

**Sales guide  
Internal use only**

**HP 9000 Computer Systems**

# HP 9000 Series 800 Multiuser Family

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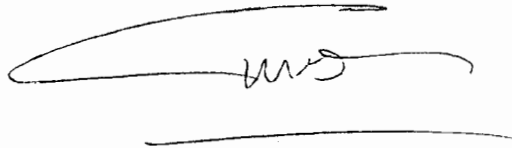
## Chapter 1. Introduction

Thanks to you, our HP 9000 Series 800 sales force, our family sales tripled last year!

Your efforts produced increased market share and installed base for our Series 800 family in established as well as new HP accounts. Here at General Systems Division we are excited to be introducing a broader Series 800 family and a wealth of software and networking enhancements. These enhancements will enable you to offer more complete solutions and be more competitive in both new and existing markets.

We designed this HP 9000 Series 800 Sales Guide to update you on the latest additions and enhancements to the HP 9000 multiuser system family. Our objective is for this tool to complement your training and sales support resources, and to contribute to your continued success!

Good Selling!



Bernard Guidon  
General Manager  
General Systems Division

## Chapter 2. HP 9000 Model 815S

### The one-minute sale

### HP-PA scaled down!!

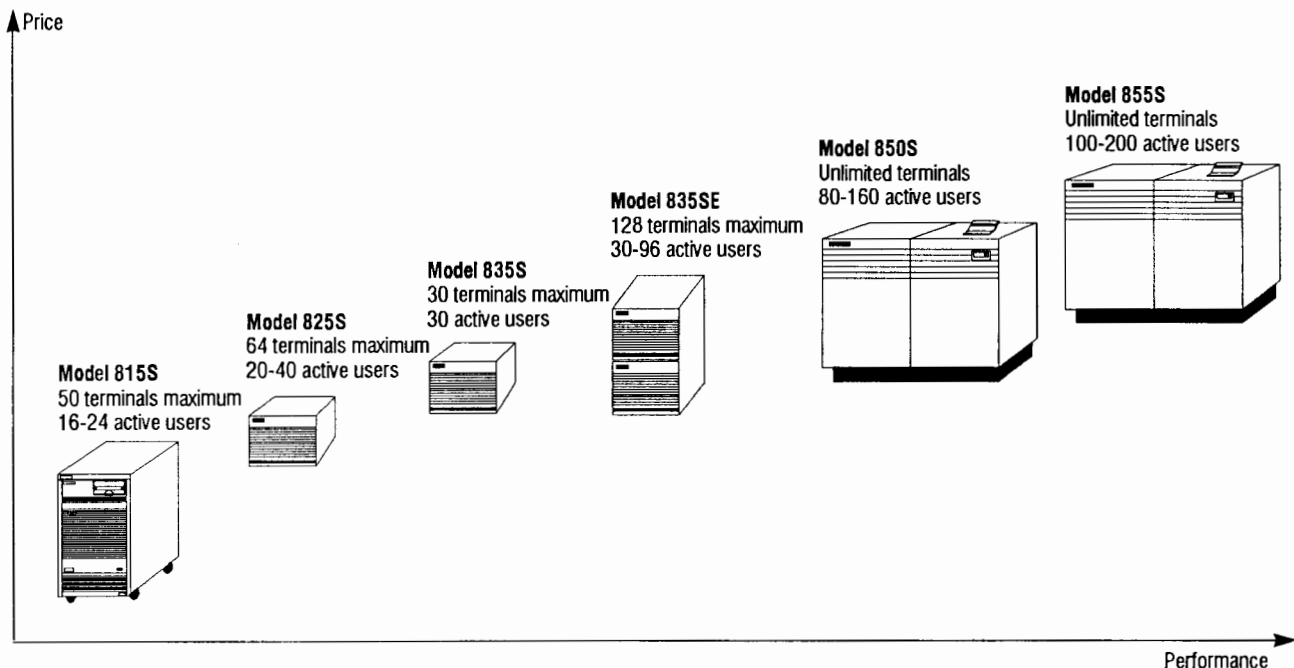
The HP 9000 Model 815S is the new entry-level HP 9000 Series 800 computer system. As part of one of the broadest RISC families on the market, the Model 815S gives us a new competitive edge. In General Systems Division's target markets, competitors like NCR and IBM now have an HP 9000 system to contend with in the 16 to 24 user range. Those of you selling into financial services, telecommunications, aerospace, hospitality, education, manufacturing, and other markets now have the advantages of performance, compatibility, and support at the low end.

The Model 815S features:

- SPU for \$14,900
- System with 300 Mbyte disk (7959B), 9144A cartridge tape for \$29,500, HP-UX pre-configured on the disk
- 16-24 active users; 50 maximum users
- 85% of Model 825S performance

Figure 2.1 summarizes the broad price/performance range of the Series 800 family.

Figure 2.1 HP 9000 Series 800 family. Announcing Model 815S\*



\* Scaled Precision Architecture and object code compatible for application portability.

## Features and benefits product summary

The Model 815S features and benefits are summarized in Table 2.1. In the Vertical Markets Features and Benefits section of this chapter, the benefits of the Model 815S are discussed with respect to the needs of several industries.

**Table 2.1 HP 9000 Model 815S features and benefits**

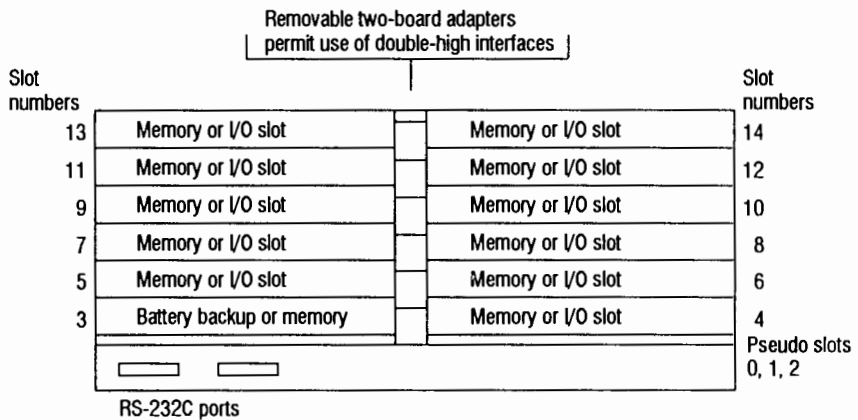
Model 815S-specific product features	Customer benefits
Low-end entry to broad Series 800 family	Lower investment cost. Affordable object-code compatibility provides cost-effective growth path to over 400 terminal connections, leverages software investment and training.
Bundled 304 Mb disk and cartridge tape drives, factory installed with HP-UX	Low installation time. System complete in a single package shipment, easy customer installation—just connect power cords.
Diskless client capability	Lower disk investment cost since several systems share one disk; greater potential for environmental tolerance with disk on LAN at remote location.
Box upgrade path to Model 835SE	Protection of customer's investment in hardware and software.
MAP 3.0 functionality	Reduces costs and increases productivity for computer-integrated manufacturing (CIM) by integrating multivendor systems based on industry standards.

The Model 815S SPU comes standard with two serial ports on the CPU board, 8 Mbytes of error correcting memory, and a 16-user HP-UX license, in a compact package well-suited for an office or lab environment (class B2). The system bundle adds HP-IB, two 8-channel MUXes, a 304-Mbyte disk, and a 67-Mbyte cartridge tape, as well as 16-user HP-UX loaded on the disk at the factory.

In addition to its entry-level price, availability as a pre-configured system is one of the primary differences between the Model 815S and the other Series 800 systems. The other primary difference is that the Model 815S features a new backplane for its I/O and memory implementation. Instead of Channel I/O (CIO), the Model 815S has HP Precision Bus (HP-PB, formerly Native I/O or NIO), which supports processor, memory, and I/O cards on a common bus. Therefore, when configuring Model 815S systems, be sure to include Model 815S I/O cards and memory cards. Other Series 800 I/O and memory cards will not fit into the Model 815S.

Figure 2.2 shows the Model 815S SPU backplane layout.

**Figure 2.2 HP 9000 Model 815S card cage**



In compliance with the Eurocard standard, the HP Precision Bus was designed to accommodate single-high (3U) and double-high (6U) I/O cards. The Model 815S has 12 single-high card slots capable of supporting 12 single-high cards or 6 double-high cards, or a combination thereof.

General card slot requirements are summarized below:

- The 8-channel MUX, HP-IB, GPI/O, and 8-Mbyte memory cards are single-high cards; each requires one single-high card slot.
- The Battery Back-up card is also a single-high card, but can only be installed in slot 3 (refer to the illustration, Model 815S SPU Backplane Layout).
- The LAN Link and X.25/9000 Series 815 Link cards are double-high cards and occupy two single-high card slots.
- The MAP 3.0 Link requires two double-high card slots.

The Model 815S is object-code compatible with all HP 9000 Series 800 computer systems, where applications with standard language I/O calls or other HP-UX system calls are used. Applications may require modification if I/O control is managed via the Device I/O Library (DIL) or I/O control call (ioctl).

When ordering either the Model 815S SPU or the bundle, a floating point coprocessor can be purchased as an option. With floating point, multiuser system performance may be improved by up to 5%. If the application requires floating point performance, we highly recommend that you include the floating point card; without it, floating point operations will be done in software.

## Ordering information and availability

The Model 815S will be placed on the July CPL, with shipments scheduled for October/November 1989. The product structure follows in Table 2.2.

**Table 2.2 HP 9000 Model 815S product structure**

Prod/Opt no.	Description	U.S. price list
A1071A	Model 815S 16-user integrated system bundle	\$29,500
	- System processing unit including:	
	HP-PA CPU	
	Hardware documentation	
	8 Mb error-correcting memory	
	2 serial ports	
	12 slot box (8 slots available)	
	HP-UX 16-user license and general usage documentation	
	- HP-IB interface and cables	
	- 16 additional serial ports	
	- 304 Mb disk	
	- 67 Mb 1/4" tape drive	
	- Battery backup	
	- Cable for system console	
	- Customer convenience kit including:	
	Pre-installed I/O and memory cards	
	HP-UX pre-configured and pre-installed on disk	
	Single package shipment	
	Power-up documentation	
	- 90-day on-site warranty	
	- Design plus cabinet	
Opt 002	Additional 8 Mb error-correcting memory	\$ 6,800
Opt 009	Replace disk with 304 expandable disk (7963B)	725
Opt 004	Replace tape drive with 133 Mb tape drive	1,240
Opt 012	Add LANLink (2 slots), ARPA and NFS Services	3,000
Opt 828	Add floating point coprocessor	2,500
Opt 020	HP-UX on cartridge tape with system administration documentation	800
A1410A	Model 815S system processing unit	\$14,900
	- HP-PA CPU	
	- Hardware documentation	
	- 8 Mb error-correcting memory	
	- 2 serial ports	
	- 12 slot box (11 slots available)	
	- HP-UX 16-user license and general usage documentation	
	- On-site installation	
	- 90-day on-site warranty	
Opt 828	Add floating point coprocessor	\$ 3,000
	<b>815 accessories:</b>	
A1404A	8 Mb error-correcting memory	\$ 8,000
A1407A	Battery back-up subsystem	2,000
A1406A	Field upgrade floating point processor	3,600



These products include options not listed here.  
Prices subject to change. Please check Corporate Price List (CPL) for current prices.

**Table 2.2 Model 815S product structure (continued)**

<b>Prod/Opt no.</b>	<b>Description</b>	<b>U.S. price list</b>
<b>Other 815 program components</b>		
<b>815 accessories:</b>		
28650A	HP-IB interface and cable	\$ 1,450
40299A	8-channel serial multiplexer	1,950
98189A	LANLink, includes TCP/IP software	2,000
36944A	X.25Link	4,000
28651A	GPIO interface	1,495
<b>815 databases and languages:</b>		
92626A	Development pack	\$ 5,430
92627A	FORTRAN 77/HP-UX compiler	2,500
92627R	FORTRAN 77/HP-UX compiler right-to-copy	2,125
92628A	Pascal/HP-UX compiler	2,500
92628R	Pascal/HP-UX compiler right-to-copy	2,125
92629A	COBOL/HP-UX developer package	5,050
92631A	COBOL/HP-UX run-time system	510
92630A	COBOL/HP-UX compiler	3,500
92636A	ALLBASE	5,000
92636R	ALLBASE right-to-copy	4,250
92637A	HP SQL run-time	2,750
92634A	HP ALLBASE/NET	2,200
92632A	ALLBASE/SQL/4GL/QUERY developer	14,200
92635A	ALLBASE/QUERY	3,330
92635R	ALLBASE/QUERY right-to-copy	2,850
92646A	ALLBASE/4GL developer pack	8,300
92646R	ALLBASE/4GL developer pack right-to-copy	7,070
92633A	ALLBASE/4GL run-time environment	1,690
<b>815 networking software:</b>		
B1016A	ARPA Services	\$ 850
B1017A	NFS Services	700
B1015A	NS Services	1,000

These products include options not listed here.  
Prices subject to change. Please check Corporate Price List (CPL) for current prices.

## Positioning within the HP multiuser/server family

This section examines some feature differentiators that help determine the appropriate system for your customer's application, in view of the Model 815S addition to the 800 family. These differentiators are summarized in Table 2.3.

**Table 2.3 HP 9000 system overview**

Model	Vectra RS/25c	HP9000 360	HP9000 370	HP9000 815S	HP9000 825S	HP9000 835S	HP9000 835SE	HP9000 850S	HP 9000 855S
Processor	180386 25MHz	M68030 25MHz	M68030 33.3MHz	HP-PA	HP-PA	HP-PA	HP-PA	HP-PA	HP-PA
Technology	CMOS	NMOS	NMOS	CMOS	NMOS	NMOS	NMOS	NMOS	NMOS
Relative performance to 825S* configuration (maximum)									
	0.37-0.65 <sup>i</sup>	1.0	1.38	0.85	1.0	2.1	2.1	2.3	3.2
Memory	4/16 Mb	4/16 Mb	8/48 Mb	8/56 Mb	8/112 Mb	8/112 Mb	24/112 Mb	32/128 Mb	32/128 Mb
Disk	600Mb	4.0Gb	4.0Gb	6.8Gb	9.1Gb	9.1Gb	9.1Gb	18.3Gb	18.3Gb
Terminals	32	32	32	50	64	30	128	300	400
Number concurrent users	6-20	15-32	15-32	16-24	20-40	30**	30-96	60-120	90-180
SPU price	\$13.3K	\$13.0K	\$22.5K	\$14.9K	\$25.5K	\$45.0K	\$99.0K	\$188.5K	\$308.5K
16-user system price	\$23,700	\$33,200	\$42,705	\$29,500	\$45,800	N/A	N/A	N/A	N/A

<sup>i</sup> Preliminary multiuser performance numbers on the RS/25c indicate a range in performance from 0.37 to 0.65 of a Model 825S. Final multiuser performance measurements will be available later this year.

\*The relative performance estimates result from the UDI020 benchmark. The UDI020 is a transaction-processing benchmark that simulates transactions typically encountered in a banking environment. The UDI020 contains a review transaction that lists several accounts and an update transaction that updates randomly selected account information in several tables. The database contains five tables ranging from a 500,000-record account table to a one-record voucher table.

\*\*30 maximum terminal connections, no expander supported.

The addition of the Model 815S to the 800 family now gives you a new, lower-cost, entry HP-PA system for price-sensitive customers. The HP Vectra RS/25c PC still has a small price (cost/user) advantage, but you must also consider the following:

### **Processor performance**

In a multiuser application, the Model 815S can be more than twice as fast as an HP Vectra RS/25c PC and similar in performance to the Model 360. Note that CPU performances in Table 2.3 are relative to the Model 825, as there is no definitive standard for MIPS measurement; relative performances also depend on the application. You may want to benchmark the application for the best indication of fit.

### **Networking and I/O capability**

System configurability and networking needs also help determine the right system to propose. The Model 815S will better meet your customer's needs for expanded memory or terminal connections. For example, the Series 300 is limited to 32 users, compared to 50 on the 815S. Also, through HP products, the 800s and 300s support industry-standard networking protocols like X Window, ARPA/Berkeley, and SNA. The Vectra supports those protocols through third-party channels.

### **Upgradability/investment protection**

Also consider your customer's growth plans. The Model 815S offers a high-end growth path to the 835SE and above (see chapter 4), while the HP Vectra and Series 300s do not, though higher-end Vectras and 300 systems will be out in the future.

### **Standards**

The HP Vectra has the advantage of industry-standard hardware and software. HP-UX and the Vectra multiuser operating system, XENIX, both meet the System V Interface Definition (SVID) and can be source-code compatible to the extent that these standards define software compatibility.

Table 2.4 Positioning HP Vectra RS/25c, Model 360, and HP 9000 Model 815S

	Vectra RS/25c	HP 9000 Model 360	HP 9000 Model 815S
Relative performance to 825S	0.37-0.65	1.0	0.85
16-user system price <sup>i</sup>	\$23,700	\$33,200	\$29,500
Number larger systems in growth path <sup>ii</sup>	0	1	5
Operating system	XENIX <sup>iii</sup>	HP-UX 7.0	HP-UX 7.0
Selling strengths	Lowest system price	Source-code compatible w/S800 3D graphics	Object-code compatible w/S800 Largest scalable family
No. of solutions	2,500	750	600
<b>Networking</b>			
ARPA services	Yes, by Santa Cruz Operation (SCO)	Yes	Yes
NFS	Yes, by SCO	Yes	Yes
X.25	Under investigation	Yes	Yes
MAP 3.0	(No)	(No)	Yes
802.3	Yes, by Excelan	Yes	Yes
StarLan	Yes, by AT&T	Yes	Yes
NS for DECVAX	(No)	Yes	Yes
HP-UX Link & Gateway SNA 3270	Yes, by SCO	Yes	
HP-UX SNA 3770 & Gateway	Under investigation	Yes	Yes
Industry Standards	HW & SW	HW & SW	SW

<sup>i</sup> Based on SPU with 8Mb RAM, 300Mb disk, 67Mb tape, 16-user OS, controller, MUX (16 ports).

<sup>ii</sup> Growth path determined by systems that are object-code compatible. See chapter 11 for definition of object-code compatible. Larger systems are under development for all hardware platforms.

<sup>iii</sup> UNIX 386 expected second half '89.

## Vertical market features and benefits

This section reviews elements that affect your end-user customers in six vertical markets, as well as your VAR customers.

Each market discussion will include three elements:

- *Critical success factors* -- Events whose successful completion are necessary for attaining the goals of the firm
- *Obstacles* -- Impediments to the success factors
- *Implications* -- Results that may arise if obstacles are not overcome

Examining these elements is an effective way of understanding your customer's problems so that a "solution" can be more effectively presented without selling product "features." The conclusion of each discussion shows how the Series 800 platform and the Model 815S in particular can be positioned as a solution. The Series 800 platform provides certain benefits that span all markets, among them:

1. A broad, scalable family, which allows customers to choose the system that best fits their application, and upgrade paths that offer growth;
2. Commitment to industry standards, which leverages hardware and software investment.

The Model 815S provides these markets with the following additional benefits of:

1. A low price point entry into the Series 800 family for smaller applications with 16 to 24 active users;
2. A pre-configured system, which reduces installation costs and the need for MIS department resources.

We will discuss these vertical markets: Financial Services, Higher Education, Hospitality, Aerospace and Defense, Telecommunications, Manufacturing, and the Resellers' Channel. Each of these markets or channels represents a significant Series 800 opportunity.



## **Financial services**

### **Bank branch office marketing and sales**

Successful branch office banking depends on two critical factors:

1) capturing the total customer relationship and 2) effectively marketing the right products to the right customers. With banking deregulation intensifying the competition, these two factors become particularly important.

Capturing the total customer relationship is difficult when one bank's customer opens an account at one branch office, yet is not recognized as one already holding an account when at another office. The risk becomes almost a certainty when banks do not have an integrated customer file.

The bank's problems are compounded when product data resides on multiple mainframe systems. One system may store all loan information, another may process all checking accounts, while a third may store only savings account data, and none of these systems are linked together.

The urgency of these issues to the bank becomes clear when considering the following: there is a 50% chance of retaining a customer for more than one year if he buys one banking product, but if he buys a second product, that probability jumps to 90%. Therefore, the bank must determine how it can better manage its customer and product data to more effectively sell its products.

#### *Critical success factors*

- Capturing the total customer relationship
- Effectively marketing the right products to the right customers

#### *Obstacles*

- Disjointed product data on multiple mainframe systems

#### *Implications*

- Inability to understand customer profile and needs
- Loss of share of customer's financial assets

#### *Solution*

- Integrated information management solution

The HP 9000 Model 815S can be a solution for the smaller branch offices. Using LAN or WAN to access data from the bank's mainframes (batch only, LU6.2 under consideration), the Series 800 platform can form a customer relational database from which customer profiles can be produced. The Model 815S's complete compatibility with larger Series 800 systems at other larger branches ensures software compatibility across the bank. Software compatibility facilitates training and is an important criterion in this high employee-turnover environment.

Two popular solutions are Brock Control System's telemarketing product (Atlanta, GA) and US West's teleservicing product (Englewood, CO).

### **Trading and investment management**

Successful trading and investment management depends on the ability to analyze, interpret, and react quickly and accurately to changes in the market. To accomplish this, traders and managers must have access to multiple data sources from which to form their recommendations. Recommendations, however, do not come easily, rather, they often involve extensive analysis.

The difficulty for this market is that data sources traditionally have been available at a trader's desk through video screens. When there are between five and ten data sources and video screens at each person's desk, the working environment becomes crowded, inefficient, and expensive. Nor is the problem over once the information is at the trader's or manager's desk. Often the data must be transferred by hand from video screen into a spreadsheet or financial model before analysis can be done.

Manipulating data in this manner is inefficient and sometimes inaccurate. As a result, two problems exist for the firm: 1) the firm lacks knowledge of real-time positions and 2) the firm runs risk exposure and loses money.

#### *Critical success factors*

- Traders and money managers must analyze, interpret, and react quickly and accurately to changes in the market.

#### *Obstacles*

- Prevalence of video equipment in the trading room
- System availability (reliability)

#### *Implications*

- Firm lacks knowledge of real-time positions
- Firm runs greater risk exposure and loses money

#### *Solution*

- Integrated digital trading systems

The Model 815S has enough power for small groups of traders and analysts requiring a UNIX solution. As an X-Terminal and X-PC server, the Model 815S is the ideal solution for data acquisition and display and can distribute multiple data feeds to one windowed X-client. By being able to distribute this information to multiple X-clients with windowing capability, the Model 815S greatly reduces space requirements and costs while improving efficiency. Data can also be fed from a Model 815S to multiple workstations for real-time spreadsheet and graphics capabilities. This would then allow fast, accurate data manipulation.

Since workstations are often used in the trading and investment management environment, the Model 815S can serve Series 300 diskless nodes, thereby offering customers cost savings. One disk can support several workstations.

In addition, standard networking products, such as X.25, ARPA Services, 802.3, and NFS, enable HP systems to work in a multivendor environment -- imperative, as traders and managers receive their data from a wide variety of sources.

Popular solutions include Rich's digital trading systems (Franklin Park, IL), Forex Advisory Service's and FX Development's foreign exchange trading (Chelmsford, UK, and Mountain View, CA, respectively), Knight-Ridder Trade Center's real-time financial graphics (New York, NY), SAS's statistical and graphical analysis (Raleigh, NC), and Security Data Corp.'s new issues/mergers/acquisitions database (New York, NY).

### **Insurance and claims processing**

Companies in the claims processing and insurance industry compete by offering better customer service at lower costs to themselves. However, the predominant use of mainframe technology today hinders improvement much beyond its present state.

For example, claims processing personnel review incoming claims and send the data to a mainframe at headquarters for processing and storage. As the number of claims processors accessing the mainframe increases, users may be forced to wait for open files to be returned before they can complete processing their claim. The result: employee productivity is impaired and the customer must wait longer for a reply.

Customer satisfaction is one issue facing insurance companies; maintaining costly communication lines between the mainframe at headquarters and each user is another. Each line costs money and so impacts the firm's operating costs.

With the tight profit margins in the insurance industry, firms have great incentive to reduce costs and improve customer satisfaction, if only just slightly.

*Critical success factors*

- Improve productivity; lower costs
- Improve customer service and satisfaction

*Obstacles*

- Cumbersome mainframe technology

*Implications*

- Customer dissatisfaction
- Decreased competitiveness

*Solution*

- Decentralized, distributed computer systems

Compatible systems, such as the Model 815S and the rest of the Series 800 family, offer insurance companies distributed processing power on data that can be downloaded from a larger host system. The Model 815S is well suited for small offices and cost-sensitive companies that still need object code compatibility with larger systems as their needs grow. For these insurance companies, the capability of the Model 815S to distribute most of the claims processing requirements over to the point of customer contact improves customer satisfaction and increases personnel productivity. This could mean that instead of receiving response to a claim in two or three weeks, the customer may have it within a few days.

A leading application is California Interactive Computing's claims processing and risk management solution (Northridge, CA).

**Higher education**

Educational institutions have two primary goals: 1) to provide students with a high-quality education and 2) to conduct first-rate research. These goals depend directly on the university's ability to attract and retain superior faculty and students, as well as its ability to secure adequate funding.

Obstructions limiting a university's attractiveness might include inadequate facilities and equipment, or the absence of teaching, research and scholarship grants. Funding for grants, or to support faculty, students, and facilities, comes predominantly from tuition fees, alumni donations, and corporate contributions. Effectively accessing these funding SOURCES is critical to the university's success. For example, inadequate alumni information or ineffective targeting of corporate resources inhibits funding.

A secondary goal of many universities is to efficiently provide support services for faculty, students, and staff. Evidence of inefficiency might include time-consuming admissions and course registration processes. Streamlining these efforts would improve a university's attractiveness if they helped ease the student enrollment and registration process, reduced staff workloads at peak periods, and communicated enrollment and registration information to faculty planning their courses.

*Critical success factors*

- Recruit and retain superior faculty and students
- Effectively solicit funding from alumni, industry, and government
- Provide efficient support services for faculty, students, and staff
- Construct and maintain campus facilities in support of academic mission

*Obstacles*

- Aging, inadequate facilities, and equipment
- Lack of shared vision among academic departments, their schools, and the university administration
- Inadequate alumni information
- Lack of centralized decision-making and information

*Implications*

- Faculty is hired away
- Declining quality of education
- Reduced research support
- Loss of academic reputation
- Reduced funding

*Solutions*

- Business administration applications for accounting, finance, and budget
- Distributed processing of centralized database for student recruiting, admissions, and registration
- Facilities management (construction, warehouse, fleet management, and inventory)
- Library automation (circulation, on-line catalog access)
- Development information (alumni and foundations) and information access
- Networking departments and administration, E-mail

The Model 815S is attractive to universities because it offers a low-cost entry into the Series 800 family. Several examples of how the Model 815S could be useful to universities follow:

1. The Model 815S could track student enrollment at the admissions office or registrar while connecting that office to various academic departments for their curriculum planning, thereby streamlining workloads at peak demand periods. Likewise, the Model 815S can serve as a low-cost communication link to leverage information between departments or campuses while offering local processing power.
2. The Model 815S might be used by facilities managers to schedule fleet service, track fleet operating costs, or control warehouse inventories. Computerizing these tasks would improve operating efficiency and ultimately reduce expenses.
3. The Model 815S is also an example of HP's commitment to educational institutions. The Model 815S represents leading-edge technology at affordable prices. One of our competitive support programs, the Educational Marketing Program, lengthens the warranty period without cost to the customer. University facilities featuring leading-edge technology can also be used as a "showcase" when recruiting new faculty and students.

Leading applications include CARS Information Systems Corporation (Cincinnati, OH), Software Research Northwest (Vashon, WA), and Guardian Educational System, Ltd. (Jacksonville, FL).

### Hospitality

The hospitality marketplace involves service businesses where fast customer service and cost minimization are keys to success. High-quality guest service and controlled costs are particularly important to a firm's market share in the lodging segment of the hospitality industry. Let's first consider the area of guest service.

When considering guest service, the front desk is the most critical area. Fast, accurate check-in and check-out are part of ensuring happy customers and repeat business. The quality of the service provided at the front desk is dependent on three factors: 1) the speed with which each guest is processed, 2) the depth of information available about each guest that has stayed there before, and 3) the employee's attitude servicing each customer while at the front desk.

Many hotels in HP's target market (over 200 rooms) have automated within the past three to five years to improve operation, control cost, and maintain competitiveness. However, much of the automation hardware is becoming very expensive to maintain (for example, IBM's Series/1) directly affecting operating costs and profitability. In addition, a large proportion of these installed systems also involve proprietary operating systems, making a replacement decision even more expensive. Software rewrites may be necessary even when staying with the same vendor.

Nevertheless, hoteliers are motivated to make the investment for several reasons: 1) automation has proven that better information is available with better technology and newer software and 2) hoteliers want an environment where long-term cost savings are available through scalability, reduced maintenance, and software portability.

*Critical success factors*

- Guest satisfaction, service
- Cost control

*Obstacles*

- Slow (or nonexistent) front office systems
- Unreliable systems, inadequate support
- Inaccessible customer data
- Non-scalable, proprietary, expensive computer systems
- Poor employee attitudes

*Implications*

- Customer dissatisfaction, loss of sales
- High employee turnover, staffing, and training problems
- High computer system and service costs, impact on profitability

*Solutions*

- Fast, reliable, scalable systems
- Fast, effective system support
- Flexible operating system and applications

Hotel properties come in sizes from 50 or fewer rooms to over 2,000 rooms. HP systems come in different sizes, too. Hoteliers can purchase the system size that they need, providing optimal response time at an appropriate cost level. They can also be assured that HP has a scalable product line, based on the POSIX-compliant HP-UX operating system, allowing easy application portability. The Model 815S can support an entire small-to-medium-sized property, where typical connectivities range from 10 to 20 users.

In addition to processor scalability and high performance, the Series 800 family offers industry-leading reliability and support. System downtime is a major obstacle for hotels because it impacts customer satisfaction. Therefore, hotels are often forced to use redundant systems, usually in the form of separate front office and back office systems. Hoteliers can significantly reduce computer costs by using the Model 815S as the one reliable, high-performance system for the entire property.

Leading solutions in the hospitality market include Computerized Lodging Systems (Long Beach, CA), ENCORE Systems (Atlanta, GA), TLI Information Systems (Albuquerque, NM), and Jonas and Erickson (North York, Ontario, Canada).

### **Aerospace and defense industry**

The aerospace and defense industry (ADI) is changing to face new market realities. Trends that will have a significant impact are:

#### **Government rights in data**

This policy asserts that if the government pays for a research and development (R&D) project, it then owns the design and can distribute the specifications to other suppliers. This policy was adopted to increase competition and reduce prices by eliminating a contractor's ability to include R&D costs in the final purchase price. One result is that prime contractors are "teaming" on bids to reduce risk.

#### **Production updating**

A result of the Rights-in-Data policy is that streamlining of production is underway. Product designs need not be your own and the government now awards fixed-price contracts to the low-cost manufacturer without a quantity commitment. The Government audits manufacturing costs through the Defense Contractor Auditing Agency (DCAA).

#### **Design process updating**

Rights-in-Data has led to insistence on design exchange capability; that is, Computer-Aided Acquisition and Logistics System (CALS) compatibility. The goal is to roll design through a variety of suppliers.

#### **Workstation usability**

Accessibility and responsiveness are attractive features of workstations. However, to appeal to design consortiums, workstations must include data exchange standards (CALS).



### **Commercial procurement**

Since the Packard Commission report, pressure to reduce costs by buying "commercial" products is increasing. Budget restrictions are helping to keep the focus on getting the best technology at the lowest cost by purchasing commercially available products.

#### *Critical success factors*

- Meeting government standards and reporting requirements
- Winning additional "add-on" business and keeping current programs
- Developing the ability to work efficiently with "teams" of other primes, partners, and subcontractors

#### *Obstacles*

- Developing methods and systems to support continuous productivity and quality improvement programs
- Disjointed products on multiple computer systems that do not allow for passing of information between contractors or buyers

#### *Implications*

- Loss of the prime's R&D investment if production is awarded to another contractor
- Delays in receiving progress payments
- Firm is subject to government fines and penalty clauses

The Model 815S fits well into a range of aerospace and defense applications when matched with VAB solutions or integrated into program buys by Federal System Integrators. This section discusses five application areas where the Model 815S works well: design, production, facilities, marketing, and administration.

In the design segment of the market, small teams of designers operating in C would have the advantages of price and easy implementation on the Model 815S. The Model 815S could also be used for test data analysis and report generation. The competition is usually a VAX or a cluster of workstations.

As a production system, the Model 815S might be used in quality control to develop Pareto charts and other statistical analyses. Similarly, if the Model 815S is integrated by OEMs, it would work well as an inspection system for manufacturing operations.

Facilities managers might choose the Model 815S to support databases requiring multiple-person access over a building site. Data might include drawings, machine tool parts, or tool crib inventory -- an easy solution for a software supplier.

An aerospace firm's marketing department needs systems to run printers/formatters/graphics output devices and scanners for bid and proposal work. The small size and low price of the Model 815S positions it well for these tasks. The availability of CALS-compliant software would open a large market segment to the Model 815S with subsequent upgrade opportunities to the Model 855. Alternatives to the Model 815S include networked workstations. It's a question of speed, type of graphics, or documentation that would guide choice.

Administration in the aerospace market often has projects requiring secure or "compartmented" systems for personnel functions or project records such as schedules and accounting. The size of the Model 815S and its UNIX operating system, HP-UX, make it an attractive solution.

Two applications for the Model 815S are Process Control Technology's data acquisition package (San Antonio, TX) and CADSI's MCAE software (Oakdale, IA).

### **Telecommunications**

Telecommunications service providers accelerated the replacement and improvement of their telephone and data networks after deregulation in 1984. Along with this change, they have begun to rethink the computer systems that manage their customer records, billing, circuit connections, inventory, and networks. Existing systems are too inflexible and poorly integrated to efficiently support the dramatic change in services offered to customers. Competition from new entrants to the industry has increased the urgency of this task.

The forces driving the service providers to upgrade their networks and computer support systems are threefold. First, they need to improve the quality of their existing voice and data communication services to prevent bypass by end users. For the same reason, they must streamline their operations and cut overhead expenses to provide these services at competitive rates. Finally, they need to grow their business by expanding into new services, which creates new revenue sources for the future.

The current information and network management systems installed within the telephone companies inhibit them from moving quickly to blunt the competition or roll out new products. Many of the existing systems are mainframes with applications dating back ten years. They are expensive to maintain and difficult to change without disrupting other dependent systems. Also, the telephone companies developed most of the systems to automate a particular department such as outside plant engineering, special services provisioning, or local loop repair. Naturally these systems are fragmented. To further automate internal operations, databases must be consolidated and

user interfaces must freely access the applications for several departments; this ensures a smooth, automated flow of activity with minimal human intervention. Unfortunately, network equipment providers and internal MIS development teams have not been responsive enough to the telephone companies' needs. They are bogged down with making time-consuming and expensive enhancements to the core systems.

Consequently, service providers suffer from 1) the imminent loss of customers to hungry competitors; 2) rates that are uncompetitive with private network solutions; 3) missed windows of opportunity for achieving a dominant market position for new services.

*Critical success factors*

- Improve the quality of existing services
- Reduce operating and overhead costs
- Deploy new services to create new revenue sources

*Obstacles*

- Expensive and inflexible mainframe applications
- Fragmented and poorly integrated systems
- Difficulty in influencing network equipment manufacturers to make timely product enhancements

*Implications*

- Loss of existing customers to competitors
- Uncompetitive rates
- Missed window of opportunity for new services

*Solution*

- Surround existing mainframes with small departmental computers that run advanced user applications
- Attach processors to network equipment to provide new information services on the network, and filter data output from the network

Inexpensive systems such as the HP 9000 Model 815S offer a superior alternative to cumbersome mainframe application development. While a telephone company's databases need to reside in a central location, freely accessible to a large number of users, application software can be off-loaded to cost-effective, responsive departmental processors. This allows a service provider to avoid the expense of creating new mainframe applications, speed introduction of new customer services, and tie together systems that previously had to be accessed separately by users.

Using wide area networking services such as X.25, the Model 815S can communicate with multiple hosts holding database information. Applications resident on the Model 815S reduce loading on the hosts and create a single system image, providing up to 24 active local sessions.

Similar to the role of a front end to remote mainframes and super-minis, the Model 815S can act as a front end to the telephone network. Many new services for customers involve processing network traffic, alarm, and configuration data. The Model 815S can monitor and control switches, cross-connects, transmission facilities, and other network elements. Network equipment manufacturers often cannot incorporate all the functionality required by service providers into their products. The Model 815S, acting as an adjunct or attached processor to the network, allows the telephone companies to introduce new services independent of their equipment suppliers.

Most telecommunications companies develop their own software solutions or rely on OEMs to provide them.

### **Manufacturing**

Manufacturing organizations, whether with discrete or process operations, have similar goals that help them improve their competitiveness. Four of these goals include increasing profitability, increasing market share, improving product quality, and responding more quickly to customers and changes in the market.

To attain these goals, certain obstacles must first be overcome. For example, profitability is affected by long product development lead time, unreliable inventory control, and high parts counts and process steps. Increasing market share may likewise be blocked by long product development lead times. Similarly, a manufacturing organization's ability to improve product quality may be inhibited by inefficient communication between the design, manufacturing, and purchasing departments. Finally, the firm's market and customer responsiveness may depend on the quality of the firm's management reporting tools.

Another obstacle confronting the firm might be the use of non-standard parts or the inconsistent use of design standards. Non-conformance with standards impairs a firm's ability to increase profitability and market share, by raising costs and lengthening its development lead time.

#### *Critical success factors*

- Reduction of product development lead time
- Reduction and control of inventory
- Efficient communication between design, manufacturing, and purchasing
- Better management reporting tools

#### *Obstacles*

- Lack of coordination and communication
- Lack of standard parts or adherence to design standards
- Lack of reliable inventory information

*Implications*

- Lower return on investment
- Lower productivity
- Loss of customers and market share
- Increased scrap

*Solutions*

- Networked factory floor operations
- Quality systems
- Database access and manipulation
- Electronic mail
- Simulation software

As HP's low-end entry into the Series 800 family, the Model 815S is a solution for smaller design groups or shop floors requiring an area manager. With products such as MAP 3.0 and UNIX mail functionality, factory floor operations and interdepartmental communication can be facilitated. Factory floor operations also can be improved by the industry standard networking products available with the Series 800 family. For example, industry networking products permit work cells to be linked, even when shops use products from different hardware vendors (providing they also adhere to the standards). HP's networking products, such as 802.3, X.25, ARPA Services, and NFS, enable us to coexist in a multivendor environment.

Leading solutions include Factor by Factrol, Inc., for finite scheduling and Capture for data collection by Industrial Computer Corp.

**Resellers' Channel: VARs, OEMs, and Systems Integrators**

One of the fastest-growing markets for systems vendors is in the area of the low-end systems. These include UNIX-based PCs, workstations, multiuser supermicros, and small minis. Forecasted shipments by leading market analysts estimate that 69% of the total UNIX market in 1992 will consist of low-end systems.

Current industry trends show that traditional minicomputer solution suppliers, in several vertical markets (manufacturing, finance, education, government, etc.), offer entry-level solutions to their customers based on low-end systems. This is due to lower price, higher performance, and standardization demanded by the end-user customers.

VARs, OEMs, and SIs see this growth in low-end systems as an opportunity to expand their customer base and generate incremental revenues. The more established resellers have concentrated less on PC-based systems due to their small profit margins and incompatibility with other vendors' UNIX systems.

*Critical success factors*

- Competitive low-end UNIX system platform that is not over-distributed and commands higher profit margins
- Reseller to end-user competitive discounts/pricing against NCR, Unisys, Altos
- Broad range of scalable products from micros to superminis using the same operating system
- Full data processing system functionality (networking, peripherals, support, etc.)

*Obstacles*

- Prevalence of software solutions on proprietary operating systems (many solutions makes porting expensive)
- Time-consuming port of current applications to UNIX
- Competition's products at higher discounts (greater margins)

*Implications*

- Unsuccessful entry to the fast growing, low-end UNIX market
- Inability to offer customers a range of platforms based on one standard operating system; lower market share

*Solutions*

- Low-end UNIX multiuser/workstation platform that is scalable and offers the full functionality of the larger data processing systems within the family
- Competitive pricing and discounts for resellers

Hewlett-Packard's HP 9000 Series 800 family is a very competitive solution. Resellers have customers who need a range of different prices and performance. Resellers can purchase the system size that they need, providing optimal response time at an appropriate cost level. They can also be assured that HP has a scalable product line based on the POSIX-compliant HP-UX operating system, which allows easy application portability. The Model 815S offers our partners a low-cost system for software porting and development and an entry-level system for their customers with smaller applications.

In addition to processor scalability, the Series 800 family offers industry-leading reliability and support. System downtime reflects badly on resellers, whose profits are directly affected by the performance of both their software and HP hardware.



## Competition

HP's Model 815S is positioned against several competitors, foremost of which are DEC<sup>®</sup> and NCR. DEC has a broad, but expensive, VAX family as well as a new DECsystem 3100 RISC-based computer that uses the MIPS R2000 chip. NCR has a large installed base of Motorola 68020 systems, but has yet to introduce any RISC-based processors. Further DEC analyses can be found in chapter 3, while an NCR discussion continues below. (See Table 2.5 for a systems comparison.)

**Table 2.5 Systems comparison**

System	HP 815S	NCR 32/450	DEC 3100	DEC MV 3300
Processor	CMOS	M68020	MIPS R2000	CVAX 78034
Clock speed	16.7 MHz	25 MHz	16.7 MHz	10 MHz
Cache	64 Kb	32 Kb	64 Kb	None
Floating point	Optional	Optional	Standard	Standard
Memory	8-56 Mb ECC	2-8 Mb ECC	8-24 Mb ECC	12-28 Mb
Networking	LAN, TCP/IP SNA, MAP 3.0 X.25	Ethernet, BSC SNA, LU6.2 X.25	TCPV/P, NFS DECnet/OSI LAN	DECnet, SNA Ethernet, TCP/IP X.25, X.400 LU6.2, NFS
OS	HP-UX	Tower OS UNIX	ULTRIX	ULTRIX, VMS
Storage	304Mb-7.2Gb	46Mb-3.0Gb	334Mb-1.2 Gb	150Mb-750Mb
Tape	67Mb or 133Mb	45Mb or 150Mb	95Mb	296 Mb
Disk controller	HP-IB	ESD/SCSI	SCSI	DSSI
Terminal controller	8 Port MUX	16 Port MUX	LAN-Based	MUX or LAN-based
Battery backup	Available	Standard	NONE	NONE
Maximum terminals	50	32	64	75
Typical users	16-24	15-24	4-32	1-48
Price range	\$15K-\$60K	\$13K-\$50K	\$20K-\$100K	\$23K-\$100K
Availability	October '89	NOW	NOW	NOW

NCR's low price and deep discounts, often up to 50%, are their primary strength and make them formidable competitors in low-end computer systems. In consideration of NCR's other strengths, NCR does offer Token-Ring networking and the LU6.2 protocol, which HP does not yet offer. They also have one of the largest installed bases of UNIX-based systems, exceeding 22,000. The size of NCR's installed base results from their strategy to sell solely to the commercial marketplace as well as the length of time they have been thus committed; NCR began marketing UNIX-based systems in 1982.

NCR also has a broad family at the low end, featuring five systems (32/200, /400, /450, /600, and /650) in the 1-64 user range. The solutions available from NCR are extensive, totaling around 800, whereas HP offers 600.

HP's Model 815S offers customers a lower price entry point into a product family that is broader than NCR's at the high end. For example, the Model 850S matches NCR's top-of-the-line system, the 32/850, in connectivity and performance, but exceeds it in contiguous memory capacity, 128 Mbyte versus 64 Mbyte for each NCR 32/850 processor. The Model 855S offers both superior performance (90 to 180 active users) and better configurability when compared with the NCR 32/850. This selling point is particularly advantageous in deals that involve multiple systems covering a wide range of performance.

The Model 815S's price is 10% below NCR's current price for their bundled 32/450 as table 2.6 shows, but with NCR's expected 15% price decrease, within the next six months, this advantage could disappear.

With or without an NCR price reduction, the Model 815S's configurability is superior. Note the greater memory capacity and connectivity offered by the Model 815S, 48 Mbyte and 50 terminals compared with 8 Mbyte and 32 terminals on the NCR 32/450.

**Table 2.6 Competitive 16-user systems**

	HP 815S	DEC 3100	NCR 32/450	DEC MV 3300
16-user system	\$29,500	\$11,900	\$14,765	\$34,750
8 Mb	INCL	INCL	\$ 6,000	INCL
300 Mb disk	INCL	\$ 6,500	\$ 7,000	INCL
Cartridge tape	INCL	\$ 4,956	\$ 2,000	INCL
16 User UNIX	INCL	\$ 6,800	INCL	INCL
Terminal connect	INCL	\$ 6,050	\$ 3,500	\$ 2,780
Battery backup	INCL	NONE	INCL	Opt.
<b>Total</b>	<b>\$29,500</b>	<b>\$36,206</b>	<b>\$33,265</b>	<b>\$37,530</b>

Note:

- The DEC 3100 has no battery backup capability.
- This NCR configuration contains a 380 Mb disk.
- This NCR configuration contains the high-speed controller.

Other strengths of HP when selling against NCR include our broad offering of peripherals. HP offers workstations, plotters, laser printers, and large (571 Mbyte) disk drives, as examples of our growing leadership in the computer industry. High product quality has helped establish our worldwide reputation and is one of the reasons the Model 815S has 51,000 hours MTBF.

HP's strong reputation also derives from our continued implementation of innovative technology. HP was one of the first to pass AT&T's System V Verification Suite, demonstrating our early embrace of the standards effort. HP was the first major computer vendor to recognize the merits of RISC-based processors and implemented that solution in a new architecture, HP-PA, one of the broadest in the industry.

We have continued to be innovative by co-founding the Open Software Foundation and offering new products to the market like Common X Interface. The ability of the Model 815S to serve diskless nodes reduces customers' costs by allowing disks to be shared, a capability currently unavailable from NCR.

In the future, customers can continue to expect the latest advances in technology implemented with HP's same exacting standards for quality. NCR's current line uses the old Motorola 68020 (MC68020) processor, two generations old with the coming availability of MC68040, and has made no signs of using either the M68030 or the RISC-based MC88000 chips. In the future, we expect NCR to introduce a 30 MHz MC68020 on their 32/850 system.

With HP's new Model 815S, however, we can begin taking some of NCR's market share in the 16-user range.

## Chapter 3. HP 9000 Series 800 product updates

### HP 9000 Model 850S/855S promotional bundles

General Systems Division is announcing high-end HP 9000 Series 800 promotional bundles (effective June 1, 1989 through October 31, 1989) for the Models 850S and 855S. These bundles lower the price hurdle between the powerful mid-range Model 835SE and high-end systems. With the discontinuance of the Model 840S, these 128-user bundles further improve HP's price/performance leadership across the Series 800 family.

### Ordering information and availability

These bundles will be placed on the June '89 CPL and made available through October 31, 1989.

The 128-user promotional bundle for the Model 850S consists of the components in Table 3.1.

**Table 3.1 128-user promotional bundle for Model 850S**

Product number	Description	List price
9742A	Qty.(1) Model 850S System SPU	\$188,500
A1104A	Qty.(1) 16 Mb RAM Memory Board	32,000
27111A	Qty.(1) HP-FL Card	5,970
Opt. 601	Qty.(1) CIO Terminal Expander	30,000
92455A	Qty.(1) HP-UX Unlimited License	34,125
Opt. 0A3	Credit for 64-User License	(18,375)
Total system list price		\$272,220
Less 10% promotional bundle		(27,222)
Total system promotional price		\$244,998

The 128-user promotional bundle for the Model 855S consists of the components in Table 3.2.

**Table 3.2 128-user promotional bundle for Model 855S**

Product number	Description	List price
A1114A	Qty.(1) Model 855S System SPU	\$308,500
A1104A	Qty.(1) 16 Mb RAM Memory Board	32,000
27111A	Qty.(1) HP-FL Card	5,970
Opt 601	Qty.(1) CIO Terminal Expander	30,000
92455A	Qty.(1) HP-UX Unlimited License	34,125
Opt 0A3	Credit for 64-User License	(18,375)
Total system list price		\$392,220
* Less 10% promotional bundle		(39,222)
Total system promotional price		\$352,998

\*Discount may vary slightly with Intercon and Europe.



Your order processing personnel are trained to handle promotional bundles through the order processing field document. For specific instructions on ordering, contact your order administrator.

In addition, IND will offer a price discount of 25% on a 20 MUX (98196A) pack.

These promotional bundles make the Model 850S/855S more competitive than ever at the 100-user level and above! (Refer to "VAX 6300 Family" to see how the 850S/855S stack up against DEC's new VAX 6300 series.) These bundles are an indication of GSY's aggressive stance in becoming a winner in the high-end supermini marketplace.

### **HP 9000 Series 800 sales update**

Many of you are aware of the value the GSY Account Profile Reference Information System (APRIS) database can offer you in sales situations. Thanks to those who have completed the Series 800 database questionnaire, we now have a wealth of information to help you win more deals!

In addition to sales, the database helps GSY plan for new products and enhancements, as well as sales and marketing programs.

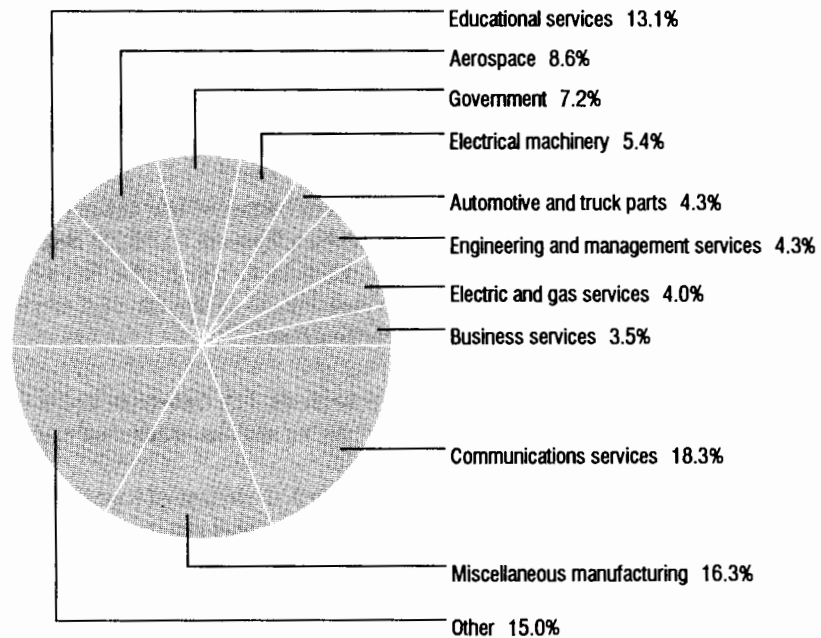
Note: APRIS is a database of installed Series 800 and 300 products. The information is received via survey from sales representatives worldwide who have sold HP 9000 systems and includes information on demographics, competitive information, configurations, and much more.

## HP 9000 Series 800 industry/application breakdown

Communication services and manufacturing continue to be the leading industries for HP's Series 800 systems.

**Figure 3.1 HP 9000 Series 800 Multiuser/Server Systems**

### Industry breakdown



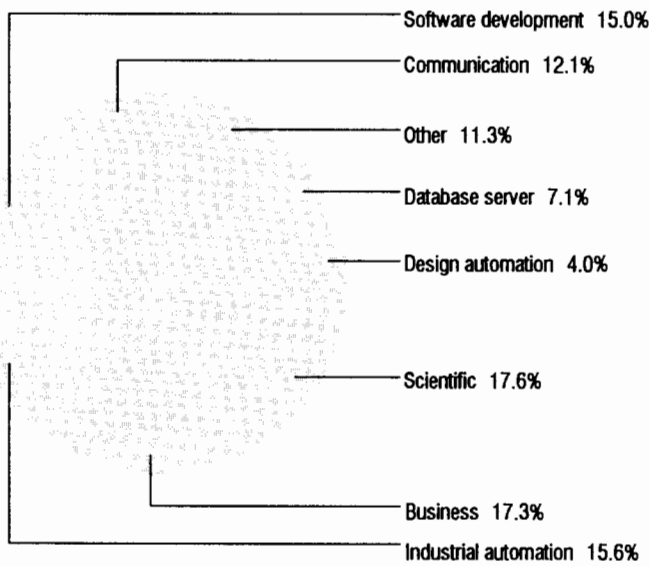
Source: Series 800 sales survey, January 1989

Within the industry breakdown, we have seen significant growth in the communication services industry (from 17% in November '88 to 23% in March '89). This is a direct result of strong orders from such customers as AT&T and several other major telecommunications customers. In addition, financial services and government are now a larger portion of the 1988 - 1989, 800 Series industry breakdown, each having gained more than 3% points from the fall of 1988.

The application breakdown has remained relatively stable from the fall of 1988 to the present. The area of significant change was in the database server application. This area grew from less than 3% of the 800 Series applications in 1988 to more than 7% presently. (See Figure 3.2.) New diskless server capabilities on the Series 800 should continue to help this area grow significantly.

**Figure 3.2 HP 9000 Series 800 Multiuser/Server Systems**

**Application breakdown**



Source: Series 800 sales survey, January 1989

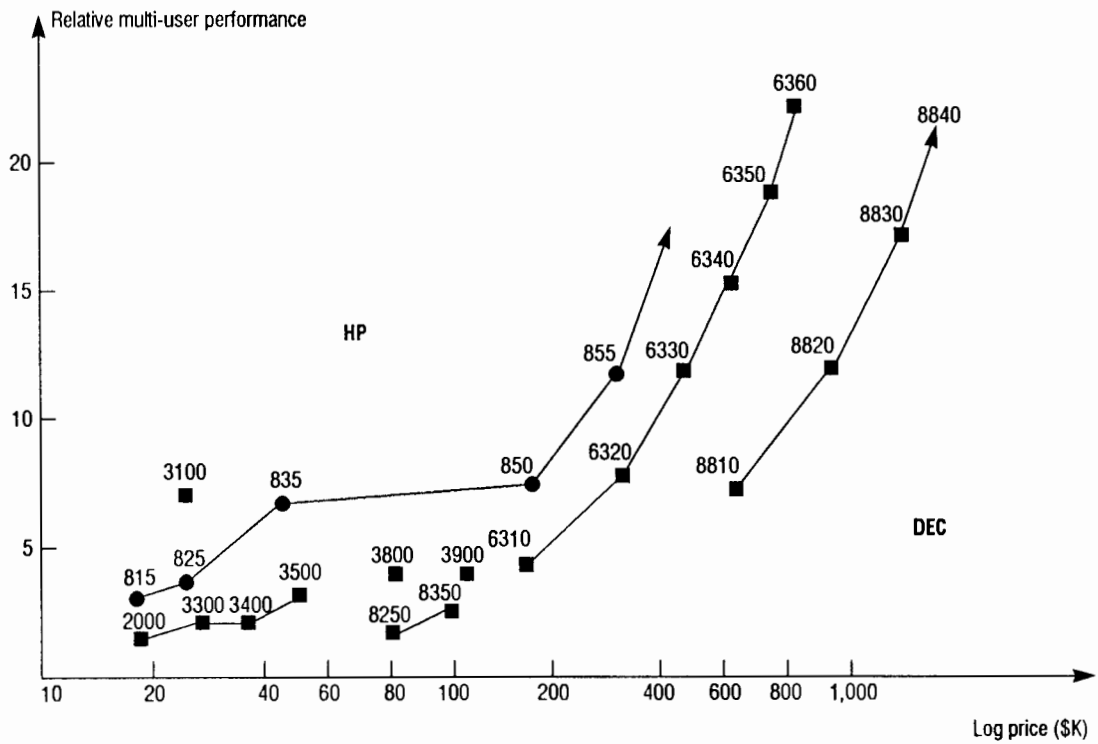
More specifically, low-end applications are typically geared more toward the scientific areas such as research analysis, statistical analysis, and software engineering and development. In the mid-range, you see a combination OLTP and scientific applications. At the high-end, the majority of applications are transaction processing-related, with almost half of our systems used as database servers or for software development.

**DEC competitive update**

DEC introduced four new systems in the first four months of 1989. The VAX 6300 family of mid-range computers was announced on January 24; the DECsystem 3100 was introduced on March 1; the MicroVAX 3800 and 3900 were introduced April 10. This section discusses DEC product positioning relative to HP's Series 800 family, key new product features, implications for DEC, and new product strengths and weaknesses.

The positioning of the Series 800 family relative to the DEC VAX line and the DECsystem 3100 appear in Figure 3.3.

**Figure 3.3 HP 9000 Series 800 family vs. DEC family**





## DECsystem 3100

The DECsystem 3100 is the first general-purpose member of Digital's RISC-based UNIX systems, which includes the DECstation 3100 workstation and the DECstation 3100S server announced in January 1989. The DECsystem 3100 computer is a multiuser version of the DECstation 3100 and will not be available in volume until the second quarter of the 1989 calendar year. (See Tables 3.3 and 3.4 for key features/options and pricing.)

**Table 3.3 DECsystem 3100 key features and options**

<b>Performance</b>	14 MIPS * 1.6 MFLOPS (double precision Linpack)
<b>Users supported</b>	4 to 64
<b>CPU</b>	MIPS R2000
<b>Floating point unit</b>	MIPS R2010
<b>Clock speed</b>	16.67 MHz
<b>Cache</b>	64-Kb instruction cache 64-Kb write-through data cache
<b>Memory</b>	8 to 24 Mb (4 Mb increments)
<b>Storage</b>	One to four 332-Mb 5.25-inch Winchester disks 95-Mb streaming tape

\*The MIPS rating refers to the performance of the MIPS CPU chip. This number applies to compute-intensive applications only and will not be realized in a multiuser environment! We expect the performance of the DECsystem 3100 to be comparable to the performance of the Model 835S/SE in a multiuser environment.

### Software

<b>Operating system</b>	ULTRIX-32 (includes TCP/IP, NFS networking protocols, X User Interface client, and optimizing C compiler)
<b>Additional layered software</b>	Optimizing FORTRAN compiler with VAX extensions DECnet/ULTRIX

**Table 3.4 Typical DECsystem 3100 U.S. pricing**

4-user system	(8 Mb memory, 332-Mb disk drive)	\$20,400
8-user system	(8 Mb memory, 332-Mb disk drive)	\$22,004
16-user system	(16 Mb memory, two 332-Mb disk drives)	\$37,704
32-user system	(24 Mb memory, three 332-Mb disk drives)	\$55,604
Optional Tape Drive	(95 Mb)	\$ 4,956

**Implications for DEC**

The most significant impact of this announcement is that DEC can now offer a RISC-based product. Digital has a valid reason to be apprehensive about the DECsystem 3100 -- it represents a marked departure from a simple, yet successful corporate strategy focusing on the long-standing VAX architecture.

The introduction raises several key positioning issues for DEC in the mid-range market, particularly with respect to its VAX product offering and its UNIX and VMS™ systems. The main concern is that the announcement creates the message that the VAX architecture is obsolete and will soon be replaced. Additionally, VAX customers, regardless of the operating system used, will be questioning the logic behind paying significantly more money for a VAX system when the cheaper, better-performing MIPS-based system is available. DEC also should be concerned that the DECsystem 3100 could cannibalize DEC's VAX family, especially those running ULTRIX. The company's fear regarding these issues probably explains why the announcement was so low-key -- a strategy very out of character for DEC.

The DECsystem 3100 may not be a significant threat to the VAX installed base running VMS applications; since it is typically a major development effort to port applications to different platforms, the DECsystem 3100 would not be a viable alternative. There is a larger probability of migrating if the customer needs cheap compute cycles.

We can view the DECsystem 3100 announcement as DEC sending up a trial balloon to assess the system's impact on its current product offering while fighting off inroads by vendors like HP and Sun. The company must now weigh closely the effect of its RISC systems on its VAX line.

## HP 9000 Series 800 family comparison

### Performance

Table 3.5 compares Model 835S/SE to the DECsystem 3100.

**Table 3.5 HP 9000 Model 835S/SE and DECsystem 3100 performance comparison**

	Model 835S/SE	DECsystem 3100
CPU Dhrystone	23K	25K
FPP	2.3 MFLOPS Single-Precision Linpacks 2.02 MFLOPS, Double-Precision Linpacks	3.7 MFLOPS  1.6 MFLOPS
Integer		
MWhetstones, Single-Precision	8.8	13.0
MWhetstones, Double-Precision	6.7	10.3
Spice 2G6	1.43 x Sun 4/260	1.91 x Sun 4/260

### Price

Table 3.6 compares pricing of Model 835S/SE to the DECsystem 3100.

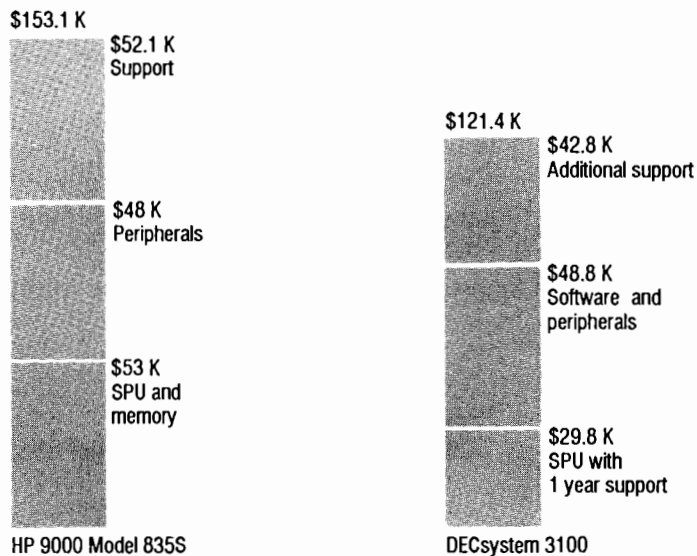
Looking at system price, we are at a premium compared to the DECsystem 3100 on our entry-level Model 835S configured with 32 users, 16 Mb RAM, 1.1-Gb disk, and 150-Mb cartridge tape:

**Table 3.6 Model 835S to DECsystem 3100 pricing comparison**

	DEC list (\$K)		HP list (\$K)
DECsystem 3100	\$ 29.8	Model 835S	\$ 45.0
Disk	19.8	Disk	31.4
Tape	5.0	Tape	4.0
		Add'l 8 Mb memory	8.0
System hardware total	54.6	System hardware	88.4
DTC hardware	24.0		
LAN software	INCL	5 6-channel MUXes	12.6
System total list:	\$ 78.6	System total list	\$101.0

When five-year hardware and software support costs are added, the Model 835S is still at a premium compared to the DECsystem 3100 (see Figure 3.4). However, keep in mind that the Model 835 offers greater expandability than the 3100 and an attractive growth path to higher-performance systems. The DECsystem 3100 is a single-point solution and has no growth paths to the higher-end VAX family systems. When selling against the 3100, also highlight the system's many weaknesses outlined in the next section.

**Figure 3.4 HP 9000 Model 835S vs. DECsystem 3100 five-year cost of ownership comparison**



Configuration: 32 users, 16 Mb RAM memory, 1.1 Gb disk, 150 Mb cartridge tape.

## **DECsystem 3100: strengths and weaknesses**

### *Strengths*

The DECsystem 3100 computer offers very competitive price/performance in a desktop multiuser system.

### *Weaknesses*

The DECsystem 3100 also has some limitations relative to our Series 800 product line that should be underscored when selling against this system:

- Only 24 Mbytes of RAM are supported on the DECsystem 3100 computer, while the 825S, 835S/SE systems support up to 112 Mbytes of RAM. The DECsystem 3100's lower memory capacity could be an issue if the customer wants to use his computer in a multiuser environment.
- The DECsystem 3100 supports only 1.3 Gbytes of disk space while the 825/835 systems support 6.85 Gbytes (with HP-IB) and 9.14 Gbytes (with HP-FL). A large database application could easily utilize the entire 1.3 Gbytes of space on the DECsystem!
- The 3100 has restricted I/O configurability with the system being well-suited only for 16- and 32-user bundles. DEC readily admits that 64 users are not easily supported on the system and thus does not offer a 64-user bundle. We can compare this to our Model 835SE, which will easily support 128 users in the November 1989 timeframe. Furthermore, DEC will typically try to sell the 63XX product line if the customer wants a system with more than 32-user support, a large application software base, expandability, and flexibility. Compared to the 63XX family, the Model 835SE is unsurpassed!
- For floating point-intensive tasks, the 835S/SE provides stronger performance as measured by the Linpack benchmark. The 835S/SE is rated at 2.02 MFLOPS while the DECsystem 3100 is rated at only 1.6 MFLOPS (both DP Linpacks numbers).
- The Series 800 family supports direct MUX connections while the DECsystem 3100 supports only LAN-based terminal connections. Hence, the DECsystem 3100 is subject to the speed limitations of the Telnet terminal server while the Series 800 family enjoys the higher performance associated with MUX connectivity.
- The DECsystem 3100 is a point product that is not object-code compatible with the VAX systems. Furthermore, there is no upgrade path from the 3100 to the higher-end VAX product line. HP offers simple, cost-effective, in-the-field board swaps for Model 825S to Model 835S/SE, Model 835S to Model 835SE, and Model 850S to Model 855S upgrades. Beyond these growth paths, we offer a multitude of upgrades and aggressive trade-in credits within the Series 800 family that allow for improved performance and connectivity. For more information about how our upgrade program compares to DEC's, refer to the "Series 800 Upgrade Program Update" section of this guide.

### MicroVAX 3800/3900

On April 10, 1989, Digital Equipment Corporation announced the MicroVAX 3800 and 3900 systems, effectively obsoleting the MicroVAX 3500 and 3600 systems which were introduced in September 1987. The new systems are based on the same CMOS processor implemented most recently in the VAX 6300 and 6200 families and claim to offer up to one and a half times the CPU performance rating of the MicroVAX 3500/3600 and four times the storage capacity.

The MicroVAX 3800 and 3900 systems are available as both general-purpose, multiuser systems and as servers. The multiuser systems support up to 76 active users and 152 subscribers with moderate work loads on DEC's business office information software package, ALL-IN-1. Both the 3800 and 3900 support either ULTRIX or VMS and are available now. Tables 3.7 and 3.8 show key features and options of the 3900 and 3800, respectively.

**Table 3.7 MicroVAX 3900 key features/options**

<b>Performance</b>	3.8 times performance of VAX 11/780 Eight relational database debit/credit transactions per second  Note: This performance claim applies to the VAX 3900 running in a VMS environment. Performance in an ULTRIX environment will be significantly lower.
<b>CPU</b>	CVAX
<b>Clock speed</b>	16.67 MHz
<b>Memory</b>	Up to 64 Mb
<b>Storage</b>	1.2 to 9.7-Gb disk

#### Typical MicroVAX 3900 U.S. pricing

Cabinet enclosure  
32-Mb memory  
1.2-Gb RA90 disk and controller  
296-Mb TK70 cartridge tape and controller  
DECnet/Ethernet adapter  
20-user VMS or 64-user ULTRIX license  
One-year return-to-Digital warranty  
\$120,200

**Table 3.8 MicroVAX 3800 key features/options**

<b>Performance</b>	3.8 times performance of VAX 11/780 Nearly eight relational database debit/credit transactions per second  Note: This performance claim applies to the VAX 3800 running in a VMS environment. Performance in an ULTRIX environment will be significantly lower.
<b>CPU</b>	CVAX
<b>Clock speed</b>	16.67 MHz
<b>Memory</b>	Up to 64 Mb
<b>Storage</b>	400 Mb to 2.4 Gb disk

**Typical MicroVAX 3800 U.S. pricing**

Pedestal enclosure  
 16 Mb memory  
 400 Mb RF71 integrated disk and DSSI adapter  
 296 Mb TK70 cartridge tape and controller  
 DECnet/Ethernet adapter  
 20-user VMS or 64-user ULTRIX license  
 One-year return-to-Digital warranty  
 \$81,000

**Implications for DEC**

The new 3800 and 3900 are positioned as the top of DEC's low-end family of systems. They are close in power to the 6310 system, which is considered the low end of DEC's mid-range systems. While the new 3800 and 3900 and the 6310 offer comparable VAX MIPS performance, the 3800 and 3900 are based on DEC's Q-Bus, and the 6310 is based on the company's more expensive BI-Bus. Key differences between the 3800 and 3900 are their cabinet and storage capacities.

In addition to the new 3800 and 3900, DEC introduced a new entry-level 3300 capable of supporting one to five users. The systems, priced at \$25,000, claim to be 43% less expensive than the previous entry-level 3300 that supports up to 10 users. Meanwhile, DEC has also reduced prices 15% for the 10-user models of its MicroVAX 3300 and 3400. These price reductions are an effort to offer better overall price/performance than IBM's AS/400 systems.

Although DEC will continue to support and offer the 3500 and 3600, the company expects that the 3800 and 3900 will replace those lines. These systems will be aimed at customers in commercial markets such as midsized departments in insurance, brokerage firms, and banks.

### HP 9000 Series 800 family comparison

For positioning purposes, the new VAX 3800 and 3900 systems fall in between the 825S and 835S/SE for most applications. Table 3.9 shows a 32-user comparison between the Model 825S and VAX 3800; Table 3.10 shows a 64-user comparison between the Model 835SE and VAX 3900.

**Table 3.9 32-user comparison between the HP 9000 Model 825S and VAX 3800**

32-User Configuration - OS, 16 Mb memory, 600-Mb disk, 1/4" tape, 32 ports

	HP Model 825S	DEC VAX 3800
Base System	\$ 25,500	\$ 81,000
Memory	8,000	INCL
Disk	14,575	11,000
Tape	4,055	INCL
Connectivity	28,165	9,000
Total hardware	80,295	101,000
Total software	6,900	INCL
Total system	\$87,195	\$101,000

For this configuration, the 825S is 14% less expensive than the VAX 3800! Given the DEC performance claim that the MV3800 provides 1.5X the performance of the MV3500, this system will have higher performance in transaction oriented applications than the 825S. For compute intensive applications, the 825S will provide superior performance. Also, keep in mind that the 825S will support up to 112 Mbyte of memory and up to 6.9 Gbyte of disk. This is a distinct advantage over the VAX 3800's capability of only 64 Mbyte memory and 2.4 Gbyte disk!

**Table 3.10 64-user comparison between the HP 9000 Model 835SE and VAX 3900**

64-User Configuration - OS, 32 Mb memory, 1.1-Gb disk, 1/2" tape, 64 ports

	HP Model 835SE	DEC VAX 3900
Base System	\$ 90,000	\$ 120,200
Memory	8,000	INCL
Disk	31,400	INCL
Tape	23,400	27,000
Connectivity	30,855	18,000
Total hardware	183,655	165,200
Total software	INCL	INCL
Total system	\$183,655	\$165,200

For this configuration, the 835S is 11% more expensive than the VAX 3900, but the 835S/SE provides greater performance in both transaction-oriented and compute intensive applications than the VAX 3900. Keep in mind that HP provides an upgrade path with return credits for customers whose needs grow beyond the 835SE. However, there is no upgrade path from the VAX 3900 to the VAX 6300 systems.

### **MicroVAX 3800/3900: strengths and weaknesses**

#### *Strengths*

DEC's new products effectively extend the MicroVAX family's performance level upwards, thus expanding the range of solutions the MicroVAX family can provide. Mass storage capacity has also been significantly increased to 9.7-Gbyte disk space on the MicroVAX 3900 system. Both systems support either Ultrix or VMS, and are compatible with all other VAX and MicroVAX systems Digital offers.

In an unusual strategy for the MicroVAX family, DEC is offering upgrade paths from current MicroVAX 3500/3600 machines to the new MicroVAX 3800/3900 systems. Also breaking tradition, the company is making available upgrade paths for MicroVAXes purchased as "VAXservers," allowing them to be made into more powerful VAXservers or into MicroVAX multiuser systems.

*Weaknesses*

The MicroVAX 3800/3900 systems also have some limitations relative to our Series 800 product line that should be highlighted when selling against these systems:

- Our Model 815S offers nearly a 60% performance advantage over the MicroVAX 3800/3900 systems when comparing relative performance to the VAX 11/780 computer, the industry comparison standard. The Model 815S is rated at about six times the performance of the VAX 11/780, while the MicroVAX 3800/3900 systems are only 3.8 times the performance of the VAX 11/780. Our mid-range products offer even greater performance with the Models 825S and 835S/SE coming in at 7 and 14 times the performance of the VAX 11/780, respectively.
- Only 64 Mbyte of RAM is supported on the MicroVAX 3800/3900 systems, while the Model 825S and 835S/SE systems support up to 112 Mbyte of RAM. DEC's lower memory capacity could be a problem if the customer wants to use the MicroVAX in a multiuser environment.
- While DEC offers the MicroVAX upgrades mentioned above, there is still no upgrade path from the 3300/3400 systems to the new high-end MicroVAX 3800/3900 systems. There is also no growth path from the MicroVAX 3300 to the 3400 or from the 3800 to the 3900. Finally, there are no upgrade paths from the MicroVAX line to DEC's higher-end VAX systems, such as the VAX 6300 family. Keep in mind that Digital offers no return credits to customers on any of the systems or products it sells! HP offers simple, cost-effective board swaps for Model 825S to Model 835S/SE, Model 835S to Model 835SE, and Model 850S to Model 855S upgrades. Beyond these growth paths, we provide a multitude of upgrades and aggressive trade-in credits within the Series 800 family that allow for improved performance and connectivity. For more information about how our upgrade program compares to DEC's, see "Series 800 Upgrade Program Update" in chapter 4.



### VAX 6300 family

On January 24, 1989, DEC announced a mid-life kicker to the VAX 6200 series, which had been announced only nine months earlier. The VAX 6300 family is billed as "an entire set of mid-range systems in a single cabinet." This new family claims to deliver up to 35% higher performance and costs just 5% more.

The VAX 6300 series is a family of six computer systems based on a symmetric multiprocessing design (for VMS only) using an advanced CMOS processor that claims to deliver 3.8 MIPS (3.8X the performance of the VAX 11/780). VAX 6200 customers can upgrade to the VAX 6300 by swapping processor boards. Table 3.11 shows a performance comparison of the two families.

**Table 3.11 Performance comparison of the two DEC families**

DEC performance claims (relative to VAX 11/780)		
CPU	VAX 6200	VAX 6300
1	2.8	3.8
2	5.5	7.4
3	8.3	11.2
4	11.0	14.8
5	N/A	18.7
6	N/A	22.4

However, DEC performance claims are based on ideal multiprocessing throughput potential, which the customer may or may not realize, depending on the application. (See "VAX 6300: strengths and weaknesses.")

DEC announced the hardware and software system configurations in table 3.12.

**Table 3.12 DEC announced these hardware and software system configurations**

VAX 6310 VMS Base System	\$ 184,100
VAX 6310 ULTRIX-32 Base System	155,200
VAX 6320 VMS Base System	318,200
VAX 6320 ULTRIX-32 Base System	256,600
VAX 6330 VMS Base System	418,300
VAX 6340 VMS Base System	584,400
VAX 6350 VMS Base System	666,700
VAX 6360 VMS Base System	751,900
<hr/>	
VAX Fileserver 6310 VMS Base System	\$ 178,500
VAX Fileserver 6310 ULTRIX-32 Base System	141,900
VAX Fileserver 6320 VMS Base System	287,500
VAX Fileserver 6320 ULTRIX-32 Base System	243,200
<hr/>	
VAXcluster 6312 System	\$ 715,300
VAXcluster 6333 System	\$2,770,000

Note that "paid-up" VMS systems are significantly more expensive than the above prices.

DEC claims that balanced system performance makes the VAX 6300 systems ideal for compute-intensive and transaction-oriented applications, including computer-aided design and manufacturing, office automation, commercial data processing, and many other engineering, scientific, and general-purpose applications.

### **Implications for DEC**

The VAX 6300 is not a breakthrough product by any measure. It is simply the completion of the original design of the symmetric multi-processing capability. However, analysts say that the new products will help DEC withstand the onslaught of IBM's AS/400 computer line.

The rapid replacement of the 6200 (a life of only nine months) is, according to a DEC vice president, "the beginning of a trend. The rate of change in performance is going to be accelerating on us." The question becomes whether DEC's aging VAX architecture will be able to keep pace with these accelerating performance demands.

Focusing on IBM as their main competition, DEC is sending a message that their mid-range is significantly broader than IBM's mid-range. The 6300 series is billed as "the most expandable mid-range in the industry." DEC claims that, in a single cabinet, the VAX 6300 crosses the performance range of four distinct IBM families: the AS/400, IBM 9370, IBM 4381, and IBM 3090. However, this claim assumes almost linear performance improvement as processors are added, which could be highly unrealistic depending on the application. For instance, in the commercial area with more disk and terminal I/O, the performance gains achieved by SMP are much more modest.

If DEC's performance claims are true, the high end of the 6300 series completely overlaps the high end of the 8800 series ECL-based systems. With significant price/performance improvement, the VAX 6300 will replace the VAX 8800 for a great majority of applications. The VAX 8800 series has not had a robust life since its introduction in April 1988. However, for certain single-threaded applications, the 8800's more powerful 6 MIPS processors are better suited than the 6300's 3.8 MIPS processors.

### Series 800 family comparison

The Series 800 Models 835S/SE, 850S, and 855S all compete against the VAX 6300 series. Tables 3.13, 3.14, 3.15, and 3.16 compare these systems on the basis of performance and price.

#### Performance

**Table 3.13 Performance comparison of these systems**

	835SE	6310	850S	6320	855S	6330
<b>Relative multiuser performance</b>	6.7	3.8	7.2	7.5	10.8	11.3
<b>Linpack</b>						
(SP MFLOPS)	2.3	0.92	2.2	0.92	2.4	0.92
(DP MFLOPS)	2.0	0.61	1.8	0.61	2.2	0.61
<b>Whetstone</b>						
(SP KWIPS)	9000	4167	8100	4167	10490	4167
(DP KWIPS)	6600	2653	6100	2653	8340	2653

In conclusion, the Series 800 family is clearly superior in compute-intensive benchmarks, such as Linpack and Whetstone, to the 6300 series!

#### Price

Compare the Series 800 to the VAX 6300 by looking at the user configurations in Tables 3.13, 3.14, and 3.15.

**Table 3.14 Price comparison for 64 users**

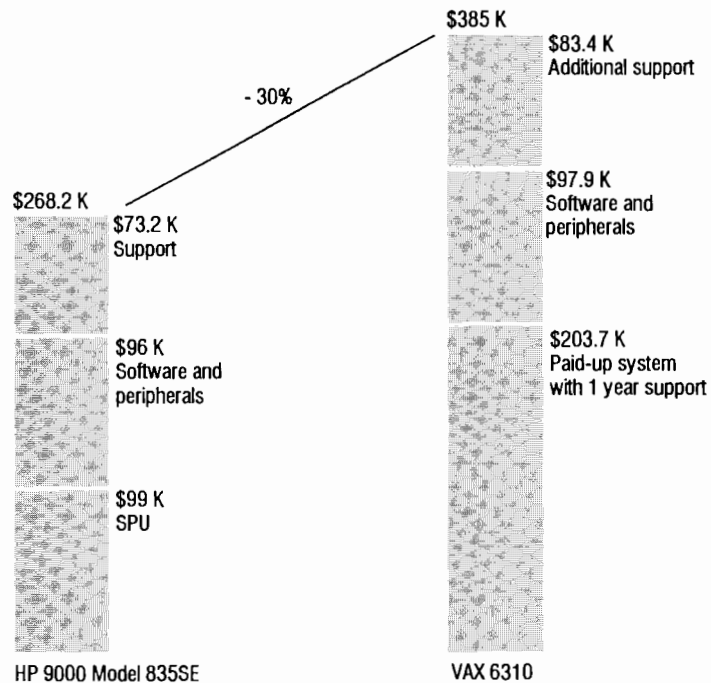
Configuration #1 - 64 users, 32 Mb RAM, 1.1 Gb disk, 6250 cpi tape

	HP Model 835SE	DEC VAX 6310
Base system	\$ 99,000	\$203,688
Memory	6,000	INCL
Disk	31,400	36,360
Tape	23,200	25,550
Connectivity	32,450	29,249
Console	895	3,017
Total hardware	<u>192,945</u>	<u>297,864</u>
Total software	<u>2,060</u>	<u>3,769</u>
Total system	\$195,005	\$301,633

The Model 835SE is over 35% less expensive than the VAX 6310 for this 64-user configuration! When hardware and software support are taken into account over a period of time, HP has a significant cost of ownership advantage. The Model 835SE is over 30% less expensive than the VAX 6310 in a five-year cost of ownership analysis! (See Figure 3.5.)



**Figure 3.5 HP 9000 Model 835SE vs. VAX 6310  
five-year cost of ownership comparison**



Configuration: 64 users, 32 Mb RAM memory, 1.1 Gb disk, 6250 cpi tape.

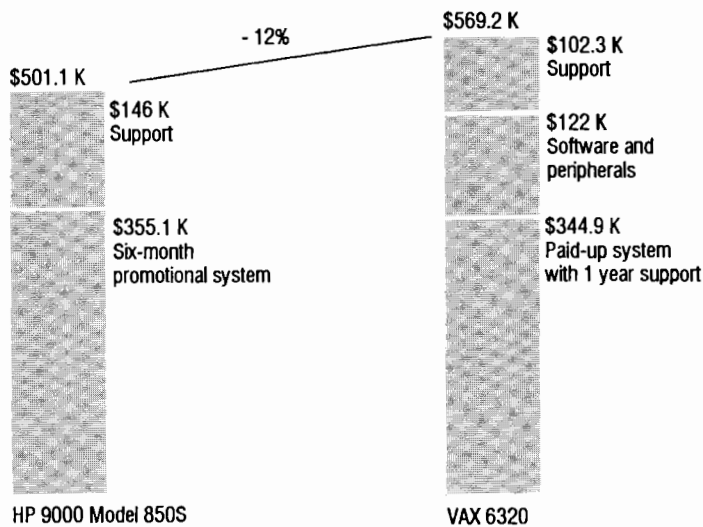
**Table 3.15 Price comparison for 96 users**

Configuration #2 - 96 users, 48 Mb RAM, 1.7 Gb disk, 6250 cpi tape

	HP Model 850S	DEC VAX 6320
Base system	\$ 188,500	\$ 344,868
Memory	32,000	INCL
Disk	50,850	54,552
Tape	23,200	25,500
Connectivity	70,400	35,169
Console	895	3,017
Total hardware	<u>365,845</u>	<u>463,106</u>
Total software	<u>15,750</u>	<u>3,769</u>
Total system	<u>\$381,595</u>	<u>\$466,875</u>
Special six-month promotion price	\$343,525	

HP's commitment to industry-leading price/performance is illustrated here, as the Model 850S is over 26% less expensive than the 6320 VMS system! This new promotional bundle means that the high-end of the Series 800 family will be more competitive than ever. When looking at five-year cost of ownership, the Model 850S is over 12% less expensive than the VAX 6320 system.

**Figure 3.6 HP 9000 Model 850S vs. VAX 6320 five-year cost of ownership comparison**



Configuration: 96 users, 48 Mb RAM memory, 1.7 Gb disk, 6250 cpi tape.

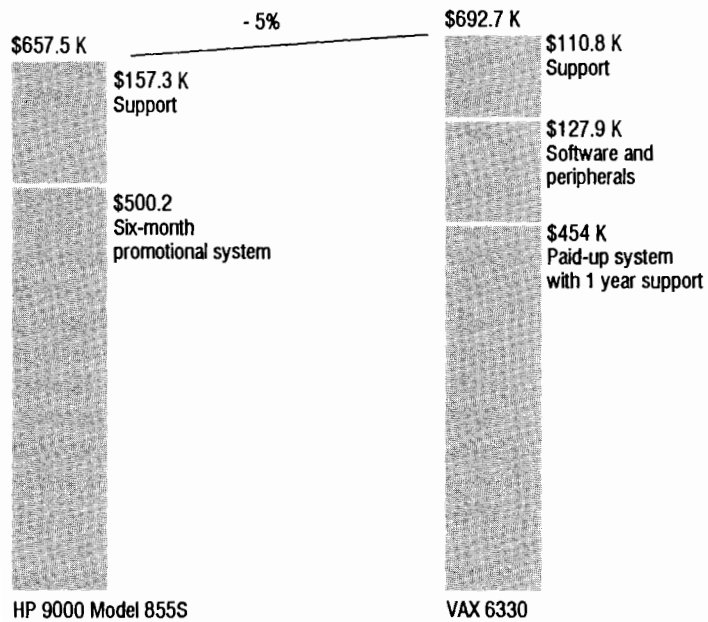
**Table 3.16 Price comparison for 128 users**

Configuration #3 - 128 users, 64 Mb RAM, 1.7-Gb disk, 6250 cpi tape

	HP Model 855S	DEC VAX 6330
Base system	\$ 308,500	\$454,028 (paid-up est.)
Memory	64,000	INCL
Disk	50,850	54,552
Tape	23,200	25,500
Connectivity	83,025	41,089
Console	895	3,017
Total hardware	530,470	578,186
Total software	15,750	3,769
Total system	\$546,220	\$581,955
Special six-month promotion price	\$500,160	

For this configuration with the promotion price, the Model 855S is over 14% less expensive than the VAX 6330! Again, the new high-end bundle means that HP's price/performance leadership position will not be threatened by DEC. When looking at five-year cost of ownership, the Model 855S is over 5% less expensive than the VAX 6330 system.

**Figure 3.7 HP 9000 Model 855S vs. VAX 6330 five-year cost of ownership comparison**



Configuration: 128 users, 64 Mb RAM memory, 1.7 Gb disk, 6250 cpi tape.

## VAX 6300: strengths and weaknesses

### *Strengths*

With the introduction of the VAX 6300 series, DEC has strengthened its position in mid-range systems. The 6300 offers convenient, expandable performance growth for new customers and investment protection for 6200 customers. The 6300 series uses the VAXBI I/O bus, which, according to DEC, offers a bandwidth of 60 Mbytes/sec, but only a throughput of 10 Mbytes/sec.

### *Weaknesses*

The VAX 6300 also has some limitations relative to our Series 800 product line that should be underscored when selling against this family:

- DEC currently lacks ULTRIX support for systems beyond the 6320. DEC salespeople will sell ULTRIX only when absolutely necessary, and may try to "bait and switch" customers to lock them into the VMS proprietary world. When forced to sell an ULTRIX system, a DEC SR will have difficulty justifying the higher price of the 63XX system versus the DECsystem 3100. In addition, ULTRIX is not SVID-compatible and has not passed the System V Verification Suite. DEC's ULTRIX employs an asymmetric (master/slave) approach to multiprocessing, wherein one processor handles all the I/O. Symmetric multiprocessing capabilities are not expected until the end of 1989, according to Digital Review.
- DEC's claim of nearly linear performance improvement by adding additional processors should be viewed with much skepticism. By DEC's own admission, commercial applications' throughput on multiprocessor systems will be much less, experiencing degradation due to software overhead, contention for shared memory and operating system resources, inability to take advantage of parallel processing features of SMP by single-threaded or batch applications that have not been specially "decomposed," etc.
- Remember that each processor in a VAX 6300 is only 3.8 MIPS -- about the power of a Model 825 processor. A single-threaded application, such as a batch MRP program, runs only ONE processor at a time, despite the presence of other processors in the cabinet. This means that for batch programs, a VAX 6360 is effectively a 6310! Therefore, larger uniprocessors such as the Model 850 or Model 855 processors are preferable solutions.

- As with the 6200 family, DEC has built in price penalties (\$16,300 to \$36,500 per upgrade) for customers who upgrade to larger systems as compared to buying the larger systems in the first place.
- ULTRIX is not optimized on the VAX architecture. The performance numbers presented above reflect the 6300 family running VMS. Keep in mind that the same VAX system running ULTRIX is typically 20% slower.
- The VAX 6300 family is weak in floating-point computation performance compared to the Series 800 family. HP's systems are more than twice as powerful as the 6300 family when comparing industry standard benchmarks, such as Linpack and Whetstone!
- With our new promotional bundles for the Models 850/855, HP has unbeatable price/performance! Compared to the aging VAX architecture, HP-PA is in the high-growth phase of its life. The Series 800 family offers industry-leading price/performance, the advantages of uniprocessor technology, an industry standard operating system, and HP quality, service, and support.

## Conclusion

DEC's new product announcements keep the company in the media's attention and help make their overall price/performance more competitive with the industry. However, these new products also promise to create confusion from customers and cannibalization problems with established VAX systems.

The DECsystem 3100 should especially create doubt and confusion from DEC loyalists. For a company that has prided itself for so long on its simple corporate strategy of "one architecture, one operating system, and one networking strategy," DEC has discarded this strategy. Since the DECsystem 3100 will not be shipping for a few months, DEC has even gone against its advertising motto of "Digital has it now."

By realizing the strengths and weaknesses of the VAX 6300 series, the MicroVAX 3800 and 3900 and the DECsystem 3100, you should be able to position HP solutions in a more effective manner to your customers. With this achieved, your customers will see the Series 800 solution as the right choice!

## Chapter 4. HP 9000 Series 800 upgrade program update

### The one-minute sale

The HP 9000 Series 800 Upgrade Program is the most comprehensive and aggressive upgrade program in the minicomputer industry! Not only can customers take advantage of smooth, economical growth paths within the Series 800 family, but HP also provides convenient upgrade paths for HP 1000 and HP 9000 Series 500 customers wishing to move to the Series 800 platform. In addition to aggressive hardware credits, HP offers 100% software credits on all upgrades. This longstanding policy allows our customers to move to more powerful systems while protecting the investments they've already made.

### HP 9000 Series 800 family upgrade program

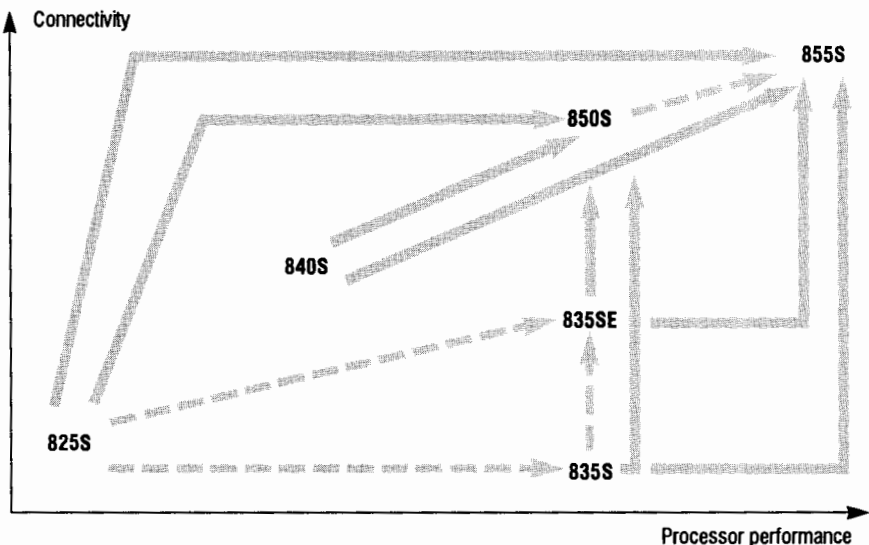
In December 1988 the Series 800 Family Upgrade Program was expanded to include new growth paths and more aggressive credits. Program enhancements include:

- Growth paths to the 855S, including the 850S board upgrade to the 855S
- 70%/80% of the current list price of the 840S as credit toward the purchase of an 850S/855S (840S consignment units purchased at a 70% discount are not eligible for this credit)
- Paths from the 835S/SE to the 850S/855S
- 30% return credit for the 825S I/O expander and power-fail battery backup system for Models 825/835

Figure 4.1 illustrates growth paths now available in the Series 800 Family Upgrade Program, excluding the Model 815S paths, and Figure 4.2 outlines preferred upgrade paths for increased performance. Customers continue to receive 100% software credits on all upgrades.

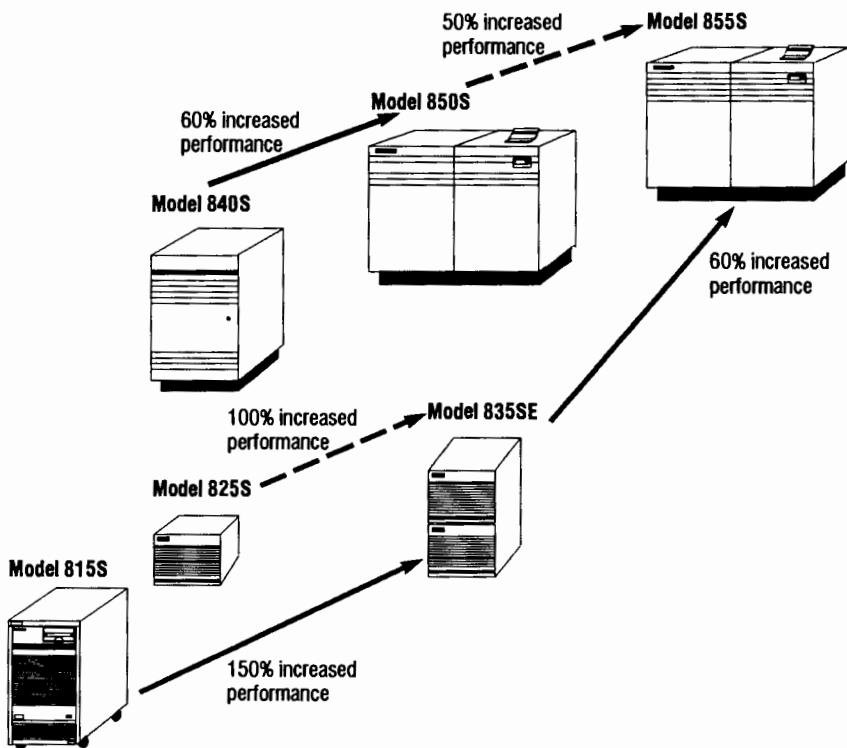
With the introduction of the Model 815S, growth paths to Models 835SE, 850S, and 855S will also be added to the July 1, 1989 CPL. The following section details Model 815S credits, and Figure 4.3 illustrates Model 815S upgrade paths.

**Figure 4.1 HP 9000 Series 800 family upgrade paths (excludes paths from HP 9000 Model 815S)**

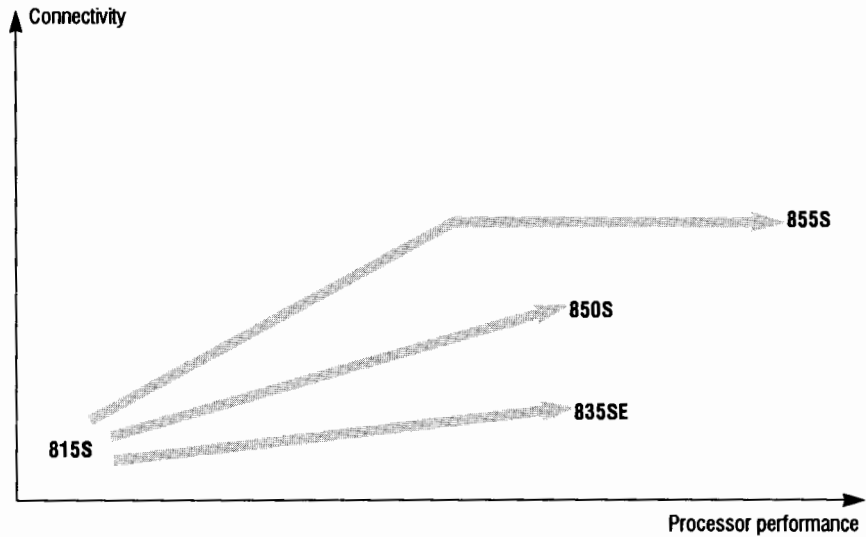


Solid line indicates box swaps.  
Dotted line indicates field upgrades.

**Figure 4.2 HP 9000 Series 800 preferred upgrade paths for increased performance**



Solid line indicates box swaps. Dotted line indicates field upgrades.

**Figure 4.3 HP 9000 Model 815S upgrade paths**

Solid line indicates box swaps.

### Upgrades to the HP 9000 Series 800 family

In addition to offering upgrades within the HP 9000 Series 800 family, the Series 800 Upgrade Program provides smooth, economical growth paths for customers wishing to upgrade to the 800 family from the HP 9000 Series 500 and HP 1000 platforms. As with the Series 800 Family Upgrade Program, customers continue to receive 100% software credits on all upgrades.



## Ordering information and availability

Use the Upgrade Program as a sales tool to win Series 800 sales today by demonstrating a cost-effective way for customers to grow to larger, more powerful Series 800 systems in the future. Our message to customers should be: No one can protect your investment the way HP can!

The new Model 815S upgrade credits in Table 4.1 will be added to the July 1989 CPL, with immediate availability.

**Table 4.1 The July '89 CPL features these HP 9000 Model 815S upgrade credits.**

Upgrade part number	Product returned	Description	Credit
A1040A, Opt. OGE	A1410A or A1071A	Return of Model 815S SPU (A1410A or A1071A) toward the purchase of Model 835SE SPU (A1040A)	\$2,760
9742A Opt. OGE	A1410A or A1071A	Return of Model 815S SPU (A1410A or A1071A) toward the purchase of Model 850S SPU (9742A)	4,250
A1114A Opt. OGE	A1410A or A1071A	Return of Model 815S SPU (A1410A or A1071A) toward the purchase of Model 855S SPU (A1114A)	5,740
A1404AN	A1404A	Return of 8 Mb ECC memory for 815S system	3,200
28650AN	28650A	Return of HP-IB Card with cable for 815S system	435
40299AN	40299A	Return of 8-channel MUX card for 815S system	585
A1407AN	A1407A	Return of battery back-up unit for 815S system	600

The Series 800 Family Upgrade Program market brief (P/N 5958-0368), targeted at both potential and existing Series 800 customers, is available at the Literature Distribution Center in Palo Alto. This piece is promotional in nature and highlights the benefits of the HP 9000 Series 800 family upgrade strategy. Use the market brief as a sales tool to help create awareness of the upgrade program among our customers and to leverage Series 800 sales by stimulating interest in upgrading within HP Precision Architecture! For more information about the availability of this market brief, contact the Sales Response Center.

## Competitive analysis

HP's 9000 Series 800 Upgrade Program is the most comprehensive and aggressive upgrade program in the minicomputer industry. Compare our program to NCR, Unisys, DEC, and Sun's upgrade programs:

### NCR

HP's Series 800 Upgrade Program is more comprehensive and aggressive than NCR's 32 Series upgrade program. While NCR has field upgrades from the Model 400 to 450, Model 600 to 650, and Model 800 to 850 (with price penalties up to \$4,000), no other upgrade paths exist within the 32 Series. Moreover, system software credits are not provided when NCR customers move to higher-end systems; customers must pay the full software price. When selling HP's Series 800 Upgrade Program, highlight the fact that we have upgrade paths available for any Series 800 system to a higher performance system (except for the Model 815S, which has growth paths from the 835SE and higher). Also, point out our 100% credits on system software.

### Unisys

HP is also very competitive with respect to Unisys' upgrade program. HP competes directly against Unisys' A Series (active models include A 1-F, A 1-FX, A 4-FX, A 6-FX, and A 6-KX) and the U5000 and U7000 families. While A Series systems can be field upgraded from the Model A 1-F through the Model A 6-KX (with significant price penalties ranging from \$3,000 to \$30,000), the systems run only on Unisys' proprietary operating system called Master Control Program/Advanced System (MCP/AS). Furthermore, a different version of MCP/AS must be purchased with each A system upgrade, and no upgrade credits are offered.

The U Series is Unisys' computer offering running on the UNIX operating system. The series consists of five sets of products: the U5000/30 and 35, U5000/50 and 55, U5000/70, U5000/85, and U5000/90 and 95. While field upgrades are available for the U5000/30 to the Model 35, the U5000/50 to the 55, and the U5000/90 to the Model 95 (at slight price penalties), no other upgrade paths exist within the U5000 family, and system software credits are unavailable. The U7000 Series consists of four products: the U7000/40 and U7000/50, 51, and 52. While the U7000/5X family members are field upgradable, no upgrades exist between the Model 40 and 5X machines. As with U5000 upgrades, Unisys doesn't offer upgrade credits for U7000 system software. Finally, Unisys does not offer upgrade paths between the U5000 and U7000 families or the A Series and U Series.

When selling the Series 800 Upgrade Program to customers also looking at Unisys, emphasize HP's comprehensive growth paths within the Series 800 family. Also, to underscore our commitment to customer investment protection, highlight the upgrade paths we have from HP 1000 and HP 9000 Series 500 systems to the Series 800 platform. Finally, tout our 100% credits on system software.

## DEC

While the majority of DEC's upgrades are board upgrades, a customer incurs a significant price penalty (up to \$36,500) by not buying the higher-end system up front. Moreover, the majority of DEC's upgrades are inter-family upgrades (i.e., upgrades within the 6200, 8800, 8600, and 8500 families); the only intra-family upgrades that DEC offers are paths from the 8250 to 8350 and the 8200 to 8350. Additionally, neither the 8900 family upgrades or upgrades from the MicroVAX III, 8550, or the DECsystem 3100 to higher-end family systems are available.

With the introduction of the 6300 series in January 1989, DEC is offering a program to field-upgrade existing 6200 systems to the 6300 line. However, customers cannot upgrade their existing 6200-type CPU boards free when moving to the 6300 series. They must pay the 5% difference in price between their older VAX 6200 system and the newer VAX 6300 system in order to receive field upgrades for their existing CPUs. For example, a customer upgrading from a VAX 6220 to a VAX 6330 will pay not only for the new (6300-type) processor, but also the difference between the 6220 system (\$303,000) and the 6320 system (\$318,000) in order to upgrade the original two 6200-type CPUs.

With regard to upgrades within the 6300 family, DEC builds in price penalties similar to upgrades within the 6200 family (\$16,300 to \$36,500 per upgrade) for customers who upgrade to larger systems. Owners who upgrade through the entire product line (i.e., 6310 to 6320 to 6330 ... to 6360) face a total penalty of \$125,800, plus installation charges.

When selling our upgrade program to a customer also considering DEC, highlight HP's comprehensive growth paths within the Series 800 family. Also, underscore our commitment to customer investment protection by pointing out our upgrade paths from HP 1000 and HP 9000 Series 500 computers to Series 800 systems. Lastly, emphasize our attractive 825S/835S and 850S/855S board upgrade pricing (zero or minimal price penalties) relative to DEC's (penalties up to \$36,500). Note: Our board upgrade prices may not necessarily equal the price of the new system less the price of the lower-performance system.

## **Sun**

While Sun has broad-based board upgrades (with price penalties up to \$14,000) across its Sun 3 and 4 families, its program does not offer upgrades from the 3/50 to higher-end systems or the 4/110 to 4/260. In addition, depending on the system configuration traded in, some upgrades may involve box swaps. Finally, Sun does not offer upgrade credits for system software. When selling HP's Series 800 Upgrade Program, emphasize our comprehensive growth paths within the Series 800 family and 100% upgrade credit for system software.

## Chapter 5. HP-UX 7.0

### The one-minute sale

Through HP's leadership in developing industry standards and providing significant innovations, HP-UX will continue to address the three main objectives of providing portability, scalability, and interoperability. HP-UX 7.0, which will be released in fall 1989, is a major release for both the Series 300s and Series 800s that has provided numerous enhancements in the area of standards, new features, and networking support. Conformance to standards in HP-UX 7.0 includes POSIX 1003.1, X/Open (TM) Branding, C2 Security, and ANSI C. Key features that have been added include disk mirroring for Series 800s, enhancements to the System Administration Manager (SAM), and server support for Series 800s for a network of diskless Series 300s or the Model 815S.

### HP-UX 7.0 enhancements

In addition to HP's leadership in standards, HP provides innovations in the HP-UX operating system that add significant benefits without compromising compatibility. For example, in HP-UX 7.0, numerous enhancements have been provided in key areas such as standards, new HP-UX features, and networking support.

### Standards

#### HP-UX convergence

With HP-UX 7.0, the HP-UX operating system for the Series 300 and Series 800 has converged in several areas. First, starting with HP-UX 7.0, the various labs work together to provide synchronized HP-UX releases for both the Series 300 and Series 800. Second, many system administration features have been converged into the System Administration Manager (SAM). From the user's perspective, update and diskless administration is the same for both the Series 300s and Series 800s, while install still requires two separate tools. Third, HP-UX 7.0 allows the Series 800 as well as a Series 300 to be a server to diskless Series 300 workstations. Finally, 7.0 provides convergence on the key industry standards, in that both the Series 300s and Series 800s meet specifically SVID 2, POSIX 1003.1, X/Open™ (XPG2), and NFS 3.2. (See "HP-UX Standards Update" later in this chapter.)

Some features have not converged. For example, the Series 300 does not have mirrored disks, MAP 3.0 networking services, or a pre-emptive kernel, which is used for real-time applications. On the other hand, HP-UX on the Series 800 does not have as many bundled packages, such as X-Window System Version 11, NFS, or NS-ARPA. In the area of language convergence, the Series 800 C compiler and the Series 300 C compiler use the same library, libc. The Series 800 C compiler now completely conforms with the ANSI C standard, while the Series 300 C compiler will conform with the ANSI C standard in HP-UX 7.1.

### **POSIX 1003.1 conformance**

HP-UX 7.0 conforms with the POSIX 1003.1 operating system specification for both the Series 300s and Series 800s, which is important since key markets such as the U.S. federal government are requiring compliance. POSIX 1003.1 defines a standard operating system interface and environment to support application portability at the source code level. This release completes the remaining POSIX features not previously provided in Release 6.5 for Series 300s and provides a complete set of POSIX 1003.1 features for Series 800s.

### **X/Open branding**

The Series 300 and Series 800 product lines now have X/Open branding, which is an important requirement to many customers, particularly in Europe. X/Open sets source-code portability standards by specifying a Common Applications Environment (CAE) built on interfaces to the UNIX operating system (as defined by various industry standards such as AT&T's SVID), and covering other aspects required of a comprehensive applications interface. The branding was achieved through compliance with the X/Open Portability Guide 2 (XPG2). Furthermore, a considerable amount of the XPG3 requirements have already been met, with full compliance expected with HP-UX 7.1.

### **C2 security level conformance**

HP-UX 7.0 addresses DOD functionality for secure systems on Series 800s and Series 300s.

### **ANSI C language conformance**

The C libraries and header files have been upgraded for the Series 800 to conform with the ANSI C standard, which is important to many customers such as the U.S. federal government. The Series 300s will conform with this standard in HP-UX 7.1 and already has the same library (libc) as the Series 800.

## New HP-UX features

### Mirrored disk

With HP-UX 7.0, disk mirroring is available as an option for all the Series 800 systems (except the HP 9000/815) with HP7936/37FL disk. Disk mirroring helps prevent data loss from occurring due to disk drive failures by maintaining two identical copies of data on separate disks. This product addresses a key customer requirement in segments of the manufacturing, business, and telecommunications markets that need high availability.

Disk mirroring is facilitated by a new device driver that makes two disk sections appear as a single section to applications. When the two sections are both on-line, writes are sent to both drives while reads are sent to the drive that can respond the fastest. The system will continue to operate when one of the disks is brought off-line, either through user interaction (such as for backups) or disk failure. (See Disk Mirroring section, later in this chapter.)

### System administration enhancements

The System Administration Manager (SAM) was first introduced with HP-UX 3.0 for the Series 800s, and is a menu-driven, screen-oriented package that performs common system administration tasks valuable to both the commercial and technical marketplace. SAM functionality includes user and group administration, file system management, kernel configuration, and UUCP management.

In HP-UX 7.0, the functionality of the Series 300 Reconfig administration tool has merged with the functionality of SAM for the Series 800 and enhancements have been made to address new features found in HP-UX 7.0. SAM now provides install, update, and diskless administration capabilities to support a mixed cluster of Series 300s and Series 800s. (The same user interface is used on both the Series 300s and Series 800s for update and diskless administration, while install is unique for each system.)

Additional SAM enhancements in HP-UX 7.0 include network configuration, disk mirroring configuration, C2 security administration, and dynamic swap administration.

### Network install/update

New functionality added in HP-UX 7.0 includes networked distribution of software. Once the host system has been identified, users can update their HP-UX operating system and its subsystems over the network. This feature provides time savings, especially in large networked configurations.

**ELM mailer**

ELM is a screen-oriented mail system geared toward general users that is more sophisticated and user-friendly than earlier mail systems. ELM is a full replacement and is compatible with other mail systems such as mail or mailx. ELM is more than one program, and includes programs such as "mailfrom" to list the user's mail, "readmail" to read mail easily, and "newmail" to monitor incoming mail.

**HP ISAM Plus**

HP ISAM Plus is important to customers, as it provides them with a single file handler for their needs regarding index sequential access of files. Transparent access to HP ISAM Plus files will be provided from within any language application. In addition to index sequential file handling, HP ISAM Plus also supports three other file types. Compatibility will exist with files already created (e.g., C-ISAM, HPToday), and HP ISAM Plus is compatible with the X/Open XPG2 standard as well as the XPG3 standard for index sequential fixed-length file types. Finally, the availability of an index sequential access method eases the migration of FORTRAN applications from the VAX/VMS environment.

**Model 815S support**

HP-UX 7.0 supports the Model 815S, which is the new low-end computer in the Series 800 line. See chapter 2 for details on the Model 815S.

**Increased connectivity for Models 835SE and 855S**

HP-UX 7.0 has been enhanced to support 128 and 400 log-ons on the Model 835SE and Model 855S, respectively.

**CD-ROM support**

HP-UX 7.0 allows transparent access to High Sierra Group/ISO 9660 CD-ROMs and mounting the CD-ROMs into an HP-UX file system by means of NFS.

## Networking support

### **Series 800 diskless node capabilities**

With HP-UX 7.0, a Model 815S can be a diskless node (client) if another Series 800 acts as its server. The cluster may be a heterogeneous cluster of Series 300 and Series 800 computers. Real-time is not supported on a diskless node.

### **Series 800 diskless server capabilities**

The diskless server capability is a major sales opportunity for Series 800s, as a Series 800 computer can now be a server to a network of diskless Series 300 workstations. Whereas, prior to HP-UX 7.0 only a Series 300 could act as a server to diskless 300s, a Series 800 can now be a boot, swap, and file server to either diskless Series 300s or diskless Model 815S's (local swap disks are also supported).

A diskless cluster may be a heterogeneous (Series 300 and Series 800) cluster that is viewed as one system, with one global file system and a single system clock. The different architectures are taken into account by context-dependent files (CDF) that allow the system to automatically select the proper version to run. The server also can dynamically allocate swap space for clients if swap space requirements increase. Finally, SAM has been enhanced to ease the administration of diskless clusters, and real-time is not supported on a diskless server.

### **NFS 3.2 support**

NFS 3.2 is now available on Series 800 in addition to the Series 300 systems, which is important due to the prevalence of NFS as a UNIX system networking standard. Enhancements include remote file locking, remote execution service, and named pipes.

### **MAP 3.0 support**

MAP 3.0, now available on the Series 800, is a subset of the Open Systems Interconnect (OSI) protocols and provides multivendor networking in the manufacturing environment. Key MAP services are manufacturing message specification (MMS) and File Transfer, Access, and Management (FTAM).

### **LAN Backup/Restore capability**

Enhancements have been made to provide remote backup and restore capability over a LAN for Series 300 and Series 800 machines.

A summary of HP-UX 7.0 benefits follows in Table 5.1; Table 5.2 shows a list of new HP-UX features; and Table 5.3 lists networking support.

**Table 5.1 Summary of HP-UX 7.0 benefit**

Feature standards	Series 300	Series 800	Customer benefits
HP-UX convergence	X	X	More consistency between HP-UX releases for 300/800
POSIX 1003.1	X	X	Helps meet customer demand for open systems
X/Open	X	X	Helps meet customer demand for open systems
ANSI C	7.1	X	Helps meet customer demand for open systems
C2 security	X	X	Addresses DOD functionality for secure systems

**Table 5.2 New HP-UX features**

	Series 300	Series 800	New HP-UX features
Mirrored disk	-	X	Helps meet customer need for high availability by protecting customer's data
SAM enhancements	X	X	Reduces administration costs through converged administration for both 300/800 and enhancements in areas such as diskless administration
Model 815S support	-	X	New low-end HP-PA computer is now available
Increased connectivity for Models 835SE and 855S	-	X	Increase log-ons for Model 835SE to 128, Model 855S to 400

**Table 5.3 Networking support**

	Networking support
800 diskless node	Allows Model 815S to be a diskless node within a cluster, thereby lowering costs to the user
800 diskless server	Series 800s can now be servers to a mixed cluster of diskless Series 300 workstations or diskless Model 815S's
NFS 3.2 support	Upgrades HP-UX support to this UNIX system networking standard
MAP 3.0 support	Provides multivendor networking in the manufacturing environment



## **General HP-UX enhancements**

HP-UX has many enhancements incorporated before HP-UX 7.0 that are important to your customers.

### **Berkeley enhancements**

Besides adhering to the AT&T SVID standard, HP-UX has incorporated some of the key Berkeley (BSD) features such as McKusick file system, the C shell, vi editor, electronic mail, symbolic links, and sockets.

### **DOS/HP-UX integration**

Software DOS emulation (SoftPC) is available on both the Series 300s and Series 800s, which provides PC-XT compatibility for workstations and multiuser/terminal based systems. Using X Window Version 11, multiple HP SoftPC window sessions can be running on one display.

### **Real-time performance**

Unlike traditional systems, based on the UNIX system, HP-UX's real-time extensions assure fast and predictable responses for priority scheduling of applications in multiuser, multitasking environments. Our real-time enhancements, which have been submitted as a standard to POSIX and OSF, can prove critical in dynamic commercial and technical computing environments.

### **Power-fail recovery**

The HP-UX operating system power-fail recovery enhances data integrity levels beyond those generally offered by other popular systems based on the UNIX system. This HP-UX feature protects customers from data loss during a power failure, and will restart user processes from the point of suspension once power is recovered.

### **Native language support**

HP's native language support (NLS) provides transparent support of a user's native language (20 languages supported). Our NLS features provide HP with a competitive edge in the international marketplace, as indicated by X/Open choosing HP's NLS as their standard. NLS can also be important in the U.S. marketplace when selling to corporations and VABs who do business internationally.

### **Quality and reliability**

The quality and reliability that is built and tested into HP-UX is an important differentiator for our systems, in that it allows lower support costs for our customers. HP-UX has already met John Young's 1992 goal for HP products, of a ten times improvement in quality over a five-year period.

### **HP-UX direction**

Through HP's leadership in setting industry standards and providing significant innovations, HP-UX addresses three main objectives: 1) Portability -- HP-UX allows software portability across different architectures that are based on the UNIX operating system as defined by industry standards, 2) Scalability -- HP-UX provides scalability across computers with a range of processing power, 3) Interoperability -- HP-UX is addressing interoperability, meaning that multivendor connectivity will be achieved using a standard network and a common user interface. These three objectives (portability, scalability, and interoperability) are important industry trends because of the following customer benefits.

### **Vendor independence/flexibility**

Portability and scalability provide customers with the flexibility to choose the best hardware for an application without losing their investment in software. UNIX system-based software is generally portable at the source-code level, meaning an application can run on a different hardware architecture after the source code is recompiled. In addition, HP-UX provides scalability in that object-code compatibility exists within the entire Series 300 product line or within the Series 800 product line.

### **Reduced maintenance and training costs**

As computer systems become more standardized, maintenance and training costs are reduced. For example, applications developed with a common user interface will reduce training costs as users know how to run common operations (for example, print a file) on new applications or different machines.

### **Multivendor connectivity**

Multivendor connectivity is more attainable with standards, as they can address connectivity across the different networks that may already exist at the customer's site.

### **Software availability**

Since software for open systems is portable, software vendors have an expanded market, which results in more application software being available for UNIX system-based computers.

### **HP-UX standards update**

To deliver on the key objectives of portability, scalability, and interoperability requires that HP not only adhere to industry standards, but be a driving force in their specification. HP's leadership in standards includes:

### **System V Interface Definition**

SVID 2 represents the minimum set of system calls and library routines that is required for all operating systems based on AT&T System V.3. Though SVID is a subset of the capabilities on AT&T System V.3 (or HP-UX), SVID helps assure portability at the source-code level if applications restrict their calls to the SVID and the computers meet the SVID standard. (Note that the compilers also need to be compatible.)

### **System V Verification Suite (SVVS) tests compliance to SVID**

HP was the first vendor outside AT&T to pass SVVS 2. Furthermore, HP-UX 7.0 is in conformance with the SVID2, as it passed the SVVS3 verification suite in the V.3 mode.

### **POSIX**

The Chairman of the POSIX P1003.1 Committee is from HP. POSIX is an IEEE group that specifies various standards for the operating system. HP-UX 7.0 complies with the POSIX P1003.1 operating system specification, which is important as customers such as the government will be requiring POSIX 1003.1 compliance. In addition, HP has submitted HP-UX real-time features as a standard.

**X/Open Company Limited (X/Open)**

The chairman of the board of X/Open is from HP. X/Open sets standards for portability at the source-code level, but at a broader scope than provided with SVID or POSIX 1003.1. With HP-UX 7.0, the Series 300 and the Series 800 product lines are X/Open branded as defined by the X/Open Portability Guide 2 (XPG2), which is important since X/Open branding is becoming a common customer requirement. This branding means portability is assured for applications that restrict calls to the XPG2. In addition, HP's NLS has been chosen as a standard for international-ization by X/Open.

**Open Software Foundation (OSF)**

HP became a founding sponsor of OSF because of the belief that truly open systems, which provide portability and multivendor connectivity, require offerings based on standards and an open vendor-neutral development process.

Several HP technologies have been submitted, such as the Common X Interface which was co-developed with Microsoft and adopted as part of Motif, OSF's standard user interface. Finally, HP is committed to offer OSF compliance while preserving HP-UX compatibility.



## Series 800 HP-UX product structure

The current structure for the HP-UX user licenses follows in Table 5.4.

Since many customers will use Model 815S's as diskless nodes, HP-UX product structure has been modified for this computer. With the new structure, the license is separated from the media and documentation to allow a customer to buy one set of media and documentation for several Model 815S's computers. (All Model 815S's computers are bundled with the 92467L license.) Finally, for all the remaining Series 800 computers, the HP-UX product structure including documentation has not changed.

**Table 5.4 HP-UX product structure and pricing**

HP-UX for Model 815S		Price
92467L	License to use, for 16 users . The General Usage Documentation set is bundled with the license.	\$4450
92467A	Media and manuals for license (requires concurrent or prior purchase of 92467L). The System Administration Documentation set is bundled with this product.	\$800
Opt AA0	Software on 1/4-inch cartridge tape	N/C
Opt AA1	Software on 1/2-inch 1600 cpi 9-track tape	N/C
HP-UX for Models 825S, 835S/SE, 840S, 850S, and 855S		Price
92452A	16 User license incl. media and all manuals	\$5250
Opt AA0	Software on 1/4-inch cartridge tape	N/C
Opt AA1	Software on 1/2-inch 1600 cpi 9-track tape	N/C
Opt OBO	Delete manuals	-300
Opt OCC	Revision Upgrade for users not on support. Requires prior purchase of original product.	-2900
92453A	32 User license incl. media and all manuals	\$10500
Opt AA0	Software on 1/4-inch cartridge tape	N/C
Opt AA1	Software on 1/2-inch 1600 cpi 9-track tape	N/C
Opt OBO	Delete manuals	-300
Opt OCC	Revision Upgrade for users not on support. Requires prior purchase of original product.	-7660
Opt OCG	Inter-processor transfer credit. Applicable if upgrading hardware and had a larger user license on old system (92453A) than what is bundled on new system.	-10500
Opt OAO	Upgrade from 16 user, 92452A or 92467L	-5250

**Table 5.4 HP-UX product structure and pricing (continued)**

<b>HP-UX for Models 825S, 835S/SE, 840S, 850S, and 855S</b>		<b>Price</b>
<b>92454A</b>	64 User license incl. media and all manuals	\$18375
Opt AA0	Software on 1/4-inch cartridge tape	N/C
Opt AA1	Software on 1/2-inch 1600 cpi 9-track tape	N/C
Opt OB0	Delete manuals	-300
Opt OCC	Revision Upgrade for users not on support. Requires prior purchase of original product.	-12600
Opt OCG	Inter-processor transfer credit. Applicable if upgrading hardware and had a larger user license on old system (92454A) than what is bundled on new system.	-18375
Opt OA1	Upgrade from 16 user, 92452A or 92467L	-5250
Opt OA2	Upgrade from 32 user, 92453A	-10500
<b>92455A</b>	Unlimited User lic. with media and all manuals	\$34125
Opt AA0	Software on 1/4-inch cartridge tape	N/C
Opt AA1	Software on 1/2-inch 1600 cpi 9-track tape	N/C
Opt OB0	Delete manuals	-300
Opt OCC	Revision Upgrade for users not on support. Requires prior purchase of original product.	-22540
Opt OCG	Inter-processor transfer credit. Applicable if upgrading hardware and had a larger user license on old system (92455A) than what is bundled on new system.	-34125
Opt OA1	Upgrade from 16 user, 92452A or 92467L	-5250
Opt OA2	Upgrade from 32 user, 92453A	-10500
Opt OA3	Upgrade from 64 user, 92454A	-18375

### HP-UX documentation structure

New documentation products have been set up to allow customers to easily order more documents if needed. These products are focused by activity: general usage, advanced usage, system administration, and programming. The 92467L comes with one set of general usage documents and the 92467A comes with one set of the system administration documents. All the other HP-UX licenses come with one set of all the documents. (See Table 5.5.)

**Table 5.5 HP-UX Documentation product pricing**

<b>Documentation product</b>	<b>Price</b>	
<b>92536A</b>	Series 800 HPUX Documentation--General Usage Set	\$55
<b>92538A</b>	Series 800 HPUX Documentation--System Admin. Set	\$325
<b>92537A</b>	Series 800 HPUX Documentation--Advanced Usage Set	\$90
<b>92539A</b>	Series 800 HPUX Documentation--Programming Set	\$475

## Chapter 6. PORT/VX update

### The one-minute sale

PORT/VX is an SE-delivered consulting product that combines a comprehensive migration planning service with powerful software porting tools. The product helps move FORTRAN applications from VMS to HP-UX on the Series 800, and consists of five days of SE consulting and a set of software migration tools. In addition to this service, SEs also can provide pre-sales analysis and post-sales support for customers moving from VAX/VMS systems to the Series 800.

PORT/VX is for customers who recognize the increased capabilities of HP-PA, but need HP's help to ease the migration process.

1. Migration software reduces the labor required for porting.
2. Bundled consulting builds their confidence and expertise in doing a migration.

In addition to PORT/VX, offer your customers the benefits of two other programs: RISC Free and VAX Buyback. RISC Free program is intended to lower the financial risk by offering Series 800 systems free of charge for a trial period of three months. Under the VAX Buyback program, your customers receive from the reseller a check for the agreed-on value of their outgoing DEC systems from a broker.

### Product description

#### Consulting

PORT/VX includes five days of consulting and software migration tools. The consulting provided by a specially trained SE is designed to initiate the migration planning process, as well as provide your customer with a copy of PORT/VX software migration tools. During these five days, the SE will prepare the software for analysis, provide application analysis, teach the use of the toolset, and establish a migration plan. At the end of the week, your customer should be able to pursue the migration by himself, calling the SE for specific issues on a Time and Materials basis. For names of trained SEs in your area, contact the Sales Center.

#### Migration toolset

The software migration tools include six components: FORTRAN Code Analyzer, FORTRAN Code Translator, Emulation Libraries, File Transfer Utility, Data Translator, and Manuals. One component of PORT/VX's software migration set that was mentioned in the November 1988's Sales Training Manual has not been released. This feature, a Command Interpreter for DEC (CID), was designed to execute HP-UX commands when VMS commands are used. Instead, a group of utilities was added, and a third-party product might be used in cases where more functionality is required.

## Ordering information and availability

### Migration consulting (P/N 50729A)

PORT/VX Migration Consulting bundles five days of consulting provided by a local SE, and software migration tools. P/N 50729A does not include an option to delete the consulting. The product is priced at \$12,100 (effective July 1, 1989).

### Migration software only (P/N 50730A)

To ensure a successful migration, 50730A should be sold only to customers who previously ordered the bundled product. Past experience has shown that most VAX/VMS users will not be able to port their code successfully without the help of HP's SEs. Specializing in VMS, they typically are not familiar with HP-UX, and in most cases lack the experience in migration. Therefore, it's highly recommended that your customers first order the consulting product. (See Table 6.1 for part numbers and prices.) This product is priced at \$5,000 (effective July 1, 1989).

**Table 6.1 Part numbers and prices of migration consulting and migration software only.**

Part Number	Description	Price
50729A	PORT/VX Migration Consulting Product	\$12,100
50730A	PORT/VX S/W Migration Toolset	5,000
50730R	PORT/VX Right to copy	4,250

Notes: Until July 1, 1989, PORT/VX Software Migration is available through Technical Marketing. Please send an HPdesk message to Laurie Wilcox or Bill Zaslove with the names of the SE and customer. These prices are effective only after July 1, 1989. Currently, 50729A costs \$10,000 and the software-only product is sold for \$2,000.

### Target market

PORT/VX is intended for companies that have VMS FORTRAN applications running on VAX systems, and are considering moving to a standards-based environment. Obviously, FORTRAN is more popular in the scientific computation market (numerical analysis, simulation, process control, etc.). Market research has shown that 65% of the scientific applications are written in FORTRAN! PORT/VX is less attractive for commercial applications, where Pascal and COBOL are the dominant languages. From a system perspective, PORT/VX is targeting customers who are using older VAXes (11/7xx, 82xx, 8300, 85xx, or MicroVAXs).

## Competition

### DEC

Currently DEC does not provide any VMS to ULTRIX migration products. However, DEC opened a Third-Party Application Center in Mountain View, CA, on November 1, 1988. Following the introduction of the RISC-based ULTRIX Workstations, the company offered Independent Software Suppliers (ISVs) "an environment where technical interchanges between Digital and ISVs can be accommodated routinely." These services are similar to those provided by HP's Technology Access Center (TAC), located in Cupertino, CA. DEC's Center will probably be attractive for end users located nearby, as well as major ISV accounts nationwide. But given the travel distance and the absence of special migration tools, PORT/VX provided by an SE should be much more attractive on a local basis.

### Boston Business Computing, Ltd. (BBC)

In the previous Field Training Manual, BBC's Run-Time Libraries project was estimated to be completed by May 1989. Presently, the project is far from completion; therefore, PORT/VX's migration libraries remain the only available offering of this type today.

### Accelr8 Technology Corporation

Accelr8 Technology Corporation, a small company (ten-person) based in Broomfield, CO, has recently joined the VMS-to-UNIX migration market. Except for Transl8, which runs on Sun Microsystems and Silicon Graphics Systems, the migration tools are built for MIPS systems.

The migration tool set includes:

- Dcl8 -- DCL command interpreter
- Edt8 -- VMS look-alike editor
- Accelr8 Libraries -- Implement the VMS Run-Time Libraries and System Services, and also identify which one of the library routines is used in the program
- Transl8 -- Moves and translates files between VMS and UNIX

PORT/VX's migration tools, bundled with five days of consulting and complemented with BBC's EDT and VCL, are better positioned to meet your customers' needs:

1. MIPS has not trained its SEs to provide migration assistance. Appearing in the company's third-party catalog, Accelr8 will find it very difficult to support customers who actually go through the migration process.
2. Dcl8 and Edt8, licensed from BBC, are not significantly different from BBC's products.
3. The libraries are far from complete, and currently cover only a minor straightforward portion of VMS' complete set. PORT/VX's migration libraries, on the other hand, address a greater portion of the calls and target the most commonly used ones.
4. PORT/VX's DTL provides the same functionality as Transl8, with the exception of addressing indexed files. Currently PORT/VX's customers using a proprietary database are advised to use a third-party product (C-ISAM from Informix) or port to a standard-based database.

## Chapter 7. Information management update

### The one-minute sale

Available now with HP-UX 7.0 is a new and improved HP ALLBASE/SQL offering. ALLBASE/SQL is now able to handle remote database connections to many HP-UX systems, it complies with new industry standards and gives users a 50% performance improvement over the last HP ALLBASE version.

### Remote database access -- ALLBASE/NET supports new systems

HP ALLBASE/NET allows a remote Series 800 or Series 300 access to an HP ALLBASE/SQL database residing on another Series 800 or Series 300 system connected via a Local Area Network (NS LAN or ARPA/Berkeley Services LAN). The Series 300 system, connected via LAN, can remotely access all the processing power of an ALLBASE/SQL application located on a Series 800 system. Therefore, your customer can run an application on a Series 300 (client) that is assigned the task of reading and updating the ALLBASE/SQL of a remote Series 800 (server). Also, ALLBASE/NET supports diskless 300 systems. The diskless 300 systems can be configured as a client location(s) on either a 300 or 800 configured as a server.

### Conformance with both SQL standards -- ANSI and X/Open

ALLBASE/SQL on HP-UX 7.0 is fully compliant with the following standards: ANSI SQL level 1 and X/Open SQL. Conformance to industry standards assists your customers in porting applications to other standard compliant environments and reduces training costs because your customer learns one SQL interface.

### Additional HP ALLBASE/SQL enhancements

- Substantial performance enhancements: Database applications should run at least 50% faster; details will be published in upcoming performance brief.
- Improved functionality beyond SQL standards Read uncommitted (dirty reads): Reduces the user's waiting time when searching a database. Read uncommitted allows access to the newest data in a file.
- Date/time data type: Allows storage of date and time information for files and file types. Important for businesses that use OLTP (On-Line Transaction Processing), or any industry that needs to change data when on-line. Most financial industry applications will benefit from this new functionality.

### ANSI C compiler

- Available with HP-UX 7.0 is the new ANSI C compiler. This ANSI C compiler is compliant with the X3-J11 committee proposal.



## Chapter 8. Networking and I/O update for HP-UX 7.0

### The one-minute sale

The HP-UX 7.0 release provides an abundant set of new functionality and improved performance for networking and I/O products sold on our existing HP 9000 machines. In addition, our new Model 815S will be available with a complete set of networking and I/O products.

A brief summary follows of our latest features and improved performance. For further information, consult your Network Sales Portfolio Field Resource Kit, June 1, 1989.

### Wide area networking

#### **X.25 is shipping!**

Native connections for the HP 9000 Series 300, 825S, 835S/SE, 840S, 850S, and 855S to X.25 are now shipping. ARPA Services can be run over X.25 protocols. Level 3 access is also available with our X.25 product.

Currently under investigation for HP-UX 7.0 are support for NS over X.25 and intersystem testing of X.25.

On the administrative side of X.25, be aware of an error on the X.25/9000 data sheet. HP-UX 6.5 and HP-UX 3.1 software versions, not 6.2 and 3.0, are required for X.25 on the HP 9000 Series 300 and 800.

### Gateway performance improvements

In HP-UX 7.0, we have implemented Transmission Control Protocol (TCP) improvements (commonly known as Van Jacobson TCP) that will minimize congestion problems incurred in communicating from HP 9000 Series 300 or 800 through a gateway. Throughput will depend on the particular gateway that is used and the amount of traffic.

BSD 4.3 networking enhancements and the remainder of Van Jacobson TCP will be implemented in HP-UX 8.0. These enhancements will result in better LAN performance, faster file transfer (ARPA-FTP, NS-NFT, NFS), and faster socket and link level throughput for HP 9000 Series 300 and 800.

### Terminal server performance improvements

Due to the overwhelming demand for better performance, our LAN terminal server performance will be significantly increased in HP-UX 7.0. These enhancements provide a 60% improvement in terminal I/O performance for the TS8 with the HP 9000 systems. This will enable us to meet demands more easily for large numbers of terminals connected to our HP-UX systems. Additional improvements are scheduled for HP-UX 8.0. Telnet performance data is available in the March Network Sales Portfolio and can be ordered through the Literature Distribution Center.

**Networking support for HP 9000 Model 815S**

The following networking links and services will be available on the Model 815S, running over Ethernet/802.3.

- LAN/9000 Link
- ARPA/Berkeley
- NS
- NFS
- SNA 3270, 3770
- X.25 (within six months of 815S release date)

Refer to the MAP 3.0 section for details on Series 800 machines running over 802.4.

**Network support of diskless**

In HP-UX 7.0, the 855S, 850S, 840S, 835S/SE, 825S, and 300's can act as servers in a diskless environment. All Series 300's and the 815S can act as diskless clients.

We recognize the need for diskless client capability on 800 workstations. This functionality is currently being prioritized for future release.

**NFS 3.2 for the Series 800**

In HP-UX 7.0, NFS 3.2 enhancements (Lock Manager, RPCGen, REX) have been added to our Network File Sharing Service for the 800. These new features improve data integrity, simplify the development of distributed applications, and provide more transparent access to computer servers.

As a reminder, NFS 3.2 for the Series 300 was released in HP-UX 6.5.

**Network management**

The following features have been added to HP-UX 7.0: BIND (Name Server), Gated (Dynamic Routing), and Nnconfig, facilitating network management. More specific information on the user benefits will be provided in an upcoming Sales Brief and *Computer News* article.

**Performance Brief for HP-UX 7.0 Networking**

An update to the HP-UX 3.0/6.5 Performance Brief will be available after the HP-UX 7.0 release, with continued improvements in performance.

## MAP 3.0

HP is the first major systems vendor to announce and ship MAP 3.0 products! HP has already shipped MAP 3.0 to two early-release customers. As a MAP leader, HP has a very rich implementation of MAP services with products designed for high performance and reliability. Standard product offerings on the 815S, 825S, and 835S/SE are estimated to be available in calendar 4th quarter 1989 and include the following:

### **HP MAP 3.0 MMS/800 -- Manufacturing Message Specification**

This is the most powerful service in the MAP 3.0 specification. Using MMS a Series 800 can control and monitor the activities of factory floor devices (for example, robots, PLCs, NC machines), and can communicate with other cell controllers or area managers. MMS uses X.500 MAP directory services in communicating with other MAP nodes.

### **HP MAP 3.0 FTAM/800 -- File Transfer, Access and Management**

FTAM is the most universal service in the OSI arena, being specified in the MAP, TOP, and GOSIP profiles. Using FTAM, a Series 800 can transfer text and binary files, access remote files, and perform remote file management. Like MMS, FTAM also uses X.500 MAP directory services to communicate with other MAP nodes.

### **HP OSI Express MAP 3.0**

This intelligent network processor card implements the OSI protocol "stack" from the physical layer through ACSE and provides a broadband or carrierband modem interface. In addition, this link product provides nodal management utilities and MAP-conformant X.500 Directory Services and Network Management Agent capabilities. The HP OSI Express MAP 3.0 uses the MAP-specified 802.4 Token-bus protocol and serves as the foundation for using MMS and FTAM services. In the first half of 1990, these products will also be provided on the 840S (installed base), 850S and 855S processors, giving full MAP 3.0 functionality across the Series 800 family. In addition, HP has two system-independent products customers may need in their MAP networks:

**HP 4974A MAP 3.0 Protocol Analyzer -- available now**

The HP MAP 3.0 Protocol Analyzer monitors the integrity of MAP 3.0 network protocols. The HP 4974A is the first product on the market to address all layers of the MAP protocol suite and provide decodes that format the bits and bytes of data into easy-to-read high level information. As part of HP's Openview Network Management offering, the HP 4974A allows users to predict network failures and better control multivendor computer communications on the network.

**Broadband/Carrierband bridge (referenced) -- available first-half 1990**

Allows carrierband subnets to connect to a broadband backbone using the 802.4 Token-bus protocol.

Leading-edge manufacturing companies are using MAP to meet their multivendor networking needs and be successful in their computer integrated manufacturing (CIM) programs. By providing timely information flow among multivendor devices and systems on the factory floor, MAP helps customers reduce costs, increase quality, and improve productivity -- key benefits resulting in increased competitiveness. Figure 8.1 shows manufacturing uses of MAP; refer to Table 8.1 for ordering information. Pricing information will be available in the late summer/early fall '89 timeframe.

Figure 8.1 HP MAP 3.0

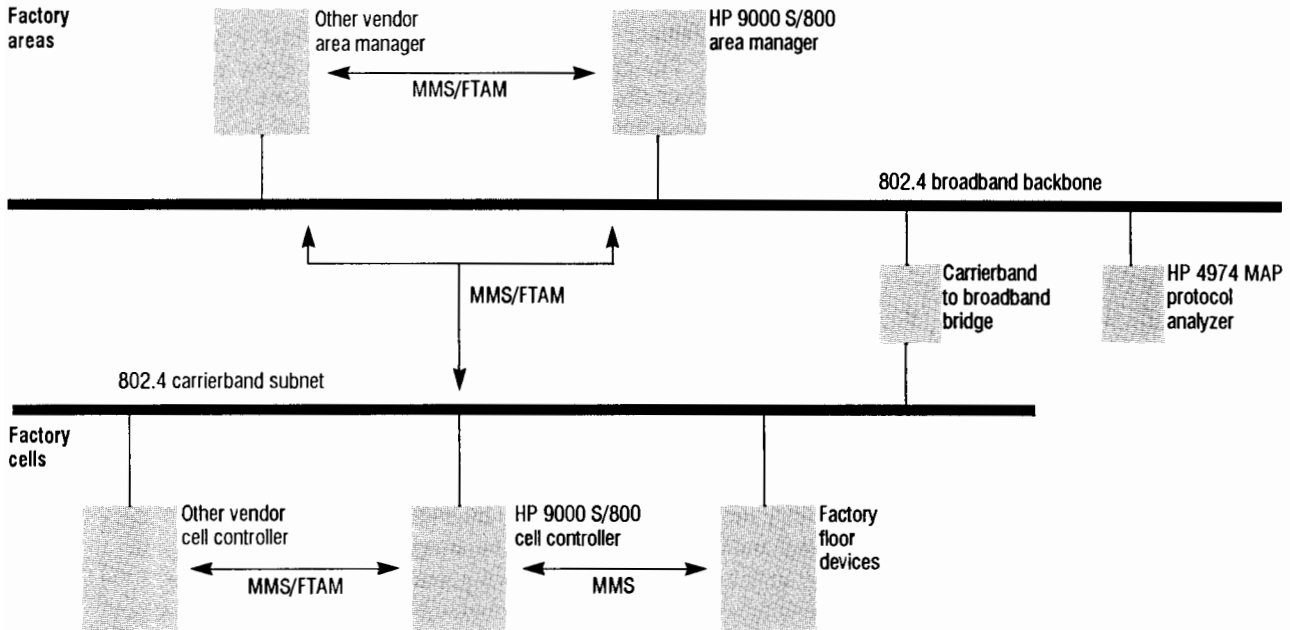


Table 8.1 Ordering information for HP MAP 3.0

Prod Number	Description	SPU Supported
32122A	OSI Exp, Carrierband	815S
32123A	OSI Exp, Broadband	815S
32124A	OSI Exp, Carrierband	825S, 835S/SE
32125A	OSI Exp, Broadband	825S, 835S/SE
B1002A	MMS	815S
B1004A	FTAM	815S
B1005A	MMS	825S, 835S/SE
B1006A	FTAM	825S, 835S/SE
4974A	MAP 3.0 Protocol Analyzer	

## Parallel I/O update

### New AFI card

The new AFI card (HP 27114B) adds GPIO functionality to CIO-based Series 800s! The asynchronous FIFO Interface card provides either general-purpose or high-speed buffered communication between external devices and CIO-based Series 800s. The HP 27114B is a revision to the 27114A allowing greater flexibility of interface and ease of use.

The HP 27114B features:

- Backward compatibility with supported HP 27114A applications
- Up to 64 words of FIFO buffering with FIFO counter
- Full handshaking mode (both master and slave)
- Up to six frontplane control lines
- Up to six frontplane status lines
- Both differential and single-ended mode communication
- Improved noise immunity for single-ended mode communication

This new functionality will be available on the 7.0 version of the HP-UX operating system and drivers. The 27114B is compatible with all existing factory supported applications of the 27114A.

## **GPIO card**

GPIO functionality is available for HP-PB Series 800s! The General Purpose I/O Interface (HP 28651A) provides multipurpose 8- or 16-bit parallel communication capabilities between external devices and HP-PB-based Series 800s. It supports several handshaking modes to facilitate connections to a variety of external devices. User-definable control and status lines are also available.

The HP28651A features:

- Several handshaking modes including full master, full slave, strobed, and pulsed modes.
- 8- or 16-bit operation
- Software-selectable logic sense (high true or low true) of frontplane handshake signals
- Ability to interrupt on an external event
- Up to five of each (user configurable) control and status lines

The maximum burst transfer rate of the HP 28651A is 1.1 Mb/sec. using 16-bit transfers. Actual performance is always dependent on system loading and application. Refer to the GPIO User's Design Guide (P/N 28651-69002) for detailed performance information.

The GPIO cable is unterminated on one end so that it can be customized for different applications. The maximum cable length supported with HP 28651A is 7.6 meters (25 feet).

## Chapter 9. User interface update

Significant developments have evolved in user interface technology that both enhance existing products and take advantage of new technologies. This chapter provides an update on X Window System™ enhancements, two new lower-cost X solutions with AXDS and HP X-Terminal<sup>1</sup>, OSF/Motif™, and NewWave on UNIX.

### X Window System for Hewlett-Packard systems -- the one-minute sale

The industry-standard X Window System\* Version 11 (hereafter referred to as "X11") supports windowed applications on a wide variety of hardware platforms and operating systems from different vendors. The system is network-transparent, so an application running on one vendor's computer can display a high-quality, graphical user interface to a user sitting either at the same system or at another computer across the network, even if the computer is from a different vendor.

In the April '89 release of X11, HP has added the capability of running high-performance, full-functionality 2D and 3D graphics libraries within X windows on local workstations. Developers have access to the accelerated 2D and 3D graphics features of HP hardware using the HP Starbase, GKS, and Phigs graphics libraries. At the same time, they have the ability to develop the user interface portion of their programs using the industry-standard X Window System.

The X Window System is virtually independent of underlying hardware and operating systems. The X Window System separates windowing into two entities: a client, which is the application program, and a server, which provides display, input, and other services. In this client/server architecture, clients (i.e., window-based applications) make requests for resources (such as display, keyboard, and mouse) from the display server. Because it uses a hardware-independent protocol and a standard programmatic interface, applications written to the X library are highly portable to other computers that support X.

The HP Window Manager is included as a client with X11. Now users are able to utilize their prior experience. Software developers can design applications whose behavior is consistent from the PC to UNIX systems, thus reducing documentation and training costs.

HP's X Window System products are available across the entire family of HP 9000 Series 300 computers and Series 800 superminicomputers. The X11 products for the Series 300 and Series 800 systems are equivalent, each supporting different displays, but providing consistent tools for the user and developer.



<sup>1</sup> The official product name is to be approved by third quarter '89.

\* The X Window System is a trademark of the Massachusetts Institute of Technology. OSF/Motif is a trademark of the Open Software Foundation.

Additional information on the X Window System can be found in the X Window System Field Training Manual distributed in March 1989. In addition to this training manual, there is an informative video tape that provides both a semihumorous dramatization and comments from four people from ESRI, a graphical information system developer. This video tape is available from the Literature Distribution Center in Palo Alto, CA (P/N 5959-2592).

## X11 enhancements

### **Behavior and appearance**

HP continues to provide leadership in user interface capabilities for both the end user and developer. Enhancements to the X11 window manager provide the end user with behavior consistent with Presentation Manager and an enhanced 3D appearance. HP has been chosen by OSF to provide this behavior and enhanced appearance for OSF/Motif, which will be available in the summer of 1989.

### **High-performance graphics**

HP has continued to provide support for industry standards by pursuing a tighter integration of the X Window System with high-performance graphics capabilities. Users of GKS, Phigs, and HP Starbase graphics libraries will now be able to utilize these libraries within X. Multiple, full functionality and full-performance HP Starbase graphic programs can now run within an X11 window on a local workstation. In addition, this capability is supported for other graphics libraries, such as Phigs, GKS, and HP Starbase Display list. On those graphics cards that accelerate graphics operations, multiple, obscurable, movable windows will also be supported. Simply stated, X11 supports multiple graphics windows that can be hidden from view and moved while making use of any available graphics hardware accelerators. If areas of these accelerated graphics windows are obscured, the application must regenerate the graphics. Normal X11 images and retained non-accelerated images do not need to be regenerated. In addition to the ability to access high-performance graphics libraries within a local X window, HP-UX X11 implements HP Starbase and GKS drivers that allow most applications written in these libraries to be displayed on a remote display.

**Development tools**

HP has provided tools and performance enhancements for application developers and end users. Software developers are provided with three levels of tools: Xlib, Xt intrinsics, and HP X Widgets.

**Ordering information and availability**

X11 began shipping in April 1989 and has the tiered pricing structure shown in Table 9.1.

**Table 9.1 X11's tiered pricing structure**

<b>Product Description</b>	<b>Part Number</b>	<b>Price</b>
<b>HP815:</b>		
X Window System Version 11 for Model 815S*		
<b>HP825/835:</b>		
X Window System Version 11 for Model 825S, 835S/SE	B1155A	\$2,100
Right to Copy B1155A X Window System (Version 11 for Model 825S, 835S/SE. Requires prior or concurrent purchase of B1155A.)	B1156A	1,785
<b>HP840S:</b>		
X Window System Version 11 for Model 840S	B1157A	3,295
Right to Copy B1157A X Window System (Version 11 for Model 840S. Requires prior or concurrent purchase of B1157A.)	B1158A	2,720
<b>HP850S/855S:</b>		
X Window System Version 11 for Model 850S/855S	B1159A	4,500
Right to Copy B1159A X Window System (Version 11 for Model 850S/Model 855S. Requires prior or concurrent purchase of B1159A.)	B1160A	3,825
Additional copies of user documentation for Series 300, 800	B1161A	165
Additional copies of programmer documentation for Series 300 and 800	B1162A	455

\* The product number and price will be determined in June '89.

**HP AXDS/PC --  
the one-minute sale**

HP AXDS/PC is an accelerated X Window System display server for industry-standard personal computers. It is a software product that implements the X Window System Version 11 Release 3 server code.

**Features**

HP AXDS/PC uses HP's Intelligent Graphics Controller (82328A) and a high-resolution (1024x768) color graphics monitor to transform a Vectra (or PC AT compatible) into a high-performance X Window System display server. In a multivendor environment, HP AXDS/PC enables network access to X Window System-based applications resident on remote workstations.

**Benefits**

HP AXDS/PC bridges the gap between MS-DOS and UNIX environments. It enables a PC user to have access to both UNIX X Window System-based applications (such as ME, EE, CASE, MEDICAL, and BUSINESS) and MS-DOS based office automation applications.

**Ordering information and availability**

HP AXDS/PC software (Product Number D2300A) will be priced at \$500 and will require the HP 82328A IGC card and an HP-supported color graphics monitor with 1024x768 resolution. AXDS/PC will be placed on the June 1989 CPL, with availability in July. AXDS/PC will be shipped on both 5 1/4-inch and 3 1/2-inch media format and will require the intelligent graphics controller (82328A). For more information, refer to the data sheet (P/N 5953-3767).

**HP X-terminal --  
the one-minute sale**

HP X-Terminal is a high-performance, high-resolution color graphics X Window System display station. It provides multiple, LAN-based, bit-mapped seats at a lower cost than a workstation solution.

**Features**

HP X-Terminal is designed to provide workstation graphics performance equivalent to an HP 9000 Model 330 configured as an X-server. Applications resident on remote multivendor workstations are to be accessed interactively.

**Benefits**

HP X-Terminal will provide a low-cost-per-workstation seat and an entry-level to the HP 9000 Series 300 and Series 800 workstations.

**Ordering information and  
availability**

HP X-Terminal's targeted introduction is in the fourth quarter 1989 -- first quarter 1990 timeframe. Final pricing will be determined in the fourth quarter 1989. For more information, contact the Sales Response Center at (408) 447-4444.

**Competition**

Here is our most recent competitive information on Sun and DEC. We are always interested in more competitive information, which you can send to X Feedback on HPdesk.

**Sun**

**Advantages**

- Promising NeWS and X11 together on the same screen
- AT&T relationship and AT&T's backing of the Open Look graphical user interface specification.
- Historically strong vendor support for SunView/SunTools non-networked windowing system.
- Intent to provide a toolkit on X11 that will allow porting of SunView applications.

**Disadvantages**

- Sun has never had an X10 or X11 product.
- Public domain X11 is used at your own risk and slow.

- Sun's first X11 product will be the X11/NeWS product. Sun's statement at the Sun Users Group in December 1988 was that this product release will not be until July 1989, nearly nine months later than HP's servers began shipping.
- Sun has never demonstrated MOMA windows or announced it as a capability.
- Open Look fails to provide a common behavior across PCs and UNIX machines.

## **DEC**

### **Advantages**

- DEC has invested a considerable amount of effort in its DECwindows program. This effort indicates initially that the performance and quality of the products will be good.
- OSF chose DEC's toolkit and widgets and UIL (User Interface Language) technology as the basis for the OSF Motif user interface standard.
- Broad product line. X11 will be available for VMS and ULTRIX.
- Initial product will contain the latest revision of X11 - R3.

### **Disadvantages**

- Initial release of DECwindows will not have Presentation Manager behavior. DEC has stated that the enhanced (3-D) appearance and PM behavior will not be available from DEC for a full year after DECwindows is released.
- OSF has contracted for HP to engineer the Motif toolkit and DEC to engineer UIL. Adding the 3-D appearance and PM behavior will alter the way the DEC widgets are programmed too. Thus, using the new set may require as much porting as from the HP X widgets.
- HP will be on their second release of development products when DEC is on their first. HP has incorporated all the R3 bug fixes into our servers as well as in Xlib. HP will be shipping the R2 Xt intrinsics. The OSF Motif widgets will be R3 when released.

## OSF/Motif -- the one-minute sale

The Open Software Foundation has chosen advanced technology from Hewlett-Packard for a major portion of its user interface, OSF/Motif. This decision marks the culmination of an unprecedented industry-wide solicitation and review process. The complete OSF user interface is based on a combination of technologies from the joint HP/Microsoft Corporation submission and the DEC submission. The resulting OSF/Motif technology conforms to the MIT X Window System (TM) protocol standard.

HP's user interface vision emphasizes the ability of computer users to readily transfer their experience from one system to another, as shown in Table 9.2. The consistent behavior of the user interface is essential in maintaining productivity as people move from system to system. (Imagine what driving a car would be like if the steering wheel and pedals changed function from model to model!)

**Table 9.2 HP's user interface lets users move easily from system to system.**

### OSF/Motif

Component	Accepted Technology
Style guide	HP/Microsoft Style Guide
Appearance	HP 3D [Bevelled] Appearance
Window Manager	HP Window Manager
Toolkit (Widgets)	DEC XUI/HP CXI
UI Language	DEC UIL



### Style guide

Consistency between the personal computer world and the UNIX system world is essential to enhance the productivity of computer users who work in both worlds. The style guide developed and written by HP defines a common user interface behavior that is consistent with Presentation Manager. While the style guide describes Presentation Manager behavior, it remains flexible to allow for the evolution of the standard as technology develops.

### Appearance

The enhanced, 3D look developed by HP provides OSF/Motif with a recognizable reference appearance. The 3D effect enables software developers to create applications that are easier for people to learn and operate because the realistic-looking graphics are more intuitive. For example, a 3D push button looks like it's been pressed when the user selects it.

### Window manager

The HP Window Manager, chosen by OSF for Motif, plays a principal role in enforcing the consistent behavior policy. By supporting Presentation Manager behavior, the HP Window Manager provides a direct bridge between PC systems and UNIX systems.

### **Toolkit (Widgets)**

The OSF/Motif toolkit is a composite developed by HP under the direction of OSF. The OSF/Motif toolkit, an amalgam of HP and DEC toolkits, preserves much of the DEC toolkit while melding to it significant portions of the HP toolkit. The OSF/Motif toolkit will exhibit the HP 3D appearance and Presentation Manager behavior. Both HP and DEC toolkits can serve as application prototyping bases, providing a smooth migration path to OSF/Motif.

### **User interface language**

The DEC User Interface Language (UIL) is the final component of OSF/Motif, a presentation description language. The presentation description language speeds the design of the user interface portion of software programs and simplifies their maintenance. The language uses the OSF/Motif toolkit engineered by HP.

### **NewWave on UNIX update**

OSF/Motif will become the base for HP NewWave on UNIX. Developed by HP, the NewWave environment is HP's advanced application environment that enables users to focus on the task rather than the methodology.

With the selection of key aspects of HP's proposal, OSF has laid the groundwork for bringing the NewWave environment to the UNIX operating system. The design of the NewWave environment will take into consideration the design of the user interface and the architecture of the operating system. In the case of the UNIX system, the design of the NewWave environment will utilize OSF/Motif and the networked architecture of the UNIX operating system, just as Microsoft® Windows® is the user interface for the current MS® -DOS version of the NewWave environment.

As shown in Table 9.3, the NewWave environment's information management capabilities plus a specific user interface and operating system equal NewWave on a specific operating system. Each NewWave version takes into consideration the user interface design and operating system architecture. While the underlying architecture is significantly different, the user will be provided with similar capabilities.

**Table 9.3 Hewlett-Packard strategy--building on standards**

User Interface		Object manager and task automation		Operating system		Common NewWave environment
Microsoft Windows	+	NewWave	+	DOS	=	NewWave/DOS
Presentation Manager	+	NewWave	+	OS/2	=	NewWave/OS/2
OSF/Motif	+	NewWave	+	UNIX	=	NewWave/UNIX

The basic premise behind HP's strategy has been to take into consideration the needs of computer users for a consistent behavior across applications and operating system environments. HP has set the stage for the delivery of the NewWave environment across multiple operating systems. NewWave applications, by utilizing standard user interfaces such as Microsoft Windows and OSF/Motif, will have a consistent behavior across different operating systems.

In addition to the NewWave environment, HP continues to investigate other technologies to create further bridges between personal computers and UNIX systems.

## Chapter 10. DataPair/800

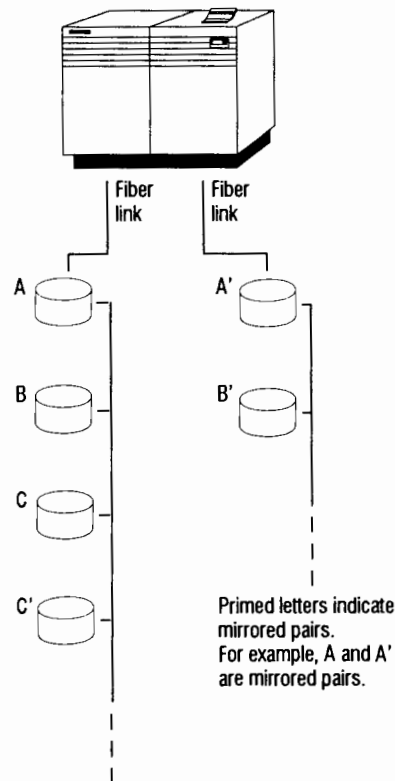
### The one-minute sale

DataPair/800 addresses the needs of customers who require data integrity and increased system availability. Customers requiring data integrity cannot afford to lose their data if there is a disk failure. DataPair/800 prevents data loss by maintaining two copies of data on separate disks so that the data is still intact after any single disk failure. Using DataPair/800 also increases system availability because the system does not go down when there is a disk failure. Furthermore, DataPair/800 can be used to perform on-line backups from one disk while the other disk continues to provide data storage to running applications.

### Product description

DataPair/800 is offered as a separate, installable software product on systems with HP-UX release 7.0 or greater (see Figure 10.1). It is available on all Series 800 machines except for the Series 815. DataPair/800 only supports the HP 7936FL and HP 7937FL disk drives, which require fiber link interface cards and connections. A single copy of DataPair/800 on an SPU will support up to 32 disks.

Figure 10.1 DataPair/800



Disk mirroring utilizes a new device driver, which makes two disk sections appear as a single section to applications. Once two sections are configured together forming a mirrored pair, they can either both be on-line, or one on-line and one off-line. When both disks are on-line, writes are sent to both drives while reads are sent to the drive that can respond most quickly. When one of the disks is off-line, all requests to the mirror will be handled by the disk remaining on-line. It is not possible to have both disks in a mirror off-line at the same time. If a disk is off-line, it can be accessed independently of the mirror for back-up and maintenance purposes.

If a section in a pair is taken off-line and not altered, it can typically be reimaged using a table that reflects changes in the on-line disk. Instead of copying the entire on-line disk to the off-line disk, only those parts that have been modified while the disk was off-line will be updated. This reduces the time it takes to reimage the off-line disk.

## Features and benefits

Table 10.1 summarizes DataPair/800 features and benefits.

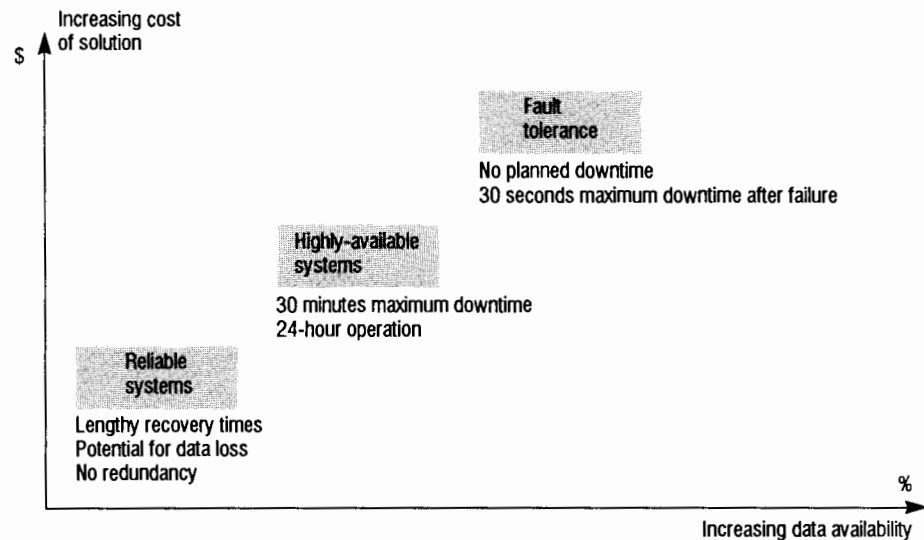
**Table 10.1 DataPair/800 features and benefits**

<b>Product features</b>	<b>Customer benefits</b>
Two-way mirroring	Protection of data when disks crash
On-line backup	Reduction of planned downtime due to maintenance, and backup
Application transparency	No need to modify existing applications
Mirror of system disk	Computer is still available if system disk crashes
Support up to 32 disks	Capability to mirror large amount of data
System administration tools	Installation and administration tasks are quick and simple

## Data availability continuum

Today there are many ways of addressing the system availability problem. Solutions range from reliable systems to elaborate fault-tolerant systems that can recover from most hardware faults in microseconds. Figure 10.2 depicts a system availability continuum showing the relative positioning of the different types of solutions. Reliable systems typically address the needs of batch and noncritical on-line applications. Most on-line application availability requirements can be met by highly available systems. At the far end of the availability continuum, fault-tolerant systems address the needs of certain real-time environments.

**Figure 10.2 Data availability continuum**



Each type of system on the availability continuum offers specific benefits. In designing a solution, trade-offs need to be made in choosing which type of system meets a specific application's needs. Typically, as systems increase in availability the price increases. For the same dollar investment, applications running on reliable systems will perform better than ones running on fault-tolerant systems.

It is important to draw clear distinctions between the capabilities of highly available systems and fault-tolerant systems. Highly available systems are based on reliable, state-of-the-art computers, configured to significantly increase the availability of the system. They quickly recover from both software and hardware faults within minutes of detecting a problem. In contrast, fault-tolerant systems are typically designed with tightly coupled redundant processors running in lock-step that limit recovery times to microseconds. The primary advantage of fault-tolerant systems over highly available systems is that they improve on a system's mean time to recover (MTTR) from hardware faults. Fault-tolerant systems do not provide any more protection against software faults than highly available systems, and software recovery times on both types of systems are similar.

## Target market

Data integrity is a common requirement in all cases where information is stored on disks. Across all types of systems, from PCs to mainframes, and in many industries including manufacturing, telecommunications, hospitality, retail, and financial services, users waste thousands of dollars when essential data is not available. Let's take a look at some industries where there are opportunities to sell Series 800 systems configured with DataPair/800.

### Telecommunications

Computers installed in the telecommunications markets are used for network and operations management purposes, as well as for mission-critical tasks such as the control of switching systems. In these two areas, system requirements are completely different. Users of network and operations management systems are usually very sensitive to loss of data due to disk failure, but can tolerate unplanned system downtime due to system failures. However, switching control systems are critical to the success of the telecom company, and therefore system failure is not acceptable for these applications. Consequently, S/800 systems configured with disk mirroring will best suit network and operations management applications, but may not be sufficient for switching environments.

The following list provides some examples of telecommunications applications used by most service providers, where DataPair/800 should help you leverage S/800 systems:

- *Service Provisioning* -- Systems that support the assignment, connection, and billing of network facilities to provide services to customers.
- *Network Monitoring and Maintenance* -- Systems that monitor and maintain the public telecommunications phone network to identify and isolate failures of transmission lines or switching elements.
- *Network Administrative Management* -- Systems that are used to reconfigure or test the current network. The functions include data administration, daily surveillance of service, switching network loads, equipment utilization, etc.
- *Voice Information Services* -- Voicemail, videotext, voice processing, all require high availability.



## **Manufacturing**

In the manufacturing environment, computers are used for a variety of applications, including production control, inventory control, process monitoring and control, order processing, and others. In each of these areas, the value of DataPair/800 is highly dependent on the system requirements. For example, systems used as area managers for process control are highly dependent on data stored on disks. The data that includes information regarding the production scheduling, specs of the products, etc., is being updated continually by the management information systems, and then compared with programmable logic controllers (PLCs) that monitor the process. In case of a disk failure in the area manager systems, the PLCs will immediately stop the production process and as a result, the whole line might be down for a few hours. For a discrete or batch manufacturing process, the cost of idle PLCs may range from \$100 to \$2,000 per hour, while an idle process control facility may cost up to \$20,000 per hour!

Another area where data integrity is critical is in warehousing management systems. A typical system keeps track of the output against orders, ensures minimum levels of thousands of different items, tracks the location of each item, etc. When disks fail, the whole system will be down, causing people who run the warehouse to do their jobs manually. Depending on the applications, if the system is down for more than 30 minutes, the plant has to stop production. To resume production, one doesn't merely push a button. In the process control industries (chemical, paper, steel, food, etc.) there are major start-up problems that are inherent to the process. In the pulp and paper industry, for example, given all the costs -- labor, raw materials, energy, amortization on investments, and loss of profits -- the loss can be \$100,000 to \$300,000 per hour!

## **Hospitality**

Data integrity is essential for the hospitality marketplace, especially affecting the quality of guest services and the ability to efficiently control costs. The front desk is the most visible area to guests, where fast and accurate check-in and check-out are critical for assuring customer satisfaction. A disk failure immediately slows the speed with which each guest is processed, reduces the depth of information available about returning guests, and significantly increases the stress of front desk employees. For these reasons, a leading hotel chain using Series 800s has its superior data availability as a competitive advantage. It allows guests free-of-charge lodging if they are unable to check out due to lack of sufficient billing data.

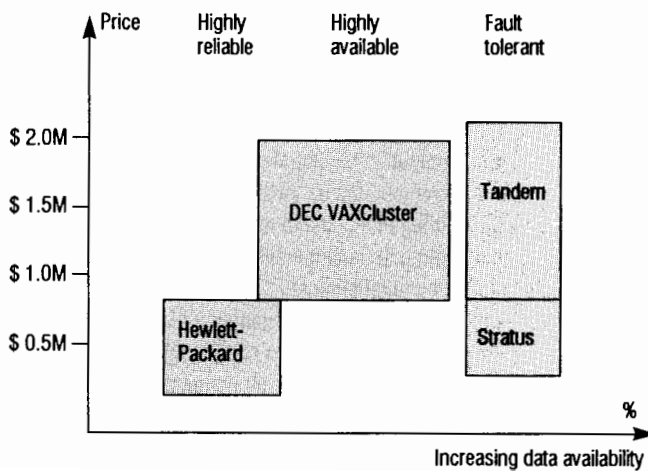
## Financial services

Banks, insurance companies, and trading and investment management companies are heavily dependent on the availability of data stored in disks, and therefore should find DataPair/800 as an essential feature. Although banks typically have disjointed data on multiple mainframe systems, by using data from IBM's mainframes, the Series 800 systems can be used to form a local customer database. System availability and reliability also are major needs for trading and investment management companies, where analysts are required to react quickly and accurately to changes in the market. And finally, insurance companies use mainframes located in their headquarters for claims processing. However, data is also downloaded to minicomputers that provide the same computing power in distributed computing environment.

## Competition

Major minicomputer vendors offer data integrity solutions as a standalone product, or as a part of a complete highly available/fault-tolerant system. Figure 10.3 shows the competitive positioning of these companies, and includes only those systems that are comparable in performance to the Series 800 systems. In the fault-tolerant segment, Tandem sells systems from \$800K to \$2M, while Stratus focuses more on the low-end arena with systems from \$200K to \$800K. DEC is strong in the highly available segment with VAXClusters for \$800K to \$2M. HP with DataPair/800 enters the low end of the highly available segment with fully configured systems sold for \$100K to \$600K.

Figure 10.3 Competitive positioning



The following sections provide information regarding the positioning of HP against these companies and, when applicable, emphasis is placed on ways to position DataPair/800 against similar products.

## **DEC**

DEC is a strong player in the high availability market, moving slowly to the fault-tolerant arena with VAXClusters and special purpose hardware and software products. However, DEC's greatest weakness is its traditional reliance on its proprietary VMS Operating System. In sales situations where customers do not want to be locked into a proprietary environment, DEC's high availability product line is useless! Given the limited scope of this section, only the capabilities of Volume Shadowing, DEC's disk mirroring product, will be described in detail.

### **Volume Shadowing**

VAX Volume Shadowing is a product available only on VAXClusters. VAXClusters were originally designed to allow large engineering and education customers to link multiple processors with a common pool of tapes and disks. The VAXCluster has hardware and software support for high availability, but not fault tolerance. The hierarchical storage controller (HSC), which is an essential part of the cluster, provides a centralized storage solution, recovery from failure, and data integrity features including disk mirroring and concurrent backups (when Volume Shadowing is installed).

Volume Shadowing offers similar features to DataPair/800, although in a cluster environment users can get more services due to the HSC capabilities. Volume Shadowing is transparent to users and therefore does not require any modifications to applications. Disks can be removed and added while the application is executing and also can be shared by two HSC controllers. Consequently, in the event of the controller failure, the volume shadowing software transfers the shadow set from failed controller to operational controller. In addition, the HSC offloads some I/O operations from the host, allows concurrent read/write access by multiple processors, and allows disks to be concatenated. In summary, Volume Shadowing installed on HSC offers more functionality than DataPair/800, primarily because it exploits the benefits of the VAXCluster architecture. However, VAXClusters are very expensive!

When competing against Volume Shadowing, start by looking at the customer's requirements. Since HP does not offer an "off-the-shelf" cluster solution, identify opportunities to meet customers' needs with an available configuration of S/800 systems enhanced with DataPair/800 for better data integrity.

If HP's solutions meets your customer's needs, use the following arguments against Volume Shadowing:

- Not available on ULTRIX (except as a "special" for the telecom markets)
- Very expensive for customers with no clusters
- Clusters are difficult to configure

### **Fault-tolerant vendors**

Tandem and Stratus sell the bulk of fault-tolerant systems. Over the past 10 years, these companies have developed systems that exceed Series 800 system performance for extremely fault-tolerant environments. The best way to compete against a fault tolerant system is to first carefully examine with your customer the true availability needs. Often, Fault Tolerance vendors have misled their customers to believe they need fault tolerance, while HP's standard, highly reliable systems often meet user need for considerably less money. Once you have identified that Series 800 systems meet your customer's needs, use the following arguments to position HP as a provider of better solutions:

- Given the fact that fault-tolerant vendors offer proprietary operating systems, users cannot enjoy the open system benefits (like portability and a larger number of applications).
- Relative to equivalent Series 800 system performance, the fault-tolerant computer systems are three times more expensive.
- HP is a much larger company, and is well known for its excellent customer support.

### DataPair/800 vs. DataPair/1000

DataPair/800 is not interchangeable with DataPair/1000, which runs on the HP 1000 systems, and therefore manual migration is required. The principal differences are in the commands used to configure the mirrored disks, and in the way disks are brought into the mirror. DataPair/800 supports one command with options that manage the mirroring operation, while DataPair/1000 has several separate commands. Also, the method by which disks in a pair are referenced is slightly different. In migrating from an HP 1000-based system to a Series 800 system, these syntactical changes are a normal part of the migration and usually impact only the system administrator. While both DataPair/800 and DataPair/1000 bring a second disk into a mirrored pair by copying all the information from the first disk to the second disk, DataPair/800 allows the second disk to be quickly brought back into the mirrored pair by copying over only the information that changed when the disk was not in the mirror.

### Ordering information

DataPair/800 will be placed on the July 1, CPL, available October 1989.

Part number	Description	Price
92623A	DataPair/800. Disk Mirroring Software product for 825S, 835S/SE systems	\$14,900
92624A	DataPair/800. Disk Mirroring Software product for the 840S systems	\$19,600
92625A	DataPair/800. Disk Mirroring Software product for 850S/855S systems	\$31,400

Note: When ordering DataPair/800, be sure to order additional disks and fiber link interface cards. To prevent the interface card or connection from becoming a single point of failure, it is best to use a separate interface card for the disks in each half of the mirrored pair.

## Chapter 11. Questions and answers

### System hardware

**Q** What are HP's plans for multiprocessing (MP)?

**A** Multiprocessing can provide a very cost-effective means of increasing performance for certain applications that consist of numerous processes. HP has initially focused on increasing uniprocessor performance because, unlike multiprocessing, all applications receive the same performance improvement without code modification when a uniprocessor is upgraded.

HP is now well positioned to move to multiprocessing. The HP-PA architecture already supports MP, we have experience doing symmetrical MP, and we have tremendous uniprocessor performance that we can use as our base for MP. HP intends to move into MP with HP-PA in 1990. The Model 855S will be the first machine to support MP.

**Q** How portable are drivers that my customer writes for an 825S to an 815S with HP-PB?

**A** There are two issues here: code similarity and tools. First, any part of the driver that deals with the interface card will need to be rewritten and any part of the peripheral driver will need only minor changes.

In the past, VERY few customers bought our tools for writing drivers, and we are no longer offering those tools for CIO or HP-PB. New drivers for HP-PB should be handled through the specials organization.

**Q** Does the 815S HP-Precision Bus run counter to HP's claims of compatibility across the family?

**A** The Model 815S is object-code compatible with all HP 9000 Series 800 computer systems, where applications with standard languages I/O calls or other HP-UX I/O system calls are used. Applications may require modification if I/O control is managed via the Device I/O Library (DIL) or I/O control calls (ioctl).

**Q** Are all HP peripherals compatible with the HP-PB bus?

**A** Almost all major standard interfaces are supported on the HP-PB bus. Some peripherals may not be supported at first release of the 815S, for instance, HP-IB printers, but support is expected in future releases. For a comprehensive list of supported peripherals, see the 815S Hardware Technical Data Sheet.



**Q** Why did HP go HP-PB and what are the benefits?

**A** HP-PB (Precision Bus) allows us to scale HP-PA to lower price points. Systems can be built with less complexity and cost, allowing us to offer our customers lower-cost systems with better price/performance. HP-PB is more reliable and offers greater throughput than other system busses on the market today.

**Q** What I/O cards are supported on the 815S?

**A** 8 Mbytes of memory, LAN 802.3 Ethernet, X.25, MAP 3.0, Battery Backup, HP-IB, GP(I/O) (parallel), and 8-channel MUXes (each is made specifically for the 815S and is not interchangeable to other 800 series). The 815S does not support the RTI card or graphics cards and therefore is not available as a workstation.

**Q** What are HP's plans for follow-on products in the mid-range?

**A** We are currently investigating future mid-range products that could develop into an 835/935 follow-on product. Since we are still in the investigation phase at this time, it is unclear as to whether a mid-range follow-on would take the form of a field upgrade or box swap to existing systems.

**Q** What are HP's long-range plans to extend the high end?

**A** HP targets a minimum of 50% performance improvement with each new high-end product. We will aggressively roll out new products that will extend the high-end through a combination of board upgrades, higher-speed technologies, multiprocessing, and higher-capacity packaging to support more users, memory, disk, and I/O bandwidth.

HP utilizes only TTL and NMOS technologies to reach the performance level that our competition achieves on higher-speed CMOS and ECL technologies. In the early 1990s, HP will also move to these technologies and that, coupled with multiprocessing, will allow us to achieve tremendous performance advantages in the minicomputer and server product price ranges.

## Upgrades

**Q** What are we doing to support more users on the 835SE?

**A** Due to customer demand, we are planning to increase 835SE connectivity to 128 active users in the November '89 timeframe. This will be implemented by a combination of 6-channel MUXes and LAN-based terminal connect solutions.

**Q** Is the software credit really 100% on all upgrades?

**A** Our policy is 100% credit on subsystem software; however, due to price changes on software that may occur, there may be discrepancies until credits are changed on the CPL.

**Q** Do standard discounts apply on Series 800 purchases involving upgrade credits?

**A** Yes. Discounts are based on total list price NET of credits.

**Q** Are there upgrades for multiuser Series 300 customers to multiuser Series 800 machines?

**A** No, we have had very few requests for this path. If a customer asks for this path, please contact the Sales Response Center. If requests for this path become more common, we will consider adding a 300-800 path to the Upgrade Program.

**Q** Is there an upgrade path from the 840S to the 835S/SE?

**A** No standard path exists. However, the 840S customer can be considered for a special credit if the following criteria are satisfied:

- 840S must have had been purchased before 6/1/88
- 840S must have been purchased under standard HP purchase agreement contract (that is, no special terms, conditions, or discounts were granted on the original sale and no consignment units are eligible)
- Only upgrades to 835SE allowed

Contact the Sales Response Center for more information.

**Q** Will there be any upgrade paths from HP 1000s to the 815S?

**A** Based on anticipated low demand and profitability, no paths will be added.

**Q** Will my customer get upgrade credits for 815S memory, I/O cards, etc., if he/she wants to grow from an 815S to a larger Series 800?

**A** Yes. For specifics, refer to Series 800 upgrade program section.

**Q** Is it HP's policy to ensure that the 825S plus the board upgrade equal the price of the 835S?

**A** No, it is not HP's policy to price board upgrades so that they equal the price of the new system less the price of the lower-performance system.

## System software

**Q** What is HP's strategy for delivering Highly Available systems?

**A** To address the need for data integrity and minimum computer downtime, HP is currently executing a program to provide customers with increased system availability on the Series 800 product line. The first phase of this program is the delivery of DataPair/800 (disk mirroring) in conjunction with the HP-UX 7.0 release. Currently under investigation for future phases and releases of HP-UX are various means of increasing system availability by providing additional redundancy in the system for critical components.

**Q** How do I respond to my customers' requests for highly available or fault-tolerant systems today?

**A** The best way to respond to customer requests for highly available or fault-tolerant systems is to carefully examine with the customer their true availability needs. Often, fault-tolerant competitors have led their customers to believe they need fault-tolerant systems when HP's standard, highly reliable systems and DataPair/800 product can meet the customer's requirements for considerably less money.

**Q** Will PORT/VX help migrate applications from VMS to other UNIX-based machines (Convex, Alliant, Cray, etc.)?

**A** Some of PORT/VX's software components can be used to move VMS FORTRAN applications to other UNIX-based systems, but the product is primarily designed to migrate software to HP-UX. For example, the VMS FORTRAN extensions translated to the HP-UX environment will not be recognized by other machines. The Migration Libraries that emulate the VMS equivalences run only on HP-UX. But the media conversion utility (Vbackup) and FORTRAN Code Analyzer should be very helpful for a generic VMS to UNIX translation. The Analyzer identifies all the non-standard FORTRAN extensions as well as the VMS System Services and Run-Time calls. Therefore, based on the Analyzer's output, your customer will be able to assess the required migration efforts to any type of UNIX-based systems.

**Q** What can I get today from HP that has been selected by OSF?

**A** Components of HP's current X Window System form the basis for OSF/Motif. In particular, the window manager and the 3D appearance are included in the current release. The toolkit in the current release can be used to develop applications with the understanding that the final OSF/Motif toolkit will be different. The source code is licensable for developers wanting to port this interface to other vendors' systems.

**Q** How does NewWave fit into all of this?

**A** OSF/Motif will be the graphical user interface for NewWave on UNIX. The OSF decision reinforces HP's strategy to offer NewWave across multiple operating systems. Microsoft Windows is the user interface used by NewWave on MS-DOS. Because OSF has endorsed HP's strategy to offer a common user interface across DOS, OS/2, and UNIX operating systems, NewWave will also be based on a consistent interface for all three operating systems. This will enable users familiar with NewWave on one operating system to switch easily to other systems without retraining. NewWave has been offered to OSF for future consideration to offer capabilities beyond those of a user interface.

**Q** What's the difference between OSF/Motif and Open Look from AT&T/Sun?

**A** Both OSF/Motif and Open Look are graphical user interfaces. The most significant difference between the two is that OSF/Motif bridges the personal computer and UNIX system worlds. By looking to the emerging standards from the PC area for consistency, the power of UNIX systems can be tapped not only by a large installed base of users, but also new users of computers.

**Q** Will OSF/Motif be the standard user interface across HP?

**A** Within the UNIX system world, OSF/Motif will be incorporated into future applications. With the consistency provided by OSF/Motif in the PC and UNIX system worlds, future interfaces will be heavily influenced by OSF/Motif.

**Q** What is HP's strategy for OSF roll-in?

**A** Though there will be updates to the existing HP-UX product for the foreseeable future, the OSF-based system will be phased in over time. We expect compatibility between HP-UX and OSF at the source code level at a minimum.

**Q** What is HP's stance on the OSF vs. UNIX International issue?

**A** Since both organizations have announced plans to be compatible with POSIX and X/Open, we believe that a high degree of compatibility will exist between the two offerings. Therefore, the benefits of standards will be retained, and the user may benefit from an even larger level of innovation within the standards framework.

**Q** Does X/Open branding assure compatibility?

**A** While the brand does not guarantee compatibility, if both the computer system and application are branded, the compatibility should be excellent. Of course, the particular application must be supported on the system. If you write applications for a branded system, a recompile will, in general, be sufficient to make the application run on another branded system.

**Q** Why is the UNIX on the Vectra different from HP-UX?

**A** Essentially, all the existing applications for PCs under UNIX are on XENIX. Therefore, we chose that system. We will move to the merged operating system when it is available (System V/386).

HP-UX is compatible with X/Open and SVID, which are the main standards for UNIX today.

In the future, all products will run a version of the operating system that is compatible with all major standards.

**Q** Will we continue to comply with AT&T's UNIX versions as we go further with OSF?

**A** HP presently complies with V.3. We will continue to track pertinent industry standards, that is, POSIX, X/Open, etc., in future releases. We anticipate a high degree of compatibility since UNIX International (based on AT&T's UNIX) is following the same standards.

**Q** Can my customer mirror disks on the same Fiber Optic interface card?

**A** Technically it can be done. However, it is highly recommended that disks in the two halves of the mirroring be connected to the SPU with different Fiber Optic interface cards. Using different cards prevents the card or connection from becoming a single point of failure. If a card or connection fails, the other disk in the pair can continue to provide disk storage.

**Q** What happens when a disk in a mirrored pair fails?

**A** When a disk in the mirror fails the other disk in the pair continues working the same way an unmirrored disk operates. This switch, from both disks working to only one disk working, is transparent to the application. When this change takes place, a message is sent to the system console notifying the system administrator of the failure. If there is only one disk on-line in a pair and there is a problem with the on-line disk, the problem is handled the same as if the on-line disk was not in a mirror.

**Q** How are applications affected by the mirroring driver?

**A** In general, applications are not affected by using the disk mirroring driver. An application that was accessing a single disk before does not know that it is now accessing two disks. When one of the disks is removed from the pair, either intentionally or unexpectedly, the application will continue without interruption, accessing the remaining disk. If the application utilizes any special commands which configure the system, these commands may need to be changed to set up the mirrored pair.

**Q** How will performance be affected?

**A** Performance is dependent upon the application's mix of reads and writes. Writing to both disks requires the mirrored driver to wait for both writes to complete. This increases the average time it takes to write to a disk. Typically, writes are expected to take between ten and twenty percent longer with the mirrored driver. Reads with the mirrored driver are expected to take less time because the read request is sent to the disk that can most likely service the request sooner. In some cases, this could increase read throughput by as much as 100%. However, it is important when discussing the mirrored driver's performance to keep in mind that performance will depend upon the specific application's mix of read and writes.

**Q** Will DataPair/800 allow SPUs to share disks?

**A** No, DataPair/800 is designed to work with only one SPU and one set of disks connected to that SPU.

**Q** Do I need to turn off the application programs before doing an on-line backup? If so, how long does that take to do.

**A** The standard on-line backup procedures require that the system administrator bring the application to a consistent state before separating the mirrors. For database applications, this is essentially completing all transactions and flushing all information to disk.



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**Printed in USA M0589  
5952-6577**