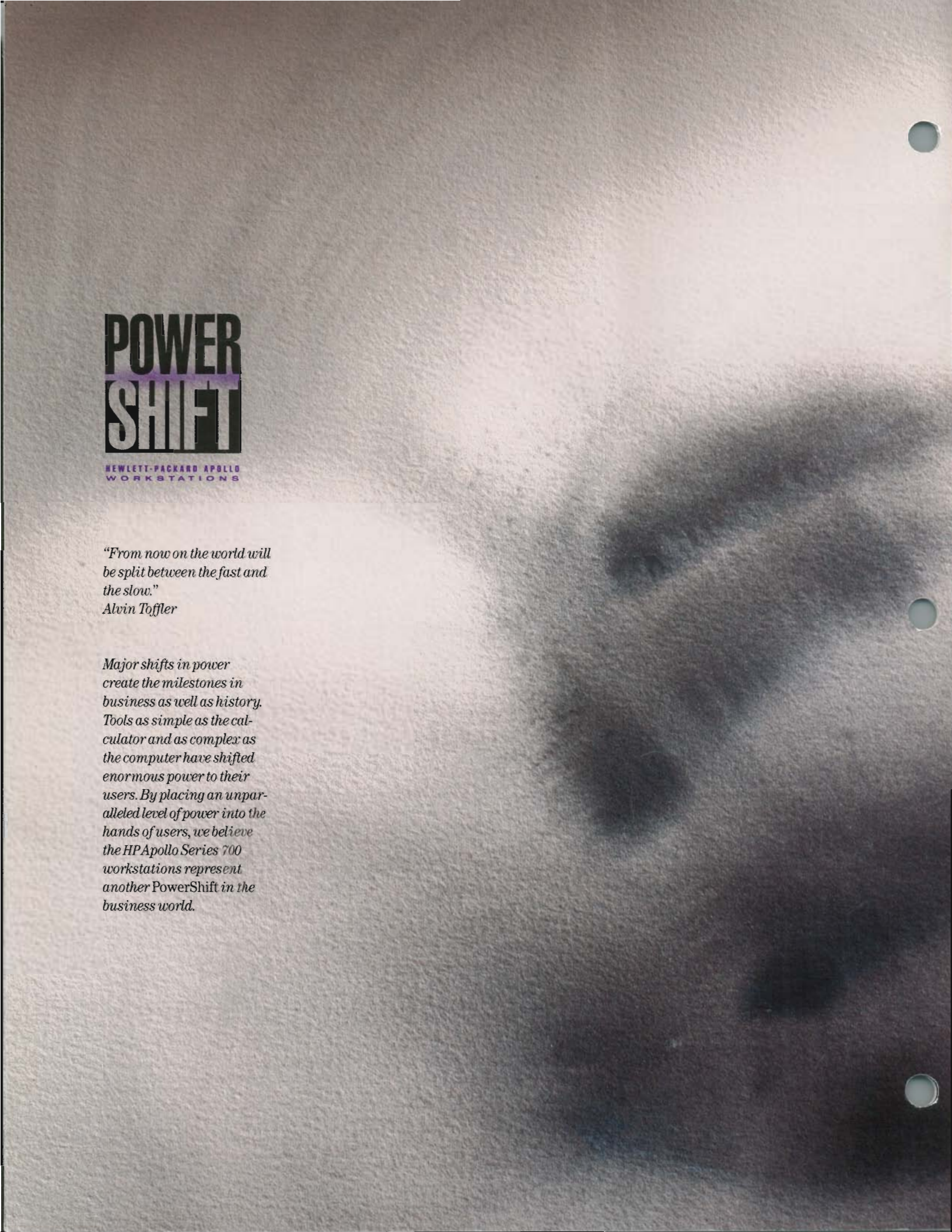
HEWLETT PACKARD

The Best RISC Workstations in the Industry



"From now on the world will be split between the fast and the slow."
Alvin Toffler

Major shifts in power create the milestones in business as well as history. Tools as simple as the calculator and as complex as the computer have shifted enormous power to their users. By placing an unparalleled level of power into the hands of users, we believe the HP Apollo Series 700 workstations represent another PowerShift *in the business world.*

HP Computer Museum
www.hpmuseum.net

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Whether you're comparing price/performance, standards, networking, or graphics, you'll find that Hewlett-Packard has the best RISC-based workstations in the industry – the HP Apollo Series 700.

The HP Apollo Series 700 workstations are the most powerful, cost-effective RISC workstations on the market today. In fact, Hewlett-Packard is the price/performance leader in RISC workstations.

The Industry's Best RISC Architecture: PA-RISC

The Series 700 workstations are based on HP's proven PA-RISC architecture. Since 1986 HP has continued to reduce the cost and improve the performance of this architecture at a rate that leads the industry. And because of its widespread use, it already enjoys broad application support throughout commercial and technical markets, so you can benefit from this outstanding performance on the Series 700 workstations today.

HP's PA-RISC architecture delivers this unprecedented performance due to innovation and investment in three key areas: a sophisticated, scalable processor architecture, superior microprocessor design and manufacturing processes, and leading-edge compiler technology. By focusing on these areas, HP delivers industry leadership on every performance front, enabling the Series 700 workstations to achieve performance levels previously available only with mainframe systems.

RISC Systems to Meet Your Price/Performance Needs

Three models comprise the Series 700 family of workstations and they're available with a variety of graphics options. The entry-level Model 720 delivers the best price/performance in the industry, along with outstanding X11 Window performance. The Model 730 provides even faster performance, making it the industry's highest performance desktop workstation. And the Model 750 combines this leading performance with outstanding expandability for your most sophisticated and demanding applications.

Model 720 and 730

The entry-level Model 720 offers 57 MIPS, 17 MFLOPS, and 55.5 SPECmarks to provide the industry's leading price/performance workstation. The Model 730 performs at up to 76 MIPS, 22 MFLOPS, and 72.2 SPECmarks, making it the most powerful desktop workstation in the industry.

Both the Model 720 and 730 come with 16-64MB of ECC RAM and up to 840MB of internal storage capacity, a full complement of connectivity features, and outstanding graphics options. And both can be configured as deskside or desktop systems, designed to meet your needs right from the start.

	Series 720	Series 730	Series 750
MIPS	57	76	76
SPECmarks	55.5	72.2	72.2
MFLOPS	17	22	22
PA RISC Processor	50MHz	66MHz	66MHz

Model 750
The Model 750 provides the same outstanding leadership performance as the Model 730 but offers exceptional expandability and larger cache and RAM capacity. The deskside Model 750 can support up to 192MB ECC RAM and has an internal storage capacity of 2.6GB. The Model 750 also supports internal removable mass storage devices such as CD-ROM, 4mm DAT, and 3.5-inch floppy disk. It also offers a standard graphics connect slot and four EISA slots. This increased memory, disk, and system flexibility make it an ideal compute server to tackle more compute-intensive applications.

Of course, the outstanding graphics functionality and ease of use you've come to expect from HP are also delivered with the Series 700 workstations.

Graphics You Have to See to Believe

HP continues to lead the way in graphics in speed, realism, and standards. Special graphics instructions and performance enhancements within HP's PA-RISC architecture allow the Series 700 workstations to achieve higher levels of graphics performance than any other workstations in their class. The Series 700 workstations have been designed to let you choose the right graphics option for your needs – from grayscale to advanced 3D graphics.

GRX – Fastest X11 Window Performance in the Industry
GRX is a high-performance, grayscale option for cost-conscious customers in areas such as CASE, artificial intelligence, database management, and document publishing. The 256 shades of gray improve viewing and aid comprehension. GRX provides outstanding windowing performance with the X Window System, OSF/Motif, and HP VUE. In fact, the Series 700 X Window performance is **the best** in the industry – nearly a million X11 vectors/second.

Features	Benefits
Graphics Options	
GRX (Grayscale, 19", 1280 x 1024, 72 Hz)	
870K-910K X11 vectors/sec	• Industry's fastest X11 windowing performance. Improved productivity in CASE, DTP, and commercial applications
820K-1.150K 2D/3D vec/sec	
8-bit grayscale	• 256 shades for increased comprehension
GPCmark* 2D ECAD: 15	• Exceptional speed
CRX (Color 2D, 3D vectors, 19", 1280 x 1024, 72 Hz)	
870K-910K X11 vectors/sec	• Leadership windowing and vector performance ideal for design, engineering, and scientific applications
1.120K-1.150K 2D/3D vec/sec	
8-bit color	• 256 colors from a palette of 16.7 million
8/8 plane double buffering	• Allows smooth movement of dynamic images
GPCmark 3D Wireframe: 24	• Exceptional speed
PersonalVRX (Color, 3D solids, 19", 1280 x 1024, 60 Hz)	
54,000 triangles/sec	• Fast solids rendering through X11/Starbase and X11/PHIGS
37,000 quads/sec	
16-bit Z Buffer	• Speeds modeling and design
Virtual 24-plane Dithering	• Realism eliminates errors and reduces costly prototypes
GPCmark 3D Solid: 16.5	• Exceptional speed
TurboVRX T2/T4 (Color, 3D visualization, 19", 1280 x 1024, 72 Hz)	
671K/882K anti-aliased 3D vec/sec	• Highest-performance rendering allows manipulation of the largest models
216K/330K triangles/sec	
98K/195K quads/sec	
24 image planes	• Realism eliminates errors and reduces costly prototype cycles
24-bit Z Buffer	
6th Order NURBS	• Provides realistic, complex shapes/curves
GPCmark 3D Solid: 40/70	• Exceptional speed
Graphics Software	
X11/PHIGS, X11/Starbase, X11/GKS	• Speed and realism through standards enhance the capabilities of all applications
Wavefront's Personal Visualizer (with PVRX and TVRX options)	• Allows users to produce highly realistic renderings without large investments or training

*Series of benchmarks from NCGA.

CRX – Outstanding 2D and 3D Color Wireframe
The CRX graphics option gives you the same exceptionally fast X Window performance, as well as price/performance leadership for 2D and 3D color vectors. In fact, the Series 700 workstations are the first desktop workstations to achieve over 1 million 2D and 3D vectors per second. This high-performance 2D and 3D color option provides a 72Hz flicker free, 1280 x 1024 monitor, producing an extremely crisp display.

PVRX – 3D Color
PersonalVRX (PVRX) delivers affordable, solid-rendering 3D graphics with dynamic shading for MCAD and MCAE markets. The PVRX option provides a wide variety of features for advanced design and analysis. Wavefront's Personal Visualizer is included to allow users to produce highly realistic rendering capabilities without large investment or training. In addition, the PVRX option lets you use the PHIGS standard on HP's Starbase graphics library in a smoothly integrated X11 Window environment.

TVRX – Highest Performance Graphics
TurboVRX (TVRX) is HP's advanced 3D modeling and rendering graphics system for high-end design, analysis, and visualization. In addition to the functionality provided by PVRX, TVRX provides high-performance anti-aliasing, alpha blending, and texture mapping capabilities. The TVRX option provides full-performance PHIGS capabilities integrated in an X11 Window environment.

Open Systems: HP-UX and OSF/1
Of course, there's more to a workstation than price/performance and graphics. Hewlett-Packard supports a wide range of industry standards to provide you with an easy-to-use, flexible computing environment for today and tomorrow. In fact, in addition to being a leader in RISC-based systems, Hewlett-Packard is

Series 700 Expansion Capabilities
HPIB
Fast SCSI-II
IEEE 802.3 plug-in card
FDDI

Series 700 Built-in Capabilities
SCSI-II
Ethernet 802.3 (Thick and Thin Net)
Centronics
RS232C serial ports
EISA slots

Networking and System Management Products
NCS – A set of cooperative computing products that allow applications to be separated at the procedure level and distributed across the network.
TaskBroker – a batch queuing system to access network resources
Omniback – provides file backup and restore procedures for a heterogeneous network of computers
NetLS – allows concurrent usage of software by a community of users
Passwd Etc. – ensures the assignment and use of unique user names and passwords across heterogeneous networks.
NFS – Network File System allows many heterogeneous systems to share the same files
Network Node Manager – manages networked systems and devices in a heterogeneous IP environment.
LAN Manager/X – allows UNIX systems to be a file server for PCs.

also the #1 UNIX hardware vendor * with its HP-UX operating system. HP-UX, HP's UNIX operating system, provides a robust, open operating environment based on UNIX System V Release 3 and Berkeley 4.3. HP-UX is a proven operating system with broad applications support and is widely used throughout the industry across HP's extended PA-RISC and Motorola family.

The Series 700 also provides you with access to the emerging distributed operating environment of the 1990s, OSF/1. HP OSF/1 is Hewlett-Packard's enhanced version of the Open Software Foundation's standards-based open operating system. In the HP tradition of protecting your investments, HP OSF/1 will allow you to build a distributed cooperative computing environment that can take advantage of the benefits offered by other emerging OSF standards.

Cooperative Computing Through Open Systems

In the early 1980s, Apollo Computer Inc., now a division of HP, was the first to offer a distributed file system with complete concurrency control and global login capability. Today, HP is a recognized leader in sophisticated distributed technologies, network, and system management tools that let you build a corporate-wide, heterogeneous, cooperative computing environment.

HP was a major contributor to the OSF's request for technology for the Distributed Computing Environment (DCE). DCE is a set of integrated, yet modular tools that provide a comprehensive distributed computing environment. DCE lets application programs share resources on the network, while managing the details of network programming. Users and applications can then take advantage of the network in a simple, convenient, and consistent way.

The Series 700 workstations give you transparent access to the full power of the network, and with HP's full complement of networking products, you can benefit today from the improved productivity that's possible with cooperative computing. In fact, the Series 700 excels in its ability to interact with other computers in a network.

As you can see, the Series 700 workstations provide leading RISC price/performance, a choice of standards-based operating systems, and industry-leading cooperative computing.

Investment Protection through a Compatible Family of Workstations

With the addition of the Series 700 RISC-based workstations to the HP product line, you can take advantage of these applications and run them on the best price/performance workstations ever. Of course, no matter what HP workstations you use, all of HP's workstations work well in a heterogeneous environment. HP's unique standards-based

*Source: UNIX World Magazine December, 1990.

networking capability reflects our cooperative computing through open systems philosophy and lets you build the most cost-effective client/server computing systems available.

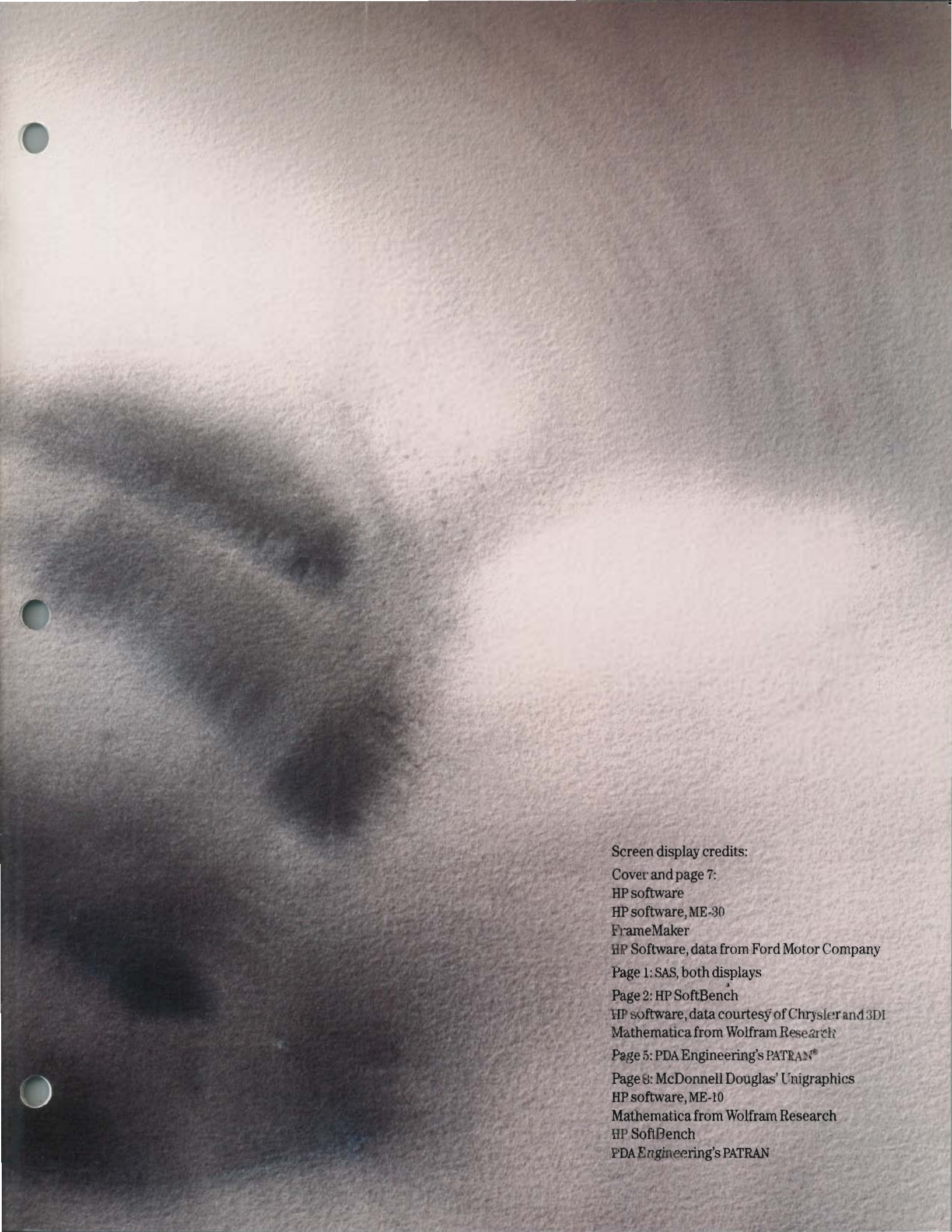
The Hewlett-Packard workstation family also includes the HP Apollo Series 400 workstations – some of the lowest-cost, highest-performing Motorola-based workstations in the industry. These workstations offer an unparalleled number of industry-leading applications, as well as upgrade paths to future Motorola and RISC enhancements. With HP's broad support of its MC68000 family, it provides the widest range of software solutions in the workstation business – in excess of 3200.

Finally, by using HP servers such as the Series 400, the Series 700, the Series 800, and the Series 10000, you can put dedicated high performance where it's needed most, and deliver power to those who need it on call. The HP-UX and PA-RISC-based Series 800 business servers combine open systems leadership with robust business capabilities to optimize transaction performance. They support up to 1000 users and offer features such as disk mirroring, automatic power recovery, and multiprocessing.

HP: The Workstation Leader

HP has the largest installed base of RISC and UNIX systems in the world and offers the broadest RISC-based family of systems in the industry. This leadership position is tightly coupled with HP's already well-established reputation as the most reliable computer vendor for product quality and customer support.

The new Series 700 workstations add to HP's unique combination of innovative products, services, and value-added business relationships that help you establish the best computing solutions available today. For more information on our products and services, call your nearest HP sales office (see list on back cover). In the U.S. you can call 1-800-752-0900 for information.



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