



SiliconGraphics
Computer Systems

Indy™ Product Guide

INDY



SiliconGraphics

1 IndyCam

This fully digital camera with adjustable focal length lens and a CCD array delivers a full resolution 640x480 digital video signal to the built-in video subsystem

2 High-Bandwidth System Architecture

64-bit system bus enables industry leading 267MB/sec sustained throughput. These high-speed busses combine with high-performance custom ASICs and the 64-bit R4000 MIPS RISC CPUs to give Indy unsurpassed application performance

3 High-Capacity Memory Subsystem

Two-way interleaved memory system accommodates up to 256MB and is powered by a 400MB/sec memory bus enabling very fast memory access and I/O throughput for your data sets

The Silicon Graphics Advantage

Imagine being able to incorporate sound, video and high-quality 3D graphics into your work without the cost and complexity of adding option cards, software, device drives, or cables to a PC, Macintosh™, or other loosely integrated workstation. Well, at Silicon Graphics we provide you with one system that has all the digital media tools you need to collaborate interactively with your workgroup.

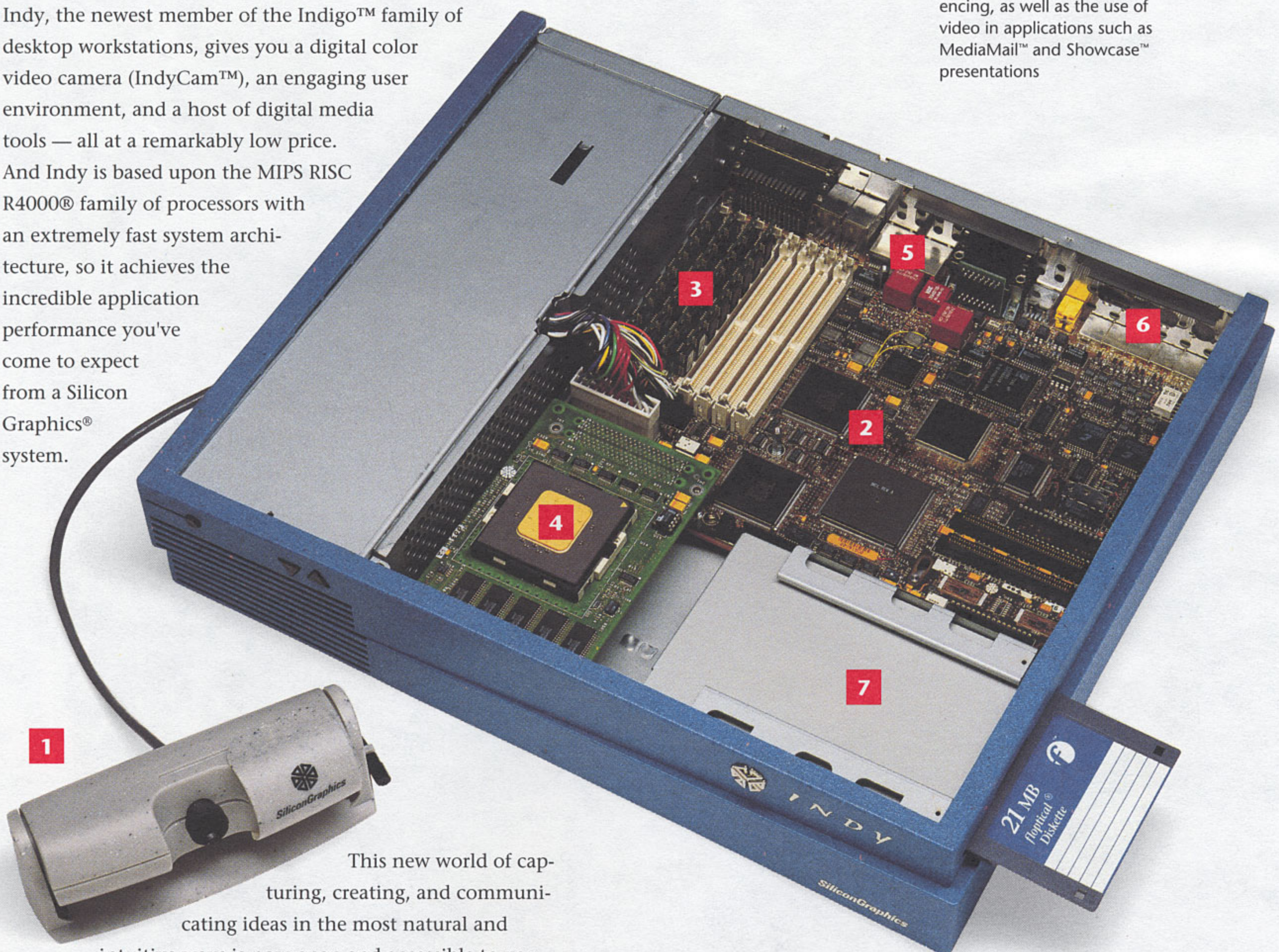
Indy, the newest member of the Indigo™ family of desktop workstations, gives you a digital color video camera (IndyCam™), an engaging user environment, and a host of digital media tools — all at a remarkably low price. And Indy is based upon the MIPS RISC R4000® family of processors with an extremely fast system architecture, so it achieves the incredible application performance you've come to expect from a Silicon Graphics® system.

4 Upgradeable CPU Module

Indy supports the MIPS R4000 family of processors. Modular CPU implementation provides for easy upgrades to more processing power today and in the future

5 Built-In Video Subsystem

Dedicated video-in ASIC captures full-resolution, full-color, and full-frame rate video directly into the high-speed system architecture. This enables the regular use of real-time video applications such as video-conferencing, as well as the use of video in applications such as MediaMail™ and Showcase™ presentations



This new world of capturing, creating, and communicating ideas in the most natural and intuitive ways is now open and accessible to you.

Over 1,300 applications are supported, which makes Indy ideal for many markets such as CAD/CAM, media authoring, software development, technical publications, chemistry, imaging, and geographical information systems. So whether you are a creative or technical professional, Indy gives you the application performance you require and the interactive media you want, at the price you've been asking for.

6 Built-In Digital Audio Subsystem

As with the video-in subsystem, the audio subsystem is fully integrated on the 64-bit system bus and provides four independent channels of CD-quality audio output, as well as two audio input channels supporting a variety of audio applications

7 Expandability

Two drive bays allow you to expand your disk space to 2GB internally, or to add a floptical drive that reads and writes Mac and PC floppies as well as 21MB floptical media

Stereo Interface
StereoView™ Ready
 Connect StereoView hardware to enable virtual reality and advanced graphics applications

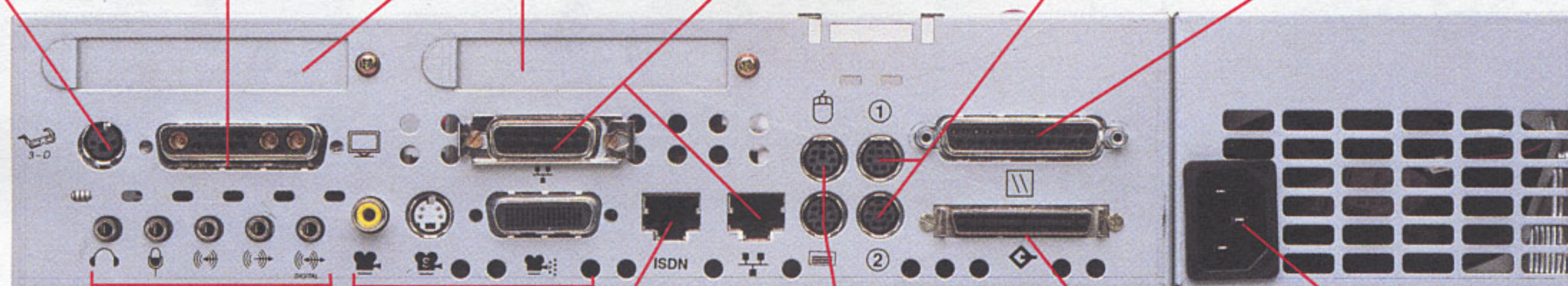
Monitor Connector
 High-resolution (1280x1024) and low-resolution color monitors up to 76Hz

GIO Expansion
 Provides maximum expandability for professional video options, video compression, additional networking interfaces, and a variety of third-party add-in cards

AUI & 10BaseT Ethernet Connections
 One ethernet controller with both AUI and 10BaseT interfaces for convenient and flexible standard networking. Both interfaces support 10Mbit/sec transmission rates

Two Serial Connections
 Mac compatible RS-422 and RS-232 as well as MIDI timing at transfer rates up to 38.4Kbits/sec through these two 8-pin mini-din connectors for easy integration with modems, printers, and other serial devices

Parallel Connection
 A bidirectional, programmable 8-bit parallel port with up to 10MB/sec transfer rate provides easy access to a variety of printers, scanners, and other devices



Audio Interfaces
 Line-in and line-out jacks, microphone-in and headphone-out jacks, as well as a digital I/O jack for CD-quality audio applications

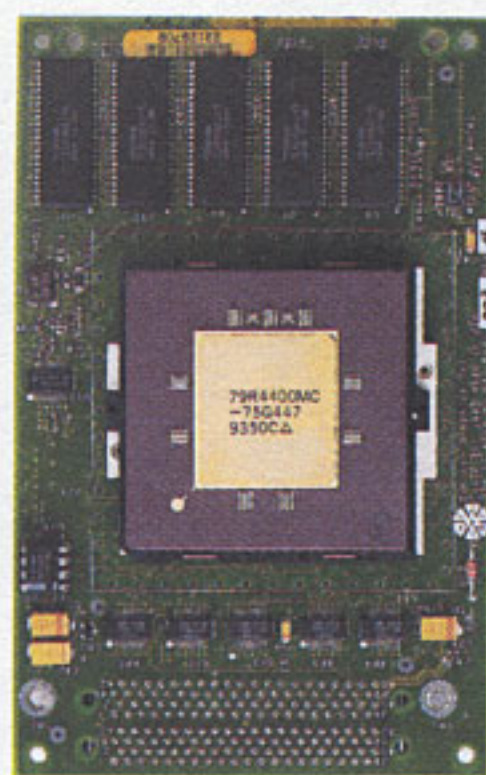
Video Input Connections
 Built-in video accepts a variety of standard video inputs with a Silicon Graphics digital port, S-video port, and a composite analog port supporting NTSC/PAL formats

ISDN Built-In
 Standard wide-area networking interface suitable for video conferencing, telephony, and emerging media application technologies. ISDN provides two channels of 64Kbits/sec transmission rate over ordinary telephone lines

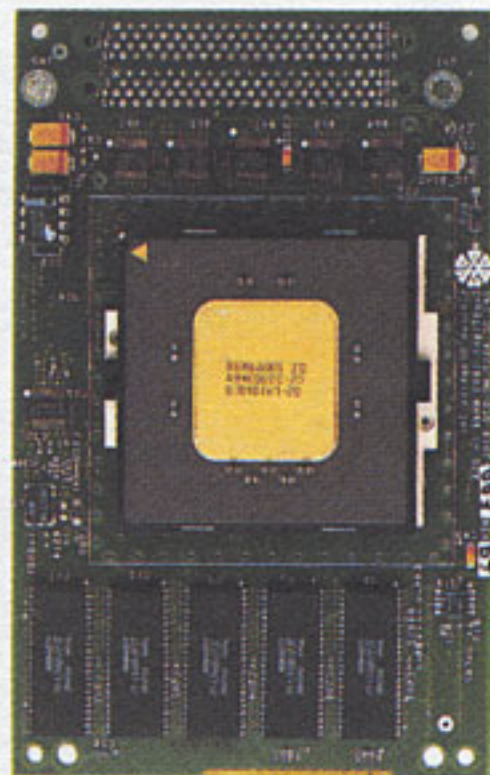
Keyboard and Mouse Connections
 Standard PS/2™ interfaces

SCSI-2 Connection
 In addition to the two internal peripheral bays, the integrated SCSI controller also supports up to five additional external devices such as disks, CD-ROMs, and scanners. The controller provides fast, single-ended, 8-bit, transfers up to 10MB/sec

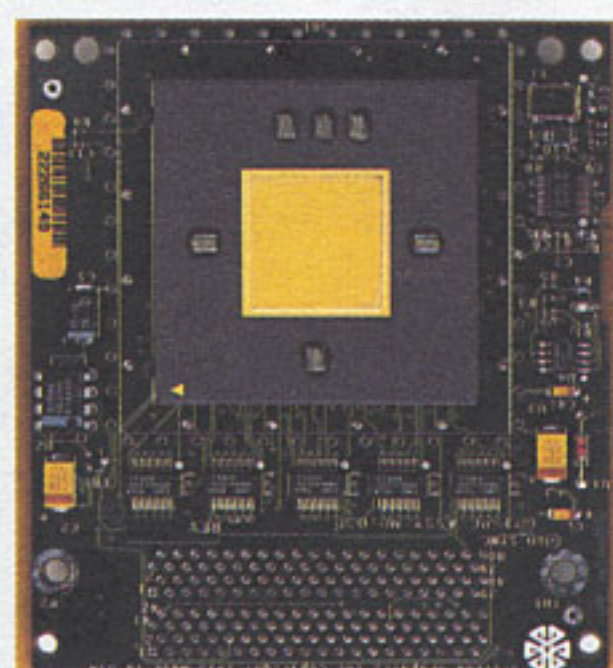
Power Supply
 170 watt autoswitching power supply enables system operation anywhere in the world



R4400SC™ CPU Module Option
 With primary cache 16K instruction and 16K data, the 150MHz R4400SC CPU offers double the on-chip cache of the R4000SC as well as 1MB of unified instruction/data high-performance secondary cache. The R4400SC powers your Indy with 136 MIPS, 25MFlops, 97.5SPECfp92 and 91.7 SPECint92



R4000SC CPU Module Option
 64-bit 100MHz R4000 CPU with primary cache (8K instruction/8K data) and an additional 1MB of unified instruction/data high-performance secondary cache. Powers your Indy system with 89.5 MIPS, 16 MFlops, 63.2 SPECfp92 and 58.6 SPECint92

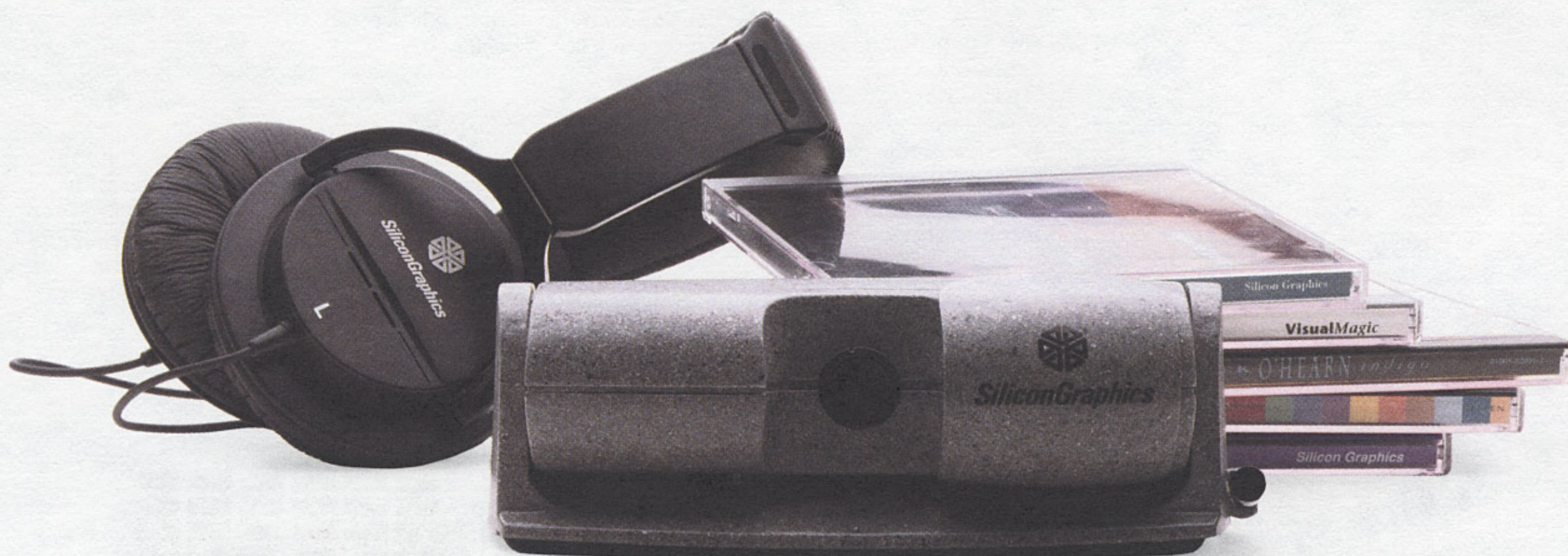


R4600PC™ CPU Module Option
 Full 64-bit 100MHz R4600PC CPU option with two-way set associative primary cache (16K instruction/16K data). Powers your Indy with 119 MIPS, 11 MFlops, 49.9 SPECfp92 and 62.8 SPECint92

The Most Technology Per Square Inch

While Indy is the lowest-priced member of the Indigo family, we didn't compromise on features. In fact, Indy packs more interactive media, work-group collaboration tools, and computing power in a PC-priced desktop system than any other comparable workstation.

This 64-bit system has been designed to crunch through large data sets — fast. And Indy can be configured and upgraded to meet your requirements, so your investment is protected. The Indy advanced system architecture gives you a choice of MIPS® RISC R4000® modules and graphics subsystems. You can add up to 256MB of memory, seven Fast SCSI-2 devices and 2GB of internal disk storage as your needs grow. Of course all configurations of Indy come standard with digital audio and video, and integrated digital networking capabilities.



A World of Digital Media

Indy has been designed with plenty of media tools to enhance your communication. Now you can incorporate 3D graphics, photorealistic images, video, CD/DAT-quality audio, and text into your work, in real time — all in digital format. And best of all, IndyCam, digital and analog video-in, microphone, CD-quality audio, support for Kodak PhotoCD™ format, and software media tools come standard with every Indy workstation.

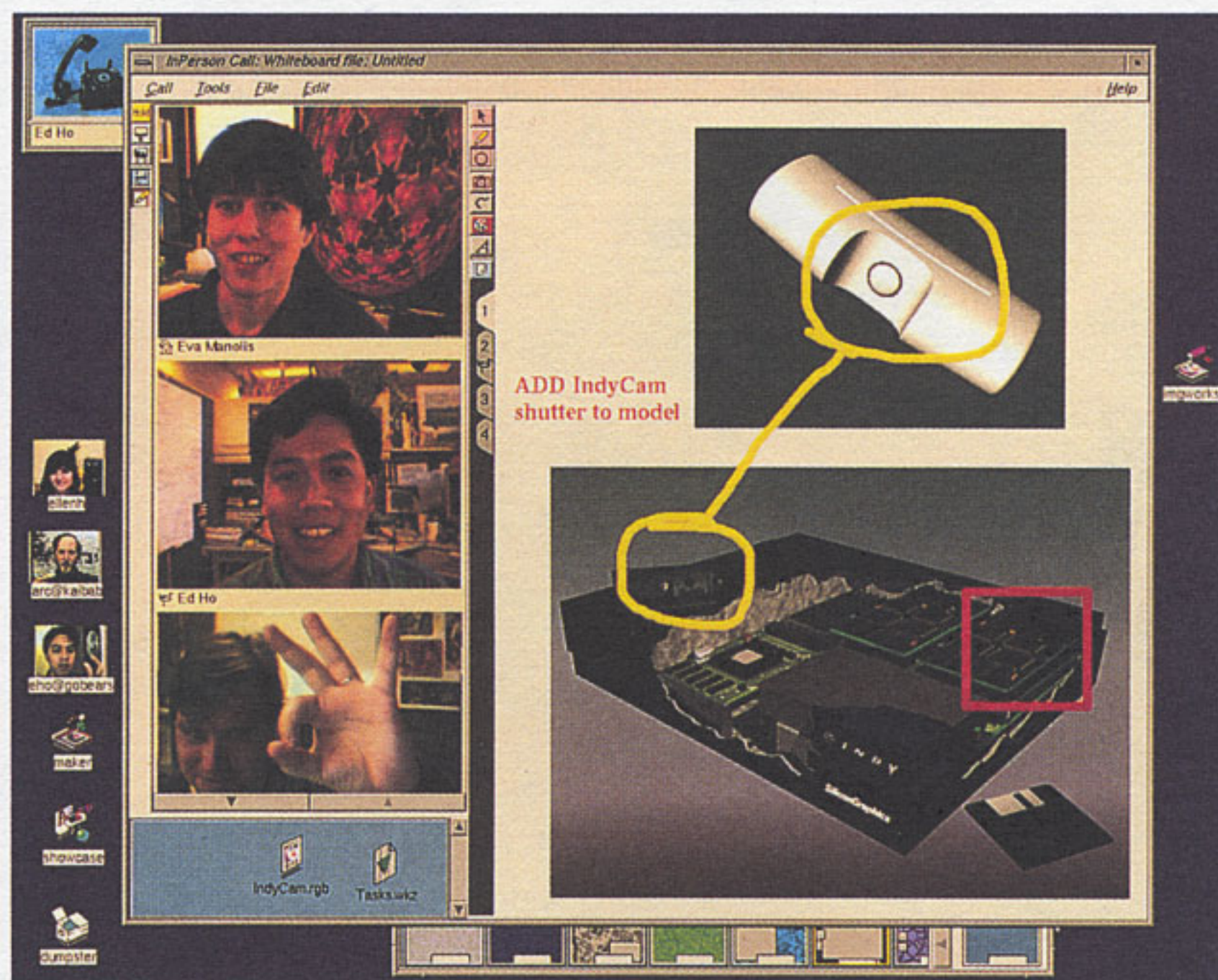
IndyCam™ is an ideal tool for collaborative workgroup communications. With IndyCam, full-resolution, full-frame video can be captured directly to memory in true digital format. The video subsystem performs filtered scaling to 1/2, 1/3, and 1/4 screen. CD/DAT quality audio includes four channels of analog audio plus two channels of digital audio. So, whether you are integrating video into your designs, or sending video clips to your co-worker, you will soon discover that the Indy digital media tools are invaluable.

Video-based Communications

Video is the most convenient and most consistently accessible method for the display of moving images. With Indy, you can create impressive visual insights and use video for sharing those insights with a wide audience. Indy comes standard with video-in for capturing video images, sending media mail, creating digital media presentations and conducting desktop conferences in real time.

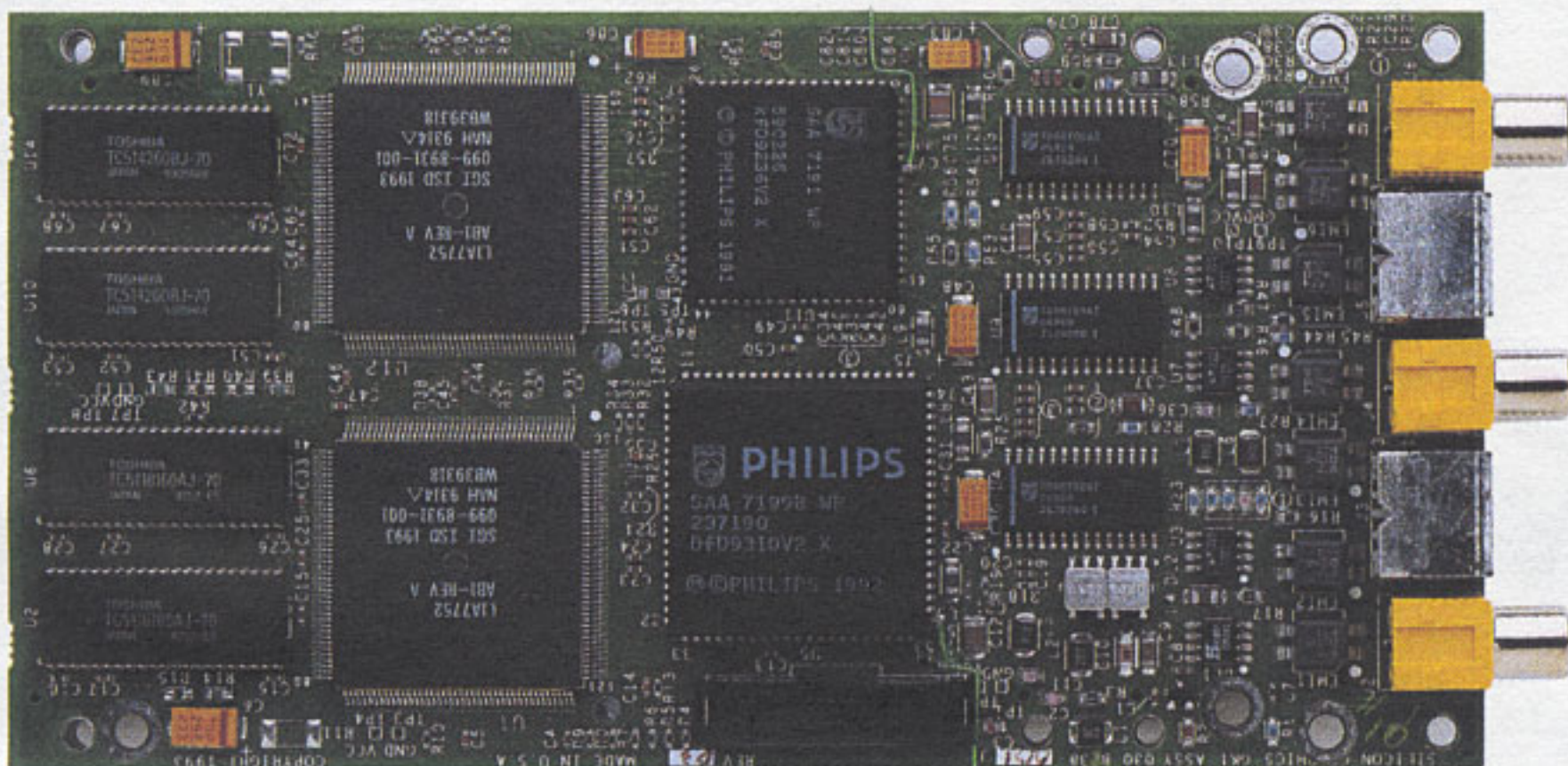
Multi-Point Desktop Teleconference

Real-time desktop teleconferencing utilizing the InPerson™ software option with the shared Whiteboard for common image viewing and manipulation as well as real-time display of digital video with audio data



High-Quality Video Output

If you need to upgrade your Indy video capabilities to print simulations and models to videotape as they appear on the screen, the Indy Video™ option card is your answer. Indy Video brings the power of high-quality video communication to your desktop workstation.



Now you can print-to-tape to share the high-resolution images you have created. You can also create video presentations quickly and perform real-time scan conversions of nearly full screen graphics to video resolution. Imagine the value of being able to send your 3D model to videotape for viewing at a customer presentation. Frame animation of compute-intensive models or simulations can be output to videotape for real-time playback.

Indy Video provides high-quality editing and special effects. Now all the real-time effects you've been wanting to do, such as overlays, dissolves, fades, wipes, chroma keying, and luma keying, can be a reality. Indy Video also allows you to capture video frames to system memory or disk. 'Video-In-A-Window' provides a convenient way to display this real-time, frame-by-frame video output.

The Fastest 2D Graphics Around

Both technical and creative professionals will appreciate the high-resolution 8-bit (virtual 24-bit) or 24-bit Indy graphics sub-system. Indy is a powerful 3D system that also offers amazing 2D graphics for imaging and line drawing performance.

With Indy, things happen fast — up to 1.6 million X11-lines/second and 51 million pixels/second — all with 1280x1024 screen resolution and up to 76Hz refresh rate. You can manipulate images at up to 1.1M 2D and 800K 3D vectors per second. Indy achieves a higher level of performance with line and triangle drawings than any other comparably priced system.

IndyGraphics

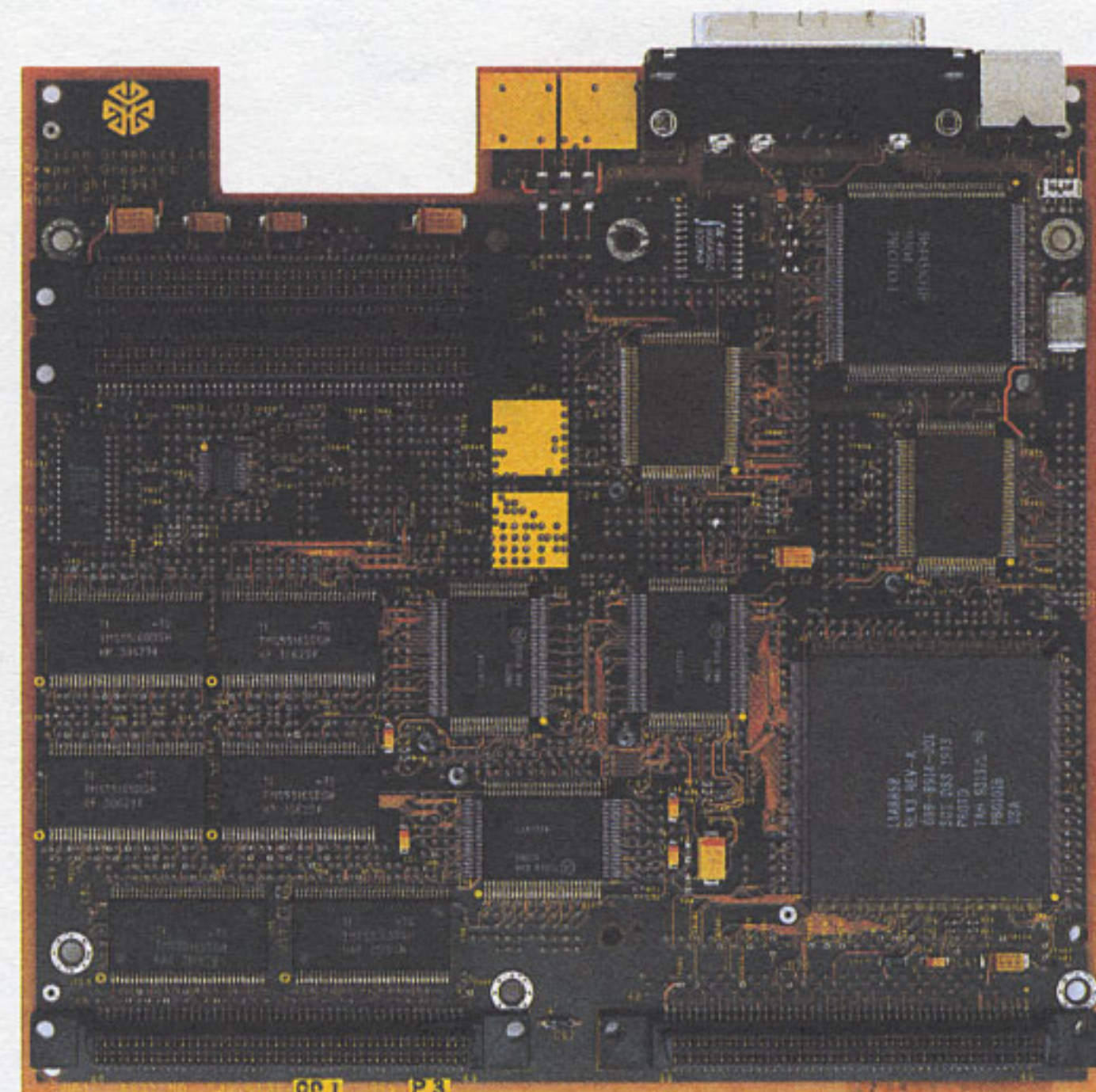
High-performance, high-resolution (1280x1024) graphics subsystem supports the Graphics Library™ as well as 32-bit Z-buffering in software. Because Indy Graphics performance is directly proportional to CPU speed, upgrades to faster CPUs automatically increase application performance

Advanced Features

Anti-aliasing through area-sampling, 256 sub-pixel positions, and endpoint filtering provide enhanced performance for wireframe applications such as mechanical CAD and molecular modeling

8-bit or 24-bit Color

The choice of either 8 or 24-bit color provides flexibility and upgradeability



Industry Leading Performance

Indy graphics draws 1.6 million X-lines/sec and fills 51 Mpixels/sec, providing unsurpassed performance for demanding imaging and line drawing applications

REX3

The Raster Engine (REX3) ASIC converts geometric data processed by the CPU into pixel and line data in the frame buffer. The REX3 supports peak fill rates of 437M pixels/sec for block fills and 62 Mpixels/sec for shaded spans



An Engaging Desktop Environment

Most user interfaces are too rigid, requiring you to adapt to their way of working instead of adapting to yours. The Indigo Magic™ User Environment changes that by providing a unique way of collaborating with your workgroup, to finish your work easier and faster than ever before.

Indigo Magic is a new generation desktop user environment that combines an intuitive desktop management system with powerful digital media tools in one user interface. In fact, we call it a 'Media User Interface', because Indigo Magic simplifies system and network access and facilitates collaborative computing through unique digital media tools.

The Indigo Magic iconic interface lets you organize your desktop environment to suit the way you work, increasing your communication and productivity. Now you have a point and click method of organizing your desktop and accessing resources.

With the Indigo Magic Desk Manager, you can create multiple, iconic desktops with all the applications, files and tools you'll need to work on specific projects. System administration and management is a breeze. Now you can set up your printer and user accounts and connect to a network with just the click of an icon. The Indigo Magic User Environment is 'network aware', so you can easily find and use all the resources on your network.

Collaborative Communication Tools

The Indigo Magic User Environment includes all of the digital media tools you need to capture, create, and communicate your ideas in ways that are more vivid and compelling than ever imagined. With bundled applications and integrated digital media tools, you can make interactive 3D graphics, audio, and video a part of all of your work.

Imagine sharing your designs in new ways. Now you don't have to crowd a dozen people into your office to show your newest model. You can print your 3D model to video and add special effects, graphics, or audio overlays and send it to your co-workers. With the Indigo Magic User Environment you have the power to make your ideas come alive.

You can be at the forefront of an exciting new era in computing and collaborative work with the InPerson™ desktop conferencing software option. InPerson is designed to partner with Indy to take full advantage of the integrated digital media hardware and the Indigo Magic User Environment.

InPerson software provides your team with the tools to share technical and creative information and insights without anyone leaving the office. High-quality audio and video, text, and images are interactively shareable, in real time, over standard network connections. InPerson will increase your productivity and the effectiveness of your collaborative efforts.

Indy Works Well With Others

Indy excels in a multivendor environment with Macs, PCs, and other UNIX® systems. Indy supports PC and Mac client software for Netware™ and AppleTalk™ networks, and supports third-party PC and Mac® emulation packages such as Quorum Equal™ and Insignia Soft PC™. Indy also reads and writes PC and Mac floppies — so you can share files in your workgroup with ease. Photo-CD™ is supported, and you can write to Quicktime™ files as well.

The Out of Box Experience

From the moment you open the box, Indy brings your ideas alive. Enter a myriad of endless possibilities. Explore your creative realm. Expand your world. Have some serious fun. You are limited only by your imagination.

Become an Indy traveler. Move through the 'Out-of-Box Experience.' Travel through the unbeaten path of Indy. Play interactive IndiZone Games and discover sounds and

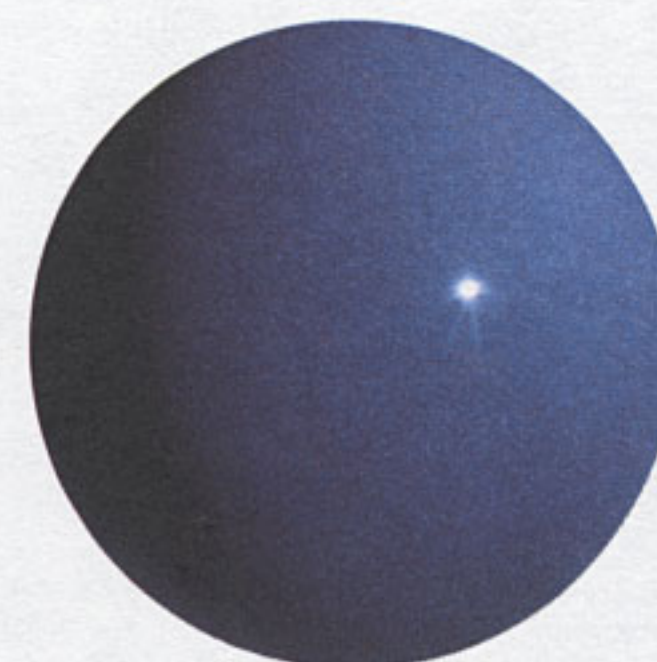
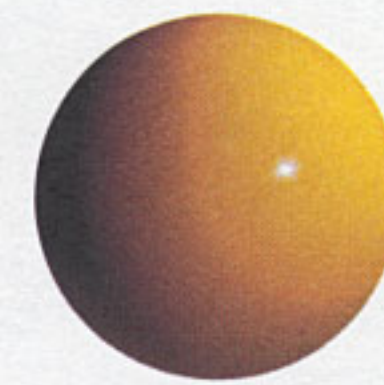
useful tools.

Get out of the box...and jump into Indy.



Indy can be used in a heterogeneous environment as a compute, file, or render server. It can also be used as both a server and a workstation.

Indy and the Indigo Magic User Environment give you everything you require in a workstation — power and ease-of-use as well as workgroup collaboration and interactive media tools — at the price you've been asking for.



Technical Specifications

Serious Hardware Features

| | |
|--------------------------|---|
| CPU module | R4600PC@ 100MHz R4000SC@ 100MHz R4400SC@ 150MHz |
| Graphics | 8-bit planes 1280x1024/1024x768 up to 76Hz refresh (upgradeable to 24) 24-bit planes 1280x1024/1024x768 up to 76Hz refresh |
| Monitor | Color 19 inch 1280x1024 resolution 60, 72, & 76Hz refresh rates Color 16 inch 1280x1024 resolution 60, 72, & 76Hz refresh rates Color 14 inch 1024x768 resolution 70Hz refresh rate |
| Input/Output | 2 serial 1 parallel 1 ethernet (10-baseT or AUI) Fast SCSI-2 ISDN Stereovision (16" & 19" monitor only) |
| Memory | 16MB to 256MB |
| Mass Storage | Two internal devices: (3.5"x1" form factor) 21MB Floptical Drive 535MB Hard Disk (U.S.) 630MB Hard Disk (EUR) 1.0GB Hard Disk (WW) |
| GIO Expansion | Two GIO-32 slots (one contains video slot) |
| Input Devices | PS2™ style keyboard and mouse Analog microphone IndyCam: full color CCD 640x480 resolution |
| Warranty | One year hardware |
| Graphics | |
| Advanced Features | Alpha blending Accumulation buffer Anti-aliased RGB lines and points Texture mapping Fog Lighting features Arbitrary clipping planes Depth cueing Sub-pixel positioning Stereo graphics Pan and zoom Sphere rendering X11 pixel operations |
| Color Maps | 4 (256 color) 1 (4096 color) 24 bit only |
| Display Modes | RGB double buffer RGB single buffer Color index double buffer Color index single buffer |
| Pop-up/Overlay Planes | 8-bit system: 2-bits/none 24-bit system: 2-bits/8-bits |

Audio

| | |
|----------------|---|
| Input | 4 analog channels Mono/Stereo microphone (mono microphone incl.) Line-level stereo analog Serial digital stereo (IEC958, AES3) |
| Output | 4 analog channels External volume controls Stereo headphone Mono internal speaker Line-level stereo analog Serial digital stereo (IEC958, AES3) |
| Sampling Rates | 48, 44.1, 32 KHz, and many lower rates Independent input/output sampling rates Simultaneous input/output |
| Converters | Two stereo audio codecs 16-bit, delta-sigma, 64x-oversampling |
| Connectors | Five 1/8 inch (3.5 mm) stereo jacks Independent input video bus (S-Video and Composite) |
| Video Input | 2 analog video-in ports (S-Video and Composite) NTSC and PAL support 1 digital video-in port 320x240x20fps to disk 640x480x32fps to memory |

Serious Software Features

| | |
|----------------|--|
| IRIX 5.2 | IEEE POSIX 1003.1 FIPS 151-1 UNIX® System V.4 4.3 BSD enhancements SVID Issue 3 X11R5 Window System OSF/Motif™ Toolkit 1.2 Display PostScript® IRIS GL™ OpenGL™ Media User Interface IRIS Showcase™ 3.0 Media Tools MediaMail™ Photo-CD™ support |
| Indigo Magic | Trial copies of PC & Macintosh emulators Client Networking |
| PC & Macintosh | |

SGI Accessories Supported

| | |
|------------------------------|--|
| GIO Options (single wide) | Indy Video Cosmo Compress™ (full-motion JPEG compression/ decompression to and from SCSI disk) Ethernet Fast SCSI-2 FDDI single attach (fiber only) Hitachi 1111C SyQuest 1.0GB QIC 2.0GB DAT |
| GIO Options (double wide) | |
| Tablet | |
| External Drives | |
| External Tapes | |
| Input Devices | Dials Dials and buttons Optical mouse Spaceball |

Performance Chart

| CPU | R4600PC @100 MHz | R4000SC @100 MHz | R4400SC @150 MHz |
|--------------------|---------------------|---------------------|---------------------|
| Cache (primary) | 16kd/16ki | 8kd/8ki | 16kd/16ki |
| Cache (secondary) | — | 1MB | 1MB |
| SPECint92 | 62.8 | 58.6 | 91.7 |
| SPECfp92 | 49.9 | 63.2 | 97.5 |
| AIM | 59.2 | 74.0 | 112.6 |
| XLines/sec | 1.4M | 1.4M | 1.6M |
| 3D Vectors/sec | 333K | 520K | 800K |
| Tmesh/sec (z) | 33K | 39K | 64K |
| Screen Clear | 3msec | 3msec | 3msec |
| DMA Pixel Transfer | | | |
| 8-bit | 45M | 45M | 51M |
| 24-bit | 19M | 39M | 40M |

| | |
|------------------------|--|
| Other External Devices | CD-ROM MIDI Interface 1GB/2GB External Disks |
|------------------------|--|

Physical Environment

| | |
|---------------------|---|
| System | 3"H x 16"W x 14"D 16 lbs. |
| 19-inch Monitor | 18.5"H x 18.5"W x 19.7"D 81.4 lbs. |
| 16-inch Monitor | 16.1"H x 15.7"W x 17.7"D 55 lbs. |
| 14-inch Monitor | 14.2"H x 13.4"W x 16.5"D 52.8 lbs. |
| Power Requirements | 100-132 VAC, 2.4-1.8A 200-264 VAC, 1.2-0.9A 47-63 Hz |
| Heat Dissipation | 900 BTU/hour |
| Ambient Temperature | + 13 to + 35 degrees C (operating) - 40 to + 65 degrees C (non-operating) |
| Relative Humidity | 10% to 80% operating no condensation 5% to 95% non-operating no condensation |
| Altitude | 10,000' operating 40,000' non-operating |
| Vibration | 0.02 inches, 5-19 Hz 0.25 G, 5-500 Hz |
| Noise | 36 dB (A) in typical operating position |

Regulatory Agency Approvals

| | |
|-----------------------------|---|
| Electromagnetic Emission | FCC Class B Canada DOC. Class B CISPR 22 Class B Germany VDE Class B VCCI Class 2 |
| Product Safety | CSA 22.2 No. 950 IEC 950 EN 60950 Class 1 SELV |
| Ergonomic/Health | Germany ZH1/618 ISO 9241 |
| Serious Fun Features | Interactive Games Out-of-Box Experience Sound Scheme Screen Savers Color Background |

For more information please call

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