

NVIDIA RIVA

TNT

TNT2

VANTA

TNT2 M64

3D GRAPHIC ACCELERATOR

MANUAL

NVIDIA RIVA TNT/TNT2 & NVIDIA VANTA AGP and PCI

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1. NVIDIA RIVA TNT/TNT2 & NVIDIA VANTA

Memory Size:

SP5000 RIVA TNT : 16MB on Board with SGRAM/SDRAM

SP5100 RIVA TNT2 : 32MB on Board with SDRAM

SP5200 VANTA : 8/16MB on Board with SDRAM

SP5300 RIVA TNT2 M64 : 16/32MB on Board with SDRAM

SP5100PCI RIVA TNT2 : 32MB on Board with SDRAM

SP5200PCI VANTA : 8/16MB on Board with SDRAM/SGRAM

SP5300PCI RIVA TNT2 M64 : 8MB/16/32MB on Board with SDRAM

1.1 NVIDIA RIVA TNT SP5000 Features

Visually stunning interactive 3D

- * Optimized Direct3D acceleration
- * Complete DirectX 5.0 and DirectX 6.0 support
- * 100% hardware triangle setup
- * Twin texel (TNT) 32-bit graphics pipeline
 - 2 texture mapped, lit pixels per clock single pass
 - multi-texturing support(DirectX 6.0 and OpenGL)Square and non-square texture support.
- * Texture Blend support examples:
 - Multi-texture
 - Bump map
 - Texture modulation
 - Light maps
 - Reflection maps
 - Detail texture
 - Environmental maps
 - Procedural textures
- * Backend blend
 - DirectX 5.0:121 modes supported for source and alpha blending
 - 32-bit ARGB rendering with destination alpha
 - Point sampled, Bilinear, Trilinear and 8-tap
 - Anisotropic filtering (batter than Trilinear Mip mapping)
- * Per pixel perspective correct texture mapping
 - Fog
 - Light
 - Mip mapping
- * 24-bit or 16-bit Z buffer (floating point or integer)
- * 8-bit stencil buffer
- * Anti-aliasing, full scene, order independent

High performance 128-bit 2D acceleration

- * High performance 128-bit 2D Acceleration
- * Pipeline optimized for multiple color depths including 32, 24, 16, 15 and 8-bits per pixel.
- * Multi-buffering for smooth animation and video playback
- * Fast 32-bit VGA/SVGA support
- * On board 16MB SGRAM/SDRAM frame buffer

Video Support

- * Video Acceleration for Direct Show, MPEG 1/2 and indeo Planar 4:2:0 and package 4:2:2
- Color Space Conversion X and Y smooth up and down scaling with filtering
- DVD sub-picture alpha blend YUV
- * NTSC and PAL TV output with AV and S-Video output connector (**Optional**)

Robust system interface

- * Side band addressing AGP2.0 Bus with 2X transfer rate mode
- * Memory configurations up to 16MB SGRAM/SDRAM

Designed to WHQL compatibility standards

Windows2000, Windows NT4.0, Windows98, and Windows95 display drivers
Complete support for DirecDraw , Direct3D, DirectShow, and ActiveX
OpenGL IDC for all operating systems listed above

1.2 NVIDIA RIVA TNT2 SP5100/SP5100PCI Features

- * Optimized Direct3D and OpenGL acceleration
- * Complete DirectX5.0, 6.x and OpenGL support
- * 2nd Generation 128-bit Twin Texel architecture
 - 2 texture-mapped, lit pixels-per-clock cycle
 - Single-pass multi-texturing
- * 32-bit Z/stencil Buffer
- * 32-bit ARGB rendering with destination alpha
- * Point-sampled, bilinear, and 8 tap Anisotropic filtering
- * Texture Blend support
 - Multi-texture
 - Bump map
 - Texture modulation
 - Light maps
 - Reflection maps
 - Detail texture
 - Environmental maps
 - Procedural textures

High performance 128-bit 2D acceleration

- * Hardware acceleration for Windows GDI operations
- * Optimized for multiple color depths including 32, 24, 16, 15, and 8-bits per pixel
- * Multi-buffering (up to quad buffering) for smooth animation and video playback
- * Fast 32-bit VGA/SVGA support

High quality video playback

- * 30fps full screen DVD playback
- * DVD sub-picture alpha-blended compositing
- * Video acceleration for DirectShow, MPEG-1, MPEG-2, and Indeo
- * Advanced support for DirectDraw
- * Hardware color space conversion(YUV 4:2:2 and 4:2:0)
- * NTSC and PAL TV output with AV and S-Video output connector **(PCI Optional)**

Robust system interface

- * Comprehensive AGP 4x / 2x interface (AGP only)
- * PCI2.2 Bus support and Bus Mastering
- * Memory configurations up to 32MB of SDRAM

Digital LCD monitor interface support (Optional)

- * VESA P&D and VESA FPMI-STM standard compliant
- * Adjustable TMDSTM low-voltageswing signaling for long distance support
- * Support for VGA, SVGA, XGA and SXGA TFT color panels monitor
- * Panel data polarity switching for EMI reduction
- * Auto-expansion and centering for VGA text and graphics modes
- * MDR20 PanelLinkTM digital standard connector

Designed to WHQL compatibility standards

Windows2000, Windows NT4.0, Windows98, and Windows95 display drivers
Complete support for DirectDraw , Direct3D, DirectShow, and ActiveX
OpenGL IDC for all operating systems listed above

1.3 NVIDIA VANTA SP5200/SP5200PCI Features

- * Hardware acceleration for all Windows GDI operations
- * Optimized for multiple color depths including 32, 24, 16, 15, and 8bits per pixel
- * True-color hardware cursor
- * Hardware color dithering
- * Multi-buffering (up to quad buffering) for smooth animation and video playback
- * Fast 32-bit VGA/SVGA support
- * Maximum resolution of 1920x1200x32 @ 72Hz

Award-winning 3D performance

- * Second-generation 128-bit Twin Texel architecture
- * Complete DirectX 6.0 and 5.0 support
- * Single-pass multi-texturing
- * 32-bit rendering with destination alpha
- * Anti-aliasing: full scene, order independent
- * Point-sampled, bilinear, and 8 tap anisotropic filtering
- * 100% hardware triangle setup
- * Texture Blend support
 - Multi-texture
 - Reflection maps
 - Bump map
 - Detail texture
 - Texture modulation
 - Environmental maps
 - Light maps
 - Procedural textures
- * Per-pixel perspective-correct texture mapping
- * Fog, light, mip mapping
- * Optimized for Pentium III and K6-2 processors

High-quality video acceleration

- * Full-screen, full-frame DVD playback
- * Advanced support for DirectDraw
- * Back-end hardware video scaling for video conferencing and playback
- * Hardware color-space conversion(YUV 4:2:2 and 4:2:0)
- * Multi-tap X and Y filtering
- * Per-pixel color keying
- * Multiple video windows with hardware color space conversion and filtering
- * DVD sub-picture alpha-blended compositing
- * Video acceleration for Direct Show, MPEG-1, MPEG-2, and Indeo
- * NTSC and PAL TV output with AV and S-Video output connector (**PCI Optional**)

Robust system interface

- * AGP 4X/2X system bus AGP 2.0 and AGP 1.0 compliant (AGP only)
- * PCI2.2 Bus support and Bus Mastering
- * 64-bit frame-buffer interface, supporting up to 32MB SDRAM/SGRAM

Designed to WHQL compatibility standards

Windows2000, Windows NT4.0, Windows98, and Windows95 display drivers
Complete support for DirecDraw , Direct3D, DirectShow, and ActiveX
OpenGL IDC for all operating systems listed above

1.4 NVIDIA RIVA TNT2 M64 SP5300/SP5300PCI Features

- * Optimized Direct3D and OpenGL acceleration
- * Complete DirectX5.0, 6.x and OpenGL support
- * 2nd Generation 128-bit Twin Texel architecture
 - 2 texture-mapped, lit pixels-per-clock cycle
 - Single-pass multi-texturing
- * 32-bit Z/stencil Buffer
- * 32-bit ARGB rendering with destination alpha
- * Point-sampled, bilinear, and 8 tap Anisotropic filtering
- * Texture Blend support
 - Multi-texture
 - Reflection maps
 - Bump map
 - Detail texture
 - Texture modulation
 - Environmental maps
 - Light maps
 - Procedural textures

High performance 128-bit 2D acceleration

- * Hardware acceleration for Windows GDI operations
- * Optimized for multiple color depths including 32, 24, 16, 15, and 8-bits per pixel
- * Multi-buffering (up to quad buffering) for smooth animation and video playback
- * Fast 32-bit VGA/SVGA support

High quality video playback

- * 30fps full screen DVD playback
- * DVD sub-picture alpha-blended compositing
- * Video acceleration for DirectShow, MPEG-1, MPEG-2, and Indeo
- * Advanced support for DirectDraw
- * Hardware color space conversion(YUV 4:2:2 and 4:2:0)
- * NTSC and PAL TV output with AV and S-Video output connector (**PCI Optional**)

Robust system interface

- * Comprehensive AGP 4x / 2x interface (AGP only)
- * PCI2.2 Bus support and Bus Mastering
- * Memory configurations up to 32MB of SDRAM
- * 64 Bit Memory bandwidth

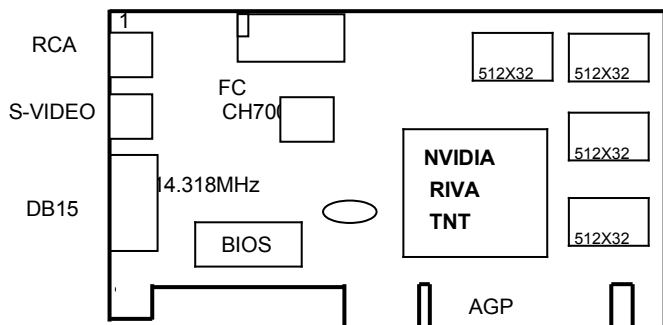
Designed to WHQL compatibility standards

Windows2000, Windows NT4.0, Windows98, and Windows95 display drivers
Complete support for DirectDraw , Direct3D, DirectShow, and ActiveX
OpenGL IDC for all operating systems listed above

2. NVIDIA RIVA TNT / TNT2 & NVIDIA VANTA Board Outline

2.1 TNT using SGRAM (SP5000)

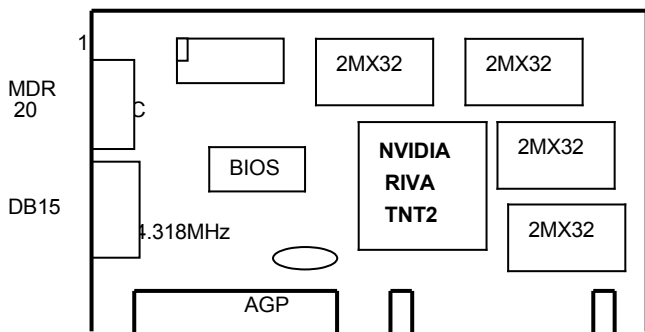
16MB on board



NOTE: TV output connector and encoder are reserved for optional.

2.2 TNT2 using SDRAM (SP5100)

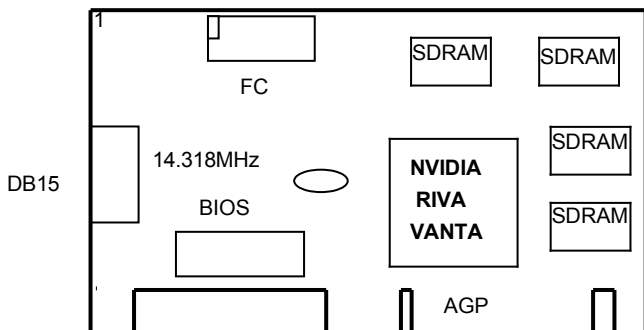
32MB on board



NOTE: MDR20 connector and LCD encoder are reserved for optional.

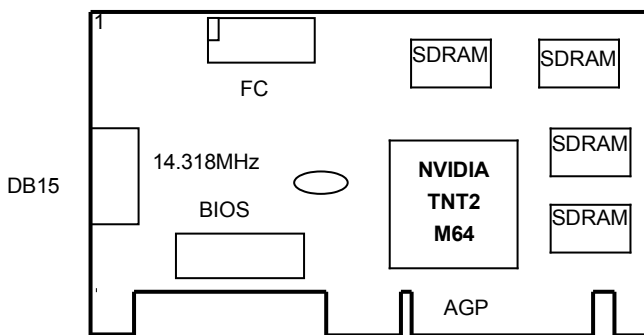
2.3 VANTA using SDRAM (SP5200)

8/16MB on board



2.4 TNT2 M64 using SDRAM (SP5300)

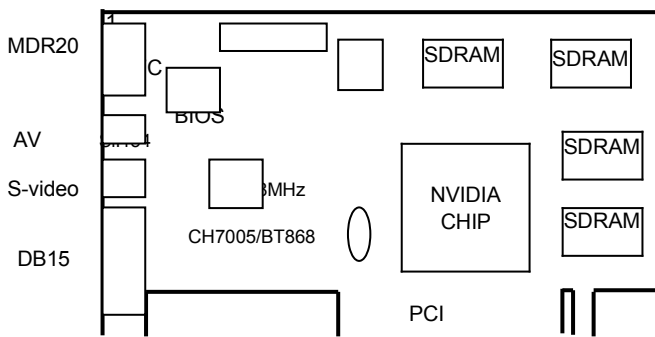
8/16/32MB on board



2.5 TNT2 / TNT2 M64 / VANTA PCI Bus VGA using SDRAM

(SP5100PCI/SP5300PCI/SP5200PCI)

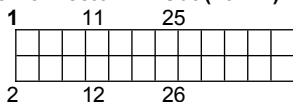
8/16/32MB on board



All models reserved MDR20 connector and Sil150/140 for optional.

All models reserved TV output connector and encoder for optional.

2.6 Feature Connector Pin Out (26 Pin)



Pin [1,3,5,7,9,11,13,15]: VID [0-7]

Pin [8,10]: HAD [0-1]

Pin [12]: HCTL

Pin [14]: SCL

Pin [26]: SDA

Pin [2,4,6,16,18,20,22,25]: Ground

Pin [17]: PIXCLK

Pin [19]: VIPCLK

Pin [21,23,24]: NC

3. Hardware Installation

3.1 Package Contents

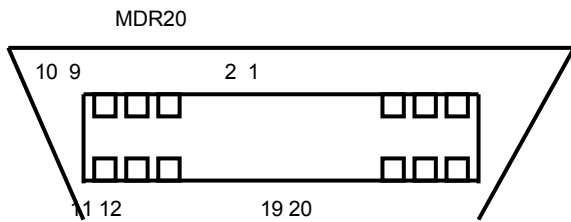
1. NVIDIA RIVA TNT / TNT2 / TNT2 M64 or NVIDIA VANTA 3D Accelerator card.
2. CD title or Software diskettes
3. This manual.

3.2 Installing the Card

1. Turn off your computer.
2. Remove the cover of the computer per the owner's manual.
3. Install the card in the AGP bus slots.
4. Replace the cover.

3.3 MDR20 PanelLink Connector Pin out Wiring Diagram (Optional)

HOST			
TX1+	1	11	TX2+
TX1-	2	12	TX2-
TX1 SHIELD	3	13	TX2 SHIELD
TXC SHEILD	4	14	TX0 SHIELD
TXC+	5	15	TX0+
TXC-	6	16	TX0-
DDC GND	7	17	NC
DDC +5V DC	8	18	SENS
NC	9	19	DDC / SDA
NC	10	20	DDC / SCL



3.4 Resolutions and colors supported:

NVIDIA RIVA TNT / TNT2 /TNT2 M64 & NVIDIA VANTA AGP bus VGA cards are fully compatible VGA with the addition of Hi-Color and True Color modes depending on the amount of video memory stalled. The amount of memory needed to display various resolutions is shown below.

Resolution & Colors	BPP	Refresh Rate (HZ)
640x480-256c	8	60/70/72/75/85/100/120/140/144/150/170/200/240
640x480-64Kc	16	60/70/72/75/85/100/120/140/144/150/170/200/240
640x480-16Mc	32	60/70/72/75/85/100/120/140/144/150/170/200/240
800x600-256c	8	60/70/72/75/85/100/120/140/144/170/200/240
800x600-64Kc	16	60/70/72/75/85/100/120/140/144/170/200/240
800x600-16Mc	32	60/70/72/75/85/100/120/140/144/170/200/240
1024x768-256c	8	60/70/72/75/85/100/120/140/144/150/170
1024x768-64Kc	16	60/70/72/75/85/100/120/140/144/150/170
1024x768-16Mc	32	60/70/72/75/85/100/120/140/144/150/170
1152x864-256c	8	60/70/72/75/85/100/120/140/144/150
1152x864-64Kc	16	60/70/72/75/85/100/120/140/144/150
1152x864-16Mc	32	60/70/72/75/85/100/120/140
1280x1024-256c	8	60/70/72/75/85/100/120
1280x1024-64Kc	16	60/70/72/75/85/100/120
1280x1024-16Mc	32	60/70/72/75/85/100
1600x1200-256c	8	60/70/72/75/85
1600x1200-64Kc	16	60/70/72/75/85
1600x1200-16Mc	32	60/70/72/75
1920x1080-256c	8	60/70/72/75/85
1920x1080-64Kc	16	60/70/72/75/85
1920x1080-16Mc	32	60/70/72(TNT/TNT2/TNT2 M64)
1920x1200-256c	8	60/70/72/75
1920x1200-64Kc	16	60/70/72/75
1920x1200-16Mc	32	60(TNT/TNT2/TNT2 M64)

4. Smart Installation

For Windows 95 OSR2.1, Windows 98, WindowsNT4.0 SP3

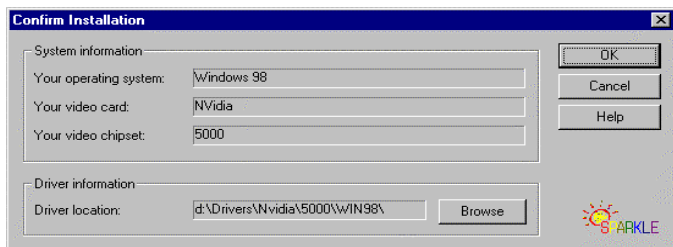
4.1 Put the DRIVERS CD in your CD-ROM

4.2 Click the **Driver installation**



4.3 If everything fine, screen will show **Confirm Installation** window.

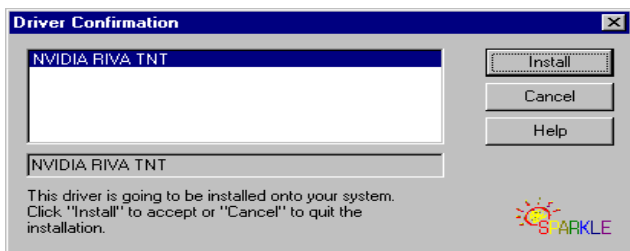
Then Select the **OK** (Here the picture shows NVIDIA RIVA TNT for example)



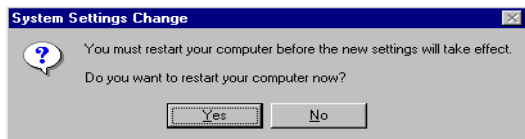
4.4 Now appears the **Driver Confirmation** window

Select the **Install**

(Here the picture shows NVIDIA RIVA TNT for example, if you are using NVIDIA RIVA TNT2, TNT2 M64 or NVIDIA VANTA, Driver Confirmation window will show NVIDIA RIVA TNT2, TNT2 M64 or NVIDIA VANTA drivers)



4.5 Then restart your computer.



5. Manually install Windows 95 & Windows 98 drivers

5.1 Installation and Setup

5.1.1 Windows95

The Windows setup program installs and modifies all of the necessary files. Follow these steps to install the Windows 95 drivers.

- Insert the DISC (CD Title Driver).
- Select **Control Panel** from **My Computer** group.
- Select the **Display** icon
- Double-click on the **Display** icon in the Setting -> **Control Panel** folder. You can also click the right mouse button anywhere on the desktop and select the Properties option from the pop-out menu.
- Click the **Settings** tab.
- Click the **change** Display Type button.
- Click the **Have Disk** button.
- Change directories and Select **NV4agp .inf**
Disc (CD Title) is E:\drivers\Nvidia\5000\WIN95 (TNT: 5000 , TNT2: 5100 , VANTA: 5200 TNT2 M64: 5300)

Note: "E:"-> CD Drive "Nvidia"-> VGA chip brand name "5000"-> VGA model name

- Select AGP driver from the list and click the **OK** button. If a message stating that one or more driver files is older than the files on the system respond **YES** to overwrite the files.
- Click the Close button and Apply button, and restart your computer.

5.1.2 Windows98

The Windows setup program installs and modifies all of the necessary files. Follow these steps to install the Windows 98 drivers.

- Insert the DISC (CD Title Driver).
- Select **Control Panel** from **My Computer** group.
- Select the **Display** icon
- Double-click on the **Display** icon in the Setting -> **Control Panel** folder. You can also click the right mouse button anywhere on the desktop and select the Properties option from the pop-out menu.
- Click the **Settings** tab.
- Then show **[Unknown Device.] Properties** tab
Select **Adapter**
- Then show **Standard PCI Graphics....** tab
Select **Change**
- Then show **Update Device** tab
Select **Next**
- Then show **Update Device** tab
Select **Search for a better.....**
Then select **Next**.
- Then show **Update Device** tab
If the **Specify a location** is wrong
Please select **Brows**
- Then show **Browse for Folder** tab
Select **E:\drivers\ Nvidia\5000\win98 (TNT: 5000, TNT2: 5100, VANTA: 5200)**
Disc (CD Title) is E:\drivers\ Nvidia\5000\WIN95

Note: “E:”-> CD Drive “Nvidia”-> VGA chip brand name “5000”-> VGA model name

Then select **OK**

- Then show **Update Device Driver Wizard** tab
Select **CD-ROM driver**
Click the **Specify a locator**, if right
Then select **Next**
- Then show **Update Device Driver Wizard** tab
Select **Next**
- Then show **Update Device Driver Wizard** tab
Select **Finish**
- Then show **System Settings Change** tab
Select **OK**

5.2 How to Change Color Depth and Resolution

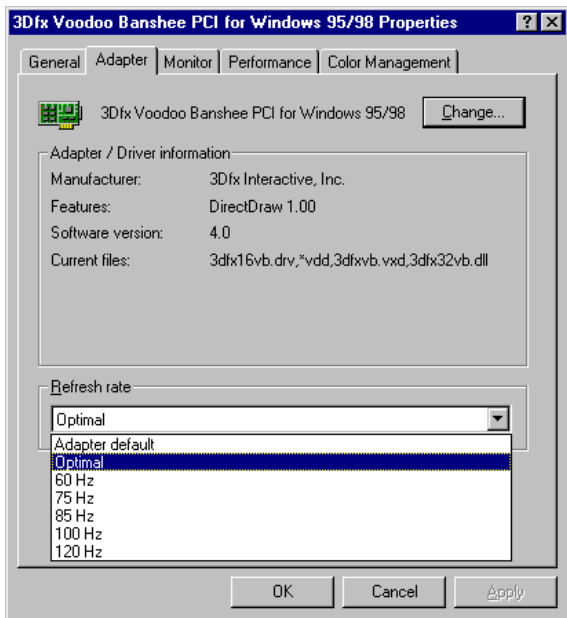
1. Make sure that you have installed windows95/98 Driver.
2. Click on the **Start** box in the lower left corner and proceed to **Control Panel**.
3. Inside the **Control panel** group , click on **Display** icon to open the **Display Properties** folder and select the **Setting table**
4. Click on the pull-down arrow from the **Color** palette area to select color depth or adjust the sliding bar to either **Less** or **More** from the **Desktop area**
5. Select **OK** to restart **WINDOWS95** and new color depth or the new resolution takes effect.

5.3 How to Change Refresh Rate

Here the picture shows Voodoo Banshee for example

1. Make sure that you have installed windows95/98 Driver. Click on the **Start** box in the lower left corner and proceed to Setting, **Control Panel**
2. Inside the **Control panel** group , click on **Display** icon to open the **Display Properties** folder and choose **Settings** click the **Advance Settings** choose **Adapter**
3. Click on the **Refresh Rate** sub window to change refresh rate
4. Select **OK** and new refresh rate takes effect

Note: If your monitor is not Branded or Plug&Play, you will only see Adapter default and optimal. Please contact your monitor supplier to get right or compatible drivers for your monitor. Otherwise you can not select the refresh rate you wanted.



- Here the picture shows Voodoo Banshee for example.
- Refresh Rate default is Optimal.
- If you change Refresh Rate from Optimal to another , you must be to restart WINDOWS 95 or 98

6. Windows NT 4.0

The following steps describe how to install Windows NT4.0 display drivers

1. Select **Control Panel** from the **Main** group.
2. Select the **Display** icon.
3. Select **Change Display Type**.
4. Select Change from the **Adapter Type** area.
5. Select **Other**.
6. Place the Disc (CD Title) into Driver. Click **OK**.
7. Select **Install** and click "**YES**" when the Installing Driver dialog box appears.
8. When the Windows NT **Setup** dialog box appears select CDROM, and click "**Continue**".

A message appears stating that drivers were successfully installed. Click **OK**. Another message appears stating that the driver could not be restarted dynamically. Restart **Windows NT** to run the new driver. Click **OK**.

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference. (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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 the instructions, may cause harmful interference in 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 into 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.

Notice:

(1) An Unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

(2) Use only shielded cables to connect I/O devices to this equipment.

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

Trademark Acknowledgments

All brand names and trademarks are the property of their owners.