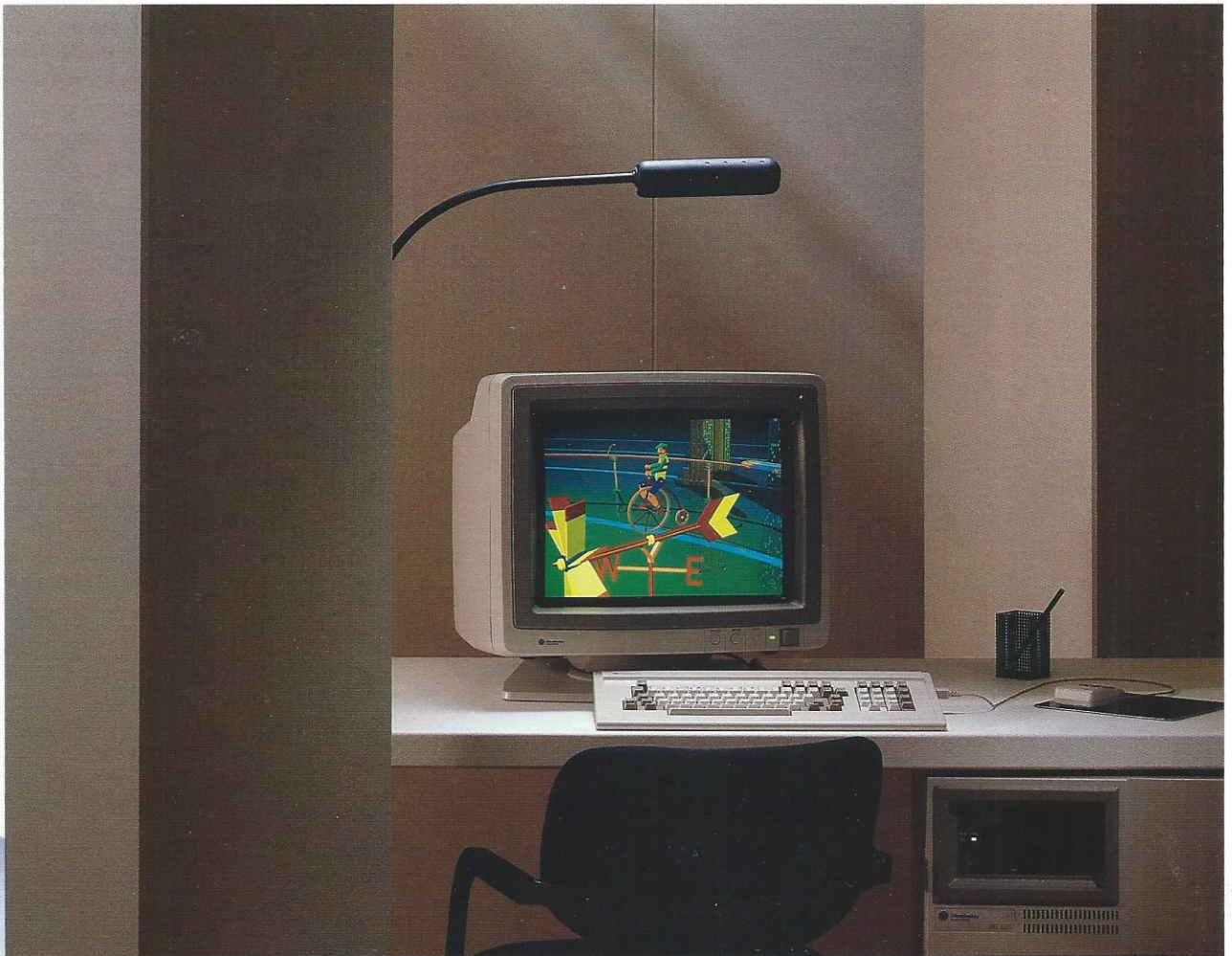


## IRIS 3030 WORKSTATION



The IRIS 3030 screen displays a scene from a TRW television commercial produced by Abel Image Research.

The IRIS 3030™ Workstation combines the computing power of the MC68020, *real-time* 3-D color graphics and a large disk drive, making this workstation an ideal solution for applications requiring fast, high-resolution graphics. The IRIS 3030 features fast response, large amounts of available memory, extensive computational power, multi-windowing, multi-tasking and powerful *real-time* 3-D graphics.

The IRIS 3030 comes in a package designed to complement the user's work environment. The chassis accommodates up to 16 MB of CPU memory, up to 32 bit-planes of display memory, and a 170 MB Winchester disk. The IRIS 3030 is capable of displaying 4096 colors simultaneously, double buffered, from a

palette of 16.7 million. Gouraud shading, Z-buffer, and depth cuing, all features of the IRIS 3030, aid in the display of graphical objects. Included with the IRIS 3030 is a 19" 60 Hz non-interlaced color monitor featuring tilt and swivel, keyboard and an optical mouse.

Like all IRIS Workstations, the IRIS 3030 operates as a personal workstation or as a node in a networked workstation environment. Supporting a large, expanding base of applications software, the IRIS 3030 comes ready to meet the needs of professionals requiring *real-time* graphics in many applications. The IRIS 3030 is an excellent solution for mechanical computer-aided-design, visual simulation, and solids modeling. The IRIS Workstation is also ideal for VLSI design, graphic arts and animation, and mechanical and electrical engineering.



**SiliconGraphics**  
Computer Systems



## IRIS 3030 WORKSTATION

The IRIS 3030 features:

- MC68020 with 2 MB memory, expandable to 16 MB
- UNIX™ operating system with demand paged virtual memory and an Extent File System
- Up to 64 MB of virtual address space
- Ethernet™ local area network with XNS and optional TCP/IP protocols
- C compiler and development environment
- 170 MB Winchester disk drive with controller
- Geometry Pipeline™ for real-time 2-D and 3-D graphics transformations
- 1024 x 1024 (1024 x 768 viewable) resolution
- Genlocked RS-170A and European Video Standard output (optional)
- Gouraud shading, real-time depth cuing and optional Z-buffer
- IRIS Window Manager™
- Full source code compatibility between the IRIS Series 2000 and the IRIS Series 3000 Workstations
- IBM link (optional)

### **Processor, Memory**

The IRIS 3030 Workstation is based on the Motorola 68020 central processor, operating at a 16 MHz CPU clock speed with true 32-bit addressing, data, and I/O. With the 68020 CPU, the user can expect a 2-3X increase in compute power, a 5-10X increase in floating point performance, and a 44 percent improvement in 3-D graphics transformations over the IRIS 2400 Workstation. To take advantage of the new hardware features, a new Extent File System has been incorporated to speed file access and reduce unnecessary overhead.

### **Advanced VLSI Technology**

The Geometry Engine™ and the Geometry Accelerator™, two custom VLSI circuits, are responsible for the *real-time* graphics performance of the IRIS system. A pipeline of ten or twelve faster 125-nanosecond Geometry Engines handles object rotation, translation and scaling, four- or six-plane clipping, perspective or orthographic viewing, and scaling to screen coordinates, at a rate of 86,300

3-D floating point coordinates per second. This is a 44 percent improvement in graphics transformation performance over the IRIS 2400 Workstation. For systems which contain the 125-nanosecond chips an improvement of 25 percent in graphics transformation performance is realized. The Geometry Accelerator, installed at each end of the pipeline, provides buffering and floating point conversion allowing the full speed of the pipeline to be attained.

The Geometry Engine and the Geometry Accelerator are examples of full-custom integrated circuits with highly parallel architectures dedicated to a specific application. The result is a dramatic increase in real-time graphics performance. Other advantages include much greater reliability, lower power consumption and space requirements, and significantly lower cost.

### **Networked Workstations**

The IRIS 3030 Workstation includes Ethernet local area network hardware and software as a standard feature (XNS protocols). This allows IRIS Workstations, Terminals, and other Ethernet network nodes to communicate with it at up to 10 Megabits/second. Network capabilities include file transfer, remote graphics, electronic mail, multicast network synchronization, and boot service for IRIS Terminals. Since the XNS protocols have been highly optimized to allow interactive real-time graphics over networks, Silicon Graphics also sells host XNS Ethernet software for VAX minicomputers (VMS and UNIX 4.2). TCP/IP workstation software is available as a system option.

The IBM Link, a high-speed communications link between Silicon Graphics workstations and terminals and IBM VM/CMS computers, is also available. This IBM communication software resides on the IRIS Workstation and the IBM host running VM/CMS, and allows for IBM 3278/3279 emulation and file transfer.

### **Operating System and Programming Tools**

A superior program development environment is available on the IRIS Workstation through the industry standard AT&T UNIX System V operating system. Silicon Graphics has incorporated many features of the Berkeley 4.2 UNIX release as well as local system

enhancements to support interactive *real-time* graphics. In order to take advantage of the IRIS 3030's new hardware features, Silicon Graphics has incorporated a new Extent File System. This unique UNIX file structure handler provides a six-fold improvement in the file handling performance over the standard System V architecture. The IRIS software environment supports C, FORTRAN 77 and Pascal compilers which have been optimized to generate true 68020 instructions. Compiler performance is now approximately twice that of the compilers in the IRIS 2400. In addition, each language is closely coupled with an optional hardware floating point accelerator through kernel and compiler enhancements.

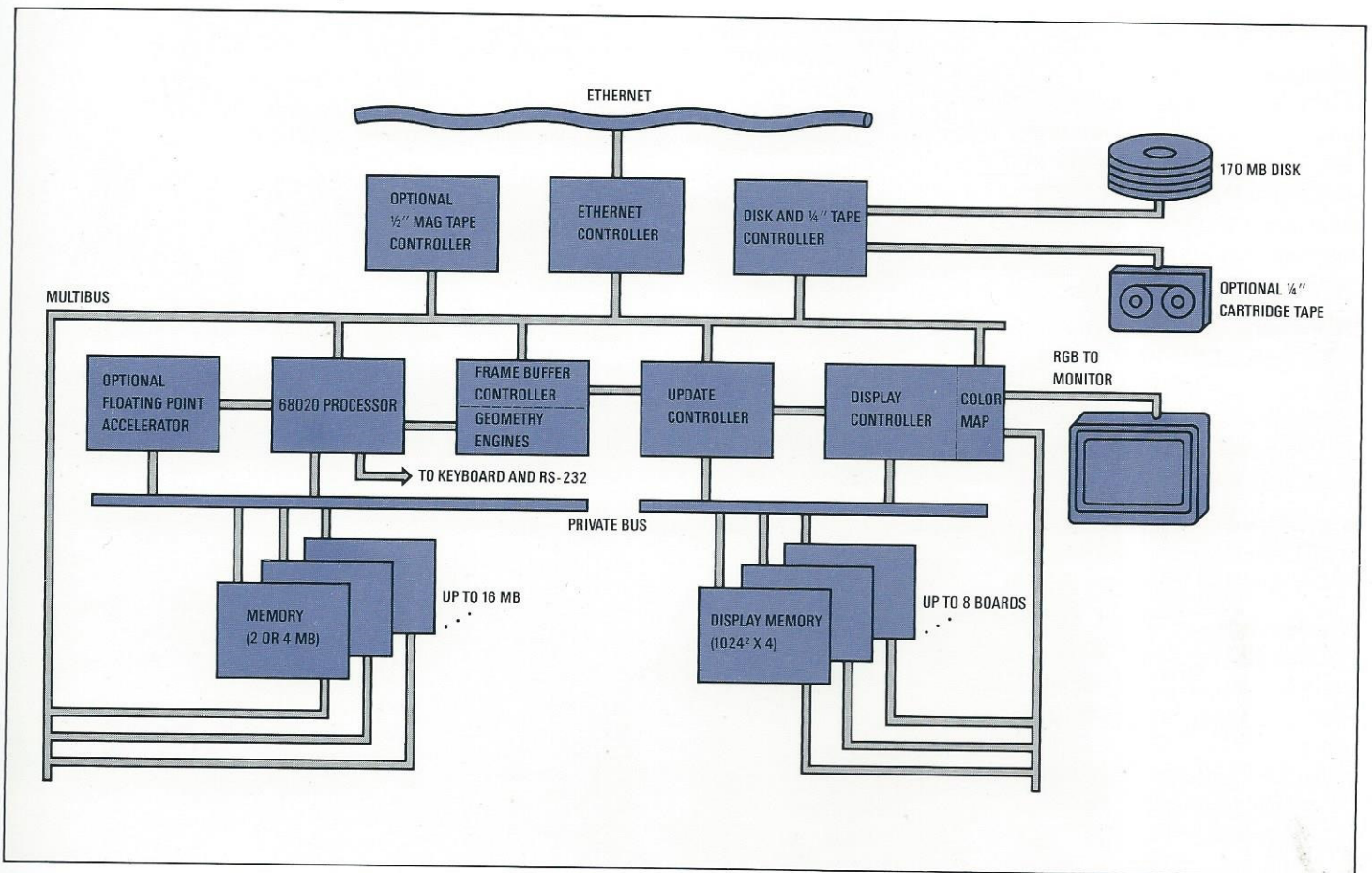
The IRIS Graphics Library II™ provides an ideal applications development environment on the IRIS Series 3000 family. This set of subroutines provides high- and low-level support for graphics programming. The IRIS Graphics Library II features several capabilities which enhance the development environment including a window manager, depth cuing, Gouraud shading, faster polygon fill, high-resolution Z-buffer operation, improved support for curves and surfaces, and fast pixel access.

Many other application tools are available through Silicon Graphics' third party software program, the Geometry Partners Program.

### **Greater Floating Point Performance**

Floating point performance can make a big difference in project productivity. The IRIS 3030 Workstation inherently provides twice the application performance of the IRIS Series 2000 68010-based system. To meet the modern engineering challenge, our new floating point accelerator has been designed to boost IRIS floating point instruction performance by a factor of 10. This floating point accelerator was designed by Silicon Graphics and uses the Weitek 1064/1065 64-bit floating point processor chip set. Using standard Whetstone and LINPACK benchmarks, the IRIS 3030 Workstation using the FPA demonstrates performance significantly greater than that of a VMS VAX 11/780 with hardware floating point assist (FPA).





The floating point accelerator incorporates several features:

- 32-bit read/write operations
- Full 64-bit arithmetic for each cycle
- Performs single and double precision integer conversions
- User accessible on-board registers
- Overlap and debugging modes

**Color Display**

All IRIS Series 3000 Workstations support a 60 Hz non-interlaced 19" or optional 15" tilt and swivel color monitor with a resolution of 1024 pixels by 768 lines, accurate digital dynamic convergence and an anti-glare screen.

The IRIS Workstations also support RS-170A and European Video Standard (PAL or SECAM) RGB outputs. The RS-170A option has a visible resolution of 636 pixels by 485 lines and

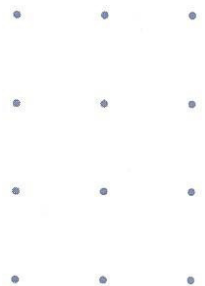
a frame rate of 30 Hz. The European Video Standard option has a visible resolution of 780 pixels by 575 lines and a frame rate of 25 Hz. When set for either of these options, the IRIS Workstation provides Red, Green, Blue, and Sync video outputs (RGSB). These last two options are suitable for many applications including simple video recording.

For operation with commercially available video tape recorders and mixing/keying equipment a genlock option is available. An external sync generator and NTSC encoder are required, but not provided by Silicon Graphics.

**Compatibility**

The IRIS 3030 is compatible with the IRIS Series 2000 and IRIS Series 3000 products. Users need only recompile when moving between a 68020-based product and a Series 2000 68010-based system.

This flexibility allows all members of the IRIS Series 3000 and IRIS Series 2000 families to use the same software and to be used interchangeably in networked environments. Silicon Graphics has a commitment to compatibility of the entire product family. This commitment to compatibility will be maintained with any new releases.



# IRIS 3030 WORKSTATION

## System Specifications

### Processors:

- 16 MHz MC68020 central processor, 32-bit internal registers, 32-bit address space
- 10 125-nanosecond Geometry Engines
- 16-bit bit-slice frame buffer controller
- Independent microcoded display processor with 32 KB memory for fonts, textures, and cursors

### CPU Memory:

- 2 MB dynamic RAM with parity error detection, expandable to 16 MB
- 256 KB EPROM for hardware initialization, self-configuration, and diagnostics, expandable to four 256/512 KB EPROMS

### Image Memory:

- 8 1024 x 1024 bit-planes standard, expandable to 32 with 16-bit Z-buffer

### Video Interface:

- RGB levels 0.7 V p-p into 75 ohms
- Separate composite 2 V p-p sync into 75 ohms
- 60 Hz non-interlaced 1024 x 768 resolution frame
- Other frame resolutions and rates available
  - 33 Hz interlaced 1024 x 768
  - 30 Hz interlaced 636 x 485
  - 25 Hz interlaced 768 x 575
- Genlock available with 485 and 575 visible line frames

### Color Range:

- Color map mode (8- or 12-bit, single or double buffered)
- 4096 simultaneous colors, double buffered, displayable from palette of 16.7 million
- RGB mode (24-bit), 16.7 million colors displayable

### Standard Peripherals:

- 170 MB unformatted 5.25" Winchester disk drive, using an ESDI interface
- 83-key up-down encoded keyboard with user definable keys
- 19" diagonal 60 Hz non-interlaced RGB tilt and swivel monitor
- Optical mouse X-Y encoder with three buttons

### Communications:

- Ethernet local area network with XNS software
- Four RS-232C ports for keyboard and serial communications (up to 19.2K baud)

### Standard Software:

- UNIX System V operating system with Berkeley 4.2 and local enhancements
- C compiler and development environment
- IRIS Graphics Library II
- IRIS Window Manager

### Chassis

- 20-slot Multibus™ card cage
- 720 watt power supply

### Options

#### Hardware:

- Z clipping
- 2 or 4 MB CPU memory cards
- 4 bit-plane image memory cards
- Floating point accelerator
- 60" rack mounted chassis

#### Peripheral:

- Floppy disk drive
- Second 170 MB Winchester disk drive
- 60 MB 1/4" cartridge tape drive
- 1/2" tape drive and controller
- Color printer and controller
- 11" x 11" digitizer tablet
- Dial and button box
- Programming Terminal
- 19" diagonal 30 Hz interlaced RGB monitor
- 15" diagonal 60 Hz non-interlaced RGB tilt and swivel monitor

### Software:

- FORTRAN and Pascal compilers
- Terminal software
- EMACS text editor
- GKS library, level 2b

### Communication:

- TCP/IP Ethernet software
- IBM link for 3278-9 emulation and file transfer

## Physical and Environmental Specifications

### Power Requirements:

- AC voltage 93-132 or 186-264 VAC (factory set)
- AC frequency 47-63 Hz
- Chassis: 1250 VA, 1000 W, 3410 BTU/hr
- 19" monitor: 225 VA, 150 W, 512 BTU/hr

### Size and Weight:

- 19" monitor: 18.5" H x 20" W x 21.5" D (51 x 48 x 54 cm), 84 lb. (38 Kg)
- Chassis: 29" H x 18" W x 27" D (74 x 46 x 69 cm), 190 lb. (86 Kg)

### Environment:

- Operating: 50-86°F (10-30°C), 20-80% relative humidity, no condensation.
- Shipping/storage: 32-122°F (0-50°C), 10-90% relative humidity, no condensation.

Specifications are subject to change without notice.

UNIX is a trademark of AT&T.

Ethernet is a trademark of Xerox.

Multibus is a registered trademark of Intel Corporation.

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