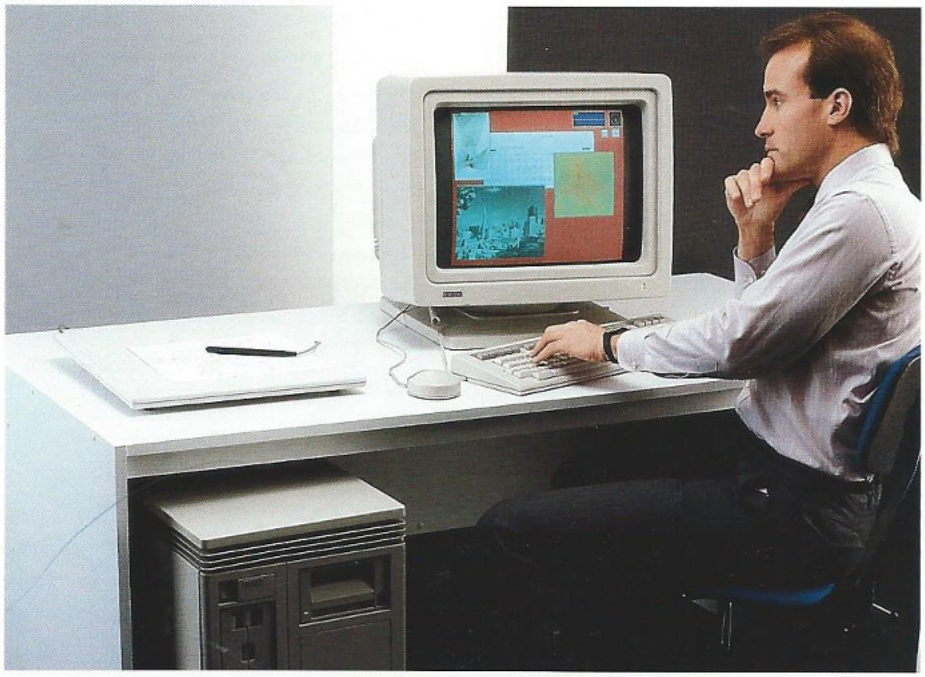
VAXstation II/GPX

MicroVAX II Workstation with High-Performance Color Graphics

digital



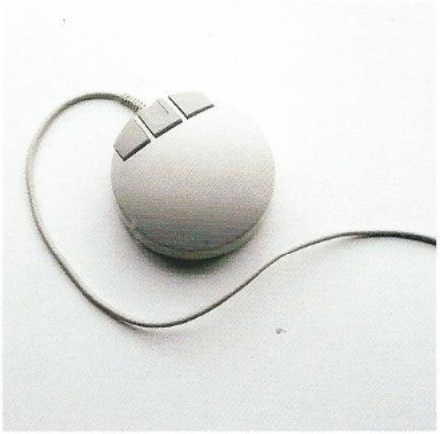
VAXstation II/GPX – A Superior Color Graphics Workstation with VAX Power and Capability.

The VAXstation II/GPX takes the VAXstation II technical workstation family one step further with superb color graphics. Based on MicroVAX II system technology, VAXstation II/GPX delivers exceptional performance.

At the forefront of VAXstation II/GPX's unique design is a powerful VLSI graphics coprocessor that offloads all text and graphics processing from the MicroVAX II CPU, giving you stunning graphics performance. VAXstation II/GPX offers the same multiwindowing, multitasking, and graphics functionality as VAXstation II, only faster and with color. It also offers all the flexibility, power, and networking capabilities you've come to expect from Digital's VAX computing family.

VAXstation II/GPX supports a wide variety of application needs ranging from VLSI and PC board layout to mechanical CAD, process control monitoring, technical document preparation, and weather mapping.

A matchless combination of advanced hardware and software technologies, VAXstation II/GPX delivers the multitasking VAX power, impressive computing performance, and sophisticated graphics speed and capability you need in a technical color workstation.



Digital's new three-button ergodynamically designed mouse comes standard with the VAXstation II/GPX.

The new 19-inch screen VR290 color monitor features a resolution of 1,024 by 864 pixels, a 60-hertz noninterlaced refresh rate, and an integral tilt/swivel base.

Highlights

- Digital designed and manufactured graphics coprocessor with dedicated VLSI power guarantees faster drawing speeds and offloads work from the MicroVAX II CPU to significantly improve graphic applications performance.
- VAXstation II/GPX is available with either the VAX/VMS or VAX/ULTRIX operating system – you choose the system software that best suits your needs.
- Full VMS and ULTRIX compatibility means that your VAXstation II/GPX system can interact with Digital's other VAX systems, from the MicroVAX to the VAX 8650.
- In both the VMS and ULTRIX environments, you have multiwindow user interfaces, letting you view and switch between a number of different functions at the same time – it's like working at more than one terminal simultaneously.
- Local and wide area networking capabilities, including DECnet and TCP/IP, along with gateways to IBM and X.25 networks, let you communicate with anyone, anywhere, whether across the hall or around the world.
- Support for multiple graphics programming interfaces, including industry-standard GKS, the X Window System (developed jointly with MIT and available on ULTRIX), and low-level interfaces, lets you choose the interface that matches the needs of your application.
- Multiple and flexible system configurations let you choose the devices and amount of storage you need.
- If you design in either an Ada® or AI environment, special VAXstation II/GPX workstation configurations have been developed specifically for these environments.
- Existing VAX/VMS and ULTRIX applications can be run without changes – no new interfaces need be written, saving programmer time and protecting your software investment.

A Coprocessor and MicroVAX II Significantly Enhance Graphics Speed.
Two unique VLSI components – the MicroVAX II processor and the graphics accelerator chipset that functions as a graphics coprocessor – make VAXstation II/GPX a true leader in workstation technology.

VAXstation II/GPX is based on the same powerful MicroVAX II that has become the standard supermicrocomputer in the engineering market. This MicroVAX 78032 microprocessor implements the VAX architecture on a single chip – true 32-bit virtual memory, 4 processor modes, 21 addressing modes, 9 VAX data types, and over 304 VAX instructions. The 78132 floating-point processor, that gives even more performance by extending data paths and accelerating instruction speeds, is standard equipment.

But VAXstation II/GPX gives you more than just the power and versatility of the MicroVAX II. Its graphics coprocessor significantly enhances your workstation's performance because it passes the processing of graphics instructions onto the coprocessor. This helps to free the MicroVAX II for more compute-intensive tasks, such as complex data manipulation. It also frees more CPU cycles for processing even more complex graphics applications. The graphics coprocessor provides direct support in hardware for drawing vectors and text, for scaling and dragging, and for other advanced graphics functions. The result is exceptional performance.

VAXstation II/GPX offers either four or eight planes of display memory. The four-plane system lets you display 16 colors from a palette of 16 million on the color monitor or 16 simultaneous shades of gray on the monochrome monitor. The eight-plane configuration lets you display as many as 256 colors from the same color palette for very fine or detailed shading of objects. Each plane is a 1K by 1K by 2 video bit-map display, with the "by 2" indicating an off-screen page that stores occluded or predrawn images. This means that you have quicker video response because graphic information is stored in the video memory rather than in the system memory or on the disk.

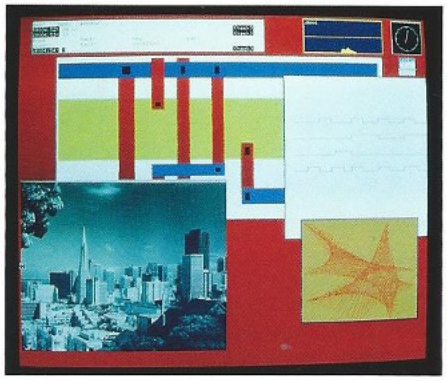
The graphics processor provides a display list interface that supports a range of raster operations including fast bit-blt and vector drawing; tiling and pattern fill; clipping, scaling, and zoom; and scrolling. The processor operates at speeds up to 560 Mbits/second.

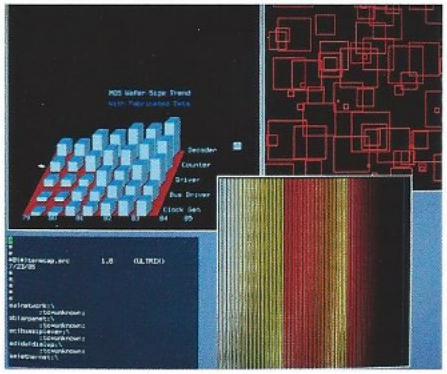
With either the monochrome or color monitor, you get a resolution of 1,024 by 864 pixels. Both monitors use a 60-hertz noninterlaced refresh rate that significantly reduces flicker and minimizes picture smear, reducing eye fatigue. And each monitor uses a 19-inch screen so that you have ample room to display multiple windows with large amounts of information, all at the same time.

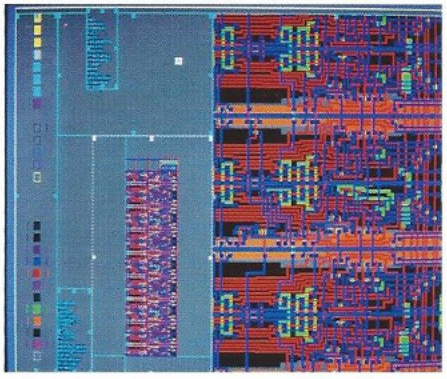
VMS or UNIX – The Choice Is Up to You.
Digital gives you a choice of either a VMS or a UNIX* environment. MicroVMS is Digital's general purpose MicroVAX operating system that has been optimized for VAX system performance. ULTRIX is Digital's enhanced native-mode UNIX system.

MicroVMS offers the same native-mode, high-performance environment you'll find on all VAX processors. It can handle processor-intensive, I/O-intensive, and realtime tasks – in any mix. Sophisticated virtual memory, and the wide range of tools, utilities, and languages are some of the advantages that make VMS the powerful, adaptable, and extendable operating system that it is. And its English-like command language makes it very easy to use. In addition, Digital has added MicroVMS Workstation Software to VMS to provide powerful multi-windowing graphics capabilities for the VAXstation series of workstations.

ULTRIX-32m is Digital's standard native-mode UNIX, compatible with Berkeley 4.3BSD and AT&T's System 5. With ULTRIX-32m you get all the standard tools and utilities you are accustomed to using on a VAX running UNIX. In addition, we've enhanced ULTRIX-32m with workstation features like support for the network-based X-Windows System, graphics library support, DECnet/Ethernet, an optimized VAX FORTRAN compiler, and a customizable human interface.







VMS and ULTRIX Applications Can Be Transported without Any Changes.
Both VMS and ULTRIX give you application portability that extends across the entire VAX family of computers. If you want to offload a nongraphics ULTRIX application from your VAXstation II/GPX to a larger VAX running ULTRIX, or transport a nongraphics VMS application to a large VAX/VMS environment, you can do it quickly and easily, without recompiling or rebuilding the application in any way.

This is the Digital style of computing. You don't need one set of application software for your workstation and another for larger systems. Nor do you have to move from one computing environment to another when you need the additional computing resources of a large timesharing system.

While other computer companies developed different architectures for systems designed to work at different levels of the organization, Digital took a single architecture and extended it to our entire computing environment, encompassing the needs of your entire organization. The same software used in MicroVAX and VAXstation systems runs unchanged on our largest VAX computers.

Multiple Computing Windows at Your Desktop.
Multiwindowing and multitasking open up almost unlimited possibilities for your applications. In either the VMS or ULTRIX environment, VAXstation II/GPX windows act like multiple, simultaneous pseudoterminals.

With these, you can view and work on several processes at the same time. For instance, if you're a CAD/CAM engineer, you can depict and manipulate graphic images from different viewpoints, on the same screen, at the same time. Using VAXstation II/GPX's mouse, you can quickly glide from one window to another, creating and moving different windows along the way. If windows overlap, pop the rear one to the foreground, or push the front window to the background. And if you're a programmer, you can simultaneously run, debug, and edit programs through different windows on the same screen.

VAXstation II/GPX puts the power and flexibility of different terminal emulation and graphics protocols within your reach. Using terminal emulation, you can work in VT100, VT220 (VMS only), and Tektronix* 4014 terminal windows. And because you can run virtually all VAX applications written for those terminals without altering the programs, your current software investments are completely protected.

Additionally, you can develop your own multiwindowing and graphics programs while still retaining complete software compatibility with the VAXstations I and II. For graphics programmers, the VAXstation VMS environment utilizes UIS as a lower-level graphics interface library.

ULTRIX utilizes QIL and the X Window System developed jointly by Digital and MIT.

UIS is a high-performance graphics interface designed and optimized by Digital specifically for the VAXstation graphics environment. It provides world and device coordinate systems; routines for cursor, window, and menu control; as well as object-oriented display list management.

QIL is a graphics interface library that facilitates direct use of the graphics hardware without requiring detailed knowledge of the VAXstation II/GPX graphics coprocessor. The X Window System is unique in allowing network-transparent windowing and graphics access. You can activate tasks on remote nodes that draw graphics on your local workstation, allowing you to off-load compute-intensive graphics tasks to larger VAXs on the network. A fully-customizable human interface is also provided, allowing the user to modify the windowing environment based on preference for mouse buttons, window colors, and window operations like moving and resizing.

The Expansive Networking Capabilities of a VAX.
VAXstation II/GPX, as the newest addition to the VAX workstation family, offers the same superior networking capabilities that you expect from any VAX.

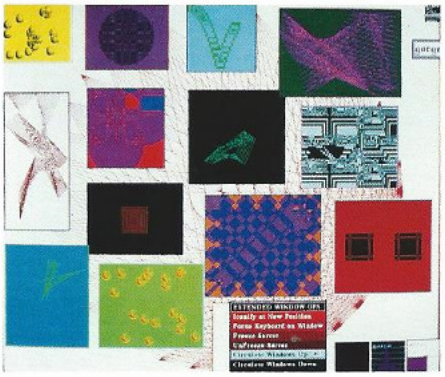
The Ethernet interface is included with each system. Together with networking software, Ethernet helps make VAXstation II/GPX a powerful workstation in an interactive distributed processing network of workstations and other compatible VAX systems.

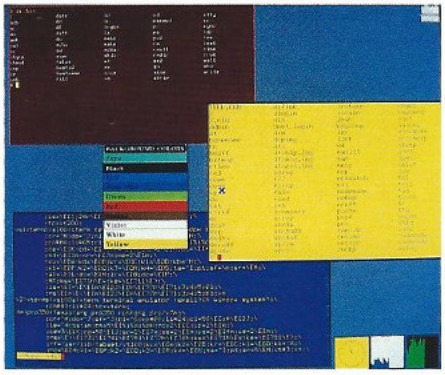
In an ULTRIX environment, Digital provides a full range of high-speed communication facilities that include TCP/IP and DECnet. In the VMS environment, we have the proven DECnet/Ethernet communication capabilities and a variety of gateways to other computing environments. These networking software products are so sophisticated that working across a network of VAX systems is almost as easy as working on a single-user system. You can send information to someone on another VAX system with the same commands you would use if the person were on your system. Just as easily, two programs on different computers can interact. No complicated commands or data conversions are necessary. VAXstation II/GPX is also capable of communicating with other vendors' equipment and other networks using such protocols as SNA or X.25.

Support for Flexible Application Development.
In order to develop your graphics applications, Digital provides you with a variety of very sophisticated, powerful tools and high-level languages in both the VMS and ULTRIX environments. The VMS development environment offers tools for window-oriented applications, including a new full-screen, fourth-generation, language-sensitive editor. The editor supports simultaneous display of source code, debugger output, and compilers for 13 languages including Ada, C, FORTRAN, Pascal, and Common LISP. Other software development productivity aids for the VMS environment include code management and module management systems, program and coverage analyzer, test manager, VAX symbolic debugger, and a system analysis monitor.

The ULTRIX environment offers valuable development tools such as the QIL graphics software interface, an optional optimizing FORTRAN (VAX FORTRAN/ULTRIX) compiler, as well as DECnet and TCP/IP support. It also includes: xlib, a programming interface for utilizing the X Window System; bundled C, FORTRAN-77, and Pascal compilers; development tools such as "make" and SCCS (Source Code Control System); and the editors, text processors, and other development utilities you've come to expect with full UNIX systems – and all included in one price.

The GKS (Graphics Kernel System) library is fast emerging as the worldwide industry standard graphics programming interface, and is included with both VMS and ULTRIX VAXstation II/GPX versions. The GKS library helps you develop a device-independent application – allowing you easily to move your graphic applications source code between different workstations. For instance, GKS allows you to easily port a VMS graphics application to an ULTRIX VAXstation II/GPX environment. The GKS library, called from higher-level programming languages, provides a con-





sistent, inhouse graphics software base that can minimize the time and cost associated with developing and maintaining your graphics applications programs.

VAXstation II/GPX Is Available in Packaged Systems.
For your convenience we've packaged four of our more popular VAXstation II/GPX system configurations—for simplified ordering and immediate delivery.

Each of these four VAXstation II/GPX packaged systems includes the system enclosure (BA23 or BA123), MicroVAX CPU board with FPU (Floating-Point Unit) and 1 Mbyte of onboard memory; at least 2 additional Mbytes of memory (expandable to 9); a hard disk, mass storage device; a TK50 95-Mbyte streaming cartridge tape subsystem; a DEQNA Ethernet controller, and a system software license. The 19-inch monitor, graphics coprocessor, mouse, and keyboard are also included. Media and documentation must be ordered separately.

The four packaged systems are
1. *Gray-Scale System*
MicroVAX II in the BA23 enclosure, an RD53 71-Mbyte hard disk, 3 Mbytes of memory, four-plane graphics coprocessor, and a VR260 monochrome monitor.
2. *Entry-Level Color System*
MicroVAX II in the BA23 enclosure, an RD53 71-Mbyte hard disk, 3 Mbytes of memory, four-plane graphics coprocessor, and a VR290 color monitor.
3. *Entry-Level Eight-Plane Color System*
MicroVAX II in the BA123 enclosure, an RD53 71-Mbyte hard disk, 3 Mbytes of memory, eight-plane graphics coprocessor, and a VR290 color monitor.
4. *Extended Color System*
MicroVAX II in the BA123 enclosure, three RD53 71-Mbyte hard disks, 9 Mbytes of memory, eight-plane graphics coprocessor, and a VR290 color monitor.

Ada and AI Workstation Models.
VAX Ada is Digital's quality implementation of the Ada programming language for the entire VAX family. It conforms to the ANSI-83 Ada standard.

The Ada Programmer's VAXstation II/GPX offers high-resolution color graphics suitable for mapping and situation display graphics. It also allows you to work with a powerful, dedicated VAX that increases your productivity, maintains consistent response time, and helps control the cost of developing Ada applications. For instance, the Ada Programmer's VAXstation II/GPX allows you to maintain multiple contexts, all running simultaneously, while being constantly updated. You could edit one Ada program, debug another, and compile a third concurrently.

The AI VAXstation II/GPX combines the performance of the MicroVAX II CPU with one of the most powerful implementations of the LISP language, VAX LISP. The end result is the first fully integrated, color, artificial intelligence workstation. In addition, over 150 UIS graphics functions have

been integrated into VAX LISP, creating one of the most powerful systems to serve the needs of the AI applications developer. You have instant access to graphics for both interpreted and compiled VAX LISP programs – without calling subroutines – and VAX LISP is Common LISP, the de facto standard for government, industry, and educational AI applications development and system delivery.

Digital's Commitment to Service.
When you buy from Digital, you're backed by one of the largest service and support organizations in the world. Our Customer Services organization offers many different service and maintenance options to help you take care of your VAXstation II/GPX, from basic hardware and software support, to the peripherals and additional software that you add as your needs grow.

There's a service package that's right for your needs. Full service is available anywhere. Or you can opt for carry-in or per-call service. Whatever your needs, Digital is there to make sure your system works at maximum efficiency.

For More Information...
For more information about Digital's VAXstation II/GPX Workstation, talk to your Digital Sales Representative or contact your nearest Digital Application Center for Technology, listed below.

United States

Application Center for Technology
Digital Equipment Corporation
Two Iron Way
MRO3-1
Marlboro, MA 01752-3011
Telephone (617) 467-6802

Application Center for Technology
Digital Equipment Corporation
16800 Greenspoint Park
Suite 150S
Houston, TX 77060
Telephone (713) 875-2236

Application Center for Technology
Digital Equipment Corporation
22 Executive Park
Suite 100
Irvine, CA 92714
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Application Center for Technology
Digital Equipment Corporation
37735 Interchange Drive
Farmington Hills, MI 48018
Telephone (313) 471-6522

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Digital Equipment Corporation
2620 Augustine Drive, Suite 101
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Telephone (408) 726-9031

Application Center for Technology
Digital Equipment Corporation
455 South Gulph Road
Executive Terrace
King of Prussia, PA 19406
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Canada

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Digital Equipment of Canada, Ltd.
785 Carling Ave., Carling Sq. II
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Application Center for Technology
Digital Equipment of Canada, Ltd.
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6815 8th Street, N.E.
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Digital Equipment of Canada, Ltd.
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Telephone (416) 675-2580

Application Center for Technology
Digital Equipment of Canada, Ltd.
394 Isabey St.
Saint Laurent, Quebec
Canada H4T IV3
Telephone (514) 342-5321

Specifications

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Main memory	3 to 9 Mbytes	
Disks	RD53 71-Mbyte (BA23: one disk maximum, BA123: one to three disks) – 38.3 Milliseconds Average Access Time – 5 Mbit/Second Peak Transfer Rate	
Tapes	TK50 95-Mbyte Streaming Cartridge Tape Subsystem – 45 Kbyte/Second Peak Transfer Rate	
Bus	Q-Bus (3 Mbit/Second Bandwidth)	
Local area network	DEQNA Ethernet Interface (Standard Equipment)	
Processor Enclosure Power Requirements		
	BA123	BA23
Line Voltage	120 V/240 V	120 V/240 V
Voltage Tolerance (RMS)	88-128 V/176-256V	88-128 V/176-256V
Freq. (Single-Phase)	60 Hz/50 Hz	60 Hz/50 Hz
Freq. Tolerance	47-63 Hz	47-63 Hz
Max. Running Current	12.0 A/6.0 A	6.0 A/3.0 A
Max. Power Consumption	690 W	345 W
Operating Environment		
Temperature (sea level)	15-32°C (59-90°F)	
Relative Humidity	10-80 noncondensing	
Max. Operating Altitude	2.4 km (8,000 ft)	
Dimensions		
BA123	62.2 cm (24.5 in) Height; 33.0 cm (13.0 in) Width; 70.0 cm (27.5 in) Depth; 59 kg (approx. 130 lb)	
BA23 (floorstand)	62.2 cm (24.5 in) Height; 25.4 cm (10.0 in) Width; 72.4 cm (28.5 in) Depth; 31.75 kg (approx. 75 lb)	
Display Monitors: Monochrome and Color		
Orientation	Landscape (horizontal)	
Format	1,024 Horizontal x 864 Vertical	
Resolution	78 Pixels (dots) per inch	
Active Display Area	28.19 x 35.40 cm (11.10 x 13.95 in)	
Refresh	60 Hz noninterlaced	
Ergonomics	Standard tilt-swivel base, nonglare screen	
Controls	Brightness, Contrast	
Detached Keyboard		
105 sculptured keys, typewriter-style main array, editing keypad, numeric keypad, 20 special-function keys		
Profile	30.0 mm (1.2 in) from palm rest to home row	
Cord Length	3.6 m (12.0 ft) coiled	
Weight	18.0 kg (approximately 4.0 lb)	
Mouse		
Output	100 pulses per inch (X and Y relative displacement)	
Function Buttons	3	