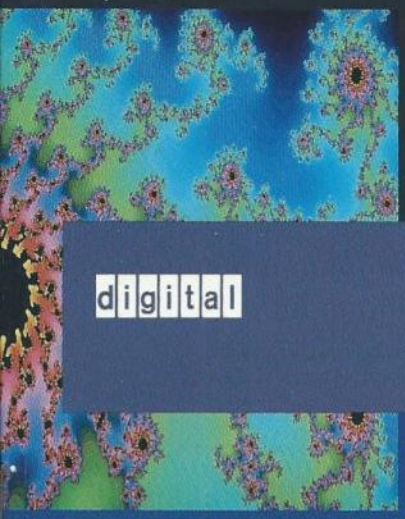
Digital's VAXstation Family of Workstations
The Productivity Leaders for All Your Workstation Needs



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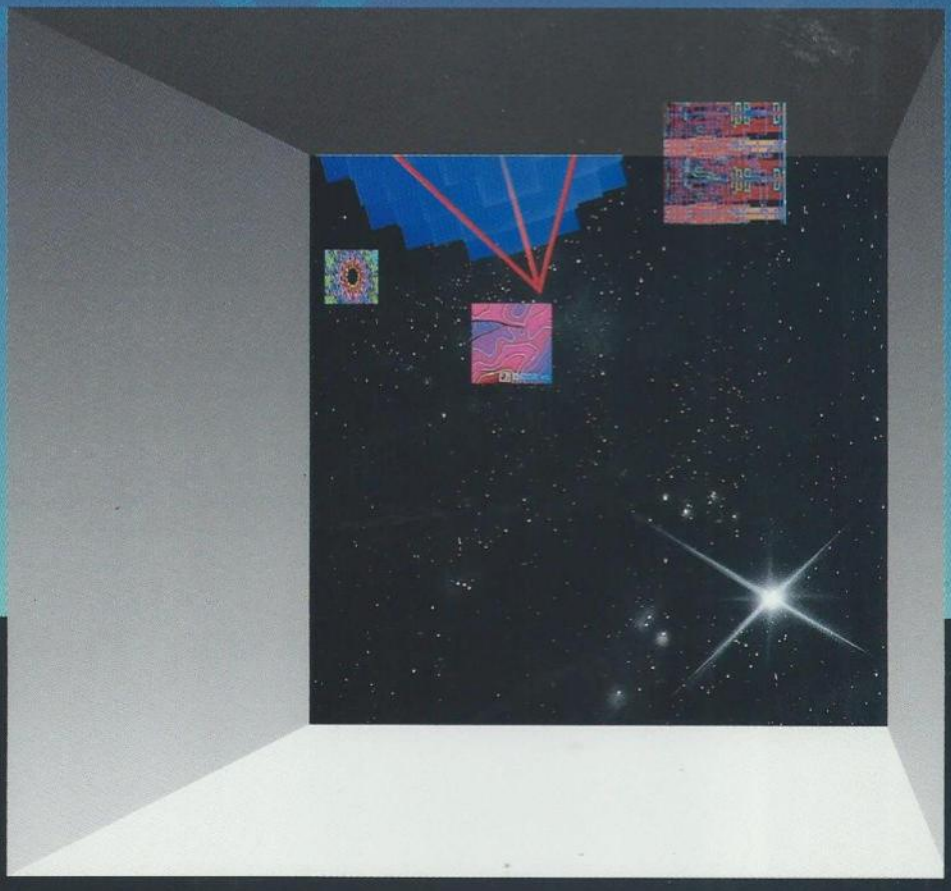
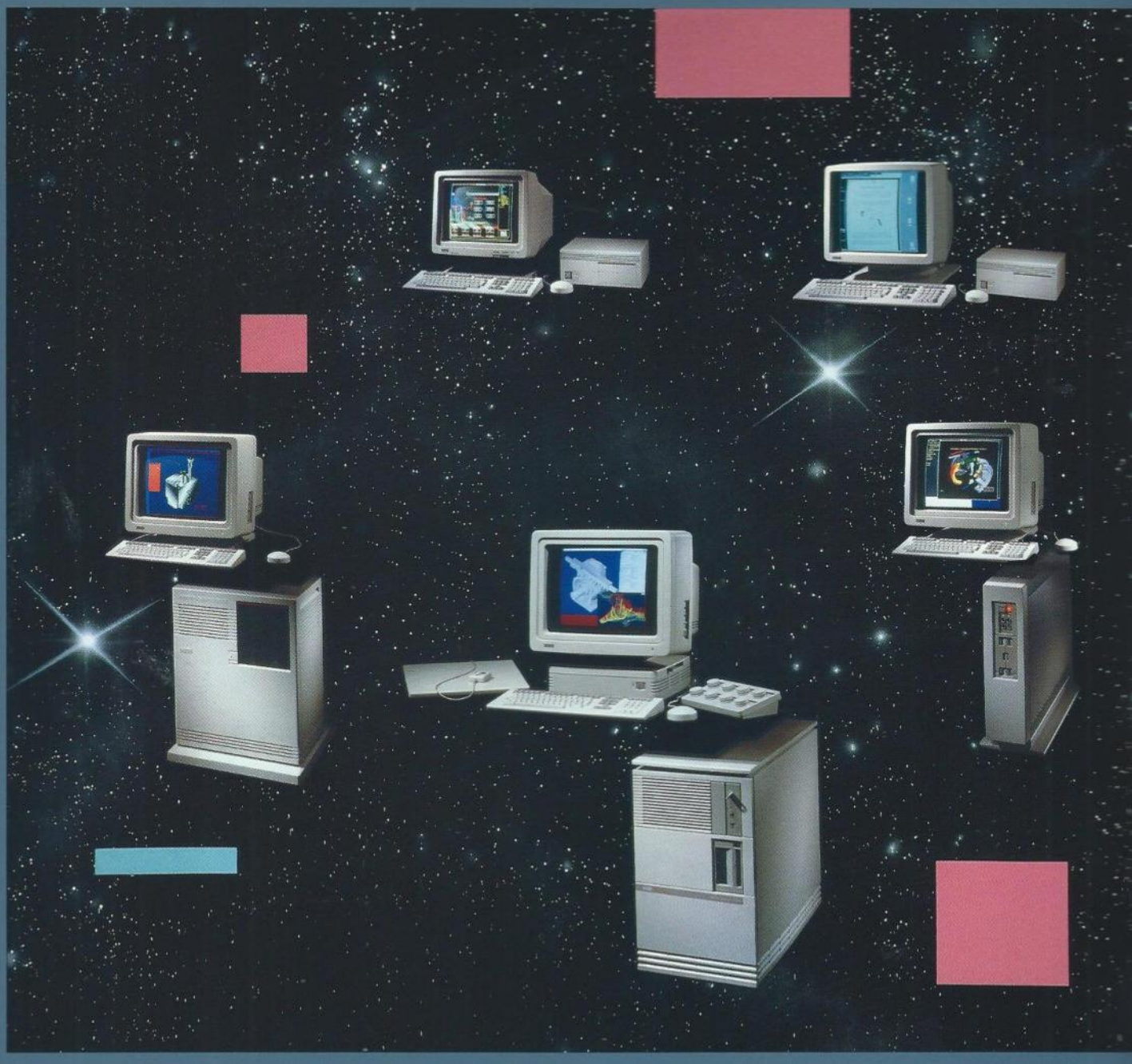




Productivity Is Making Digital the Fastest Growing Workstation Vendor in the Industry

You and your competition are doing everything you can to gain a competitive edge. You're searching for ways to produce a better engineering design in a shorter time. Trying to optimize manufacturing plans on schedule. Attempting to update complex arbitrage and hedging strategies instantaneously as markets change. In short, you're looking for ways to improve your productivity.

What you may not know is that many of your competitors are probably using Digital's VAXstation family of workstations to sharpen their edge.

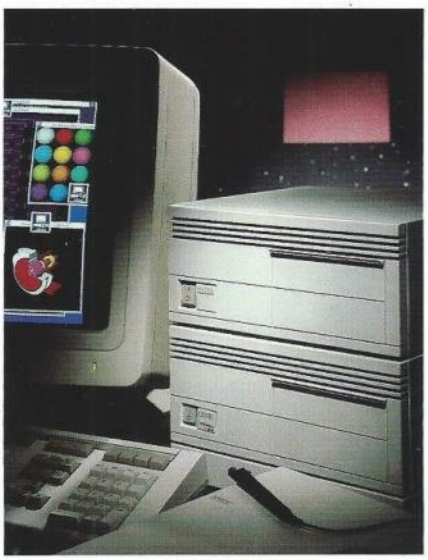
In fact, Digital is now the fastest growing workstation vendor in the industry. Because people like yourself are recognizing the value of workstations designed *with your overall productivity in mind*. Not just MIPS, but productivity. That means the right processing, graphics, networking, and applications to help solve problems and increase productivity.

Digital's VAXstation family includes a range of systems, each of which is designed to address a certain set of your needs. Pick and choose, mix and match. They're all designed to work together.

Choose from the two most popular workstation operating systems. Use proven technologies to set up a working environment in which computing resources are in the hands of the people solving the problems. Select from among top-of-the-line applications in engineering, CAD, CAM, finance, publishing, modeling, laboratory, and many other areas. And enjoy service and support – hardware and software service, consulting, educational offerings – from Digital's worldwide, experienced service staff.

Behind this broad spectrum of workstation products, you'll find Digital's complete range of computer products and solutions. Digital is more than just a workstation-only vendor. We're concerned with ensuring that your entire company, whether a small office or huge multinational corporation, use computing resources that will increase your overall productivity by putting the best information and information-processing tools in the hands of the people who need them.

VAXstation Systems Span the Range of Your Needs



It's easy to tailor VAXstations to your needs. For example, you can add storage devices to the VAXstation 2000, up to a maximum of 318 Mbytes of local hard-disk storage.

The VAXstation family includes single-user workstations for a wide range of computing needs. Our goal is to provide local processing, graphics, and storage that's appropriate to the work at hand. But more important, Digital's approach is to make sure you can share information easily among workstations and beyond.

So all of Digital's VAXstation products share a common VAX processing heritage. That means you can run the same applications and use the same data across your entire set of VAXstations. And the same applications and data will run beyond the workstation environment, too, on larger VAX systems located throughout your organization.

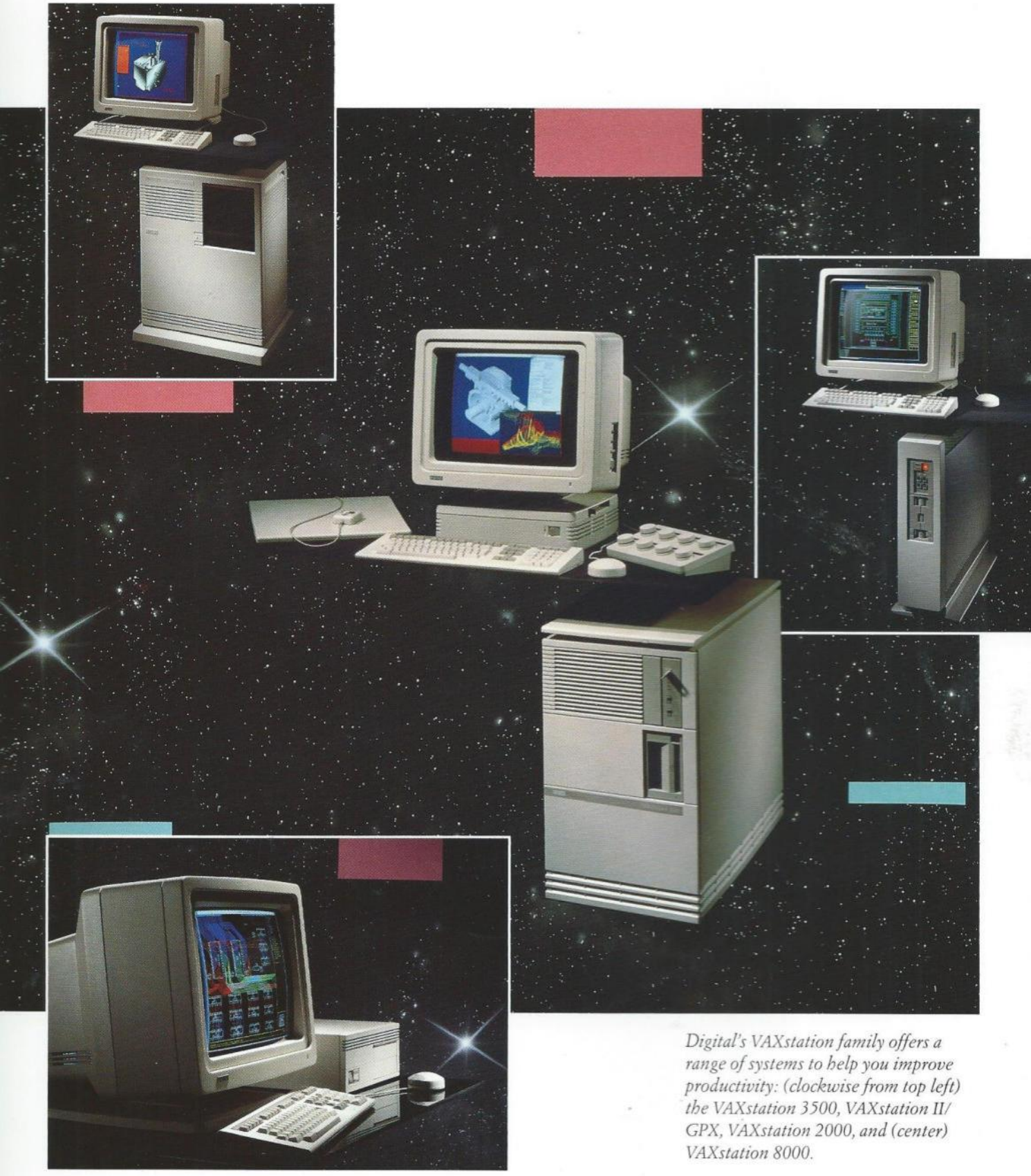
VAXstation systems also use the same monitor and input devices to create a familiar environment for users. The standard 19-inch (48.5-cm) color or monochrome monitor provides clear, crisp graphics. You can input and manipulate data conveniently with Digital's award-winning keyboard and three-button mouse, or optional digitizing tablet with light pen or cross-haired puck.

For local storage, the decision's up to you. You can configure your VAXstation workstation with local disk storage or without.

Most important, all VAXstations are designed from the ground up to be networked systems. That doesn't mean you have to use them in a network, but if you want a networked environment, you can set one up easily. An interface for Ethernet, the most popular hardware medium for networking, is built into every VAXstation. Use your choice of Digital's networking software – DECnet-OSI (Digital's OSI-compliant networking protocol with thousands of nodes installed) or TCP/IP (the UNIX® networking protocol standard), plus gateways to IBM® or X.25 networks – to tie your workstation into any other networked system, anywhere in the world.

Where Price Is the Key – The Versatile VAXstation 2000

For users who need 2-D graphics and the processing power of a workstation, and for whom cost is a primary concern, there's the VAXstation 2000. It is the lowest-cost member of the VAXstation family. This desktop system comes in both color and monochrome versions with four or eight planes of graphics, as well as in disk-based and diskless implementations. Select either the 15-inch or the 19-inch monitor – either way, you get the high-resolution screen you need.



Digital's VAXstation family offers a range of systems to help you improve productivity: (clockwise from top left) the VAXstation 3500, VAXstation II/GPX, VAXstation 2000, and (center) VAXstation 8000.

If you're working in technical publishing, software development, or an administrative, business or educational environment, the monochrome VAXstation 2000 is an ideal choice. If you need low-end CAD capabilities or color business applications, the color version of the VAXstation 2000 is your low-cost choice.

For Entry-level 3-D and Expansion – The VAXstation II/GPX
Users who need entry-level 3-D graphics and the ability to add memory and local disk storage will find the VAXstation II/GPX their best choice. The VAXstation II/GPX delivers high-performance computing and high-performance graphics in a deskside package.

Users working on VLSI and PC board layout, MCAD, process control monitoring, CASE, and mapping find that the VAXstation II/GPX has everything they need to get down to work. Also, the VAXstation II/GPX is the system to choose when you need a low-cost Q-bus system.

High-performance Processing and Graphics – The VAXstation 3200 and 3500
Users who need exceptional processing speed and fast, low-end 3-D graphics can choose the VAXstation 3200 and 3500 systems. Both offer Digital's new CMOS VAX processor to deliver high levels of local processing power – up to four times that of the VAXstation II/GPX. Both come with either color or monochrome graphics, and as disk-based or diskless systems.

The VAXstation 3200 is an expandable, deskside system that is most often used in networked environments. The VAXstation 3500 is packaged in a new cabinet that provides quiet operation and enhanced resistance to shock and vibration. Equally appropriate in the office or on the factory floor, this cabinet provides more option slots to provide maximum expansion for the VAXstation 3500.

If your work includes MCAD, ECAD, Artificial Intelligence (AI) system development, earth resources, molecular modeling, or complex realtime analytics, the VAXstation 3200 or VAXstation 3500 is the system for you.

Industry-leading Graphics Speed and Clarity – The VAXstation 8000
The most demanding graphics users will find that the VAXstation 8000 meets their needs. The result of a joint development project between Evans & Sutherland Inc. and Digital Equipment Corporation, the VAXstation 8000 provides the fastest vector drawing speed in the industry, outstanding real-time 3-D graphics clarity, and a high level of local processing power.

The VAXstation 8000 system consists of a powerful Digital processor and a graphics coprocessor from Evans & Sutherland, an acknowledged leader in computer graphics technology. Truly exceptional graphics are the result of a unique antialiasing technique that uses hardware to provide very clean, crisp, smooth images in realtime.

To manipulate complex 3-D graphic objects in realtime, choose the VAXstation 8000. Applications in which this top-of-the-line system is most popular include molecular modeling, fluid dynamics, mechanical computer-aided engineering and design, manufacturing engineering, command and control, and computer animation.

VAXstation Family Comparison Chart

	VAXstation 2000	VAXstation II/GPX	VAXstation 3200	VAXstation 3500	VAXstation 8000
Monochrome available	Yes	Yes	Yes	Yes	No
Maximum simultaneous colors	16 or 256	16 or 256	16 or 256	256	16 million
Number of planes	1 or 4 or 8	4 or 8	4 or 8	4 or 8	58
Resolution (pixels)	1024 by 864	1024 by 864	1024 by 864	1024 by 864	1024 by 864*
Processor technology	ZMOS	ZMOS	CMOS	CMOS	ZMOS
Relative processor performance	1†	1†	2.6 to 4.2†	2.6 to 4.2†	1.4‡
Graphics coprocessor§	Yes	Yes	Yes	Yes	Yes
Max. system memory	14 Mbytes	16 Mbytes	16 Mbytes	32 Mbytes	32 Mbytes
Backplane	None	Q-bus	Q-bus	Q-bus	VAXBI bus
Number of slots	None	8 or 12	8	12	6
Expansion slots	None	2 or 6	1	4 or 6	1
Storage					
Diskless support	Yes	Yes	Yes	Yes	Yes
Disk (Min/Max)	42/318 Mbytes	71/477 Mbytes	159/318 Mbytes	280/560 Mbytes	159/477 Mbytes
Internal tape	95 Mbytes	95 Mbytes	95 or 296 Mbytes	296 Mbytes	95 Mbytes
Ethernet	Yes	Yes	Yes	Yes	Yes

* Effective 8192-by-6912 pixels
† 1 = VAX-11/780
‡ One VAX 8250 CPU. Three MicroVAX II CPUs bring total to 4.3.
§ On grey-scale or color configurations

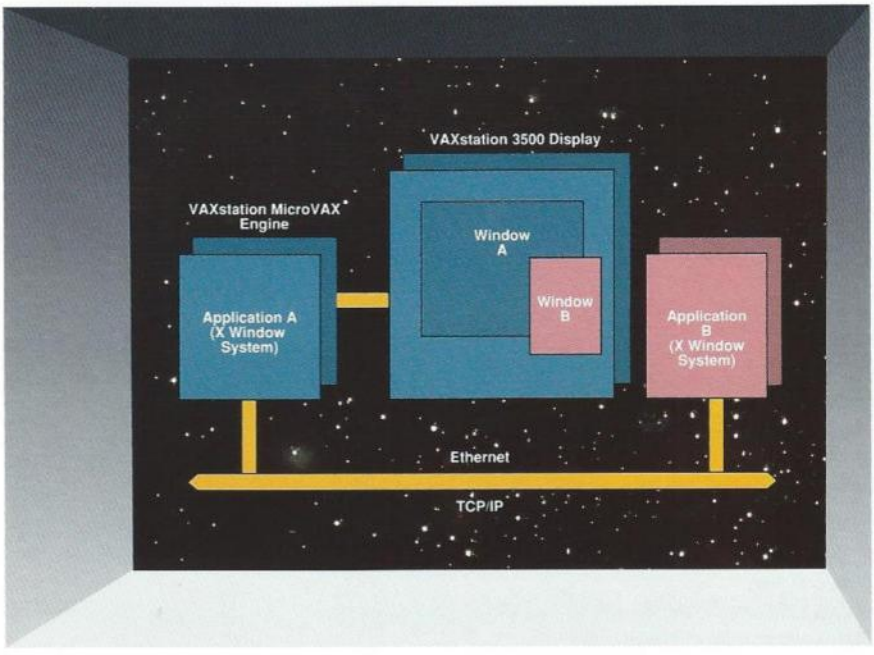
Choose from the Two Most Popular Workstation Operating Systems

Digital offers you the two most popular workstation operating systems in the industry: a UNIX product and a VMS product. Digital has been a leading supplier of UNIX systems ever since the first UNIX system was written on a Digital PDP-7. In fact, Digital has been the leading seller of UNIX-based hardware and software for the last 19 years. The renowned VMS operating system was designed and written specifically to take advantage of the VAX architecture. A sophisticated virtual-memory system, VMS offers a rich set of tools, utilities, and languages to help you work efficiently.

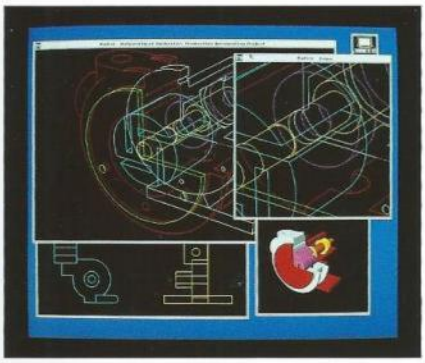
UNIX Products for VAXstations – The ULTRIX-32w Family

Digital's UNIX-based software is called ULTRIX. ULTRIX is based on the Berkeley Software Distribution 4.3 operating system and has base-level AT&T™ System V Interface Definition (SVID) support.

ULTRIX for VAXstations includes ULTRIX-32w windowing software that enables users to open and manipulate multiple windows on the screen so that they can work on multiple tasks simultaneously. The ULTRIX-32w software, based on the emerging UNIX windowing standard, the X Window System,™ enables you to resize, restack, move, and iconify windows, and provides pop-up menus for creating new windows, changing colors, or starting applications. You can easily customize the software, too, so you and other users have complete control over your window environment. The X Window System also offers a complete graphics toolkit, including windows, scrollbars, buttons, selectors, and geometry managers.



The X Window System, an emerging windowing standard for UNIX-based workstations, is network-based. Graphic applications running on a larger VAX host can run on a more powerful processor on the network, with the graphics result presented within the local VAXstation X Window. You can literally get mainframe compute power in each window!



The X Window System for ULTRIX-based VAXstations and the VWS windowing system for VMS-based VAXstations improve users' productivity by enabling them to move among windows to work on several tasks simultaneously. Users easily create, manipulate, and change the characteristics of the windows.

A key advantage of the X Window System is that it is network-based. So if you've set your workstation up as part of a network, you'll be able to run graphics applications on more powerful systems in the network, and have the graphics presented on your workstation monitor. This technology can save you hours of processing time by running compute-intensive tasks on servers on the network, while retaining the graphics presentation you need.

A VMS System with Windows – VMS with VWS Software

People more familiar with Digital's popular VMS operating system may choose VMS for VAXstation systems.

The VMS running on your workstation includes Digital's VAX Workstation Software (VWS). VWS provides powerful multiwindowing graphics capabilities for the VAXstation family. Through the VWS menu-based human interface, users have easy access to the VAXstation's windowing routines. These menus help you create emulated VT220 windows, control their location, enlarge or shrink them, and change such display characteristics as background and text color.

Building on the rich VMS application-development environment, the VWS software makes it easy to create applications that can use multiple windows; generate graphics and produce such graphic effects as zooming and panning; generate text in application-selectable fonts; and react to user input from the mouse, keyboard, tablet, or other input device.

Digital has also announced the DECwindows program, which will add a consistent user interface to the X Window software already running in the ULTRIX-32w software.

With VAXstations, You Can Have the Best of Both Worlds

If some people in your group prefer a UNIX system and others prefer a VMS system, that's fine. Digital's VAXstation family of products includes a set of tools that enables users to link their ULTRIX and VMS systems and applications in a mixed operating system environment. Users throughout the network will work together smoothly, regardless of the operating system they choose.

For example, to facilitate networking in a mixed ULTRIX/VMS environment, Digital offers TCP/IP and DECnet-OSI for ULTRIX and VMS systems. To help application developers writing software for users in a mixed operating system environment, Digital provides the same compilers (e.g., VAX FORTRAN and VAX LISP) and graphics libraries (GKS and, for the VAXstation 8000, PHIGS) for both ULTRIX and VMS systems.

Then, for UNIX users who want access to VMS, we offer VNXset software. VNXset provides a user interface identical to the ULTRIX user interface, including VAX DEC/Shell, a command-language interface to VMS similar to the Bourne shell; and VAX DEC/Code Management System and VAX DEC/Module Management System, which provide capabilities similar to Source Code Control System.

Put Your Resources in the Hands of the People Who Need Them

As the pioneer of the minicomputer industry, Digital has been working for years to put computing resources in the hands of the people who need them. In some cases, that means a timesharing environment with users working at terminals. In other cases, it means giving people powerful workstations that combine the efficiency of local processing and graphics with the networking that enables them to share information and expensive resources.

With Digital's distributed VAXstation strategy, you get the best of the workstation and timesharing worlds. Compute stations can be distributed when and where needed. Expensive peripherals can be shared easily. And there's no need for large amounts of disk storage on each workstation. Large disks can be shared transparently by all users. Workstation system management and maintenance is centralized. Data and applications can easily be shared by all users. Best of all, everyone has the graphics, power, and performance of Digital's state-of-the-art VAXstation workstations.

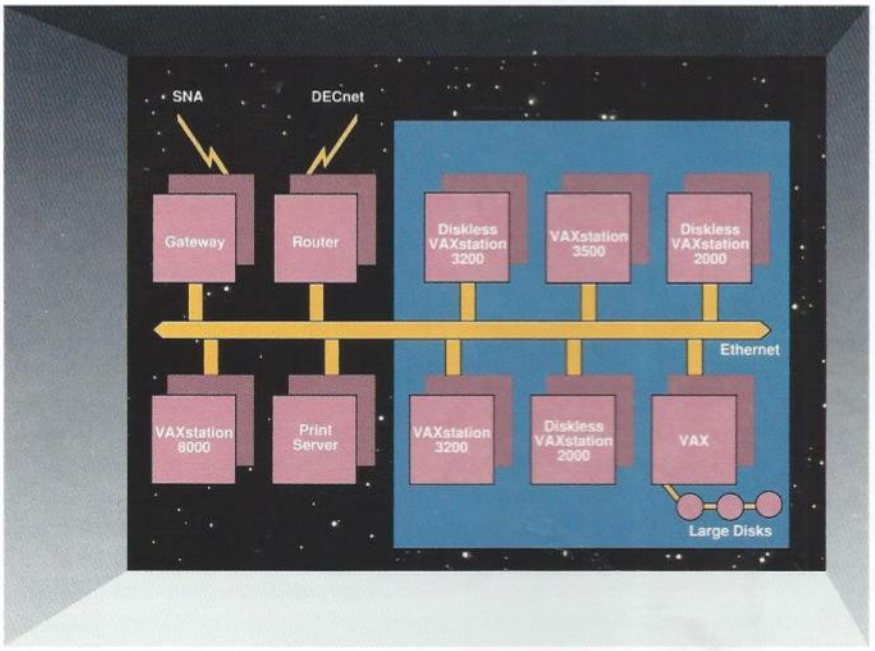
Digital provides distributed computing platforms for both VAXstation operating systems: NFS™ for ULTRIX workstations, and Local Area VAXcluster software for VMS workstations.

NFS for ULTRIX Workstations
For UNIX-based workstations, Digital supports the popular Network File System (NFS). Using Ethernet as the hardware medium, NFS effectively creates a single, systemwide directory to enable users to share files and data. Users working on a VAXstation running ULTRIX have transparent access to files on larger VAX systems, on file servers, and on other workstations. Users need never concern themselves with whether the file is on a local disk, or on a remote system.

NFS also simplifies system management with its network administrator service, Yellow Pages. Yellow Pages distributes and maintains the data needed to define the network, its users, and services. Network managers who have centralized access to this information enter any necessary changes once, and Yellow Pages automatically updates all related data files.

Local Area VAXcluster Software for VMS Users
For VAXstation users running VMS, Digital offers the powerful Local Area VAXcluster software. This elegant network clustering scheme offers truly transparent distributed computing. Local Area VAXcluster systems integrate diskless and disk-based VAXstation and MicroVAX systems with servers, high-speed peripherals, and midrange and large VAX systems. The result is an environment that can work as a single, powerful, flexible system.

Local Area VAXcluster software for VMS-based VAXstations creates a single environment in which every system in the Local Area VAXcluster has transparent access to any other system or resource attached to the Ethernet. Now Local Area VAXclusters can also connect to VAXclusters of larger systems.

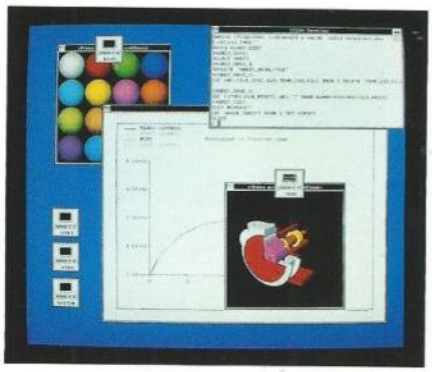


The Local Area VAXcluster software provides a single file system that is available to the entire cluster of systems. With it, the Ethernet network becomes the backbone of the VAXcluster environment, giving every system on the VAXcluster transparent access to any other system or resource attached to it. This means that users working on VAXstations have instant access to the Local Area VAXcluster's disk and file servers, high-speed printers and plotters, and to high-performance compute servers such as the VAX 8840.

When you set up your workstations in a Local Area VAXcluster environment, you no longer need large amounts of local storage for each VAXstation: the VMS operating system, windowing software, and data and applications can be stored centrally.

You and other users in a Local Area VAXcluster environment will also find yourselves with more time to do productive work because you won't have to deal with the system maintenance generally associated with workstations. All of the systems in the VAXcluster are managed as a single VAX system, so individual VAXstation users are completely free from such regular maintenance tasks as backing up data and updating software when new versions are released.

Applications That Get the Work Done



Choose from top-of-the-line workstation applications in a variety of application areas, and take advantage of the thousands of applications available for VAX systems.

The bottom line in workstation productivity is applications. Can you run the applications you want on the workstation? If you want to use proven applications from leading software vendors, the answer for VAXstations is a resounding "Yes!"

Over the years, Digital has cultivated solid business relationships with many of the top-of-the-line application vendors. These companies make their software applications available for new Digital systems as soon as they're announced. Choose from among the most respected applications in such application areas as ECAD, MCAD, science and research, research and laboratories, earth resources, CASE, electronic engineering, office, electronic publishing, Computer Integrated Manufacturing (CIM), and AI.

Because all of Digital's VAX systems share a common heritage, VAXstation users also have access to the applications that are available for Digital's other VAX systems. That's literally thousands of applications: VAX systems boast the largest library of applications available on a single family of products. Use the *VAX Software Source Book* and the *ULTRIX Software Source Book* to get a sense of just how many applications are available to you.

DECwindows Program Puts All Applications Within Your Reach

The DECwindows Program may be the most important factor in your future productivity. With the DECwindows Program, Digital has announced its intention to provide users with a consistent user interface for applications, whether they're using ULTRIX, VMS, or MS-DOS, or whether the application is running locally or halfway around the world. Just think of the savings in training and retraining, in hours lost making costly mistakes because you're working in an unfamiliar environment.

The DECwindows program is based on the X Window System software Digital currently offers on ULTRIX workstations. The X Window System allows users to run applications anywhere on the network simply by opening a window on their VAXstations. The application runs wherever it resides, and the graphics are displayed at the user's workstation. To this base, DECwindows will add a consistent user interface that will be available with all software from Digital. The DECwindows Toolkit will also make it easy for application developers to write software that will present the same consistent interface to users.

Watch for announcements of DECwindows products.

Integrated Services Offer Support for All Aspects of Your Computing Solution

Worldwide service from Digital includes hardware and software service for your systems, management consultants to help you implement the best computing solution for your organization, and educational services to get users up to speed quickly.

Digital understands that you're probably much more interested in getting your work done than you are in worrying about your computing solutions. So we offer one of the most diverse suites of services available in the industry. Service that keeps your systems running at peak performance, helps your company design and implement the best computing solution, and brings users up to speed quickly.

Worldwide Service from Over 10,000 Professionals

Timely, efficient service for your workstations is an important aspect of ensuring your productivity. It's simple: the more uptime you have, the more work you can get done.

Behind each VAXstation stands a service team of over 10,000 experienced service professionals. Developed over the course of more than 30 years, this organization is one of the largest, most respected service groups in the computing industry. The robust service options available to you translate into more uptime for your systems, whether you're responsible for a few workstations downstairs or for hundreds around the world.

Digital's Customer Services organization offers many different service and maintenance options to help you take care of your VAXstations, from basic hardware and software support to the peripherals and software that you add as your needs grow. In addition, special software and systems resource teams are available for customized VAXstation solutions.

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

Digital Can Help You Design and Implement a Complete Solution

In all likelihood, your VAXstations will be one of many computing resources working on your business problems. Digital's experienced service staff can help you get the most from these resources by designing and then managing the implementation of solutions that range from application programs to complete systems and networks. Look to our management services professionals to provide leadership and management expertise for your projects, programs, and system integration efforts. Or count on our network experts to provide a full range of services that can optimize your network.

The Right Training Shortens the Learning Curve to Productivity

Learning how to get the most out of your workstation environment is crucial to increasing your productivity. Training from Digital Educational Services can help make that learning process as convenient as possible, with your choice of classroom lectures and labs at one of over 40 training and consulting centers around the globe, computer-based instruction, interactive video technology, self-paced print and video-based courses, and seminars. If you prefer, our education professionals will work with you at your site to provide custom training.

With VAXstations, You Build Your Future on Standards

We all hear a lot of talk these days about the importance of standards. Seemingly overnight, companies claim they've developed a standard for this or that. It's confusing – so many standards, so many claims of standardization.

Amid all the confusion Digital is taking a consistent stance. We've been working on computing solutions long enough to appreciate the painstaking work involved in developing a standard. Point by point, detail by detail, with give-and-take among technology experts and users with investments in existing technology to protect. It's this kind of time-consuming, expensive work and rework that derives meaningful standards. And it's this kind of standards development that Digital participates in and drives.

But we know that you can't just sit back and wait while this long process takes place. So we commit ourselves to adhering to developing standards – such as UNIX, POSIX, OSI, and X Windows. You're assured that the products you order today will be able to work within the standard environments as they develop over the years.

Your Workstations Will Help You Work Productively with the Whole Company
With so many workstation vendors, the description of the workstation product is the end of the discussion. With Digital, it's only the beginning.

Digital offers a full line of compatible, networked computing solutions, from desktop VAXstations through the large VAX 8800 Series and VAXclusters. With this product breadth, Digital can offer you a complete range of integrated solutions throughout your organization, and beyond. And assure you that the VAXstations you buy today will easily become part of a larger computing environment.

Moreover, Digital leads the industry in integrating computers from a variety of vendors into a single, productive information system. The recently announced Network Application Support program underscores Digital's long-term commitment to making it easy to integrate systems from other vendors into Digital's DECnet/OSI networks.

For More Information...
For more information on how VAXstation workstations from Digital can help your organization be more productive, contact your local sales representative.

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