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HP 9000 Series 700 Model 735/125 Product Guide

March 1994

Introduction

The new high-end Model 735/125 extends the HP 9000 Series 700 workstation family with a higher-performance processor, while at the same time offering strong investment protection to current Model 735 customers. In addition the Model 735/125 offers an extremely fast I/O subsystem which includes a fast-wide SCSI-II interface with a burst transfer rate of 20mb/second.

After completing this product guide, you will be able to identify the unique characteristics and key benefits of the Model 735/125. Information is divided into:

- Family Position and Product Overview
- Investment Protection
- Product Features
- Processor Performance
- Packaging
- Memory
- Graphics
- Mass Storage Support
- Removable Media Options
- Standard I/O Specifications
- Networking Support
- Competitive Comparisons
- Target Markets
- Top Selling Features

Family Position and Product Overview

The HP 9000 Series 700 family continues to provide a complete range of industry-leading PA-RISC workstations at every price point. This successful family is now complemented by the new high-end Model 735/125.

The Model 735/125 offers exceptionally higher performance CPUs in today's Model 735 packaging, opening doors to go head-on against Sun, DEC, SGI, and IBM in every selling situation where higher CPU, graphics and server performance needs are mission critical.

The new model is based on a 125MHz implementation of the PA-RISC architecture known as the PA-7150. In addition to providing optimized performance, the new PA-7150 offers:

- Full binary compatibility with the Series 700
- Preservation of customer investments in existing system packaging , peripherals, graphics, and memory.
- Greater system performance is achieved by optimizing fast-wide disk technology.

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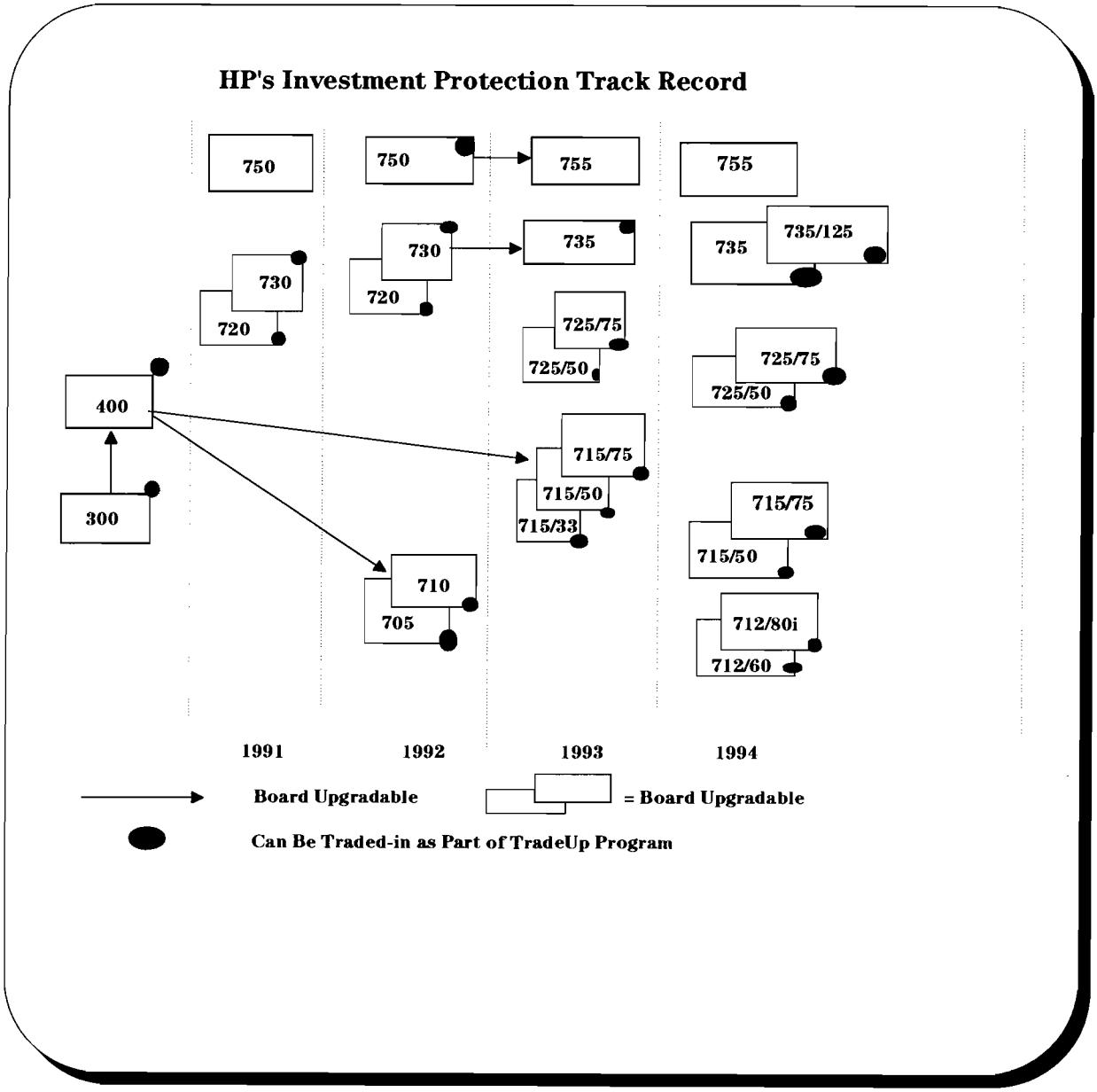
The performance gain for customers in moving from a 99MHz to a 125MHz system is substantial and is additionally boosted through increased graphics throughput, optional fast-wide disk technology and a maximum memory capacity of 400MB. Depending on the application, customers will typically experience performance increases of up to 50 percent.

Investment Protection

With the Model 735/125, HP continues to provide unparalleled investment protection in the Series 700 product line. Customers who have invested in Models 720, 730, 735 and 755 can upgrade to the new 125MHz systems through a simple CPU board swap. They'll benefit from an immediate increase in application performance while protecting their investment in memory, graphics, peripherals, and software.



Product Features

The Model 735/125 offers exceptional desktop I/O through-put with its optional fast-wide disk technology subsystem. Not only does the workstation offer a fast-wide disk sub-system but it also supports 2 GB disk devices. The EISA slot provides advanced capabilities with additional network connectivity, and disk storage.

Like other Series 700 workstations, the Model 735/125 supports standard GRX grayscale and integrated GRX 8-plane color, as well as optional CRX 24, 24Z, and 48Z graphics. As a result these systems continue Series 700 leadership in 2D/3D vectors as well as 3D solids solutions—at prices that position these systems very competitively. The following table lists the main features of the Model 735/125.

Model 735/125 at a Glance	
Processor	PA-RISC
Clock	125MHz
Cache	256KB Instruction 256KB Data
RAM	32-400MB
Graphics	19" GRX 1280 X 1024 72Hz
Internal Formatted Disk Capacity	735/125: 1.05GB (2 X 525MB) or 2.10GB (2 X 1.05GB) Single-ended and Fast-wide Disks Cannot be Combined
Total Disk Capacity	125.4GB
Internal Removable Media Options	1.44MB 3.5" floppy
Built-in I/O	IEEE 802.3 Ethernet (ThickNET) 1 SCSI-II (Single-ended) 2 RS-232 Ports 1 Centronics Port 1 HP-Hil 1 EISA Slot Audio Ports Keyboard Options: HP-UX or PC-style
HP-UX Options	HP-UX 9.x Run-time Environment Instant Ignition Media and Docs HP-UX 9.x Developer's Environment Media and Docs

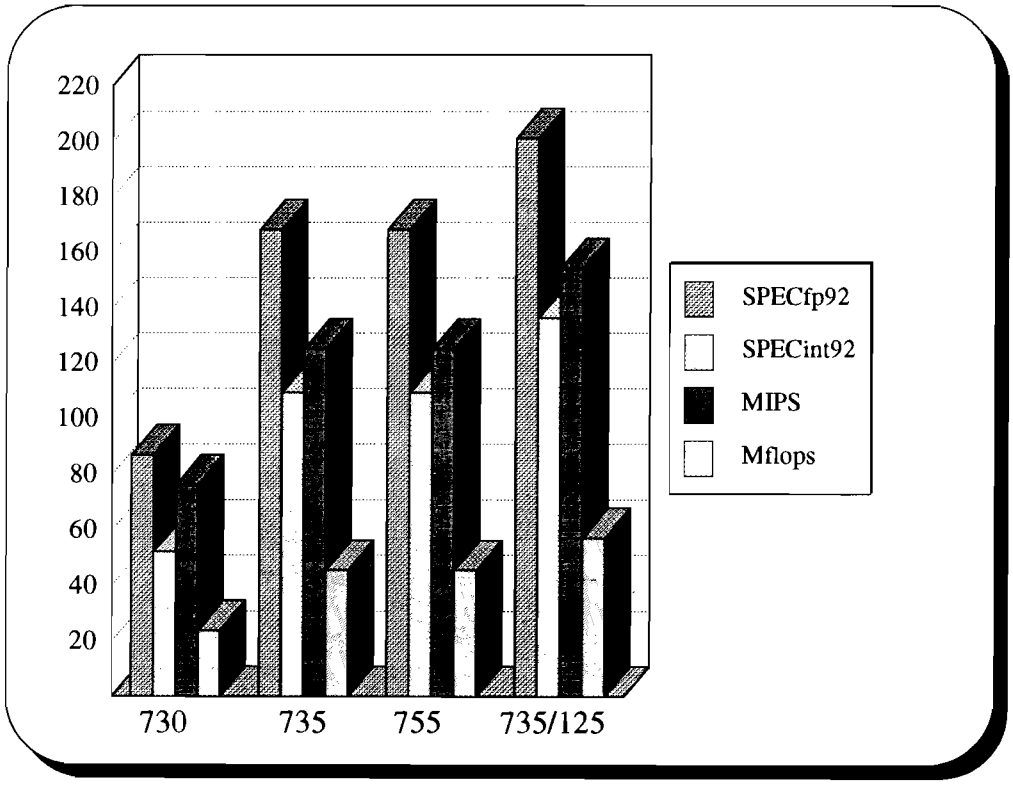
Processor Performance

The Model 735/125 delivers impressive CPU performance by combining a 125MHz PA-7150 integer processor with a 125MHz floating-point processor. These processors, coupled with 256KB instruction and 256KB data caches, as well as a low-latency memory interface, provide the user with leading-edge application performance. These new systems not only deliver great performance and price/performance, they also offer additional functionality including CRX graphics and multimedia capabilities.

Performance Results

The Model 735/125 offers outstanding performance as illustrated in the chart below:

	730	735	755	735/125
SPECfp92	86.7	168	167.9	201
SPECint92	52	109	109.1	136
MIPS	76	125	124.8	154
Mflops	23.7	45	45.4	57



The Model 735/125 is designed to meet the needs of workstation users for the scientific and engineering as well as software development markets.

Target markets include: ECAD, MCAD, Electronic Design Automation (EDA), Architecture and Engineering Construction (AEC), Geographic Information Systems (GIS), Oil & Gas and Scientific Applications.

Packaging

By making use of the existing Model 735 packaging, customers are able to add substantially higher performance through a simple CPU board swap. Existing memory, graphics, peripherals, and software applications can continue to be used with the 125 MHz systems. For details regarding upgrade requirements and prerequisites, review the price and configuration guide.

The Model 735/125 is offered in the small, quiet Model 735 desktop package ideally suited for an office environment. The package measures 4.5 inches high, 20.0 inches wide, and 18.5 inches deep. This compact size is made possible by integrating the CPU, FPU, 8-plane graphics and standard I/O all on a single board. The package design gives the user the choice of placing the system on the desktop or on the floor in the deskside position using an optional pedestal.

Though compact, the small package can support up to two mass storage devices:

- two hard drives
- or, one hard drive and one removable floppy drive

For example, one 1GB single-ended disk drive and one removable floppy disk can be configured within the system package.

The Model 735/125 MHz system can use both single-ended and fast-wide hard disk drives. They cannot however be combined. In addition, the Model 735/125 can accommodate 32-400MB of memory. One EISA slot is available for optional expansion (such as EISA LAN/9000, EISA , X.25, EISA 802.5 IBM Token Ring, etc.).

The Model 735/125 provides easy installation, upgradability, expansion and service. The package opens from the top so that all components are easy to access. These workstations are as easy to configure as stereo components, featuring plug-in memory modules, processor upgrade boards, disks, and removable media devices.

Memory (RAM)

The Model 735/125 offers maximum memory capacity of 400MB. The memory subsystem is designed to achieve data transfer rates 20MB/sec peak that match the high CPU performance of these systems. Two-way memory interleaving results in a balanced system architecture providing high application throughput. Consistent with HP's operational philosophy of "maximum reliability", ECC single-bit error correction and multiple-bit error correction logic are used. Industry-standard, low-cost DRAM SIMMS are used.

Memory Increments

Memory increments of 32, 48, 80, 144, 208 and 400MB are offered either factory integrated or as add-ons. The memory occupies 6 pairs of dedicated slots. Be sure to help customers plan for future memory needs so that they can grow to the maximum memory capacity without having to exchange existing SIMMS. For example, a customer with low density SIMMS would not be able to expand to the maximum allowed memory without exchanging SIMMS.

32MB Memory Configuration Support and Constraints

The Model 735/125 supports a minimum of 32MB of memory. This configuration is suitable for most 2D and some 3D application support. This configuration can be suitable for environments where applications run locally with either no requirement for a high-speed graphical user interface such as a CRX-24Z, or with a user interface that can run remotely.

We believe that approximately 40% of Model 735/125 users will run a 32MB configuration. It is important to note that the majority of 3D, cache-intensive applications will require at least 64MB of total memory for optimum performance.

Graphics

The Model 735/125 delivers excellent graphics performance. Customers upgrading from Model 720, 730 and 735 workstations will experience a significant boost in graphics just by swapping CPU boards to obtain the new 125MHz systems.

The graphics hardware is the same integrated grayscale and 8-plane color implementation used in the Model 735.

Standard graphics on the Model 735/125 support is available in either 19-inch grayscale or a choice of 8-plane color monitors. The following table shows the graphics performance results.

Model 735/125 Standard Graphics	
Xmark93	9.4
GPC PLB2D93	68
GPC PLBwire93	75

All advanced CRX graphics options are also available. The following tables summarizes the Model 735/12 graphics specifications.

Model 735/125 Advanced Graphics Specifications	
Grayscale	
Image Planes	8 Single Buffered
Monitor Size, Resolution	19" Grayscale 1280 x 1024
Scan Rates	72Hz (Single Sync)
Color	
Image Planes	8 Plane
Monitor Size, Resolutions	19" 1280 X 1024
Scan Rates	72Hz
Max. Graphics Performance*	
Xmark93	10.8
GPC PLB2D93	71
GPC PLBwire93	79
GPC PLBsurf93	112
Graphics Features	
Hardware Cursor	Yes
Hardware BLT	Yes
Hardware Text Acceleration	Yes
CPU Integrated Graphics	Yes
Graphics Interfaces	
X11 R5	Yes
PEX	Yes
PHIGS	Yes
Starbase	Yes
GKS	Yes
PowerShade	Yes
CRX Options	
CRX-24 19" Monitor 1280 x 1024 72Hz	24-plane, 3D wireframe
CRX-24Z 19" Monitor 1280 x 1024 72Hz	24-plane, Z-buffered, 3D solids
CRX-48Z 19" Monitor 1280 x 1024 72Hz	48-plane, Z-buffered, 2D/3D solids and visualization

Mass Storage Support

The Model 735/125 features high-performance, single-ended and fast-wide internal and external disk subsystems utilizing the industry-standard SCSI-II interface. SCSI-II is capable of supporting up to 20MB/sec synchronous data rate throughput while the fast-wide interface is up to a maximum of four times faster.

The Model 735/125 workstation can accommodate up to two 3.5-inch half-height internal SCSI-II disks, providing up to 2GB of internal disk capacity. The Model 735/125, supports 525MB and 1GB single-ended disks as well as 1GB fast-wide disks. HP is one of the only workstation suppliers that provides fast-wide technology at an affordable price.

Note: Single-ended and fast-wide disks cannot be combined in the same system.

The Model 735/125 uses the same mass storage devices that are found in the current 735. For a detailed description of their specifications, refer to *The HP 9000 Series 700 Product Family*, publication # SR12037A.

Removable Media Options

Model 735/125 offers a wide choice of internal removable media options. One removable storage slot accommodates a 3.5-inch device, accessible from the system's front panel. It accommodates the 1.44MB floppy drive for internal, removable media options:

Note: HP-UX supports only one removable device of the same type at a time (externally or internally).

The Model 735/125 takes advantage of the same removable media options that are found in the current 735 and 755. For a detailed description of their specifications, reference section 3.8 of the HP 9000 Series 700 U.S. Self Study Guide.

Standard Input/Output (I/O) Support

The Model 735/125 supports a wide variety of industry-standard I/O interfaces, similar to the other members of the Series 700 family. In order to provide the best possible performance and cost savings for the user, the system has built-in Local Area Networking (LAN) AUI (ThickNET) connections as well as an external SCSI-II port, bi-directional centronics interface, two RS-232 serial ports, audio I/O, and 1 EISA bus slot.

The Model 735/125 supports a choice of two keyboards, the standard HP-UX keyboard and the PC-style keyboard. Both of these keyboards use HP's proprietary HP-HIL interface to the system. Only one keyboard can be configured with the system at any given time.

The Model 735/125 includes built-in capability for recording and playing back CD-quality sound. The potential applications of CD-quality audio include voice annotation, voice notification, computer-based training, and emerging application areas such as verbatim recording and audio command & control.

The Model 735/125 uses the same standard I/O features that are found in the current 735 and 755. The following table illustrates the standard I/O support.

Single-ended SCSI-II	**All Series 700 Models**
Quantity	1
Type	SCSI-II single-ended, 8-bit
Data Rate	Up to 5MB/sec synchronous
Device limit	7 devices
Connector	SCSI-II, ALT-1 (50-pin high density)
Fast-Wide SCSI-II	**Models 735, 735/125 and 755 Only***
Quantity	1
Type	SCSI-II differential, 16 bit
Data Rate	Up to 20MB/sec synchronous
Device Limit	15 devices (reduced to 7 if disk arrays)
Connector	SCSI-3, P-connector (68-pin high-density)
Serial Interface	**All Series 700 Except 712s**
Quantity	2
Type	EIA RS232C, CCCITT V.24/V.28
Data Rate	Up to 230.4 kbps with CTS/RTS
Device Limit	2 (1 per connector)
Connector	9-pin male
Parallel Interface	**All Series 700**
Quantity	1
Type	Centronics (ACK, BUSY)
Data Rate	Up to 300+ KB/sec with DMA Up to 200 KB/sec sustained
Device Limit	1 per interface
Connector	25-pin female (PC standard)

Networking Support

The Model 735/125 includes the Ethernet 802.3 hardware integrated on the CPU board. In order to be able to meet our diverse customer needs, an AUI (ThickLAN) connector is no longer standard in the base configuration. Refer to the Price and Configuration Guide, for detailed ordering instructions.

In addition to the standard Ethernet controller, the Model 735/125 also provides:

- FDDI
- SNA
- X.25
- IEEE 802.3
- (IBM) Token Ring
- IEEE 802.5
- HP-IB and Token Ring interfaces through the EISA bus

For a complete list of EISA options with product numbers, please refer to the Price and Configuration Guide.

The Model 735/125 provides the same leading edge networking technology that is currently found in today's Model 735 and 755 workstations. For a detailed description of all supported network specifications, reference section 6 of the *HP 9000 Series 700 Product Family*, Publication # SR12037A.

Competitive Comparisons

This unit summarizes relevant competitive information. The table below provides general comparative information in a quick-reference format.

	HP 9000 Model 735/125	**DEC Alpha AXP 3800**	**IBM RS/6000 375**	**Silicon Graphics Indigo2 R4400**	**Sun SPARCstn SS 10:51**
Package Desktop	Desktop/Deskside	Deskside	Desktop	Desktop	Desktop
Ship Date	Q1 '93	Q4 '93	2/93	Q1 '93	4/93
Performance					
SPECint92	136	130.2	70.3	82	65.2
SPECfp92	201	184	121.1	85.9	83
MIPS	154	–	NP	120	135.5
MFLOPS	57	NP/40.8	25.9	22.6	27.3
System Design					
Processor Type	PA-RISC7150	Alpha DEChip21064	Power 6232/int	R4400	SuperSPARC
Max. No. of Processors		1	1	1	1
CPU Clock Speed	125MHz	200MHz	62.5MHz	75MHz	50MHz
No. of IO slots	1 EISA	6 Turbo	1	4	4
Cache Internal Instruction/Data	256KB	8KB/8KB	32KB/32KB	16KB/16KB	20KB/16KB
Cache External Instruction/Data	256KB	2MB	NA	1MB	1024KB
Configuration					
RAM Min./Max.	32–400MB	64MB/1GB	32–128MB	32–384MB	35–512MB
Disk, Internal Max.	2GB	8.4GB	4GB	3.6MB	2.1GB
Disk, External Max.	125.4GB	161.6GB	100GB	48GB	41GB
Graphics					
Highest Option	CRX-48Z	ZLX/M2	GTO-02i	Extreme	Reality Engine 2
Xmark/X11	9.4/1.2 million	NP	NP	NP	NP/480
3D Vectors/Sec (k)	2,180	NP	990	1,200	750
Displayable Colors	16.7 million	16.7 million	16.7 million	16.7 million	16.7 million
Z Buffering	24-bit HW	24-bit HW	24-bit HW	24-bit HW	24-bit HW

NP= non-published data

The competitive information contained in this unit was valid at the time of printing but is subject to change. It is important to *verify all data* before using it in your sales strategy or presentations to customers.

Target Markets

This section helps you identify those markets where the Series 700 Model 735/125 and are appropriate workstations. Generally, you are in a solid position to win in any selling situation in which:

1. Cost effective workstations are required for fast X window performance .
2. 2D/3D wireframe grayscale or color graphics are required. High-end CRX graphics are required

Key markets for the Model 735/125 are ECAD, MCAD, Electronic Design Automation (EDA), Geographic Information Systems (GIS), and Science, as well as emerging markets such as Oil & Gas, Customer Services, and Financial Services. Multimedia functionality is supported through CD-quality audio and add-on video card options. Entry-level surface rendering is available through HP's PowerShade 3D surface software. Optional CRX graphics are offered for solids modeling, visualization, and accelerated rendering requirements.

Mechanical Market

From a price/performance perspective, the Model 735/125 fills out the entire Series 700 product line. It competes head-to-head with SGI and their R4400-based products. For design applications such as solids modeling, it provides an attractive alternative in price-sensitive situations where the Model 735 does not offer adequate performance.

EDA (Electronic Design Automation)

The Model 735/125 is an important addition to the HP workstation product line for EDA. It is the ideal solution for customers who perceive the need for more performance—especially integer performance—than that available with the Model 715 or 735. The Model 735/125 represents an ideal server for EDA accounts using less expensive software. It will do best in the IC design area and with power users in other areas of EDA.

Architecture and Engineering Construction (AEC)

The addition of the new Model 735/125 is especially important news for this market. Many applications are moving to 3D—i.e., the performance requirements are increasing. Facility design, large facility management, and infrastructure design and management are great opportunities for a low-cost, high-performance visualization system.

GIS (Geographic Information Systems)

The Model 735/125 is a key product for the GIS marketplace. The Model 735/125 teamed with ENVIZEX Stations should form a potent configuration, offering a very attractive cost per seat. Acceptance of X stations has been growing rapidly in GIS, and the Model 735/125 will be an excellent X server in this configuration. Application areas within state and local government ranging from tax assessment to city planning and environmental analysis will be large-scale users of such a configuration.

Scientific Market

Independent instruction and data cache (256KB each) will allow larger, more logical data sets to be read into fast memory. Because of the vast amount of data required in Visualization, Oil & Gas, Chemistry, and Statistical Analysis, this ability will result in much higher application performance for those industries. Especially when competing against SGI in Computational Chemistry and Oil Exploration & Production, the Model 735/125 will be an excellent fit.

Top Selling Features

1. The Model 735/125 is the fastest desktop system on the market.
2. It outperforms IBM, Sun, and DEC in price/performance.
3. The Model 735/125 offers clear investment protection not only to the Model 735 customers but also to the installed base of Models 720 and 730.
4. It offers Fast-Wide SCSI for those users seeking the fastest throughput for compute intensive applications.

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