EGS-28/24 Spectrum Product Info

www.gvp-m.com

Description

The EGS-28/24 Spectrum — the second member of GVP's EGS family of graphics boards — is a high-performance, high-resolution, 24-bit graphics board that will take any Amiga 2000, 3000, or 4000 beyond AGA! Following the same philosophy as the first member of the EGS family, the powerhouse EGS-110/24, this entry level graphics board provides power and performance at an affordable price.

The EGS-28/24 Spectrum is capable of displaying video resolutions (NTSC, PAL, and SECAM) as well as workstation-like high resolutions like Next (1120 x 832). It also adapts automatically to either a Zorro-II (16-bit A2000) or Zorro-III (32-bit A3000/A4000) bus and supports Workbench 2.04, 2.1, and 3.0 to take maximum advantage of its environment. *(Capable of supporting Commodore's RTG graphics standard when it becomes available.)*

For the ultimate in convenience and functionality, the EGS-28/24 Spectrum has a built-in pass through for the native Amiga RGB display. When working with a native EGS screen, the EGS-28/24 Spectrum displays its contents on the connected monitor, and when working with a native Amiga screen, the EGS-28/24 Spectrum simply passes the Amiga display out to the monitor! While others may claim to be a one-monitor solution, there will always be incompatible software that requires the use of a second monitor — the EGS-28/24 Spectrum is truly a one-monitor solution!

As if that weren't enough, our unique MultiGFX™ technology allows multiple EGS-28/24 Spectrum boards to be installed in the same machine, and the device libraries handle all of the necessary details. Multiple applications can be running on multiple EGS-28/24 Spectrum boards, each visible on a separate monitor simultaneously in stunning full 24-bit color at any resolution. This is a blessing for those who need to see a lot of different things all at the same time. For example, consider the 3D animator who needs to see a high-resolution wireframe display of the scene being edited, an NTSC (or PAL) color preview of the animation in progress, and a control panel screen with all of the needed commands available at the click of a mouse!

The EGS-28/24 Spectrum system uses the new Enhanced Graphics System (EGS) device libraries. These device independent libraries allow high-resolution, 24-bit software to be written for ANY graphics board that supports these libraries. To date, a number of graphics boards on the market already support the EGS libraries, and all software written for those boards will run on the EGS-28/24 Spectrum. Likewise, any software written to support the EGS-28/24 Spectrum will run on any of the other display boards that support the EGS libraries. Programmers are no longer committed to a single graphics board; by programming for the EGS system, programs can run unmodified on any display board that support the libraries!

The EGS libraries were painstakingly checked and rechecked by programmers around the world to make them as close as possible to existing Amiga graphics calls, differing only when necessary to support new features. This effort was taken to make porting applications as easy as possible for programmers. *(Some function calls were made so identical that the only difference is the addition of an **E_** in front of the function name, with all parameters and return values the same!)*

The EGS libraries also provide some new and very useful additions to the basic array of graphics programming features that native Amiga programmers are used to, for example: Tear-Off menus, Menu gadgets, and more.

Description (cont.)

However, realizing that good software takes time, GVP has provided a Workbench driver for the EGS-28/24 Spectrum. This driver allows Workbench to run on the EGS-28/24 Spectrum board in any supported resolution, with up to 256 colors — Workbench limits the color depth to 256 colors for itself and Workbench-compliant software. Any software that opens its display on Workbench will automatically run on an EGS-28/24 Spectrum Workbench. The only restriction is that no direct Amiga Blitter operations be performed by programs running on the EGS-28/24 Spectrum display, since the Amiga Blitter operates on Chip RAM and the EGS-28/24 Spectrum has its own blitter that operates on the display maintained entirely in its own DRAM. (By the way, this means that ALL Chip RAM normally used by Workbench is free for other use.)

It is also important to realize that the EGS display subsystem is entirely separate from the normal Amiga display. A two-monitor configuration allows the EGS-28/24 Spectrum monitor to display a high-resolution display (from a CAD system for example) on the EGS monitor and the native Amiga output system to display something completely different, and even from a completely different program! An interesting and extremely useful example would be running a high-resolution paint program in the EGS display while a video application (like the IV24™, the Video Toaster™, or OpalVision™) runs on the native Amiga display. As pictures are framegrabbed and saved, an EGS Paint system can load them in for touchup, while the video framegrabbing continues — maximum productivity and efficiency!

The EGS-28/24 Spectrum hardware and the EGS system software take the Amiga platform beyond AGA, and into the true-color world of high-end graphics workstations. The already installed base of A2000 and A3000 owners, and the fresh new base of A4000 owners can leap past the limitations of AGA and enter a new world of high-resolution, true-color, hardware-independent graphics. Keep in mind that when writing applications for the EGS system, they are not just for a single graphics board, they will run on any current and future graphics boards that support the EGS system libraries!

Features and Benefits

ITEM	FEATURE	BENEFIT
EGS-28/24 Spectrum Hardware	Zorro-II / Zorro-III autosensing	The EGS-28/24 Spectrum takes full advantage of whatever Amiga it is installed in. Installed in a Zorro-II bus it uses a 16-bit interface, and installed in a Zorro-III bus, it opens up to a full 32-bit interface for maximum speed and performance.
	Zorro-II FORCE option	Useful when running in early Zorro-III Amiga's that still have bugs when using Zorro-III DMA. This guarantees compatibility in any Amiga.
	Hardware Blitter	The EGS-28/24 Spectrum has a built-in hardware blitter to rapidly move chunks of data from one area of memory to another. This makes the EGS-28/24 Spectrum the perfect tool for real-time animations and 24-bit paint applications. Fills, brush pastes, region operations, image manipulation can all be performed by the blitter leaving the processor free to perform other work.
	Amiga RGB Pass-Through Single-monitor technology	Other graphics boards often require two monitors (one for the Amiga display and one for the custom graphics display), and some others like the Video Toaster™ require three monitors. The EGS-28/24 Spectrum has special circuitry that takes the Amiga display as input and allows software control over whether the Amiga or the EGS screen is displayed. It is truly a one-monitor solution.
	MultiGFX™ device sharing technology	Other graphics boards often expect to be the only graphics board in the system, and if more than one is installed, the controlling software may become confused. EGS' device sharing allows multiple EGS-28/24 Spectrum boards to function independently while the libraries handle all of the work to keep things running smoothly.
	2MB of onboard display memory	This allows for high-resolution 24-bit displays that are rock-solid and flicker-free. Using more memory for larger displays would result in flicker that can cause headaches. Boards claiming 4MB or more of 24-bit display memory often flicker because the graphics chip is not capable of displaying 4MB of data fast enough to be flicker free. Other graphics boards may claim that the extra memory is used to keep multiple screens open at the same time. The EGS-28/24 Spectrum uses a smarter technique that swaps out non-visible display data to standard system RAM to conserve display memory for crisp, stunning displays. Adding memory beyond 2MB is inefficient and needlessly expensive.
	Programmable Resolutions, Refresh Rates, and Scanning Frequencies	Allows the Amiga display to be as large as the monitor will allow. For example, a Commodore 1950 can be used with the EGS-28/24 SPECTRUM now, and a larger IDEK, NEC, or other monitor later; the EGS-28/24 Spectrum will increase its displayable resolutions to match the monitor. (Or you can start with a high-resolution monitor and enjoy the benefits immediately.)
	Custom GVP Workbench driver	Allows Workbench (and programs that run on Workbench) to be displayed on a high-resolution screen without requiring a software re-write. Existing software will run today!
	Uses built-in hardware "pixel packing" techniques	Only the absolute minimum amount of RAM to store a display is used, so that larger displays can be stored in a smaller amount of RAM, without affecting quality.
	Does not use the Amiga's Video Slot	EGS-28/24 Spectrum can be used with other video products like the IV24™, the Video Toaster™, or OpalVision™.
EGS Retargetable Graphics Libraries	Fully re-targetable graphics operating system	Programs written using the EGS libraries will run on ANY graphics board that supports EGS. Programmers can concentrate on writing bug-free, feature-filled software without worrying about which particular graphics board it will run on — it will run on them all (with EGS libraries).
	Complete true-color, 24-bit environment	All graphics applications in the EGS libraries are treated as 24-bit, true-color applications, even if the display device can't support 24-bit. Editing and painting in 8-bit, 16-bit, or any other mode will still maintain the quality and clarity of a 24-bit image!
	Support for 1, 2, 3, 4, 8, 16, and 24-bit screens	The EGS libraries allow any color-depth screen to be opened, from a black & white 1-bit screen, to a 256 color 8-bit screen, to a 16 million color 24-bit screen. Use as much or as little memory as needed by a specific application.
	Automatic dithering to current color depth	In most graphics operating systems, opening a 24-bit application on an 8-bit screen would result in the 24-bit application failing to open. The EGS libraries automatically dither the 24-bit display using extremely fast and accurate dithering algorithms to provide a crisp display and allow the 24-bit application to continue working in 24-bit (i.e. all actions occur in 24-bit and are only displayed in 8-bit). If a 24-bit screen is used later, all of the quality and clarity of the 24-bit application is preserved.
	Scaleable Graphics User Interface (GUI)	Gadgets, fonts, and all Graphics User Interface items are completely scaleable. If a smaller display is used, the appropriate items get smaller. If a larger display is used, the appropriate items get larger. All GUI aspects are completely user controllable.
	Fully functional	Allows CLIs/Shells to open on an EGS screen with command history. Completely

	Console-Handler	compatible with all programs that use standard output (stdout or stderr) or standard input (stdin).
EGS SpectraPaint	24-bit, real-time paint package	Allows instantaneous painting and manipulating of an image or images. Say good-bye to the "paint-and-wait" days!
	Window based environments	Images are loaded into windows rather than screens. This allows multiple images to be in memory and on-screen at once for easy comparison or compositing with the Pantograph™ tool.
	Resizable control panel	The Control Panel and all Toolboxes scale with the system to take as much or as little room as desired. Small displays with limited screen space can shrink the toolbox for more image area, and large displays can expand the toolbox for easier gadget selection.
	Runs on the default EGS screen	The default EGS screen is a standard ground for window-based applications. Multiple programs can open on the default screen to make data sharing and data comparison simple and easy. For example, an independent palette program can be used to generate a precise color, and that color can be "copied" into the paint programs pen color for immediate use. Likewise, all sorts of other programs like clocks, word processors, etc. can be running side-by-side with the paint package.
	Extremely FAST real-time paint routines	24-bit painting doesn't have to be slow and cumbersome. EGS-Paint uses extremely optimized logic algorithms to make painting quick and easy, even complex operations like Pantograph, airbrush, monochrome painting!
	Pantograph™ Rub-Through	Most paint packages allow a 'spare page' image to be rubbed through to the main image buffer with varying amounts of transparency, however the 'spare page' must be aligned with the main buffer and you can't arbitrarily rub through any section of a 'spare page', only what is underneath the main image. EGS-Paint's Pantograph™ tool allows any portion of another image, or even another portion of the same image to be 'rubbed through' to the main image with complete control!
EGS SpectraPaint	Extremely powerful MagicWand	Magic Wand control allows selection of areas based on color closeness. For example, all RED pixels, including maroon and pink, can be selected and altered without affecting the rest of the image. Tighter or looser controls allow more or less matches to the base color. This makes it extremely easy to select a blue sky background and replace or tint it with another color, and leave the rest of the image untouched.
	Artist's Palette	The palette is designed for an artist, not a computer user. Select a few main colors and mix them on a mixing pad, and choose the desired colors for painting from there. No need to memorize RGB values or pick colors forced into "Color Pots". Mix exactly the color you want and use it.
	Lightening Fast Magnification	Zooming in on an area is extremely fast, and painting can continue while the image is being zoomed in or out. Up to 16x magnification, and out to 1/4 scaling for a full picture view of an image that may be larger than the screen. Painting, manipulating, and stenciling can all continue in any zoom mode.
	Multi-View mode	Up to four different "views" of the same image can be opened, each fully active for painting functions. For example, open an image with two people in it, select 4-view, zoom one view in on the first persons face, the second view on the second persons face, and the third view on both faces side by side. Any edits to one face will show up in the fully unzoomed images, the close-up of both faces, as well as the zoomed in views. Any edits or changes can be seen in context immediately without sacrificing the precise control of a zoomed in view. This is a necessity for high-quality image manipulation and editing.
	Intelligent Window Management	All image windows open within the screen boundaries, even if the image is larger than the available screen size. Scroll bars allow movement within the window to get to different parts of the image, or zooming out will display the entire image within the available screen size.
	Multiple DrawModes	EGS-Paint contains many drawmodes to allow adding just the right touch to a painting. Drawmodes include normal, blend, Add, Subtract, AND, OR, XOR, Delta, Colorize, Complement, Tint, and Monochrome.
	Power Stencil Modes	Stencils allow or restrict painting operations in different areas of an image. Stencils can be rectangular, freeform, or based on a Magic Wand. You can also add to or remove from a current stencil without starting over. If you select too little or too much, simply add or remove what you need and proceed with your painting.
	IFF24 Load/Save module	Supports loading of almost any IFF file, from 1-bit to 24-bit, HAM, HAM8, and Extra-Halfbright. Saves images in full 24-bit for maximum detail and color resolution.
	JPEG Load/Save module	Supports loading and saving of JPEG images for fast, convenient storage of high-resolution images.

Comparison Checklist

Feature	EGS-28/24	Retina	Picasso II	Piccolo
Supports older Zorro-II Interface (on Amiga 2000)				
Takes *full advantage* of Zorro-III Interface				

Zorro-II / Zorro-III AutoSensing	?			?
1MB RAM configuration	?		?	?
2MB RAM configuration	?	?	?	?
Onboard Blitter	?		?	?
Fully Programmable Display Resolutions	?	?	?	?
Hardware Sprite	?		?	?
EGS Retargetable Graphics Libraries	?			?
Supports Workbench	?	?	?	?
Uses valuable ChipRAM ***and*** DisplayRAM for Workbench and custom Intuition displays		?		
Amiga RGB Pass-Through for One-Monitor solution	?		?	?
Support for linking multiple boards in a single system to create a large virtual display (i.e. 3200x2560x8)	?			?

Detailed Competition Analysis

Feature	EGS-28/24	Retina	Picasso II	Piccolo
Maximum 24-bit Pixel Display Speed	28MHz	25MHz	28MHz	28MHz
Maximum 8-bit Pixel Display Speed	80MHz	70MHz	80MHz	80MHz
System Memory to Display Memory Transfer Speed	**up to 12MB/s**	up to 3MB/s	up to 3MB/s	up to 12MB/s
Blitter Data Transfer Speed	30MB/s		30MB/s	
Horizontal Display Scan Rate	15 to 75KHz	15 to 75KHz	15 to 75KHz	15 to 75KHz
Vertical Display Scan Rate	up to 200Hz	50 to 95Hz	up to 200Hz	up to 200Hz
Maximum 24-bit display resolution	800 x 600	1152 x 862	800 x 600	800 x 600
Maximum 16-bit display resolution	1152 x 900	1024 x 768	1152 x 900	1024 x 768
Maximum 8-bit display resolution	1600 x 1280	1600 x1280	1600 x 1280	1600 x 1280

At VGA 640 x 480 resolution.

Interlaced.

Screen Sizes based on RAM Configuration

EGS-28/24 SPECTRUM 1MB

Resolution	Bit Depth	Number of Colors
320 x 200	24	16.7 M
640 x 400	24	16.7M
640 x 480 (VGA)	24	16.7M
736 x 480 (NTSC)	16	65,536
736 x 575 (PAL)	16	65,536
800 x 600	16	65,536
1024 x 768 (SVGA)	8	256
1120 x 832 (NeXT)	8	256
1280 x 1024 (Interlace)	4	16
1600 x 1280 (Interlace)	4	16

EGS-28/24 SPECTRUM 2MB

Resolution	Bit Depth	Number of Colors
320 x 200	24	16.7 M
640 x 400	24	16.7M
640 x 480 (VGA)	24	16.7M
736 x 480 (NTSC)	24	16.7M
736 x 575 (PAL)	24	16.7M
800 x 600	24	16.7M
1024 x 768 (SVGA)	16	65,536
1120 x 832 (NeXT)	16	65,536

1280 x 1024 (Interlace)	8	256
1600 x 1280 (Interlace)	8	256

NOTE1: The minimum and maximum resolutions indicated above are the system limits, however the EGS-28/24 SPECTRUM is completely programmable, allowing for any resolution between the minimum and maximum limits. The above are only a few examples of the most common screen resolutions possible.

NOTE2: For easy reference, the grey shaded resolutions represent 24-bit displays.

Applications

The EGS-28/24 Spectrum can be used in a variety of applications where true-color and/or high-resolution are needed. Some examples include:

- **Desktop Publishing** — Full pages can be seen on-screen and still remain readable and editable. Inserted pictures and graphics can be displayed in 24-bit color for a 100% WYSIWYG (What You See Is What You Get) display. Facing pages can be viewed on-screen for accurate placement of cross-page graphics and artwork without loss of clarity or speed.
- **Photographic Touchup** — Photographs and other digitized images can be edited, manipulated, and/or composited together on a high-resolution screen in true, 24-bit color. One image can be pantographed into another image with full edge-feathering and transparency control — no more guessing with double-exposure tricks.
- **Real-Time 24-bit Animation Playback** — The EGS-28/24 Spectrum hardware is capable of playing NTSC or PAL 24-bit animations in real-time and eliminates the need for expensive single-frame recorders.
- **3D Modeling and Design** — Large, complex three dimensional scenes and animations can be difficult to design in the small Amiga screen resolutions, with frequent scrolling left and right, up and down to see the whole scene. The EGS-28/24 Spectrum increases the available screen space and eliminates the need for wasteful screen scrolling.
- **Rotoscoping** — With the right software and a high-quality framegrabber (like the IV24) the EGS-28/24 Spectrum is the perfect "Paintbox™" solution. Images can be framegrabbed and sent to a high-resolution paint application for touchup and editing, with a wide variety of tools and manipulation options available.
- **Print Media / Artistry** — The EGS-28/24 Spectrum is perfect for the print media artist who generates artwork custom artwork from a combination of methods: painting, digitizing, or rendering. Tools are available to "feather" one image into another with strict control over the area feathered and the transparency level of compositing that is used. On a high-resolution screen with multiple paint windows, both the source and destination images can remain visible on-screen for precise control and unerring accuracy.

Software Compatibility

Native EGS Software

Software Title	Manufacturer	Description
EGS-SpectraPaint	GVP	24-bit high-resolution multi-window paint package bundled with the EGS-28/24 Spectrum board.
ImageFX-EGS	GVP	Special version of ImageFX V1.5 that runs completely on the EGS-28/24 SPECTRUM! Image Processing package with scanner support, painting tools, user extensible operations, loaders, savers, and exhaustive ARexx support.
ADPro 2.5	ASDG	Image Processing program.
Magic Lantern	Terra Nova Development	24-Bit Animation creation/playboack application with sound support!
EMPLANT	Utilities Unlimited	Macintosh emulation hardware/software combination that provides a fully functional Macintosh environment that multitasks with the Amiga!
TVPaint 2.0	Tecsoft	High-end 24-bit paint program with powerful feature set.
Rainbow Painter	Omega Datentechnic	24-bit paint package bundled with the Rainbow board, but functional on any EGS supported board.
MPEG Player	Public Domain	Initial release of an MPEG playback program still in development; functional on any EGS supported board.
Connect Four (clone)	Public Domain	Clone of the popular Connect Four children's game written exclusively for the EGS native environment; functional on any EGS supported board.

NOTE: Many other small games and utilities exist in the public domain for the EGS environment, but are too many to name here.

EGS Workbench and Display Database Compatible Software

Software Title	Manufacturer	Description
LightRave	Warm & Fuzzy Logic	Allows LighWave to run on any Amiga without a Video Toaster. Supports rendering directly to an EGS-DEFAULT screen.
PageStream	SoftLogik Publishing	Desktop Publishing package, used internally by GVP for product User's Guides and Installation Manuals.
Art Expression	SoftLogik	Vector (object) drawing program for crisp, resizable artwork.

	Publishing	
TypeSmith	SoftLogik Publishing	Vector based font editor.
Real 3D	RealSoft International	3D modeling, rendering, and animation package with many high-end features and capabilities.
Final Copy	Softwood	Word processing package.
Electronic Thesaurus	Softwood	Online thesaurus.
Proper Grammar	Softwood	Online document grammar checker.
ProWrite 3.x	New Horizons	Word processing package.
QuickWrite	New Horizons	Starter version of the ProWrite 3.x word processing package.
Design Works	New Horizons	Vector (object) drawing program for crisp, resizable artwork.
Flow 3.0	New Horizons	Outline program with some text processing features...
ProPage	Gold Disk	Professional desktop publishing package with AGA color preview.
ProCalc	Gold Disk	Professional spreadsheet package with charting features.
ProDraw	Gold Disk	Vector (object) drawing program for crisp, resizable artwork.
ProVector	Taliesin	Vector (object) drawing program for crisp, resizable artwork.

Software Compatibility (cont.)

EGS Workbench and Display Database Compatible Software

Software Title	Manufacturer	Description
CygnusEd Professional	ASDG	Comprehensive text editor targeted for programmers, includes exhaustive ARexx interface.
TurboText	Oxxi	Comprehensive text editor targeted for programmers, includes exhaustive ARexx interface.
Superbase 4	Oxxi	Powerful relational database for the Amiga and other platforms.
Ami-Back	Moonlighter Software	Comprehensive archival software package.
Ami-Tools	Moonlighter Software	Comprehensive disk error recovery and maintenance software package.
Quarterback 5.x	Central Coast Software	Comprehensive archival software package.
Quarterback Tools	Central Coast Software	Disk error recovery and maintenance software package.
DiskMaster	Progressive Peripherals and Software	Directory utility.
Directory Opus	Inovatronics	Directory utility.
TeX Previewer	Public Domain	Allows screen preview of a TeX document before printing.
TeX Special Text Set System	Public Domain	Allows graphical front-end for TeX document creation and processing.
JRComm	Public Domain / Shareware	Terminal emulation program.
Rotor	Public Domain / Shareware	Screenblanker.
KCommodity 2.5	Public Domain / Shareware	Screenblanker.
MuchMore	Public Domain / Shareware	Text reader.
Leggi	Public Domain / Shareware	Text reader.
WBFed	Public Domain / Shareware	Font editor.

NOTE: Many other applications and utilities exist — both commercial and public domain — that work on the EGS Workbench or one of the EGS display modes in the Display Database.

EGS-28/24 SPECTRUM Technical Specifications

Bus interface	Zorro-II or Zorro-III autosensing 16-bit or 32-bit depending on bus environment
Internal Graphics Architecture	32-bit VL Bus using Cirrus Logic video controller/processor. Data is long-word aligned and pixel-packed for maximum RAM conservation. RGBRvGBRGvBRGBvRGBR
Maximum pixel display speed	28,000,000 pixels per second in 24-bit color per pixel 80,000,000 pixels per second in 8-bit color per pixel
Display Resolution	Programmable from 320x200 to 1600x1280 in 4-bit 1280x1024 in 8-bit

	800x600 in 24-bit
Display Refresh Rate	Fully programmable up to 120Hz at VGA 640x480
Display Scan Rate	Fully programmable up to 80KHz
Bus bandwidth	12MB per second with Zorro-III
	3.5MB per second with Zorro-II
Hardware Sprite/Cursor Support	64x64 pixel, 4-color built-in hardware sprite
Pseudo Color Modes	2 colors out of 16 million 1-bit per pixel
	4 colors out of 16 million 2-bits per pixel
	16 colors out of 16 million 4-bits per pixel
	256 colors out of 16 million 8-bits per pixel
True Color Modes	65,536 colors 16-bits per pixel
	16,777,216 colors 24-bits per pixel
Graphics Outputs	15-pin high-density DSUB connector that plugs into standard VGA-style monitor connectors and contains the following signals:
	Red: 0.7Vp-p
	Green: 0.7Vp-p
	Blue: 0.7Vp-p
	H-Sync: Low-Active 5Vp-p or TTL levels
	V-Sync: Low Active 5Vp-p or TTL levels
Inputs	9-pin DSUB connector that contains the following signals:
	Red: 0.7Vp-p
	Green: 0.7Vp-p
	Blue: 0.7Vp-p
	H-Sync: Low-Active 5Vp-p or TTL levels
	V-Sync: Low Active 5Vp-p or TTL levels

System Requirements

- Amiga 2000, 3000, or 4000
- Workbench 2.04, 2.1, 3.0, or higher
- System Hard Drive (approximately 10MB required for complete installation)
- VGA or MultiSync monitor (Commodore 1950, 1960, NEC, IDEK, Sony, etc.)

Recommended Additional Equipment

The following equipment is not required to use the EGS-28/24 SPECTRUM board, but is recommended to make using the EGS-28/24 SPECTRUM as simple and enjoyable as possible:

- 170MB or larger hard drive; 24-bit images take up a lot of room and hard drive space can disappear quickly; 24-bit images take up roughly 1MB per image at NTSC resolutions and can take up as much as 5MB per image at 1280 x 1024.
- Motorola 68040-based machine or accelerator; image manipulation and 3D rendering take a lot of horsepower, and a 68040 based machine will grind through the toughest job quickly and easily.