

HP 9000 Series 800 Business Servers Models 807S/817S/827S/ 837S/847S/857S

Technical Data

HP 9000 Series 800 Integrated Business Servers

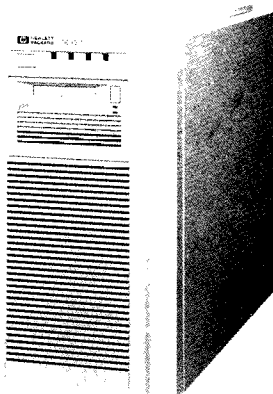
The HP 9000 Series 800 Models 807S/817S/827S/837S/847S/857S are low-end and mid-range members of the broad HP 9000 Business Server family. These high performance systems offer reliable and cost effective solutions to data processing and computational needs. Hewlett-Packard has combined HP Precision Architecture RISC (PA-RISC) with HP's high speed CMOS and Very Large Scale Integrated (VLSI) circuit technology to deliver the powerful performance needed in multiuser, multitasking environments.

The Models 807S/817S/827S/837S/847S/857S's space saving package designs are ideal for both office and data center environments. All systems combine HP's industry leading RISC-based processor performance with fast, reliable disk and tape drives in a compact cabinet designed for both deskside use in the office and rack mounting in the data center. Cost-effective, high capacity Digital Audio Tape (DAT) backup is standard on all models.

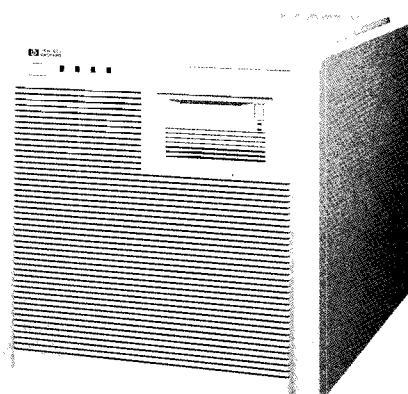
Like all other HP 9000 Series 800 Business Servers, the Models 807S/817S/827S/837S/847S/857S run the HP-UX operating system. HP-UX conforms to AT&T's UNIX® System V Interface Definition (SVID), IEEE POSIX (1003.1), the X/Open (XPG3) standard for application portability, and is XPG3 branded. HP-UX provides a solid foundation to run your business through powerful system and network management tools, and a full range of high availability solutions. In addition, HP-UX offers industry leading software development tools (CASE), information management products and a sophisticated office environment. The Models 807S/817S/827S/837S/847S/857S are fully object code compatible with all HP 9000 Series 800 Business Servers. This compatibility provides the Models 807S/817S/827S/837S/847S/857S with the multitude of business solutions currently available on the Series 800.

Figure 1.

**HP 9000 Series 800
Models 807S/817S/837S**



**HP 9000 Series 800
Models 827S/847S/857S**



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Features

- Industry leading performance in a compact desktide and rack mountable package with integrated disk and tape drives.
- Single-chip VLSI central processing unit (CPU) utilizing HP Precision Architecture RISC.
- High-performance floating point coprocessor (optional).*
- Large instruction and data caches
- High speed, dedicated memory bus and 80 nsec ECC memory
- High speed 32 bit HP Precision I/O Bus (21 Mbyte/sec sustained throughput, 32 Mbyte/sec max throughput)
- Reliable, high performance SCSI-2 disk drives
- Up to 1.36 Gbytes of internal SCSI disk storage on Models 807S, 817S, and 837S and up to 4 Gbytes on Models 827S, 847S, and 857S.
- Additional SCSI disk storage available in both desktide and rack mountable external mass storage systems.
- High capacity backup with integrated Digital Audio Tape drive.
- 8-user HP-UX operating system pre-installed on disk.
- Friendly log-in screen.
- Automatic restart after a power failure available with Powerfail battery backup.
- Standard dedicated office power and cooling requirements.

Cost effective board upgrades

Since the Models 807S/817S/827S/837S/847S/857S all use the same core technologies, the systems can easily and cost effectively be upgraded for both greater expandability and higher performance.

HP Precision Architecture

The HP 9000 Series 800 Business Servers all use HP Precision Architecture RISC to provide high performance and reliability at a low cost.

PA-RISC is a Reduced Instruction Set Computing Architecture (RISC). This design approach delivers greatly simplified computers that are optimized to provide the highest performance for a given integrated circuit technology. The inherent simplicity of PA-RISC also means machines can be built with fewer components providing higher levels of reliability than is possible with more complex architectures.

PA-RISC utilizes a Load/Store design and register-to-register operations to reduce the number of memory accesses. To further enhance performance, optimizing compilers schedule instructions and manage the instruction pipeline. With hardwired control, a Load/Store design, and optimizing compilers, instructions can be executed on virtually every clock cycle. Single-cycle instruction execution accounts for much of the superior performance of PA-RISC.

VLSI Technology Leadership

HP's use of CMOS VLSI technology allows the entire CPU including the floating point coprocessor, instruction and data caches, and translation lookaside buffer (TLB) to be placed on a single printed circuit board. This reduced complexity results in fewer components and, therefore, higher reliability and lower cost. See figure 2.

System Organization

The processor communicates with memory over a synchronous, dedicated 72 bit interface with a peak transfer rate of 192 Mbyte/sec. This dedicated memory bus greatly enhances system performance while freeing I/O slots for other uses. The HP Precision Bus (HP-PB) synchronously transfers processor and I/O data over a 32 bit data path. Data transfer between the processor and memory and I/O is handled by the Memory and I/O Controller.

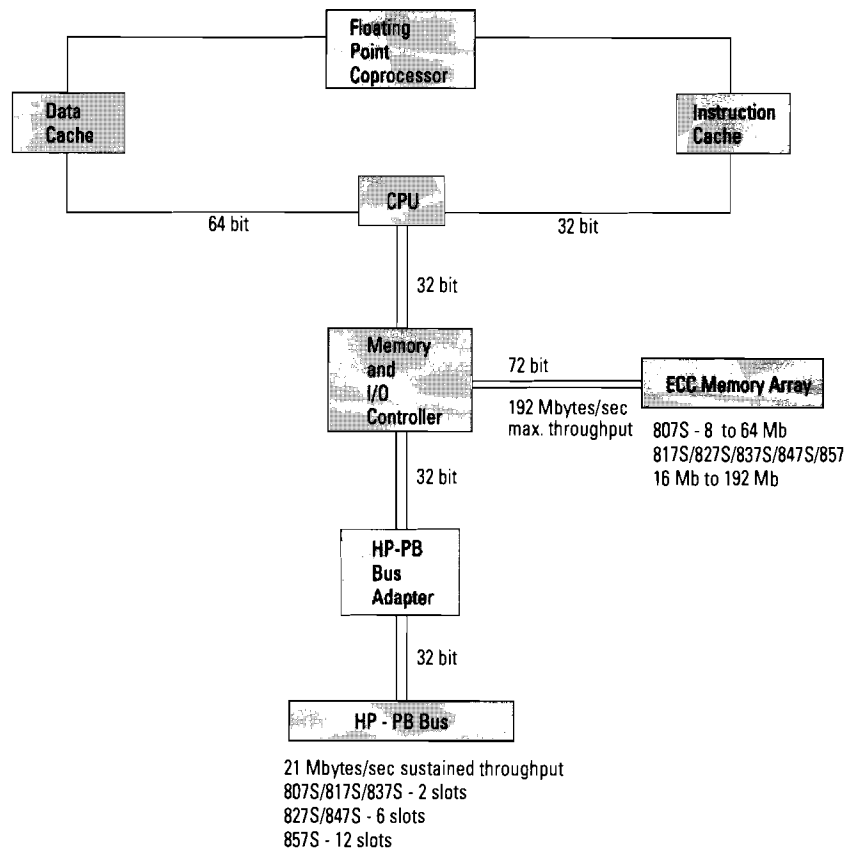
Caches

The use of high speed static RAM caches enhances system performance by minimizing CPU requests for instructions or data stored in memory or on disk. The large caches on Models 807S/817S/827S/837S/847S/857S increase processor utilization and result in higher system performance in multiuser environments.

All models use direct mapped instruction and data caches. Cache size varies between models as shown in Table 1. The cache operates in a write-back mode where the cache writes modified data to system memory only when the processor needs the cache location for other data. The operating system flushes a cache location both due to a direct memory access operation and in the event of a power failure. Parity checking protects the cache, and a parity error triggers a recovery algorithm that resolves most failures.

* Floating Point Coprocessor is not available on Model 807S

Figure 2.



Instruction Pipelining

Instruction pipelining is a technique that overlaps instruction processing so that one instruction can begin to execute before the previous one is finished. PA-RISC's efficient use of a five-stage pipeline complements optimized compilers and its Load/Store design to improve single-cycle execution and enhance system performance.

Floating Point Coprocessor

A full 64 bit floating point coprocessor is available on the Models 817S/827S/837S/847S/857S as an option. The coprocessor significantly decreases the time required to perform single and double precision floating point calculations. These calculations can overlap with CPU operations as long as there is no interlocking data. This ability to operate in parallel results in higher performance for applications that are compute intensive.

Virtual Memory

Virtual addresses ensure ample expandability to meet growing software needs. PA-RISC implements a virtual memory design with 64 bit addressing capability and an addressing range of 256 terabytes. The Translation Lookaside Buffer (TLB) stores recently accessed virtual page translations and converts the virtual addresses into physical addresses. The instruction and data TLBs are each fully associative, contain 96 entries, and implement four variable size block entries capable of mapping up to 16 Mbytes of system memory.

Memory Subsystem

Memory on all systems is available in 8 Mbyte, 16 Mbyte and 32 Mbyte increments. See Table 1 for standard and maximum memory configuration. The 8 Mbyte memory module implements 80 nsec, 1 Mbit DRAM. The 16 Mbyte and 32 Mbyte memory modules use 80 nsec, 4 Mbit DRAM.

The ECC memory assures high performance, reliability and availability. Single bit errors are automatically corrected. Rare double bit errors are automatically detected.

Powerfail battery backup protects the system in the event of a power failure. When AC power is lost, the state of the processor is secured in memory for at least 15 minutes. As long as power is restored within this limit the system restores itself and resumes processing.

Table 1. HP 9000/8X7S Business Servers at a Glance

	807S	817S	827S	837S	847S	857S
<i>SPU Performance</i>						
Clock Speed	32 MHz	48 MHz	48 MHz	48 MHz	48 MHz	48 MHz
MIPS Dhrystone	34	53	53	53	53	53
Relative OLTP Performance	1.0	2.0	2.0	2.7	2.8	2.9
Floating Point Coprocessor	Not available	Optional	Optional	Optional	Optional	Optional
<i>Memory/Cache</i>						
RAM	8-64 Mbytes	16-192 Mbytes	16-192 Mbytes	16-192 Mbytes	16-192 Mbytes	16-192 Mbytes
Standard Memory	8 Mbytes	16 Mbytes	16 Mbytes	16 Mbytes	32 Mbytes	64 Mbytes
Instruction Cache	32 Kbytes	64 Kbytes	64 Kbytes	256 Kbytes	256 Kbytes	256 Kbytes
Data Cache	64 Kbytes	64 Kbytes	64 Kbytes	256 Kbytes	256 Kbytes	256 Kbytes
<i>Mass Storage</i>						
Standard Disk	230 Mbyte	320 Mbyte	320 Mbyte	320 Mbyte	670 Mbyte	670 Mbyte
Max Internal Capacity	1.36 Gbytes	1.36 Gbytes	4.06 Gbytes	1.36 Gbytes	4.06 Gbytes	4.06 Gbytes
Max Disk Capacity	10.9 Gbytes	28.5 Gbytes	47.6 Gbytes	28.5 Gbytes	47.6 Gbytes	47.6 Gbytes
with SCSI-II	10.9 Gbytes	28.5 Gbytes	47.6 Gbytes	28.5 Gbytes	47.6 Gbytes	47.6 Gbytes
with HP-FL	N/A	N/A	21.4 Gbytes	N/A	21.4 Gbytes	32.1 Gbytes
with HP-IB	5.4 Gbytes	5.4 Gbytes	10.8 Gbytes	5.4 Gbytes	10.8 Gbytes	10.8 Gbytes
Internal 4mm OAT	1.3 Gbytes	1.3 Gbytes	1.3 Gbytes	1.3 Gbytes	1.3 Gbytes	1.3 Gbytes
Maximum 4mm DAT	2.6 Gbytes	2.6 Gbytes	5.2 Gbytes	2.6 Gbytes	5.2 Gbytes	5.2 Gbytes
<i>Connectivity</i>						
Available I/O Slots	2/1* HP-PB	2/1* HP-PB	6/3* HP-PB	2/1* HP-PB	6/3* HP-PB	12/6* HP-PB
Standard RS-232 ports	8	8	8	8	8	8
Max. Mux Connects	40	40	104	40	104	200
Max Users	208	368	368	432	432	528

* Single-high/double-high slots. One double-high slot equals 2 single-high slots

Flexible Deskside and Rack-mountable Packaging

Models 807S/817S/827S/837S/847S/857S are designed for both desktop use in the office and rack mounting in the data center. This flexible packaging integrates the processor, disk storage, DDS DAT drive, and I/O slots into a single compact package. In addition, all models include a personality card. The Model 807S personality card integrates 8 RS/232 serial ports, one with modem capability. Personality cards in Models 817S/827S/837S/847S/857S integrate 8 RS-232 ports, all with modem capability, a SCSI interface, and a parallel Centronics interface.

All models accommodate single-high and double-high I/O cards. See Table 1 for available I/O slots for each model. HP-PB single-high cards include the 8 and 16 channel multiplexers, the SCSI/parallel Centronics

interface, the HP-IB interface, the LAN/9000 Link, and the X.25/9000 Link. Double-high cards for Models 827S, 847S, and 857S include the HP-FL interface and the MAP 3.0 Link.

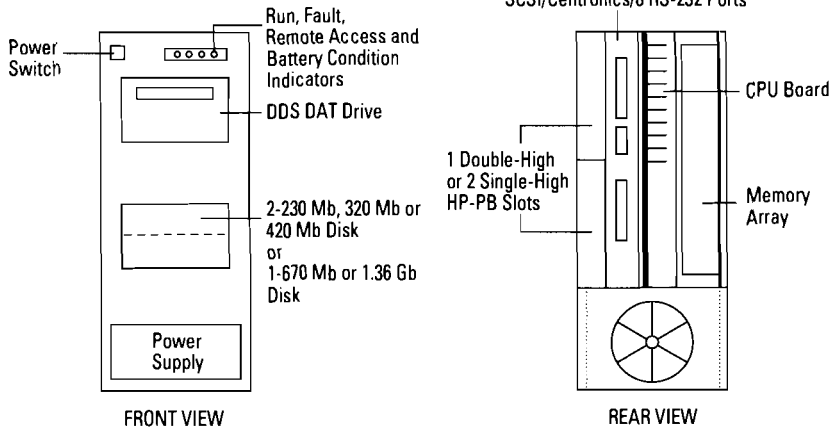
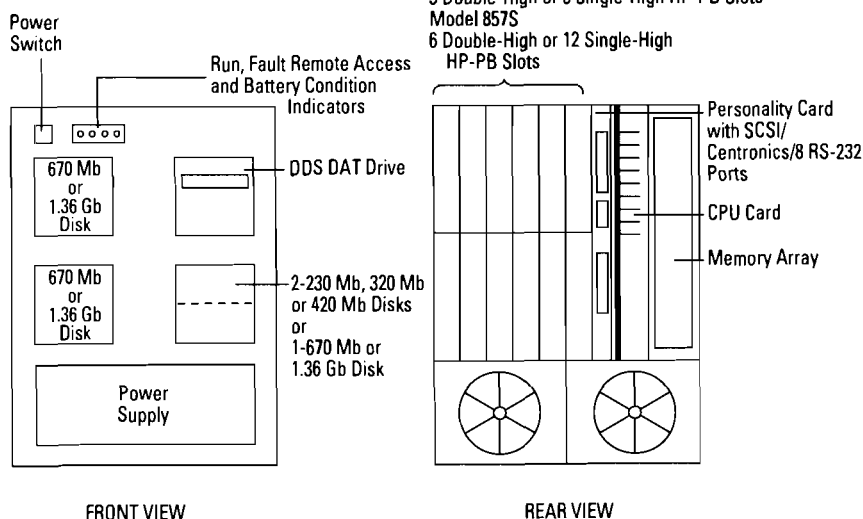
Digital Data Storage

Cost effective backup for all models is provided by HP's DDS DAT drive. The large capacity storage eliminates the need for operator intervention in system backup and offers a convenient and compact storage medium. High data reliability is achieved through read-after-write, three levels of error correcting code (ECC), and correction circuitry. The DDS tape drive also offers typical transfer rates of 11 Mbytes/sec and a 512 Kbyte data buffer to maintain the host transfer rate.

Disk Storage

Models 807S/817S/827S/837S/847S/857S use reliable, high performance, industry standard SCSI-2 single-ended mechanisms. Both 3.5-inch and 5.25-inch drives are supported with capacities ranging from 230 Mbytes to 1.36 Gbytes. Seek times of 12.6 msec for the 3.5-inch mechanisms and 13.5 msec for the 5.25-inch drives demonstrate the high disk performance. In addition, the disk mechanisms offer HP's industry leading reliability as demonstrated by MTBF ratings of 150,000 hours. Data integrity and fast system recovery is assured by support for powerfail battery backup.

Additional SCSI-2 disk storage is available using the external HP Series 6000 Multiuser SCSI Mass Storage System. HP-IB external standalone disk mechanisms are also supported on Models 807S/817S/827S/837S/847S/857S. High performance Hewlett-Packard FiberLink (HP-FL) external standalone disk mechanisms are supported on Models 827S, 847S, and 857S. With the HP-PB FL interface and these disks, Models 827S, 847S, and 857S support disk mirroring through DataPair/UX and processor failover through Switch-over/UX. Maximum capacity for each interface is shown in Table 1.

Figure 3.**807S/817S/837S Card Cage****827S/847S/857S Card Cage****Peripheral Connections**

Disks, tapes and plotters are connected via a SCSI-2 interface, an HP-IB channel card, or an HP-FL channel card. Each SCSI-2 channel has a maximum data rate of 5 Mbytes/sec and supports up to seven peripherals at distances of up to 6 meters. Each HP-IB channel supports up to eight high-speed or 14 low-speed devices. Each HP-FL channel supports up to eight disk drives at up to 5 Mbytes/sec and distances of up to 500 meters.

Eight and 16-channel multiplexers are available to connect PCs, workstations, terminals, modems, serial printers, and other serial devices. Both RS-232 and RS-423 interfaces are supported.

The LAN/9000 Link, standard on Models 817S/827S/837S/847S/857S and an option on the 807S allows connection to IEEE 802.3 local area networks (LAN). PC, workstation, and X-terminal clients are supported over the LAN, as well as distributed terminal controllers for additional RS-232 and RS-423 serial devices.

The X.25/9000 Link provides all necessary hardware and software to connect Models 807S/817S/827S/837S/847S/857S to an X.25 public data network.

Application Software

Over 3000 application software packages are available on HP-UX. Contact your HP sales representative for information regarding specific applications.

Supported peripherals

A wide range of disk drives, tape drives, optical drives, printers, plotters, terminals, and data communication devices are supported on the Models 807S/817S/827S/837S/847S/857S. Contact your HP sales representative for the most current information on supported peripherals.

Support Services

A wide range of support services is available worldwide for all HP 9000 Series 800 Business Servers. Contact your HP sales representative for details on support services.

Installation Service

Models 807S/817S/827S have been designed to be customer installable if you have PC and UNIX experience. You can also purchase HP installation services if you prefer HP installation. Models 837S/847S/857S include HP installation.

Site Planning Service

The Models 807S/817S/827S/837S/847S/857S are designed for office and data center environments. Sites must meet the technical

specifications in Table 2. You can purchase HP site planning services if you need assistance. The Models 847S/857S include HP site planning services.

Table 2. Technical Specifications

Electrical Specifications				
AC power input voltage/frequency	Nominal	Range	807S/817S/837S Rated current	827S/847S/857S Rated current
	100–120VAC, 50/60Hz	90–132VAC, 47–63Hz	6.5A	12A
	220–240VAC, 50–60Hz	198–264VAC, 47–63Hz	3.5A	6A
Power dissipation		807S/817S/837S	827S/837S/847S	
	Typical	375 Watts	600 Watts	
	Maximum	400 Watts	800 Watts	
Environmental Specifications				
Temperature	Operating: +5C to +40C Non-operating: –40C to +65C Non-operating: –40C to +45C (for tape media)			
Maximum rate of temperature change	< 20C without DDS DAT tape drive < 10C with DDS DAT tape drive			
Relative humidity	Operating: 20% to 80%, non-condensing (max 26C wet bulb temperature) Non-operating: 5% to 80%, non-condensing			
Maximum rate of humidity change	< 30%/hr			
Altitude	Operating: to 3000 m (10,000 ft) Non-operating: to 4,500 m (15,000 ft)			
Regulatory Compliance				
Electromagnetic interference	Complies with FCC rules and regulations, Part 15, Subpart J, as a Class A computing device. Manufacturers Declaration to German FTZ 1046. Registered with Japanese VCCI.			
Safety	UL Listed, ETL Listed, CSA certified, compliant with EN 60950.			
Physical Characteristics				
Dimensions	807S/817S/837S	827S/847S/857S		
	Height: 43.0 cm	Height: 43.0 cm		
	Width: 22.2 cm	Width: 44.4 cm		
	Depth: 53.3 cm	Depth: 53.3 cm		
Weight	31.8 kg (70 lbs)	50 kg (110 lbs)		
Acoustics	< 5.8 bels (A)	< 6.5 bels (A)		
	sound power below 30C	sound power below 30C		
ESD, power transients, vibration	Designed for office and data center environments			

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