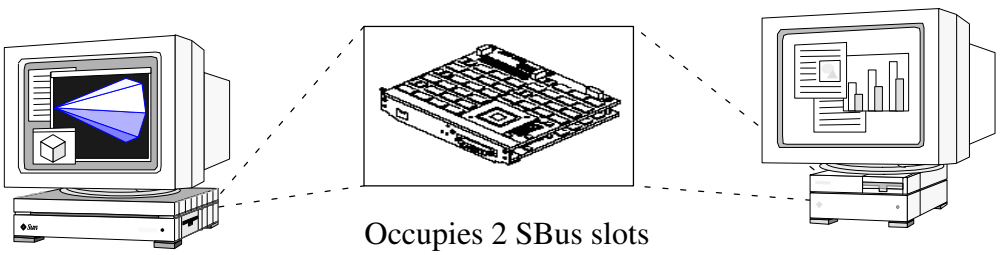

Occupies 2 SBus slots

SPARCstation™ ZX: Fastest 3-D in Its Class
SPARCstation 10ZX: Power 3-D Desktop on MP Systems

Product Description

SPARCstation™ ZX and SPARCstation 10ZX are the leaders in the 3-D desktop graphics market. Each system provides 310,000 3-D shaded polygons per second delivering this performance with unequaled graphics quality and features.

The SPARCstation ZX is part of the SPARCstation LX family. This system based on the microSPARC™ platform provides outstanding performance and value in a very compact package.

As part of the SPARCstation 10 family the SPARCstation 10ZX offers the best range of computation performance available today with multi-processing and tremendous expandability. Quite simply, the SPARCstation ZX and SPARCstation 10ZX set the new standard for graphics performance, features, quality, and computational power.

Advanced Design

Based on a new, advanced highly parallel design, the system provides the maximum speed possible while minimizing both size and cost. Sun designed fully custom ASICs supply the fastest and most compact processing possible for graphics data intensive tasks.

The system contains four different types of Sun designed ASICs: a command chip, floating-point chips, drawing chips, and a cross-bar chip. Each chip is designed to optimize information flow through the system. The floating-point chip's revolutionary design furnishes 150 MFLOPS of graphics floating-point processing power on each of four floating-point processors giving each system the equivalent of 600 MFLOPS of graphics floating-point processing power. This power is crucial to the system's industry leading performance.

Complex 3-D models can be very data intensive. The system's design provides a special high-performance direct memory access from the SPARC CPU virtual memory space. Combined with the systems ability to be either a SBus master or slave, this design ensures the fast transfer necessary to maintain full graphics performance at all times.

Optimized for Real Applications

The hardware design is optimized for customers' real applications, not just high benchmark ratings. The hardware design lets isolated triangles, commonly generated by real applications, process just as fast as the long triangle strips usually used in benchmarks. Another example is depth cueing, which enhances realism in 3-D applications but is not part of industry benchmarks. The system's design provides per pixel depth cueing with no degradation in performance.

Advanced architecture is one of the reasons this is possible. Both systems uses a multiple instruction multiple data (MIMD), graphics architecture. This is superior to the (single instruction multiple data), architecture used by other systems. MIMD allows multiple instructions to be processed simultaneously. Each system's advanced hardware and architecture delivers performance customers can actually use.

Graphic Features

Today's 3-D graphics applications require fast manipulation of realistic-looking images. The system provides this realism with its rich selection of features. These include specialized capabilities for:

- Data transfer
- Lines
- Polygons
- Blending
- Dynamically tessellated NURBS in firmware
- Text
- Points
- Lighting
- Per pixel depth cueing

The five-way interleaved memory architecture and special text block move commands provide high-speed text scrolling. This means that the same system used for design can also handle other important text-based applications.

High-Quality Antialiasing

Each system allows a user to choose between normal and antialiased vectors. Antialiased lines increase productivity in MCAD/MCAE and other applications by providing the best representation of wireframe models. As models grow in complexity, full-line antialiasing is necessary to properly distinguish the features and characteristics of a model. The system supplies full antialiasing with sub-pixel accuracy and slope correction to ensure accurate line representation. Many wireframe models include points as well as lines. The system's sub-pixel accuracy extends to points. Point antialiasing uses a 3 x 3 filter to guarantee the high quality points.

Solid Modeling

Solid modeling adds realism that promotes quick and accurate design decisions. The system provides the fast Gouraud shaded, Z-buffered, lighted polygons needed for solid modeling. Surfaces created by the polygons may be opaque or transparent and lighted with single or multiple light sources. Both screen door or alpha blend transparency are supported. Quick selection and manipulation of these surfaces is possible because of the system's hardware cursor. To provide additional graphics information, a separately controllable yet fully integrated 8-bit overlay is included. This overlay enables superimposing of temporary images over the surfaces without affecting the surfaces or requiring them to be redrawn.

Dynamically Tessellated NURBS

Each systems provides the industry's first dynamically tessellated NURBS (non uniform rational B splines) in firmware. NURBS allow users to create complex 3-D surfaces with precision. Dynamic tessellation allows users to determine the number of and size of polygons used to represent a surface and hence its precision. Together they let users regulate the system trade-off of rendering time, versus image quality and precision. This gives users a level of control over their solid model‘s geometry that is unmatched in the industry today.

Superior Display Capabilities

Superior graphics generation requires superior display capabilities. The system provides this through several features. Multiple double-buffered windows allow fully asynchronous updating of displayed widows. This double buffering, combined with the lightning fast 200 microsecond window clear speed, allows smooth full-speed 3-D manipulation of objects. Each system supports all current Sun color monitors from the older 1152 x 900 @66 Hz monitors to the newest 1280 x 1024 @76 Hz monitor.

The new monitor, included in all system systems, is stereo ready. Users simply set the monitor to 960 x 680 @ 112 Hz for stereo, plug in a stereo shutter control unit, and put on stereo glasses. The system can also generate NTSC or PAL RGB timing video. This video can be fed directly to RGB monitors or into an encoder to generate composite NTSC or PAL signals ready for video recording or transmission. Software commands switch the display system between these various modes.

Software Support

Software support is a critical part of any graphics system. Sun customers can select from the largest number of software applications in the industry today. Applications developers provide a wide range of both engineering and general productivity applications. The engineering developers include all the major MCAD independent software vendors which already support or will soon support the system.

Sun provides a rich development environment for users writing their own applications. This environment includes XGL™, SunPHIGS™, PEX, XIL™ and Xlib application programming interfaces. The OpenWindows™ environment supplies windowing while supporting both the OPEN LOOK® and Motif® graphical user interfaces. The Solaris® 2.2 operating system completes the software support by providing the industry's premier 32-bit operating environment based on UNIX® technology.

SPARCstation ZX and SPARCstation 10 ZX Architecture

- Powerful 3-D graphics performance
- MIMD
- Dynamically tessellated NURBS in firmware
- Direct memory access
- High-quality antialiasing of lines and dots
- No penalty per pixel depth cueing
- Gouraud shading
- Multiple resolutions support
- 96-bit frame buffer
- 24-bit double buffered image
- 24-bit Z-buffer
- 10 Window IDs
- 6 fast clear planes
- Independent 8-bit overlay
- Alpha-blended/screen door transparency
- Sun designed silicon compiler ASICs
- Full support for Stereo in window system Software APIs and by supplied monitor

SPARCstation ZX and SPARCstation 10 ZX Specifications

Performance (with SPARCstation 10 Model 40)

- 750,000 3-D 10 pixel vectors per second
- 450,000 10 pixel antialiased vectors per second
- 310,000 50 pixel polygons, triangle mesh, unlighted,Gouraud shaded, Z-buffered through XGL
- 250,000 50 pixel polygons, independent, triangles, lighted,Gouraud shaded, Z-buffered through XGL
- 200,000 100 pixel polygons, independent, triangles, lighted,Gouraud shaded, Z-buffered through XGL
- 125,000 100 pixel, independent, quadrilaterals, lighted,Gouraud shaded, Z-buffered through XGL

Monitors supported

- 1024 x 768 @ 67Hz, 70Hz, 76Hz
- 1152 x 900 @ 66Hz, 76Hz
- 1280 x 1024 @ 67Hz, 76Hz
- 960 x 680 @ 112 Hz (Stereo)
- NTSC and PAL RGB video output

Standards Compliance

- UL 1950, CSA 950-M89, EN60-950
- FCC Class B, VDE Class B
- VCCI II, Swedish Magnetics

Mechanical

- Dual SBus slot form factor
- Monitor Output 13W3 D
- Stereo Shutter Output RCA Jack

Power Requirements

- +5 volts at 7amps

Environmental Operating

- Ambient temperature: 0 to 40 º C (32 to 104º F)
- Relative humidity: 5 to 80 percent (non-condensing)
- Shock: Shock 5 G's peak for 11 ms
- Vibration: 0 to 500Hz at 0.25 G's peak

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business
2550 Garcia Avenue, Mountain View, CA 94043
415 960-1300 fax 415 969-9131

Sales Offices
Australia: (02) 844-5000
Belgium: +32 2 730 38 11
Brazil: 011-55-11-887-9011
Canada: 416 477-6745
Finland: +358-0-525561
France: (1) 30 67 50 00
Germany: (0) 89-46 00 8-0
Greece: 3-01-689-2210
Hong Kong: 852 802 4188
Hungary: 361-201-2732
Italy: 039 60551
Japan: (03) 3221-7021
Korea: 822-563-8700
Latin America/Caribbean:
+1 415 688-9464
Mexico: 011-525-580-5229
Netherlands: 033 501234
New Zealand: (04) 499 2344
Nordic Countries: +46 (0) 8 623 90 00
People's Republic of China:
861-831-5568
Singapore: 224 3388
Spain: (91) 5551648
Switzerland: (1) 825 71 11
Taiwan: 2-514-0567
U.A.E.: +971-4-366-333
United Kingdom: 0276 20444
United States: 800 821-4643
Venezuela: 011-582-283-1026
Worldwide Headquarters:
+1 415 960-1300

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