



Online Manual

Choose one of the following categories:

- **Getting Started Guide**
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User's Guides

Click on your product:

- **ALL-IN-WONDER 128**
- **ALL-IN-WONDER PRO**
- **ATI MULTIMEDIA CENTER**
Some ATI Graphics cards will not support all of the features and functionality in the ATI Multimedia Center
- **ATI-TELETEXT MANUAL**
- **ATI-TV**
- **ATI-TV WONDER**
- **USING VIDEO IN/OUT**



Technical Information

Click on your product:

- 3D CHARGER
- ALL-IN-WONDER
- ALL-IN-WONDER 128
- ALL-IN-WONDER 128 PRO
- ALL-IN-WONDER PRO
- RAGE FURY
- RAGE FURY MAXX
- RAGE FURY PRO
- RAGE MAGNUM
- XPERT 98
- XPERT 99
- XPERT 128
- XPERT 2000
- XPERT LCD
- XPERT@WORK
- XPERT@PLAY

Getting Started...



- Installing Your ATI Graphics Accelerator Card
- Installing Enhanced Drivers for Windows® 95 and Windows® 98
- Installing Enhanced Drivers for Windows® NT
- Multiple Display Support in Windows® 98
- Troubleshooting Tips
- Using the Online Manual

ATI's graphics accelerators are the most advanced on the market today. They improve the performance of your system and display exceptional graphics.

Your ATI graphics accelerator comes complete with enhanced drivers and comprehensive award-winning software utilities designed to make you more productive. Please read this guide before attempting to install your card.

Preparing Your Computer



Turn off the power to your system and discharge your body's static electric charge by touching a grounded surface—for example, the metal surface of the power supply—before performing any hardware procedure.

The manufacturer assumes no liability for any damage, caused directly or indirectly, by improper installation of any components by unauthorized service personnel. If you do not feel comfortable performing the installation, consult a qualified computer technician.

Damage to system components, the accelerator card, and injury to yourself may result if power is applied during installation.

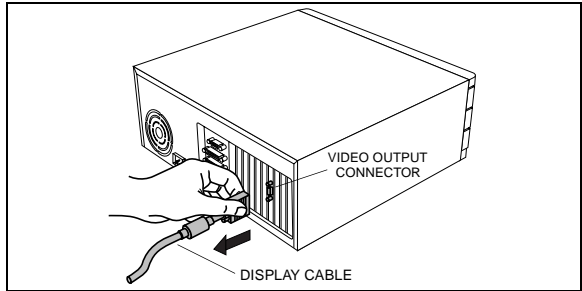
If you are using **Windows® NT**, you need to update your operating system to **Service Pack 3 (SP3)** or later before installing your ATI graphics accelerator. Additionally, if your current system configuration uses special drivers that are not **640x480 VGA**, you may encounter conflicts with the card. We recommend that you first reconfigure your operating system to use a **VGA** driver supplied with your operating system before installing the card. For more information about changing your operating system configuration, see your operating system documentation.

Installing Your ATI Graphics Accelerator Card

Now that you have prepared your computer, you are ready to install your graphics accelerator card.

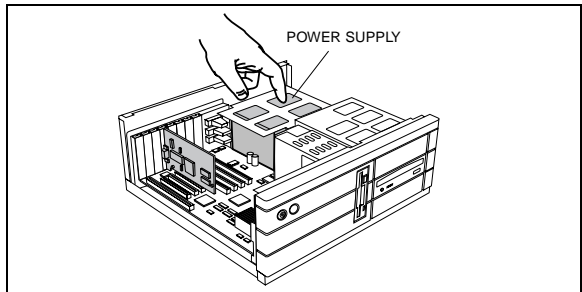
To install your graphics accelerator card

- 1** Power off the computer and monitor, then disconnect the display cable from the back of your computer.



- 2** Remove the computer cover. If necessary, consult your computer's manual for help in removing the cover.

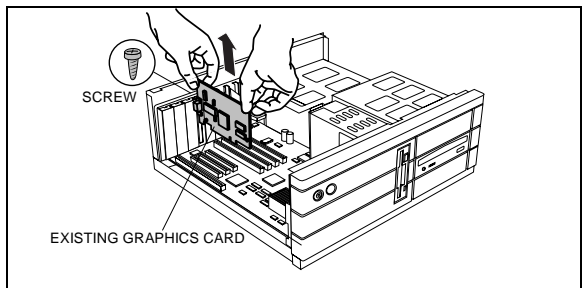
Remember to discharge your body's static electricity by touching the metal surface of the computer chassis.



- 3** If you intend to run multiple displays with Windows[®] 98 (see [page 6](#)), then proceed to step 4. **Otherwise, remove any existing graphics card from your computer.**

If the old graphics card sticks, rock it gently from end to end.

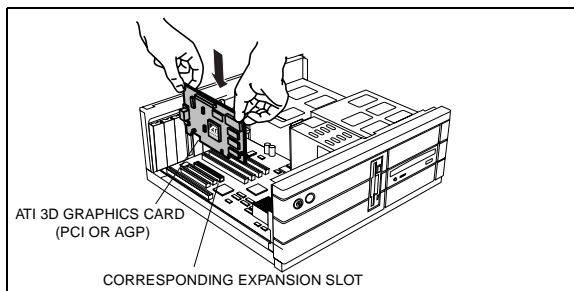
Remember to save the screw.



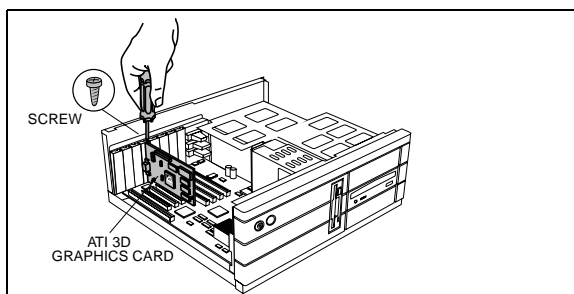
*Or, if your computer has any **on-board graphics capability**, you may need to **disable** it on the motherboard. For more information, see your computer documentation.*

- 4** If necessary, remove the metal cover from the empty expansion slot that you select (PCI card use a PCI slot; AGP cards use an AGP slot); then **align your new card with the expansion slot, and press it in firmly until the card is fully seated.**

*Grasp the new card by the top edge and carefully seat it into the appropriate expansion slot (PCI or AGP). Ensure that the metal contacts are **completely** pushed into the slot.*

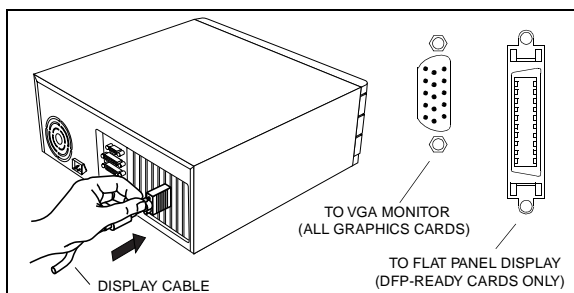


- 5** Replace the screw to fasten the card in place, and replace the computer cover.



- 6** Plug the display cable into your card; then turn on the computer and display device. For cards with a Digital Flat Panel (DFP) connector, connect your monitor or flat panel display (or both) to the appropriate connector, as shown. Next, **reboot your system.**

Make sure all cables are securely connected.



You are now ready to proceed with the installation of ATI's enhanced drivers. For detailed instructions, select your operating system from the list below:

- Windows[®] 95/98, see **Windows[®] "New Hardware Found"** on [page 4](#).
- Windows[®] NT, see [page 6](#).

Windows® “New Hardware Found”

If you are running Windows® 95 or Windows® 98, new hardware may be detected after you restart your computer. Follow the step-by-step instructions below to allow Windows® to correctly identify your new hardware.

To identify new hardware in Windows® 95

- 1 Windows® 95 briefly displays the “New Hardware Found” dialog before launching the “Update Device Driver Wizard”.

If the wizard does not appear, proceed directly to [Installing Enhanced Drivers for Windows® 95 and Windows® 98](#) on page 5.

- 2 Click **Next**.
- 3 Click **Finish**.
- 4 Insert your Windows® 95 CD-ROM into your CD-ROM drive.
- 5 Click **OK**.
- 6 Type the following:
D:\WIN95
(If **D** is not your CD-ROM drive, substitute **D** with the correct drive letter.)
- 7 Click **OK**.
- 8 Click **Yes** to restart your computer.

You are now ready to install your ATI enhanced drivers. Proceed to [Installing Enhanced Drivers for Windows® 95 and Windows® 98](#) on page 5, and follow the step-by-step instructions to complete the installation.

To identify new hardware in Windows® 98

After restarting your system, Windows® 98 will briefly display the “New Hardware Found” dialog. Depending on your new hardware, you will either be prompted to insert your Windows® 98 CD-ROM or Windows® 98 will launch the “Add New Hardware Wizard”.

If Windows® 98 automatically begins installing drivers for your new hardware, click **Yes** to restart your computer when prompted; then proceed to [Installing Enhanced Drivers for Windows® 95 and Windows® 98](#) on page 5.

To identify new hardware using Windows® 98 CD-ROM

- 1 Insert your Windows® 98 CD-ROM.
- 2 Click **OK**.
- 3 Type the following:
D:\WIN98
(If **D** is not your CD-ROM drive, substitute **D** with the correct drive letter.)
- 4 Click **OK**.
- 5 Click **Yes** to restart your computer.

You are now ready to install your ATI enhanced drivers. Proceed to [Installing Enhanced Drivers for Windows® 95 and Windows® 98](#) on page 5, and follow the step-by-step instructions to complete the installation.

To identify new hardware using “Add New Hardware Wizard”

- 1 Windows® 98 launches the “Add New Hardware Wizard” which prompts you to search for the Standard PCI Graphics Adapter (VGA).
- 2 Click **Next** to continue.
- 3 Select **Search for the best driver for your device**.
- 4 Click **Next** to continue.
- 5 Click **Next** to start the driver search.
- 6 Click **Next** to install the Standard PCI Graphics Adapter (VGA).
- 7 Click **Finish**.
- 8 Click **Yes** to restart your computer.

You are now ready to install your ATI enhanced drivers. Proceed to [Installing Enhanced Drivers for Windows® 95 and Windows® 98](#) on page 5, and follow the step-by-step instructions to complete the installation.

Installing Enhanced Drivers for Windows® 95 and Windows® 98

With Windows® 95 or Windows® 98 running on your computer, you need to install the enhanced ATI drivers to take advantage of your card’s higher performance, resolutions, and special features.

To ensure that you install the latest drivers, install the ATI enhanced drivers located on the CD-ROM shipped with your graphics accelerator card.

To install the ATI enhanced drivers for Windows® 95 or Windows® 98

- 1 Insert the ATI INSTALLATION CD-ROM into your CD-ROM drive.
If Windows® runs the CD-ROM automatically, proceed to step 6.
- 2 Click **Start**.
- 3 Select **Run**.
- 4 Type the following:
D:\ATISETUP
(If **D** is not your CD-ROM drive, substitute **D** with the correct drive letter.)
- 5 Click **OK**.
- 6 Click on **ATI Easy Install** to begin the Installation Wizard.
- 7 Click **Next**.
- 8 Click **Yes**.

- 9 Follow the Wizard's on-screen instructions to complete the installation.

*The **Express** installation option is recommended. If your ATI product includes a multimedia component, the software for that component will automatically be installed, along with the ATI enhanced drivers, by selecting this option.*

Installing Enhanced Drivers for Windows® NT

Make sure that your operating system has been updated to Service Pack 3 (SP3) or later before attempting to install your ATI graphics accelerator card. After installing your card, Windows® NT will default to standard VGA mode (640 x 480, 16 colors).

To install the ATI enhanced drivers for Windows® NT 4.0

- 1 Insert the ATI INSTALLATION CD-ROM into your CD-ROM drive.
If Windows® NT runs the CD-ROM automatically, proceed to step 6.
- 2 Click **Start**.
- 3 Select **Run**.
- 4 Type the following:
D:\ATISETUP
(If **D** is not your CD-ROM drive, substitute **D** with the correct drive letter.)
- 5 Click **OK**.
- 6 Click on **ATI Easy Install** to begin the Installation Wizard.
- 7 Follow the Wizard's on-screen instructions to complete the installation.

Multiple Display Support in Windows® 98

IMPORTANT: Please read the **Readme** file on the ATI Installation CD-ROM for the latest information regarding Multiple Display Support in Windows® 98.

Windows® 98 provides support for using more than one display device at a time – you simply install a separate PCI or AGP graphics card for each additional display you intend to use. With multiple displays, you can expand your desktop, run different programs on separate displays, even play some newer games with multiple views. And each display can have a different resolution and color depth!

Note that, under Windows® 98, one graphics card is automatically designated by the system as the **primary** graphics card. Each additional graphics card is designated by the system as a **secondary** graphics card. Certain 3D and multimedia features are only available on the **primary** graphics card. The primary graphics card is the one that displays the POST information during startup. If you are installing more than one graphics card, you need to consider the following:

- If you install both a PCI and an AGP graphics card in the same system, the AGP graphics card will become the secondary graphics card, in most systems. Some manufacturers offer an upgraded BIOS that allows an AGP card to be designated as the primary graphics card. Contact your system vendor for details.
- If you install two or more PCI graphics cards in the same system, the primary graphics card is typically the one installed in the PCI slot with the *lowest* number. This is typically the PCI slot *furthest* from the computer's ISA slots. Consult your computer system manual for help in selecting a slot.

Troubleshooting Tips

The following troubleshooting tips may help if you experience problems. Contact your dealer for more advanced troubleshooting information.

- Check that the card is seated properly in its expansion slot.
- Ensure the display cable is securely fastened to the card's display connector.
- Make sure that the display and computer are plugged in and receiving power.
- If necessary, disable any built-in graphics capabilities on your motherboard. For more information, see your computer's manual.
- Make sure you selected the appropriate display device and graphics card when you installed your enhanced driver.
- For more troubleshooting tips, right-click the ATI icon in the taskbar and select **Troubleshooting**.
- If you have problems during start-up, start your computer in **Safe Mode**. In Windows[®] 95, press the F8 key when "Starting Windows 95" appears; or, in Windows[®] 98, press and hold the CTRL key until the Windows[®] 98 Startup Menu appears on the screen. Then select the number for Safe Mode, and press **Enter**.

Using the Online Manual

Your graphics accelerator comes with an online manual that describes the extensive features of your graphics card. The **Online Manual** provides reference, specification, disclaimer, legal, and compliance information that is not contained in this paper guide.

To open the Online Manual

- 1 Insert the ATI INSTALLATION CD-ROM into your CD-ROM drive.

If Windows[®] runs the ATI INSTALLATION CD-ROM automatically, proceed to step 6.

- 2 Click **Start**.

- 3 Select **Run**.

- 4 Type the following:

D:\ATISSETUP

(If **D** is not your CD-ROM drive, substitute **D** with the correct drive letter.)

- 5 Click **OK**.

- 6 Click on **Online User Manual**..



3D Charger Technical Information

System Requirements

Computer System Pentium®/Pentium Pro®/Pentium II®, or compatible system with PCI Local Bus or AGP expansion slot.

Expansion Slot 32-bit PCI Local Bus (AGP slot for AGP variants).

Operating System DOS® 5.0 or higher, Windows 3.1x®, Windows 95®, Windows 98®, Windows NT®, or OS/2 Warp®.

Specifications

Memory Configuration 4MB or 8MB.

Sync Signals Separate horizontal and vertical sync at TTL levels.

TV Output Connectors (Not available in all configurations):
Composite Output (NTSC or PAL standard) S-Video Output.

Video BIOS PCI 2.1 compliant. AGP 1.0 compliant (AGP 2X compliant).

Video Output Connector 15-pin D shell (female), IBM standard.

Video Interrupt Auto-configured by system for PCI or AGP, as required.

AMC Connector 2x20 pin header. Shares the same footprint with the 2x13 pin VGA Feature Connector, VGA Out only, VESA standard.

Power +5V ±5% @ 1.3A typical.

Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).



Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF >250,000 hours.

Video Mode Table

3D CHARGER Video Mode Table												
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)								
				4 MB				8 MB				
				8	16	24	*32	8	16	24	*32	
640x480	60	31.5	25.1	•	•	•	•	•	•	•	•	
640x480	72	37.4	32.0	•	•	•	•	•	•	•	•	
640x480	75	37.5	31.5	•	•	•	•	•	•	•	•	
640x480	85	43.3	36.0	•	•	•	•	•	•	•	•	
640x480	90	48.0	39.9	•	•	•	•	•	•	•	•	
640x480	100	52.9	44.9	•	•	•	•	•	•	•	•	
640x480	120	63.7	55.0	•	•	•	•	•	•	•	•	
640x480	160	84.1	70.0	•	•	•	•	•	•	•	•	
640x480	200	100.2	81.0	•	•	•	•	•	•	•	•	
800x600	48	33.8	36.0	•	•	•	•	•	•	•	•	
800x600	56	35.2	36.0	•	•	•	•	•	•	•	•	
800x600	60	37.8	39.9	•	•	•	•	•	•	•	•	
800x600	70	44.5	44.9	•	•	•	•	•	•	•	•	
800x600	72	48.0	50.0	•	•	•	•	•	•	•	•	
800x600	75	46.9	49.5	•	•	•	•	•	•	•	•	
800x600	85	53.7	56.2	•	•	•	•	•	•	•	•	
800x600	90	57.1	56.6	•	•	•	•	•	•	•	•	
800x600	100	62.5	67.5	•	•	•	•	•	•	•	•	
800x600	120	76.0	81.0	•	•	•	•	•	•	•	•	
800x600	160	99.6	106.0	•	•	•	•	•	•	•	•	
800x600	200	125.9	135.0	•	•	•	•	•	•	•	•	
1024x768	43	35.5	44.9	•	•	•	•	•	•	•	•	
1024x768	60	48.4	65.0	•	•	•	•	•	•	•	•	
1024x768	70	56.5	75.0	•	•	•	•	•	•	•	•	
1024x768	72	58.2	75.0	•	•	•	•	•	•	•	•	
1024x768	75	60.0	78.8	•	•	•	•	•	•	•	•	
1024x768	85	68.7	94.5	•	•	•	•	•	•	•	•	
1024x768	90	76.2	100.0	•	•	•	•	•	•	•	•	
1024x768	100	79.0	110.0	•	•	•	•	•	•	•	•	
1024x768	120	96.7	130.0	•	•	•	•	•	•	•	•	
1024x768	140	113.3	157.5	•	•	•	•	•	•	•	•	
1024x768	150	120.6	160.0	•	•	•	•	•	•	•	•	



3D CHARGER Video Mode Table												
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)								
				4 MB				8 MB				
				8	16	24	*32	8	16	24	*32	
1152x864	43	45.9	65.0	*	*	*	*	*	*	*	*	*
1152x864	47	44.9	65.0	*	*	*	*	*	*	*	*	*
1152x864	60	54.9	80.0	*	*	*	*	*	*	*	*	*
1152x864	70	66.1	100.0	*	*	*	*	*	*	*	*	*
1152x864	75	75.1	110.0	*	*	*	*	*	*	*	*	*
1152x864	80	76.4	110.0	*	*	*	*	*	*	*	*	*
1152x864	85	77.1	121.5	*	*	*	*	*	*	*	*	*
1152x864	100	90.2	135.0	*	*	*	*	*	*	*	*	*
1280x1024	43	50.0	80.0	*	*	*	*	*	*	*	*	*
1280x1024	47	50.0	80.0	*	*	*	*	*	*	*	*	*
1280x1024	60	64.0	110.0	*	*	*	*	*	*	*	*	*
1280x1024	70	74.6	126.0	*	*	*	*	*	*	*	*	*
1280x1024	74	77.9	135.0	*	*	*	*	*	*	*	*	*
1280x1024	75	80.0	135.0	*	*	*	*	*	*	*	*	*
1280x1024	85	91.2	157.5	*	*	*	*	*	*	*	*	*

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



RAGE FURY MAXX

Technical Information

System Requirements

Pentium® III/II, Celeron, AMD K6-3, Athlon, or compatible system with Accelerated Graphics Port (AGP) slot.

AGP compliant.

CD-ROM drive required for software.

DVD drive required for DVD playback.

Specifications

Operating System Windows® 98.

Memory Configuration 64 MB.

Sync Signals Separate horizontal and vertical sync at TTL levels.

Video BIOS AGP compliant.

Video Output Connector CRT monitor, 15-pin D shell (female), IBM standard.

Display support DDC1/2b/2b+ monitor support; VESA Display Power Management support.

Video Interrupt IRQ 11 is requested, although the actual IRQ number is automatically assigned by the Plug & Play system BIOS.

Power +5V $\pm 5\%$ @ 0.6 A typical.
+3.3V $\pm 5\%$ @ 2.2 A typical.
+12V $\pm 5\%$ @ .05 A typical.



Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).

Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF >300,000 hours.

EMC Certification CISPR2:1998-Class B-Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment.

EN 50082-1:1997-Generic Immunity Standards- Residential, Commercial and Light Industry.

FCC PART 15, SUBPART B-UNINTENTIONAL RADIATORS, CLASS B COMPUTING DEVICES FOR HOME AND OFFICE USE.

Video Mode Table

RAGE FURY MAXX 64 MB *Video Mode Table													
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				2D Display Modes				3D Display Modes					
				8	16	24	*32	8	16	24	*32		
640x480	60	31.5	25.2	*	*	*	*	*	*	*	*	*	*
640x480	75	37.9	31.5	*	*	*	*	*	*	*	*	*	*
640x480	85	43.3	36.0	*	*	*	*	*	*	*	*	*	*
640x480	90	45.4	37.8	*	*	*	*	*	*	*	*	*	*
640x480	100	50.9	43.1	*	*	*	*	*	*	*	*	*	*
640x480	120	61.8	52.4	*	*	*	*	*	*	*	*	*	*
640x480	160	84.3	72.8	*	*	*	*	*	*	*	*	*	*
800x600	60	37.9	39.9	*	*	*	*	*	*	*	*	*	*
800x600	75	46.9	49.5	*	*	*	*	*	*	*	*	*	*
800x600	85	53.7	56.3	*	*	*	*	*	*	*	*	*	*
800x600	90	56.8	60.0	*	*	*	*	*	*	*	*	*	*
800x600	100	63.6	68.1	*	*	*	*	*	*	*	*	*	*
800x600	120	77.1	83.9	*	*	*	*	*	*	*	*	*	*
800x600	160	105.4	116.4	*	*	*	*	*	*	*	*	*	*
1024x768	60	48.4	65.0	*	*	*	*	*	*	*	*	*	*
1024x768	75	60.0	78.8	*	*	*	*	*	*	*	*	*	*
1024x768	85	68.7	94.5	*	*	*	*	*	*	*	*	*	*
1024x768	90	72.8	100.1	*	*	*	*	*	*	*	*	*	*



RAGE FURY MAXX

RAGE FURY MAXX 64 MB *Video Mode Table											
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)							
				2D Display Modes				3D Display Modes			
				8	16	24	*32	8	16	24	*32
1024x768	100	81.4	113.3	•	•	•	•	•	•	•	•
1024x768	120	98.7	139.0	•	•	•	•	•	•	•	•
1024X768	160	134.8	192.0	•	•	•	•	•	•	•	•
1152x864	60	53.7	81.6	•	•	•	•	•	•	•	•
1152x864	75	67.5	108.0	•	•	•	•	•	•	•	•
1152x864	85	77.0	119.6	•	•	•	•	•	•	•	•
1152x864	100	91.5	143.4	•	•	•	•	•	•	•	•
1152x864	120	111.1	176.0	•	•	•	•	•	•	•	•
1280x1024	60	64.0	108.0	•	•	•	•	•	•	•	•
1280x1024	75	80.0	135.0	•	•	•	•	•	•	•	•
1280x1024	85	91.1	157.5	•	•	•	•	•	•	•	•
1280x1024	100	108.5	190.9	•	•	•	•	•	•	•	•
1280X1024	120	131.6	233.7	•	•	•	•	•	•	•	•
1600x1200	60	75.0	162.0	•	•	•	•	•	•	•	•
1600x1200	72	90.0	195.9	•	•	•	•	•	•	•	•
1600x1200	75	93.8	202.5	•	•	•	•	•	•	•	•
1600x1200	85	106.3	229.5	•	•	•	•	•	•	•	•
1600x1200	90	113.8	251.2	•	•	•	•	•	•	•	•

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



ALL-IN-WONDER PRO

ALL-IN-WONDER

Technical Information

System Requirements

Computer System Pentium®/Pentium® Pro®, Pentium®, II or compatible systems with PCI Local Bus or AGP bus.

Expansion Slot 32 bit PCI Local Bus (AGP) slot for AGP variants.

Operating System Windows 95®, Windows 98®. Only graphics features are supported under DOS 5.0® or higher, Windows 3.1x®, Windows NT® 3.51, 4.0, OS/2 2.1® or OS/2 Warp®.

Specifications

Video Display Buffer All-In-Wonder 2 MB non-upgradable, 2 MB upgradable to 4 MB, or 4 MB; All-In-Wonder Pro 2MB or 4MB, upgradable to 6MB or 8MB.

Sync Signals Separate horizontal and vertical sync at TTL levels.

Video BIOS PCI 2.1 compliant.

Video Output Connector 15-pin D shell (Female), IBM standard.

AMC Connector 2x20 pin header. Shares the same footprint with the 2x13 pin VGA Feature Connector, VGA Out only, VESA standard.

Video interrupt (Reserved for future use):PCI — system auto-configurable.

Power +5V $\pm 5\%$, @ 1.3A typical.



Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).

Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF 120,000 hours.

Video Mode Table

ALL-IN-WONDER and ALL-IN-WONDER PRO Video Mode Table															
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)											
				2 MB				4 MB				6 MB or 8 MB			
				8	16	24	*32	8	16	24	*32	8	16	24	*32
640x480	60	31.5	25.1	.	.	.	.	.	.	.	.	.	.
640x480	72	37.4	32.0	.	.	.	.	.	.	.	.	.	.
640x480	75	37.5	31.5	.	.	.	.	.	.	.	.	.	.
640x480	85	43.3	36.0	.	.	.	.	.	.	.	.	.	.
640x480	90	48.0	39.9	.	.	.	.	.	.	.	.	.	.
640x480	100	52.9	44.9	.	.	.	.	.	.	.	.	.	.
640x480	120	63.7	55.0	.	.	.	.	.	.	.	.	.	.
640x480	160	84.1	70.0	.	.	.	.	.	.	.	.	.	.
640x480	200	100.2	81.0	.	.	.	.	.	.	.	.	.	.
800x600	48	33.8	36.0	.	.	.	.	.	.	.	.	.	.
800x600	56	35.2	36.0	.	.	.	.	.	.	.	.	.	.
800x600	60	37.8	39.9	.	.	.	.	.	.	.	.	.	.
800x600	70	44.5	44.9	.	.	.	.	.	.	.	.	.	.
800x600	72	48.0	50.0	.	.	.	.	.	.	.	.	.	.
800x600	75	46.9	49.5	.	.	.	.	.	.	.	.	.	.
800x600	85	53.7	56.2	.	.	.	.	.	.	.	.	.	.
800x600	90	57.1	56.6	.	.	.	.	.	.	.	.	.	.
800x600	100	62.5	67.5	.	.	.	.	.	.	.	.	.	.
800x600	120	76.0	81.0	.	.	.	.	.	.	.	.	.	.
800x600	160	99.6	106.0	.	.	.	.	.	.	.	.	.	.
800x600	200	125.9	135.0	.	.	.	.	.	.	.	.	.	.
1024x768	43	35.5	44.9	.	.	.	.	.	.	.	.	.	.
1024x768	60	48.4	65.0	.	.	.	.	.	.	.	.	.	.
1024x768	70	56.5	75.0	.	.	.	.	.	.	.	.	.	.
1024x768	72	58.2	75.0	.	.	.	.	.	.	.	.	.	.
1024x768	75	60.0	78.8	.	.	.	.	.	.	.	.	.	.
1024x768	85	68.7	94.5	.	.	.	.	.	.	.	.	.	.



ALL-IN-WONDER and ALL-IN-WONDER PRO Video Mode Table

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)													
				2 MB				4 MB				6 MB or 8 MB					
				8	16	24	*32	8	16	24	*32	8	16	24	*32		
1024x768	90	76.2	100.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	100	79.0	110.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	120	96.7	130.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	140	113.3	157.5	*	*			*	*	*	*	*	*	*	*	*	*
1024x768	150	120.6	160.0	*	*			*	*	*	*	*	*	*	*	*	*
1152x864	43	45.9	65.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	47	44.9	65.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	60	54.9	80.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	70	66.1	100.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	75	75.1	110.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	80	76.4	110.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	85	77.1	121.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	100	90.2	135.0	*	*			*	*	*	*	*	*	*	*	*	*
1152x864	120	108.7	172.0	*	*			*	*	*	*	*	*	*	*	*	*
1280x1024	43	50.0	80.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1280x1024	47	50.0	80.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1280x1024	60	64.0	110.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1280x1024	70	74.6	126.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1280x1024	74	77.9	135.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1280x1024	75	80.0	135.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1280x1024	85	91.2	157.5	*	*			*	*	*	*	*	*	*	*	*	*
1280x1024	90	96.2	160.0	*	*			*	*	*	*	*	*	*	*	*	*
1280x1024	100	106.4	172.0	*	*			*	*	*	*	*	*	*	*	*	*
1600x1200	52	68.0	135.0	*				*	*	*	*	*	*	*	*	*	*
1600x1200	58	75.0	135.0	*				*	*	*	*	*	*	*	*	*	*
1600x1200	60	76.2	156.0	*				*	*	*	*	*	*	*	*	*	*
1600x1200	72	89.7	194.4	*				*	*	*	*	*	*	*	*	*	*
1600x1200	75	93.8	202.0	*				*	*	*	*	*	*	*	*	*	*
1600x1200	85	106.2	229.5	*				*	*	*	*	*	*	*	*	*	*

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



ALL-IN-WONDER™ 128 PRO

Technical Information

System Requirements

Pentium® II/III, Celeron or compatible system with Accelerated Graphics Port (AGP) slot.

AGP 1.0 compliant.

CD-ROM drive required for software installation.

DVD drive required for DVD playback.

Specifications

Operating System Windows® 95b (OSR2), Windows® 98, Windows® 98 SE or Windows® NT 4.0. (Graphics only. No multimedia features available).

Memory Configuration 32 MB.

Sync Signals Separate horizontal and vertical sync at TTL levels.

TV Output Connectors NTSC output (PAL versions available). Composite and S-Video connectors.

Video BIOS AGP 1.0 compliant (AGP 2X compliant).

Video Output Connector CRT monitor, 15-pin D shell (female), IBM standard.

Display support DDC1/2b/2b+ monitor support; VESA Display Power Management support.

Video Interrupt IRQ 11 is requested, although the actual IRQ number is automatically assigned by the Plug & Play system BIOS.

Power +5V ±5% @ 0.4 A typical.
+3.3V ±5% @ 2.0 A typical.
+12V ±5% @ 0.1 A typical.



Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).

Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF >300,000 hours.

EMC Certification FCC Class B.

Video Mode Table

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				32 MB			
				8	16	24	*32
640x480	60	31.5	25.2	•	•	•	•
640x480	72	37.9	31.5	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•
640x480	90	48.0	37.8	•	•	•	•
640x480	100	50.9	43.1	•	•	•	•
640x480	120	61.8	52.4	•	•	•	•
640x480	160	84.3	72.8	•	•	•	•
640x480	200	108.0	95.0	•	•	•	•
800x600	48	26.4	29.3	•	•	•	•
800x600	56	35.1	36.0	•	•	•	•
800x600	60	37.9	39.9	•	•	•	•
800x600	70	43.7	45.5	•	•	•	•
800x600	72	48.1	50.0	•	•	•	•
800x600	75	46.9	49.5	•	•	•	•
800x600	85	53.7	56.3	•	•	•	•
800x600	90	56.8	60.0	•	•	•	•
800x600	100	63.6	68.1	•	•	•	•
800x600	120	77.1	83.9	•	•	•	•
800x600	160	105.4	116.4	•	•	•	•
800x600	180	120.0	132.5	•	•	•	•
800x600	200	135.0	149.0	•	•	•	•
1024x768	43	35.5	44.9	•	•	•	•
1024x768	60	48.4	65.0	•	•	•	•
1024x768	70	56.5	75.0	•	•	•	•



ALL-IN-WONDER 128 PRO Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
1024x768	72	57.6	78.4	•	•	•	•
1024x768	75	60.0	78.8	•	•	•	•
1024x768	85	68.7	94.5	•	•	•	•
1024x768	90	72.8	100.1	•	•	•	•
1024x768	100	81.4	113.3	•	•	•	•
1024x768	120	98.7	139.0	•	•	•	•
1024x768	140	116.6	164.2	•	•	•	•
1024x768	150	125.7	176.9	•	•	•	•
1024x768	160	134.8	192.0	•	•	•	•
1024x768	180	153.5	218.6	•	•	•	•
1152x864	43	38.0	56.0	•	•	•	•
1152x864	47	41.7	62.1	•	•	•	•
1152x864	60	53.7	81.6	•	•	•	•
1152x864	70	63.0	96.7	•	•	•	•
1152x864	75	67.5	108.0	•	•	•	•
1152x864	80	72.4	112.3	•	•	•	•
1152x864	85	77.0	119.6	•	•	•	•
1152x864	100	91.5	143.4	•	•	•	•
1152x864	120	111.1	176.0	•	•	•	•
1152x864	150	141.4	226.3	•	•	•	•
1152x864	160	151.6	242.6	•	•	•	•
1280x1024	43	45.1	75.1	•	•	•	•
1280x1024	47	49.4	83.0	•	•	•	•
1280x1024	60	64.0	108.0	•	•	•	•
1280x1024	70	74.6	128.9	•	•	•	•
1280x1024	74	79.0	138.5	•	•	•	•
1280x1024	75	80.0	135.0	•	•	•	•
1280x1024	85	91.1	157.5	•	•	•	•
1280x1024	90	97.0	169.2	•	•	•	•
1280x1024	100	108.5	190.9	•	•	•	•
1280x1024	120	131.6	233.7	•	•	•	•
1280x1024	125	137.6	244.4	•	•	•	•
1600x1200	52	64.2	137.7	•	•	•	•
1600x1200	58	71.9	155.4	•	•	•	•
1600x1200	60	75.0	162.0	•	•	•	•
1600x1200	66	82.2	178.9	•	•	•	•
1600x1200	72	90.0	195.9	•	•	•	•
1600x1200	75	93.8	202.5	•	•	•	•
1600x1200	76	95.2	208.7	•	•	•	•
1600x1200	85	106.3	229.5	•	•	•	•
1800x1440	60	89.4	219.5	•	•	•	•



ALL-IN-WONDER 128 PRO Video Mode Table

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				32 MB			
				8	16	24	*32
1800x1440	65	97.1	238.5	•	•	•	•
1800x1440	70	104.9	249.9	•	•	•	•
1920x1080	60	67.0	172.7	•	•	•	•
1920x1080	70	78.6	205.1	•	•	•	•
1920x1080	75	84.6	220.6	•	•	•	•
1920x1080	80	90.4	237.4	•	•	•	•
1920x1200	60	74.5	193.1	•	•	•	•
1920x1200	72	90.0	222.2	•	•	•	•
1920x1200	75	93.9	231.4	•	•	•	•
1920x1200	76	95.2	245.0	•	•	•	•
1920x1440	60	89.4	234.5	•	•	•	•

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



ALL-IN-WONDER™ 128

Technical Information

System Requirements

Computer system	Pentium®/Pentium® Pro®, Pentium® II Pentium® III, Celeron™ or compatible systems with PCI Local Bus or AGP bus
Expansion Slot	32-bit PCI Local Bus (AGP slot for AGP variants)
Operating System	Windows® 95, Windows® 98, Windows® NT 4.0
Monitor	VGA, supporting minimum 640x480 resolution. <i>A Plug-and-Play monitor that supports VESA's Display Channel specifications (DDC1 or DDC2b) is required to take advantage of the DDC1/DDC2b features.</i>



Specifications

Memory Configuration	16MB or 32MB, non-upgradable synchronous RAM.
Sync Signals	Separate horizontal and vertical sync at TTL levels.
Video BIOS	AGP 1.0 compliant (AGP 2X compliant).
Video Output Connector	CRT monitor — 15-pin D shell (Female), IBM standard.
TV Output Connectors	<ul style="list-style-type: none"> • Available under Windows® 95, Windows® 98, or Windows® NT • NTSC output (PAL versions available) • Composite, S-Video connectors
Power	<ul style="list-style-type: none"> • +5V ±5%, @ 0.4A typical. • +3.3V ±5%, @ 1.4A typical • +12V ±5%, @ 0.3A typical
Ambient Temperature	<p>Operating — 50° to 122° F (10° to 50° C).</p> <p>Storage — 32° to 162° F (0° to 70° C).</p>
Relative Humidity	<p>Operating — 5% to 90% non-condensing.</p> <p>Storage — 0% to 95%</p>
MTBF	250,000 hours.
EMC Certification	FCC Class B



Video Mode Table

ALL-IN-WONDER 128 Video Mode Table (16MB / 32MB Memory)							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				16 or 32 MB			
				8	16	24	*32
640x480	60	31.5	25.2	•	•	•	•
640x480	72	37.9	31.5	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•
640x480	90	48.0	37.8	•	•	•	•
640x480	100	50.9	43.1	•	•	•	•
640x480	120	61.8	52.4	•	•	•	•
640x480	160	84.3	72.8	•	•	•	•
640x480	200	108.0	95.0	•	•	•	•
800x600	48	26.4	29.3	•	•	•	•
800x600	56	35.1	36.0	•	•	•	•
800x600	60	37.9	39.9	•	•	•	•
800x600	70	43.7	45.5	•	•	•	•
800x600	72	48.1	50.0	•	•	•	•
800x600	75	46.9	49.5	•	•	•	•
800x600	85	53.7	56.3	•	•	•	•
800x600	90	56.8	60.0	•	•	•	•
800x600	100	63.6	68.1	•	•	•	•
800x600	120	77.1	83.9	•	•	•	•
800x600	160	105.4	116.4	•	•	•	•
800x600	180	120.0	132.5	•	•	•	•
800x600	200	135.0	149.0	•	•	•	•
1024x768	43	35.5	44.9	•	•	•	•
1024x768	60	48.4	65.0	•	•	•	•
1024x768	70	56.5	75.0	•	•	•	•
1024x768	72	57.6	78.4	•	•	•	•
1024x768	75	60.0	78.8	•	•	•	•
1024x768	85	68.7	94.5	•	•	•	•
1024x768	90	72.8	100.1	•	•	•	•
1024x768	100	81.4	113.3	•	•	•	•
1024x768	120	98.7	139.0	•	•	•	•
1024x768	140	116.6	164.2	•	•	•	•
1024x768	150	125.7	176.9	•	•	•	•
1024x768	160	134.8	192.0	•	•	•	•
1024x768	180	153.5	218.6	•	•	•	•
1152x864	43	38.0	56.0	•	•	•	•
1152x864	47	41.7	62.1	•	•	•	•
1152x864	60	53.7	81.6	•	•	•	•

*32 - 24bpp color data is processed using a 32bpp data format.



ALL-IN-WONDER 128 Video Mode Table (16MB / 32MB Memory)							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				16	24	*32	8
1152x864	70	63.0	96.7	•	•	•	•
1152x864	75	67.5	108.0	•	•	•	•
1152x864	80	72.4	112.3	•	•	•	•
1152x864	85	77.0	119.6	•	•	•	•
1152x864	100	91.5	143.4	•	•	•	•
1152x864	120	111.1	176.0	•	•	•	•
1152x864	150	141.4	226.3	•	•	•	•
1152x864	160	151.6	242.6	•	•	•	•
1280x1024	43	45.1	75.1	•	•	•	•
1280x1024	47	49.4	83.0	•	•	•	•
1280x1024	60	64.0	108.0	•	•	•	•
1280x1024	70	74.6	128.9	•	•	•	•
1280x1024	74	79.0	138.5	•	•	•	•
1280x1024	75	80.0	135.0	•	•	•	•
1280x1024	85	91.1	157.5	•	•	•	•
1280x1024	90	97.0	169.2	•	•	•	•
1280x1024	100	108.5	190.9	•	•	•	•
1280x1024	120	131.6	233.7	•	•	•	•
1280x1024	125	137.6	244.4	•	•	•	•
1600x1200	52	64.2	137.7	•	•	•	•
1600x1200	58	71.9	155.4	•	•	•	•
1600x1200	60	75.0	162.0	•	•	•	•
1600x1200	66	82.2	178.9	•	•	•	•
1600x1200	72	90.0	195.9	•	•	•	•
1600x1200	75	93.8	202.5	•	•	•	•
1600x1200	76	95.2	208.7	•	•	•	•
1600x1200	85	106.3	229.5	•	•	•	•
1800x1440	60	89.4	219.5	•	•	•	•
1800x1440	65	97.1	238.5	•	•	•	•
1800x1440	70	104.9	249.9	•	•	•	•
1920x1080	60	67.0	172.7	•	•	•	•
1920x1080	70	78.6	205.1	•	•	•	•
1920x1080	75	84.6	220.6	•	•	•	•
1920x1080	80	90.4	237.4	•	•	•	•
1920x1200	60	74.5	193.1	•	•	•	•
1920x1200	72	90.0	222.2	•	•	•	•
1920x1200	75	93.9	231.4	•	•	•	•
1920x1200	76	95.2	245.0	•	•	•	•
1920x1440	60	89.4	234.5	•	•	•	•

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



RAGE™ FURY

Technical Information

System Requirements

Pentium® II microprocessor-based or compatible system with Accelerated Graphics Port (AGP) slot.

AGP 1.0 compliant.

CD-ROM drive required for software.

DVD drive required for DVD playback.

Specifications

Operating System Windows® 95, Windows® 98, or Windows® NT 4.0.

Memory Configuration 16 MB, 32 MB, 32 MB (TV).

Sync Signals Separate horizontal and vertical sync at TTL levels.

TV Output Connectors NTSC output (PAL versions available). Composite and S-Video connectors.

Video BIOS AGP 1.0 compliant (AGP 2X compliant).

Video Output Connector CRT monitor, 15-pin D shell (female), IBM standard.

Display support DDC1/2b/2b+ monitor support; VESA Display Power Management support.

Video Interrupt IRQ 11 is requested, although the actual IRQ number is automatically assigned by the Plug & Play system BIOS.

AMC Feature Connector 32 MB (TV): 2x20 pin header, VGA Out only, VESA standard.

VIP Feature Connector 16 MB/32 MB: 26-pin dual row header (male), VESA standard.



Power +5V ±5% @ 0.4 A typical.
 +3.3V ±5% @ 1.4 A typical.
 +12V ±5% @ 0.3 A typical.

Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).

Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF >300,000 hours.

EMC Certification FCC Class B.

Video Mode Table

RAGE FURY Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
*32 - 24bpp color data is processed using a 32bpp data format.							
640x480	60	31.5	25.2	•	•	•	•
640x480	72	37.9	31.5	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•
640x480	90	48.0	37.8	•	•	•	•
640x480	100	50.9	43.1	•	•	•	•
640x480	120	61.8	52.4	•	•	•	•
640x480	160	84.3	72.8	•	•	•	•
640x480	200	108.0	95.0	•	•	•	•
800x600	48	26.4	29.3	•	•	•	•
800x600	56	35.1	36.0	•	•	•	•
800x600	60	37.9	39.9	•	•	•	•
800x600	70	43.7	45.5	•	•	•	•
800x600	72	48.1	50.0	•	•	•	•
800x600	75	46.9	49.5	•	•	•	•
800x600	85	53.7	56.3	•	•	•	•
800x600	90	56.8	60.0	•	•	•	•
800x600	100	63.6	68.1	•	•	•	•
800x600	120	77.1	83.9	•	•	•	•
800x600	160	105.4	116.4	•	•	•	•



RAGE FURY Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
800x600	180	120.0	132.5	•	•	•	•
800x600	200	135.0	149.0	•	•	•	•
1024x768	43	35.5	44.9	•	•	•	•
1024x768	60	48.4	65.0	•	•	•	•
1024x768	70	56.5	75.0	•	•	•	•
1024x768	72	57.6	78.4	•	•	•	•
1024x768	75	60.0	78.8	•	•	•	•
1024x768	85	68.7	94.5	•	•	•	•
1024x768	90	72.8	100.1	•	•	•	•
1024x768	100	81.4	113.3	•	•	•	•
1024x768	120	98.7	139.0	•	•	•	•
1024x768	140	116.6	164.2	•	•	•	•
1024x768	150	125.7	176.9	•	•	•	•
1024x768	160	134.8	192.0	•	•	•	•
1024x768	180	153.5	218.6	•	•	•	•
1152x864	43	38.0	56.0	•	•	•	•
1152x864	47	41.7	62.1	•	•	•	•
1152x864	60	53.7	81.6	•	•	•	•
1152x864	70	63.0	96.7	•	•	•	•
1152x864	75	67.5	108.0	•	•	•	•
1152x864	80	72.4	112.3	•	•	•	•
1152x864	85	77.0	119.6	•	•	•	•
1152x864	100	91.5	143.4	•	•	•	•
1152x864	120	111.1	176.0	•	•	•	•
1152x864	150	141.4	226.3	•	•	•	•
1152x864	160	151.6	242.6	•	•	•	•
1280x1024	43	45.1	75.1	•	•	•	•
1280x1024	47	49.4	83.0	•	•	•	•
1280x1024	60	64.0	108.0	•	•	•	•
1280x1024	70	74.6	128.9	•	•	•	•
1280x1024	74	79.0	138.5	•	•	•	•
1280x1024	75	80.0	135.0	•	•	•	•
1280x1024	85	91.1	157.5	•	•	•	•
1280x1024	90	97.0	169.2	•	•	•	•
1280x1024	100	108.5	190.9	•	•	•	•
1280x1024	120	131.6	233.7	•	•	•	•
1280x1024	125	137.6	244.4	•	•	•	•
1600x1200	52	64.2	137.7	•	•	•	•
1600x1200	58	71.9	155.4	•	•	•	•
1600x1200	60	75.0	162.0	•	•	•	•
1600x1200	66	82.2	178.9	•	•	•	•



RAGE FURY Video Mode Table

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
1600x1200	72	90.0	195.9	•	•	•	•
1600x1200	75	93.8	202.5	•	•	•	•
1600x1200	76	95.2	208.7	•	•	•	•
1600x1200	85	106.3	229.5	•	•	•	•
1800x1440	60	89.4	219.5	•	•	•	•
1800x1440	65	97.1	238.5	•	•	•	•
1800x1440	70	104.9	249.9	•	•	•	•
1920x1080	60	67.0	172.7	•	•	•	•
1920x1080	70	78.6	205.1	•	•	•	•
1920x1080	75	84.6	220.6	•	•	•	•
1920x1080	80	90.4	237.4	•	•	•	•
1920x1200	60	74.5	193.1	•	•	•	•
1920x1200	72	90.0	222.2	•	•	•	•
1920x1200	75	93.9	231.4	•	•	•	•
1920x1200	76	95.2	245.0	•	•	•	•
1920x1440	60	89.4	234.5	•	•	•	•

*32 - 24bpp color data is processed using a 32bpp data format. 2D and 3D resolutions are refresh rates are subject to change.



RAGE™ FURY PRO

Technical Information

System Requirements

Pentium® III/II, Celeron or compatible system with Accelerated Graphics Port (AGP) slot.

AGP 1.0 compliant.

CD-ROM drive required for software.

DVD drive required for DVD playback.

Specifications

Operating System Windows® 95, Windows® 98, or Windows® NT 4.0.

Memory Configuration 16 MB, 32 MB.

Sync Signals Separate horizontal and vertical sync at TTL levels.

TV Output Connectors NTSC output (PAL versions available). Composite and S-Video connectors.

Video BIOS AGP 1.0 compliant (AGP 2X compliant).

Video Output Connector CRT monitor, 15-pin D shell (female), IBM standard.

Display support DDC1/2b/2b+ monitor support; VESA Display Power Management support.

Video Interrupt IRQ 11 is requested, although the actual IRQ number is automatically assigned by the Plug & Play system BIOS.

Power +5V ±5% @ 0.4 A typical.
+3.3V ±5% @ 2.0 A typical.
+12V ±5% @ 0.1 A typical.



Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).

Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF >300,000 hours.

EMC Certification FCC Class B.

Video Mode Table

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)									
				16 MB				32 MB					
				8	16	24	*32	8	16	24	*32		
640x480	60	31.5	25.2	*	*	*	*	*	*	*	*	*	*
640x480	72	37.9	31.5	*	*	*	*	*	*	*	*	*	*
640x480	75	37.5	31.5	*	*	*	*	*	*	*	*	*	*
640x480	85	43.3	36.0	*	*	*	*	*	*	*	*	*	*
640x480	90	45.4	37.8	*	*	*	*	*	*	*	*	*	*
640x480	100	50.9	43.1	*	*	*	*	*	*	*	*	*	*
640x480	120	61.8	52.4	*	*	*	*	*	*	*	*	*	*
640x480	160	84.3	72.8	*	*	*	*	*	*	*	*	*	*
640x480	200	108.0	95.0	*	*	*	*	*	*	*	*	*	*
800x600	48	26.4	29.3	*	*	*	*	*	*	*	*	*	*
800x600	56	35.1	36.0	*	*	*	*	*	*	*	*	*	*
800x600	60	37.9	39.9	*	*	*	*	*	*	*	*	*	*
800x600	70	43.7	45.5	*	*	*	*	*	*	*	*	*	*
800x600	72	48.1	50.0	*	*	*	*	*	*	*	*	*	*
800x600	75	46.9	49.5	*	*	*	*	*	*	*	*	*	*
800x600	85	53.7	56.3	*	*	*	*	*	*	*	*	*	*
800x600	90	56.8	60.0	*	*	*	*	*	*	*	*	*	*
800x600	100	63.6	68.1	*	*	*	*	*	*	*	*	*	*
800x600	120	77.0	83.2	*	*	*	*	*	*	*	*	*	*
800x600	160	105.4	116.4	*	*	*	*	*	*	*	*	*	*
800x600	200	135.0	149.0	*	*	*	*	*	*	*	*	*	*
1024x768	43	35.5	44.9	*	*	*	*	*	*	*	*	*	*
1024x768	60	48.4	65.0	*	*	*	*	*	*	*	*	*	*
1024x768	70	56.5	75.0	*	*	*	*	*	*	*	*	*	*
1024x768	72	56.6	78.4	*	*	*	*	*	*	*	*	*	*



RAGE FURY PRO Video Mode Table												
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)								
				16 MB				32 MB				
				8	16	24	*32	8	16	24	*32	
1024x768	75	60.0	78.8	*	*	*	*	*	*	*	*	*
1024x768	85	68.7	94.5	*	*	*	*	*	*	*	*	*
1024x768	90	72.8	100.1	*	*	*	*	*	*	*	*	*
1024x768	100	81.4	113.3	*	*	*	*	*	*	*	*	*
1024x768	120	98.7	139.0	*	*	*	*	*	*	*	*	*
1024x768	140	116.6	164.2	*	*	*	*	*	*	*	*	*
1024x768	150	125.7	176.9	*	*	*	*	*	*	*	*	*
1024x768	160	134.8	192.0	*	*	*	*	*	*	*	*	*
1024x768	180	153.5	218.6	*	*	*	*	*	*	*	*	*
1024x768	200	172.8	246.1	*	*	*	*	*	*	*	*	*
1152x864	43	38.0	56.0	*	*	*	*	*	*	*	*	*
1152x864	47	41.7	62.1	*	*	*	*	*	*	*	*	*
1152x864	60	53.7	81.6	*	*	*	*	*	*	*	*	*
1152x864	70	63.0	96.7	*	*	*	*	*	*	*	*	*
1152x864	75	67.5	108.0	*	*	*	*	*	*	*	*	*
1152x864	80	72.4	112.3	*	*	*	*	*	*	*	*	*
1152x864	85	77.0	119.6	*	*	*	*	*	*	*	*	*
1152x864	100	91.5	143.4	*	*	*	*	*	*	*	*	*
1152x864	120	111.1	176.0	*	*	*	*	*	*	*	*	*
1152x864	150	141.4	226.3	*	*	*	*	*	*	*	*	*
1152x864	160	151.6	242.6	*	*	*	*	*	*	*	*	*
1280x1024	43	45.1	75.1	*	*	*	*	*	*	*	*	*
1280x1024	47	49.4	83.0	*	*	*	*	*	*	*	*	*
1280x1024	60	64.0	108.0	*	*	*	*	*	*	*	*	*
1280x1024	70	74.6	128.9	*	*	*	*	*	*	*	*	*
1280x1024	74	79.0	138.5	*	*	*	*	*	*	*	*	*
1280x1024	75	80.0	135.0	*	*	*	*	*	*	*	*	*
1280x1024	85	91.1	157.5	*	*	*	*	*	*	*	*	*
1280x1024	90	97.0	169.2	*	*	*	*	*	*	*	*	*
1280x1024	100	108.5	190.9	*	*	*	*	*	*	*	*	*
1280x1024	120	131.6	233.7	*	*	*	*	*	*	*	*	*
1280x1024	125	137.6	244.4	*	*	*	*	*	*	*	*	*
1280x1024	130	143.5	254.9	*	*	*	*	*	*	*	*	*
1600x1200	52	64.2	137.7	*	*	*	*	*	*	*	*	*
1600x1200	58	71.9	155.4	*	*	*	*	*	*	*	*	*
1600x1200	60	75.0	162.0	*	*	*	*	*	*	*	*	*
1600x1200	66	82.2	178.9	*	*	*	*	*	*	*	*	*
1600x1200	72	90.0	195.9	*	*	*	*	*	*	*	*	*
1600x1200	75	93.8	202.5	*	*	*	*	*	*	*	*	*
1600x1200	76	95.2	208.7	*	*	*	*	*	*	*	*	*
1600x1200	85	106.3	229.5	*	*	*	*	*	*	*	*	*
1600x1200	90	113.8	251.2	*	*	*	*	*	*	*	*	*



RAGE FURY PRO Video Mode Table

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)								
				16 MB				32 MB				
				8	16	24	*32	8	16	24	*32	
1792X1344	60	83.5	203.0	*	*	*	*	*	*	*	*	*
1792X1344	75	105.2	259.3	*	*	*	*	*	*	*	*	*
1800X1440	60	89.4	219.5	*	*	*	*	*	*	*	*	*
1800X1440	65	97.1	238.5	*	*	*	*	*	*	*	*	*
1800X1440	70	104.9	249.9	*	*	*	*	*	*	*	*	*
1856X1392	60	86.5	218.6	*	*	*	*	*	*	*	*	*
1856X1392	75	109.0	277.2	*	*	*	*	*	*	*	*	*
1920X1080	60	67.0	172.7	*	*	*	*	*	*	*	*	*
1920X1080	70	78.6	205.1	*	*	*	*	*	*	*	*	*
1920X1080	75	84.6	220.6	*	*	*	*	*	*	*	*	*
1920X1080	80	90.4	237.4	*	*	*	*	*	*	*	*	*
1920X1200	60	74.5	193.1	*	*	*	*	*	*	*	*	*
1920X1200	72	90.0	222.2	*	*	*	*	*	*	*	*	*
1920X1200	75	93.9	231.4	*	*	*	*	*	*	*	*	*
1920X1200	76	95.2	245.0	*	*	*	*	*	*	*	*	*
1920X1200	80	100.5	263.7	*	*	*	*	*	*	*	*	*
1920X1200	85	107.1	282.7	*	*	*	*	*	*	*	*	*
1920X1440	60	89.4	234.5	*	*	*	*	*	*	*	*	*
1920X1440	75	112.7	297.6	*	*	*	*	*	*	*	*	*
2048X1536	60	95.3	267.0	*	*	*	*	*	*	*	*	*
2048X1536	70	111.9	315.2	*	*	*	*	*	*	*	*	*
2048X1536	75	120.2	340.5	*	*	*	*	*	*	*	*	*

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



RAGE™ MAGNUM

Technical Information

System Requirements

Pentium® II microprocessor-based or compatible system with Accelerated Graphics Port (AGP) slot.

AGP 1.0 compliant.

CD-ROM drive required for software.

DVD drive required for DVD playback.

Specifications

Operating System Windows® 95, Windows® 98, or Windows® NT 4.0.

Memory Configuration 32 MB, non-upgradeable.

Sync Signals Separate horizontal and vertical sync at TTL levels.

TV Out Not available with this product.

Video BIOS AGP 1.0 compliant (AGP 2X compliant).

Video Output Connector CRT monitor, 15-pin D shell (female), IBM standard.

Display support DDC1/2b/2b+ monitor support; VESA Display Power Management support.

Video Interrupt IRQ 11 is requested, although the actual IRQ number is automatically assigned by the Plug & Play system BIOS.

VIP Feature Connector 26-pin dual row header (male), VESA standard.

Power +5V $\pm 5\%$ @ 0.4 A typical.
+3.3V $\pm 5\%$ @ 1.4 A typical.
+12V $\pm 5\%$ @ 0.3 A typical.



Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).

Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF >300,000 hours.

EMC Certification FCC Class B.

Video Mode Table

RAGE MAGNUM Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				32 MB			
				8	16	24	*32
*32 - 24bpp color data is processed using a 32bpp data format.							
640x480	60	31.5	25.2	•	•	•	•
640x480	72	37.9	31.5	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•
640x480	90	48.0	37.8	•	•	•	•
640x480	100	50.9	43.1	•	•	•	•
640x480	120	61.8	52.4	•	•	•	•
640x480	160	84.3	72.8	•	•	•	•
640x480	200	108.0	95.0	•	•	•	•
800x600	48	26.4	29.3	•	•	•	•
800x600	56	35.1	36.0	•	•	•	•
800x600	60	37.9	39.9	•	•	•	•
800x600	70	43.7	45.5	•	•	•	•
800x600	72	48.1	50.0	•	•	•	•
800x600	75	46.9	49.5	•	•	•	•
800x600	85	53.7	56.3	•	•	•	•
800x600	90	56.8	60.0	•	•	•	•
800x600	100	63.6	68.1	•	•	•	•
800x600	120	77.1	83.9	•	•	•	•
800x600	160	105.4	116.4	•	•	•	•
800x600	180	120.0	132.5	•	•	•	•
800x600	200	135.0	149.0	•	•	•	•
1024x768	43	35.5	44.9	•	•	•	•
1024x768	60	48.4	65.0	•	•	•	•



RAGE MAGNUM Video Mode Table

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
1024x768	70	56.5	75.0	•	•	•	•
1024x768	72	57.6	78.4	•	•	•	•
1024x768	75	60.0	78.8	•	•	•	•
1024x768	85	68.7	94.5	•	•	•	•
1024x768	90	72.8	100.1	•	•	•	•
1024x768	100	81.4	113.3	•	•	•	•
1024x768	120	98.7	139.0	•	•	•	•
1024x768	140	116.6	164.2	•	•	•	•
1024x768	150	125.7	176.9	•	•	•	•
1024x768	160	134.8	192.0	•	•	•	•
1024x768	180	153.5	218.6	•	•	•	•
1152x864	43	38.0	56.0	•	•	•	•
1152x864	47	41.7	62.1	•	•	•	•
1152x864	60	53.7	81.6	•	•	•	•
1152x864	70	63.0	96.7	•	•	•	•
1152x864	75	67.5	108.0	•	•	•	•
1152x864	80	72.4	112.3	•	•	•	•
1152x864	85	77.0	119.6	•	•	•	•
1152x864	100	91.5	143.4	•	•	•	•
1152x864	120	111.1	176.0	•	•	•	•
1152x864	150	141.4	226.3	•	•	•	•
1152x864	160	151.6	242.6	•	•	•	•
1280x1024	43	45.1	75.1	•	•	•	•
1280x1024	47	49.4	83.0	•	•	•	•
1280x1024	60	64.0	108.0	•	•	•	•
1280x1024	70	74.6	128.9	•	•	•	•
1280x1024	74	79.0	138.5	•	•	•	•
1280x1024	75	80.0	135.0	•	•	•	•
1280x1024	85	91.1	157.5	•	•	•	•
1280x1024	90	97.0	169.2	•	•	•	•
1280x1024	100	108.5	190.9	•	•	•	•
1280x1024	120	131.6	233.7	•	•	•	•
1280x1024	125	137.6	244.4	•	•	•	•
1600x1200	52	64.2	137.7	•	•	•	•
1600x1200	58	71.9	155.4	•	•	•	•
1600x1200	60	75.0	162.0	•	•	•	•
1600x1200	66	82.2	178.9	•	•	•	•
1600x1200	72	90.0	195.9	•	•	•	•
1600x1200	75	93.8	202.5	•	•	•	•
1600x1200	76	95.2	208.7	•	•	•	•
1600x1200	85	106.3	229.5	•	•	•	•



RAGE MAGNUM Video Mode Table

Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
1800x1440	60	89.4	219.5	•	•	•	•
1800x1440	65	97.1	238.5	•	•	•	•
1800x1440	70	104.9	249.9	•	•	•	•
1920x1080	60	67.0	172.7	•	•	•	•
1920x1080	70	78.6	205.1	•	•	•	•
1920x1080	75	84.6	220.6	•	•	•	•
1920x1080	80	90.4	237.4	•	•	•	•
1920x1200	60	74.5	193.1	•	•	•	•
1920x1200	72	90.0	222.2	•	•	•	•
1920x1200	75	93.9	231.4	•	•	•	•
1920x1200	76	95.2	245.0	•	•	•	•
1920x1440	60	89.4	234.5	•	•	•	•

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



XPERT™ 128

Technical Information

System Requirements

Pentium® II microprocessor-based or compatible system with Accelerated Graphics Port (AGP) slot or 32-bit PCI Local Bus expansion slot.

AGP 1.0 compliant.

PCI 32-bit PCI Local Bus

CD-ROM drive required for software.

DVD drive required for DVD playback.

Specifications

Operating System Windows® 95, Windows® 98, or Windows® NT 4.0.

Memory Configuration 16 MB, non-upgradeable.

Sync Signals Separate horizontal and vertical sync at TTL levels.

TV Out Not available with this product.

Video BIOS AGP 1.0 compliant (AGP 2X compliant).

Video Output Connector CRT monitor, 15-pin D shell (female), IBM standard.

Display support DDC1/2b/2b+ monitor support; VESA Display Power Management support.

Video interrupt IRQ 11 is requested, although the actual IRQ number is automatically assigned by the Plug & Play system BIOS.

VIP Feature Connector 26-pin dual row header (male), VESA standard.



Power +5V ±5% @ 0.4 A typical.
 +3.3V ±5% @ 1.4 A typical.
 +12V ±5% @ 0.3 A typical.

Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).

Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF >300,000 hours.

EMC Certification FCC Class B.

Video Mode Table

XPERT 128 Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
*32 - 24bpp color data is processed using a 32bpp data format.							
640x480	60	31.5	25.2	•	•	•	•
640x480	72	37.9	31.5	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•
640x480	90	48.0	37.8	•	•	•	•
640x480	100	50.9	43.1	•	•	•	•
640x480	120	61.8	52.4	•	•	•	•
640x480	160	84.3	72.8	•	•	•	•
640x480	200	108.0	95.0	•	•	•	•
800x600	48	26.4	29.3	•	•	•	•
800x600	56	35.1	36.0	•	•	•	•
800x600	60	37.9	39.9	•	•	•	•
800x600	70	43.7	45.5	•	•	•	•
800x600	72	48.1	50.0	•	•	•	•
800x600	75	46.9	49.5	•	•	•	•
800x600	85	53.7	56.3	•	•	•	•
800x600	90	56.8	60.0	•	•	•	•
800x600	100	63.6	68.1	•	•	•	•
800x600	120	77.1	83.9	•	•	•	•
800x600	160	105.4	116.4	•	•	•	•



XPERT 128 Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
800x600	180	120.0	132.5	•	•	•	•
800x600	200	135.0	149.0	•	•	•	•
1024x768	43	35.5	44.9	•	•	•	•
1024x768	60	48.4	65.0	•	•	•	•
1024x768	70	56.5	75.0	•	•	•	•
1024x768	72	57.6	78.4	•	•	•	•
1024x768	75	60.0	78.8	•	•	•	•
1024x768	85	68.7	94.5	•	•	•	•
1024x768	90	72.8	100.1	•	•	•	•
1024x768	100	81.4	113.3	•	•	•	•
1024x768	120	98.7	139.0	•	•	•	•
1024x768	140	116.6	164.2	•	•	•	•
1024x768	150	125.7	176.9	•	•	•	•
1024x768	160	134.8	192.0	•	•	•	•
1024x768	180	153.5	218.6	•	•	•	•
1152x864	43	38.0	56.0	•	•	•	•
1152x864	47	41.7	62.1	•	•	•	•
1152x864	60	53.7	81.6	•	•	•	•
1152x864	70	63.0	96.7	•	•	•	•
1152x864	75	67.5	108.0	•	•	•	•
1152x864	80	72.4	112.3	•	•	•	•
1152x864	85	77.0	119.6	•	•	•	•
1152x864	100	91.5	143.4	•	•	•	•
1152x864	120	111.1	176.0	•	•	•	•
1152x864	150	141.4	226.3	•	•	•	•
1152x864	160	151.6	242.6	•	•	•	•
1280x1024	43	45.1	75.1	•	•	•	•
1280x1024	47	49.4	83.0	•	•	•	•
1280x1024	60	64.0	108.0	•	•	•	•
1280x1024	70	74.6	128.9	•	•	•	•
1280x1024	74	79.0	138.5	•	•	•	•
1280x1024	75	80.0	135.0	•	•	•	•
1280x1024	85	91.1	157.5	•	•	•	•
1280x1024	90	97.0	169.2	•	•	•	•
1280x1024	100	108.5	190.9	•	•	•	•
1280x1024	120	131.6	233.7	•	•	•	•
1280x1024	125	137.6	244.4	•	•	•	•
1600x1200	52	64.2	137.7	•	•	•	•
1600x1200	58	71.9	155.4	•	•	•	•
1600x1200	60	75.0	162.0	•	•	•	•
1600x1200	66	82.2	178.9	•	•	•	•



XPERT 128 Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
1600x1200	72	90.0	195.9	•	•	•	•
1600x1200	75	93.8	202.5	•	•	•	•
1600x1200	76	95.2	208.7	•	•	•	•
1600x1200	85	106.3	229.5	•	•	•	•
1800x1440	60	89.4	219.5	•	•	•	•
1800x1440	65	97.1	238.5	•	•	•	•
1800x1440	70	104.9	249.9	•	•	•	•
1920x1080	60	67.0	172.7	•	•	•	•
1920x1080	70	78.6	205.1	•	•	•	•
1920x1080	75	84.6	220.6	•	•	•	•
1920x1080	80	90.4	237.4	•	•	•	•
1920x1200	60	74.5	193.1	•	•	•	•
1920x1200	72	90.0	222.2	•	•	•	•
1920x1200	75	93.9	231.4	•	•	•	•
1920x1200	76	95.2	245.0	•	•	•	•
1920x1440	60	89.4	234.5	•	•	•	•

*32 - 24bpp color data is processed using a 32bpp data format. 2D and 3D resolutions and refresh rates are subject to change.



XPERT 98, XPERT LCD, XPERT@WORK, XPERT@PLAY

Technical Information

System Requirements

Computer System Pentium®/Pentium Pro®/Pentium II®, or compatible system with PCI Local Bus or AGP expansion slot.

Expansion Slot 32-bit PCI Local Bus (AGP slot for AGP variants).

Operating System DOS® 5.0 or higher, Windows 3.1x®, Windows 95®, Windows 98®, or Windows NT®.

Specifications

Memory Configuration 4MB (*XPERT XL*), 2MB upgradeable to 4MB or 6MB, 4MB upgradeable to 6MB or 8MB, or 8MB.

Sync Signals Separate horizontal and vertical sync at TTL levels.

TV Output Connectors (Not available in all configurations).
Composite Output (NTSC or PAL standard) S-Video Output.

Video BIOS PCI 2.1 compliant. AGP 1.0 compliant (AGP 2X compliant).

Video Output Connector 15-pin D shell (female), IBM standard.
20-pin Mini D Ribbon (MDR), Female (DFP cards only).

Video Interrupt Auto-configured by system for PCI or AGP, as required.

AMC Feature Connector 2x20 pin header. Shares the same footprint with the 2x13 pin VGA Feature Connector, VGA Out only, VESA standard.



Power +5V ±5% @ 0.4 A typical.
+3.3V ±5% @ 1.4 A typical.

Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).

Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF >250,000 hours.

EMC Certification FCC Class B.

Video Mode Table

XPERT 98 / XPERT LCD Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
640x480	60	31.5	25.2	•	•	•	•
640x480	72	37.4	32.0	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•
640x480	90	48.0	39.9	•	•	•	•
640x480	100	52.9	44.9	•	•	•	•
640x480	120	63.7	55.0	•	•	•	•
640x480	160	81.0	70.0	•	•	•	•
640x480	200	100.2	81.0	•	•	•	•
800x600	48	33.8	36.0	•	•	•	•
800x600	56	35.2	36.0	•	•	•	•
800x600	60	37.8	39.9	•	•	•	•
800x600	70	44.5	44.9	•	•	•	•
800x600	72	48.0	50.0	•	•	•	•
800x600	75	46.9	49.5	•	•	•	•
800x600	85	53.7	56.3	•	•	•	•
800x600	90	56.6	56.6	•	•	•	•
800x600	100	63.9	67.5	•	•	•	•
800x600	120	76.1	81.0	•	•	•	•
800x600	160	101.9	110.0	•	•	•	•
800x600	200	125.9	135.0	•	•	•	•
1024x768	43	35.5	44.9	•	•	•	•
1024x768	60	48.4	65.0	•	•	•	•



XPERT 98 / XPERT LCD Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
1024x768	70	56.1	75.0	•	•	•	•
1024x768	72	57.9	75.0	•	•	•	•
1024x768	75	60.0	78.8	•	•	•	•
1024x768	85	68.7	94.5	•	•	•	•
1024x768	90	76.2	100.0	•	•	•	•
1024x768	100	80.4	110.0	•	•	•	•
1024x768	120	96.7	130.0	•	•	•	•
1024x768	140	113.1	157.5	•	•	•	•
1024x768	150	120.6	160.0	•	•	•	•
1152x864	43	45.9	65.0	•	•	•	•
1152x864	47	44.9	65.0	•	•	•	•
1152x864	60	54.9	80.0	•	•	•	•
1152x864	70	66.1	100.0	•	•	•	•
1152x864	75	75.1	110.0	•	•	•	•
1152x864	80	76.4	110.0	•	•	•	•
1152x864	85	77.1	121.5	•	•	•	•
1152x864	100	90.2	135.0	•	•	•	•
1152x864	120	108.6	172.0	•	•	•	•
1280x1024	43	50.0	80.0	•	•	•	•
1280x1024	47	50.0	80.0	•	•	•	•
1280x1024	60	64.0	110.0	•	•	•	•
1280x1024	70	74.6	126.0	•	•	•	•
1280x1024	74	77.9	135.0	•	•	•	•
1280x1024	75	80.0	135.0	•	•	•	•
1280x1024	85	91.2	157.5	•	•	•	•
1280x1024	90	96.2	160.0	•	•	•	•
1280x1024	100	106.4	172.0	•	•	•	•
1600x1200	52	68.0	135.0	•	•	•	•
1600x1200	58	75.0	135.0	•	•	•	•
1600x1200	60	76.2	156.0	•	•	•	•
1600x1200	66	82.7	172.0	•	•	•	•
1600x1200	72	89.7	194.4	•	•	•	•
1600x1200	75	93.8	202.5	•	•	•	•
1600x1200	76	95.2	198.0	•	•	•	•
1600x1200	85	106.2	229.5	•	•	•	•

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



XPERT@WORK / XPERT@PLAY Video Mode Table																
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)												
				2 MB				4 MB				6 MB or 8 MB				
				8	16	24	*32	8	16	24	*32	8	16	24	*32	
640x480	60	31.5	25.2	*	*	*	*	*	*	*	*	*	*	*	*	*
640x480	72	37.4	32.0	*	*	*	*	*	*	*	*	*	*	*	*	*
640x480	75	37.5	31.5	*	*	*	*	*	*	*	*	*	*	*	*	*
640x480	85	43.3	36.0	*	*	*	*	*	*	*	*	*	*	*	*	*
640x480	90	48.0	39.9	*	*	*	*	*	*	*	*	*	*	*	*	*
640x480	100	52.9	44.9	*	*	*	*	*	*	*	*	*	*	*	*	*
640x480	120	63.7	55.0	*	*	*	*	*	*	*	*	*	*	*	*	*
640x480	160	81.0	70.0	*	*	*	*	*	*	*	*	*	*	*	*	*
640x480	200	100.2	81.0	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	48	33.8	36.0	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	56	35.2	36.0	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	60	37.8	39.9	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	70	44.5	44.9	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	72	48.0	50.0	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	75	46.9	49.5	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	85	53.7	56.3	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	90	56.6	56.6	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	100	63.9	67.5	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	120	76.1	81.0	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	160	101.9	110.0	*	*	*	*	*	*	*	*	*	*	*	*	*
800x600	200	125.9	135.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	43	35.5	44.9	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	60	48.4	65.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	70	56.1	75.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	72	57.9	75.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	75	60.0	78.8	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	85	68.7	94.5	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	90	76.2	100.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	100	80.4	110.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	120	96.7	130.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	140	113.1	157.5	*	*	*	*	*	*	*	*	*	*	*	*	*
1024x768	150	120.6	160.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	43	45.9	65.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	47	44.9	65.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	60	54.9	80.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	70	66.1	100.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	75	75.1	110.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	80	76.4	110.0	*	*	*	*	*	*	*	*	*	*	*	*	*
1152x864	85	77.1	121.5	*	*	*	*	*	*	*	*	*	*	*	*	*



XPERT@WORK / XPERT@PLAY Video Mode Table															
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)											
				2 MB				4 MB				6 MB or 8 MB			
				8	16	24	*32	8	16	24	*32	8	16	24	*32
1152x864	100	90.2	135.0	*	*			*	*	*	*	*	*	*	*
1152x864	120	108.6	172.0	*	*			*	*	*	*	*	*	*	*
1280x1024	43	50.0	80.0	*				*	*	*	*	*	*	*	*
1280x1024	47	50.0	80.0	*				*	*	*	*	*	*	*	*
1280x1024	60	64.0	110.0	*				*	*	*	*	*	*	*	*
1280x1024	70	74.6	126.0	*				*	*	*	*	*	*	*	*
1280x1024	74	77.9	135.0	*				*	*	*	*	*	*	*	*
1280x1024	75	80.0	135.0	*				*	*	*	*	*	*	*	*
1280x1024	85	91.2	157.5	*				*	*	*	*	*	*	*	*
1280x1024	90	96.2	160.0	*				*	*	*	*	*	*	*	*
1280x1024	100	106.4	172.0	*				*	*	*	*	*	*	*	*
1600x1200	52	68.0	135.0	*				*	*			*	*	*	8 MB
1600x1200	58	75.0	135.0	*				*	*			*	*	*	8 MB
1600x1200	60	76.2	156.0	*				*	*			*	*	*	8 MB
1600x1200	66	82.7	172.0	*				*	*			*	*	*	
1600x1200	72	89.7	194.4	*				*	*			*	*	*	
1600x1200	75	93.8	202.5	*				*	*			*	*	*	
1600x1200	76	95.2	198.0	*				*	*			*	*	*	
1600x1200	85	106.2	229.5	*				*	*			*	*	*	

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



XPERT™ 99

Technical Information

System Requirements

Pentium® II microprocessor-based or compatible system with Accelerated Graphics Port (AGP) slot.

AGP 1.0 compliant.

CD-ROM drive required for software.

DVD drive required for DVD playback.

Specifications

Operating System Windows® 95, Windows® 98, or Windows® NT 4.0.

Memory Configuration 8 MB, non-upgradeable.

Sync Signals Separate horizontal and vertical sync at TTL levels.

TV Out Not available with this product.

Video BIOS AGP 1.0 compliant (AGP 2X compliant).

Video Output Connector CRT monitor, 15-pin D shell (female), IBM standard.

Display support DDC1/2b/2b+ monitor support; VESA Display Power Management support.

Video interrupt IRQ 11 is requested, although the actual IRQ number is automatically assigned by the Plug & Play system BIOS.

VIP Feature Connector 26-pin dual row header (male), VESA standard.

Power +5V ±5% @ 0.4 A typical.
+3.3V ±5% @ 1.4 A typical.
+12V ±5% @ 0.3 A typical.



Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).

Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF >300,000 hours.

EMC Certification FCC Class B.

Video Mode Table

XPERT 99 Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8 MB			
				8	16	24	*32
640x480	60	31.5	25.2	•	•	•	•
640x480	72	37.9	31.5	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•
640x480	90	45.4	37.8	•	•	•	•
640x480	100	50.9	43.1	•	•	•	•
640x480	120	61.8	52.4	•	•	•	•
640x480	160	84.3	72.8	•	•	•	•
640x480	200	108.0	95.0	•	•	•	•
800x600	48	26.4	29.3	•	•	•	•
800x600	56	35.1	36.0	•	•	•	•
800x600	60	37.9	39.9	•	•	•	•
800x600	70	43.7	45.5	•	•	•	•
800x600	72	48.1	50.0	•	•	•	•
800x600	75	46.9	49.5	•	•	•	•
800x600	85	53.7	56.3	•	•	•	•
800x600	90	56.8	60.0	•	•	•	•
800x600	100	63.6	68.1	•	•	•	•
800x600	120	77.1	83.9	•	•	•	•
800x600	160	105.4	116.4	•	•	•	•
800x600	180	120.0	132.5	•	•	•	•
800x600	200	135.0	149.0	•	•	•	•
1024x768	43	35.5	44.9	•	•	•	•
1024x768	60	48.4	65.0	•	•	•	•
1024x768	70	56.5	75.0	•	•	•	•



XPERT 99 Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
1024x768	72	57.6	78.4	•	•	•	•
1024x768	75	60.0	78.8	•	•	•	•
1024x768	85	68.7	94.5	•	•	•	•
1024x768	90	72.8	100.1	•	•	•	•
1024x768	100	81.4	113.3	•	•	•	•
1024x768	120	98.7	139.0	•	•	•	•
1024x768	140	116.6	164.2	•	•	•	•
1024x768	150	125.7	176.9	•	•	•	•
1024x768	160	134.8	192.0	•	•	•	•
1152x864	43	38.0	56.0	•	•	•	•
1152x864	47	41.7	62.1	•	•	•	•
1152x864	60	53.7	81.6	•	•	•	•
1152x864	70	63.0	96.7	•	•	•	•
1152x864	75	67.5	108.0	•	•	•	•
1152x864	80	72.4	112.3	•	•	•	•
1152x864	85	77.0	119.6	•	•	•	•
1152x864	100	91.5	143.4	•	•	•	•
1152x864	120	111.1	176.0	•	•	•	•
1152x864	140	141.4	226.3	•	•	•	•
1152x864	150	151.6	242.6	•	•	•	•
1280x1024	43	45.1	75.1	•	•	•	•
1280x1024	47	49.4	83.0	•	•	•	•
1280x1024	60	64.0	108.0	•	•	•	•
1280x1024	70	74.6	128.9	•	•	•	•
1280x1024	74	79.0	138.5	•	•	•	•
1280x1024	75	80.0	135.0	•	•	•	•
1280x1024	85	91.1	157.5	•	•	•	•
1280x1024	90	97.0	169.2	•	•	•	•
1280x1024	100	108.5	190.9	•	•	•	•
1280x1024	120	131.6	233.7	•	•	•	•
1600x1200	52	64.2	137.7	•	•	•	•
1600x1200	58	71.9	155.4	•	•	•	•
1600x1200	60	75.0	162.0	•	•	•	•
1600x1200	66	82.2	178.9	•	•	•	•
1600x1200	72	90.0	195.9	•	•	•	•
1600x1200	75	93.8	202.5	•	•	•	•
1600x1200	76	95.2	208.7	•	•	•	•
1600x1200	85	106.3	229.5	•	•	•	•
1800x1440	60	89.4	219.5	•	•	•	•
1800x1440	65	97.1	238.5	•	•	•	•
1800x1440	70	104.9	249.9	•	•	•	•



XPERT 99 Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
1920x1080	60	67.0	172.7	•	•	•	•
1920x1080	70	78.6	205.1	•	•	•	•
1920x1080	75	84.6	220.6	•	•	•	
1920x1080	80	90.4	237.4	•	•	•	
1920x1200	60	74.5	193.1	•	•	•	
1920x1200	72	90.0	236.3	•	•	•	
1920x1200	75	93.9	246.5	•	•	•	
1920x1200	76	95.2	249.8	•	•	•	
1920x1440	60	89.4	234.5	•	•	•	

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



XPERT™ 2000

Technical Information

System Requirements

Pentium® II/III microprocessor-based, Celeron or compatible system with Accelerated Graphics Port (AGP) slot.

AGP 1.0 compliant.

CD-ROM drive required for software.

DVD drive required for DVD playback. (Windows® 95b, Windows® 98)

Specifications

Operating System Windows® 95, Windows® 98, Windows® NT 4.0

Memory Configuration 32 MB, non-upgradeable.

Sync Signals Separate horizontal and vertical sync at TTL levels.

Video BIOS AGP 1.0 compliant (AGP 2X compliant).

Video Output Connector CRT monitor, 15-pin D shell (female), IBM standard.

Display support DDC1/2b/2b+ monitor support; VESA Display Power Management support.

Video interrupt IRQ 11 is requested, although the actual IRQ number is automatically assigned by the Plug & Play system BIOS.

Power +5V ±5% @ 0.4 A typical.
+3.3V ±5% @ 1.4 A typical.
+12V ±5% @ 0.3 A typical.



Ambient Temperature

Operating 50° to 122° F (10° to 50° C).

Storage 32° to 162° F (0° to 70° C).

Relative Humidity

Operating 5% to 90% non-condensing.

Storage 0% to 95%.

MTBF >300,000 hours.

EMC Certification FCC Class B.

Video Mode Table

XPERT 2000 Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
640x480	60	31.5	25.2	•	•	•	•
640x480	72	37.9	31.5	•	•	•	•
640x480	75	37.5	31.5	•	•	•	•
640x480	85	43.3	36.0	•	•	•	•
640x480	90	45.4	37.8	•	•	•	•
640x480	100	50.9	43.1	•	•	•	•
640x480	120	61.8	52.4	•	•	•	•
640x480	160	84.3	72.8	•	•	•	•
640x480	200	108.0	95.0	•	•	•	•
800x600	48	26.4	29.3	•	•	•	•
800x600	56	35.1	36.0	•	•	•	•
800x600	60	37.9	39.9	•	•	•	•
800x600	70	43.7	45.5	•	•	•	•
800x600	72	48.1	50.0	•	•	•	•
800x600	75	46.9	49.5	•	•	•	•
800x600	85	53.7	56.3	•	•	•	•
800x600	90	56.8	60.0	•	•	•	•
800x600	100	63.6	68.1	•	•	•	•
800x600	120	77.1	83.9	•	•	•	•
800x600	160	105.4	116.4	•	•	•	•
800x600	180	120.0	132.5	•	•	•	•
800x600	200	135.0	149.0	•	•	•	•
1024x768	43	35.5	44.9	•	•	•	•
1024x768	60	48.4	65.0	•	•	•	•
1024x768	70	56.5	75.0	•	•	•	•



XPERT 2000 Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
1024x768	72	57.6	78.4	•	•	•	•
1024x768	75	60.0	78.8	•	•	•	•
1024x768	85	68.7	94.5	•	•	•	•
1024x768	90	72.8	100.1	•	•	•	•
1024x768	100	81.4	113.3	•	•	•	•
1024x768	120	98.7	139.0	•	•	•	•
1024x768	140	116.6	164.2	•	•	•	•
1024x768	150	125.7	176.9	•	•	•	•
1024x768	160	134.8	192.0	•	•	•	•
1024x768	180	153.5	218.6	•	•	•	•
1024x768	200	172.8	264.1	•	•	•	•
1152x864	43	38.0	56.0	•	•	•	•
1152x864	47	41.7	62.1	•	•	•	•
1152x864	60	53.7	81.6	•	•	•	•
1152x864	70	63.0	96.7	•	•	•	•
1152x864	75	67.5	108.0	•	•	•	•
1152x864	80	72.4	112.3	•	•	•	•
1152x864	85	77.0	119.6	•	•	•	•
1152x864	100	91.5	143.4	•	•	•	•
1152x864	120	111.1	176.0	•	•	•	•
1152x864	150	141.4	226.3	•	•	•	•
1152x864	160	151.6	242.6	•	•	•	•
1280x1024	43	45.1	75.1	•	•	•	•
1280x1024	47	49.4	83.0	•	•	•	•
1280x1024	60	64.0	108.0	•	•	•	•
1280x1024	70	74.6	128.9	•	•	•	•
1280x1024	74	79.0	138.5	•	•	•	•
1280x1024	75	80.0	135.0	•	•	•	•
1280x1024	85	91.1	157.5	•	•	•	•
1280x1024	90	97.0	169.2	•	•	•	•
1280x1024	100	108.5	190.9	•	•	•	•
1280x1024	120	131.6	233.7	•	•	•	•
1280x1024	125	137.6	244.4	•	•	•	•
1280x1024	130	143.5	254.9	•	•	•	•
1600x1200	52	64.2	137.7	•	•	•	•
1600x1200	58	71.9	155.4	•	•	•	•
1600x1200	60	75.0	162.0	•	•	•	•
1600x1200	66	82.2	178.9	•	•	•	•
1600x1200	72	90.0	195.9	•	•	•	•
1600x1200	75	93.8	202.5	•	•	•	•
1600x1200	76	95.2	208.7	•	•	•	•



XPERT 2000 Video Mode Table							
Display Screen Resolution	Refresh Rate (Hz)	Hor. Scan (kHz)	Pixel Clock (MHz)	Colors (Bits Per Pixel)			
				8	16	24	*32
1600x1200	85	106.3	229.5	•	•	•	•
1600x1200	90	113.8	251.2	•	•	•	•
1792x1344	60	83.5	203.0	•	•	•	
1792x1344	75	105.2	259.3	•	•	•	
1800x1440	60	89.4	219.5	•	•	•	•
1800x1440	65	97.1	238.5	•	•	•	
1800x1440	70	104.9	249.9	•	•	•	
1800x1440	75	112.7	278.7	•	•	•	
1856x1392	60	86.5	218.6	•	•	•	
1856x1392	75	109.0	277.2	•	•	•	
1920x1080	60	67.0	172.7	•	•	•	•
1920x1080	70	78.6	205.1	•	•	•	•
1920x1080	75	84.6	220.6	•	•	•	•
1920x1080	80	90.4	237.4	•	•	•	•
1920x1200	60	74.5	193.1	•	•	•	
1920x1200	72	90.0	222.2	•	•	•	•
1920x1200	75	93.9	231.4	•	•	•	•
1920x1200	76	95.2	245.0	•	•	•	
1920x1200	80	100.5	263.7	•	•	•	
1920x1200	85	107.1	282.7	•	•	•	

*32 - 24bpp color data is processed using a 32bpp data format.
2D and 3D resolutions and refresh rates are subject to change.



Compliance Information

FCC Compliance Information

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

This device may not cause harmful interference, and

This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

The use of shielded cables for connection of the monitor to the graphics card is required to ensure compliance with FCC regulations.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.



Industry Canada Compliance Statement

ICES-003 This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe B Respecte toutes les exigences du Règlement sur le matériel brouiller du Canada.

CE Compliance Information

EMC Directive 89/336/EEC and Amendment 92/31/EEC, Class B Digital Device

EN 50081-1, Generic Emissions Standard for Residential, Commercial and Light Industrial Products

(EN 55022/CISPR 22, Limits and Methods of Measurement of Radio Interference Characteristics Information Technology Equipment)

Warning: This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

EN 50082-1, Generic Immunity Standard for Residential, Commercial and Light Industrial Products

(IEC 801-2, IEC 801-3, IEC 801-4)

Directive EMC 89/336/CEE et amendement 92/31/CEE, dispositif numérique de Classe B

EN 50081-1, Norme sur les émissions génériques pour les produits domestiques, commerciaux et industriels légers

(EN 55022/CISPR 22, Limites et méthodes de mesure des caractéristiques d'interférences radiophoniques, Matériel des technologies de l'information) *Mise en garde: ceci est un produit de Classe B. Il risque produire des interférences radiophoniques dans un environnement domestique auquel cas l'utilisateur peut se voir demandé de prendre des mesures adéquates.*

EN 50082-1, Norme sur l'immunité générique pour produits domestiques, commerciaux et industriels légers.

(CEI 801-2, CEI 801-3, CEI 801-4)

EMC Richtlinie 89/336/EEC und Änderung 92/31/EEC, Digitales Gerät der Klasse B

EN 50081-1, Allgemeiner Emissions-Standard für Haushalt- und kommerzielle Produkte sowie Erzeugnisse der Leichtindustrie



(EN 55022/CISPR 22, Beschränkungen und Verfahren der Messung von informationstechnischen Ausrüstungen mit Funkstörmerkmalen)

Warnung: Dies ist ein Erzeugnis der Klasse B. Dieses Erzeugnis kann Funkstörungen im Wohnbereich verursachen; in diesem Fall können entsprechende Maßnahmen seitens des Benutzers erforderlich sein.

EN 50082-1. Allgemeiner Unempfindlichkeits-Standard für Haushalt- und kommerzielle Produkte sowie Erzeugnisse der Leichtindustrie (IEC 801-2, IEC 801-3, IEC 801-4)

Product Notices

Macrovision Corporation

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Using Video In/ Video Out

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Printed in



Using Video In

Capture full motion or still image video

Your new RAGE™ 128-based graphics card has Video In (also known as Composite In) capability for capturing full motion or still image video. Just attach a video device such as a VCR, camcorder, or laser disk player to the *Video In* connector on the back of your new graphic card.

Connecting a Video Device

To connect your computer to a video device such as a VCR, camcorder, or laser disk player, attach a composite cable from the *Composite Output* connector on your VCR, camcorder, or laser disk player to the *Video In* on your graphic card. Most video devices such as VCRs, camcorders, and laser disk players have a *Composite Output*, also referred to as an RCA output.

Connecting Your video device

- 1 Turn off your computer and your VCR, camcorder, or laser disk player.
- 2 Ensure your graphics card is installed correctly.
- 3 Locate the *Composite Output* on your VCR, camcorder, or laser disk player.
- 4 Looking at the back of your computer, locate your graphics card. Using a Composite cable, attach one end of the cable to the *Video In* on your graphics card and the other to the *Composite Output* on your video device.
- 5 Turn on your computer and your video device.
- 6 Use the ATI Multimedia Center to capture streaming Video or still images.

For detailed information on video capture, and various capture formats available, refer to the Online User's Guide included with your ATI Install CD ROM.



Using Video Out

View your PC's display on a television!

Your new RAGE™ 128-based graphics card has Video Out (also known as TV Out) capability. Just attach your new card to a television, a monitor, or both. You can even attach your graphics card to your VCR and record your computer's display.

Television display is ideal for playing games, giving presentations, watching movies, and browsing the Internet. The following tips will help you get the most out of your Video Out feature.



READ ME FIRST

IMPORTANT INFORMATION for European Customers

- Some PC monitors in Europe **cannot** be used simultaneously with television display. When you enable television display in Europe, the refresh rate for the monitor and television is set to 50Hz. Some monitors may not support this refresh rate and could be damaged.

Please check the documentation supplied with your monitor to see if your monitor supports a refresh rate of 50Hz. **If your monitor does not support 50 Hz (or you are not sure), then turn off your monitor before turning on your computer when using your television as a display.**

For information about how to disable television display, see **Enabling and Disabling the Television Display** on **page 6**.

- Some televisions in Europe may use a SCART connection. If you use SCART, read **Using SCART Connectors for European Televisions** on **page 6** before attempting to connect your PC to your television.

Connecting your PC to a television or a VCR

To connect your computer to a television or a VCR, attach a connector cable from the television (or VCR) to your card. Most televisions and VCRs have a Composite video input, also referred to as a phono jack or RCA input. A growing number of televisions and VCRs have another type of video input called S-Video or S-VHS. An S-Video connection produces a higher quality display than Composite video. If your television has cable input only, which is the case on

older units, you can connect your graphics card to your television using your VCR or an RF modulator (available in most electronics stores).

Connecting Your Video Out Graphics Card to a Television or VCR

- 1 Turn off your computer and your television or VCR.
- 2 Ensure your graphics card is installed correctly.
To use television display, you need the enhanced ATI driver (version 6.0 or greater) installed on your system. For information about placing the card in your computer and installing the enhanced ATI driver, see the [Getting Started...guide](#).
- 3 Determine if your television or VCR has an S-Video or Composite video connection.
- 4 Looking at the back of your computer, locate your graphics card. Using an S-Video or Composite cable, attach one end of the cable to your graphics card and the other to your television or VCR. (See **Figure 1. Connecting your ATI graphics card to a TV or VCR** below.)
- 5 Turn on your computer and your television or VCR.
- 6 To turn your television display on and off, please see **Enabling and Disabling the Television Display on page 6**.

If there is no display on your television, you may need to switch your television to video display. For more information, see the documentation supplied with your television. If you have a television connected to your VCR, you can use the television as your computer's display. For information about connecting a television to your VCR, see the documentation that came with your VCR.

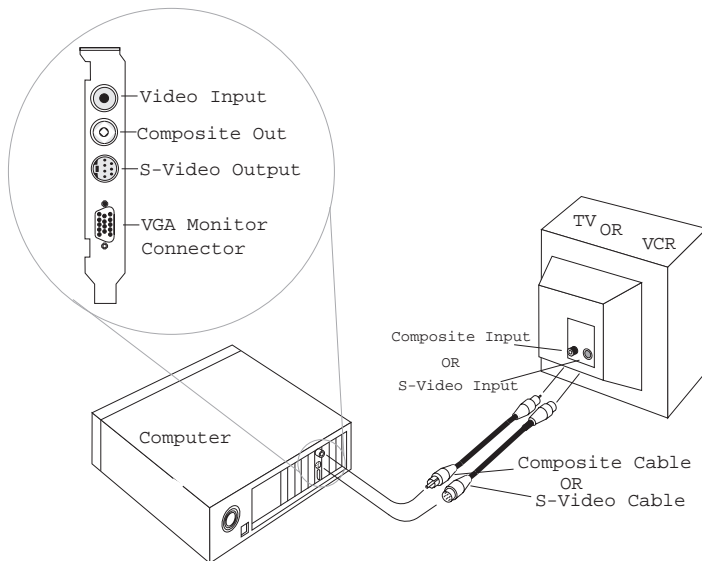


Figure 1. Connecting your ATI graphics card to a TV or VCR

Using SCART Connectors for European Televisions

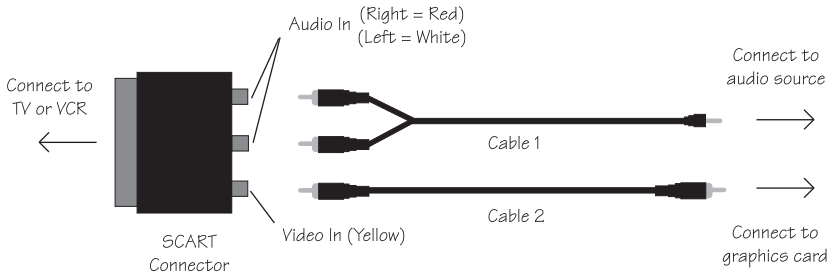


Figure 2. Using a SCART connector with a Composite cable

The SCART connector supports only the Composite video format, which is the most common type. Figure 2 shows how to connect to a SCART connector with a Composite cable.

If your television supports S-Video (also called S-VHS) video input, you can use an S-Video cable (available in most consumer electronic stores) to view your PC on a television.

Using and Adjusting Video Out

Enabling and Disabling the Television Display

- 1 Start Windows®.
- 2 Click **Start**.
- 3 Point to **Settings**, then click **Control Panel**.
- 4 Double-click **Display**.
- 5 Click on the **ATI Displays** tab.
*Windows® 98 users: Click on the **Settings** tab and then the **Advanced** button, before clicking the **ATI Displays** tab.*
- 6 Click on the green **enable/disable** button next to the word “TV” to enable/disable television display.
- 7 Click **OK** or **Apply** to save the changes you have made.
*For information about how to use television display and the **ATI Displays Properties** page, click the **Help** button.*

Starting Windows® with Television Display Enabled

The television screen may become scrambled temporarily during the initial Windows® logo display. This is only a temporary effect and your television screen will be restored within a few seconds.

During start up, your Video Out graphics card will go through a sequence of mode settings during which your television display will remain blank. This process takes only a few seconds and helps program the television display.

Using a Monitor vs. Using the Television Display

Using your television for your computer's display is ideal for playing games, giving presentations, watching movies, and browsing the Internet. The display on your monitor may change or look squashed. This occurs because the display adjusts to fit the dimensions of your television. To correct the monitor's display, use the controls on the monitor to adjust the display size and position.

Some single frequency monitors may not work with television display enabled. If you experience problems when television display is enabled, disable television display to restore your monitor's display.

Adjusting Monitor Display

The size of the display on your monitor may be smaller and not perfectly centered when you have television display enabled. These effects are caused by the changes required to provide a proper display on the television.

Use the controls available on the Adjustments tab on the Monitor Properties page (click on the **Monitor** button on the ATI Displays page) to adjust the display on your monitor only. Click on the **Television** button to adjust the television display only.

Viewing Text on Television

Due to the different technology used in the manufacturing of televisions and PC monitors, standard PC text may look too small on your television. You can compensate for this by using larger fonts.

To Use Larger Display Fonts

- 1 Start Windows®.
- 2 Click **Start**.
- 3 Point to **Settings**, then click **Control Panel**.
- 4 Double-click **Display**.
- 5 Click on the **Settings** tab.
- 6 In the **Font Size** box, select the size you want your displayed fonts to be.
*Windows® 98 users: Click on the **Advanced** button; then select your font size.*
- 7 Click **OK** or **Apply**; then follow the onscreen instructions to save your new settings.

Reducing Edge Distortion

When using a television for your PC's display, you may see some edge distortion on the left and right side of your television screen. This effect depends on your television and the PC application you are running.

To reduce edge distortion, you can increase the horizontal size.

To Increase the Horizontal Size

- 1 Start Windows®.
- 2 Click **Start**.
- 3 Point to **Settings**, then click **Control Panel**.
- 4 Double-click **Display**.
- 5 Click on the **ATI Displays** tab.
*Windows® 98 users: Click on the **Settings** tab and then the **Advanced** button, before clicking the **ATI Displays** tab.*
- 6 Click on the **TV** button.
- 7 Click on the **Adjustments** tab.
- 8 Click on the plus (+) button under Horizontal Screen to increase the horizontal size of the television display.
- 9 Click **OK** or **Apply** to save the changes you have made.

You can also reduce edge distortion by reducing the brightness.

To Change the Brightness

- 1 Start Windows®.
- 2 Click **Start**.
- 3 Point to **Settings**, then click **Control Panel**.
- 4 Double-click **Display**.
- 5 Click on the **ATI Displays** tab.
*Windows® 98 users: Click on the **Settings** tab and then the **Advanced** button, before clicking the **ATI Displays** tab.*
- 6 Click on the **TV** button.
- 7 Drag the **Brightness slider** to the left to decrease the brightness.
- 8 Click **OK** or **Apply** to save the changes you have made.

Changing Display Configurations

If you move your computer to a place where you are using television display only, make sure that you have the television display feature enabled; see

Enabling and Disabling the Television Display on page 6

If you change your display mode, television display is disabled beyond the 800x600 mode. If a television is your only display device and a non-supported mode is selected, the display on your television will disappear. Try pressing ESC or wait for 15 seconds to see if your display will return. If your display does not return, you will need to hook up a monitor to your computer to re-enable television display.

Using Games and Applications

Some older games and applications may program the graphics card directly to run under a specific display mode. This may cause your television display to turn off automatically or become scrambled (the PC monitor will not be affected). Your television display will be restored once you exit the game or if you restart your system.

