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Macintosh Display Cards Overview (3 of 3)

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(This is a continuation of, "Macintosh Display Cards Overview (2 of 3)")

- NuBus Block Transfer

One important display card acceleration feature is the NuBus block transfer function. Macintosh Display Card 8/24 GC supports both master and slave NuBus block transfer. Macintosh Display Card 4/8 and 8/24 support NuBus block transfers in slave mode only.

Most Macintosh systems do not support NuBus block transfer so this function is primarily a factor between NuBus cards with block transfer abilities. However, the Macintosh IIx does support block transfers in slave mode only.

NuBus block transfer facilitates faster movement of data. Normally data is moved across NuBus in 32-bit words, 16-bit half-words, or bytes. Bus availability must be arbitrated between each word transferred. Under NuBus block transfer, the bus is arbitrated by the master, and then held while one address word and 16 data words are transferred to the addressed NuBus slave. Block transfer mode significantly accelerates the flow of data between the new display cards.

Because the Macintosh and many other NuBus cards lack NuBus block transfer support, another scheme is used to speed up data transfer between the Display Card 8/24 and other NuBus clients. Pseudo-block transfer is similar to block transfer in that it claims the bus for a 16 NuBus data word transaction; however, it must send an address word for each data word that it sends. The extra transfer activity makes pseudo-block transfer slower than block transfer but still an improvement over normal NuBus access times.

- Multiple Display Cards in One System

When multiple display cards are installed, the Macintosh Display Card 8/24 GC accelerates drawing in frame buffers of the Macintosh Display Card 4/8, 8/24, or other frame buffer cards. Display Cards 4/8 and 8/24 show the most improvement because they support slave NuBus block transfers and many other display cards do not. Acceleration for frame buffers other than the one resident on the Display Card 8/24 GC card would not be as dramatic because of the greater amount of NuBus traffic required. Only one 8/24 GC may be used for graphics acceleration in a system. If two cards are present, one will have its

acceleration function disabled.

- Upgrades

The Macintosh Display Card 4/8 can be upgraded to Display Card 8/24 by using the Macintosh Display Card VRAM Kit.

The Macintosh Display Card 8/24 GC can be upgraded with the Macintosh Display Card DRAM Expansion Kit, which improves the performance of applications that use large off-screen bitmaps and other imaging methods.

System Software

System Software Version 6.0.5 or greater is required with Display Cards 4/8, 8/24 and 8/24 GC. Macintosh II, IIx, and IIcx systems require the 32-bit QuickDraw patch file. Macintosh IIfx and IIcx systems have 32-bit QuickDraw in ROM and require only System 6.0.5 or greater.

System Requirements

To use the Macintosh Display Card 4/8, 8/24, or 8/24 GC you need:

- A modular Macintosh II personal computer with an available NuBus slot
- System Software Version 6.0.5 or greater
- For Macintosh II, IIx and IIcx: the 32-bit QuickDraw software file is needed to run 24-bit color applications.
- To take advantage of full 24-bit color, a minimum of 2MB of memory is recommended.

Support Issues

- Cables For Current Portrait and Two-Page Display Customers

Current Portrait and Two-Page display customers must purchase a DB-15 to DB-25 adaptor when connecting any of the new display cards. Customers buying new Portrait and Two-Page displays will receive the proper cable.

- A/UX

The Display Card 8/24 GC will not initially work with A/UX. A/UX 2.0 compatibility is planned.

- Power Consumption

The Display Card 8/24 GC uses up to a maximum of 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. Six-slot Macintosh modularity provide 90 watts for nuBus, 3-slot Macintosh provide 45 watts.

- Macintosh II ROMs

The original Mac II ROMs had several problems that will not allow the Display

Cards to function properly. There is a service program in place that will replace the original ROMs with new ones.

Connector Pinouts

DB-15 Monitor Video Connector for Display Cards 4/8, 8/24 and 8/24 GC.

Pin	Signal	Description
1	RED.GND	Red Video Ground
2	RED.VID	Red Video
3	CSYNC~	Composite Sync.
4	MON.ID1	Monitor ID, Bit 1
5	GRN.VID	Green Video
6	GRN.GND	Green Video Ground
7	MON.ID2	Monitor ID, Bit 2
8	nc	(No Connection)
9	BLU.VID	Blue Video
10	MON.ID3	Monitor ID, Bit 3
11	C&VSYNC.GND	CSYNC & VSYNC Ground
12	VSYNC~	Vertical Sync.
13	BLU.GND	Blue Video Ground
14	HSYNC.GND	HSYNC Ground
15	HSYNC~	Horizontal Sync.
Shell	CHASSIS.GND	Chassis Ground

the Portrait and Two-Page Displays.

DB-15	Signal	D-25
1	RED.GND	A3 (Outer)
2	RED.VID	A3 (Center)
3	CSYNC~	5
4	MON.ID1	9
5	GRN.VID	A2 (Center)
6	GRN.GND	A2 (Outer)
7	MON.ID2	8
8	nc	
9	BLU.VID	A1 (Center)
10	MON.ID3	3
11	C&VSYNC.GND	4, 7, 10
12	VSYNC~	2
13	BLU.GND	A1 (Outer)
14	HSYNC.GND	1
15	HSYNC~	6
Shell	CHASSIS.GND	Shell

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