Hewlett-Packard's Family of Data Terminals

Product Guide
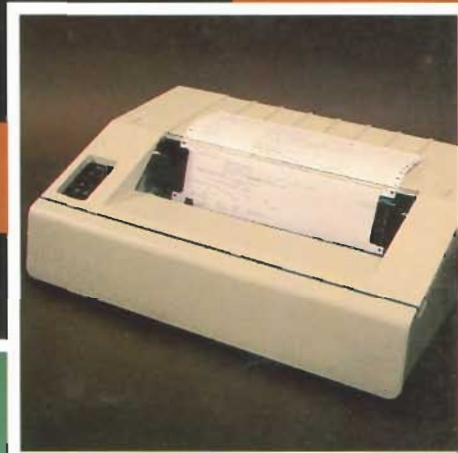
HEWLETT **hp** PACKARD
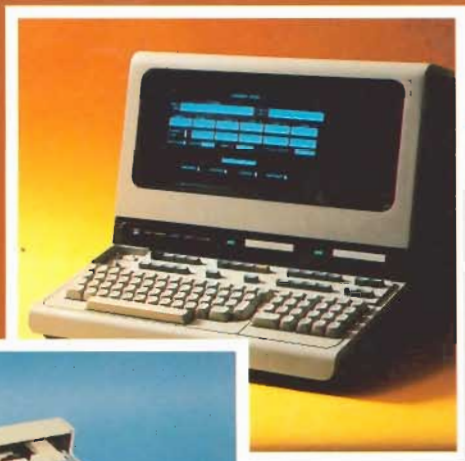
Interactive Terminals

Graphics

Printers

Data Capture

HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

Interactive Terminals

Human engineered for user efficiency

- **High resolution display**
- **Two page memory**
- **Self contained hard copy**
- **Ease of use**
- **Editing functions**
- **RS232C, full duplex up to 9600 baud**

Optimized for interactive applications

The 2621A and 2621P terminals emphasize simplicity, reliability, and quality in a product designed for interactive applications. The 2621P also adds an integral thermal printer combining the convenience of local hard copy with the speed of a video terminal.

These two models display 24 lines of 80 characters on a 6 by 8½ inch display. The 9 x 15 dot character cell allows precise formation of complex symbols for a bright, easy-to-read display and improved operator efficiency.

Two full pages (48 lines) of memory are provided for a quick reference to previous dialogue. Memory contents are viewable either page-by-page or by scrolling.

The 2621P has an integral hard copy unit ideal for the occasional walk-away copy. Upper/lower case letters, control codes,

Simple architecture for high reliability

and underline are printed on thermal paper at 120 characters per second.

The typewriter-style keyboard of both the 2621A and 2621P presents a friendly, familiar interface designed to simplify operation and to minimize training time. The screen-labeled control keys provide editing, configuration, self-test, cursor control, printer control, and other functions. Rapid numeric entry is assisted by an embedded numeric pad.

Both models are equipped with editing functions designed to work in interactive character-mode applications without a need for system software modifications. Even in character mode, both models allow the user to edit the current line *(or any line in memory)* before transmission to the host computer.

International Terminals

A full line of international terminals is also offered. Each presents a character set and keyboard unique to a particular language.

Model 2640C — Cyrillic *(Russian):* Bilingual switch selectable Roman or Cyrillic operation.

Model 2640N/2645N — Danish/Norwegian: Unilingual terminal for Danish and Norwegian.

Model 2640S/2645A — Swedish/Finnish: A 2640B-based and a 2645A-based unilingual terminal. Each contains the Swedish and Finnish character sets.

Model 2645K — Katakana *(Japanese):* Bilingual switch selectable Roman or Katakana operation.

Model 2645R — Arabic: Bilingual switch selectable Roman or Arabic operation.

2640B Display Terminal

Interactive solutions for manufacturing

- **Enhanced high resolution display**
- **Inverse video with optional half bright, underline and blinking**
- **Character mode or block mode**
- **Full editing capability**
- **Off screen storage**
- **Up to four independent plug-in character sets**
- **Flexible data communications**
- **Modular architecture with self-test**

The 2640B Interactive Display Terminal offers a new dimension in display technology. A large 5" x 10" screen presents up to 1920 characters in 24 lines by 80 columns. Optimized for easy interactive computer sessions, the 2640B employs a 9 x 15 dot matrix for crisp, precise charac-ters and a multitask detachable keyboard to solve many varied application problems.

Full editing capability with block mode data transfers substantially reduces your computer overhead on terminal communications. Off-screen storage further enhances the 2640B's formatting capability. Protected fields and the forms drawing character set provide unique data entry capabilities engineered for high reliability, the 2640B features a special built-in self test function to ensure proper terminal operation. The 2640B also offers flexible data communications to meet your changing needs.

2645A Display Station

Interactive for a wide variety of applications

Fully integrated dual cartridges
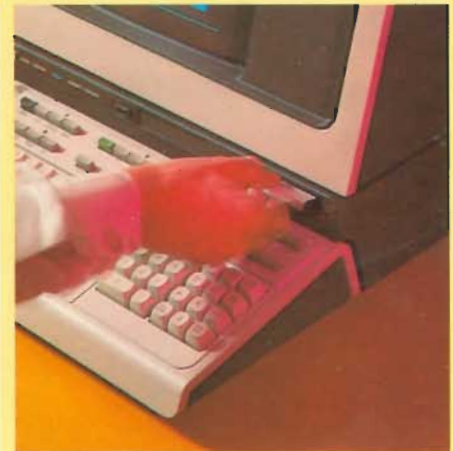

2645A used as a remote work station

- **9600 baud, full or half duplex**
- **Optional polling**
- **User defined soft keys**
- **Fully integrated dual cartridges (optional)**
- **Up to 11 kilobytes display screen storage**
- **Alphanumeric field checking**
- **Adjustable margins with character wraparound**

The 2645A Display Station is a sophisticated and flexible interactive terminal providing substantial off-line capabilities with optional mass storage. It is a superset of the 2640B features with up to 9600 baud, character mode or block mode with a choice of communication capabilities. RS232C serial ASCII is standard, in addition to optional 20mA current loop or polling.

Optional fully integrated dual cartridge tapes provide up to 110 Kbytes mass storage for each tape. Easy-to-use with fast search times, the dual cartridges can allow the user to perform many tasks off line. The stored data can then be later transmitted to a host computer. Data en-try, text editing, and program preparation can all benefit from dual cartridge tapes.

Protected fields, alphanumeric checking and the line drawing character set are just a few features that make data entry easy. Adjustable margins, line inserts or deletes, character wraparound and block moves provide a powerful tool for text editing or program preparation.

Soft keys allow the user to define up to 80 unique characters for each key. Useful in reducing repetitive keystroke sequences, the soft keys can transmit messages to a computer or control local functions, greatly simplifying terminal operation.

Interactive Terminals

2649A Microprogrammable Terminal

2649A programmed to monitor weight distribution/center of gravity during ship loading activities

Typical screen display during load monitoring

Modular design allows flexible configurations

- **Complete system in a single package**
- **Modular architecture**
- **Powerful central processor**
- **Graphic display capability**
- **Flexible memory options**
- **Easy to interface**

The 2649A Microprogrammable Terminal offers the OEM a reliable and cost effective solution to the need for a terminal/controller. Having all the desirable features of the 264X family of display terminals, it can be microprogrammed to tackle applications such as a stand-alone controller or preprocessor in computer networks ... or other dedicated controller applications.

Because of modular architecture and a wide choice of memory and interface options, the 2649A's configuration can be optimized to meet the needs of OEM's and provide an opportunity for 'value added.'

Sophisticated development tools are available which include a comprehensive hardware and firmware documentation package, cross assembler and source code listings and tapes.

2641A APL Display Station

Interactive APL with character verification

- **Full 128 character APL set**
- **Full 64 character overstrike set**
- **Automatic verification of overstruck characters**
- **Both APL and ASCII operation**
- **Detachable bit paired keyboard**
- **Fully integrated mass storage (optional)**

The 2641A APL Display Station retains all the 2645A features and offers a complete 128 APL character set with overstrike and automatic overstrike verification. The high resolution display makes the overstruck characters easy to read. The detachable bit paired keyboard has both ASCII and APL legends making it easy-to-use as an APL terminal, or as an ASCII interactive display station. Inverse video, half bright, underline and blinking are standard display enhancements.

Also, the 2641A will optionally support bit-paired or typewriter-paired local line printers and fully integrated dual cartridge tape.

2635A Printing Terminal

2635A used for interactive problem solving or timesharing

... for data entry

... or for program development

- **180 CPS (instantaneous)**
- **Smart bi-directional printing**
- **Typewriter type keyboard**
- **Numeric key pad**
- **RS232C or current loop interface**
- **Up to 9600 baud**
- **Cartridge ribbon**

The 2635A printing terminal is a powerful interactive hard copy terminal with high speed printing capability. Using HP's silicon on sapphire (SOS) microprocessor, the 2635A maximizes throughput and allows versatility in printing.

The 2635A prints at 180 cps using an automatic bi-directional technique. It has three different print sizes; five characters per inch for headings and titles, ten characters per inch for normal size printing and sixteen characters per inch which allows printing 132 columns on an 8½ inch wide form. Variable line spacing allows further flexibility in printing. The 7 x 9 dot matrix character formation allows a clear, crisp copy on up to six-part forms.
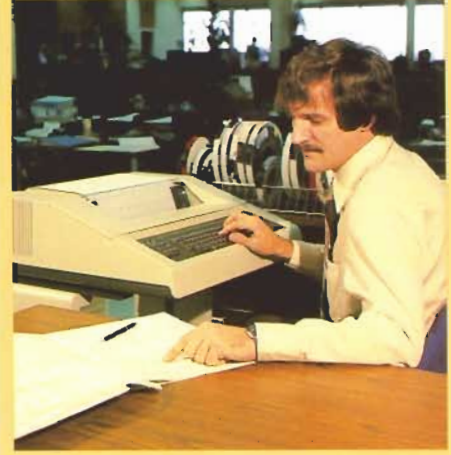
The 2635A fits well in applications such as program development, data entry, report generation, remote terminal applications requiring hard copy (such as inventory control), and applications where remote printing is required with an additional need for interacting with the host CPU. The 2635A interfaces via RS232C or 20 MA current loop, and can run at transmission speeds up to 9600 Baud.

2639A Printing Terminal

2639A used for interactive program solving

- **High throughput**
- **Printing versatility**
- **Flexible serial data communications**
- **Long life cartridge ribbon**

The 2639A combines all the print speed and versatility features of the 2635A, plus adds extensive serial data communications capability. This will enable the 2639A to be easily used with many different host CPU's, over full or half duplex modems, without loss of data.

The 2639A is an excellent alternative for a local or remote data entry transaction or program development terminal. Its print speed and versatility make it an excellent selection for use as a remote print station.

2631A Printer

- 180 CPS (instantaneous)
- Smart bi-directional printing
- 128 character USASCII
- Single or multi-part forms
- Three print modes
- Cartridge ribbon
- Interfacing flexibility

The 2631A is a high performance character serial printer optimized for throughput and printing versatility. Utilizing HP's silicon on sapphire (SOS) microprocessor, the 2631A prints at 180 cps and follows the shortest possible printing path (smart bi-directional printing technique). The microprocessor also allows three programmable print sizes and seven selectable line spacings and an automatic underscore capability for printing versatility.

A wide variety of interfaces allows the 2631A to be used in many different appli-

2631A can be a low volume system printer

... or a remote printing station

cations: as a primary or secondary system printer (for light duty applications); as a printer connected directly to any of HP's wide variety of interactive and intelligent CRT's; or as a remote printing station to locate the output device near the user.

The 2631A can be interfaced using 8-bit parallel differential, 8-bit parallel TTL, HP-IB (IEEE488-1975), RS232C, and 20mA current loop. Baud rates from 110 to 9600 can be used.

9876A Thermal Graphics Printer

9876A prints hard copy quickly, quietly.

- 480 lines per minute
- 80 characters per line
- quiet operation
- seven, software-selectable, character sets
- fanfold, perforated, high-contrast paper
- self-test features

The 9876 is a fast and quiet thermal line printer offering sophisticated graphics capabilities in addition to alphanumeric printing.

Microprocessor-controlled, the 9876 prints at speeds up to 480 lines per minute. It is ideal for applications requiring high-speed listings, frequent working reports, or quick plotting and graphics. Plus the 9876 is quiet enough for the office or lab, and reliable enough to run unattended. The 9876 is available with both HP-IB (IEEE 488-1975) and 8-bit parallel interfaces.

9871A Impact Printer

9871A provides full character hard copy

- Full font character printer
- Multiple language capability
- 30 CPS print speed
- Single sheet or continuous fan fold forms

The 9871A Option 240 printer, interfaced to the 2640 Series Terminals, provides permanent full character hard copy records of the terminal display. Because of daisy wheel design, the printout is full character quality, easily reproduced, and

comparable to typewriter printout. Interchangeable 96 character disks allow English, European, ASCII, Katakana, Cyrillic, and APL characters to be printed at 30 characters per second. Full character copy output from the terminal display using the 9871A will provide personalized text capability on letterhead forms or continuous fan-fold paper, including multiple copy.

307X Family of Data Capture Terminals

Interactive shipping/receiving transactions

- **No operator training required**
- **User definable special function keys and prompting lights**
- **Built-in alphanumeric reader and printer**
- **Monitoring and control of remote equipment**

The 3070B desktop data capture terminal is the first of a family of terminals providing an easy way for people with little or no computer experience to enter data in a manufacturing environment.

User definable special function keys and prompting lights allow the user to tailor the terminal to individual applications requirements. The operator is guided step-by-step through each transaction by the 15 prompting lights and the thermal strip printer. Data is then entered by the operator via the 10 special function keys, the numeric keypad or the multifunction reader. Application areas of the 3070B include shipping/receiving transactions, inventory control, order processing, process control and labor vouchering.

Ideal for turn-around document applications, the multifunction reader accepts punched cards, type III plastic badges as well as mark sense forms and mixed cards (punched and marked).

A choice of data communications protocols is available depending on your needs. The serial link data communications interface of the 3070B supports up to 56 of these terminals on one HP 1000 computer system at distances up to 1.2 miles (2km) from the computer. HP-IB compatible instruments can be connected to the HP-IB connector of the terminal for additional capability.

7260A Optical Mark Reader

Materials tracking using turn-around documents

- **Low cost, remote data capture**
- **Hard copy source data**
- **Reads user designed mark sense forms**
- **Easy remote connection to computer via modems and RS232C interface**
- **Off-line operation with terminals.**

It is often the case in commercial environments that the source data for a data processing system is generated in many small batches at a large number of locations remote from the computer. If the source data is carried by mail or courier to the computer, delays are inevitable. If on-line keyboard terminals are located at each data source, there is the problem of large numbers of people all wanting to use the same terminal. Again, delays are inevitable.

However, an HP 7260A located, for example, at each branch office and connected on-line via a data link to a remote computer in the head office overcomes these problems. Mark sense forms are used as the source documents; they can be prepared off-line at leisure using an ordinary soft lead pencil and then batched in the 7260A input hopper ready for transmission.
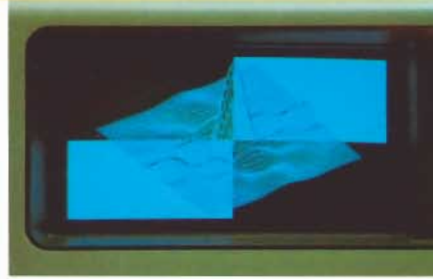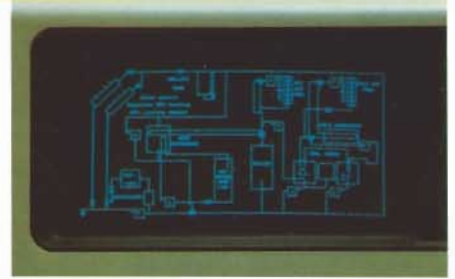
Graphics

Zoom

- **Raster scan display**
- **Automatic plotting of tabular data**
- **Zoom and pan**
- **Rubber band line**
- **Independent alphanumeric and graphic memories**
- **Pattern generation with area fill**
- **Compatibility mode**
- **Full interactive alphanumerics capability**

The 2648A Graphics Terminal offers high performance capabilities, normally found in larger CPU based systems, to users requiring low cost graphics terminals. Raster scan technology offers a new level of picture clarity and brightness, reducing eye fatigue and allowing use in high ambient light areas.

The 2648A can be used in computer aided design; scientific, engineering and business data plotting; business management information; computer aided artwork and many other application areas.

Interactive math function analysis

Easy graphs of tabular data with autoplot

Easy plots of tabular data can be obtained without any host CPU graphics software. Just fill out a simple menu and, with a few keystrokes, the 2648A will plot the data with the axes automatically scaled and labeled.

Process flow diagram

Graphics keypad

If you also need interactive alphanumerics, the 2648A is your solution. Retaining all the features of the 2645A Display Station, you can perform text editing, data entry and program preparation in addition to graphics.

2631G Graphics Printer


2631G prints business graphics and reports

- **Includes 2631A Features PLUS**
- **Graphics output on standard paper**
- **4 print modes**
- **Multiple optional character sets**
- **Programmable forms length**

The 2631G combines the optimum throughput and high performance printing characteristics of the 2631A with the ability to print graphics. The 2631G is capable of printing the contents of the graphics memory of the HP 2647A and 2648A graphics terminals. With its compatible 72 x 72 dots per inch resolution, the entire graphics memory is reproduced on a one for one dot basis. This makes the 2631G an excellent solution to your graphics hardcopy needs.

For printing versatility, the 2631G has four print modes; 5 cpi and 7.5 cpi for titles and headings; 10 cpi for normal text; 14.4 cpi compressed printing which allows printing 196 columns on standard computer paper or 110 columns on 8½ inch wide paper. The 2631G has enhanced forms handling with program selectable page and text length plus an automatic perforation skip mode. Like the 2631A, this model can print on single or multi-part forms *(up to six parts)* as wide as 15.75 inches. These features make the 2631G ideal for many different printing applications.

Also, the 2631G can contain up to 4 program selectable character sets, including a line draw set for easy forms printing and a high density set for applications requiring higher print quality.

2647A Intelligent Graphics Terminal
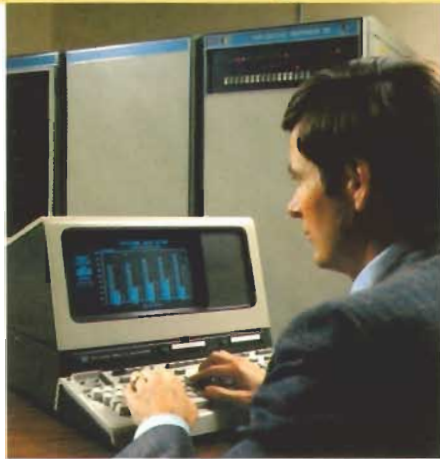
On line programmability for pre and post data processing

High level graphics commands

Pie charts locally

Bar charts locally

- **User programmable in BASIC**
- **Multiple automatic plotting**
- **High level graphics commands**
- **Graphic memory input/output**
- **Shared hardcopy and peripheral devices** *(optional)*
- **Dual integrated cartridge tape**
- **All 2648A features and compatibility**

The 2647A combines the latest in display and microprocessor technology to provide a uniquely flexible and programmable tool for a wide range of application areas. The bright and easy to read raster scan display is suitable for use in normally lit rooms.

Microprocessor intelligence brings sophisticated graphics to the user who has little or no programming experience. By using the menu driven multiple-automatic plotting feature, pie, bar, log, and cartesian charts can be created without system software. Since no system software is required, graphic output can be enjoyed in applications without modifying the existing software in your computer.

Additionally, for the more sophisticated user addressing specialized application areas, user programmability in a high level language permits reduced program implementation time and costs.

For other tasks not requiring graphics, the 2647A offers full interactive alphanumeric capability. This makes the 2647A a most effective solution in other areas such as program preparation, text entry or editing and data entry.

7225A Graphics Plotter

Quality graphics, flexible interfacing, and low cost of ownership.

- **High-quality, low-cost plotting**
- **Modular interface design to support a variety of computers and controllers**
- **Customized OEM interface modules**
- **High reliability for low cost of ownership**

The 7225A produces crisp line graphics with highly readable characters on 8½ x 11 inch or ISO A4 *(210 x 297 mm)* paper. In addition, multicolor graphics can be drawn by manually changing pens.

The 7225A can be user-adapted to a wide range of systems through the use of various plug-in units, called "Personality Modules." These Personality Modules provide the appropriate interface, language, and graphics capabilities for a variety of computer and intelligent terminal systems. The three different Personality Modules enable the 7225A to operate with parallel computer interfaces, general I/O interfaces, and the Hewlett-Packard Interface Bus *(conforms to IEEE 488-1975)*. In addition, custom OEM Personality Modules can be designed to enable operation with other computer-based and non-computer-based systems.

Graphics

- **High quality multicolor graphs on paper and on overhead transparencies**
- **Programmable selection of 4 colors**
- **Programmable character size, slant, and direction**
- **Selectable pen velocity**
- **Arcs and circles of any radius, starting, and stopping angle (7221A)**
- **Internal character generation**
- **Error-free off-scale data handling**
- **Point digitizing**
- **Multiple dashed-line fonts**
- **HP-IB interface (9872A)**
- **RS-232C/CCITT V.24 interface (7221A)**
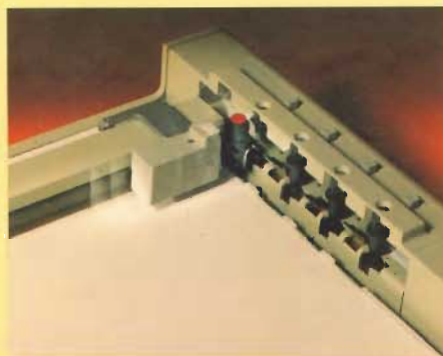
Plotter automatically selects, draws, returns and recaps each pen.

Overhead transparencies in seven vivid colors for meetings and seminars.

9872A Graphics Plotter

The 9872A is a microprocessor-based HP-IB plotter that produces high quality, multicolor graphic plots on any size paper up to 280 x 432 mm *(ISO A3)* or 11 x 17 inches. The 9872A offers exceptional line and character quality with addressable moves as small as 0.025 mm *(0.001 inches)*. Thirty-eight different instructions are built-in to equip the plotter with capabilities such as point digitizing, labeling, character sizing, and window plotting. The 9872A is interfaced through the Hewlett-Packard Interface Bus *(conforms to IEEE 488-1975)*.

For enhanced graphical presentation, lines are plotted in color by the 9872A's automatic selection of any of four multicolor pens through either program control or front panel pushbuttons. In addition, the 9872A provides seven different dashed line fonts, symbol mode plotting, and user-defined characters.

Another important feature of the 9872A is a programmable choice of 36 pen speeds from 10 mm/s to 360 mm/s. This feature produces high quality graphics on a variety of papers or transparent materials.

Produce professional, crisp, ink-line graphics from design and computational data.

7221A Graphics Plotter

The 7221A is the RS-232C/CCITT V.24 serial interface version of the 9872A. It has the same microprocessor-based stepper-motor drive for high resolution, quality, multicolor plots. Over 40 different instructions are included to simplify programming and increase the efficiency of data communications. Advanced instructions include point digitizing, labeling, character sizing, programmable graph limits, rotation, and single command arc and circle plotting.

Selectable baud rates *(75 to 2400 baud)* and a choice of full or half duplex provide a means to adapt the 7221A to a selection of terminal speeds and echo requirements, thereby enhancing data communications.

An 1150-byte buffer has been incorporated to store incoming data. Included in the buffer capacity is room for macro-instructions. Each macro-instruction is a user defined series of graphics instructions which can be invoked by a single command, reducing program size and computer connect time. As an option, an additional 2048 bytes of buffer memory can be ordered.

Software support is available for a number of computers and from various timesharing services. Often, this support enables the end-user to concentrate on problem-solving, allowing freedom from manipulating and formatting the solution.

7245A Plotter/Printer

- High resolution vector plotting and alphanumeric printing in one unit
- Hard-copy dot-for-dot raster printouts of 2647A and 2648A graphics displays *(optional)*
- Programmable page advance for unattended plotting and printing
- Long axis plots up to 5 metres *(16.4 feet)*
- Quiet thermal operation
- Programmable graph limits
- Multiple dashed-line fonts
- Error-free off-scale data handling
- Programmable character size, slant, and direction

The 7245A combines high resolution vector plotting, long axis plotting, and quiet, high quality, dot matrix thermal printing in a single desktop unit. And with an optional feature, the 7245A provides hard copy dot-for-dot raster printouts of the graphics displayed on the HP 2647A and 2648A graphics terminals. With 46 built-in instructions, the user can do bidirectional long-axis plots up to 5 metres *(16.4 feet)* and label or annotate with both drawn and dot matrix characters. Drawn characters

The combination of long-axis vector plotting with dot matrix printing makes the 7245A the one peripheral necessary to produce complete, illustrated reports.

can be programmed for size, slant, and direction. Dot matrix characters can be printed in two font sizes in any orthogonal direction.

The 7245A uses standard printer ASCII escape code sequences to initiate common printer functions, such as margin control, tabbing, and underlining. With

Optional graphics terminal display dump capability.

minimal programming changes, text can be combined with plots on the same page for enhanced presentations.

The 7245A is connected through the Hewlett-Packard Interface Bus *(conforms to IEEE 488-1975)* to computers and graphics terminals using a standard interface cable.

9874A Digitizer

- Adjustable glass platen *(435mm X 315mm)*
- Automatic alignment of the coordinate system
- Rear projection of images
- 10 special function keys
- Self-test
- Absolute coordinate system with relocatable origin
- .025mm resolutions
- 15 character LED display
- Cursor vacuum system
- Axis extension up to 53 kilometers *(either direction)*
- 16 bit microprocessor
- 40 statement instruction set
- HP-IB interface *(IEEE 488-1975)*

Designed for maximum flexibility and comfort
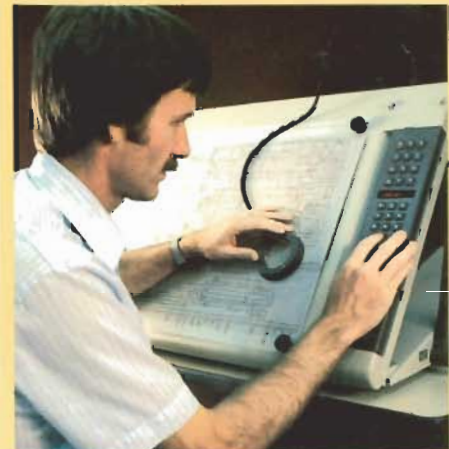
9874A digitizes engineering drawings

Many sources of data, such as maps, photographs, stripcharts and engineering drawings, contain information which is easily recognized by humans but unusable by computers. The 9874 digitizing workstation easily transforms this pictorial data into a series of discrete X-Y coordi-

nates. The product incorporates many features which make the input process more comfortable, flexible and less prone to error.

The HP 1000 family consists of powerful, low-cost, real-time processors available to OEMs and end-users as systems, stand-alone computers, and board computers. Proven successful in over 30,000 installations, the HP 1000 is designed for engineering and manufacturing applications such as automatic testing, measurement and control, and lab computation. System prices start at $20,000; board prices, around $1500.

HP 1000 systems feature a powerful Real-Time Executive *(RTE)* operating system and are programmable in FORTRAN, BASIC, Assembly Language, and Microcode. Optional software packages are available for graphics capability, data base management, and linking systems together in a distributed system network.

Up to 32 terminals can be interfaced to one system. Hardware options include high-performance memory, power fail recovery subsystem, and fault-control memory that improves MTBF three times or more. Instrumentation can be interfaced to the computer easily via the Hewlett-Packard Interface Bus *(HP-IB)*.

At the top of the line, the HP 1000 model 45 provides processing speed and power unprecedented in its price range. The system can process 1.8 Mbyte-size data arrays directly in main memory; up to 64 programs can execute concurrently; and average execution time is 2.5 to 6 times faster than previous minicomputer models. The HP 1000 provides expansive computing power at an inexpensive price.

The HP 250, HP 300, and HP 3000 computer systems offer complete general purpose data processing capabilities that can easily be tailored to satisfy the full range of your business processing needs.

HP 250

Our lowest-priced computer with true data base management, the HP 250 was designed to be simple both to program and to operate. Eight soft keys underneath the screen can be programmed to lead the user through each task step-by-step. The system can accommodate four terminals and has up to 256K bytes of main memory. Software application tools include IMAGE/250 DBM and its inquiry scheme QUERY/250, FORMS/250, and REPORT WRITER/250.

HP 300

Virtual memory, Silicon-On-Sapphire *(SOS)* technology and an Integrated Display System give the HP 300 big performance in a very compact frame. It can handle up to 16 users simultaneously, grow to a megabyte of main memory and over 250 megabytes of disc storage, do transaction processing and sort-and-print jobs simultaneously, and control every application from the central console. RPGII and Business BASIC, IMAGE data base management, plus an English-like inquiry facility make it easy to write your programs and manage your information.

HP 3000 Series 33

The Series 33 also uses SOS technology to pack a lot of power into a simple desk unit. Designed for multiple users at remote terminals, the system can expand to a megabyte of error-correcting main memory, and grow to 960 megabytes of disc storage. It offers the operating system *(MPE III)* and IMAGE data base management that set the HP 3000 line apart from other interactive computers.

HP 3000 Series III

The top of the line HP 3000 Series III offers more power than the Series 33 while sharing the same powerful operating system and data base management. It has six high-level languages *(COBOL, RPG, APL, FORTRAN, BASIC and SPL)*, as well as a powerful operating system that supports up to 63 users at the same time. Other features include virtual memory, networking, remote data base access in a distributed network, and transaction logging.

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