

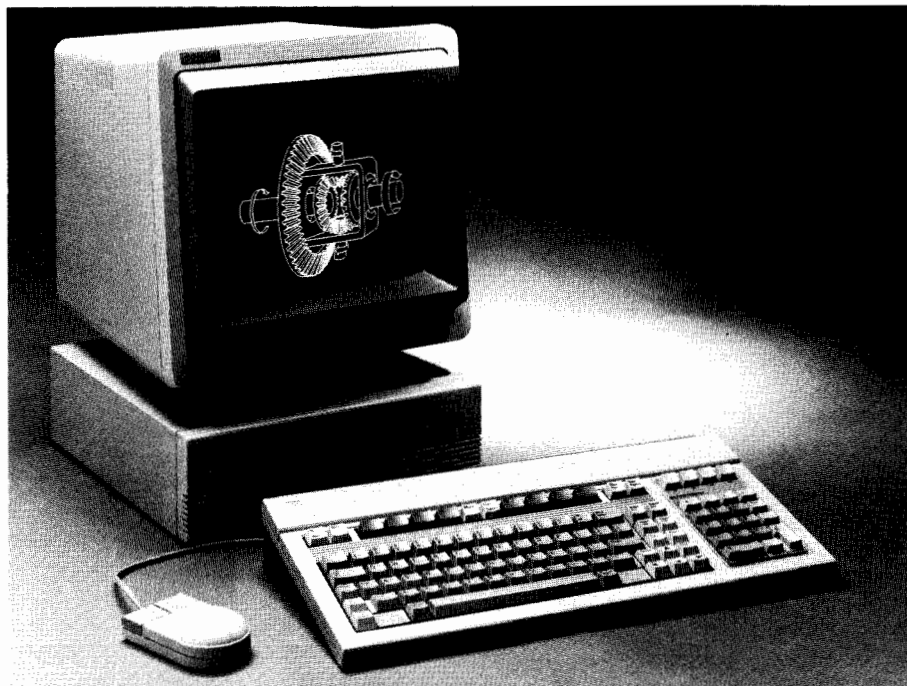
# HP 2393A

## Graphics Terminal



### Features

- **Bit Mapped Vector Graphics**
  - Selectable 512H x 390V or 640H x 400V pixels resolution
  - Primitives: Polyline, Area Fill and Text
  - Rubberband Line
  - TEKTRONIX® 4010/4014 Compatibility
- **Input Devices Supported**
  - Touchscreen
  - Graphics Tablet
  - Mouse
  - Bar Code Reader
- **Output Devices Supported**
  - Printers
  - Plotters
  - Film Recorders
  - Large Screen Projectors
  - Large Screen Monitors
- **Graphics Software Support**
  - HP Graphics/1000 II
  - HP DSG/3000, HPDRAW, HPEASYCHART, HPMAP
  - TEKTRONIX PLOT 10®
  - Graphics Software from Independent Software Vendors
- **Complete Independent Alphanumerics**
  - Up to 12 pages of Display Memory
  - Horizontal Scrolling to 160 Columns
  - Smooth Vertical Scrolling
  - Display Enhancements including Double High Double Wide Characters
  - Line Drawing, Math, Italics and Bold Character Sets
  - Block Mode
  - Format Mode and Local Editing Capabilities
  - Edit Checking/Transmit-only Fields/Modified Data Tag



HP 2393A Graphics Terminal with HP Mouse

- **Ergonomics**
  - Modular, Compact Design
  - Integrated Tilt and Swivel
  - Anti-Glare Green Phosphor Screen
  - Inverse Video Display in Alphanumeric Mode selectable
  - Front Panel Power, Brightness and Contrast Controls
  - Detachable Low-Profile Keyboard
- **Ease of Use**
  - Screen Labelled Function Keys for Terminal Control
  - 8 User-Definable Function Keys with 16-Character Labels
  - 8 Pre-defined Function Keys
  - 4 Non-volatile User-Definable Function Keys
  - Non-volatile Configuration Menus
  - 17 National Keyboard Layouts
  - 27th Line for Terminal Status
  - Self-Test Capability
  - Screen Saver
- **High Performance Data Communications**
  - Character, Line or Page Mode Transmission
  - System Port offers both RS232C and HP422 with data rates up to 19.2 kbps with handshaking
  - Peripheral Port provides a choice of an optional RS232C Serial Interface, a Centronics®-type Parallel Interface, or an HP-IB Interface
  - Supports X.25 PAD connection
- **ANSI\* X3.64 Compatibility**

TEKTRONIX® and PLOT10® are registered trademarks of TEKTRONIX, Inc.  
Centronics® is a registered trademark of Centronics Data Computer Corporation  
\*American National Standards Institute.

## The HP 2393A

The HP 2393A — the graphics workstation designed to offer you flexibility. Set it up the way you want it - select from an impressive array of user-friendly input devices like HP Touch, connect to the output peripherals of your choice, choose from a list of software packages and even adjust the tilt and swivel on your display.

The HP 2393A, with its range of input devices, provides the engineer or scientist with the tools to create and display graphics — in process control, industrial automation, preview design and other technical applications.

The HP 2393A gives the manager or professional the ability to graphically display business data for analysis, reports and presentations using a variety of output devices like printers, plotters, film recorders and large screen projectors.

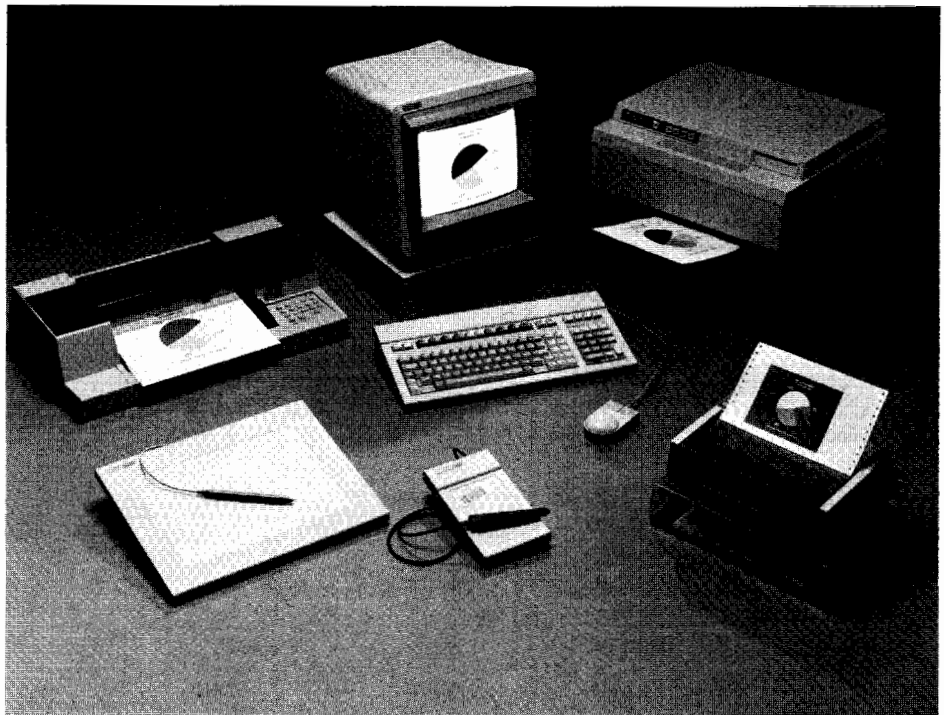
In addition, the HP 2393A offers comprehensive alphanumeric capabilities as well as optional ANSI compatibility at no cost.

The HP 2393A is one of the most flexible graphics terminals in its class, providing quality and reliability that you have come to expect of Hewlett Packard display terminals.

### Graphics Features

The 2393A supports bit mapped vector graphics on a raster display with a selectable resolution of 512 pixels horizontally by 390 pixels vertically or 640 pixels horizontally by 400 pixels vertically.

The 2393A has the intelligence to draw polyline vectors based on end points specified by the host. The user can select from 11 different line types including one that is user defined. The terminal allows the user to fill complex shapes with up to 148 sides selecting from 10 different area fill patterns including one defined by the user. These features increase drawing speed while reducing data communications and system overhead.

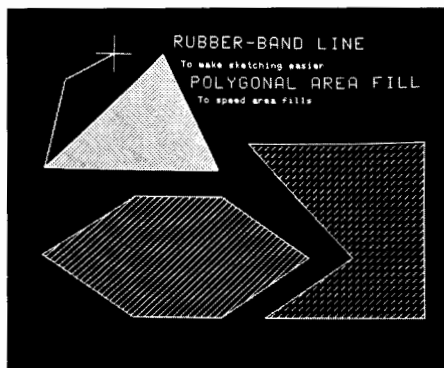


*HP 2393A offers remarkable input/output flexibility*

The 2393A allows the user to add vector drawn graphics text to images. Graphics text can be normal or slanted, in one of 8 sizes and 4 different orientations.

The rubberband line feature allows the user to preview a vector before it is stored in graphics memory. This interactive feature used in conjunction with a touchscreen, mouse or graphics tablet, significantly increases user productivity and minimizes system overhead.

The 2393A has a TEKTRONIX 4010/4014 compatibility mode that allows images designed for those terminals to be displayed in scaled or unscaled modes.



*Local features reduce system overhead*

### Input Device Support

With the unique HP-HIL (Human Interface Link) interface on the 2393A, the user can connect input devices and hardcopy devices simultaneously. The 2393A allows the user to daisy chain up to three input devices to the keyboard, thus offering considerable flexibility in the input configuration and freeing the auxiliary port for hardcopy devices. Supported graphics input devices include HP Touch, Mouse, Graphics tablet and Bar Code reader. These accessories may be ordered separately.

The touchscreen can be used in alphanumeric as well as graphics applications. To facilitate data entry and speed data inquiry in alphanumeric mode, the touchscreen can be used to select softkeys, user-defined fields or to move the cursor to a desired location. In graphics mode, the touchscreen duplicates the functions of a mouse. For example, you can use your finger to draw lines.



*HP Touch — A natural way to communicate with your computer*

The mouse can be used in graphics operations to move, draw and pick objects. As a positioning device, it is faster than graphics cursor keys on the keyboard, and hence an aid to productivity.

The graphics tablet is ideal for digitizing and sketching drawings. It is useful in interactive graphics, graphics entry and menu selection applications.

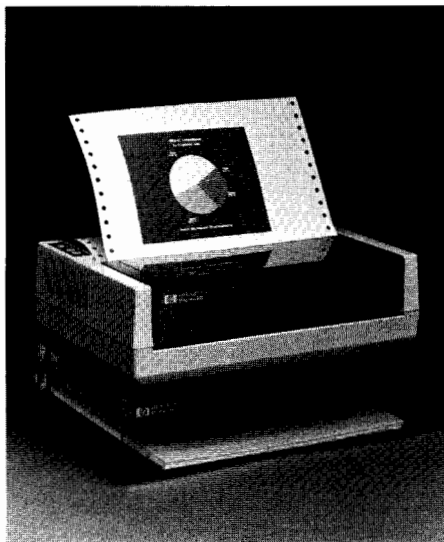
The bar code reader is well suited for rapid data entry applications, e.g. inventory tracking, point of sale terminals, etc.

## Output Device Support

The 2393A offers a broad range of output options. This allows the user flexibility in connecting to a host of HP peripherals.

The user can generate engineering drawings, charts and overhead transparencies on HP plotters, print text and graphics on Thinkjet and other HP printers, and create 35mm slides on a HP film recorder.

In addition, the 2393A can be connected to commercial large screen projectors, film recorders or large monitors.

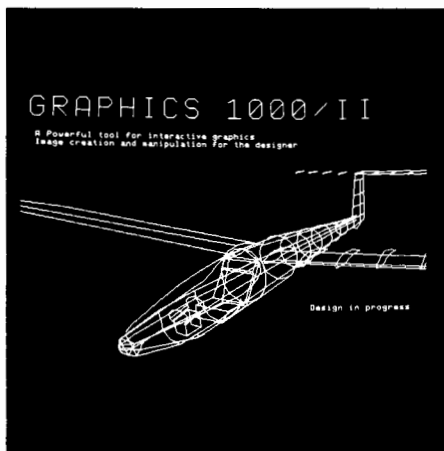


*HP Thinkjet — Affordable graphics hardcopy*

## Graphics Software Support

The 2393A is supported by a wide variety of Hewlett-Packard software.

Graphics 1000/II and Graphics 9000 are high level graphics application development tools designed for use on HP1000 and HP9000 computer systems respectively and can provide a solution to a range of technical display graphics applications.



*Software solutions for graphics applications*

DSG/3000, HPDRAW, HPEASYCHART and HPMAP are designed specifically for business applications on HP3000 computer systems.

The TEKTRONIX 4010/4014 compatibility mode allows the 2393A to operate with TEKTRONIX Inc's PLOT 10 software.

In addition to Hewlett-Packard software, the 2393A operates with Precision Visual's™ DI-3000™ and GRAFMAKER™, ISSCO's® DISSPLA® and TELL-A-GRAF®, SAS Institute's SAS/GRAPH™, and Megatek's TEMPLATE®. These packages run on HP as well as non-HP systems.

## Complete Independent Alphanumeric

The 2393A has a 12-inch diagonal CRT that displays 24 lines of 80 characters on a high-resolution green phosphor screen. The characters are formed in a 8 by 14 dot character cell with half-dot shifting to create smooth, well-defined characters.

Up to 12 pages of text can be stored in display memory and viewed easily using smooth scrolling capabilities. The display memory can be configured to support up to 160 columns. This is useful in running applications written for 132 column displays. Columns beyond the 80th can be viewed via horizontal scrolling.

The 2393A has character sets that include Line Drawing, Math, Italics and Bold characters. Display enhancements - underline, inverse video, blinking, half-bright and Double High Double Wide - can be used with the character sets to emulate existing paper forms. Security video, an additional enhancement, allows passwords and other confidential data to be input to the system without being displayed on the screen.

TEMPLATE® is a registered trademark of Megatek Corporation.

Precision Visuals™, DI3000™ and GRAFMAKER™ are trademarks of Precision Visuals Inc.

ISSCO®, DISSPLA® and TELL-A-GRAF® are registered trademarks of Integrated Software Systems Corporation.

SAS/GRAPH™ is a trademark of SAS Institute Inc.

HEWLETT-PACKARD ROSEVILLE TERMINALS DIVISION						Order # 92355-6412-2215	
Bill to: ERGONOMIC FORMS INC.				Ship to: HI-VOL DATA OPERATIONS			
Address: 1235 BIRCHMEAD PL.				Address: 3450 LONG BEACH DR. BLDG. 3			
City: SANTA CLARA State: CA Zip: 95050				City: PASAROBLES State: CA Zip: 97238			
Item	Product	Qty	Description	Unit \$	Total \$		
0001	97-2397	10	FIELD UPGRADE KIT	1000.00	10,000.00		
0002	402426	10	PRINTER CABLE	80.00	800.00		
Entered by: S. SUNDARESH Date: 07/01/85 Total Price: 10,800.00							

>> BLINKING FIELDS INDICATE ERROR <<

HP 2393A — A complete alphanumeric terminal too

In block mode, forms, text and data can be edited with the local edit keys before the information is transmitted to the computer for processing. On HP1000 and HP3000 systems the 2393A provides full compatibility with FORMS/1000 and VPLUS applications.

With format mode enabled, protected and unprotected fields make filling out forms an easy task. Three edit checks (alpha, numeric and alphanumeric), transmit-only fields and modified data tag give the 2393A powerful data entry/inquiry capabilities.

## Ergonomics

The 2393A offers a modular design with standard ergonomic features. These features include an integral tilt and swivel mechanism, front panel power, brightness and contrast controls, and an anti-glare display screen. In addition, the low profile detachable keyboard can be adjusted for use in either a flat or an angled position. The sculptured keys are color-coded and conveniently clustered by function.

For quiet operation, the 2393A is convection cooled, eliminating the need for a fan.

## Ease of Use

The 2393A has twenty function keys that can be used to simplify the operation of the terminal. These keys can be programmed to tailor the terminal for specific applications. Eight of the function keys have corresponding screen labels at the bottom of the display. In shifted mode, these keys perform pre-defined functions. The settings of the remaining four keys can be stored in nonvolatile memory, thereby retaining the contents of these keys when the terminal is turned off.

Screen menus containing user-selected or default settings are provided to simplify configuring the terminal. Configuration settings can be saved in nonvolatile memory.

The 2393A provides a choice of 17 national language keyboards. For a complete list of the keyboards available, refer to the Product Specifications section.

Terminal status information appears on the 27th line of the screen display. The status line indicates, for example, when the terminal is set for Graphics Pad, CAPS lock or ANSI mode operation.

The 2393A offers extensive self-test capabilities which allow the user to verify that the terminal is functioning properly.

A built-in screen saver shuts off the display after a period of inactivity. The inactive period of time to trigger the shut-off can be preset by the user. This feature prolongs the life of the display.

## Data Communications

The 2393A offers page, line or character mode communications. Full duplex point-to-point asynchronous transmission is supported with flexible hardware and software handshaking to interface with a variety of computer systems and peripherals.

The Systems Port offers both RS232C and HP422 capabilities at data transmission rates up to 19.2 kbps with handshaking.

For additional flexibility, an optional Peripheral Port offers a choice of an RS232C serial interface, a Centronics-type parallel interface or an HP-IB interface. These modules are easily installed by the user.

The 2393A also connects to an X.25 PAD (Packet Assembler/Disassembler) network.

## ANSI X3.64 Compatibility

The 2393A optionally provides at no cost a subset of the ANSI X3.64 standard for those users requiring a device-independent environment. In addition, the 2393A can execute many DEC® VT100® and VT52® control sequences. The user can select this mode via the terminal's configuration menu or programmatically from the host system. While in ANSI character mode operation, the user has access to TEKTRONIX compatibility mode in order to run PLOT 10 software.

## Reliability/Serviceability

The 2393A has been engineered to provide years of trouble-free service. For support services, Hewlett-Packard has a world-wide network of sales and service offices staffed by highly qualified customer engineers and systems engineers.

DEC®, VT100® and VT52® are registered trademarks of Digital Equipment Corporation

# HP2393A Product Specifications

---

## GRAPHICS

---

Addressability:	32K x 32K points in HP mode 4096 x 4096 points in TEK 4014 mode 1024 x 1024 points in TEK 4010 mode
Viewable Resolution:	512(H) x 390(V) pixels, or 640(H) x 400(V) pixels, selectable
Display Area:	160 mm x 214 mm (6.3 inches x 8.4 inches) or 131mm x 201mm (5.2 inches x 7.9 inches), selectable
Cursor:	Crosshair
Primitives:	Polyline; 11 line types Area fill; fill polygons up to 148 sides using 10 patterns Text; 8 sizes, normal or slant, 4 orientations, 10 fully supported national character sets.



---

## ALPHANUMERICS

---

Display Area:	155 mm x 201 mm (6.1 inches x 7.9 inches) or 124 mm x 201 mm (4.9 inches x 7.9 inches), selectable
Character Generation:	7 x 11 dot matrix in 8 x 14 dot cell with half-dot shift
Character Size:	1.9 mm x 3.7 mm (0.075 inch x 0.146 inch)
Screen Capacity:	24 lines x 80 columns (1920 characters). 25th and 26th line for function key labels. 27th line for terminal status information.
Character Set:	ROMAN 8 comprising 128 ASCII character set and 61 national characters from the extended Roman set. National characters include United Kingdom, Danish, Dutch, Finnish, French, German, Italian, Norwegian, Spanish, and Swedish. Plus Line Drawing, Math, Italics, and Bold characters. Total of 768 characters.
Cursor:	Blinking-underline or blinking-block.
Display Enhancements:	Inverse, underline, blinking, halfbright, security video, and double high double wide in any combination.
Video Attributes:	Memory lock, display lock, protected fields, user selectable margins and tabs, plus jump or smooth scrolling.
Editing:	Insert character/line, delete character/line, clear line/all. Insert/delete line character with wraparound.
Page control:	Next/previous page (top, bottom, right, left).
Display Memory:	Memory is allocated dynamically. Up to 12 pages standard (288 lines x 80 columns or 144 lines x 160 columns) Depending on the number of display enhancements and security video fields used, memory available can vary.

---

## DISPLAY

---

CRT Type:	Etched anti-glare, with implosion protection
Phosphor:	Green P31
CRT Size:	30 cm (12 inches) diagonal
Refresh Rate:	60 Hz Non-interlaced
Brightness Control:	User accessible
Contrast Control:	User accessible

---

## KEYBOARD

---

Style:	Detachable typewriter keyboard with 2.4 meter (8 ft.) fully extended coiled cable.
Layout:	107 sculptured keys. Separate numeric keypad, and independent user, editing and cursor keys. 17 national layouts are available: USASCII, Swedish, Norwegian, French, German, UK, Spanish, French-Canadian, English-Canadian, Italian, Dutch, Finnish, Danish, Swiss-German, Swiss-French, Spanish-Latin American and Flemish.
Operation:	Auto-repeat; N-key rollover.
Function Keys:	8 screen labeled user-defined function keys; screen labels up to 16 characters and function key definitions up to 80 characters in length. Can include control codes and escape sequences. 4 additional user-defineable auto-executable function keys; definitions can be saved in non-volatile memory. 8 predefined function keys.
Included overlays:	An overlay is included for the numeric pad which labels the graphics functions active when the graphics pad is enabled. Other overlays are included with the corresponding options.

---

## DATA COMMUNICATIONS

---

Data Rates:	System Port: 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200 baud. Operation with control codes or escape sequences may require handshaking or CPU-supplied delays. Optional Peripheral Port with RS232C interface: 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200 baud. Operation with control codes or escape sequences may require handshaking or CPU-supplied delays.
Handshake:	System Port: selectable software ENQ/ACK and XON/XOFF (transmit and receive), hardware CS (Clear to Send), TR (Terminal Ready), DM (Data Set Ready), and RR (Receiver Ready). Optional Peripheral Port: selectable software XON/XOFF (transmit only), hardware CS (Clear to Send), SRR (secondary Receiver Ready), and DM (Data Set Ready).
Parity:	Selectable in 7-bit operation: even, odd, zero, one. Always none in 8-bit operation.
Operating Modes:	Local, remote, character, block line or page, format, and optional ANSI operation. X.25 compatible using XON/XOFF when block mode is enabled and when the terminal is connected to an external PAD.
Transmission Modes:	Full duplex, asynchronous point-to-point. Compatible with Bell 103A, Bell 212A, Vadic VA3400 or equivalent full duplex modem.
Electrical Interface:	System Port: combined RS232C/HP422 data communications. Optional Peripheral Port: RS232C serial interface, Centronics-type parallel 8-bit interface , or HP-IB interface.

---

## POWER REQUIREMENTS

---

Input Voltage:	100-120V (+10%, -10%) at 47-66 Hz, or 200-240V (+10%, -10%) at 47-66 Hz, switch selectable.
Power Consumption:	50 watts, Terminal Processing Unit 45 watts, Display Monitor

---

## PHYSICAL CHARACTERISTICS

---

Display Monitor Weight:	10.0 kg (22 pounds)
Display Monitor Dimensions:	328 mm wide x 351 mm deep x 345 mm high (12.9 inches x 13.8 inches x 13.6 inches).
Terminal Processing Unit Weight:	4.3 Kg (9.5 pounds)
Terminal Processing Unit Dimensions:	325 mm wide x 325 mm deep x 100 mm high (12.8 inches x 12.8 inches x 3.9 inches).
Keyboard Weight:	2.1 kg (4.7 pounds)
Keyboard height: (at center row)	30 mm (1.2 inches) flat; 58 mm (2.3 inches) on stand.
Keyboard Dimensions:	456 mm wide x 225 mm deep x 30 mm high (18.0 inches x 8.9 inches x 1.2 inches).

---

## ENVIRONMENTAL CONDITIONS

---

PARAMETER	CONDITION	SPECIFICATION
Altitude	Operating	0 to 4,600 meters (15,000 ft)
	Non-operating	0 to 15,300 meters (50,000 ft)
Humidity	Operating	5 to 95% Relative Humidity at 40°C
	Non-operating	90% relative Humidity at 65°C
Temperature (free ambient)	Operating	0°C to +55°C (+32°F to +131°F)
	Non-operating	-40°C to +75°C (-40°F to +167°F)

---

## PRODUCT REGULATIONS

---

Safety:	United States	UL Listing under standards 478 and 114
	Canada	CSA Certification under standard C22.2 154
	Germany	TUV GS mark pending per VDE 0806
	Finland	FEI approval pending
	International	IEC 380 Safety of Electrically Energized Office Machine compliance IEC 435 Safety of Data Processing Equipment Compliance
RFI:	United States	FCC Docket 20780 Part 15 for class A equipment
	Germany	VDE 0871 level B Radio Protection Mark pending
Acoustics:		Less than 4.0 Bels sound power A-weighted
Datacomm:	CCITT V.24 interchange, V.28 electrical Recommendations	
	Australia	Approved
	Belgium	Approval pending
	Germany	Approved
	Japan	Approved
	Nordic network	Approved
	Sweden	Approved
	UK	Approval pending

Contact the local HP Sales Office for current status of datacom approval in your country.

---

## PRODUCT SUPPORT

---

Hardware Supplied:	HP 2393A Graphics Terminal
Documentation Supplied:	HP 2393A User's Manual (02397-90001)
	HP 2393A Reference Manual (02397-90002)
Documentation Available:	HP 2393A Service manual (02393-90003)
HP Systems Support:	Refer to appropriate HP system data sheet for use and support of the HP 2393A on systems. When this product is used in a customer-assembled system, the overall operational responsibility of the system rests with customer.
Warranty:	The HP 2393A is warranted against defects in material and workmanship. Contact the local HP Sales Office for terms and conditions.
Maintenance:	HP maintenance agreements are available for HP 2393A support after the warranty period. Contact the local HP Sales Office for terms and conditions.

Corporate Headquarters:  
Hewlett-Packard  
3000 Hanover Street  
Palo Alto, CA 94304 USA

European Headquarters:  
Hewlett-Packard S.A.  
7 rue du Bois-du-Lan  
P.O. Box  
CH-1217 MEYRIN 2  
Geneva, Switzerland

International Headquarters  
Hewlett-Packard  
3495 Deer Creek Rd.  
Palo Alto, CA 94304 USA

# HP 2393A

## ORDERING INFORMATION

Product Number	Description
2393A	Graphics Terminal
<b>OPTIONS</b>	
-049	ANSI X3.64 Operation
-060	Delete Monitor
<b>User Installable Options</b>	
-046	Port 2: HP-IB Interface
-092	Port 2: 25 pin RS232C Interface
-093	Port 2: 8 bit parallel Centronics Interface
<b>Localization Options</b>	
-015	Delete US Monitor, add International Monitor
-101	Swedish
-102	Norwegian
-103	French
-104	German
-105	UK
-106	Spanish
-107	Canadian-French
-108	Canadian-English
-109	Italian
-110	Dutch
-111	Finnish
-112	Danish
-113	Swiss-German
-114	Swiss-French
-115	Spanish-Latin American
-116	Flemish
<b>Cable Options</b>	
-301	US Modem cable, same as cable accessory 40242M
-302	European modem cable, same as cable accessory 40242M
-303	RS232C cable, same as cable accessory 40242C
-304	HP direct connect RS232C cable, same as cable accessory 40242X
-305	EMP protect cable, same as cable accessory 40242Y
-306	HP direct connect RS422 cable, same as cable accessory 40242P

## HP 2393A ACCESSORIES

Product Number	Description
<b>Port 2 Interfaces</b>	
40210H	Port 2: HP-IB Interface
40210R	Port 2: 25 pin RS232C Interface
40210P	Port 2: 8 bit parallel Centronics Interface

<b>Datacomm Cables</b>	
40242A	RS232C/HP422 cable. Male (25-pin)/female (50-pin)
40242C	RS232C cable. Female (25-pin)/male (25-pin), 5m (16 ft)
40242M	U.S./European modem cable. Male (25-pin)/male (25 pin), 5m (16 ft)
40242P	HP direct connect type 422 cable. Male (25-pin)/male (5-pin), 5m (16 ft)
40242X	HP direct connect type 232 cable. Male (25-pin)/male (3-pin), 5m (16 ft)
40242Y	EMP protect cable. Male (25-pin)/male (25-pin), 5m (16 ft)
40242Z	RS232C modem bypass cable. Male (25-pin)/female (24-pin), 5m (16 ft)

<b>Peripheral Cables</b>	
40242D	Parallel printer cable. Amphenol male (36-pin)/male (36-pin), 2m (6.6 ft)
40242G	Serial (RS232C) printer cable. Male (25-pin)/male (25-pin), 5m (16 ft)
40242V	Composite video cable, 0.4m (1.5 ft)
45529A	HP-IB cable, 1m (3.3 ft)
92241A	HP-HIL cable

## HP 2393A SUPPORTED DEVICES

Product Number	Description	Interface
<b>Input Devices</b>		
35723A	Touchscreen	HP-HIL
46060A	Mouse	HP-HIL
46087A	A-size Tablet	HP-HIL
92916A	Bar code reader	HP-HIL
<b>Monitors</b>		
35731A/B	12" Monochrome	Composite Video
35721A/B	14" Monochrome	Composite video
<b>Printers/Copiers</b>		
2225D/C/A	Thinkjet	RS232C/Centronics/HP-IB
2686A	Laserjet	RS232C
2932A	Dot matrix serial	RS232C/HP-IB
2934A	Letter quality	RS232C/HP-IB
<b>Plotters/Recorders</b>		
7470A	Graphics 2-pen	RS232C/HP-IB
7475A	Graphics 6-pen	RS232C/HP-IB
7550A	Graphics 8-pen	RS232C/HP-IB
7510A	Film Recorder	RS232C/HP-IB

**Note:** The above list is by no means exhaustive. Contact your local HP Sales Office for information about other supported devices.