MCL/50. Any HP 1000 Computer can serve as the host for this configuration.

Combining the A600's direct memory access per I/O channel with the RTE (real-time executive) operating system provides true multiuser, multitasking capabilities.

Write your programs in FORTRAN 77 or Pascal

The Control/1000 design retains the best features of the MCL/50 language, while adding powerful new capabilities. You can now write process control programs in either FORTRAN 77 or Pascal and run them on the A600 Computer. Control/1000 can be called as a series of subroutines from high-level languages running in the local processor. Using a measurement and control interface (MCI) card, the I/O calls are just as easy to perform as were the MCL/50 I/O routines.

512K bytes of memory for independent control

A 512K-byte memory space allows the A600 to decouple from the host computer to perform detailed measurement and control tasks independently. With this memory, you can now write application programs on the A600 without worrying about constant segment passing to the HP 2250 because of lack of memory.

Packaging options

Control/1000 components may be housed in either the HP 2250H Rack Cabinet or the HP 2250A NEMA-12 Industrial Cabinet, an enclosed cabinet for use on the factory floor.

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

Color graphics software provides low-cost slides and transparencies

Want to enhance your presentations with high-quality 35-mm slides and overhead transparencies without blowing your graphics budget? PRESENTATION/2700, a new software package for the HP 2700 Color Graphics Workstation, lets you produce presentation-quality slides and transparencies at about one-fourth the normal cost, once you have purchased the necessary equipment.

With PRESENTATION/2700 you can create high-resolution 35-mm slides and 4 x 5 or 8 x 10 photographic negatives using a Matrix Instruments QCR-D4/2 Film Recorder. Using the HP 2700's ability to draw and store pictures in a large address space, PRESENTATION/2700 digitally transfers the high-resolution image from memory to the Matrix film recorder. This recorder can be connected to the HP 2700 with a Hewlett-Packard Interface Bus (HP-IB IEEE 488) and plug-in cable.

Other key features

Picture files created locally on the HP 2700 can be uploaded on an HP 3000 Computer in the same format as HP 3000 graphics software for integration into applications software

programs such as HPDRAW, DSG/3000, and TDP/3000. This means that HP 2700 graphic images sent to an HP 3000 can be displayed on other terminals and produced on plotters or other peripherals. Other important features include:

- Exposure time as fast as five minutes, depending on user-selected size and resolution
- Picture spooler allowing unattended exposure of up to 36 pictures from graphics files stored on disc
- Creation of color separations for printing in three or four colors
- CRT screen menus for easy operation
- Custom graphics capability for use with the HP 2680 Laser Printer.

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

New precision coaxial attenuator for OEMs

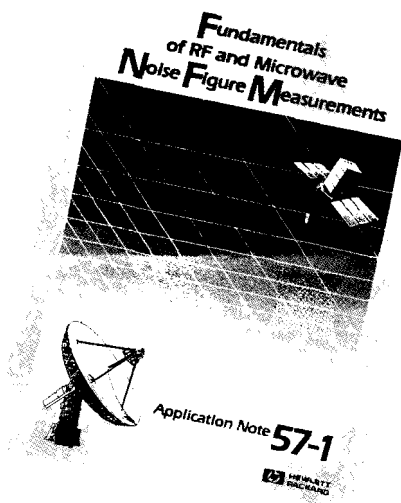
The HP 33340C Coaxial Attenuator is the latest in Hewlett-Packard's line of OEM components. If your signal needs precise attenuation, or if a component's SWR is too high, you can pad it out with this new coaxial component. The HP 33340C, which operates from dc to 26.5 GHz, offers six optional attenuation values: 3, 6, 10, 20, 30, and 40 dB.

Although OEM service usually involves "bolting in" a component and then forgetting it, the HP 33340C is designed for repeated connections. Its APC-3.5 connectors have a main shoulder of 0.021 inch, compared with 0.009 inch for SMA. Thus, they're much more rugged when repairs are needed.

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



New application note replaces popular noise figure primer



If you're concerned with the noise figure of devices, components, subsystems, or systems, you'll want to send for Hewlett-Packard's new application note, *Principles of RF and Microwave Noise Figure Measurements*. This new application note, Number AN 57-1, replaces the highly popular AN 57, *Noise Figure Primer*.

This 40-page note can serve as a comprehensive tutorial for the neophyte, while also providing useful information for the experienced engineer. You'll find material covering subtle measurement considerations such as single-sideband versus double-sideband measurements, effects of local oscillator noise, second-stage effects and corrections, and a review of Y-factor and hot/cold techniques.

An extensive glossary includes common symbols, detailed explanations of most terms, and a bibliography of 34 other noise-related references.

For your free copy of AN 57-1, "Principles of RF and Microwave Noise Figure Measurements," check **H** on the HP Reply Card.

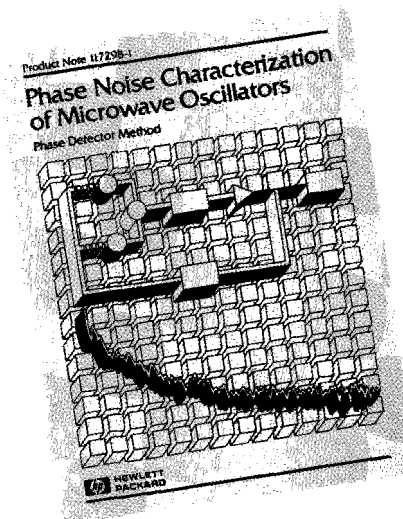
Product note simplifies single-sideband phase noise measurements

Hewlett-Packard's Model 11729B Carrier Noise Test Set turns a relatively complex, subtle measurement procedure into a high-confidence routine for test signals from 5 MHz to 18 GHz. Typical system noise floor at X-band for 10 kHz offsets is below -123 dBc/Hz.

Product Note 11729B-1, *Phase Noise Characterization of Microwave Oscillators (Phase Detector Method)*, presents an overview of the importance of phase noise and compares several common measuring techniques with emphasis on the phase-detection method.

Specific topics covered include phase-lock considerations, loop characterization, system noise-floor calculations, typical system accuracy, and a full section of step-by-step measurement procedures.

For your free copy of Product Note 11729B-1, "Phase Noise Characterization of Microwave Oscillators (Phase Detector Method)," check **I** on the HP Reply Card.



NSC800 emulator added to logic development system



This new unit adds emulation support for National Semiconductor's NSC800 microprocessor to the HP 64000 Logic Development System. HP now offers emulators for more than 20 popular microprocessors.

Emulation support for the NSC800 microprocessor is now available for the HP 64000 Logic Development System. With the addition of Hewlett-Packard's new Model 64292S NSC800 Emulation Subsystem, the HP 64000 System offers processor-specific emulators for more than 20 popular microprocessors.

Emulators play an important role in the development phase of microprocessor-based products, since they are used by hardware and software engineers to test and debug code and circuits. On the HP 64000 System, emulators can be run from various combinations of emulator and target-system memories. As a result, new components can be exercised as they are developed, regardless of how much actual hardware has been completed.

All emulators for the HP 64000 System offer a common set of basic features and capabilities that provide broad design flexibility:

- Real-time operating mode for an accurate view of system activity
- Single-stepping, display and modify memory, and I/O modes
- Interactive modes with other HP 64000 subsystems:
 - Internal logic analyzer for real-time, nonintrusive traces of the emulator bus activity
 - Other emulators for multiprocessor applications
 - Powerful hardware and software logic analysis subsystems for complex integration and troubleshooting tasks
 - Software performance analyzer to optimize program flow and eliminate bottlenecks.

Wide-ranging microprocessor support

The HP 64000 Logic Development System offers a wide range of processor-specific tools for more efficient analysis, including emulators, assembler/linkers, C compilers, Pascal compilers, and preprocessor interfaces.

A family of user-definable products lets you take advantage of the HP 64000's sophisticated tools for use with other microprocessors not specifically supported with HP 64000 products. User-definable emulators, preprocessors, assemblers, and inverse assemblers let you create new tools compatible with the HP 64000 system, yet tailored to a specific microprocessor.

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

Only one day to efficient logic analysis with new user training program

When Hewlett-Packard customers ask how they can learn quickly to use the full capabilities of the HP 1630A/D Logic Analyzer, the best answer is, "Go to school." If you're a software or hardware design engineer seeking to take full advantage of the capabilities of the HP 1630, Hewlett-Packard's one-day user-training course is for you.

This course, HP 1630A/D + 24D Logic Analysis Measurement Techniques, is designed to help you become more productive with your HP 1630. Using intensive, hands-on exercises and carefully prepared lectures, the training will help you learn how to use the full range of the HP 1630's capabilities to solve specific measurement problems and how to interpret correctly the data presented by logic analysis. To enroll in this course, it is recommended that you have a knowledge of microprocessor fundamentals and understand basic logic analysis principles and functions.

Application-oriented exercises

The course structure follows the HP 1630's systematic approach to problem solving. Since 60% of your course time is spent applying lecture principles to application-oriented, problem-solving exercises, you will emerge from the course with detailed logic analysis skills for using the HP 1630.

Three vital analysis functions are taught in this course: state, timing, and software performance. You will learn to solve hardware/software interaction problems using the HP 1630's interactive state and timing capabilities. You will also develop your own guidelines for matching measurement techniques to specific types of problems.

Depending on which model you have, you can order this course as either HP 1630A + 24D or HP 1630D + 24D. Training will be conducted at various locations worldwide each year, or sessions can be held at your location. Think of the time and money your company can save by sending you and your colleagues to a one-day course to learn what might otherwise take several weeks to learn on your own.

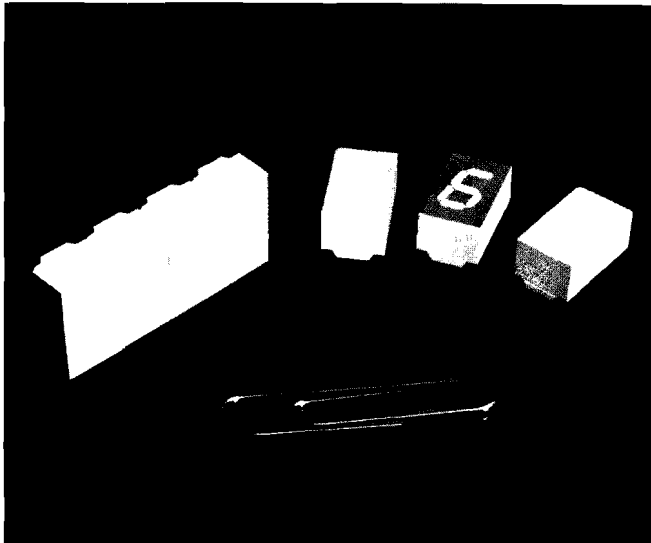
For more information, check **K** on the HP Reply Card.



HP Computer Museum
www.hpmuseum.net

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Hewlett-Packard introduces super-bright, seven-segment display family



Featuring the latest advances in LED materials and packaging, this new seven-segment display requires 25% less current to achieve the same brightness as other HP displays.

Hewlett-Packard's new 0.3-inch (7.6 mm), seven-segment LED display incorporates the latest advances in LED materials and packaging concepts. Key features of the new HDSP/7300 Series Display Devices include bright, evenly lighted segments, low forward-drive current, space-saving packaging, and an attractive character font.

State-of-the-art materials and design enable the HDSP/7300 displays to achieve the same brightness as other HP displays while using a lower drive current. Requiring up to 25% less current, they can be seen at distances up to 10 feet (3 meters). If typical drive currents of 5 to 10 mA are used, brightness can be increased up to 50%, making the HDSP/7300 displays well suited for high ambient light applications.

The HDSP/7300 displays are compact—only 0.3 by 0.5 inch (7.62 by 12.7 mm)—and feature pin-for-pin compatibility with Fairchild's FND 35X/36X Series.

This new LED display family is available in four colors: standard red, high-efficiency red, yellow, and green. Mitered segments and categorization for luminous intensity help provide an attractive front panel. Yellow and green displays are also categorized for color.

Typical applications appropriate for these displays include use in instruments, aircraft and marine equipment, point-of-sale terminals, clocks, and appliances.

For further information and a free sample of this new display, check **L** on the HP Reply Card.

Two new bar-code readers offer fast, accurate data entry

Flexibility in data communications design, speed, accuracy, and reliability—these are the attributes of two new bar-code readers recently introduced by Hewlett-Packard. Depending on your needs, you can select either the HP 16800A Programmable Bar-Code Reader or the nonprogrammable HP 16801A Bar-Code Reader.

Popular industrial bar codes supported

Both readers can be configured with a wide range of computers and terminals to fit your specific application. Both standard models can read three popular industrial codes: 3 of 9, Interleaved 2 of 5, and Industrial 2 of 5. Option 001 adds the capability to read UPC/EAN/JAN codes, and a Codabar option will be available soon. By changing the positions of the switches at the rear of the unit, two or more codes can be enabled simultaneously.

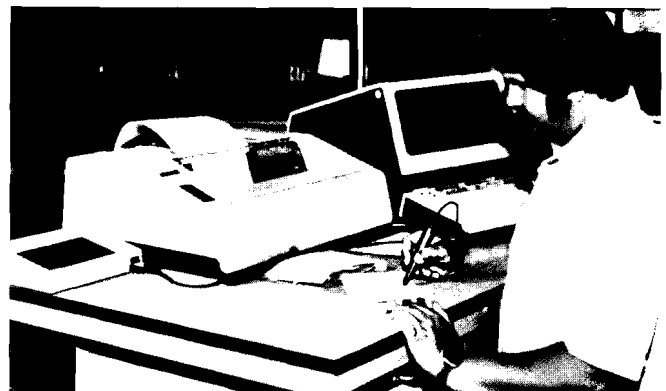
Stand-alone data-entry capability

Two RS-232-C/V.24 ports allow both readers to be used as either stand-alone data-entry stations via a direct interface to the host computer or as auxiliary data-entry devices between the CRT terminal and host computer. Using a multiplexer lets you communicate with a cluster of bar-code readers.

The HP 16800A programmable model can operate as part of an interactive data-entry system. Audio and visual feedback are provided through a multitone beeper and two LED indicators. The nonprogrammable HP 16801A has a beeper for local feedback.

You can optimize the reading capability of these bar-code readers by selecting the HP wand that best meets your needs. The HP 16830A Digital Bar-Code Wand, standard with both models, is suitable for a range of high-, medium-, and low-resolution bar codes. HP's wand design offers a 45-degree scan angle, durable case, and replaceable sealed sapphire tip, suitable for demanding industrial applications.

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



Flexible enough to read several different bar codes without readjustment, the programmable HP 16800A and nonprogrammable HP 16801A Bar-Code Readers can be configured with a wide range of computers.

High-speed data acquisition system offers custom capabilities

A ready-to-use scanning system for high-speed data acquisition is now available from Hewlett-Packard. The HP 6901S Measurement and Analysis System is a fully integrated, high-speed system for measuring multiple channels of voltage, current, or resistance. The HP 6901S can help improve productivity, since it allows users to begin making measurements immediately. It is also flexible enough to be customized for individual applications.

Easy-to-use software and hardware

The HP 6901S software package is so comprehensive that for many applications no software programming is required. Descriptive menus provide an easy way to enter test parameters and incorporate automatic error checking. Sequencing of menus is controlled by the HP 6901S general-purpose mainline program, which simplifies configuration of the system.

The system comes fully assembled in a desk-height rack, which provides a convenient work surface for your computer. Any of the HP Series 200 Computers can be specified with the HP 6901S, including Models 16, 26, or 36.

Customizing for special needs

Both the hardware and software of the HP 6901S can be customized for your special needs. The standard system software has many separate utilities to handle functions such as instrumentation I/O, computation and analysis, data management, and data presentation. Each of these is written in BASIC and can be accessed by the user by modifying the mainline program.

Hardware can also be customized using the HP 14750A Programming Package included with the system. HP Multi-programmer Series II I/O Cards can be added to the system to perform many automatic test, data acquisition, and control functions, ranging from A-to-D conversion to voltage output.



A ready-to-use scanning system for high-speed data acquisition, the HP 6901S Measurement and Analysis System can be customized for your particular application.

Key features

The standard HP 6901S can scan from 1 to 64 single-ended, analog channels at up to 25,000 channels per second, or up to 100 scans per second with programmable limit checking. (A scan is one complete pass through every channel.) By adding more scanning cards, you can increase the scanning capability up to 256 channels, or up to 768 channels using your own termination panels.

HP 6901S graphics utilities support four kinds of output: multichannel plotting, histogram plotting, cumulative distribution plotting, and tabular listings. The system also supports the HP 2671G Graphics Printer and three HP graphics plotters for hard copies and overhead transparencies.

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

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