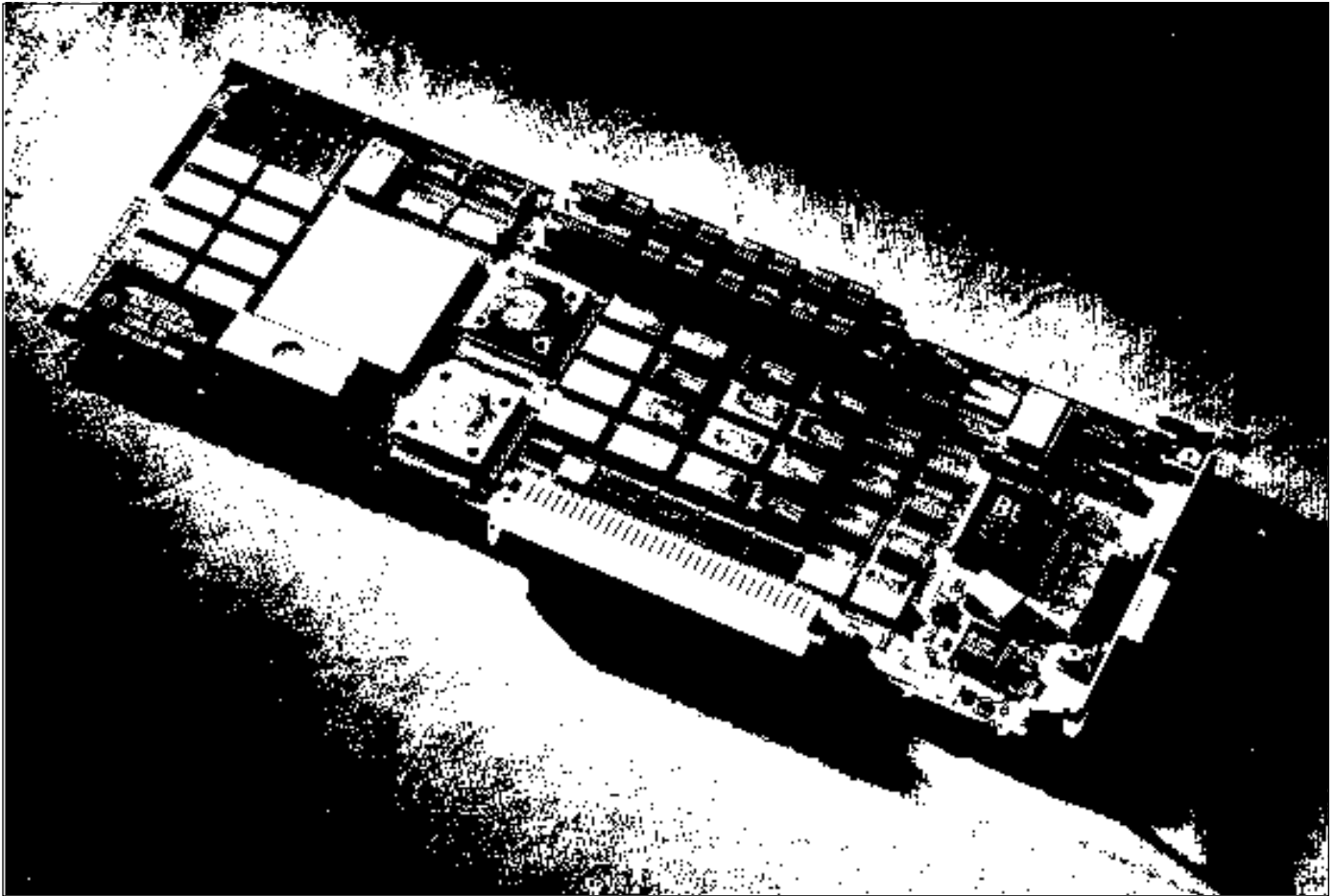# Macintosh Display Card 8•24 GC

Overview

The Macintosh® Display Card 8•24 GC combines the capabilities of a display card with the power of a dedicated graphics coprocessor, providing the Apple® Macintosh II family of personal computers with sophisticated graphics capabilities at significantly faster drawing speeds.

The Macintosh Display Card 8•24 GC contains an Am29000 RISC-based microprocessor that runs a version of QuickDraw™ that has been optimized for a coprocessing environment. The Am29000 and the Macintosh CPU work together to accelerate the QuickDraw environment, increasing the Macintosh drawing speed 5 to 30 times depending on the application. As a result, graphics-intensive applications work faster and more smoothly, especially when using full 24-bit color.

The Macintosh Display Card 8•24 GC supports all Apple displays to the maximum of their capabilities, including full 256-level true gray scale on all Apple displays. The card also supports full 24-bit true color on the AppleColor™ High-Resolution RGB Monitor, giving you the ability to display up to 16.7 million colors simultaneously to generate images of photographic quality. In addition to letting you display and work with photographic-quality images, true gray-scale and true color capabilities allow you to work with lifelike simulations, animations, and visual effects.

The card also supports RS-170 standard timing, for compatibility with interlaced video devices such as televisions and VCRs, and provides the highest-possible-

quality interlaced video through the use of Apple Convolution. A capability that is usually associated with much more expensive systems, Apple Convolution evaluates adjacent lines and pixels on interlaced video devices, then adjusts the image on the screen to provide smoother, more continuous images than could otherwise be generated.

In addition, the Macintosh Display Card 8•24 GC can be upgraded using the Macintosh Display Card DRAM Expansion Kit, which can improve the performance of applications that use larger off-screen bitmaps and other imaging methods.

The capabilities of the Macintosh Display Card 8•24 GC, combined with the power of Macintosh, enable you to produce powerful results.

Features	*Benefits*
▶ Combined display and graphics coprocessing capabilities with support for all Apple displays	▶ Provides support for a wide range of display types, both color and gray scale. ▶ Enables you to upgrade to color displays or to larger displays without replacing the card. ▶ Requires only one NuBus™ slot.
▶ On-board Am29000 RISC-based microprocessor running at 30 mega-hertz	▶ Enables graphics-intensive applications to run more quickly, and new types of applications to run, by boosting the performance of applications by as much as 30 times over normal Macintosh drawing speeds. ▶ Provides fast access to display memory.
▶ 24-bit true color and 256-level true gray-scale support	▶ Supports up to full 24-bit true color on the AppleColor High-Resolution RGB Monitor, and full 256-level gray scale on all Apple displays. ▶ Offers a comprehensive range of colors and gray levels for enhancing graphics, presentation materials, and other documents.
▶ Software downloading at system startup	▶ A single file placed in the Macintosh System Folder provides instructions to the Macintosh Display Card 8•24 GC. ▶ Provides a version of QuickDraw imaging software that is optimized for a coprocessing environment, as well as a Control Panel accessory.
▶ Auto-configuration and software-selectable display modes	▶ Streamlines operation by automatically determining which Apple display is attached and switching modes without user intervention. ▶ Lets you choose pixel depths to display 2, 4, 16, 256, or 16.7 million colors with a simple change on the computer's Control Panel.
▶ RS-170 timing and Apple Convolution	▶ Provides interlaced video output compatible with many types of video equipment. ▶ Apple Convolution improves the image quality on interlaced video devices; with the Macintosh Display Card 8•24 GC, up to 256 colors (8 bits per pixel) are supported.
▶ NuBus compatible	▶ Plugs easily into any Macintosh II slot. ▶ Supports NuBus master and slave block transfer modes for fast access to other cards installed in the computer.
▶ Optional Macintosh Display Card DRAM Expansion Kit	▶ Lets users add on-board dynamic RAM (DRAM) to boost the performance of applications that use off-screen bitmaps and other graphics techniques.

System Requirements	To use the Macintosh Display Card 8•24 GC, you'll need the following: ▶ A personal computer in the Macintosh II family with an available NuBus slot	▶ System Software Version 6.0.5 or later ▶ A minimum of 2 megabytes of memory	▶ For Macintosh II, IIx, and IIcx: The 32-bit Quick-Draw software is needed to run 24-bit color applications.

Technical Specifications	**Graphics coprocessor** ▶ Advanced Micro Devices Am29000 RISC-based processor running at 30 megahertz **On-board memory** ▶ 2 megabytes of DRAM used as display frame buffer and processor instruction memory ▶ 64 kilobytes of SRAM used as processor instruction cache ▶ Can be expanded via SIMM sockets with the Macintosh Display Card DRAM Expansion Kit to hold an additional 2 megabytes of DRAM, for processing of large off-screen graphics. Can be expanded to up to 8 megabytes via third-party SIMMs. **Display modes** ▶ 1, 2, 4, 8, or 24 bits per pixel (2, 4, 16, 256, or 16.7 million colors) ▶ Software-selectable **Display resolution** ▶ Up to 1,152 pixels horizontally by 870 pixels	vertically, depending on display resolution ▶ Auto-configuring **Apple Convolution** ▶ Convolution available for RS-170 interlaced video to up to 8 bits per pixel (256 colors) **Interface** ▶ NuBus; plugs into any Macintosh II slot ▶ NuBus master and slave block transfer modes supported **Connector** ▶ 15-pin D-style **Color lookup table** ▶ In 24-bit mode, provides direct access to 16.7 million colors, driving 8-bit DACs (digital-analog converters) for each of the three RGB channels ▶ In other modes, provides a palette of up to 256 colors out of 16.7 million **Output signals** ▶ Modes: RGB (analog) and gray scale	▶ Video: RS-343 standard. Supports RS-170 timing standard for interlaced video with overscan and underscan modes. ▶ Sync: Separate or composite depending on display resolution; nega-tive-going; TTL **Raster rates** ▶ Variable raster rates under software control ▶ Vertical refresh: 66.7 or 75 hertz depending on display resolution ▶ Dot clock: 12.2727, 30.24, 57.2832, or 100 megahertz depending on display resolution **Power consumption** ▶ 20 watts (In systems with all NuBus slots utilized, the power requirements of all cards installed should be added together to ensure that the NuBus power draw is not exceeded. For more information, see the Macintosh owner's guide.)

Display Modes Supported

Display	Macintosh Display Card 8•24 GC
▶ Apple High-Resolution Monochrome Monitor	▶ 640 x 480 pixels ▶ 2, 4, 16, or 256 gray levels
▶ AppleColor High-Resolution RGB Monitor	▶ 640 x 480 pixels ▶ 2, 4, 16, 256, or 16.7 million colors
▶ Apple Macintosh Portrait Display	▶ 640 x 870 pixels ▶ 2, 4, 16, or 256 gray levels
▶ Apple Two-Page Mono-chrome Monitor	▶ 1,152 x 870 pixels ▶ 2, 4, 16, or 256 gray levels
▶ Interlaced video devices	▶ 640 x 480 pixels ▶ 2, 4, 16, 256, or 16.7 million colors (Apple Convolution enabled up to 256 colors)

Ordering Information

Macintosh Display Card 8•24 GC	Order No. M0122	With your order, you'll receive: ▶ Macintosh Display Card 8•24 GC ▶ Macintosh Display Card 8•24 GC software ▶ Owner's guide ▶ Limited warranty statement
Macintosh Display Card DRAM Kit	Order No. M0505LL/A	With your order, you'll receive: ▶ Two DRAM upgrade SIMMs