Tektronix Introduces Three New Families of Full-Performance Graphics Workstations and Terminals

4336 and 4335 3D Graphics Workstations.

4236 and 4235 3D Graphics Terminals.

New Graphics Workstations and Terminals

- **4330/4230 Family of 3D and 2D Graphics Workstations and Terminals with Dynamic Motion and True Color**
- **4320/4220 Family of 2D Workstations and Terminals with Sophisticated Color Graphics**
- **4310 Series of Low-Cost Workstations**

Tektronix continues to provide the graphics world with the best in price/performance value in its new series of graphics workstations and terminals. Offering the serious graphics user a selection of 3D and 2D, terminal or workstation, and an ability to upgrade terminals to workstations, Tek meets the need for performance, value and versatility in the graphics environment.

3D Workstations and Terminals

The 4330/4230 Family provides a range of color graphics workstations (4330 Series) and terminals (4230 Series) with 3D and 2D capabilities. Do you need a full performance graphics workstation or does a graphics terminal meet your requirements? Either way, you'll get Tektronix-quality graphics and performance. And you'll select a workstation or terminal that has just the performance level, displayable colors and display size you need.

2D Workstations and Terminals

The 4320/4220 Family offers a range of 2D color graphics workstations (4320 Series) and terminals (4220 Series). Whether you select a workstation or terminal, you'll choose from a variety of products to meet your needs.

Tek Plans for Growth

The 4330/4230 and 4320/4220 families offer easily-installed kits to upgrade your terminal to a workstation. You can select a 4230 3D terminal, knowing that any time you want a 4330 3D workstation instead—with 2.5 MIPS additional processing power and full-color graphics capabilities—Tek makes it easy to upgrade. Or you can begin with a 4220 2D terminal and upgrade to a 4320 2D workstation.

Entry-Level Workstations

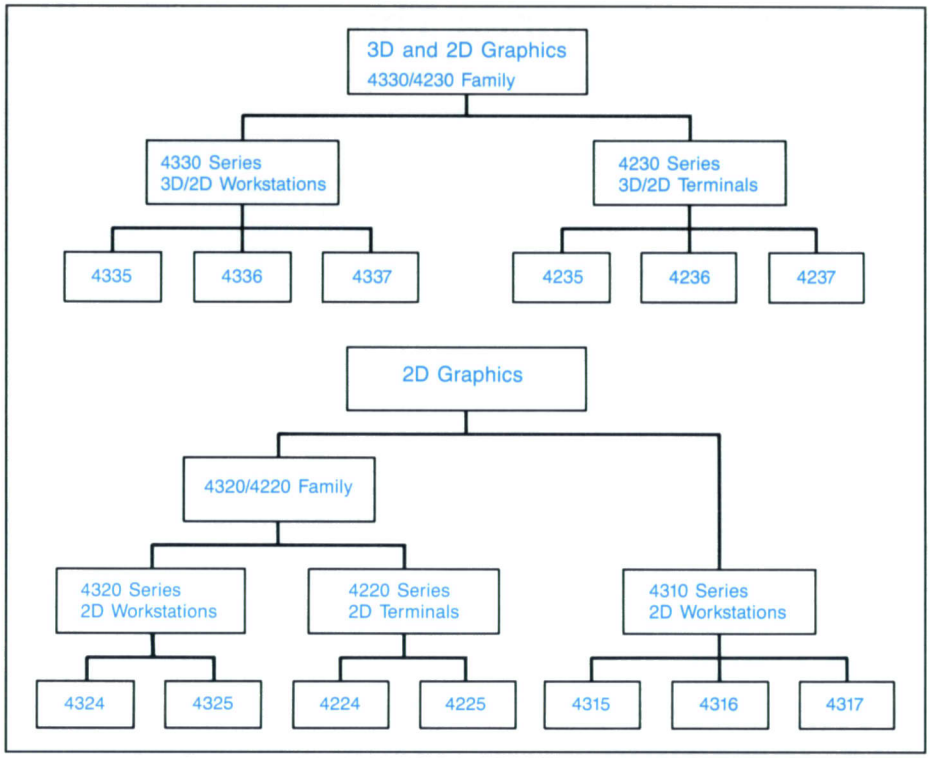
The 4310 Series—the 4315, 4316 and 4317 Graphics Workstations—combine high performance with software and programming support in a low-cost, efficient engineering workstation.

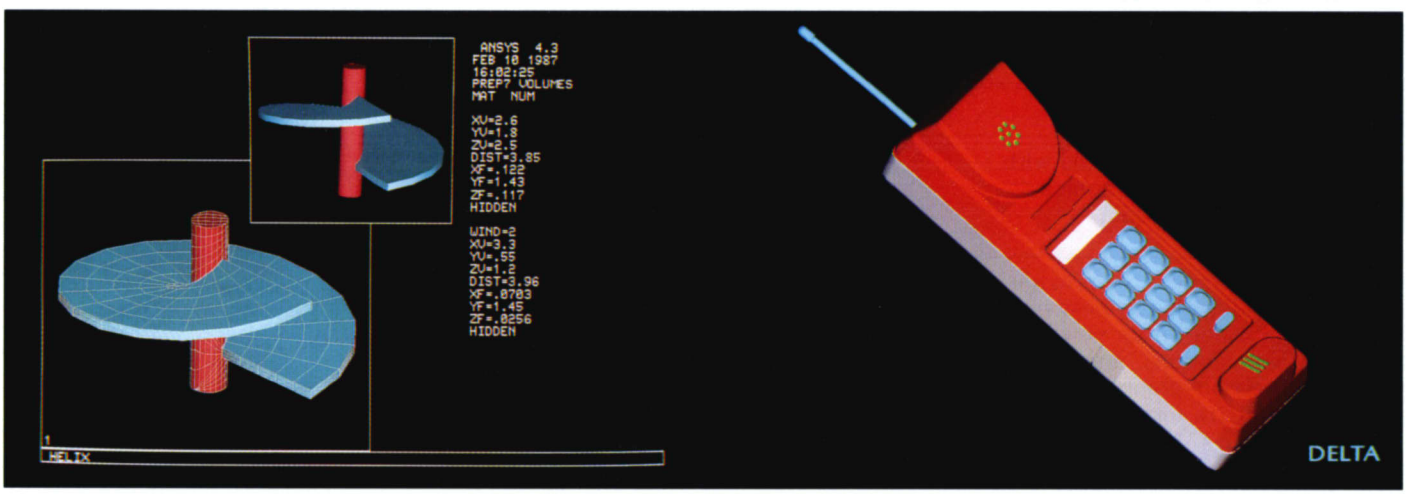
How to Find the Right Tektronix Graphics Workstations and Terminals for You

As Tektronix introduces our new families of graphics workstations and terminals, you may be confused about how to find the right equipment. Here's how to use this catalog to make the best selection of Tektronix graphics systems.

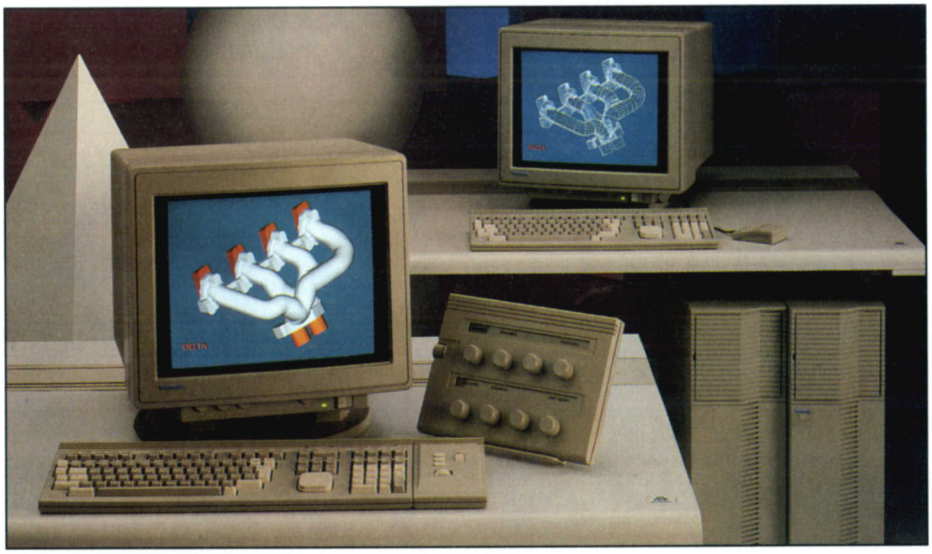
The family tree describes the three families we're introducing: one for 3D and 2D graphics, and two for 2D graphics. Two of the families offer both workstation and terminal configurations.

Tektronix offers several product choices within each Series so that you can select the specific qualities you need. In the following pages, you'll find a summary of the performance and graphics features of each Family, followed by brief descriptions of each product that list only the unique features of that product. To understand the product you're interested in, read the Family information as well as the list of distinguishing features.





4330 screens with Ansys (left) and Delta (right) software.



NEW 4330/4230 FAMILY

3D/2D Graphics Workstations and Terminals

- **Integrated Workstation or Host/Network-Connected Terminal Configurations**
- **20 MHz 68020/68881 Workstation CPU, with Optional Floating Point Accelerator**
- **16.7 MHz 68020/68881 Graphics Engine**
- **UNIX-based UTek™ Operating System with System Administration Interface, On-Line Tutorials and On-Line Help**
- **Pipelined Architecture and Custom Gate Arrays for Maximum Graphics Performance**
- **True Color Capability with up to 24 Bit Planes**
- **3D Wireframe, Shaded Surface and Stereoscopic Representations**
- **Supports High-Performance 2D Graphics**
- **Support for X Windows, Ethernet, TCP/IP and Sun NFS**
- **System Software Includes IBM PC/XT Emulation and C, with Optional FORTRAN, Pascal and UNIFY Data Base Manager**
- **4M Bytes System Memory, Expandable to 12M Bytes**
- **86M Bytes Hard Disk, 156M Bytes and 234M Bytes Optional**

UTek is a trademark of Tektronix, Inc.

The Tektronix 4330 Graphics Workstations and 4230 Terminals deliver the 3D and 2D graphics features set that Tek pioneered in the 4120 Series, now enhanced to provide even higher performance.

High-Performance Processing

The 4330/4230 Family offers excellent graphics price/performance. Motorola's 68020 16.7 MHz processor manages the display list, ASCII command processing, and input/output. Three microcoded engines, including a bit-sliced engine, accelerate graphics data manipulation. 4M bytes of graphics memory (3M bytes available to the user as display list memory) are standard with an additional 48M bytes optional.

The 4330 Series Workstations operate with two 68020 processors, working together to boost total applications performance. The applications processor operates at 20 MHz and is augmented by the 68881 floating point processor—and an optional floating point accelerator.

Tektronix' UTek Operating System is a powerful implementation of Berkeley 4.2 UNIX. With a number of extensions from System V, UTek facilitates system administration and maintenance.

The Right Features for 3D Graphics

Displayed objects can be shaded via constant, cosine or Gouraud shading methods. Users can select from 16 predefined translucency patterns and specify ambient light intensity and direction for up to 16 sources of white light for each of 64 possible views. Objects can be viewed in parallel or perspective projection, sectioned, clipped, rolled and rotated.

Graphics segments and a 32-bit virtual graphics coordinate space (24 bits for 3D graphics) support true zoom and pan. Segment editing and subroutining, and the powerful DRAW FACETS command, provide high-level programming entities. Tek has expanded its patented implementation of matching segment classes so they can be "picked" for graphics input.

The 4330/4230 Family offers high-performance 2D graphics capability, with 2D speeds five times faster than available in the 4320/4220 Family.

Easy Handling of Graphics Data

For entering and manipulating graphics data, 4330/4230 systems include a VT220-compatible modular keyboard with a cursor pad and optional thumbwheels. A mouse is standard with the workstations and optional with the terminals. An optional Valuator Dial Box provides 8 fully-programmable graphics input controls for the greatest productivity in manipulating 3D graphics.

To support the dense graphics used in scientific and engineering applications, all systems come with 4M bytes of display memory, with 3M bytes available to the user. Additional memory is available in 16M byte increments, with a total of 52M bytes (51M bytes available to the user).

Superior Display Quality

The 4330/4230 systems offer a choice of 16 or 19-inch color displays with 1280×1024 addressable points for an exceptionally crisp image. For flicker-free viewing, displays operate at 60 Hz, non-interlaced. True stereoscopic viewing (available as an option) provides alternate left-eye, right-eye views at a rate of 115 Hz.

Plenty of Mass Storage

The 4330 Workstations include an 86M byte hard disk and a 1.2M byte flexible disk for mass storage. Optional additions are 156M byte or 234M byte hard disks, a 60M byte cartridge tape, and a 360K byte flexible disk. For storing even more data, the Tektronix 4944 Mass Storage Unit supports a variety of streamer tape, hard disk and flexible disk options.

Extensive Compatibility with Software Applications

Compatibility with Tek's 4120 Series and new 4320/4220 Family allows hundreds of previously-developed applications to run with few or no changes, providing the flexibility to select the most useful combination of software and hardware. To simplify software porting, the workstations support industry standards like UNIX, X Windows, and FORTRAN.

TABLE 1. 4330/4230 FAMILY PERFORMANCE CHARACTERISTICS

	4335 Workstation	4336 Workstation	4337 Workstation	4235 Terminal	4236 Terminal	4237 Terminal
System Processors	68020 @ 20 MHz 68881 coprocessor	68020 @ 20 MHz 68881 coprocessor	68020 @ 20 MHz 68881 coprocessor			
Optional Accelerator	Floating pt. accel.	Floating pt. accel.	Floating pt. accel.			
Graphics Processor	68020 @ 16.7 MHz	68020 @ 16.7 MHz	68020 @ 16.7 MHz	68020 @ 16.7 MHz	68020 @ 16.7 MHz	68020 @ 16.7 MHz
Bit Planes Maximum	4 8+8	8 8	12 24	4 8+8	8 8	12 24
Display Modes	2D, 3D wireframe	2D, 3D wireframe, hidden line, shaded surface, double buffered	2D, 3D wireframe, hidden line, shaded surface, double buffered, true color	2D, 3D wireframe	2D, 3D wireframe, hidden line, shaded surface, double buffered	2D, 3D wireframe, hidden line, shaded surface, double buffered, true color
Optional Display	Stereoscopic	Stereoscopic	Stereoscopic	Stereoscopic	Stereoscopic	Stereoscopic
Displayable Colors Maximum	16 256	256 256	4,096 16.7M	16 256	256 256	4,096 16.7M
Display Size	406 mm (16 in.)	406 mm (16 in.)	406 mm (16 in.)	406 mm (16 in)	406 mm (16 in.)	406 mm (16 in.)
Optional Display Size	483 mm (19 in.)	483 mm (19 in.)	483 mm (19 in.)	483 mm (19 in.)	483 mm (19 in.)	483 mm (19 in.)
Addressability	1280 x 1024	1280 x 1024	1280 x 1024	1280 x 1024	1280 x 1024	1280 x 1024
System Memory (bytes) Maximum (bytes)	4M 8 or 12M	4M 8 or 12M	4M 8 or 12M			
Display Memory (bytes) Maximum (bytes)	4M 20, 36, or 52M	4M 20, 36, or 52M	4M 20, 36, or 52M	4M 20, 36, or 52M	4M 20, 36, or 52M	4M 20, 36, or 52M
Mass Storage (bytes)	86M hard disk, 1.2M flexible disk	86M hard disk, 1.2M flexible disk	86M hard disk, 1.2M flexible disk			
Optional Mass Storage (bytes)	156 or 234M hard disk, 60M cartridge tape, 360K flexible disk	156 or 234M hard disk, 60M cartridge tape, 360K flexible disk	156 or 234M hard disk, 60M cartridge tape, 360K flexible disk			
Interfaces	Dual RS-232C, LAN, Second RGB output, SCSI, Color printer	Dual RS-232C, LAN, Second RGB output, SCSI, Color printer	Dual RS-232C, LAN, Second RGB output, SCSI, Color printer	Host RS-232C, Dual RS-232C, LAN, Second RGB output, Color printer	Host RS-232C, Dual RS-232C, LAN, Second RGB output, Color printer	Host RS-232C, Dual RS-232C, LAN, Second RGB output, Color printer
Optional Interfaces	Additional RS-232C, Dual Centronics I/FS	Additional RS-232C, Dual Centronics I/FS	Additional RS-232C, Dual Centronics I/FS	Interactive DMA	Interactive DMA	Interactive DMA
System Software	UTek, C, X Windows 10.4, PC software support	UTek, C, X Windows 10.4, PC software support	UTek, C, X Windows 10.4, PC software support			
Optional Software	Pascal, UNIFY, ACCELL	Pascal, UNIFY, ACCELL	Pascal, UNIFY, ACCELL			
Supported GIN Devices	Thumbwheels, tablets, mouse, valuator dials, cursor pad	Thumbwheels, tablets, mouse, valuator dials, cursor pad	Thumbwheels, tablets, mouse, valuator dials, cursor pad	Thumbwheels, tablets, mouse, valuator dials, cursor pad	Thumbwheels, tablets, mouse, valuator dials, cursor pad	Thumbwheels, tablets, mouse, valuator dials, cursor pad
Supported Tek Color Printers	4692, 4696, 4693D	4692, 4696, 4693D	4692, 4696, 4693D	4692, 4696, 4693D	4692, 4696, 4693D	4692, 4696, 4693D

Tektronix PLOT 10® TekniCAD™ and TekniCAP™ are supported, and PLOT 10 Standard Tektronix Interface (STI) and Terminal Control System (TCS) have been enhanced to provide fast access to the 4330/4230 Family.

Software emulation of the IBM PC/XT is also standard, allowing the workstations to run a variety of PC/XT-based applications.

The 4330 Workstations and 4230 Terminals include a local area network port (IEEE 802.3) as well as dual RS-232C, Centronics-style, and Small Computer System Interface (SCSI) ports. Multiple RS-232C DMA ports and additional Centronics-compatible interfaces can be installed.

Tektronix and Industry Standards

The 4330 Workstations include industry-standard implementations of C, with FORTRAN 77 and ISO Pascal available as options.

In addition to the Tektronix PLOT 10 graphics standards, the 4330 Workstations implement UTek, Tektronix' powerful UNIX-based operating system. UTek's menu-based **sysadmin** interface simplifies the most complex system tasks, including network and system administration.

Networking is supported by an IEEE 802.3 Ethernet interface and the standard TCP/IP protocol. For file management across the network, the 4330 Series uses Sun Microsystems' Network File System (NFS)*.

Output Support

The 4330 Workstations and 4230 Terminals support Tek's new 4693D Color Image Printer which prints up to 16 million shades at 300 dots-per-inch addressability. Built-in color interfaces provide driver connection and hardware support for the Tektronix 4696 and 4692 Color Ink-Jet Printers. 4330/4230 Workstations and Terminals are free for other use while files are printing.

* *Sun Microsystems' NFS will be available in Spring 1988.*

TekniCAD and TekniCAP are trademarks of Tektronix, Inc.
PLOT 10 is a registered trademark of Tektronix, Inc.

NEW 4330 SERIES

3D/2D Graphics Workstations

Tektronix offers a selection of 3D graphics workstations to meet users' graphics computing needs. Each of the three 4330 Workstations shares the features and performance described in the preceding paragraphs and in Table 1. In addition, each one has specific features designed to meet the range of display quality and flexibility required by graphics users. The differing features of each workstation are listed below.

4335

3D/2D Graphics Workstation

- **Wireframe Modeling**
- **4 Bit Planes, 8+8 Max**
- **16 Displayable Colors, 256 Max**

The 4335 introduces the 4330 Series 3D Graphics Workstations with Tektronix-quality graphics features and high-performance computing.

The 4330 Series operates with two 68020 processors working together to boost total applications performance. The applications processor operates at 20 MHz and is augmented by the 68881 floating point processor—and an optional floating point accelerator. An additional 68020 off-loads graphics processing from the CPU.

In addition to sharing the graphics features of the 4330/4230 Family, the 4335 offers extensive software compatibility, window management, and networking capabilities.

4336

3D/2D Graphics Workstation

- **Shaded Surface Images, Wireframe Modeling, Hidden Line Removal**
- **8 Bit Planes**
- **256 Displayable Colors**

The 4336 3D Graphics Workstation enhances display quality with 8 bit planes and 256 displayable colors.

Four more bit planes and a Z-buffer make the 4336 the entry-level workstation for applications requiring hidden line removal, translucency, and shaded surface rendering.

4337

3D/2D Graphics Workstation

- **True Color Display**
- **Shaded Surface Images, Wireframe Modeling, Hidden Line Removal**
- **12 Bit Planes, 24 Max**
- **4,096 Displayable Colors, 16.7M Max**

For the highest quality image rendering, the 4337 3D Graphics Workstation offers enhanced 4330/4230 performance. The 4337 comes with 12 bit planes, allowing the system to display 4,096 colors. It can be configured with up to 24 bit planes to provide true color—the ability to define displayable colors with 24 bits of precision and thus display 16.7 million shades. For smooth, dynamic movement, double-buffering is available on the 4337 by purchasing an additional 12-plane frame buffer.

NEW 4230 SERIES

3D/2D Graphics Terminals

Tektronix 4230 Terminals offer a series of 3D graphics terminals. Each of the three 4230 terminals shares the performance and quality display features described in the preceding paragraphs and in Table X. In addition, each terminal features some unique qualities to offer users the specific capabilities they require in graphics terminals. The differentiating features of each terminal are listed below.

4235

3D/2D Graphics Terminal

- **3D and 2D Wireframe Modeling**
- **4 Bit Planes, 8+8 Max**
- **16 Displayable Colors, 256 Max**

The 4235 3D Graphics Terminal provides an entry-level product in the 4330/4230 3D Family, offering high-performance 3D wireframe and expandability into other Family features. The 4230 Series operates with a 16.7 MHz 68020, and includes one RS-232C host port, two RS-232C peripheral interfaces, and color printer and LAN interfaces. Terminals come with 4M bytes of display memory, with an additional 20, 36, or 52M bytes optional.

A 4100F1U Field Upgrade Kit upgrades the 4235 Terminal to a fully-integrated 4335 3D Graphics Workstation.

4236

3D/2D Graphics Terminal

- **Hidden Line Removal and Local Shaded Surface Rendering**
- **3D and 2D Wireframe Modeling**
- **8 Bit Planes and 256 Displayable Colors**

The 4236 3D Graphics Terminal shares the performance of the 4235 Terminal and offers 8 bit planes and 256 displayable colors. Its enhanced graphics features include hidden line removal and shaded surface modeling.

A 4100F1U Upgrade Kit upgrades the 4236 Terminal to a 4336 3D Graphics Workstation.

4237

3D/2D Graphics Terminal

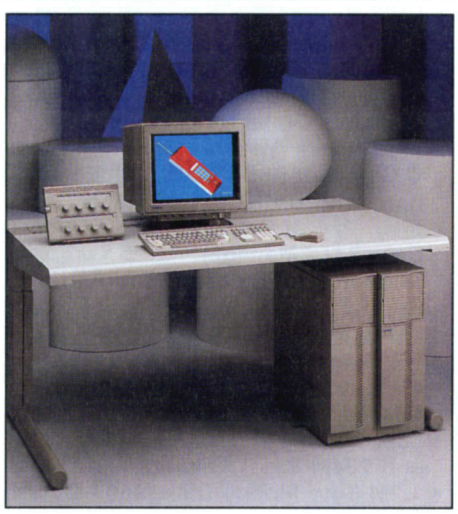
- **True Color Graphics**
- **12 Bit Planes, 24 Max**
- **4,096 Displayable Colors, 16.7M Optional**

The 4237 3D Color Graphics Terminal is Tek's highest-performance terminal. While it shares the 3D graphics performance of the rest of the 4230 Series, the 4237 is enhanced to offer 12 bit planes and 4,096 displayable colors. It can be configured with up to 24 bit planes, providing the ability to define displayable colors with 24 bits of precision and thus display 16.7 million shades.

A 4100F1U Upgrade Kit upgrades the 4237 Terminal to a 4337 3D Graphics Workstation.

For more information on the 4330/4230 3D/2D Graphics workstations and Terminals see Table 1.

Ordering information is on page 66.



4330 3D/2D Graphics Workstation.

NEW 4320/4220 FAMILY

2D Graphics Workstations and Terminals

- **Integrated Workstation or Host/Network-Connected Terminal Configurations**
- **20 MHz 68020 Workstation CPU, with 68881 Coprocessor and Optional Floating Point Accelerator**
- **16.0 MHz 68020/68881 Graphics Engine**
- **Pipelined Architecture and Custom Gate Arrays for Maximum Graphics Performance**
- **UNIX-Based UTek™ Operating System with System Administration Interface, On-Line Tutorials and On-Line Help**
- **256 Displayable Colors**
- **Tektronix Graphics Feature Set**
- **X Windows, Version 10.4**
- **C Compiler and IBM PC/XT Emulation, with Optional FORTRAN Compiler, Pascal Compiler, and UNIFY Data Base Manager**
- **Support for Ethernet, TCP/IP and Sun NFS***
- **4M Byte Display Memory, 8M Bytes Max**
- **4M Byte Workstation System Memory, Expandable to 12M Bytes**
- **86M Byte Hard Disk, 156M Bytes and 234M Bytes Optional**
- **1.2M Byte Floppy Disk, 360K Bytes Optional**

The Tektronix 4320 Series Graphics Workstations and 4220 Series Graphics Terminals deliver the advanced features and high performance needed to manipulate complex 2D graphics.

High-Performance Processing

The 4320/4220 Family offers excellent graphics price/performance. Motorola's 68020 16.0 MHz processor manages the display list, ASCII command processing, and input/output. Three microcoded engines, including a bit-sliced engine, accelerate graphics data manipulation. 4M bytes of graphics memory (3M bytes available to the user as display list memory) are standard, with an additional 4M bytes optional.

The 4320 Series Workstations operate with two 68020 processors working together to boost total applications performance. The applications processor operates at 20 MHz and is augmented by the 68881 floating point processor—and an optional floating point accelerator.

Tektronix' UTek Operating System is a powerful implementation of Berkeley 4.2 UNIX. With a number of extensions from System V, UTek facilitates system administration and maintenance.

Superior Graphics

The 4320/4220 Workstations and Terminals share outstanding graphics features. Graphics segments, combined with 32-bit virtual graphics coordinate space, allow full detail zoom and pan. Surfaces of one or more bit planes can be manipulated as layers, with user control over visibility. The scrolling dialog area keeps host communications, menus, and similar tasks separate from the graphics image, and user-definable markers can be used to create custom icons.

Software Compatibility

Tek's 4320/4220 Family is software-compatible with Tektronix 4120 Series Workstations and the new 4330/4230 Family of 3D Workstations and Terminals. This compatibility provides instant access to many software packages for tasks ranging from presentation graphics and drafting to cartographic analysis and mechanical design.

An industry-standard implementation of C is standard with the 4324 and 4325, and FORTRAN 77 and ISO Pascal are optional. IBM PC/XT software emulation is standard. Tektronix PLOT 10® TekniCAD™ and TekniCAP™ have been enhanced for the 4324.

Tektronix and Industry Standards

In addition to the Tektronix PLOT 10 graphics standards, 4320 Workstations implement UTek, Tektronix' powerful UNIX-based operating system. UTek's menu-based **sysadmin** interface simplifies the most complex system tasks, including network and system administration.

Networking is supported by an IEEE 802.3 Ethernet interface and the standard TCP/IP protocol. For file management across the network, the 4320 Series uses Sun Microsystems' Network File System (NFS)*.

Color Monitors

The 4320/4220 Family Workstations and Terminals offer a choice of color graphics monitors that display 256 colors from a palette of more than 16.7 million shades. Users can select 16-inch or 19-inch color displays, and choose either 1280×1024 addressability or 1024×768 addressability. Anti-reflective coating on the CRT screen cuts glare and the 60 Hz, non-interlaced operaton virtually eliminates flicker.

Colorful Hardcopy

A built-in color printer interface supports the Tektronix 4693D Color Image Printer and Tek's 4692 and 4696 Color Ink-Jet Printers. Print spooling allows system use while images are being printed.

* *Sun Microsystems' NFS will be available in Spring 1988.*

TABLE 2. 4320/4220 FAMILY PERFORMANCE CHARACTERISTICS

	4324 Workstation	4325 Workstation	4224 Terminal	4225 Terminal
System Processor	68020 @ 20 MHz 68881 coprocessor	68020 @ 20 MHz 68881 coprocessor		
Optional Accelerator	Floating point accel.	Floating point accel.		
Graphics Processor	68020 @ 16.0 MHz	68020 @ 16.0 MHz	68020 @ 16.0 MHz	68020 @ 16.0 MHz
Displayable Colors	256	256	256	256
Display Size Maximum Display Size	406 mm (16 in.) 483 mm (19 in.)	406 mm (16 in.) 483 mm (19 in.)	406 mm (16 in.) 483 mm (19 in.)	406 mm (16 in.) 483 mm (19 in.)
Addressability	1024×768	1280×1024	1024×768	1280×1024
System Memory (bytes) Maximum (bytes)	4M 12M	4M 12M		
Display Memory (bytes) Maximum (bytes)	4M 8M	4M 8M	4M 8M	4M 8M
Mass Storage (bytes)	86M hard disk, 1.2M flexible disk	86M hard disk, 1.2M flexible disk		
Optional Mass Storage (bytes)	156 or 234M hard disk, 60M cartridge tape, 360K flexible disk	156 or 234M hard disk, 60M cartridge tape, 360K flexible disk		
Interfaces	Dual RS-232C, LAN, Second RGB output, SCSI, Color printer	Dual RS-232C, LAN, Second RGB output, SCSI, Color printer	Host RS-232C, Dual RS-232C, LAN, Second RGB output, Color printer	Host RS-232C, Dual RS-232C, LAN, Second RGB output, Color printer
Optional Interfaces	Additional RS-232C	Additional RS-232C		
System Software	UTek, C, X Windows 10.4, PC software support	UTek, C, X Windows 10.4, PC software support		
Optional Software	Pascal, UNIFY, ACCELL	Pascal, UNIFY, ACCELL		
Supported GIN Devices	Thumbwheels, tablets, mouse, cursor pad	Thumbwheels, tablets, mouse, cursor pad	Thumbwheels, tablets, mouse, cursor pad	Thumbwheels, tablets, mouse, cursor pad
Supported Tek Color Printers	4692, 4696, 4693D	4692, 4696, 4693D	4692, 4696, 4693D	4692, 4696, 4693D

The 4320/4220 Family Workstations and Terminals produce 2D color output with the Tektronix 4693D Color Image Printer.

NEW 4320 SERIES

2D Graphics Workstations

Tektronix provides a selection of 2D graphics workstations with quality performance and graphics capabilities. Both 4320 Workstations share the features of the 4320/4220 Family described in the preceding paragraphs and Table 2. In addition, each workstation has distinguishing features, offering the user a selection to meet specific graphics needs. Unique features of each workstation are listed in the following paragraphs.

4324

2D Graphics Workstation

• 1024×768 Addressability

The 4324 Graphics Workstation introduces the Tektronix 4320 Series of fast, powerful graphics systems for integrated workstation environments. With Tek's UTek operating system to facilitate operations and maintenance, the 4324 has the power needed for mechanical design, cartography, and other graphics- and compute-intensive applications. With adherance to industry standards, the 4324 fits easily into a mixed-vendor computing environment.

4325

2D Graphics Workstation

• 1280×1024 Addressability

The 4325 2D Graphics Workstation includes the features of the 4324, but adds higher, 1280×1024 addressability.

4224 2D Graphics Terminal with PLOT 10 TechniCAD.

NEW 4220 SERIES

2D Graphics Terminals

Tektronix introduces two 2D graphics terminals, both featuring the graphics performance of the 4320/4220 Family. To give the graphics user a selection, each terminal offers different display features, described in the following paragraphs.

4224

2D Graphics Terminal

• 1024×768 Addressability

The 4224 2D Graphics Terminal provides the same performance and graphics qualities as the 4320/4220 Family. Dual RS-232C, LAN, and color printer interfaces make the 4224 suitable for host-based computing and environments with a network of hosts and workstations.

A 4100F1U Field Upgrade Kit easily upgrades the 4224 Terminal to a fully-integrated 4324 2D Graphics Workstation.

4225

2D Graphics Terminal

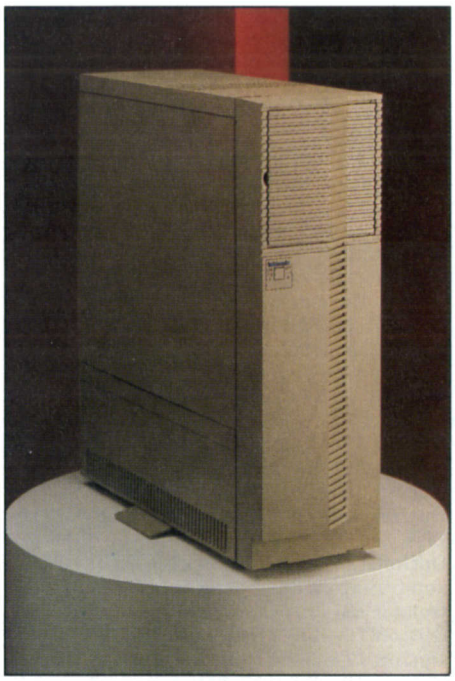
• 1280×1024 Addressability

The 4225 2D Graphics Terminal enhances the features and performance of the 4224 Terminal. With addressability of 1280×1024, it improves 2D viewing of complex graphics images.

A 4100F1U Field Upgrade Kit upgrades the 4225 Terminal to a 4325 2D Graphics Workstation.

For more information on the 4320/4220 2D Graphics Workstations and Terminals see Table 2.

Ordering information is on page 66.



4301 Applications Processor.

The 4330/4230 Family Workstations and Terminals produce 3D color output with the Tektronix 4693D Color Image Printer.

NEW 4301

Applications Processor

- **20 MHz 68020 CPU, 68881 Floating Point Unit, Optional Floating Point Accelerator**
- **Tektronix UTek™ Operating System**
- **Integrated Ethernet Networking, with TCP/IP and Network File System**
- **Additional Computing for Tek 4120 Series Users**

A Workstation Compute Engine for Tektronix 4100 Series, 4120 Series and 4200 Series Terminals

The Tektronix 4301 Applications Processor provides local computing resources for Tektronix 4100, 4120 and 4200 Series terminals. The 4301 adds 2.5 MIPS of processing in a Unix-based operating system, local area networking, extensive mass storage, and broad-based software support.

High-Performance Engine

The 4301 bus architecture is built around a Motorola VMEbus, powered by a full 32-bit, 20 MHz 68020 and a 68881 floating point processor. An optional floating point accelerator provides even greater speed.

Tek's UTek operating system, an implementation of Berkeley 4.2 UNIX, offers a large command set with many System V extensions and advanced functions. With virtual memory of 256M bytes, UTek's interactive interface simplifies system administration and maintenance.

Programming and Software Support

A high-performance compiler for C is standard with the 4301, and a FORTRAN 77 compiler and ISO Pascal compiler are optional.

The 4301 supports Tektronix PLOT 10® TekniCAD™ and TekniCAP™. Software emulation for text-based IBM PC/XT applications is standard.

Networking

With a high-speed Ethernet local area network, the 4301 can connect to a network of Tektronix 4132 workstations, 4330 and 4320 workstations, 4230 and 4220 terminals, and other hosts and workstations. The Network File System and TCP/IP communications protocols expand networking capabilities.

Rapid Communications

The 4301 transfers data over a dual RS-232C port at rates of up to 38.4K bytes per second. The optional Interactive DMA Interface provides single-path communications at parallel speeds, and can be used with minimal programming for both bulk data and interactive transmissions to pass through a single channel.

ORDERING INFORMATION

4330/4230 3D GRAPHICS WORKSTATIONS AND TERMINALS

4335 3D Graphics Workstation*1
Includes: Color display, tilt/swivel base, graphics module, compute module, VT 220-type keyboard, mouse, power cords, keyboard overlays, RGB cables, Operator Manual, Command Reference Manual, UTek Tools Manual, System Administration Guide, X Windows System Reference, NFS Reference*2, C User Manual, Workstation Master Index.
Optional Accessories: Service Manual, display calibration graticules, Software Porting Guide.
4336 3D/2D Graphics Workstation*1
Includes: Same as 4335.
4337 3D/2D Graphics Workstation*1
Includes: Same as 4335.
4235 3D/2D Graphics Terminal*1
Includes: Color display, tilt/swivel base, graphics module, VT 220-type keyboard, power cords, keyboard overlays, RGB cables, RS-232C cable, Operator Manual, Reference Manual, Introduction Brochure.
Optional Accessories: Service Manual, display calibration graticules.
4236 3D/2D Graphics Terminal*1
Includes: Same as 4235.
4237 3D/2D Graphics Terminal*1
Includes: Same as 4235.

4330/4230 FAMILY OPTIONS

Option 1A—(4330 Series Only) Floating Point Accelerator*1
Option 1B—(4330 Series Only) 4M byte Additional System Memory (8M bytes Total)*1
Option 1C—(4330 Series Only) 8M bytes Additional System Memory (12M bytes Total)*1
Option 2A—(4235/4335 Only) Additional 4 Bit Planes (8 Total)*1
Option 2E—(4237/4337 Only) 12 Bit Planes Double Buffered*1
Option 3A—(4330 Series Only) Dual RS-232C DMA*1
Option 3B—(4330 Series Only) Dual Centronics Interface*1
Option 3E—(4330 Series Only) Network Adapter*1
Option 3F—Interactive DMA for DEC DRV-11WA Interfaces*1
Option 3G—(4330 Series Only) Local Bus Adapter*1
Option 3W—Interactive DMA for DEC DR-11W Interfaces*1
Option 10—(4330 Series Only) Additional 360K byte Flexible Disk*1
Option 11—(4330 Series Only) Additional 360K byte Flexible Disk and Streamer Tape*1
Option 12—(4330 Series Only) Additional Streamer Tape*1
Option 16—(4330 Series Only) 156M byte Hard Disk*1
Option 17—(4330 Series Only) 234M byte Hard Disk*1
Option 32—19-inch 1280×1024 Color Display*1
Option 33—Stereoscopic Display*1
Option 49—Rental Tag*1

4320/4220 2D GRAPHICS WORKSTATIONS AND TERMINALS

4324 2D Graphics Workstation*1
Includes: Color display, tilt/swivel base, graphics module, compute module, VT220-type keyboard, mouse, power cords, keyboard overlays, RGB cables, Operator Manual, Command Reference Manual, UTek Tools Manual, System Administration Guide, X Windows Reference, NFS Reference*2, C User Manual, Workstation Master Index.
Optional Accessories: Service Manual, display calibration graticules, Software Porting Guide.
4325 2D Graphics Workstation*1
Includes: Same as 4324.
4224 2D Graphics Terminal*1
Includes: Color display, tilt/swivel base, graphics module, VT 220-type keyboard, mouse, power cords, keyboard overlays, RGB cables, RS-232C cable, Operator Manual, Command Reference Manual, Introduction Brochure.
Optional Accessories: Service Manual, display calibration graticules.
4225 2D Graphics Terminal*1
Includes: Same as 4224.

4320/4220 FAMILY OPTIONS

Option 1A—(4320 Series Only) Floating Point Accelerator*1
Option 1B—(4320 Series Only) 4M bytes Additional System Memory (8M bytes Total)*1
Option 1C—(4320 Series Only) 8M bytes Additional System Memory (12M bytes Total)*1
Option 3A—(4320 Series Only) Dual RS-232C DMA*1
Option 3B—(4320 Series Only) Dual Centronics Interface*1
Option 3E—(4320 Series Only) Network Adapter*1
Option 3G—(4320 Series Only) Local Bus Adapter*1
Option 10—(4320 Series Only) Additional 360K byte Flexible Disk*1
Option 11—(4320 Series Only) Additional 360K byte Flexible Disk and Streamer Tape*1
Option 12—(4320 Series Only) Additional Streamer Tape*1
Option 16—(4320 Series Only) 156M byte Hard Disk*1
Option 17—(4320 Series Only) 234M byte Hard Disk*1
Option 32—(4224/4324 Only) 19-inch 1024×768 Color Display*1
Option 32—(4225/4325 Only) 19-inch 1280×1024 Color Display*1
Option 49—Rental Tag*1

4301 APPLICATIONS PROCESSOR

Includes: Power cord, Installation Guide, Workstation User Guide, Command Reference, Tools Manual, System Administration Guide, NFS*2 Reference, C User Manual, Workstation Master Index.
Optional Accessories: Service Manual, Software Porting Guide.

OPTIONS

Option 1A—Floating Point Accelerator*1
Option 1B—Additional 4M byte System Memory*1
Option 1C—Additional 8M byte System Memory*1
Option 3A—Dual RS-232C DMA*1
Option 3B—Dual Centronics Interface*1
Option 3E—Network Adapter*1
Option 3F—Interactive DMA*1
Option 3G—Local Bus Adapter*1
Option 10—360K byte Flexible Disk*1
Option 11—360K byte Flexible Disk and Streamer Tape*1
Option 12—Streamer Tape*1
Option 16—156M byte Hard Disk*1
Option 17—234M byte Hard Disk*1
Option 49—Rental Tag*1

SOFTWARE PRODUCTS

4300P21 Data Base Manager*1
4300P22 ACCELL Integrated Development System*1
4300P37 FORTRAN 77 Compiler*1
4300P38 Pascal Compiler*1

SOFTWARE OPTIONS

01—Streamer tape media*1
02—1.2M byte flexible disk media*1

*1 *Contact your local sales office for information.*
*2 *Sun Microsystems' NFS will be available in Spring 1988.*

Field Upgrade Kits, international keyboards and international power cords are available. Contact your local Tektronix sales representative.

WARRANTY-PLUS SERVICE PLANS

See Customer Service.

RECONDITIONED TEKTRONIX INFORMATION DISPLAY PRODUCTS

- **Quick Delivery**
- **Low Prices**
- **New Product Warranties**
- **Quantity Discounts**

With Tek's quick delivery, you can be using Information Display products at substantial savings in just two weeks. Tektronix remanufactures demo and lease returns to latest specifications and offers them with new product warranties. Quantity discounts apply to current as well as discontinued products.

In the U.S., contact your local Tektronix Field Office for IDG Reconditioned Product availability and prices. Overseas customers call your Tektronix Sales Office.

NEW 4310 SERIES

Graphics Workstations

- **32-Bit 68020 CPU, 68881 Floating Point Processor**
- **Tektronix UTek™ Operating System**
- **Extensive Programming and Software Support, Including IBM PC Emulation**
- **X Windows with 4107 Graphics**
- **Choice of 13-inch Monochrome, 19-inch Grayscale, or 19-inch Color Displays**
- **Integrated Local Area Network**

The new Tektronix 4310 Series Graphics Workstations—the 4315, 4316 and 4317—bring together high-performance bit-mapped graphics, Tek's UTek operating system, an advanced set of programming languages, and software support for Tek 4107 and IBM PC applications. All three workstations are designed for computer-aided software engineering, 2D drafting, mapping, technical publishing, and other tasks.

Cost-Effective Performance

The 4310 Workstations are built around a 32-bit 68020 CPU and a 16.7 MHz 68881 floating point coprocessor, with a minimum of 4M bytes of RAM. They include integrated networking, an RS-232C port, and a Centronics-style parallel interface.

Each workstation includes a 1.2M byte flexible disk, an 86M byte hard disk, and a built-in SCSI to provide rapid disk input and output. With Ethernet and TCP/IP, the 4310 workstations support electronic mail, host communications, and peripheral sharing. All three workstations come with a three-button mouse and support Tek's new 4693D Color Image Printer and 4692 and 4696 Color Ink-Jet Printers.

UTek Power

Tek's UNIX-based UTek Operating System furnishes a comprehensive set of reliable utilities. Based on Berkeley 4.2bsd with a number of System V enhancements, UTek includes software development tools such as an enhanced **make** build control program, a version control system, and sophisticated queueing facilities. UTek's interactive interface simplifies system administration and maintenance.

Extensive Software

The 4310 Series Workstations come standard with a 68000 assembler, Green Hills Software's C compiler, and Tek's implementation of X Windows Version 10.4. To expand access to software, the 4310 Workstations can support Tektronix 4107 applications (via X Windows) and IBM PC/XT applications.

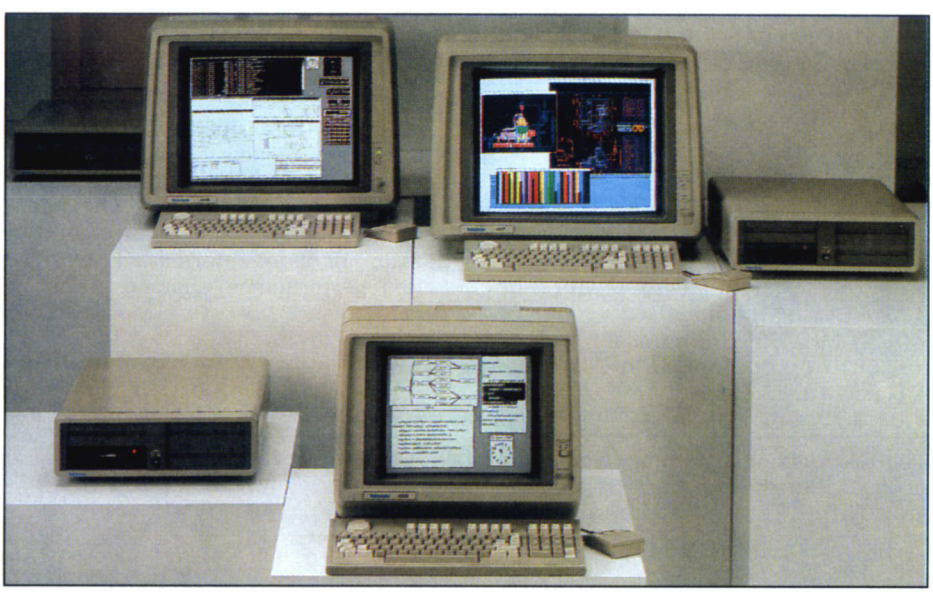
All three workstations support Tektronix PLOT 10® TekniCAD™ and several third-party software packages. The 4316 and 4317 support PLOT 10 TekniCAP™ also.

Smalltalk-80 and Other Advanced Languages

The 4310 Series provides Smalltalk-80 standard, enhanced by Tek with more than 500 additional classes of objects, an unlimited Large Object Space interpreter, grayscale and color integration into Smalltalk applications, and the ability to call functions and routines written in other languages. 4310 Workstation options include Green Hills' FORTRAN 77 and Pascal compilers, Tek Common LISP® , and QUINTUS PROLOG. Users have access to a large library of graphics routines and PLOT 10 Terminal Control System and Software Terminal Interface. Software developed for the Tektronix 4132, 4320 and 4330 Workstations is easily ported to the 4310 Series.

4310 SERIES PERFORMANCE CHARACTERISTICS

	4315	4316	4317
Processors	68020 @ 16.67 MHz 68881 coprocessor	68020 @ 16.67 MHz 68881 coprocessor Custom gate arrays	68020 @ 16.67 MHz 68881 coprocessor Custom gate arrays
Display Type	Monochrome	Grayscale (16 levels)	Color (16 from 4096)
Display Size	330 mm (13 in.)	483 mm (19 in.)	483 mm (19 n.)
Displayable Resolution	640×480	1376×1024	1376×1024
Addressability	1376×1024	1376×1024	1376×1024
System Memory (bytes)	5M	4M	4M
Optional Memory (bytes)	9 or 13M	8 or 12M	8 or 12M
Mass Storage (bytes)	86M hard disk 1.2M flexible disk	86M hard disk 1.2M flexible disk	86M hard disk 1.2M flexible disk
Optional Storage (bytes)	156 or 234M hard disk	156 or 234M hard disk	156 or 234M hard disk
Interfaces	RS-232C, LAN, SCSI, Centronics	RS-232C, LAN, SCSI, Centronics	RS-232C, LAN, SCSI, Centronics
Software	UTek, C, Smalltalk, X Windows 10.4, 4107 Virtual Terminal	UTek, C, Smalltalk, X Windows 10.4, 4107 Virtual Terminal	UTek, C, Smalltalk, X Windows 10.4, 4107 Virtual Terminal
Optional Software	Prolog, Common LISP, FORTRAN, Pascal	Prolog, Common LISP, FORTRAN, Pascal	Prolog, Common LISP, FORTRAN, Pascal
Supported Tek Printers	4692, 4696, 4693D	4692, 4696, 4693D	4692, 4696, 4693D



NEW 4315

Graphics Workstation

- **5M Byte System Memory, with 9 or 13M Bytes Optional**
- **1376×1024 Addressability, 640×480 Displayable Resolution**
- **Monochrome 13-Inch Display**
- **16.67 MHz 68020 Processor and 68881 Coprocessor**
- **UTek, C, Smalltalk and X Windows**

The Tektronix 4315 Graphics Workstation is a desktop workstation powered by a 16.67 MHz 68020 CPU and 68881 coprocessor. With the UTek Operating System, the 4315 provides tools for software development, an enhanced **make** build control program, the Revision Control System, and the Multiple-Device Queueing System.

The 4315's 640×480-pixel screen acts as a window into the 1376×1024 bitmapped display memory, effectively providing a much larger working area. To access the enlarged work space, a smooth panning feature automatically starts when the screen cursor reaches a display edge.

Advanced Languages and Software

The 4315 includes Tek's proprietary version of Smalltalk-80, enhanced to provide an even more efficient programming environment. FORTRAN 77 and Pascal compilers, Tek Common LISP, and QUINTUS PROLOG are optional with the 4315. It also runs Tek's PLOT 10 TekniCAD and a number of third-party software packages.

With 5M bytes of RAM, upgradeable to 13M bytes, the 4315 has an 86M byte hard disk and a 1.2M byte flexible disk. A three-button mouse aids input, and Tek's 4692, 4696, and 4693D printers are supported. For more information on 4310 Series performance characteristics, see page 67.

NEW 4316

Grayscale Graphics Workstation

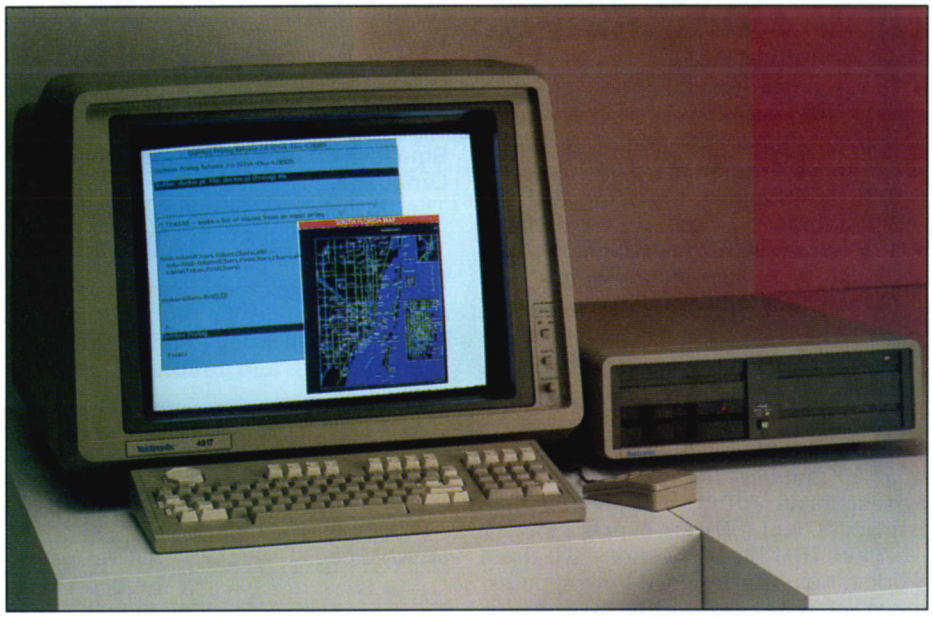
- **1376×1024 Addressability**
- **Grayscale 19-Inch Display**
- **4M Byte System Memory, with 8 or 12M Bytes Optional**
- **16.67 MHz 68020 Processor and 68881 Coprocessor, with Custom Gate Arrays**
- **UTek, C, Smalltalk and X Windows**

The Tektronix 4316 Graphics Workstation offers a 19-inch screen and 16 shades of gray. With 1376×1024 addressability and 10-mil spot size, the 70-Hz noninterlaced display has a flicker-free image. Proprietary gate array technology provides very fast grayscale BitBlt performance. This speed and resolution make the 4316 an excellent tool for technical publishing, grayscale imaging and vision system applications.

Programming and Software Support

The 4316 includes Tek's proprietary version of Smalltalk-80, enhanced to provide an even more efficient programming environment. To aid programmers, the 4316 offers as options FORTRAN 77 and Pascal compilers, Tek Common LISP, and QUINTUS PROLOG. It also supports Tektronix' PLOT 10 TekniCAD and TekniCAP.

With 4M bytes of RAM, upgradeable to 12M bytes, the 4316 has an 86M byte hard disk and 1.2M byte flexible disk. The 4316 supports Tektronix 4692 and 4696 Ink-Jet Printers and the new 4693D Color Image Printer. It comes with a 32×32-pixel, two-plane hardware cursor; a full-screen, cross-hair cursor; and a three-button mouse. For more information see 4310 Series performance characteristics on page 67.



4317 Color Graphics Workstation.

NEW 4317

Color Graphics Workstation

- **16 Colors From a Palette of 4096**
- **1376×1024 Addressability**
- **19-Inch Display**
- **4M Bytes System Memory, 8 or 12M Bytes Optional**
- **16.67 MHz 68020 Processor and 68881 Coprocessor, with Custom Gate Arrays**
- **UTek, C, Smalltalk and X Windows**

The Tektronix 4317 Graphics Workstation uses proprietary gate arrays to deliver outstanding color BitBlt performance. The 4317 displays 16 colors at once, selected from a palette of 4096 shades.

Programming and Software Support

The 4317 includes Tek's proprietary version of Smalltalk-80. FORTRAN 77 and Pascal compilers, Tek Common LISP, and QUINTUS PROLOG are available as options. The 4317 runs Tektronix' PLOT 10 TekniCAD and TekniCAP, as well as a number of third-party software packages.

The 4317 has 4M bytes of RAM, upgradeable to 12M bytes, an 86M byte hard disk and 1.2M byte flexible disk. The 4317 supports Tektronix 4692, 4696 and 4693D printers. It comes with a 32×32-pixel, two-plane hardware cursor; a full-screen, cross-hair cursor; and a three-button mouse. For more information see 4310 Series performance characteristics on page 67.

ORDERING INFORMATION

4315 Graphics Workstation*[1]
Includes: 68020 CPU, 68881 F.P., 5M byte RAM, 86M byte hard disk, 1.2M byte flexible disk, 13-in. monochrome display, 640×480 displayable resolution, Ethernet, RS-232 port, parallel port, 56M byte virtual address space, UTek O/S, Smalltalk-80, C, Assembler, IBM PC emulation, 4107 virtual terminal.
4316 Graphics Workstation*[1]
Includes: Same as 4315, except 4M byte RAM, 19-in. grayscale display, 1376×1024 displayable resolution, 6M byte virtual address.
4317 Graphics Workstation*[1]
Includes: Same as 4316, except with 19-in. color display.

OPTIONS

Option 05—(4315 Only) Additional 4M byte Memory (Total 9M bytes)*[1]
Option 05—(4316/4317 Only) Additional 4M byte Memory (Total 8M bytes)*[1]
Option 06—(4315 Only) Additional 8M byte Memory (Total 13M bytes)*[1]
Option 06—(4316/4317 Only) Additional 8M byte Memory (Total 12M bytes)*[1]
Option 23—156M byte Hard Disk (Replaces 86M byte Hard Disk)*[1]
Option 24—234M byte Hard Disk (Replaces 86M byte Hard Disk)*[1]
Option 4310F05—Field Installed 4M byte Daughter Board*[1]

SOFTWARE PRODUCTS

4300P21 Data Base Manager*[1]
4300P22 ACCELL Integrated Development System*[1]
4300P37 FORTRAN 77 Compiler*[1]
4300P38 Pascal Compiler*[1]

SOFTWARE OPTIONS

Option 01—Streamer tape media*[1]
Option 02—1.2M byte flexible disk media*[1]

*[1] *Contact your local sales office for information.*

International Power Plug Options Are Available.

***WARRANTY-PLUS* SERVICE PLANS**
See Customer Service.

SMALLTALK-80

- **Extensible, Object-Oriented Programming**
- **Bit-Mapped Graphics User Interface**
- **Designed for Exploratory Programming**

Smalltalk-80 combines an object-oriented programming language with the most advanced user interface available. Pioneered at Xerox PARC, Smalltalk-80 permits exploratory programming through rapid prototyping and experimentation. Smalltalk-80 provides an interactive approach to solving complex problems.

High-Performance Implementation

Tektronix' implementation of Smalltalk-80, combined with the powerful hardware architecture of the 4300 Series, provides graphic response fast enough to support screen animation under direct control of Smalltalk-80.

Smalltalk-80 satisfies the needs of advanced software developers in the field of artificial intelligence and is ideal for AI research and development. Smalltalk-80 can be extended by defining new instances of an object class (each with its own internal state) or by defining an entirely new object class with a distinct set of rules and default behavior. The class structure of Smalltalk-80 provides both multiple inheritance and hierarchical inheritance mechanisms. Over 200 predefined classes support the data and control abstractions most commonly used in AI applications development.

Original Windowing System

Bit-mapped graphics and window management were originally developed for Smalltalk-80. The Smalltalk-80 Model-View-Controller window-based manager supports the creation of new window-based applications. Multiple processes are supported with a virtually unlimited number of overlapping windows.

Smalltalk-80 supports primitive graphics functions such as scaling, translation, rotation, logical combination of pixels, and text attribute modification, through its integral "BitBlt" operator.

Any activity—text editing, file manipulation, compilation, execution, debugging—can be performed, regardless of the current state. The user simply "opens" another window and proceeds with the new operation. Smalltalk-80 allows immediate access to any of its subsystems, whether user-defined or predefined, for inspection or modification.

TEK Common LISP®

- **A Full Common LISP Implementation**
- **Optimized for 4300 Systems**
- **Rapid Prototyping of AI Concepts**
- **Run Time Compiler for Optimized Machine Code**

TEK Common LISP® has been specifically optimized and enhanced for the Tektronix 4300 Series. It provides AI researchers and software developers with a personal LISP programming environment previously available only on dedicated LISP machines.

Common LISP was conceived by a large committee of academicians and AI researchers as a language that would incorporate the very best features of other LISP dialects. Tek Common LISP is a full implementation of this language (as specified in "Common LISP, the Language" by Guy Steele). It offers a much richer set of data types and more complex program structures than other LISP dialects currently in use.

A New Standard

Common LISP is considered by many artificial intelligence experts to be a new industry standard for AI programming environments. This consensus is reflected in the general parameters established for the language.
Commonality: Common LISP focuses the features of several different implementations of LISP into a common dialect.
Portability: Applications written in Common LISP are easily ported to any Common LISP implementation.
Expressiveness: Common LISP is a very rich language that employs the most valuable constructs from other LISP dialects.
Efficiency: Common LISP has features designed to facilitate the production of fast, high-quality compiled code.
Compatibility: Since Common LISP is derived from a number of popular dialects, code from other LISP dialects should readily map into Common LISP.

Additional Tek Common LISP Features

Additional features include a powerful optimizing compiler with built-in debugging features; lexically-scoped interpreter and compiler; full-featured package system for symbol name differentiation; rich collection of numerical primitives and built-in functions; built-in garbage collector and dynamic storage management; complete implementation of arrays, vectors, and strings; flexible interactive user interface; flexible debugging aids; powerful facilities for structures and macros; lexical closures; built-in user-extensible data-type facility; and built-in user-extensible parser and hash-table facility.

The rich set of primitives available in Common LISP makes the language an appropriate candidate for expert systems, natural-language interfaces, and all types of symbolic programming. Tek Common LISP goes beyond the specifications of the language to provide on-line documentation, a user-definable error handler, powerful and robust foreign function interfaces to C and FORTRAN programs, and a built-in Flavors system for object-oriented programming.

QUINTUS PROLOG

- **Configured for 4300 Series Systems**
- **Non-Procedural Language for Rapid Development**
- **Modularity for Less Complexity**

QUINTUS PROLOG, as implemented for the Tektronix 4300 Workstations, is a unique language that allows programmers to solve problems by specifying answers needed rather than describing a detailed solution procedure. Based entirely on facts and logical relationships or rules, PROLOG is one of the acknowledged languages in artificial intelligence. PROLOG allows programmers to concentrate on the problem/solution without the confusion of computer-constrained procedures.

PROLOG operates on the principle of "controlled deduction." The programmer creates a network of facts and rules that describes the known relationships between the elements of a problem. Once the logical network is defined, PROLOG makes logical inferences from the relationships when queried by the programmer. These features make PROLOG ideal for many AI applications including expert systems, natural-language processing, data base-query languages, and automatic programming systems.

Language and AI Environment for Productivity

QUINTUS PROLOG simplifies complex problems and reduces program development time. Program development is integrated with an EMACS editor, allowing interactive editing and debugging. And programs can call other languages to create a full AI environment. Predicate definitions and programs can be edited, loaded, and then tested immediately with the PROLOG Interpreter. PROLOG modules are developed individually and then integrated with other modules into an application. Once they are debugged, the modules can be compiled to create highly efficient executable code.

Performance for Complex Problems

The inherent efficiency of QUINTUS PROLOG is enhanced by the power of the Tek 4300 Series hardware. With compiled QUINTUS PROLOG code more than 70,000 logical inferences per second are possible on the 4300 Series. When combined with the 4300 Series, QUINTUS PROLOG is an ideal vehicle for both advanced software development and end-user AI applications.

ORDERING INFORMATION

4300P32 EMACS Editor*1
4300P33 TEK Common LISP*1
4300P36 QUINTUS PROLOG*1

OPTIONS

Option 01—Streamer Tape*1
Option 02—1.2M byte Flexible Disk*1

*1 *Contact your local sales office for information.*

4944

Mass Storage Unit

- **Compatible with Tektronix 4300 Graphics Workstations**
- **Removable 45 or 60M Byte Streamer Tape**
- **Standard SCSI Interface**
- **86, 90, 156 and 234M Byte Hard Disks**

To satisfy a variety of customer requirements, the 4944 Mass Storage Unit offers a flexible combination of streamer tape, hard disk and floppy disk drives.

Options

- Four 86-, 90-, 156-, and 234-M byte high-performance, Winchester disk drives, with seek time of less than 30 microseconds and track-to-track access time of less than 6 microseconds.
- 4944 streamer tape drive operating at 90 inches per second and transferring data at a maximum rate of 86.7K bytes per second, making it ideal for quick back-up and restoring information stored on hard disks.

4944 options have been tailored for use with the Tektronix workstations.

ORDERING INFORMATION

4944 Mass Storage Unit **$1,000**
Includes: Power cord (161-0066-00); two meter SCSI cable (012-1117-00); Instruction Manual (070-5978-00); SCSI terminator (011-0090-00).

OPTIONS (4300, 6130, 4132 Series)
Requires UTek O/S

Option 11—60M byte streamer tape **+$2,500**
Option 12—90M byte disk **+$5,500**
Option 15—60M byte streamer tape +90M byte disk **+$8,000**
Option 16—156M byte disk **+$7,500**
Option 17—60M byte tape +156M byte disk **+$10,000**
Option 18—234M byte disk **+$10,000**
Option 19—60M byte tape +234M byte disk **+$12,500**

OPTIONS (4400 Series)
Requires Uniflex O/S

Option 01—60M byte streamer tape **+$1,750**
Option 02—90M byte disk*1
Option 03—60M byte streamer tape +90M byte disk **+$5,250**

OPTIONS (4120 Series)

Option 21—45M byte disk*1
Option 22—45M byte disk + dual floppies*1

FIELD INSTALLED KITS

4944F01—60M byte streamer tape **$2,750**
4944F02—90M byte fixed hard disk **$5,750**
4944F03—86M byte fixed hard disk **$5,750**
4944F04—156M byte fixed hard disk **$7,750**
4944F05—234M byte fixed hard disk **$10,250**

INTERNATIONAL POWER PLUG OPTIONS

Option A1—Universal Euro 220 V, 50 Hz.
Option A2—UK 240 V, 50 Hz.
Option A3—Australian 240 V, 50 Hz.
Option A4—North American 240 V, 60 Hz.
Option A5—Switzerland 220 V, 50 Hz.

*1 *Contact your local sales office for information.*

OPTIONAL ACCESSORIES

SCSI Cables—
25 inch, 4944 to 4944 or 4926 or 61TC01. Order 012-1178-00 **$155**
2 m, 4944 to 4400 or 4120. Order 012-1117-00 **$70**
2 m, 4944 to 4132/6130. Order 012-1146-00 **$140**
SCSI Interface—For 4132/6130. Order 61KP04 **$800**
DC600A Tape Cartridge—
Order 119-1463-01 **$285**