Sun™ Ultra™ 1

Just the Facts

Sun microsystems

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Sun™ Ultra™ 1 Systems: The New Generation in Computing

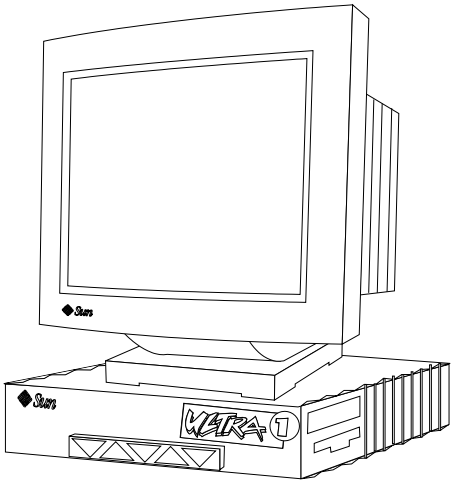


Figure 1. Sun™ Ultra™ 1 systems—the new generation in computing

UltraComputing™—Very High-Performance Graphics, Network, I/O, and UltraSPARC™ CPU

With Ultra™ 1, Sun Microsystems raises the level of performance and functionality in affordable desktop systems to unprecedented heights. The performance levels of the Ultra 1 enable a whole new class of applications to be realized and used in the workstation environment.

Sun™ Ultra™ 1

The Sun™ Ultra 1 Model 170E and 200E come with highly integrated Creator Graphics**.** Creator Graphics works closely with the UltraSPARC™ CPU to give meaning to the term “standard graphics.”

The Sun Ultra 1 is designed to be a balanced system. The powerful UltraSPARC CPU is complemented not only by the high-performance Creator Graphics but also by a faster interconnect on the motherboard through the Ultra Port Architecture (UPA). It has more memory bandwidth through the double data-width memory subsystem; an industry-standard expansion bus faster and wider than previous-generation systems, with the 64-bit SBus running at 25 MHz; faster I/O, with Fast/Wide SCSI functionality; and faster networking through the integrated Fast Ethernet port.

Sun Ultra 1 Systems: The New Generation in Computing *(cont.)*

Sun Ultra 1 Key Messages

Sun Ultra 1 is a member of the UltraSPARC-I processor-based desktop systems.

- **Sun Ultra 1 provides supercomputing power at desktop prices**
  - Sun Ultra 1 establishes a reference standard for desktop computing
- **High-performance UltraSPARC-I CPU**
  - The Sun Ultra CPU is the SPARC™ v9, 64 bits
  - This CPU more than doubles the performance of earlier-generation SPARCstation™ systems
- **Full binary compatibility**
  - The Sun Ultra 1 system runs 32-bit applications unmodified from the Solaris™ 2.3/2.4 operating system
- **High-end graphics standard**
  - The Sun Ultra 1 system uses the innovative 3D-RAM technology
  - Sun Ultra 1 offers integrated 24-bit true-color graphics, supporting both imaging and advanced 3-D graphics in one architecture
  - Sun Ultra 1offers fast windowing and 2-D graphics
- **Ultra-fast throughput**
  - UPA provides a crossbar-oriented interconnection to replace the traditional motherboard bus, establishing a 144-bit-wide, ECC-protected data path to the CPU. Clocked at 100 MHz, it gives a peak throughput of 1.6 GB per second
  - The memory subsystem is a double-data-width system offering a 288-bit-wide memory access path to SIMMs configured in pairs
  - The industry-standard SBus is 64 bits wide and runs at 25 MHz, giving a peak throughput of 123 MB per second
  - Fast/Wide SCSI is integrated on the motherboard, offering 20 MB per second bandwidth
- **Blazing networking and connectivity**
  - Fast Ethernet (100 MBps) through twisted pair is a standard feature in the Sun Ultra 1 Model 140E, 170E, and 200E, but the system also maintains connectivity with 10-Mbps networking technology through an autosensing speed switch feature
  - Each Sun Ultra 1 Model 140E, 170E, and 200E has a standard MII port to connect to external transceivers, providing connectivity to media other than twisted pair
  - Advanced networking options include ATM, ISDN, FDDI, and additional Fast Ethernet ports through SBus cards
- **Excellent upgradability and investment protection**
  - Upgrading from the SPARCstation 20 is an easy exchange of the CPU box; the customer keeps the memory, disk, and practically everything external to the CPU enclosure. The components that can be carried forward to the new-generation systems represent a major part of the investment
  - Ultra 1 Model 170E customers can upgrade to a model 200E through a motherboard upgrade

Sun Ultra 1 System Models

Sun Ultra 1 Model	Model 140	Model 140E	Model 170	Model 170E	Model 200E
Availability	Discontinued	Discontinued	Available	Available	Available
Processor speed	143 MHz	143 MHz	167 MHz	167 MHz	200 MHz
UPA speed	71 MHz	71 MHz	83 MHz	83 MHz	100 MHz
SBus slots	3	2	3	2	2
UPA slots	0	1	0	1	1
SPECint_95*	4.66	4.66	6.26	6.26	7.44
SPECfp_95*	7.90	7.99	9.06	9.06	10.40

* SPECint_95 & SPECfp_95 results using compiler version 4.2

Sun Ultra 1 System Models

The Sun Ultra 1 is available in three models. Model 170 is targeted towards more price-sensitive customers who do not require the more advanced features of the Model 170E. The Model 170E is for the customer who wants the new graphics, Fast/Wide SCSI, and 100-Mb Ethernet in one system. Model 200E is aimed at customers demanding the best uniprocessor performance.

Availability

- Sun Ultra 1 Model 140 began shipping in November 1995 and was transitioned in April 1997
- Sun Ultra 1 Model 140E began shipping in August 1996 and was transitioned in April 1997
- Sun Ultra 1 Model 170 began shipping in December 1995 and was repriced at a lower price in April 1997
- Sun Ultra 1 Model 170E began shipping in January 1996 and is currently available
- Sun Ultra 1 Model 200E began shipping in late August 1996 and is currently available

Key Applications

Sun has worked closely with major software vendors to ensure that their applications are tested and are available and officially supported. All major applications are available and can be found in Sun's *Catalyst* catalog of third-party solutions.

Product Placement Strategy

Target Users

Sun Ultra 1 systems are aimed at traditional “power desktop” users. This includes both technical and commercial users who need the wide variety of applications and functional capabilities of the Solaris 2.x environment, the high-performance of the UltraSPARC I processor, and the integration and support capabilities provided by Sun channels. The additional features and performance of the Ultra 1 make it well-suited for performance-intensive tasks and multimedia applications. The “pizza-box” enclosure is ideal for Wall Street trading floors.

Target Markets

The market opportunities for the Sun Ultra 1 are even better than those of the previous generation of SPARCstation products, due to the higher performance and better price/performance ratio, as well as new multimedia capabilities and advanced graphics.

Industry	Key Features to Highlight	Model 170	Model 170E	Model 200E
Software Development (CASE) – ISVs – In-house development at large organizations	• High-performance Solaris environment • Availability of applications	✓	✓	✓
Mechanical Design (MCAD/MCAE) – Automotive – Aerospace – Defense industry – Mechanical equipment designers	• High-performance CPU • High-end graphics performance and functionality standard (Model 170E and Model 200E) • Availability of applications	✓ (low end)	✓	✓
Electronic Design (EDA) – Chip designers, board designers – System houses – Telco, manufacturing, aerospace, automotive	• High-performance CPU • High-performance graphics in entry-level configurations • Availability of applications	✓	✓	✓
Research and Development – In-house development – Research institutions	• High-compute performance • Feature-rich Solaris environment • Availability of applications	✓	✓	✓
Publishing/Imaging – Newspapers – Magazines – Image banks – Advertising agencies – Scientific visualization	• High-performance CPU • High-end performance and functionality for both graphics and imaging operations		✓	✓
Financial – Stock and commodity traders – Banks	• High performance • Compact design • Multimedia capabilities	✓	✓	✓

The new level of performance and functionality makes the Ultra 1 systems attractive for new kinds of applications and should attract applications previously not available for the SPARCstation platform.

Creator Graphics

Product Overview

Creator Graphics brings a new level of graphics performance, functionality, and integration to the desktop. Creator Graphics delivers 24-bit true color and high-resolution graphics. It also provides acceleration for windowing, 2-D and 3-D graphics, solids, and imaging. Creator Graphics merges the functions found in TurboGX™, TurboGXplus™, SX, ZX, and TurboZX™ into one architecture, along with significantly faster performance.

Creator Graphics is available in two configurations: single-buffered (standard on Sun™ Ultra™ 1 Model 170E and 200E systems), and optional double-buffered for increased 3-D graphics acceleration. Creator 3D Series II double-buffered cards have replaced the earlier Series I cards. Creator 3D Series II workstations can be distinguished by the 4-GB hard disk in the base configuration.

High Performance

Creator Graphics performance is based on a new system-level approach to designing graphics.

- **UltraSPARC™ CPU**
  - Creator Graphics relies on the power of the UltraSPARC CPU for floating-point calculations, and on the Visual Instruction Set (VIS™) to accelerate imaging. This eliminates the need for a dedicated graphics processor, and results in a significant cost advantage.
- **UPA graphics interconnect**
  - UPA provides a high-speed, high-bandwidth interconnect between the CPU, Creator Graphics, and system memory. It raises overall graphics performance while maintaining a balanced throughput. Unlike the peripheral SBus, UPA interconnect ties Creator Graphics directly to the CPU and memory, and delivers orders of magnitude greater bandwidth.
- **Creator rendering ASIC**
  - A completely new ASIC renders graphics primitives at very high speeds. The Creator ASIC accelerates fills, scroll, text, lines, and polygon rendering.
- **3D-RAM graphics memory**
  - A breakthrough in graphics memory provides high bandwidth and built-in acceleration for 3-D graphics.

Scalable Performance

Creator Graphics performance is expected to scale up with increases in CPU clock rate, making it unnecessary to upgrade graphics as new generations of CPU become available.

More Standard Functionality

All Creator Graphics products come with 24-bit true color standard, as well as 1280 x 1024 at 76-Hz high resolution. Optional Creator3D supports 2 x 24-bit double-buffer and 28-bit Z-buffer. In addition, stereo output support is built-in.

Fully Compatible with Existing APIs

Creator Graphics runs existing APIs unmodified, including X11, XIL™, and XGL™ graphics libraries and Solaris™ OpenGL™ 1.1.

Creator Graphics Models

Creator Graphics is offered in two models: Creator and Creator3D. These models are physically two different boards. A Creator board *cannot* be upgraded to a Creator3D board by adding more 3D-RAM memory.

- **Creator:**
  - Standard on Ultra 1 Creator Model systems
  - Limited 3-D acceleration
  - Replaces TurboGX and SX graphics
  - Suited for 2-D, windowing, and imaging applications including CASE, EDA, medical imaging, financial, and general research
  - 24-bit true color single-buffered
  - 8-bit overlay and visual planes
  - Stereo display up to 960 x 680 x 32 single-buffered
  - 5 MB of 3D-RAM memory
  - 1280 x 1024 at 76 Hz standard with programmable bootprom resolution
  - 64-bit discretionary access control (DAC)
- **Creator3D (Series I):**
  - Optional on Ultra 1 systems
  - Full 3-D acceleration
  - Replaces ZX and TurboZX graphics
  - Ideal for 3-D graphics and solids in MCAD and MCAE, as well as high-end imaging applications
  - 2 x 24-bit true color double-buffering
  - 28-bit Z-buffer
  - 8-bit overlay and visual planes, plus 4-bit stencil plane, for a total of 96 planes
  - Stereo display up to 960 x 680 x 32, double- and Z-buffered
  - 15 MB of 3D-RAM memory
  - 1280 x 1024 at 76 Hz standard with programmable bootprom resolution
  - 128-bit DAC
- **Creator 3D (Series II) adds the following features:**
  - On-board color space conversion
  - Faster video playback
  - Support for 24-inch monitor (in single-buffer mode)

Sun™ Ultra™ 1 Graphics Performance

Sun Ultra 1 Model	Model 140E Creator	Model 140E Creator3D Series I	Model 170E Creator	Model 170E Creator3D Series I	Model 200E Creator	Model 200E Creator3D Series I
Availability	Discontinued		Available			
Xmark	15.3		16.26		18.3	
2-D vectors per second	1530		1810		1818	
3-D vectors per second	2417		2423		2434	
3-D AA vectors per second	1413		1439		1440	
3-D triangles per second	N/A	694	N/A	786	N/A	803
3-D quads per second	N/A	237	N/A	261	N/A	293
PLBwire93	120.2	123.3	128.9	132.8	143.2	146.8
PLBsurf93	N/A	161.8	N/A	184.9	N/A	208.3
XIL scale/copy	165/125	165/125	175/136	175/136	199/150	199/150
XIL convolve/rotate	18/52	18/52	21/60	21/60	25/71	25/71

Metrics defined:

- 2-D vectors are 10-pixel, randomly oriented, clipped projection (in thousands)
- 3-D vectors are 10-pixel, 3-D vectors, chained, parallel projection (in thousands)
- 3-D AA vectors are 10-pixel, anti-aliased 3-D vectors, chained, parallel projection (in thousands)
- 3-D triangles are 50-pixel 3-D triangles, one light—ambient, diffuse, chained, perspective, Gouraud-shaded, Z-buffered with culling (in thousands)
- 3-D quads are 100-pixel 3-D quads, one light—ambient, diffuse, isolated, perspective, Gouraud-shaded, Z-buffered with culling (in thousands)
- XIL numbers are in million pixels (megapixels per second) for a single-band image
- Creator 3D Series II specs on the models 170E and 200E were not available at the time of printing

Creator Graphics, Series II Overview

Ultra™ Creator Graphics, Series II is the next generation of the Creator Graphics accelerator. It provides fast, high-quality transformation and display of 3-D solid and wireframe objects. It also accelerates 2-D objects that meet the X11 rules.

Series II is designed to match or exceed the CPU performance increase to 300 MHz and beyond. The original generation of Creator Graphics has a single graphics/frame buffer clock for logic that runs at 67 MHz. This new generation has one clock for internal graphics processing and another clock for the frame buffer, enabling each part to run at maximum speed independently from each other.

Creator Graphics is available in two configurations: single-buffered for hardware acceleration of 2-D graphics (known as Creator Graphics), and double-buffered for increased 3-D graphics performance (known as Creator3D Graphics).

- **Features**
  - Creator functionality standard
  - True color as standard
  - Superset of earlier available functionality
  - Sun™ OpenGL™ 1.1, the industry-standard 3-D graphics library, is available and fully supported and optimized for Creator Graphics architecture
- **Benefits**
  - Unprecedented performance and functionality
  - 8-bit overlay plane for compatibility
  - Unprecedented performance and functionality

High Performance

Creator Graphics performance is based on a unique system-level approach to designing graphics.

- **UltraSPARC™ CPU**
  - Creator Graphics relies on the power of the UltraSPARC CPU for floating-point calculations, and on the VIS™ instruction set to accelerate imaging. This design eliminates the need for a dedicated graphics processor and results in a significant cost advantage with Creator Graphics.
- **UPA graphics interconnect**
  - UPA provides a high-speed, high-bandwidth interconnect between the CPU, Creator Graphics, and system memory. It raises overall graphics performance while maintaining a balanced throughput. Unlike the peripheral SBus, UPA interconnect ties Creator Graphics directly to the CPU and memory, and delivers greater bandwidth by orders of magnitude.
- **Creator rendering ASIC**
  - A new ASIC renders graphics primitives at very high speeds. The Creator ASIC accelerates fills, scroll, text, lines, and polygon rendering.
- **3D-RAM graphics memory**
  - A breakthrough in graphics memory provides high bandwidth and built-in acceleration for 3-D graphics.

Creator Graphics, Series II Overview *(cont.)*

What's New with Series II?

Creator, Series II has evolved from the initial generation of Creator Graphics and, therefore, shares many of the characteristics of the original Creator and Creator3D series and remains 100 percent compatible with previous generation Creator Graphics. The new features provided by Creator Graphics on both the single-buffered and double-buffered cards are:

- Faster video decompression by on-board YCC to RGB color-space conversion
- Imaging and windowing support, including contrast stretch and consecutive block prefetch for SFB reads
- Increased video and monitor support
  - Line doubling for interlace video writes
  - DDC2B monitor serial communication, with EDID default resolution support in the graphics board bootprom
  - Provides a utility to change the resolution within the upper and lower limits of what the board can support

For the double-buffered, Creator3D option, these additional features are new:

- Single-buffered, high-resolution (2.3 M pixels) support:
  - 1920 x 1200 landscape mode (HDTV-style)
- Buffer B addressing for stateless (DFB) and video accesses

Creator Graphics Models

Creator Graphics is offered in two models: Creator and Creator3D. These models are two physically different boards. A Creator board cannot be upgraded to a Creator3D board by adding more 3D-RAM memory. An upgrade is done by changing the graphics board.

Creator	Creator3D
• Limited 3-D acceleration • Suited for 2-D, windowing, and imaging applications including: CASE, EDA, medical imaging, and general research • 24-bit true color single-buffered • 8-bit overlay and visual planes • Stereo display up to 960 x 680 at 112 Hz noninterlaced • 5-MB 3D-RAM memory • 1280 x 1024 at 76 Hz standard with programmable bootprom resolution • 64-bit DAC • High resolution (1280 x 1024 at 76 Hz non-interlaced)	• Full 3-D acceleration • Ideal for 3-D graphics and solids in MCAD and MCAE, as well as high-end imaging applications • 2 x 24-bit true color double buffering • 8-bit overlay and visual planes • 28-bit Z-buffer • Stereo display up to 960 x 680 at 112 Hz noninterlaced, double- and Z-buffered • 15-MB 3D-RAM memory • 1280 x 1024 at 76 Hz standard with programmable bootprom resolution • 128-bit DAC • Single-buffered, high-resolution monitor support (1920 x 1200 with Sun 24-inch, wide-screen monitors)

Creator Graphics Software Interfaces

Creator Graphics systems support all Solaris™ 2.5.1 graphics and window system APIs, including OpenGL, XGL™, XIL™, and Display PostScript™. A large number of Sun and third-party graphics APIs are also supported, including IRIS GL, OpenGL, GKS, HOOPS, and PHIGS. Industry-standard X-extension libraries, such as Xlib and PEXlib, are available and are accelerated via the XGL and XIL foundation graphics libraries.

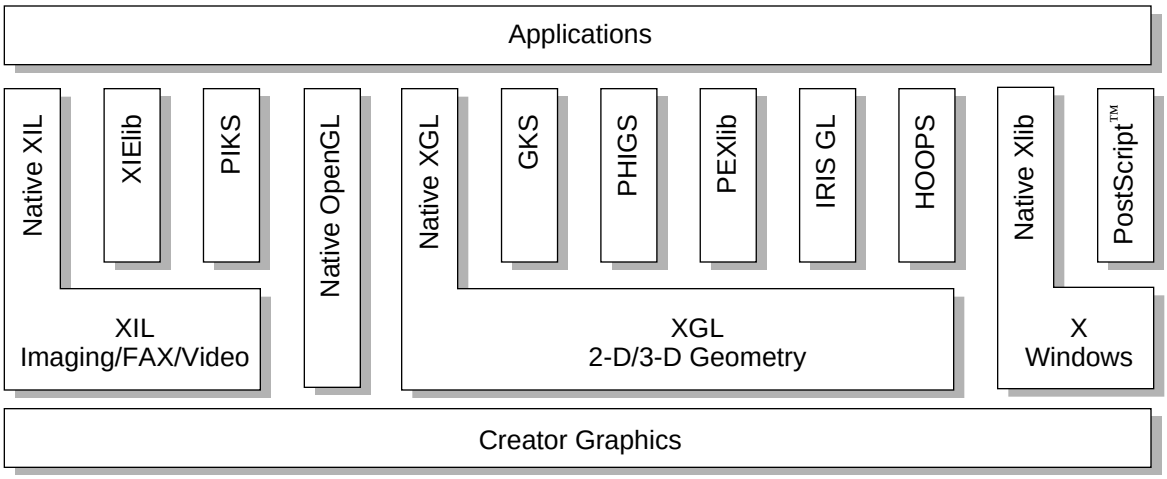


Figure 1. Creator Graphics software interfaces

Because Creator Graphics platforms provide windowing, imaging, and geometry acceleration, they enhance the performance of all of the APIs mentioned above.

Components of the New Generation System

More Than Just a Fast Chip

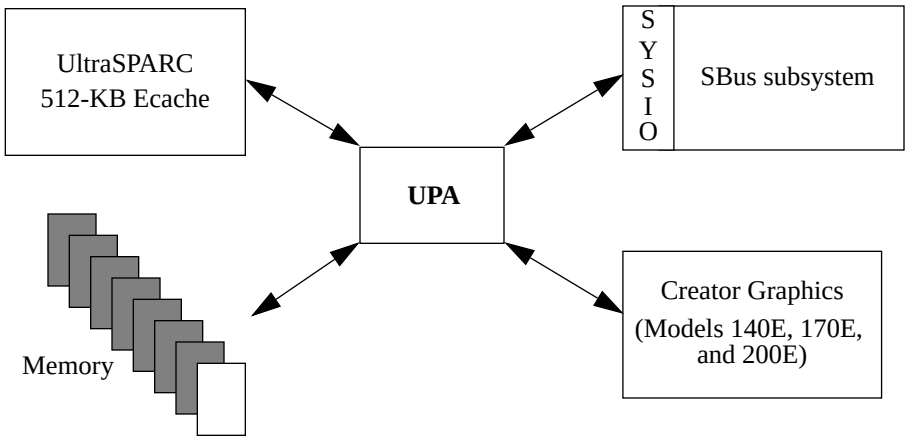


Figure 2. Components of the new generation system—more than just a fast chip

Technology Overview

Sun Ultra 1 systems represent a new workstation design, by leveraging and improving upon the features of the highly successful SPARCstation family. The new generation inherits and expands upon system modularity, expandability, and configurability—the hallmarks of all SPARCstation designs. The continued commitment to the SPARC architecture enables compatibility with the largest installed base of networked workstations. This architecture also boosts performance using the new 64-bit UltraSPARC processor.

It All Comes Together with Balanced Application Performance

Good performance through advanced applications typically demands excellent performance from more than one part of the system. Most often, an application consists of data fetching, computation, and presentation. Unless the system is designed to address all of these, it will always be limited by the weakest link in the chain.

The Sun Ultra 1 workstation is designed for balanced system performance, accelerating applications at every step. Faster I/O and networking, together with the UPA interconnect, allow fast data fetching. The UltraSPARC CPU provides supercomputing power and moves data through the UPA at high speed. Tightly integrated Creator Graphics provides high-end graphics functionality and performance for the Ultra 1 Creator systems. The systems provide these features and high performance to every user, resulting in higher efficiency throughout the organization.

Components of the New Generation System *(cont.)*

UltraSPARC™-I Processor

- **Features**
  - V9, 64-bit implementation of SPARC
  - Four-way superscalar design
  - On-board Visual Instruction Set (VIS)
  - Multilevel trap handling
- **Benefits**
  - Provides very high application performance
  - Offers an efficient design for lower cost
  - Makes every system ready for multimedia and is transparent to applications (no ports)
  - Provides efficient process handling

Creator Graphics—24-bit Accelerated Graphics Standard

- **Features**
  - True color as standard
  - Superset of earlier available functionality
  - High performance
- **Benefits**
  - Results in excellent graphics performance and functionality

High-Speed Memory Bus

- **Feature**
  - 288-bit wide, high-speed memory bus
- **Benefit**
  - Delivers high-performance memory access

Components of the New Generation System *(cont.)*

SBus

- **Features**
  - 25-MHz clock/ 64-bit wide
  - 123MB/sec. bandwidth (peak)
  - Compatibility with 32-bit SBus
- **Benefits**
  - Very-high-performance SBus
  - Provides access to many third-party solutions
  - Meets IEEE standard (1496), and is compatible with all existing SBus solutions

Fast/Wide SCSI*

- **Feature**
  - 20-MB/sec. SCSI
- **Benefit**
  - Provides fast access and retrieval of mass storage data

Fast Ethernet*

- **Features**
  - High-performance 100BASE-T
  - Compatibility with 10BASE-T
  - Autosensing
- **Benefits**
  - Delivers fast access to network resources
  - Makes each system easy to deploy in existing environments
  - Provides transparent acceleration

* Available as an SBus expansion option with base configurations of the Sun Ultra 1 Model 170. Fast Ethernet and Fast/Wide SCSI are standard on 170E and 200E configurations.

Components of the New Generation System *(cont.)*

Key Facts

- High-performance desktop system using the UltraSPARC processor
- High-end graphics functionality and performance at entry-level prices
- Balanced system design
  - Matching performance enhancement in I/O, networking, and memory access
  - Delivers application performance without compromise

Tech Facts

- New higher-performance system bus
  - Fast access to memory and graphics
- Easy disk expandability
  - Up to two internal SCSI disks
  - Up to 324 GB of total disk storage
- Optional removable mass storage
  - One optional internal CD-ROM drive with 12x speed or a 4-mm/8-mm tape drive
  - One optional floppy drive
- High-performance memory subsystem
  - Up to 1 GB using 8 x 128 MB SIMMs
  - Supports the SPARCstation 20 SIMMs for compatibility and investment protection
  - 660-MB/sec. bandwidth (peak)
- Designed for interactive media applications
  - Integrated Visual Instruction Set (VIS) in the UltraSPARC CPU
  - Advanced 24-bit accelerated graphics standard (Model 140E, 170E, and 200E)
- Expansion to advanced networking
  - Fast Ethernet, 100BASE-T, auto-sensing, and auto-switching to 10BASE-T for backward-compatibility (built in to the Model 140E, 170E, and 200E)
  - MII connector to Fast Ethernet for connection to other types of Ethernet transceivers and media
  - SunATM™ adapters available for the SBus, connecting the system to the emerging ATM technology
- New system enclosure
  - Fitted in a compact pizza-box style enclosure with a new exterior design
- High-performance I/O
  - 20-MB/sec. SCSI (16-bit Fast/Wide) with Sun Ultra 1 Model 140E, 170E, and 200E
  - 10-MB/sec. SCSI (8-bit Fast/Wide) with Sun Ultra 1 Models 140 and 170

Sun™ Ultra™ 1 Systems at a Glance

Model	Sun™ Ultra™ 1 Model 140	Sun Ultra 1 Model 170	Sun Ultra 1 Model 140E	Sun Ultra 1 Model 170E	Sun Ultra 1 Model 200E
Availability	Transitioned	Available	Transitioned	Available	Available
Dimensions and weight	102.5 mm x 417.5 mm x 443 mm (HxWxD) 9.55 kg to 12.50 kg				
CPU – Architecture – Clock rate – Cache on chip – External cache – CPU module slots – Multiprocessing	 UltraSPARC™-I 143 MHz 32 KB 512 KB N/A No	 UltraSPARC-I 167 MHz 32 KB 512 KB N/A No	 UltraSPARC-I 143 MHz 32 KB 512 KB N/A No	 UltraSPARC-I 167 MHz 32 KB 512 KB N/A No	 UltraSPARC-I 200 MHz 32 KB 512 KB N/A No
Memory – Memory type – DRAM speed – Bus width – SIMM sizes	64–1024 MB ECC 60 ns 288 bits 16, 32, 64, and 128 MB				
Storage – Maximum internal – Maximum total	10-MB/sec. SCSI built-in 4.2 GB 324 GB		20-MB/sec. SCSI built-in 4.2 GB 324 GB		
I/O architecture – SBus – Graphics – Serial ports – Parallel port	SBus Three 25-MHz, 64-bit slots — Two RS-232/RS-423 (two DB25) One Centronics compatible (DB25)		SBus Two 25-MHz, 64-bit slots One dedicated slot (UPA) Two RS-232/RS-423 (two DB25) One Centronics compatible (DB25)		
Networking ports	TP Ethernet 10BASE-T or AUI Ethernet *plus* optional ISDN-FDDI and ATM via SBus cards		TP Ethernet 10/100BASE-T or external transceiver via MII *plus* optional ISDN-FDDI and ATM via SBus cards		
Backup and Distribution – Internal – External	 Optional 3.5-inch floppy Optional SunCD™ 12x Optional 4-mm DDS2 tape Optional 8-mm tape 14-GB 8-mm tape 2.5-GB 0.25-inch tape 4- to 8-GB DDS2 4-mm tape				
Operating system required	Solaris 2.5 hardware: 1/96		Solaris 2.5.1		

Monitors and Graphics

Product Highlights	Sun Ultra 1 Model 140/170	Sun Ultra 1 Models 140E, 170E, and 200E		
Monitor	17-inch entry-level color monitor 17- and 20-inch high-resolution color monitor	20-inch high-resolution color monitor		24-inch high-resolution color monitor
Graphics				
– Graphics processor	TurboGX™	Creator	Creator3D	Creator3D (Series II)
– Resolution/ color planes and visual capabilities	1152 x 900 8-bit 1280 x 1024 8-bit 1600 x 1280* 8-bit	1280 x 1024 at 76 Hz 24-bit plus 8-bit overlay for a total of 32 planes 1152 x 900 at 76 Hz and other programmable resolutions NTSC/PAL Stereo (960 x 680) at 112 Hz	1280 x 1024 at 76 Hz 24-bit plus 8-bit overlay for a total of 32 planes 1152 x 900 at 76 Hz and other programmable resolutions NTSC/PAL Stereo (960 x 680) at 112 Hz	up to 1920 x 1200 on a 24-inch (in a single buffer mode)
– Double buffer	8-bit	8-bit	24-bit	
– Z-buffer	—	—	28-bit	
– Multimedia features		24-bit true color accelerated video playback	24-bit true color accelerated video playback	Adds on-board color/space conversion
Graphics market positioning				
– Windowing and 2-D	✔	✔	✔	
– 3-D wireframe	✔	✔	✔	
– 24-bit and imaging		✔	✔	
– 3-D solids			✔	
– Multimedia		✔	✔	
✔ = Primary Application				

* 1600 x 1280 resolution not supported on Sun monitors.

Sun™ Ultra™ Software

Solaris™ Operating Environment

The Sun™ Ultra™ 1 systems include the industry's leading enterprise operating system, Solaris™ 2.5. Built on the latest UNIX® technology, the Solaris environment delivers unparalleled scalability and performance. With enterprise integration by design, Solaris provides easy access to a wide range of computing environments and network technologies. Solaris delivers a competitive advantage to businesses through networked computing, scalability, and multi-architecture support. Solaris provides an advanced, superior solution for all customer IT needs, both technical and business. Solaris is an industrial-grade solution with the performance, quality, and robustness to deliver mission-critical reliability.

For technical desktop users, Solaris delivers unique advantages. Its advanced features and functionality, combined with built-in networking, give users a high-performance computing environment, enabling faster and higher-quality work.

For graphics and performance-intensive computing such as design automation, finance, and data visualization, Solaris provides the power, performance, and innovation that businesses need to compete.

Solaris 2.5 delivers the power of the Sun Ultra 1 systems, with benefits that include enhanced networking capabilities and performance, graphics and imaging, increased standards compliance, and key operating system performance advancements.

• **Features**	• **Benefits**
– Solaris 2.5 operating environment	– One of the industry's leading enterprise operating systems
– Multithreaded operating environment	– Provides high performance and scalability
– Over 5000 native Solaris 2 applications	– Wide range of tuned and tested applications
– Compatible with Solaris 1	– Backward-compatible to thousands of additional Solaris 1.x applications
– Graphics: Foundation-layer libraries	– Compatible with feature-rich and industry-standard graphics libraries
– Common Desktop Environment (CDE)	– One of the industry's standard, multivendor graphical user interfaces
– Wabi™ 2.1	– Allows access to the most popular PC applications and application suites
– Networking: Multinetworking integration	– Provides transparent access to PC and enterprise networking resources
– Workgroup server: High NFS™ and transaction performance	– Delivers strong workgroup server performance
– Object technology	– Supports OMG/CORBA-compliant Solaris™ NEO™ object environment

Solaris Tech Facts

- Sun Ultra 1 Models 140 and 170 require Solaris 2.5 hardware: 1/96 or later.
- Sun Ultra 1 Models 140E, 170E, and 200E require Solaris 2.5/or later.
- Solaris takes advantage of UltraSPARC™ processor enhancements, and provides a reliable, stable platform for mission-critical applications.
- Features now integrated into Solaris 2.5:

  Improved performance

  – SPARCstorage™ Array drivers
  – PCMCIA drivers
  – In-kernel `telnet` and `rlogin` support
  – Kernel asynchronous I/O
  – XGL™ 3.2, XIL™ 1.2.1, PEX 3.0, OpenWindows™ 3.5
  – Optimized support for *Sun4u* architecture, utilizing the UltraSPARC processor's extra floating-point registers, Visual Instruction Set (VIS™), accelerated `bcopy` and `bzero` functions, and separate kernel and user address spaces
  – Improvements to the virtual memory system and kernel memory allocation to decrease system memory requirements and boost large-system performance
  – Faster pipes and standard I/O to increase application I/O performance
  – NFS version 3, for faster network file writes and directory reads; reduces server loading
  – NFS over TCP, for better performance over wide-area networks
  – Improved network file locking (`lockd`), for faster and more reliable distributed file locking
  – Name Service Cache (NSC) providing very fast name service lookups, and speeding directory, mail, and http accesses

  Improved security

  – Access control lists and NIS+ password aging

  Increased standards support

  – Posix threads (1003.1c) support
  – Full X/Open® xpg4/xcu4 branding
  – X/Open XFN federated naming, allowing two or more naming services to cooperate
  – Kodak Color Management System™
  – CDE 1.0.1, Wabi 2.1, and ODBC copackaged, MAE 3.0

  Improved Solaris 1 compatibility

  – Support for Solaris 1 binaries that utilize a mixture of static and dynamically linked libraries
  – Additional Solaris 1 commands and library interfaces
- The Solaris environment connects users to the enterprise.
  – Provides connectivity to and integration with other enterprise resources
  – Supports the applications, tools, and services to retrieve, process, and manage information
  – Provides a user interface to present information; facilitates communication through a graphical user interface (GUI) and graphics, imaging, and other technology

Solaris OpenGL™ 1.1 Ultra™ Creator Edition

OpenGL™ is the standard software interface for graphics hardware that allows programmers to create interactive 3-D applications. OpenGL provides an easy-to-use, full-featured, network-transparent application programming interface (API) for developing applications that use 3-D graphics.

Solaris OpenGL 1.1 is targeted at developers creating interactive 3-D applications for the enterprise, the intranet, and the Internet. These developers are affiliated with ISVs or VEUs in technical markets or in research labs. Potential users include those in computer-aided design and manufacturing, global information systems, simulation, industrial design and modeling, entertainment, biochemistry, and petroleum exploration market segments.

Solaris OpenGL 1.1 is a functionally conforming implementation based upon the OpenGL 1.1, GLX 1.2, and GLU 1.2 API specified by the OpenGL Architecture Review Board (ARB). Solaris OpenGL 1.1 is available on Ultra Creator and Ultra Creator3D platforms, where the OpenGL functionality is accelerated in hardware. In addition, Solaris OpenGL 1.1 is available on all the legacy SPARCstations™ equipped with SX, ZX, GX, GXplus, TurboGX™, TurboGXplus™, S24™, TCX or FSV frame buffers; this is made possible through an optimized software rendering pipeline.

Note: *Solaris OpenGL 1.0 is supported only by Creator3D.*

OpenGL Features and Benefits

Solaris OpenGL 1.1 provides significantly improved performance, making it an attractive choice for ISVs to port their applications to Sun platforms.

- **Features**
  - A single, industry-standard 3-D graphics API which runs across all major graphics hardware, and Solaris, other UNIX, and Microsoft platforms
  - Existing OpenGL applications are easily portable to Ultra Creator3D systems
  - Conforms to OpenGL Architecture Review Board (ARB) OpenGL 1.1 specification

- **Benefits**
  - Developers can now work with a single source-code pool for multiplatform 3-D graphics applications, gaining the following benefits:
    - Reduced support costs
    - Reduced application tuning work
  - Enables Sun platforms to attract mainstream applications in the oil and gas, visualization, simulation, and animation industries
  - Gives customers a broader range of applications from which to choose
  - Enhanced 3-D application portability and interoperability among OpenGL implementations from different vendors

Solaris OpenGL 1.1 Ultra Creator Edition *(cont.)*

OpenGL Competition

- Silicon Graphics, IBM, and DEC all have native implementations of OpenGL in their graphics systems product lines. HP uses a third-party solution but will have a native implementation in the near future.
- Evans and Sutherland provides OpenGL for the Freedom Series of graphic system accelerators for their OEM allies, including HP, IBM, DEC, and Sun.
- Template Graphics Software (TGS) provides software-only implementations of OpenGL for Solaris, Apple Macintosh, and HP-UX. TGS also provides accelerated versions of OpenGL for Sun's ZX and TurboZX™.
- Portable Graphics, an Evans and Sutherland subsidiary, provides software-only implementations for HP and Linux.
- Microsoft has bundled OpenGL with Microsoft Windows95 and Microsoft Windows NT.

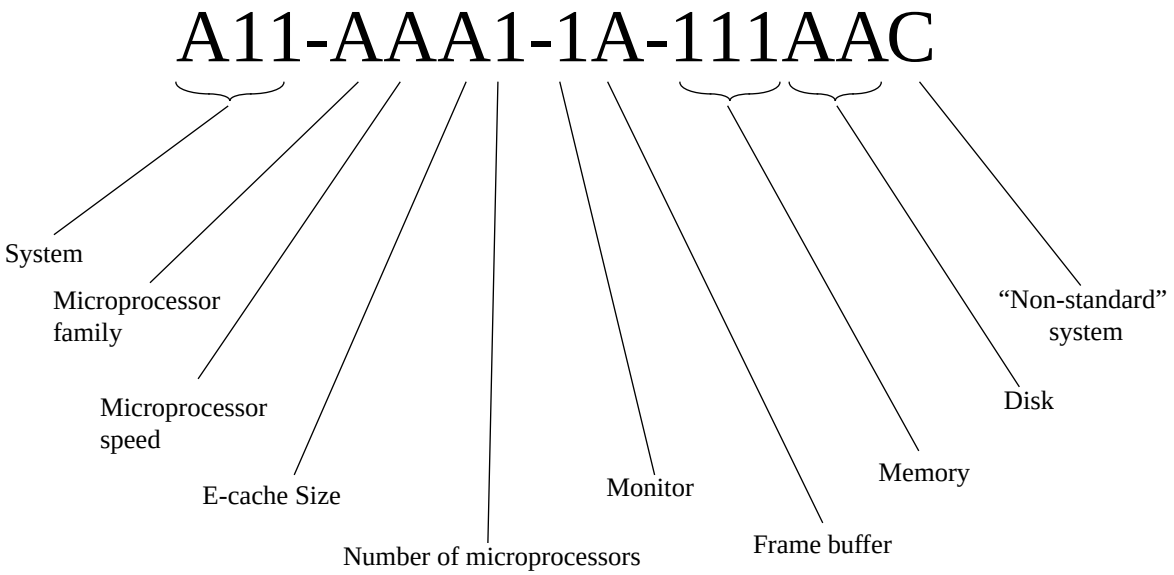
OpenGL Tech Facts

- OpenGL 1.1 system requirements:
  - Platforms ..... Creator3D, Creator, ZX, GX, TCX, SX product families
  - Operating system ..... Solaris 2.5.1 with Maintenance Update 3 patch, or Solaris 2.6 or higher
  - Window system..... CDE, OpenWindows
  - Disk space
    - For end-user runtimes..... 17.34 MB
    - For developers ..... 17.52 MB (runtime binaries and header files)
      10.7 MB (documents and examples)
  - Memory..... 64 MB minimum
    128 MB or higher recommended for serious applications
  - Other ..... Network interface
    Routers
    Media

Marketing Order Number Scheme

The Sun™ Ultra™ systems use a new marketing order number scheme that is designed to provide greater flexibility and expandability. This page explains how to read the new order numbering scheme. “N” means “Not available” or “Not applicable.”

Model



(Note: A = alpha character, 1 = numeric character, C = optional alpha or numeric character)

Key (Subset of Order Number Definitions)

Microprocessor/System	Monitor	Frame Buffer	Disk
System A11 = Sun Ultra 1 Models 140 and 170 A12 = Sun Ultra 1 Model 140E, 170E, and 200E A14 = Sun Ultra 2 **Microprocessor Family** U = UltraSPARC™ **Microprocessor Speed** A = UltraSPARC 143 MHz B = UltraSPARC 167 MHz C = UltraSPARC 200 MHz **Ecache Size** A = 512 KB B = 1 MB C = 2 MB D = 4 MB	1 = 20-inch color 2 = 17-inch color 3 = 17-inch color, low-cost 4 = 20-inch color (Southern Hemisphere) 5 = 17-inch color (Southern Hemisphere) 6 = 17-inch color, low-cost (Southern Hemisphere) 7 = 21-inch color 9 = Headless 13 = 17-inch, low-cost, PC-compatible monitor 14 = 19-inch color Memory 064 = 64 MB 128 = 128 MB 256 = 256 MB 512 = 512 MB 001 = 1 GB	A = TurboGX™ B = TurboGXplus™ C = Reserved D = Reserved E = Creator F = Creator3D G = Reserved H = Creator 3D Series II N = No frame buffer S = Server	AA = 1 GB AB = 2.1 GB AC = 4.2 GB CA = 1 GB + CD-ROM CB = 2.1 GB + CD-ROM CC = 4.2 GB + CD-ROM DA = 2 x 1 GB DB = 2 x 2.1 GB EA = 2 x 1 GB + CD-ROM EB = 2 x 2.1 GB + CD-ROM MA = CB + MM-KIT MB = CB + MM-KIT(UK) MC = CB + MM-KIT(EU) NN = Diskless

Sun™ Ultra™ 1 Ordering Information

Sun™ Ultra™ 1 Model 170

Order Number	167-MHz UltraSPARC™ with TurboGX™ graphics, 512-KB Ecache, 2.1-GB Fast/Wide SCSI disk, 10-Mb Fast Ethernet
A11-UBA1-1A-T64AB	– 20-inch color monitor
A11-UBA1-14A-O64AB	– 19-inch color monitor
A11-UBA1-13A-T64AB	– 17-inch entry-level color monitor
A11-UBA1P-1A-T64AB	– 20-inch color monitor with bundled SunPC™ card

Sun Ultra 1 Model 170E Creator and Creator3D

Order Number	167-MHz UltraSPARC, Fast/Wide SCSI, and 100-Mb Fast Ethernet
A12-UBA1-1E-128AB	– 20-inch color monitor, Creator single-buffer graphics, 128-MB memory, 2.1-GB Fast/Wide SCSI-2 disk
A12-UBA1P-1E-128AB	– 20-inch color monitor, Creator single-buffer graphics, 128-MB memory, 2.1-GB Fast/Wide SCSI-2 disk with bundled SunPC card
A12-UBA1-1H-128AC	– 20-inch color monitor, Creator3D Series II double-buffer graphics, 128-MB memory, 4.2-GB Fast/Wide SCSI-2 disk
A12-UBA1P-1H-128AC	– 20-inch color monitor, Creator 3D Series II double-buffer graphics, 128-MB memory, 4.2-GB Fast/Wide SCSI-2 disk with bundled SunPC card

Sun Ultra 1 Model 200E Creator and Creator3D

Order Number	200-MHz UltraSPARC, Fast/Wide SCSI, and 100-Mb Fast Ethernet
A12-UCA1-1E-128AB	– 20-inch color monitor, Creator single-buffer graphics, 128-MB memory, 2.1-GB Fast/Wide SCSI-2 disk (uses 2 x 64 MB SIMMs)
A12-UCA1-1E-512AB	– 20-inch color monitor, Creator single-buffer graphics, 512-MB memory, 2.1-GB Fast/Wide SCSI-2 disk (uses 4 x 128 MB SIMMs)
A12-UCA1-1H-128AC	– 20-inch color monitor, Creator3D Series II double-buffer graphics, 128-MB memory, 4.2-GB Fast/Wide SCSI-2 disk (uses 2 x 64 MB SIMMs)
A12-UCA1-1H-512AC	– 20-inch color monitor, Creator3D Series II double-buffer graphics, 512-MB memory, 4.2-GB Fast/Wide SCSI-2 disk (uses 4 x 128 MB SIMMs)

Sun Ultra 1 Options

Below is a *partial* list of system expansion, networking, graphics, and multimedia options available for Sun Ultra 1 systems. Refer to the *Sun Price Book* and configuration guides for complete option listings, configuration notes, and ordering information. When no maximum number is listed, look in the configuration information for that option.

Order Number	Option description	Maximum number supported	Comments
Memory			
X7001A	32-MB 60-ns SIMM memory expansion (2 x 16 MB)	4	These are all pairs of SIMM units.
X7002A	64-MB 60-ns SIMM memory expansion (2 x 32 MB)	4	
X7003A	128-MB 60-ns SIMM memory expansion (2 x 64 MB)	4	
X7004A	256-MB 60-ns SIMM memory expansion (2 x 128 MB)	4	
Mass Storage			
X6001A	3.5-inch 1.44-MB internal floppy drive	1	
X6161A	644-MB internal SunCD™ 12x CD-ROM	1	
X5153A	2.1-GB internal Fast/Wide SCSI-2 disk	2	
X6212A	14-GB 8-mm internal tape option	1	
X6282A	12 to 24-GB DDS3 internal tape option	1	
X5214A	4.21-GB internal fast SCSI: disk	2	
	The following UniPack options come with a 68-68-pin SCSI cable:		
X5151A	2.1-GB 7200-RPM Fast/Wide SCSI-2 disk UniPack		
X6261A	4-8-GB DDS2 tape UniPack		
X6280A	12-24-GB DDS3 tape UniPack		
X6157A	SunCD 12 UniPack		
X6208A	14-GB BMM tape UniPack		
X6101A	2.5-GB QIC tape UniPack		
X6230A	20-40-GB BMM tape UniPack		
	The following UniPack options come with a 50-68-pin SCSI cable:		
X5203A	4.2-GB 5400-rpm Fast/Wide SCSI-2 disk UniPack		
X5152A	2.1-GB 7200-rpm Fast/Wide SCSI-2 disk UniPack		
X626A	4-8-GB DDS2 Tape UniPack		
X6280A	12-24-GB DDS3 Tape UniPack		
X6102A	2.5-GB QIC tape UniPack		
X5204A	4.2-GB 5400-rpm Fast/Wide SCSI-2 disk UniPack		
X6158A	SunCD 12 UniPack	4	
X6209A	14-GB BMM Tape UniPack	4	
X6231A	20-40-GB BMM Tape UniPack	4	
X790A	SPARCstorage™ Array Model 112 (6 x 2.1-GB 7200-rpm disk)		
X791A	SPARCstorage Array Model 112 (18 x 2.1-GB 7200-rpm disk)	1	
X792A	SPARCstorage Array Model 112 (30 x 2.1-GB 7200-rpm disk)		
X1057A	25-MB/sec. Fibre Channel SBus adapter (FC25/S)		
X6227A	140-GB SPARCstorage™ Library Model 8/140, Tower		
X795A	SPARCstorage Array Model 210 (36 x 9-GB disk)		
X586A	SunPC™ Compatibility Card		

Sun Ultra 1 Options *(cont.)*

Order Number	Option description	Maximum number supported	Comments
Networking			
X1053A	SBus fast SCSI-2/buffered Ethernet card (FSBE/S)	2	
X1057A	25-MB/sec. Fibre Channel SBus card (FC25/S)	2	
X1058A	SBus Quad Ethernet controller	2	
X1015A	SunFDDI™ single-attach SBus interface card	2	
X1019A	High-speed serial interface/SBus (HSI/S)	2	
X1021A	Sun SBus Prestoserve NFS™ Accelerator	1	
X1023A	SBus SAS FDDI 4.0	2	
X1014A	Token ring interface/SBus (TRI/S)	1	
X1056A	SunFastEthernet™ SBus controller	2	
X1050A	SunATM™-155/MFiber SBus adapter	2	
X1051A	SunATM-155/UTP5 SBus adapter	2	
X1012A	SunISDN™ SBus expansion kit	2	
X1030A	PCMCIA interface/SBus card	2	
Graphics and Multimedia			
X1085A	SunVideo™ video capture and compression SBus board	1	
X487A	Sun multimedia kit: SunVideo SBus board, color camera, CDware™ CD	1	
X322A	TurboGX frame buffer with 17-inch color monitor	2	In addition to standard frame buffer
X359A	TurboGX frame buffer with 20-inch color monitor	2	
X367A	TurboGXplus frame buffer with 20-inch color monitor	2	
X7109A	Server Console, frame buffer/cable with 17-inch entry color monitor	2	
Other Options			
X903A	1.2-meter, 50-68-pin SCSI adapter cable	1	
X904A	2.0-meter, 50-68-pin SCSI adapter cable	1	
X907A	Optional power cable, CPU to monitor, 1.5 meter	1	
X908A	Optional power cable, CPU to monitor, 2.5 meter	1	
X467A	MII-AUI Converter	1	
Printers			
CPRN-360	NeWSprinter CL+™ color printer	2	
NPRN-20	NeWSprinter™ 20 laser printer	2	
SPRN-600	SPARCprinter™ II	2	
SPRN-E	SPARCprinter E laser printer	2	
SPRN-EC	SPARCprinter EC color laser printer	2	

Sun™ Ultra™ 1 Upgrades

Sun™ upgrades offer customers superior investment protection for their existing Sun equipment. Upgrading a SPARCstation™ 20 system is as easy as swapping the existing chassis, system board, and module for a next-generation Sun Ultra™ 1 chassis and system board. By migrating existing memory, graphics, disks, and all external devices, Sun provides customers outstanding value for their existing investments.

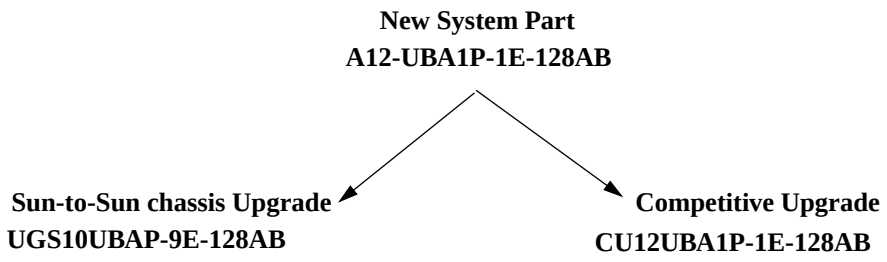
Key Messages

- Sun offers customers a variety of flexible upgrade paths to the most popular Sun systems.
- Choose from module-only, chassis or full-system upgrades.
- Sun upgrades allow as many components as possible to be carried forward, protecting the customer's hardware investment, and lowering total cost of ownership.
- Existing investments in non-Sun hardware can be preserved by upgrading to Sun through competitive full-system upgrades.
- SPARCstation 20, SPARCstation 5, and SPARCstation 4 upgrades offer superior value by allowing the migration of memory, disks, and graphics from some of those platforms to Sun Ultra 1 systems.

Upgrade Paths

From/To	Receive	Return
From a SPARCstation 20 to Ultra 1 Models 170, 170E, or 200E	Ultra 1 excluding memory, and disk, with Creator3D Series II graphics	SPARCstation 20 chassis, motherboard, frame buffer, and CPU, excluding memory, disk, and external options
From SPARCstation 10 to Ultra 1 Models 170, 170E, or 200E	Ultra 1, 128-MB memory, 4-GB internal Fast SCSI-2 disk, and Creator3D Series II graphics	SPARCstation 10 chassis including memory, disk, motherboard, frame buffer, and CPU
From SPARCstation 4 or SPARCstation 5 to Ultra 1 Model 170, 170E, or 200E	Ultra 1 excluding disk, with 128-MB memory, and Creator3D double-buffer graphics	SPARCstation 4 or 5 chassis, graphics, and memory, excluding disk and external options
From SPARCstation 2, SPARCstation LX, or SPARCstation IPX to Ultra 1 Models 170, 170E, or 200E	Ultra 1, 128-MB memory, 4-GB disk, and Creator3D Series II graphics	SPARCstation chassis including memory, disk, motherboard, CPU, and frame buffer
From any SPARC™ system to Ultra 1 Models 170, 170E, or 200E	Ultra 1, 20-inch color monitor, 128-MB memory, 2.1-GB disk, and Creator3D double-buffer graphics	Complete SPARCstation including monitor, chassis, memory, disk, and graphics
Competitive system, Sun-3™, or Sun386i™ to Ultra 1 Models 170, 170E, or 200E	Ultra 1, 20-inch color monitor, 128-MB memory, 4-GB internal Fast SCSI-2 disk, and Creator3D Series II graphics	Complete system including monitor, chassis, memory, disk, and graphics

Marketing Upgrade Numbering Scheme



- The differences between the upgrade and new system order numbers lie in the first eight characters; the ten trailing characters carry the same interpretation as new system parts.
- Sun-to-Sun upgrades begin with U or UG; competitive upgrades begin with CU.
- Sun-to-Sun upgrades show the “from” path system in the first three characters that follow the U or UG.
- Character representations following the “from” system have the same interpretation as new system parts, but dashes may be removed from left to right, as necessary, to meet the maximum order number length of 18 characters.

Sun™ Ultra™ 1 Model 170

Order Number	Model 170 Upgrade
UG20-UBA1-9N-T00NN	SPARCstation 20 chassis upgrade, no memory, no disk, no graphics
UG10-UBA1-9A-T64AB	SPARCstation 10 chassis upgrade, 64-MB memory, 2.1-GB disk, TurboGX™ graphics
UGS2-UBA1-9A-T64AB	SPARCstation 2 chassis upgrade, 64-MB memory, 2.1-GB disk, TurboGX graphics
UGFS-UBA1-1A-T64AB	Full system upgrade from any SPARCstation to Ultra 1 Model 170 with 64-MB memory, 20-inch color monitor, 2.1-GB disk, TurboGX graphics
CU11-UBA114A-O64AB	Competitive full-system upgrade to Ultra 1 Model 170 with 64-MB memory, 19-inch color monitor, 2.1-GB disk, TurboGX graphics
CU11-UBA1-1A-T64AB	Competitive full-system upgrade to Ultra 1 Model 170 with 64-MB memory, 20-inch color monitor, 2.1-GB disk, TurboGX graphics
UG10-UBA1P9A-T64AB	SPARCstation 10 chassis upgrade, 64MB memory, 2.1-GB disk, TurboGX graphics, bundled with SunPC™ card
UGFS-UBA1P1A-T64AB	Full system upgrade from any SPARCstation, 20-inch color monitor, 64 MB memory, 2.1-GB disk, TurboGX graphics, bundled with SunPC card
CU11-UBA1P1A-T64AB	Competitive upgrade, 20-inch color monitor, 64-MB memory, 2.1-GB disk, TurboGX graphics, bundled with SunPC card

Sun Ultra 1 Model 170E with Creator Single-Buffer Graphics

Order Number	Model 170E Upgrade
UGS20UBA-9E-000NN	SPARCstation 20 chassis upgrade, Creator single-buffer graphics, no memory, no disk
UGS4/5UBA9E-128NN	SPARCstation 4 or SPARCstation 5 chassis upgrade, 128-MB memory, no disk, Creator single-buffer graphics
UGS10UBA-9E-128AB	SPARCstation 10 chassis upgrade, 128-MB memory, 2.1-GB disk, Creator single-buffer graphics
UGSS2UBA-9E-128AB	SPARCstation 2, LX, IPX™, chassis upgrade, 128-MB memory, 2.1-GB internal disk, Creator single-buffer graphics
UGFS-UBA-1E-128AB	Full system upgrade, any SPARCsystem, 20-inch color monitor, 128-MB memory, 2.1-GB internal disk, Creator single-buffer graphics
CU12UBA1-1E-128AB	Competitive, Sun-3, or Sun 386*i* full-system upgrade, 20-inch color monitor, 128-MB memory, 2.1-GB internal disk, Creator single-buffer graphics
UGS10UBAP-9E-128AB	SPARCstation 10 chassis upgrade, 128-MB memory, 2.1-GB disk, Creator Graphics, bundled with SunPC card
UGFS-UBAP-1E-128AB	Full system upgrade from any SPARCstation, 20-inch color monitor, 108-MB memory, 2.1-GB disk, Creator Graphics, bundled with SunPC card
CU12UBA1P-1E-128AB	Competitive upgrade, 20-inch monitor, 128 MB memory, 2.1-GB disk, Creator Graphics, bundled with SunPC card

Sun Ultra 1 Model 170E with Creator3D Graphics

Order Number	Model 170E Upgrade
UGS20UBA-9H-000NN	SPARCstation 20 chassis upgrade, Creator3D Series II graphics, no memory, no disk
UGS10UBA-9H-128AC	SPARCstation 10 chassis upgrade, 128-MB memory, 4-GB internal Fast SCSI-2 disk, Creator3D Series II graphics
UGSS2UBA-9H-128AC	SPARCstation 2, LX, IPX, chassis upgrade, 128-MB memory, 4-GB internal Fast SCSI-2 disk, Creator3D Series II graphics
UGFS-UBA-1H-128AC	Full system upgrade from SPARC-1, IPC, SLC™, ECL, or Classic, 20-inch color monitor, 128-MB memory, 4-GB internal Fast SCSI-2 disk, Creator3D Series II graphics
CU12UBA1-1H-128AC	Competitive full-system upgrade, 20-inch color monitor, 128-MB memory, 4-GB internal Fast SCSI-2 disk, Creator3D Series II graphics
CU12UBA1P-1H-128AC	Competitive full-system upgrade, bundled SunPC card, 20-inch color monitor, 128-MB memory, 4-GB internal Fast SCSI-2 disk, Creator3D Series II graphics
UGFS-UBAP-1H-128AC	Full system upgrade from SPARC-1, IPC, SLC, ECL, or Classic, bundled with SunPC card, 128-MB memory, 4-GB hard drive, 20-inch color monitor, Creator3D Series II graphics
UGS10UBAP-9H-128AC	SPARCstation 10 or similar Chassis upgrade, bundled with SunPC card, 128-MB memory, 4-GB internal SCSI-2 disk, Creator3D Series II disk

Sun Ultra 1 Model 200E with Creator Single-Buffer Graphics

Order Number	Model 200E Upgrade
UG20-12UCA19E000NN	SPARCstation 20 chassis upgrade, Creator single-buffer graphics, no memory, no disk
UGS5-12UCA19E128NN	SPARCstation 4 or SPARCstation 5 chassis upgrade, 128-MB memory, no disk, Creator single-buffer graphics
UG10-12UCA19E128AB	SPARCstation 10 chassis upgrade, 128-MB memory, 2.1-GB, Creator single-buffer graphics
UGS2-12UCA19E128AB	SPARCstation 2, LX, IPX, chassis upgrade, 128-MB memory, 2.1-GB internal disk, Creator single-buffer graphics
UGFS-12UCA11E128AB	Full system upgrade, any SPARCsystem, 20-inch color monitor, 128-MB memory, 2.1-GB internal disk, Creator single-buffer graphics
CU12UCA1-1E-128AB	Competitive, Sun-3, or Sun 386i full-system upgrade, 20-inch color monitor, 128-MB memory, 2.1-GB internal disk, Creator single-buffer graphics

Sun Ultra 1 Model 200E with Creator3D Graphics

Order Number	Model 200E Upgrade
UG20-12UCA19H000NN	SPARC 20 chassis upgrade, Creator3D Series II graphics, no disk, no memory
UG10-12UCA19H128AC	SPARCstation 10 chassis upgrade, 128-MB memory, 4-GB hard disk, Creator3D Series II graphics
UG10-12UCA19H512AC	SPARCstation 10 chassis upgrade, 512-MB memory, 4-GB internal Fast SCSI-2 disk, Creator3D Series II graphics
UGS2-12UCA19H128AC	SPARCstation 2, LX, IPX, chassis upgrade, 128-MB memory, 4-GB internal Fast SCSI-2 disk, Creator3D Series II graphics
UGFS-12UCA11H128AC	Full system upgrade from SPARC-1, IPC, SLC, ELC, or Classic, 20-inch color monitor, 128-MB memory, 4-GB internal Fast SCSI-2 disk, Creator3D Series II graphics
CU12UCA1-1H-128AC	Competitive, full system upgrade, 20-inch color monitor, 128-MB memory, 4-GB internal Fast SCSI-2 disk, Creator3D Series II graphics
CU12UCA1-1H-512AC	Competitive, full system upgrade, 20-inch color monitor, 512-MB memory, 4-GB internal Fast SCSI-2 disk, Creator3D Series II graphics
CU12UCA1-7H-128AC	Competitive, full system upgrade, 24-inch color monitor, 128-MB memory, 4-GB hard drive, Creator3D Series II graphics
UFS-12UCA17H-128AC	Full system upgrade SPARC-1, IPC, SLC, ELC, or Classic, 128-MB memory, 4-GB hard drive, 24-inch color monitor, Creator3D Series II graphics

CPU Module Upgrade

Order Number	CPU Module Upgrade
UG -U11-U12-200-SFB	Module upgrade to Ultra 1 200-MHz CPU board and Creator single-buffer graphics

Ordering Guidelines and Notes

- **Memory**
  - All SIMMs supported in the SPARCstation 20 are also supported in Ultra 1 systems in like pairs.
- **Disk/floppy**
  - Internal single-connector fast SCSI-2 disks from the SPARCstation 4, SPARCstation 5, and SPARCstation 20 or server systems are supported by the Ultra 1, but require a shift of the plastic bracket. Two plastic brackets come with the upgrade kit.
  - Disk performance is limited by the performance of the transferred disk(s).
  - The internal floppy can be moved from a SPARCstation 4, SPARCstation 5, or SPARCstation 20 system to the new system.
- **AUI**
  - Sun Ultra 1 Model 170E and 200E have an MII connector in place of the AUI connector. An MII-AUI converter needs to be ordered if the environment requires connection to an external transceiver through an AUI connection (see the Ordering section).
- **Monitor**
  - Older 19-inch monitors may appear with a default resolution setting of 1152 x 900, 66 Hz rather than 1280 x 1024, 76 Hz when used with Creator/Creator3D Graphics. Please see the *Creator Graphics Installation Manual* for instructions on how to change the default resolution to 1280 x 1024, 76 Hz.
- **SCSI**
  - The SCSI connector of the Ultra 1 Model 170E and 200E is a wide SCSI-2 connector (68-pin). A wide-to-narrow SCSI adapter cable needs to be purchased if external narrow SCSI devices are to be connected to the system (see the Ordering section).
- **ZX**
  - The SBus ZX graphics card is supported in the Ultra 1 system when upgrading from a SPARCstation 20. It requires an SBus-to-SBus power cable (#503-2290) and the Solaris™ 2.5.1 operating environment. No other SBus options are supported when the ZX is installed in an Ultra 1 system.
- **Keyboard**
  - Type 4 keyboards are not supported on the Ultra 1. Order Type 5 keyboards, when applicable.

Service and Support

SunSpectrum[SM] is an innovative and flexible service offering that allows customers to choose the level of service best suited to their needs — ranging from mission-critical support for maximum solution availability to backup assistance for self-support customers. SunSpectrum provides a simple pricing structure in which a single fee covers support for an entire system, including related hardware and peripherals, the Solaris[TM] operating system software, and telephone support for Sun[TM] software packages. The majority of Sun's customers today take advantage of the SunSpectrum program, underscoring the value it represents. Customers should check with their local SunService[SM] representative for program/feature variance and availability in their area.

FEATURE	SUNSPECTRUM[SM] PLATINUM[SM] Mission-Critical Support	SUNSPECTRUM[SM] GOLD[SM] Business-Critical Support	SUNSPECTRUM[SM] SILVER[SM] Systems Support	SUNSPECTRUM[SM] BRONZE[SM] Self Support
Systems Features				
Systems approach coverage	Yes	Yes	Yes	Yes
System availability guarantee	Customized	No	No	No
Account Support Features				
Service account management team	Yes	No	No	No
Personal technical account support	Yes	Yes	No	No
Account support plan	Yes	Yes	No	No
Software release planning	Yes	No	No	No
On-site account reviews	Monthly	Semi-annual	No	No
Site activity log	Yes	Yes	No	No
Coverage / Response Time				
Standard telephone coverage hours	7 day/24 hour	7 day/24 hour	8 AM–8 PM, Monday–Friday	8 AM–5 PM, Monday–Friday
Standard on-site coverage hours	7 day/24 hour	8 AM–8 PM, Monday–Friday	8 AM–5 PM, Monday–Friday	N/A
7-day/24-hour telephone coverage	Yes	Yes	Option	No
7-day/24-hour on-site coverage	Yes	Option	Option	N/A
Customer-defined priority setting	Yes	Yes	Yes	No
– Urgent (phone/on-site)	Live transfer/ 2 hour	Live transfer/ 4 hour	Live transfer/ 4 hour	4 hour / N/A
– Serious (phone/on-site)	Live transfer/ 4 hour	2 hour/next day	2 hour/next day	4 hour / N/A
– Not critical (phone/on-site)	Live transfer/ customer convenience	4 hour/ customer convenience	4 hour/ customer convenience	4 hour / N/A
Additional contacts	Option	Option	Option	Option

Service and Support *(cont.)*

FEATURE	SUNSPECTRUM PLATINUM Mission-Critical Support	SUNSPECTRUM GOLD Business-Critical Support	SUNSPECTRUM SILVER Systems Support	SUNSPECTRUM BRONZE Self Support
Enhanced Support Features				
Mission-critical support team	Yes	Yes	No	No
Sun Vendor Integration Program (SunVIP™)	Yes	Yes	No	No
Software patch management assistance	Yes	No	No	No
Field change order (FCO) management assistance	Yes	No	No	No
Remote Systems Diagnostics				
Remote dial-in analysis	Yes	Yes	Yes	Yes
Remote systems monitoring	Yes	Yes	No	No
Remote predictive failure reporting	Yes	Yes	No	No
Software Enhancements and Maintenance Releases				
Solaris enhancement releases	Yes	Yes	Yes	Yes
Patches and maintenance releases	Yes	Yes	Yes	Yes
Sun unbundled software enhancements	Option	Option	Option	Option
Internet and CD-ROM Support Tools				
SunSolve™ license	Yes	Yes	Yes	Yes
SunSolve EarlyNotifier℠ Service	Yes	Yes	Yes	Yes

Sun™ Ultra™ 1 Glossary

3D-RAM	Dual-ported video memory with graphics functionality built into the memory chip.
100BASE-T	See Fast Ethernet.
CDE	Common Desktop Environment.
Fast Ethernet	IEEE standard for 100-Mb Ethernet.
MII	Media-Independent Interface. Used for connecting external transceivers to Fast Ethernet.
ODBC	Open Database Connectivity.
PLB	Picture Level Benchmark, a standard benchmark for graphics.
UPA	Ultra™ Port Architecture. A high-speed, crossbar-oriented, packet-switched motherboard interconnect.
V9	Version 9 of the SPARC™ definition.
VIS™	Visual Instruction Set. A set of instructions implemented in the UltraSPARC™ CPU to handle visual or partitioned data.