TARGA® 2000 for Windows NT
Online Reference Manual

Pinnacle Systems, Inc.
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Mountain View, CA 94043

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Note: 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, and (2) this device must accept any interference received, including interference that may cause undesired operation. *Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.*

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 the 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:

- Re-orient 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.

To minimize emissions from your system, use only shielded interface cables and certified Class B peripherals.

Carl Calabria, Senior Vice-President, Engineering
Pinnacle Systems, Inc.
280 N. Bernardo Avenue
Mountain View, CA 95051

CE

DECLARATION OF CONFORMITY

Application Of Council Directive 89/336/EEC

Standards to which Conformity is Declared:
EN 55022 and EN 50082-1

Manufacturer's Name:	Truevision Inc.
Manufacturer's Address:	2500 Walsh Avenue Santa Clara, CA 95051
Type of Equipment:	PCI Display Card (PC Platform)
Model Name:	TARGA 2000
Tested By:	EMCE Engineering, Inc. 44370 S. Grimmer Blvd. Fremont, CA 94538-6309 USA
Manufacturer's Test Engineer:	Joe Cunningham

*I, the undersigned, herby declare that the equipment specified above
conforms to the above Directive and Standard.*

Name (please print): Carl Calabria

Title: Senior VP of Engineering

Signature: *Carl Calabria*

Date: December 8, 1995

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Official Notices And Warranties

Introduction

Using the TARGA 2000™ Online Reference Manual

This electronic document has been created in the Adobe™ Acrobat™ Portable Document Format (PDF). Pinnacle suggests that you print a hard copy of this manual for quick reference and note making. Hypertext links (the highlighted words) and a bookmarked index have been provided with this manual so you can quickly reference topics and locate information. The controls you use to navigate through this document are in the toolbar and status area of the Acrobat Viewer. They are defined as follows:

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Using This Manual

Chapter 1 -- contains basic concepts and information on digital movies. This should be read before making a movie with your TARGA 2000™.

Chapter 2 -- shows how to use the Control Panels and tells which support utilities are installed for the TARGA 2000.

Chapter 3 -- is a tutorial introducing you to using the TARGA 2000 with a digital movie editing application such as Adobe Premiere.

Appendix A -- contains troubleshooting and contacting Pinnacle information.

Appendix B -- gives the technical specifications for the TARGA 2000.

Appendix C -- describes TARGA cables and contains cable specifications.

Appendix D describes how to upgrade a TARGA 2000 CA/V card to a TARGA 2000 Pro card.

Appendix E describes how to upgrade a TARGA 2000 DTX card to a TARGA 2000 RTX card.

Appendix F describes how to upgrade a TARGA 2000 RTX card to a TARGA 2000 SDX card.

Appendix G describes how to upgrade a TARGA 2000 RTX or SDX card to a TARGA 2000 3D card.

Chapter 1 – Basic Concepts and Tips

Contents

This Chapter Contains:

About Video Formats

Video is comprised of a series of still images called frames. When the frames are displayed in rapid succession, the eye interprets the changes between frames as motion. The NTSC video format displays 29.97 fps (often referred to as 30 fps). The PAL video format displays at 25 fps.

Each video frame is made up of a series of horizontal lines, called scan lines. In the NTSC format, there are a total of 525 lines. Not all of these lines are part of the image. Some provide synchronization and other information. The TARGA 2000™ digitizes 486 lines in NTSC and 576 lines in PAL.

The odd and even numbered scan lines (counting from the top) are separated into two groups, called fields. When the frame is displayed, one field is scanned first. Then the system goes back to the top of the screen and scans the other field. In this way, the two fields are alternately drawn. This is called interlaced display because the two fields interlace on the screen. While one field is fading, the other is drawn, so that the screen is constantly and uniformly refreshed.

The resolution or dimensions of the video frame is described as the number of pixels in each line by the number of lines. The video digitizer (i.e., TARGA 2000) samples each line at up to 648 pixels in NTSC and up to 768 pixels in PAL or SECAM. NTSC is 640 x 480, PAL and SECAM are 768 x 576. (The TARGA 2000 Pro upgrade and TARGA 2000 RTX offer CCIR 601 720 x 486 for NTSC and 720 x 576 for PAL.)

The sound track that accompanies most videos is a completely separate set of data. The only relationship the sound track has to the video is synchronization.

Video Sources

The best quality video source will yield the best recorded image. You will have to assess your intended audience and quality needs before deciding what device to record movies from. The most basic TARGA 2000 card accepts analog input in the form of S-Video (Y/C) and Composite Video. If you have the TARGA 2000 Pro, DTX or RTX version of the card, the analog inputs accepted by the card are Composite, S-Video (Y/C), RGB, and Component (Betacam, SMPTE/EBU) video. The TARGA 2000 SDX only accepts serial digital input. If you have the SDX version of the card, the serial digital input is SMPTE 259-M compliant. Most consumer cameras and VCRs output Composite video. Higher-end video products provide an S-Video signal. Professional level video products often provide RGB, Component, or Serial Digital.

Serial digital is preferred over RGB; RGB is preferred over Component; Component is preferred over S-Video; and S-Video is preferred over Composite. Cost increases as you move up the scale, but the benefits are better color saturation, sharper edges, better stability, and less noise.

Every transition between analog media lowers the signal quality, so recording directly from a video camera is ideal. Recording from tape involves a second step, which introduces signal loss. A second-generation tape (a copy of a tape) brings another degree of loss. A tape that has been used many times (i.e., worn tape) will also contribute to signal loss.

Note: Use only shielded video cable. Unshielded cable can pick up electronic noise from other hardware, like the computer and monitor, and degrade the signal. For composite video, be sure to use 75-Ohm video cable, not audio cable.

Hardware vs. Software Playback

The TARGA 2000 software allows you to select QuickTime™ MOV (.mov or movie file format) or Video For Windows® (.avi file format) as your multimedia device driver. (For Premiere 5, Pinnacle recommends QuickTime.) When saving an AVI or Movie file in most video-editing applications, you are generally asked to choose the type of compression/ decompression (CODEC) method for saving the file. This allows the files to be exchanged between applications or between PCs. There is a difference, however, between the various CODECs. Some of them are software methods of compression/decompression, and some are hardware methods. For instance, common QuickTime software CODECs are Cinepak, Indeo, and Motion JPEG. Common VFW software CODECs are Cinepak, Microsoft Video 1, and Indeo. All of these are software CODEC schemes because you do not need special hardware to playback a movie saved in these formats. Therefore, these movies can be played back on any PC and do not require a specific compression board.

TARGA 2000 digitizes video frames in the AVI and QuickTime MOV formats. With Video for Windows, the compression format is "TARGA MJPG." With QuickTime, the compression formats are "TARGA Video" and "TARGA M-JPEG B." Both of the QuickTime compression formats represent compressed video frames using the JPEG algorithm. TARGA Video has a slightly higher performance system, but can only be compressed on systems that also have TARGA boards installed. TARGA M-JPEG B is a format that is equivalent to a QuickTime provided software compressor called Apple Motion JPEG B.

TARGA 2000 is designed to save movies in either the "TARGA Video" or "TARGA M-JPEG B" format. If you want to play a TARGA 2000 movie in real-time mode though, the PC playing the movie must have a TARGA 2000 card installed and operational.

Note: Any file created on a TARGA 2000 installed PC, but played on a PC which does not have a TARGA 2000, will retain its "full frame" capability, but will not retain the guaranteed "full motion" capability possible with a TARGA 2000.

Transfer And Conversion Of .MOV And .AVI Files

Any QuickTime aware application (on a TARGA 2000 installed PC) will be
able to import a TARGA 2000 file without any special conversion.
Conversion is necessary, however, when you want the TARGA 2000 to read
a file from a format other than "TARGA Video" or "TARGA M-JPEG B."
To convert the file, simply use an application such as Adobe Premiere 5, or
any application capable of converting a file to the .mov or .avi format. Open
the file and save it in one of the following formats: TARGA M-JPEG B,
TARGA Video, TARGA MJPG or DVM . Applications such as Adobe
Premiere 5 or the Pinnacle Digital VCR Utility can also covert a "TARGA
Video" file format to various other formats.

> **Note:** When converting a file to .avi with "TARGA MJPG," the image must be 24-bit. If
> the image is not 24-bit, the Pinnacle compression option will not appear. Also, if the file
> is not 30 fps, it needs to be converted or playback will be compromised.

Hardware Considerations When Using TARGA 2000

You should be aware that there are a number of hardware considerations that
can influence your movie recording ability. Some involve the speed at which
you can capture video frames while others affect image quality.

The primary criteria for evaluating analog components of your system is their
ability to keep pace with the stream of data, both video and audio. The
NTSC square-pixel resolution is 640 x 480 pixels, for a total of 307,200
pixels. At 29.97 (or 30) frames per second, that's 9,216,000 pixels per
second. At 24 bits per pixel, that's 21 megabits per second (if audio is
included then the data rate can increase by up to 192K per second).
Therefore, a SCSI controller that has a high-performance 7200 rpm ultra-
wide drive is essential in order for you to achieve the necessary data rates for
optimal results.

Square vs. Non-Square Pixels

Many of today's video editing applications (not to mention computer software in general), assume that you are working in a resolution that uses square pixels, that is, one that has the same number of pixels horizontally and vertically for a given length. More specifically, these video editing applications assume that full-screen video resolution is 640 x 480 (NTSC) or 768 x 576 (PAL).

Some video products, such as TARGA 2000 SDX, utilize resolutions with non-square pixels. As mentioned previously, the resolution of NTSC for TARGA 2000 SDX is 720 x 480. On a video monitor, the video signal displays more pixels in the horizontal direction than in the vertical direction for a given length. As a result, NTSC pixels are rectangular, taller than they are wide, on the video monitor. The situation is reversed in PAL where the resolution is 720 x 576. In this case, the rectangular pixels are wider than they are tall.

This merging of the square and non-square pixel worlds manifests itself in a variety of ways, some of which have already been described. In general, they will not affect your work but you should nonetheless be aware of the implications.

Displaying Serial Digital Clips On A Computer Screen

The non-square nature of the serial digital format is most obvious when you play back a serial digital clip with a software CODEC, such as Adobe Premiere, on your computer screen. The taller, rectangular NTSC serial digital pixels are stretched horizontally to square pixels on the computer screen and the image appears slightly "squashed." The wider, rectangular PAL serial digital pixels are stretched vertically to square pixels on the

computer screen and the image appears slightly "scrunched." The diagram below illustrates this phenomenon for NTSC.
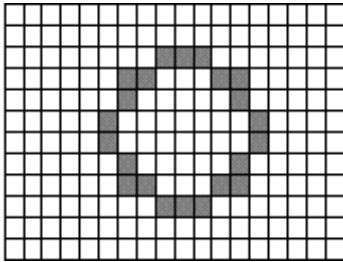
Circle on a video monitor
(with rectangular pixels)
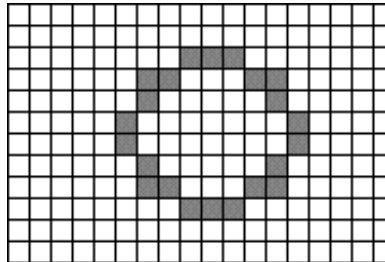
Circle on a computer monitor
stretches (with square pixels)

Again, the distorted display of non-square resolution video on the computer screen will not affect how your video looks when you output via serial digital to a video monitor.

Note: If you are editing a 16:9 project in Adobe Premiere, your computer screen previews will be further distorted due to the fact that you cannot set these previews to a 16:9 aspect ratio. Again, this will not affect how your video looks when output with serial digital, except as described immediately below.

Effects, Transitions, And Titles

Many video applications calculate their effects, transitions, and titles based on an assumed square pixel aspect ratio. Those effects and transitions that are geometric in nature, as well as titles, will appear slightly distorted when rendered to the serial digital format. For example, in NTSC, a circular iris transition will appear as a slightly elongated oval when it is calculated. The angle of a page peel will be slightly steeper than 45 degrees. Titles will be rendered slightly taller. The distortion is greater if you are editing a 16:9 project. The extent to which these slight distortions matter will depend on you and your audience.

About TARGA 2000 Audio

The common audio rate that is supported is 48 KHz (also 44.1 and 32 KHz are common), 16 bit, stereo. To setup QuickTime to utilize audio, you must select the audio options in the QuickTime control panel as shown in the next two figures. The QuickTime Control Panel can be opened by clicking the Start button, highlighting Settings, selecting the Control Panel folder, and then selecting the QuickTime Control Panel.

QuickTime Sound In

QuickTime Sound Out

Note: The QuickTime settings "Built-in" and "waveOut" are linked to whatever audio device is selected within the Multimedia Control Panel of Windows. For your audio to function probably, TARGA or Pinnacle DVR should be the selected as the audio device in the Multimedia Control Panel.

Chapter 2 – TARGA 2000™ Control Panels And Utilities

Contents

This Chapter contains:

Accessing The Control Panels

There are several software settings you must configure for audio, video input, and video output before using your TARGA 2000. These settings are made via the TARGA 2000 Control Panels. The Control Panels for TARGA 2000 are:

- Video Input Control Panel
- Video Output Control Panel
- Audio Control Panel
- QuickTime Control Panel

All of the hardware and software settings made in the control panels are saved in the DVR.INI file in the Windows NT directory, and remain the default until changed.

The TARGA 2000 Control Panels can be accessed by "Start » Settings » Control Panel » Pinnacle DVR (for Video Input and Video Output) or QuickTime." The Control Panels (except for QuickTime) and all of the software utility applications that accompany TARGA can also be accessed by "Start » Programs » TARGA 2000."

Video Input Control Panel
The Video Input Control Panel allows you to specify what types of video inputs are connected to the board for your video input source, and allows you to make adjustments to the video input.
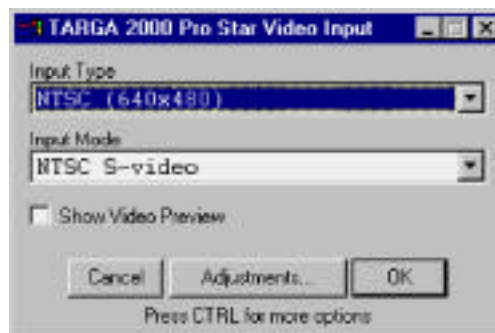
Input Type

Use your mouse or keyboard to select an appropriate video input type (signal type) for your particular video input source. The TARGA 2000 can accept the following input types (available video types will vary with different board types):

- NTSC 720x486
- NTSC 648x486
- NTSC Japan 720x486
- NTSC Japan 648x486
- NTSC Japan 640x480
- NTSC 640x480

- PAL 720x576
- PAL 768x576

Input Mode

Use your mouse or keyboard to select an appropriate video input mode (specific signal type) for your particular video input source. The TARGA 2000 can accept the following input types (available video types will vary with different board types):

- NTSC Betacam (Y, B-Y, R-Y)
- NTSC Composite
- NTSC MII GBR
- NTSC SMPTE GBR
- NTSC GBR (No Setup)
- NTSC GBR (With Setup)
- NTSC MII (Y, B-Y, R-Y)
- NTSC S-Video

- PAL Composite
- PAL SMPTE/EBU (Betacam/MII)
- PAL SMPTE GBR
- PAL S-Video

Show Video Preview

When selected, this setting allows live video to pass to your video output display device. Use this setting to verify that you have correctly set your video input. Your video input must be activated (i.e., tape playing or camera on) for this function to operate.

Note: The TARGA 2000 does not convert video signals from NTSC to PAL, or vice versa. If you have NTSC input, the output will automatically be set to NTSC. The same applies to PAL.

Video Input Adjustments

Pinnacle supplies various filters and settings for your video input signal. Depending on your board, your input type, and your input mode, you could see a variety of options when you click on the Adjustments button.

Chapter 2

TARGA 2000 Control Panels And Utilities
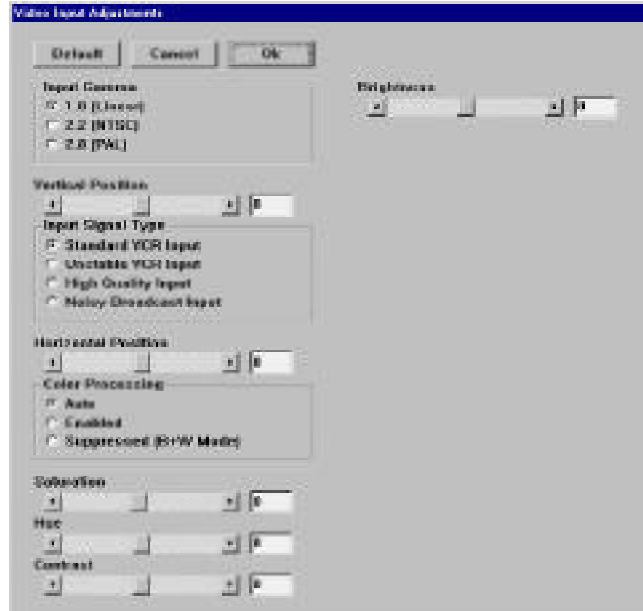
INPUT GAMMA

Allows you to make adjustments for color signal variations among different pieces of video equipment. We recommend 1.0 Linear Gamma for recording and playback of compressed video.

— 1.0 (Linear) -- Use when the incoming video already has the correct gamma component factored into it, and further correction is not needed.

— 2.2 (NTSC) -- Use to remove the effects of gamma from the NTSC input signal (i.e., to convert non-linear/gamma corrected video data to linear video data.)

— 2.8 (PAL) -- Use to remove the effects of gamma from the PAL input signal (i.e., to convert non-linear/gamma corrected video data to linear video data.).

COLOR PROCESSING
Enables/disables the automatic color killing processing function.

- Auto -- If color burst information meets or exceeds the color killer threshold, the decoder will attempt to extract color information.

- Enabled -- Forces color processing on signals that have input color information so weak that color processing could not compensate. If an input signal has no color information and Color Processing is forced on, erroneous color artifacts can occur.

- Suppressed (B+W Mode) -- Color processing neither looks for color burst information nor attempts to generate color burst signals as in Enabled mode.

SATURATION
The ratio of the Hue component to the White component. Another term for this is purity. The lower the white content the more saturated or pure the color. This controls the Chrominance Gain independent of the Luminance Gain. Decreasing the saturation moves the hue to a pastel shade.

HUE
The property of pure color. The hues are the primary colors of red, green, and blue and their complements of cyan, magenta, and yellow. A hue has only one wavelength associated with it while a blend of hues, such as white, has multiple wavelengths. Therefore, white and black are colors but not hues. The Hue control adjusts the subcarrier phase so that the displayed "color" agrees with your conception. An example is the flesh tone of a person. This can be adjusted over a gamut of red to green.

CONTRAST
The contrast controls both luminance and chrominance to preserve the purity while increasing the "brightness" of an image. Contrast is the overall gain control.

BRIGHTNESS

This is the amount of overall luminance perceived. Increasing "brightness" increases the amount of white light added to a picture reducing the saturation or purity of an image. Brightness implements a DC offset in the picture content.

VERTICAL POSITION

Allows you to adjust the vertical positioning of your video on the output monitor.

INPUT SIGNAL TYPE

These settings can be used to help the board adjust to the quality of the input signal.

— Standard VCR Input -- The default for normal quality video input.

— Unstable VCR Input -- Use if you have a input signal with weak sync pulses. This means the input might roll horizontally or vertically, appear distorted, or be shifted on the screen. This setting basically increases the tolerance for sync pulse instability.

— High Quality Input -- Use for better input sources (such as laser disks) that are expected to provide very clean video and timing pulses.

— Noisy Broadcast Input -- Use for high quality sources such as laser disks that have clear timing pulses but happen to contain noisy video signals.

HORIZONTAL POSITION

Allows you to adjust the horizontal positioning of your video on the output monitor.

REMOVE SYNC ON GREEN

When using an RGB input, this selection designates whether sync is expected on the green component of the input or as a separate signal. The default expects sync with the green signal.

Advanced Video Input Adjustments

The Advanced Video Input Adjustments are provided for even finer control over incoming video signals. All of these adjustments are minute, and require the use of a scope to measure. To access the Advanced Video Input Adjustments window, hold down the <CTRL> key and click the Adjustments button in the Video Input Window. Depending on your board model, input type, and input mode you could see a variety of input adjustments.
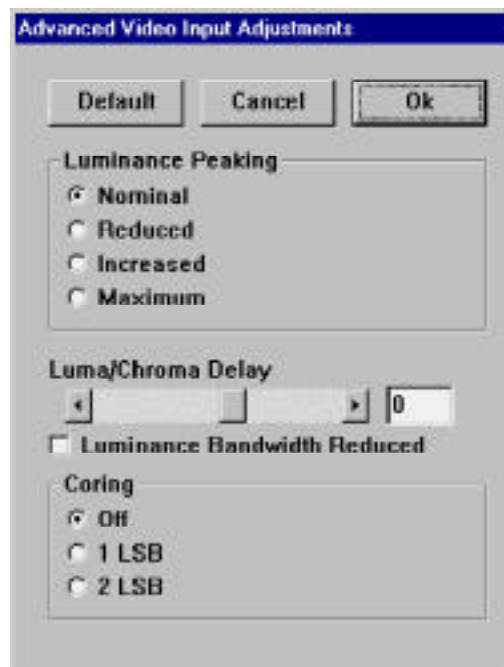
LUMINANCE PEAKING

When used with filters that tend to wash out the luminance signal, this option boosts the luminance signal by forcing a higher gain near the color burst frequency.

— Nominal -- The default setting for the board (Luma bandwidth is 4.2 MHz nominal).

— Reduced -- Use if you have a weak or "dirty" input signal that has a "washed out" look to the video (Luma bandwidth less than 4.2 MHz).

— Increased -- Use for better input sources (such as laser disks) that are expected to provide a clean look to the video (Luma bandwidth greater than 4.2 MHz but less than 4.5 MHz).

— Maximum -- Use for high quality sources such as laser disks when you want to keep the detail and have a very clean look to the video. (Luma bandwidth greater than 4.5 MHz)

LUMA/CHROMA DELAY
The separate processing paths for luminance and chrominance can cause variations in each signal's time delay to the decoder. Luma/Chroma delay allows adjustment of the luminance delay to provide alignment with the chrominance at the output of the decoder.

LUMINANCE BANDWIDTH REDUCED
This high frequency filter attempts to limit high frequency noise caused by forced extraction of color signals or digitization of analog signals.

CORING
Provides processing control over the high frequency components of luminance which reduces noise (sparkles) in dark areas of video. Used with higher aperture factors to reduce amplified noise, coring basically throws away the least significant bits of information in the portion of a bipolar chrominance signal around the 0 crossover point.

— Off -- All digital sampling is preserved.

— 1 LSB -- Removes 1 Least Significant Bit (values in the range of +1 to -1 mapped to 0) of the chrominance signal to reduce the resolution of data around the crossover point.

— 2 LSB -- Removes 2 Least Significant Bits (values in the range of +1 to -1, +2 to -2, and +3 to -3 mapped to 0) of the chrominance signal to reduce the resolution of data around the crossover point.

LUMA COMB FILTER

An alternate or supplemental filter to the Chroma Trap that is used to separate the luminance signal from the chrominance signal. This filter separates the luminance signal from the chrominance signal for processing into R', G', and B' signals (' is prime and prime is non-linear here).

— Enabled, Auto Mode -- Enables a 1 or 2 line filter depending on whether the signal is a PAL (1 line) or NTSC (2 line) signal.

— Enabled, 1 Line -- A filter for PAL is enabled.

— Enabled, 2 Line -- A filter for NTSC is enabled.

— Disabled -- The Luma Comb Filter is turned off.

VERTICAL BANDWIDTH REDUCED

Removes high frequency noise by removing the highest frequency ranges of the luminance signal bandwidth. This filter will also strip away some video information. This setting should be used in conjunction with Chroma Bandwidth Reduced.

CHROMA TRAP DISABLED

Improves the purity of the luminance (black and white) information by filtering out the 3.58 MHz (NTSC) subcarrier signal.

CHROMA COMB FILTER DISABLED

This filter tries to eliminate high frequency artifacts in the chroma signal caused by forced color extraction.

CHROMA BANDWIDTH REDUCED

Removes high frequency noise by removing the highest frequency ranges of the chrominance signal bandwidth. This filter will also strip away some video information. This setting should be used in conjunction with Vertical Bandwidth Reduced.

Video Output Control Panel

The Video Output Control Panel allows you to specify what types of video outputs are connected to the board for your video output source, and allows you to make adjustments to the video output.

Output Type

Use your mouse or keyboard to select an appropriate video output type (signal type) for your particular video output source. The TARGA 2000 can accept the following output types (available video types will vary with different board types):

- NTSC 720x486
- NTSC 648x486
- NTSC Japan 720x486
- NTSC Japan 648x486
- NTSC Japan 640x480
- NTSC 640x480

- PAL 720x576
- PAL 768x576

Output Mode

Use your mouse or keyboard to select an appropriate video output mode (specific signal type) for your particular video output source. The TARGA 2000 can provide the following output types (available video types will vary with different board types):

- NTSC Betacam (Y, B-Y, R-Y)
- NTSC Composite & S-Video
- NTSC MII GBR
- NTSC SMPTE GBR
- NTSC GBR (No Setup)
- NTSC GBR (With Setup)
- NTSC MII (Y, B-Y, R-Y)

- PAL Composite & S-Video
- PAL SMPTE/EBU (Betacam/MII)
- PAL SMPTE GBR

Show Video Preview
When selected, this setting allows live video to pass to your video output
display device. Use this setting to verify that you have correctly set your
video output. Your video input must be activated (i.e., tape playing or
camera on) for this function to operate.

Note: The TARGA 2000 does not convert video signals from NTSC to PAL, or vice
versa. If you have NTSC input, the output will automatically be set to NTSC. The same
applies to PAL.

Video Output Adjustments
Pinnacle supplies various filters and settings for your video output signal.
Depending on your board, your output type, and your output mode, you
could see a variety of options when you click on the Adjustments button.

GENLOCK INPUT CONTROL

This setting provides three options: Disabled (None), Current Video In, and Blackburst Genlock Input. We suggest you select Disabled if you do not need genlock.

— Disabled -- The default that assumes that genlock is not needed.

— Current Video Input -- If you are using a Composite Video source, you can choose Current Video In so that your input and output devices are in step with one another. If you have an S-Video source, you cannot use Video Source 1 as a genlock source because you get a timing lock but not a true genlock. To get around this problem, however, you can attach a Composite Signal Source (Composite Out on the device) to the yellow Composite cable lead on the CA-204 cable.

— Blackburst Genlock Input -- Intended for the studio environment in which there is a house sync. Connect the BLACK lead on your CA-204 cable to this sync.

OUTPUT TIMING

There is a defined video standard for timing an analog active video signal, and another defined video standard for timing a digital active video signal. The two standards do not exactly correspond in regards to actual active video signal timing. Thus, when full active video is captured by the TARGA 2000 board, a dark line may be seen on the edges of the video due to the timing discrepancy in the standards of analog and digital video.

— SMPTE 170M -- This setting conforms to the timing of full active video for analog. For NTSC, only 712 pixels of data are used to produce full active video. For PAL, only 702 pixels of data are used to produce full active video.

— Full 720 Pixels -- Use this setting if the editing software application addresses all 720 pixels (e.g., a rendered image) that are used to produce full active video.

Note: If either setting is selected and the editing application does not address all pixels, the TARGA board will fill the leftover pixels with data, and a black line will be seen along the edges of the video output.

OUTPUT GAMMA
Allows you to make adjustments for color signal variations among different pieces of video equipment. We recommend 1.0 Linear Gamma for recording and playback of compressed video.

— 1.0 (Linear) -- Use when the incoming video already has the correct gamma component factored into it, and further correction is not needed.

— 2.2 (NTSC) -- Use to compensate for the nonlinear relationship between the source and the monitor for NTSC. For instance, if you are creating an animation using computer generated footage which has never been gamma corrected in the NTSC format, use this selection.

— 2.8 (PAL) -- Use to compensate for the nonlinear relationship between the source and the monitor for PAL. For instance, if you are creating an animation using computer generated footage which has never been gamma corrected in the PAL format, use this selection.

REMOVE SYNC ON GREEN
Removes the Sync signal from the green component of GsBR Component video signals.

DISABLE COLOR (B+W MODE)
This option (for Composite and S-Video Outputs) causes the encoder to remove color information from the output signal creating a black and white image.

Advanced Video Output Adjustments
The Advanced Video Output Adjustments are provided for even finer control over output video signals. All of these adjustments are minute, and require the use of a scope to measure. To access the Advanced Video Output Adjustments window, hold down the <CTRL> key and click the Adjustments button in the Video Output Window. Depending on your board model, output type, and output mode you could see a variety of Output adjustments.

HORIZONTAL PHASE
This is the timing relationship between the genlock signal and the output signal and requires the use of a scope. This is for studio users only. The human eye will not be able to discern differences through slider adjustments. This coarse adjustment allows us to shift the output signal in pixel clock increments relative to the genlock reference. (Note: Pixel clock increments can vary depending on your setup.).

FINE HORIZONTAL PHASE

This adjustment further divides the pixel clock so that adjustments can be performed in very fine steps, allowing for a very accurate sync of video signals. (Note: Pixel clock increments can vary depending on your setup.).

ALPHA DELAY

This slider adjusts timing of the Alpha (Key) channel through the TARGA 2000 hardware to adjust to any sync variances in relation to the chroma/luma signals.

TEST PATTERNS

Generates test patterns on the video output port for Composite and S-Video format tests.

— None -- No test patterns are generated.

— 75% Color Bar -- 100% white level, 75% chroma color bars are generated.

— 100% Color Bar -- 100% white level, 100% chroma color bars are generated.

— Modulated Ramp -- A ramp signal with +/- 20 IRE subcarrier modulation is generated.

SCH PHASE (DEGREES)

Used to align color information in your video signals, and will require a vector scope. Color information is carried in the part of the signal called burst. The burst is composed of a carrier frequency of 3.58 MHz for NTSC and 4.43 MHz for PAL. For NTSC, the SCH phase refers to the phase relationship between the leading edge of horizontal sync at the 50% amplitude point, and the zero crossings of the color burst by extrapolating the color burst back to the leading edge of sync. This is expressed in degrees of subcarrier phase. The definition for PAL is slightly different, but similar.

Audio Control Panel

The Audio Control Panel allows you to control the audio input and output signals of the audio devices attached to the TARGA 2000, and also sets up the defaults for the QuickTime driver. Depending on your board type, you could see various settings.

Note: TARGA SDX only works with 16-bit stereo audio. The output sample rate will automatically set itself to match the sample rate of your audio input device, so you do not need to alter the setting unless you are only outputting audio.

Note: Click on Audio Preview to pass through audio so that you can hear the audio when setting the Record and Playback levels. If you are not using Balanced Audio, make sure that it is not checked so that audio can be heard during preview.

RECORD L R

The first set of slider bars are labeled "Record L R" and refer to the left and right channels of the audio input signal. Moving these sliders allows you to make adjustments to input gain.

Input gain is like a record level. For instance, the input level from a microphone jack output is tiny 1 mV or 1 millivolt, while the record level from a cd player or tape deck is 700 mV or 700 millivolts. Here is a rule of thumb to follow regarding input gain: Set the hardware for the maximum input gain possible without causing distortion or dropouts. Then, adjust the second set of sliders labeled "Playback L R."

PLAYBACK L R

Output gain (or output volume) is controlled by the second set of sliders labeled "Playback L R" and refers to the left and right channels of the audio output signal. Moving these sliders up or down allows you to adjust the audio output level.

SAMPLE RATE (kHz)

Determines the highest audio frequency that you can record. Sample Rate or sampling rate is the number of digital samples per second taken by the TARGA 2000 hardware. It is the number of times per second that the amplitude of the sound wave (analog signal) is tested and recorded. The more frequently the amplitude is sampled, the closer the sample values will follow the wave form.

In the figure one wave form is shown with a low sampling rate and again with a higher rate. The shaded area beneath the wave form shows a discrepancy between the digital sample and the analog signal over time. The higher sampling rate, with less gray, indicates a higher fidelity. A reference point for sampling rate is that audio CD's are sampled at 44,100 samples per second or 44.1 kHz.
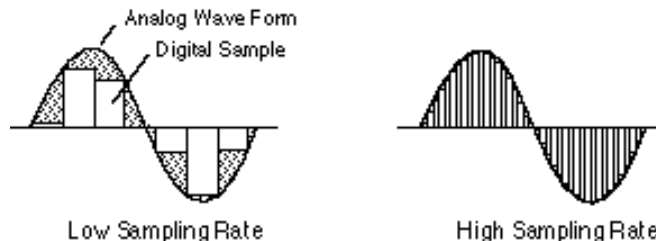
Note: The TARGA 2000 offers a dozen or so audio sampling rates, but many QuickTime applications only deal with 11, 22, and 44.1 audio sampling rates. Keep this in mind when you are exporting files to these applications. These three rates are the "usual" Windows rates and are NOT a limitation of the TARGA 2000 drivers.

MISCELLANEOUS

— Audio Preview -- When you click on this box, you simply allow sound
to pass through so that you can hear it and make adjustments. Like
Video Preview, it will turn off when you close the control panel.

— Stereo -- When you click on this box, you are choosing to keep two
separate audio channels. The trade-off is that this doubles the amount
of data required to store the information.

— 16-Bit Samples -- When you click on this box, you increase the
amount of audio data saved for each sound sample. For example, the
possible values available for a single sound sample when the data is
saved at 8-bits is 256 possible values. At 16-Bit sampling, the number
of possible values for a sound is increased to 65,536.

The bit depth (8 or 16-bit) is the number of binary digits (bits) used to
specify the amplitude of each digital sample. With more bits used, the
digital samples approach the true amplitude more closely. An 8-bit
resolution provides 256 levels (0-255), and a 16-Bit resolution
provides more than 65 thousand levels. The figure below shows a
portion of a wave form described at 4-bit depth and 8-bit depth. The
shaded area beneath the wave form shows a discrepancy between the
recorded amplitude of the digital sample and the true amplitude of the
analog signal. The higher resolution, with less gray, indicates a higher
fidelity.

4-bit Resolution   8-bit Resolution
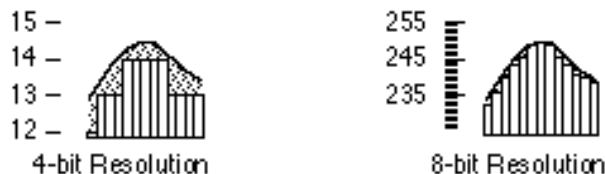
— Std Stereo Sample Order -- This control dictates the ordering of stereo
samples in a file. When this option is checked, the pairing order is Left
then Right. When this option is unchecked, the pairing order is Right
then Left.

— Mute -- When you click on this box, you are turning off the sound. When you select this option, you are muting, not disabling, Audio Preview.

— Balanced -- The TARGA 2000 DTX and RTX boards only work with balanced audio. Therefore, "On" is the default for this setting. *If you are using unbalanced audio connectors (RCA stereo jacks), you must turn this setting Off or audio will not work on your system.*

— Wave Output Adjustments -- This control improves audio/video synchronization. It is used to adjust the audio sample rate during playback to match a stable video clock. If the video is genlock to an unstable video signal, audio distortion can occur and this option should be turned off.

QuickTime Control Panel

The common audio rate that is supported is 48 kHz (also 44.1 and 32 kHz are common), 16 bit, stereo. To setup QuickTime to utilize audio, you must select the audio options in the QuickTime control panel to match those settings made in the Audio Control Panel and in your movie-editing software (e.g., Adobe Premiere). The QuickTime Control Panel can be opened by clicking: "Start » Settings » Control Panel » QuickTime."
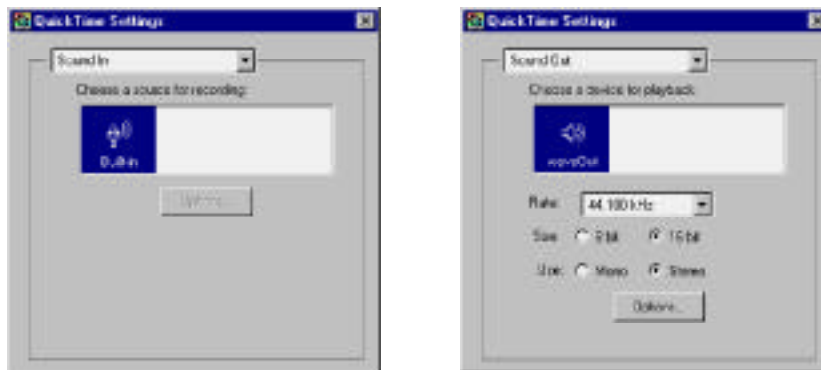
Note: The QuickTime settings "Built-in" and "waveOut" are linked to whatever audio device is selected within the Multimedia Control Panel of Windows. For your audio to function probably, TARGA or Pinnacle DVR should be the selected as the audio device in the Multimedia Control Panel.

Accessing The TARGA 2000 Utilities

Several software utilities are provided with the TARGA 2000. The utilities
are not necessary to use the TARGA board and are provided for highly
specialized purposes. The TARGA 2000 Utilities are briefly described here.
The utilities provided for TARGA 2000 are:

- TARGA Service Selector
- Desktop To Video
- Digital VCR
- DVR Capture
- DVR Info
- TARGA AVI Player
- TARGA QuickTime Player
- Uninstall TARGA 2000 Software
- VidCap (Video For Windows must be the only Multimedia Service
  selected in the TARGA Service Selector Utility for VidCap to work.)

The TARGA 2000 utility applications that accompany TARGA 2000 can
also be accessed by "Start » Programs » TARGA 2000."

TARGA Service Selector Utility

This utility allows selecting between Microsoft Video For Windows or Apple QuickTime for Windows. For Premiere 5, we recommend using QuickTime. By choosing one or the other service, performance and reliability will be increased.

Desktop To Video Utility

The Desktop To Video Utility (also known as Video Out Window) allows you to export your computer monitor's Windows desktop to the video output port.

Digital VCR Utility

The TARGA 2000 Digital VCR allows you to record and play back movie clips to and from your hard disk at full frame rates with better than CD quality audio synchronized to video. Digital VCR has been optimized for speed and motion-smooth video while sustaining a synchronized sound track. Whatever your digital video needs, the Digital VCR software lets you control the aspects most important to you.

DVR Capture Utility

This is a frame capture application that enables you to grab single frames from live video into two separate frame buffers. It is also a convenient file format converter, and can generate color bars for testing your TARGA 2000.
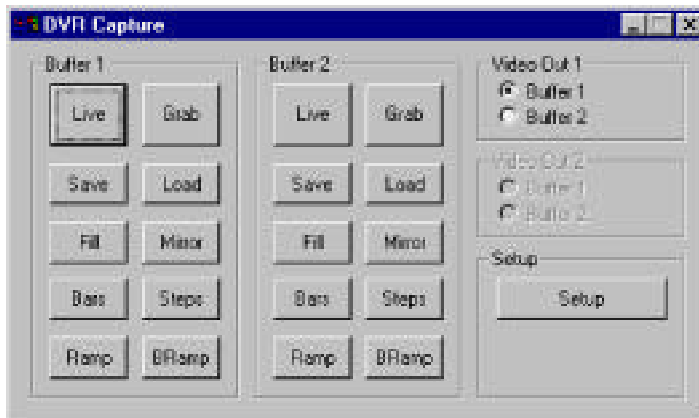
DVR Info Utility

This utility provides information on your TARGA 2000 hardware, software, and memory resources to be used in troubleshooting and compatibility testing. The information included in these windows covers topics such as board type, chip versions, compression and video modules, software versions, memory base addresses, and interrupt requests (IRQs). This information is intended to help Pinnacle Technical Support resolve any possible problems by giving information on your particular board.

TARGA AVI Player Utility

This utility provides a quick, stand-alone way to access the TARGA 2000 video and audio playback capabilities for .avi files stored on your hard disk. The TARGA AVI Player can be used in several ways, such as a DVCR

independent movie controller, or a video preview and export to tape output tool.

TARGA QuickTime Player Utility

This utility provides a quick, stand-alone way to access the TARGA 2000 video and audio playback capabilities for QuickTime MOV files stored on your hard disk. The TARGA QuickTime Player can be used in several ways, such as a independent movie controller, or a video preview and export to tape output tool. The QuickTime movie files can be dragged and dropped into the QuickTime Window.
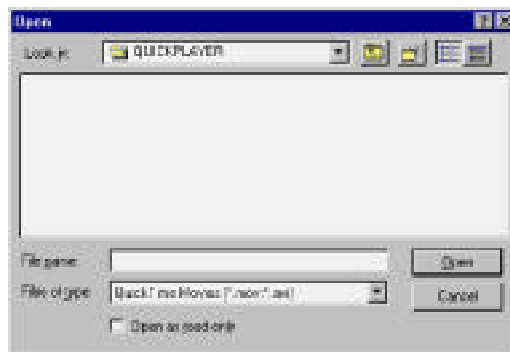
Uninstall TARGA 2000 Software Utility

This utility removes all TARGA 2000 files from your system in one easy step. This utility is useful before installing upgraded TARGA software or before reinstalling software that may have been damaged.

VidCap Utility

VidCap is a Microsoft data-capture application that lets you capture video sequences onto your computer system. With VidCap, you can capture individual images or entire video sequences from a VCR, a videodisc player, or a video camera and microphone. VidCap focuses on data collection; the VidEdit application, also included with Video for Windows, supports functions such as editing, compression, and formatting.

Note: Video For Windows must be the only Multimedia Service selected in the TARGA Service Selector Utility for VidCap to work.
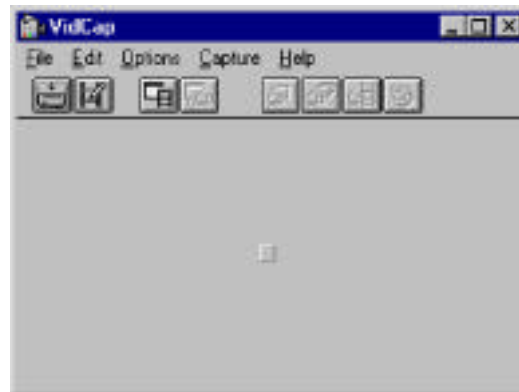
Chapter 3 – TARGA 2000™ Tutorial

Contents

This Chapter contains:

- Tutorial Introduction
- Lesson 1: Configuring Your Computer
- Lesson 2: Capturing Video
- Lesson 3: Making Movies
- Answers To Frequently Asked Questions

Chapter 3

TARGA 2000 Tutorial

For Adobe Premiere 5

TUTORIAL INTRODUCTION

This tutorial will guide you through the first use of your TARGA 2000 with Adobe Premiere™ 5 and Windows NT®. We assume that you have a working knowledge of Windows NT, that you are using NTSC equipment, and that you have a video and audio-editing software application (such as Adobe Premiere 5) already installed. (PAL users can also use this tutorial, but bear in mind that some of the settings described must be changed for PAL usage.) Every new TARGA 2000 owner, whether a total novice or an expert with a similar product, should work through these lessons. Pinnacle has created this tutorial to help TARGA 2000 users quickly learn and become productive with our product.

This document consists of three lessons: **Configuring Your Computer**, **Capturing Video,** and **Making Movies**. We recommend that you work through all three in a single session. This will take you less than two hours. Also included in this tutorial is a section called **Answers To Frequently Asked Questions**. The questions listed and answered in this section are those most frequently received by our Technical Support staff.

LESSON 1: CONFIGURING YOUR COMPUTER

Before beginning this tutorial, read the "Basic Concepts And Tips" sections in Chapter 1 of this manual. Also, the latest information about TARGA 2000 is available from Pinnacle Technical Support's FaxBack or On-line Services. See the "Pinnacle Customer Satisfaction Center" in "Appendix A - Troubleshooting" of this manual for contact information. Also refer to Appendix A if you have a problem while using your TARGA 2000.

Hardware Setup
For this tutorial, use the following hardware configuration:

— Use your TARGA 2000's computer monitor (non-interlaced) display as your desktop monitor. This configuration is outlined in the Hardware Installation procedure in your Installation Guide under VGA Loop Through.

— Connect an active video source (e.g., VCR, video camera, or laser disc player) to the TARGA 2000's video and audio inputs.

— Connect a video output device to the TARGA 2000 video output.

— Connect the TARGA 2000 audio outputs to the inputs of your video output device, amplifier, or speakers.

Software Setup

— Make sure that Windows NT 4.0 (with Service Pack #3 or #4), QuickTime, Adobe Premiere 5, and the TARGA 2000 software have been installed on your computer. Refer to the Quick Start sheet titled "Getting Started With TARGA 2000."

— Proceed to "Lesson 2: Capturing Video."

LESSON 2: CAPTURING VIDEO

Turn on all the hardware in your configuration. If you are using a VCR as input source, play a video tape. Some of the video will be captured to your 7200 rpm ultra-wide hard drive during this tutorial.

Set The TARGA Video Input Control Panel
You must specify what types of audio/video inputs are connected to the board. The Video Input Control Panel allows you to set your video input type (i.e., NTSC, PAL, 720x486, etc.) and mode (i.e., Composite, S-Video, GBR, etc.).

— Launch the Video Input Control Panel.
  (Start » Programs » TARGA 2000 » Video Input)
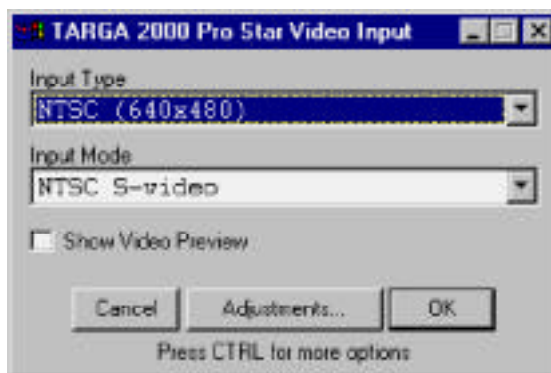
— Depending on your board, you will have a variety of choices. Proper settings are dependent upon your particular equipment. Use your mouse or keyboard to select the appropriate video input formats.

— Start your video input source (camera on and/or VCR playing).

— Click **Show Video Preview** to pass live video to your video output device. If you see live video, you have correctly configured your software to accept your input type and mode. If video fails to pass through, verify that your cables are correctly attached, and that your input type and mode are correctly set.

— Click **OK** to close the Video Input Control Panel.

Set The TARGA Video Output Control Panel

Not only do you need to choose the video *input*, you must also set the type of video *output* connected to the TARGA 2000.

— Launch the Video Output Control Panel.
   (Start » Programs » TARGA 2000 » Video Output)
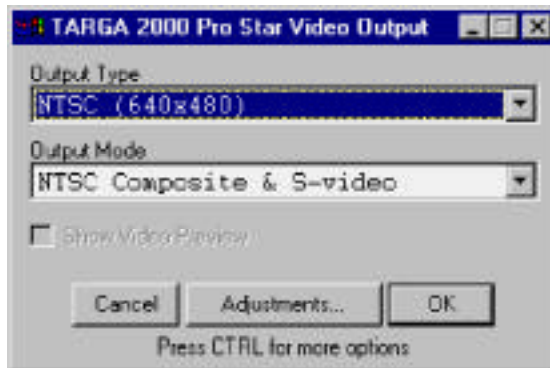
— Depending on your board model, you will have a variety of options. Select the appropriate output type and mode for your equipment.

— Press and hold the Control key. Show Video Preview changes to Show Color Bars. Select Show Color Bars to export color bars to your video output device (this is a good way to troubleshoot your TARGA board without having to use an actual video input device).

— Click **OK** to close the Video Output Control Panel.

Set The TARGA Audio Control Panel

If your are going to capture audio with the video, then you must also set the audio parameters for the TARGA 2000 board.

— Launch the TARGA Audio Control Panel.
  (Start » Programs » TARGA 2000 » Audio)

— We recommend selecting **Stereo** and **16 Bit Samples**, and setting the **Sampling Rate** to "44.1 kHz" to capture the highest quality audio possible. It is important to note what settings you capture audio in, as you will need to use the same settings in your editing application.

— Activate your audio input source.

— Select **Audio Preview** to verify that your connections are attached correctly. If you are not using Balanced Audio, make sure that it is not checked so that audio can be heard during preview.

— Click **OK** to close the Audio Control Panel.

Start-Up Adobe Premiere

— Launch Adobe Premiere (Start » Programs » Adobe » Premiere 5).

Set Adobe Premiere Project Settings

Before you can capture video with the TARGA 2000, various project settings need to be made within Adobe Premiere so that the TARGA 2000 "knows" what to do. The settings are for:

- General (editing mode, timebase, time display)
- Video
- Audio
- Keyframe and Rendering Options
- Capture

— Open the Project Settings dialog window by pulling down the **PROJECT MENU,** scrolling to the **SETTINGS** submenu, and selecting **GENERAL**.
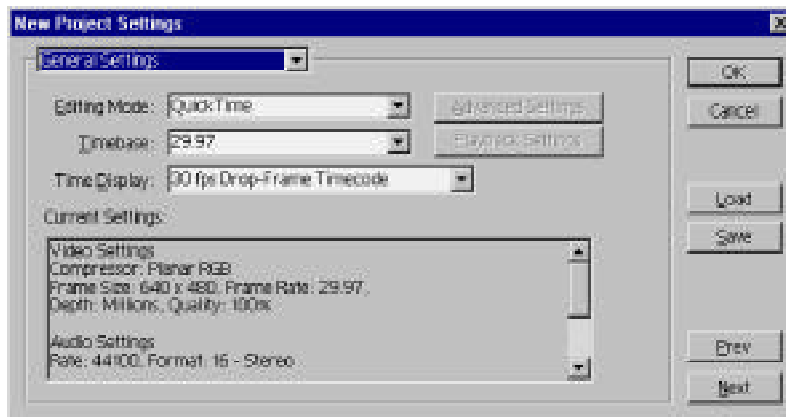
— Select the options as follows:

- Editing Mode: QUICKTIME
- Timebase: 29.97
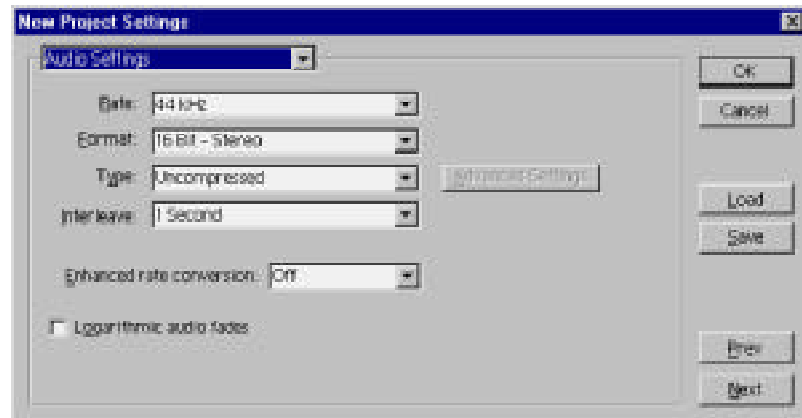- Time Display: 30 FPS DROP-FRAME TIMECODE

— From the pull-down within the New Project Settings dialog window
select **VIDEO SETTINGS**.
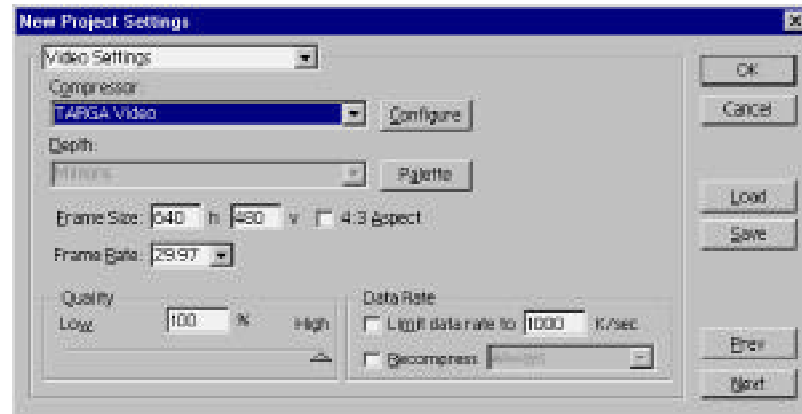
— Select the options as follows:

• Compressor: TARGA VIDEO
• Frame Size: 640 h 480 v
• Frame Rate: 29.97
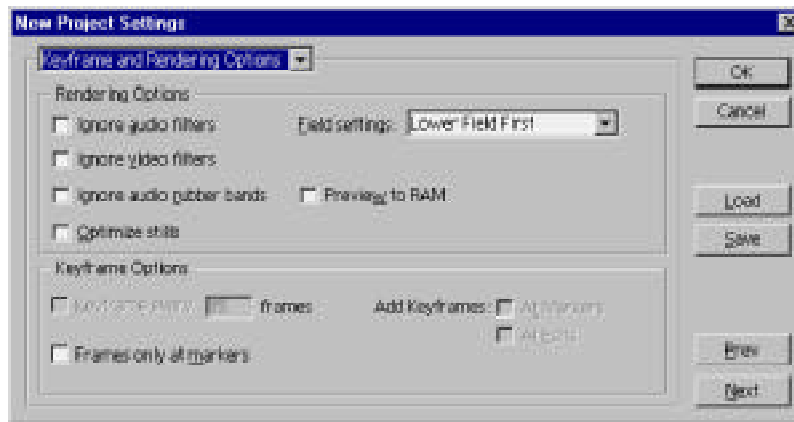• Quality: 100%

— From the pull-down within the New Project Settings dialog window
select **AUDIO SETTINGS**.

— Select the options as follows:

- Rate: 44 KHz
- Format: 16 BIT - STEREO
- Interleave: 1 SECOND
- Enhanced rate conversion: OFF

— From the pull-down within the New Project Settings dialog window
select KEYFRAME AND RENDERING OPTIONS.

— Select LOWER FIELD FIRST for the Field Settings. None of the other
options are needed for this tutorial

For interlaced display, odd and even numbered scan lines are separated
into two groups, called fields. LOWER FIELD FIRST is for NTSC or PAL.
What this means is when a frame is displayed, one field is scanned first.
Then the system goes back to the top of the screen and scans the other
field.

Note: Do not use "Optimize Stills" for the TARGA format.

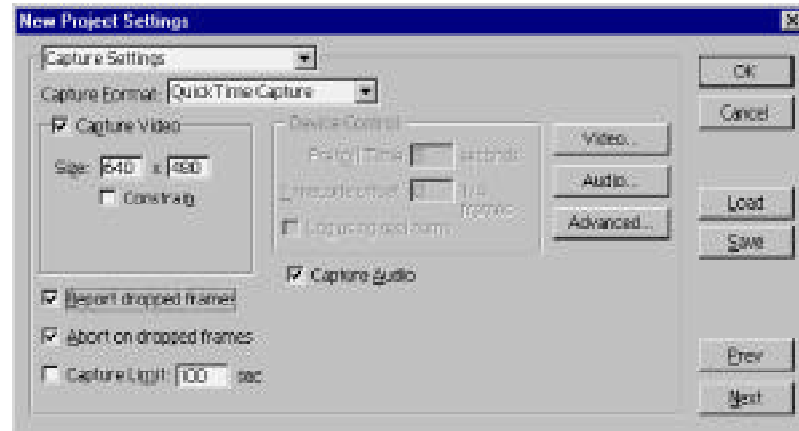— From the pull-down within the New Project Settings dialog window select **CAPTURE SETTINGS.**

— Select the options as follows:

- Capture Format: QUICKTIME CAPTURE
- Capture Video: Should be checked (click on box with mouse)
- Size: 640 x 480
- Abort on dropped frames: Should be checked
- Capture Audio: Should be checked *only if your source is using audio*

REPORT DROPPED FRAMES is a popular option, and a good way to zoom in on a realistic throughput. Keep it selected. When it is selected, an Adobe Premiere dialog window will appear after video capture displaying the number of frames dropped (if any) during the capture process.

Next you need to set how the TARGA 2000 compresses and controls images. This is done by way of the Video dialog window.

Set Adobe Premiere Video Settings

Once all the Project Settings have been made, you need to set how the TARGA 2000 compresses and controls images. This is done by way of the Video dialog window.

—From capture settings within the "New Project Settings" dialog window, click on the VIDEO button. The Video dialog window will be displayed.

—From the pull-down window within the Video dialog window, select SOURCE. The Video-Source dialog window will be displayed.
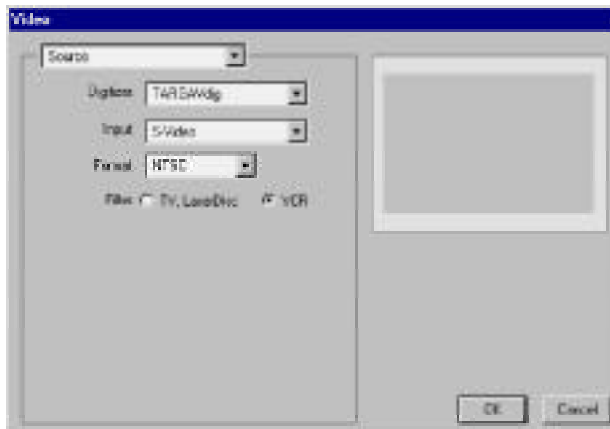
—Select the options as follows:

• Digitizer: TARGAVdig
• Input: If you have a TARGA 2000 DTX or RTX, your choices are:
  • S-Video (Y/C)
  • Composite Video

- Component RGB
- Component RGB-Sync
- Component YUV (BetaCAM)

If you have a TARGA 2000 SDX, your choice is:

- Serial Digital

• Format: NTSC (or PAL if you are using PAL equipment)

• Filter: These two buttons actually control the PLL (Phase Lock Loop) mode of the decoder. The PLL is handling a tape artifact known as "head switching," which is especially noticeable on Hi-8 tapes (due to the density of the tapes). VCR's have a broad range and thus a low-quality video signal. The VCR filter is a circuit that locks onto a poor video source and minimizes distortion of the image and colors. If your source is a VCR, use this filter.

TV and Laser Disc have a narrow range and thus a high-quality video signal. If your source is a laser disc, video camera, or other high-quality source, use the "TV, Laser Disc" filter.

— If all your settings are correct, there should be video in the preview box at right.

Note: If your Preview box is black, then your input does not match your video source. Select another input source or change your video source cabling.

If you don't see a picture after waiting about 20 seconds, close and reopen the "Video" dialog window for **SOURCE**. If this doesn't work,

then check your cables and video source, then consult the
Troubleshooting section of this manual. Remember to close the "Video"
dialog window before adjusting your cables.

—From the pull-down window within the Video dialog window, select
 COMPRESSION. The Video-Compression dialog window will be displayed.
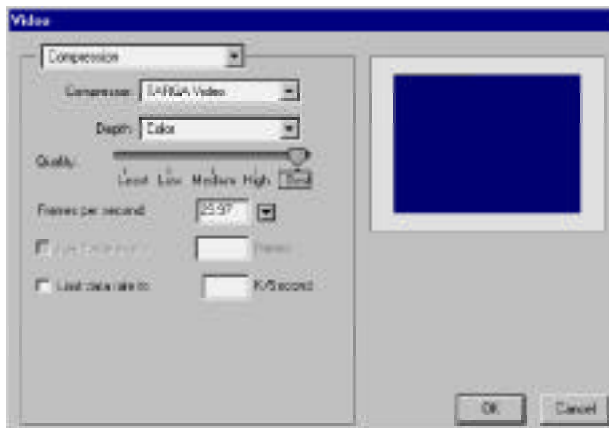
— Select the options as follows:

- Compressor: TARGA VIDEO
- Depth: Color
- Frames Per Second: 29.97
- Quality Slider: Best

For now set the **QUALITY** at "Best" and do not limit the data rate. As you
gain a working knowledge of the TARGA 2000, you might want to
experiment with the relationship between the **LIMIT DATA RATE** and
QUALITY slider settings. Used in combination, these tools can give you
some real power and flexibility to achieve the best trade-off of image
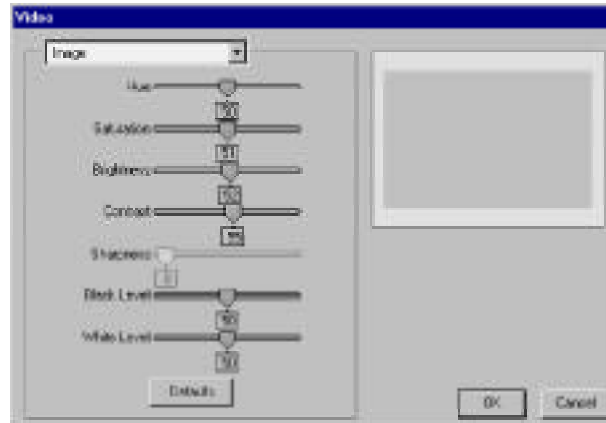quality vs. storage space.

—From the pull-down window within the Video dialog window, select **IMAGE**. The Video-Image dialog window will be displayed.

— The slider controls are as follows:

Note: If Component RGB, Component RGB-Sync, or Component YUV is selected as source input, only the Brightness and Contrast sliders are active. Sharpness is not available with the TARGA 2000 DTX, RTX, or SDX.

• Hue -- The property of pure color. The hues are the primary colors of red, green, and blue and their complements of cyan, magenta, and yellow. A hue has only one wavelength associated with it while a blend of hues, such as white, has multiple wavelengths. Therefore, white and black are colors but not hues. The Hue control adjusts the subcarrier phase so that the displayed "color" agrees with your conception. An example is the flesh tone of a person. This can be adjusted over a gamut of red to green.

• Saturation -- The ratio of the Hue component to the White component. Another term for this is purity. The lower the white

content the more saturated or pure the color. This controls the Chrominance Gain independent of the Luminance Gain. Decreasing the saturation moves the hue to a pastel shade.

- Brightness -- This is the amount of overall luminance perceived. Increasing "brightness" increases the amount of white light added to a picture reducing the saturation or purity of an image. Brightness implements a DC offset in the picture content.

- Contrast -- The contrast controls both luminance and chrominance to preserve the purity while increasing the "brightness" of an image. Contrast is the overall gain control.

- Sharpness -- (May not be available depending on your TARGA type.) Sharpness controls the contrast at a boundary within an image. As such, it is an attribute of the luminance bandwidth. Increasing "sharpness" increases the luminance bandwidth.

- Black Level -- This is the level at which the display is cut off and no image is seen. This can be adjusted to have a "setup" pedestal (standard NTSC/PAL) or no "setup" pedestal (Japanese NTSC).

- White Level -- The white level is the threshold value above which pixels are considered white. As the White Level is decreased, more pixels are turned white.

- Defaults Button -- revert the image settings to those shown.

—If you are using a TARGA 2000 DTX, RTX, or SDX, then from the pull-down window within the Video dialog window, select **TARGA VIDEO RESOLUTIONS**. The Video Resolutions dialog window will be displayed.

The Video Resolutions dialog allows you to set the resolution size for the fields within the capture frame. Your choices are:

- NTSC at 640 x 480
- Full NTSC at 648 x 486
- NTSC 720 x 480 (primarily for CD-ROM use)
- NTSC 601 at 720 x 486 (NTSC CCIR-601)
- PAL at 768 x 576
- PAL 601 at 720 x 576 (PAL CCIR-601)

For DTX and RTX TARGA boards set the resolution to 640 x 480 for NTSC, 648 x 486 for full NTSC, or 768 x 576 for PAL. For SDX set the resolution to 720 x 486 for NTSC, 720 x 480 for CD-ROM, or 720 x 576 for PAL.

—From the pull-down window within the Video dialog window, select **TARGA DISK PERFORMANCE**. The Video-Disk Performance dialog window will be displayed.
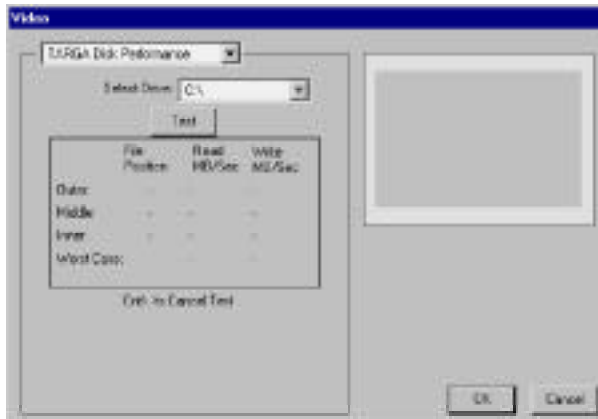
— The disk performance test is designed to simulate video activity to the disk drive that you are capturing video to. The test provides an estimate of the achievable read and write data rates which are accurate to within about ±15%. Click on the "Test" button to check your capture drive.

— Click **OK** to return to the capture settings within the "New Project Settings" dialog window, then click **OK** again to close the dialog window.

## Set Adobe Premiere Scratch Disk Preferences

Your video needs to be recorded onto the fastest drive available to achieve the best quality video capture and playback. In Adobe Premiere, incoming video and temporary files are recorded to your Scratch *Disks*.

— Choose your scratch disk by pulling down the **FILE MENU,** scrolling to the **PREFERENCES** submenu, and selecting **SCRATCH DISK/DEVICE CONTROL**.
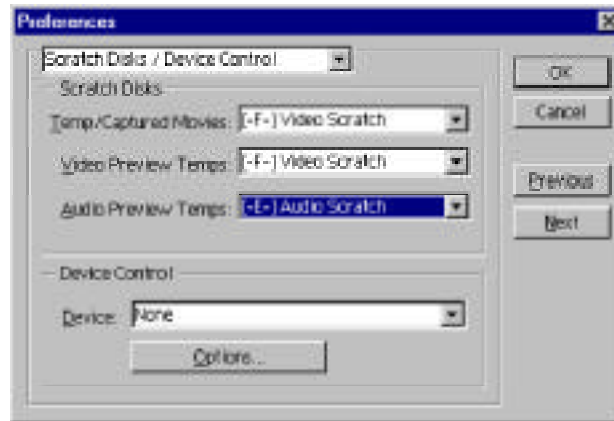
— Set the "Temp/Captured Movies" and "Video Preview Temps" to your video disk volume. Also make sure that "Audio Temps" are set to the audio scratch drive. All temp drives that you select should already be optimized.

— Click **OK**.

Capturing Video

Now that your video settings have been made, you can record (capture) video to the disk drive that you indicated in "Set Adobe Premiere Scratch Disk Preferences" above.

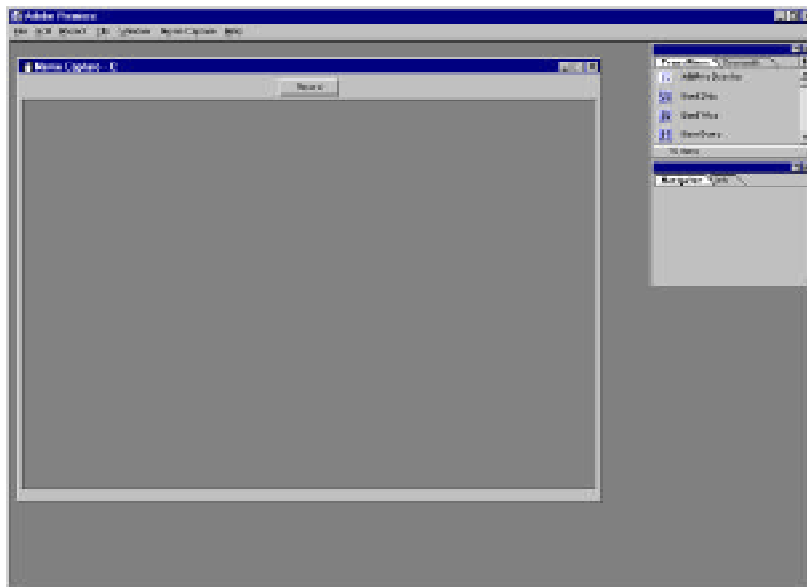— Pull down the **FILE** menu to "Capture" and then select the **MOVIE CAPTURE** from the submenu.

— The MOVIE CAPTURE dialog window will be displayed.

Record Video

— A **RECORD VIDEO** option is located in the **MOVIE CAPTURE** menu. Make sure that this option is enabled (checked).

Record Audio

— A **RECORD AUDIO** option is located in the **MOVIE CAPTURE** menu. If you want to have audio with your video make sure that this option is enabled (checked).

Audio Recording

The audio settings made in Adobe Premiere must match the settings made in the TARGA Control Panel for audio, and also must match the sound options in the QuickTime Control Panel. The Volume and Gain adjustments are controlled in the TARGA Audio Control Panel. They have no effect when used from Premiere.

— If you are recording audio, from the **MOVIE CAPTURE** menu select **AUDIO**. From the pull-down within the dialog window select **SOURCE**.
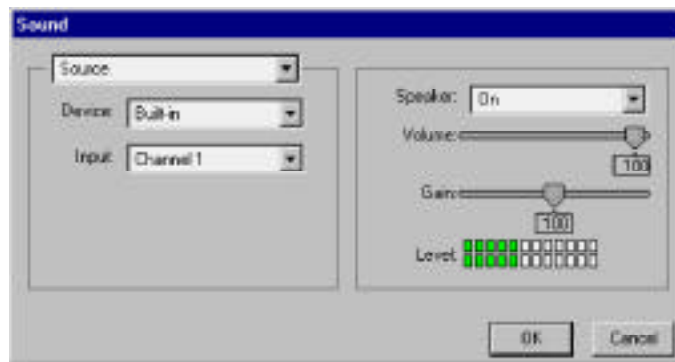
— Select the options as follows:

• Device: BUILT IN with speakers set to ON

— From the pull-down within the dialog window select **SAMPLE** and use the following settings:
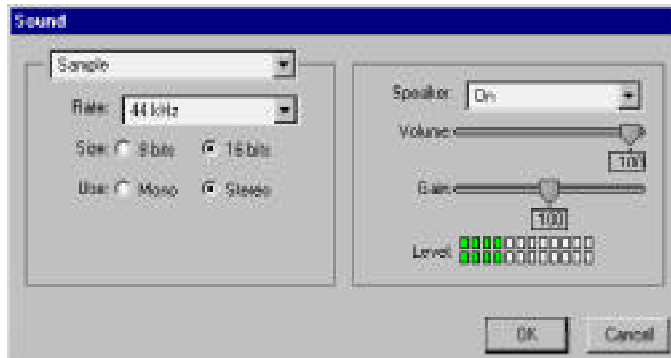
- Rate: 44 KHz
- Size: 16 BIT - STEREO
- Use: STEREO

— From the pull-down within the dialog window select **COMPRESSION** and use the following settings:

- Compressor: NONE

— Click **OK** to close the Sound Dialog.

Set The QuickTime & Multimedia Audio **Options**

— Launch the QuickTime Control Panel (Start » Settings » Control Panel » QuickTime) and set the audio options to match what you are using.
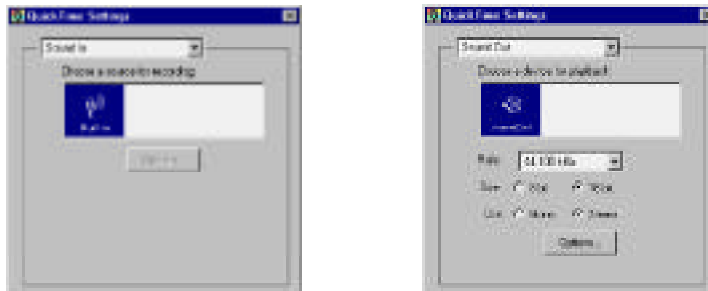
Note: The QuickTime settings "Built-in" and "waveOut" are linked to whatever audio device is selected within the Multimedia Control Panel of Windows. For your audio to function probably, TARGA or Pinnacle DVR should be the selected as the audio device in the Multimedia Control Panel.

Record Movie

—Click **RECORD** in the **MOVIE CAPTURE** window. Let it record for about ten seconds. Click the mouse button or press the Escape (Esc) key to stop. A "Clip Window" will appear.

Playback and Save Clip

—Click the play icon at the bottom of the Clip Window. The TARGA 2000 will playback the video at full size to the video monitor. Select **SAVE** within the **FILE** menu, give the file (clip) a name, and click the **SAVE** button. Then close the Clip Window.

—**RECORD**, playback, and **SAVE** a few clips (at least three). You will use three of the clips to make a movie.

—Close all of the Clip Windows, and close the Movie Capture Window. Proceed to "Lesson 3: Making Movies."

LESSON 3: MAKING MOVIES

Movies made in Adobe Premiere are created from captured video clips. To begin making a movie, you must first assemble the clips you wish to use into a Project file. The Project Window displays the clips in the Project file while you perform the various tasks of making your movie.

—To load a clip into Premiere for use in a movie, select the File Menu > Import >File command (or press the <CONTROL> key and "I" key). This will open the usual Windows File Load dialog box. Use this to locate the clips you made earlier in this tutorial.

— Select one of the three clips you made, and click **OPEN**. Notice the clip appears as a thumbnail in a Project Window similar to the one shown below with information such as clip duration, audio settings, and resolution. Repeat this process for the other two clips that you made.

— The Project Window should be active. From the **FILE** menu select **SAVE**, give your project a file name, and then click the **SAVE** button.
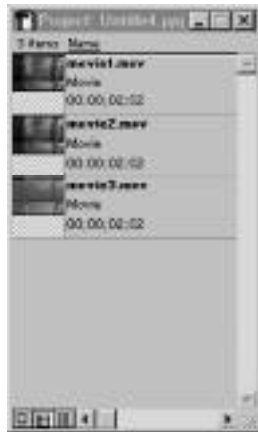
Once you've selected the clips you want to use, you need to assemble them in the Timeline Window.

— If the Timeline Window is not displayed on your screen, select "Timeline" from the Windows menu within Adobe Premiere.
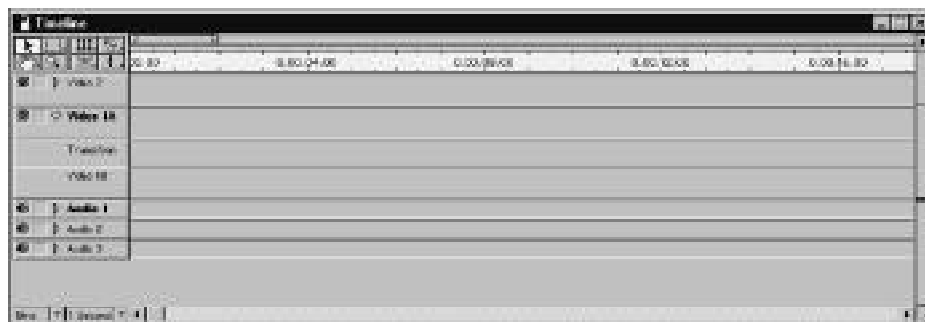
Note: If the Video 1A track is not collapsed (Transition track not shown), click on the triangle so that it points downward (as shown in the illustration above).

The simplest way to place a clip in the Timeline Window is to drag and drop from the Project Window. When you place the mouse pointer over a movie thumbnail, you will notice the pointer turns into a hand. Click and hold left the mouse button to "grab" a clip so you can drag it to the Timeline Window.

— Grab the first clip from the Project Window and drag it to Video Track "A" in the Timeline Window. Position the clip all the way to the left of the window.

— Repeat this step with the second clip, but place the clip on Track "B," and leave a short overlap with the clip on Track "A." The Timeline Window should then look similar to this:
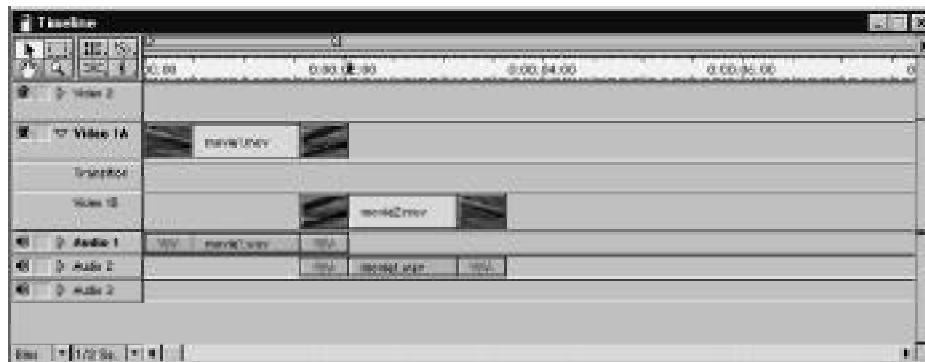
Next, you will add a transition to the Timeline Window. A transition is a way to change from clip to clip without an abrupt switch.

— Locate the Transition Window. If it is not displayed on your screen, select "Transitions" from the Windows Menu.

— Locate the transition called "Barn Doors."

— You place a transition the same way you place a movie clip, by "grabbing" it with the hand cursor. Drag the transition to the overlap of the two movie clips, on the track marked "T" (for Transitions).

The Timeline Window should look something like:

Notice how the transition automatically sizes itself to fit the overlap. If it does not snap to the clip edges, place the cursor on the edge of the transition. It will change into a stretch tool allowing you to adjust the edges of the transition to line up with the clip edges. You can also double-click on the transition to check its settings (Track A to Track B).

— Add the third clip using the above methods, placing it on Track "A," with a slight overlap to the second clip on Track "B." Place the Cross Dissolve transition between the overlaps. Remember, if you want a transition to occur between two clips, the clips must be on separate tracks. If not, Premiere will just abruptly switch to the next clip when the current one runs out. View the following Timeline Window for an example of how it should look like so far:
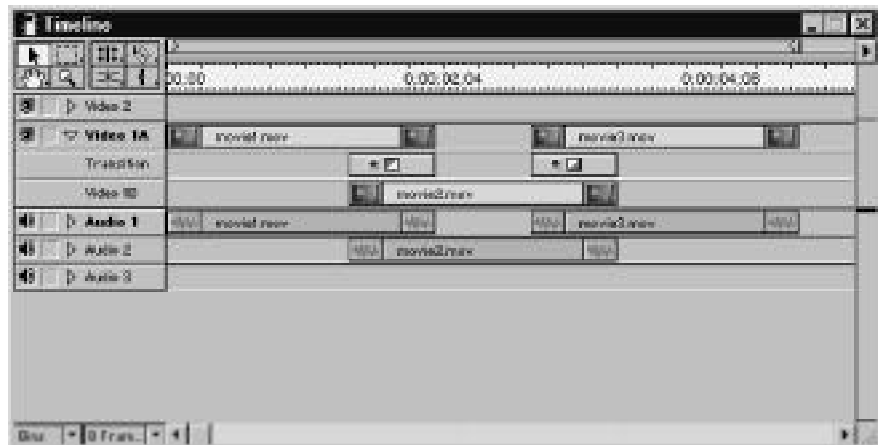
Previewing Your Movie

Once you have placed the parts of your movie, it is time to preview it. Do the following:

— First stretch the Work Area bar (blue bar) at the top of the Timeline Window to the end of the final clip in your movie. The blue bar is a selection tool, like a lasso or marquee, and defines the active portion or "Work Area" of the Timeline Window, telling Premiere how much of your project you want to preview.

— Hit <Enter> to build the preview.

— Premiere will build a preview of what you've done so far, and open the preview in a Preview Window.

Important: *The preview will play material compressed with the QuickTime CODEC TARGA Video to the video monitor. Material not compressed with TARGA Video, such as transitions, will appear in the Preview Window. Effects and transitions play in real-time from the Adobe Premiere Timeline Window. If you need to output movies to tape larger than 2GB in size, you can put multiple 2GB files in the Timeline and use Print To Video.*

— You should play your movie from the Timeline Window for seamless video. This is the recommended way to output long movies to tape.

Compiling Movies
Adobe Premiere allows you to compile movies that you want to use with another application, or put into another format besides MOV. When you make a movie, Premiere constructs a single MOV file from your clips and transitions, and saves it to your hard disk. Premiere will also open your finished movie after it has been compiled. To compile a movie, follow these steps:

Note: There is a 2 Gigabyte size limit (9.5 minutes) for movies played from a file.

— From the FILE » EXPORT » MOVIE » SETTINGS BUTTON, select "Video Settings" from the pull-down menu of the Export Movie Settings dialog window and check the settings. "TARGA Video" should be your compressor method, and the frames per second should be either 29.97 (NTSC users) or 25 (PAL users). The frame size should be 720 x 486.

— From the pull-down menu of the Export Movie Settings dialog window, select "General Settings" and check the settings. The File Type should be "QuickTime," the Range should be "Entire Project." "Export Video," "Export Audio," and "Open When Finished" should be checked. The Current Settings should be what you have previously selected for this tutorial. Click SAVE, name your movie "Mine.MOV" and then click OK. Click OK again to close the Export Movie Settings dialog window.

It may take some time to compile the entire movie, but Premiere will update you frequently on how long it may take. When Premiere is finished, the new movie will open in a clip window, and also be saved on your hard disk.

— In the lower left corner of the Movie Window is the play button. Click this once to watch the movie you've just created on your video monitor.

Saving Your Capture Settings

Before you finish, you need to save your Project Settings.. You may recall that at the beginning of Lesson 2 you created various "Project Settings" for the movie that you played in Lesson 3. The Project Settings you created can be saved and used again when you are making more movies, thus saving you from creating the same Project Settings again. The Project Settings can be saved as follows:

— Open the Project Settings dialog window by pulling down the **PROJECT MENU,** scrolling to the **SETTINGS** submenu, and selecting **GENERAL**. A dialog window similar to the one below will be displayed:
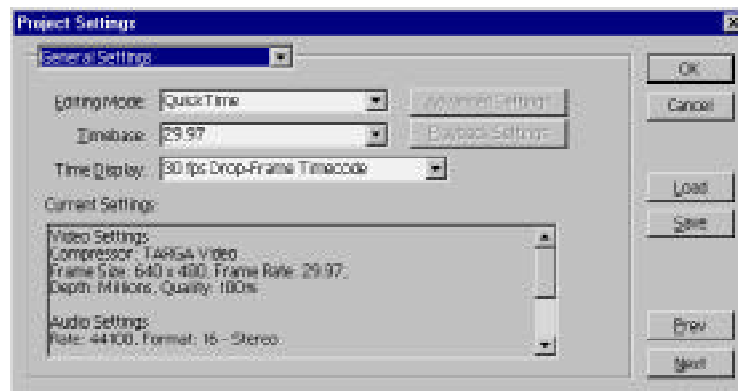
— Select either "29.97" fps if you're using NTSC, or "25" fps for PAL. If you have a custom application that uses a different time base, select the appropriate one.

Note: If you are using NTSC and playback is jerky, check that your playback is 29.97 instead of 30.

— Make sure that the settings for **VIDEO, AUDIO, KEYFRAME AND RENDERING,** and **CAPTURE** are correct by selecting each one from the pull-down menu within the dialog window.

— Click on the **SAVE** button. This will allow you to add your settings to the "Load Project Settings" selection box (accessed via the **LOAD** button) for future use. You will be presented with a dialog box asking you to name and describe the Project Settings to be saved.
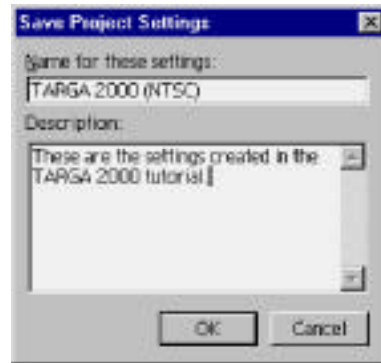
Name the project TARGA 2000 (NTSC), type a brief description of the project, and then click **OK**. Now the project will be available to you each time Premiere is launched.

— Click **OK** to close the Project Setting dialog window.

— **Save** and close the Project window.

You can use the saved Project settings to make TARGA 2000 movies in the future by pulling down the **FILE** menu to the **NEW** submenu, selecting **PROJECT**, and then clicking on the **LOAD** button.
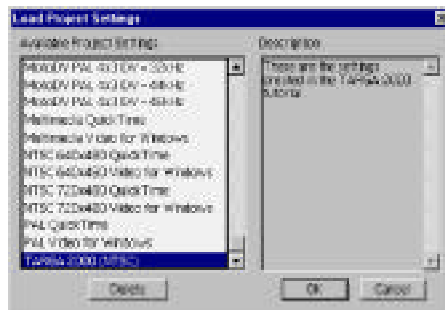
You will have several Project Settings to choose from, including the one you just created. Feel free to save as many Project Settings as you need.

This concludes the tutorial. Anyone interested in a more comprehensive understanding of Adobe Premiere should consult the Adobe Premiere User's Guide and Tutorial accompanying the Premiere software. Also available from Adobe is the "Classroom in a Book," which includes a CD with several step by step tutorials.

Chapter 3

TARGA 2000 Tutorial

For Adobe Premiere 5

ANSWERS TO FREQUENTLY ASKED QUESTIONS

Listed below are the most frequently asked questions about the TARGA 2000 received by our Technical Support staff. The answers to each question are in italics. Please read this section to become more familiar with our product, and possibly save yourself a phone call to Pinnacle Technical Support.

1. **What are the best drives for use with the TARGA 2000? How do I configure them? Why and when do I need a SCSI card or disk array? Which SCSI card is best for use with the TARGA 2000?**

    Pinnacle's FaxBack service has a list of drives and controller cards tested as working well with the TARGA 2000. The important things to remember are to use equipment that is Fast-Wide (or Ultra Wide) SCSI II, and PCI bus. AV (Audio-Video) rated drives will have even better performance. Check with the disk manufacturer to configure the drive for peak performance.

2. **What data rates do I need for (Composite/S-VHS/Betacam) I/O?**

    For the hobbyist or semiprofessional videographer, Composite VHS quality 2.0 - 3.5 MB/sec should be enough to meet the requirements. The industrial videographer working with Hi 8 or S-VHS mediums will need a data transfer rate of 3.0 to 4.5 MB/sec. For the broadcast professional data throughput is a critical variable. For the broadcaster, the data rates should sustain 4.5 - 5.5 MB/sec. Preferably you should be working with a first generation Betacam SP or RGB source. As a general rule, the cleaner your input signal is, the cleaner your video capture is going to be. Motion JPEG compression is sensitive to noise introduced in multiple tape dubs. Whenever possible, use the first generation source as your capture material.

3. **Can the TARGA 2000 output broadcast quality video?**

    TARGA 2000 meets all the NTSC and PAL timing requirements for both square pixel and non-square pixel CCIR 601 resolutions. However, it is important that you start with broadcast quality material, and have a system capable of maintaining broadcast quality data rates (4.5 - 5.5 MB/sec). For optimum quality video, a TARGA 2000 Pro is the minimum recommended to provide Component level video (i.e., RGB, Betacam, and SMPTE/EBU).

4. **How do I use the TARGA 2000 with third party audio cards?**

    Select and load the appropriate driver from the Multimedia icon in the Windows Control Panels folder, opened by clicking Start, highlighting Settings, and selecting Control Panel. However, the TARGA 2000 should always be used as the audio device.

5. **Why can't I capture square pixel PAL 768 x 576 resolution on my TARGA 2000 Pro PCI?**

    The TARGA 2000 Pro PCI has been optimized for CCIR 601 (non-square pixel) resolution. By definition that means 720 x 486 for NTSC and 720 x 576 for PAL. TARGA 2000 DTX and RTX support all square and non-square pixel resolutions.

6. **What PC clones do you support?**

    Pinnacle maintains a list of compatibility tested machines in our FaxBack system. The number for FaxBack is (800) 522-TRUE. Your machine must fully support the PCI 2.1 specifications.

7. What are the best settings for Previews in Premiere?

Follow the guidelines mapped out in the TARGA 2000 PCI tutorial. If you still have problems please contact our Technical Support for assistance.

8. What applications work with the TARGA 2000?

The TARGA 2000 works with any standard Windows QuickTime or Video For Windows application and is suited best to desktop video editing. Any Windows applications such as Adobe Photoshop, PhotoMorph, or Fractal Design Painter will benefit from the 24-bit desktop, and any QuickTime or Video For Windows aware application such as VidCap and VidEdit will run with the TARGA 2000. However, the main applications utilized on the TARGA 2000 are nonlinear editing software apps such as Adobe Premiere and Media Studio from U-Lead.

9. Will I use my VGA display for the desktop functions of the TARGA 2000?

Yes, your computer will still need a VGA card.

10. How much disk space is required to record (X...) amount of video?

At a compression ratio of approximately 10 to 1, and a data rate of 2MB per second (S-VHS quality), one minute of video takes up approximately 90MB of storage space. For example, 10 minutes of video would take approximately 900MB or almost 1 Gigabyte. Don't forget that you will be recording into a scratch file and then saving the video to a permanent file.

11. Why is the hard drive so important?

There are a number of hardware considerations that can influence your movie recording ability. Some involve the speed at which you can capture video frames while others affect image quality.

The primary criteria for evaluating digital components of your system is their ability to keep pace with the stream of data, both video and audio. The NTSC full frame resolution is 640 x 480 pixels, for a total of 307,200 pixels. At 30 frames per second, that's 9,216,000 pixels per second. At 24 bits per pixel, that's 26.4MB per second. (PAL is higher). Furthermore, adding sound can increase the data rate by up to 192K per second (stereo at 48 kHz, 16-bit resolution).

Compression and resolution reduction can bring the data rate within range, but for best quality movies, you'll want to work as high in the range as possible. Use a CPU and disk drive capable of high data rates. They are essential to keeping pace with a steady stream of movie data. (Consider a parallel disk array for fast-access mass storage.)

In addition, it is imperative that you optimize and defragment your disk before video recording. This will create contiguous blocks of disk space that can be accessed more quickly. Disk fragmentation slows disk access, which can affect recording and playback. And as the disk nears capacity, this problem increases. Use a disk with a large amount of free space and use a disk utility program to defragment your hard disk.

12. What criteria should be considered when purchasing a hard drive?

1) Average Access and Seek Times (ms)
  - time in milliseconds to find and retrieve data on the disk
  - a digital video drive with numbers below 15ms (under 10ms is best).

2)   Average Latency (ms)
  - delay for the drive platter to spin to the correct position
  - a digital video drive should have numbers below 6ms and drive spin rates of at least 5,400 rpm. (7,200 rpm is better)

3)   Average Throughput (MB/sec)
  - the consistent data rate throughput to the drive
  - a digital video drive should perform at 3MB/sec or higher

4)   MTBF (Mean Time Between Failures)
  - average number of usage hours before failure
  - a digital video drive has a hard life because you are constantly reading and writing large amounts of data with a high data throughput rate
  - average MTBF should be about 300,000 hours, longer is better

For digital video a minimum 1GB hard drive with <15ms access time is recommended. A SCSI-2 or Fast/Wide SCSI-2 PCI controller is required to transfer these amounts of data. Of course, as you increase the quality of the video compression and audio digitizing you also increase the needs of your system components.

13. What tips or techniques will improve the quality of my digital video?

Desktop video digitizing products that use real-time compression/ decompression hardware to achieve full-motion, full-frame capture of video to hard disk are especially sensitive to video noise due to the compression algorithms being used. As a result, you will achieve best performance by using higher quality video cameras (S-VHS and Hi-8) with S-Video connections, or RGB and component (broadcast quality) video equipment with a TARGA 2000 Pro board.

Be aware that generation loss will degrade video digitizing performance. Do not record tape-to-tape and then use second generation video to digitize to your computer hard disk. Always use original video footage to record to hard disk. Low light conditions during the shooting of video will degrade video resolution and image quality; shooting video with lots of light will maintain a maximum overall video signal to noise ratio.

Compression is additive. This means that loss introduced by video compression is additive. For example, if you are compositing multiple layers of video together, save each layer as a movie with no compression (or with a maximum quality setting). Do your video compositing with the uncompressed video, and then, once your are done make a final movie with an appropriate target compression method.

If you are shooting video that will ultimately be pressed to CD-ROM, think about the actual video production. The CD-ROM author achieves best playback performance with video that has the following characteristics:

- *No fast movement of objects in video*
- *Large low frequency areas (large areas with little detail, like blue sky, black backgrounds, or white wall backdrops*
- *Head shots and other objects of interest should fill the video frame (small objects and minute detail may be lost in the compression process)*

Always capture video clips to a pre-allocated defragmented scratch file. This saves the system overhead in finding, allocating, and seeking new sectors as the video is being recorded.

Appendix A — Troubleshooting

TARGA 2000 TROUBLESHOOTING

Occasionally, you may have a problem while using your Pinnacle TARGA 2000 system. This Appendix covers potential situations and describes steps you can take to identify and correct them. TARGA 2000 troubleshooting in this Appendix is subdivided into the following categories:

- General Problems
- IRQ Problems
- Video Monitor Problems
- Video Input Problems
- Video Capture Problems
- Audio Problems
- Playback Problems
- Error Messages

Important: If your problem is not solved by this Troubleshooting section, additional help can be obtained from the Pinnacle Customer Satisfaction Center. Refer to the Customer Satisfaction Center section later in this Chapter.

General Problems

TARGA 2000 driver is not loaded (Error 103)

— If you get a message saying that the TARGA driver is not loaded you can load the driver into the system by using the path: **My Computer » (C:) » Targa2k » Misc » Install » Loaddrv.exe** and double clicking the file "Loaddrv.exe"

Display driver is not loaded

— To link your desktop display monitor to the driver use the path:

Start » **Settings » Control Panel** and then **Display » Settings Tab » Display Type button » Change button** and select "Pinnacle DVR" and click the **OK** button. Your "Adapter Type" is now set to Pinnacle DVR.

Note: If necessary, the file "Dvminip.sys" can be found via the "Browse" button in the **Targa2k » Winnt » Display folder.** Double-click the file or click the "Open" button and then select **OK**.

Can't open TARGA control panels

1. Verify that the board is correctly installed.

2. Make sure Control Panels aren't open and backgrounded in Windows NT. If a panel is open and hidden, other Control Panels may not open.

3. Make sure driver the is loaded.

4. Make sure Overlay is off (if accessing from within another capture application).

You have a SCSI boot drive (internal) and an A/V drive (external). Your data rates are not great and occasionally the system freezes and lockups

— Your problem is probably related to SCSI Termination. You should always use an active terminator on the end of your SCSI chain. Another problem in this scenario is that you may have placed your SCSI card in the middle of your SCSI chain. The best alternative will be to move your external A/V drive into the machine and add it to the end of the internal SCSI ribbon cable. This will keep all the data moving in one direction with the source on one end (i.e. SCSI controller) and with destinations (i.e., hard drives) on the other. Although the SCSI controller manufacturers show the original configuration as a viable one, sustained high data-throughput negates this option. Also use an active terminator. Most drives typically include only passive termination.

Audio and Video not in sync

1. Increase the compression ratio (which will decrease your data rate).

2. Reduce your audio sampling rate.

3. Make sure you are using the TARGA sound drivers.

4. If you have a sound card installed, remove it.

5. Check the "Wave Output" Adjustment in the TARGA Audio Control Panel.

Poor performance

1. For best performance, capture the video and audio to a second hard disk (i.e., a 7200 rpm ultra-wide hard disk or Ultra-Wide SCSI disk that does not have the operating system or any software installed on it).

2. Use Dual-Channel Bus-Mastering Ultra-Wide SCSI Controllers with Windows 32-bit drivers.

3. Some NTSC systems prefer a timebase of 29.97 frames per second as opposed to 30 fps, or vice versa when using video-editing software. If video capture or playback appears to jitter, change your NTSC capture rate from 30 to 29.97 or vice versa.

4. Since the TARGA captures two fields of video for each frame, high-motion frames will appear to jitter when they are grabbed or still-framed. This is normal and occurs with any product, high-end or low-end, that captures two fields per frame. During normal video playback, this technique makes motion look smoother and more realistic, indicating a high-quality capture system.

IRQ Problems

IRQ (Interrupt ReQuest) conflict

— The most common problem encountered when you install PC hardware of
any type is the limited number of Interrupt ReQuests (IRQs) available to
expansion cards. Most expansion cards require at least one IRQ, and
sometimes more. If you have an IRQ conflict, you can resolve it by telling
the conflicting device to use a different IRQ. Consult your Windows Help
or manual on hardware conflicts.

Note: Use IRQ's of 9 or higher that are not in use by other devices.

You notice that the Windows NT Diagnostics says that another card is sharing an IRQ with the SCSI controller

— It is true that Windows NT can handle shared IRQs, but if the
proceeding scenario is the case, expect your data rate to be halved.
Remove any peripheral cards except for your VGA card, your SCSI
controller card and your TARGA 2000. If this solves the speed issue
then you can add back your other cards being careful to "manually"
assign ISA IRQ's to the appropriate cards, while leaving as many IRQ's
available to peripherals on the PCI bus.

You tried to provide the TARGA card and the SCSI controller a non-shared IRQ but it always ends up shared. Your BIOS does not allow you to assign IRQ's

— Try reordering the cards in your PCI slots. Try to give the TARGA card
the first/primary PCI slot. This should ensure that the TARGA gets a
clean non-shared IRQ. The next slot should be the SCSI controller
followed by your VGA card. This will give you the ideal slot priority.

Note: Systems with 440 BX and GX motherboards always share resources on PCI
slots 1 and 4. Manufacturers may force sharing on other slots as well.

Monitor Problems

Desktop Monitor Blank

1. If monitor boots but stops at blue text screen, then reverse the VGA Loop-Through Cable.

2. Check monitor power.

3. If you have a dual input Monitor, then make sure input selection button on the monitor is set correctly.

4. Make sure your monitor runs at the specified resolution.

5. Make sure VGA Loop Through cabling is set up correctly.

Video Monitor Black

1. Check Monitor power.

2. Check Break Out Box connection and all cables connected to the Breakout Box.

3. From the Video Input or Output dialog box hold <Ctrl> and select "show color bars" to test output.

4. Check the Video Source window in your application.

5. Check the card installation. Make sure it is firmly inserted into the PCI slot.

6. Check the cables. Make sure they are plugged into both the card and monitor.

7. Reinstall the TARGA software.

Video Input Problems (Pass Through)

Live video does not work

1. Verify that your output is working.

2. Verify that you have all of the software components correctly installed.

3. Make sure the software is set to match your video format and source signal.

   • NTSC or PAL format, and RGB, S-Video, Composite signal, or etc.

4. Check your video source.

   • Some video cameras shut off automatically after a few minutes.

5. If you're using a Break Out Box, check Break Out Box connection and all cables connected to the Break Out Box .

6. Check the cable from the video source to your multimedia card.

Video Capture Problems

Capture not working

1. Verify input (pass through) is working.

2. Reboot the system.

3. Check by using another capture application.

TARGA card records nothing or a few frames

1. Reboot the system.

2. Verify that all necessary software is installed.

3. Check the video signal and cabling. Video should be playing on video monitor before you try to record.

4. Make sure you are capturing to your "AV" Drive, and that it is not full.

5. Lower the data rate.

Drop frames on record

1. Increase the compression ratio (which will decrease your data rate).

2. Try capturing just the video (turn off the audio).

3. Set your "AV" drive as the "Scratch Disk" within your video editing application.

4. Do not select a removable media drive (e.g., backup drive) as your "AV" drive.

Audio Problems

No sound

1. Make sure TARGA is set up as the preferred device in the "Audio Tab" of the Multimedia Control Panel.

2. Make sure the speakers are connected to the TARGA "Audio Out."

3. Make sure the output is working by playing a system sound file in the Sound Control Panel.

4. Make sure sound is not turned down or muted on your output device.

5. Verify that audio was captured.

**You record audio in mono, but when you play back there doesn't seem
to be any audio**

— Check the audio connections to make sure everything is properly cabled
(the right channel is used for mono input). Make sure Mute is off in the
Audio Control Panel. Also check the Playback slider bars for adequate
settings, and check the volume setting on any external controllers.

**You are working with audio peripherals and monitoring devices that
support balanced audio, but your TARGA 2000 or TARGA 2000 Pro
support unbalanced audio input and output**

— Use a good quality transformer with appropriate adapter connectors and
wiring when converting from balanced to unbalanced audio. The better
the transformer, the better the chance that it can sense the impedance
level and compensate for the loads to match signal levels from input to
output.

Audio output crackles or pops

1. Audio output level may be too high; turn down audio amplification for
the Audio (i.e., set volume lower). Settings for unity in the Audio
Control Panel should be 0 for record amplification and 26 for playback
(attenuation).

2. Decrease the input level (or gain) within the movie editing application.

3. Input from device may be "hot." Reduce the audio level at the input
device.

Playback Problems

Movie doesn't play smoothly or pauses intermittently

1. Check that the correct playback format is used: NTSC or PAL

2. Verify the movie frame rate (30 fps for NTSC; 25 for PAL).

3. Free as much RAM as possible. (Quit other applications.)

4. Check that no other background programs are running.

5. Verify that the movie is playing from the "AV" drive.

Can't playback captured movie

1. If applicable, try playing the file back in another application such as MediaPlayer or TARGA AVI Player If the file plays, then the QuickTime or VFW application may be corrupted. If the file does not play, then the file may be corrupted.

2. Check that the application's playback feature is correctly set.

3. Make sure the TARGA software is correctly installed.

4. Reinstall the movie editing software (it may have gotten corrupted).

Problems when recording to VCR

1. Make sure output is working.

2. Check cabling.

3. Make sure VCR is set to use the line inputs (see VCR documentation).

Error Messages

You get the following error message: "cannot allocate DVR buffers"

— In the rare instance where an application that uses the TARGA 2000 board unexpectedly quits, you may see this message. In order to recover, try restarting your machine and applications.

You get the following error message "cannot allocate enough DVR memory for compression buffers"

— This happens when you try to run more than one application that uses the TARGA 2000 board. Applications such as Digital VCR or Premiere may need to enlist all of the on-board memory available on the board and therefore cannot be open at the same time.

After a capture or during a preview or render, Premiere complains that certain files are not accessible because they are "locked or in use"

— There are almost certainly background copies of Premiere consuming system resources.

You get an error message on your screen that says there is a problem related to error number X, where X is one of the error message numbers below:

— Find the error message number in the list, and note if there is a solution or action item provided. Those messages that do not show a specific action item simply require you to reboot your machine.

Error 1 Could not locate a TARGA board.
Error 3 PCI -- Bios mapped the board at a non 256MByte boundary or PCI—Bios mapped the board at 0x50000000
Error 5 Could not map BIC address space.

Error 6   Could not map SLIC address space.
Error 7   Could not map BEC address space.
Error 8   Could not map HUB address space.
Error 10 Illegal VRAM size detected.
Error 11 Illegal DRAM size detected.
Error 12 Could not map DVR DRAM address space.
Error 13 Could not map DVR DRAM address space.
Error 14 Illegal interrupt number. Valid interrupts are 0 through 15.
         PCI—BIOS assigned a bad interrupt number.

Error 15 Windows NT —Could not create DVR interrupt
Error 17 DVR.INI did not contain an IOModulePath statement.
Error 18 The directory name pointed to by IOModuleSubdir was valid but no
         line with IoModuleSubdir=filename was found.

Error 19 A MOD file has an incorrect format or was not found.
Error 20 Could not execute an otherwise correct MOD file.
Error 21 Could not read the DSP software file indicated by the
         LOADER=parameter in DVR.INI.

Error 22 LOADER COFF file does not have the proper format.
Error 24 A input MOD file has been used on an encoder, or an output
         MOD file has been used on a decoder.

Error 25 Could not allocate enough host RAM to load DSP software
         LOADER.

Error 26 Could not open the file specified by the LOADER=parameter in
         DVR.INI.

Error 31 Could not read the DSP software file indicated by the
         KERNEL=parameter in DVR.INI.

Error 33 KERNEL COFF file does not have the proper format.

Error 35 Could not allocate enough host RAM to load DSP software
KERNEL.

Error 39 Could not open the file specified by the KERNEL=parameter in
DVR.INI.

Error 40 Host timed out waiting, waiting for DSP to start.

Error 101 Create Service on DVRNTSRV.SYS failed. Calling GetLastError
may have more info.

Error 102 Start Service on DVRNTSRV.SYS failed. Calling GetLastError
may have more info.

Error 103 Kernel-mode driver open call failed. Calling GetLastError may
have more info.

PINNACLE CUSTOMER SATISFACTION CENTER

You can contact the Pinnacle Customer Satisfaction Center for additional help. Before contacting the Customer Satisfaction Center, please complete the Troubleshooting Questionnaire (below) and have the answers ready when you contact us.

Troubleshooting Questionnaire

Please have answers to the following questions before calling for additional help:

1. What are the serial numbers, model numbers, and software version numbers of the Pinnacle products that you have installed on your computer?

2. Which computer system are you using with the product listed in item 1 of this questionnaire?

3. What version of DOS or Windows are you using?

4. How much memory (RAM) is installed in your computer?

5. What Terminate and Stay Resident (TSR) programs do you have installed on your computer?

6. What other hardware is connected to your computer (multimedia cards, monitors, network cards, hard drives, etc.) and what resources do they use? Please include all relevant model numbers, ROM version numbers, and software version numbers, where applicable.

7. What are the steps to duplicate the problem?

Contact Information

Online services are available 24 hours per day. Customer Satisfaction Center personnel are available Monday through Friday 9:00 A.M. to 6:00 P.M. Eastern Time (1300 - 2200 Universal Time/GMT).

On-Line Services

E-mail: truevision-support@pinnaclesys.com

WWW Site: www.pinnaclesys.com

Fax Inquires

U.S. and Canada: (317) 576-7770
Worldwide: (317) 594-2900

Telephone Contact

Sales Information, Technical Support, FaxBack System
(The FaxBack System is an automated system that allows you to obtain immediate information on products, price lists, bulletins, and upgrades.)

U.S. and Canada: (800) 522-TRUE {8783}
Worldwide: (317) 577-8788

Note: This information is subject to change. Check www.pinnaclesys.com on the web for the latest contact information.

Appendix B — Technical Specifications

TARGA 2000 SPECIFICATIONS*

General
Card Size ....12.3" x 4.2"

Bus Interface.............................1 PCI slot (non-shared PCI interrupt)

Power Consumption ....CA/V: 24 Watts max   Pro: 27 Watts max
                                          DTX: 28 Watts max   RTX: 34 Watts max
                                          SDX: 30 Watts Max

Regulatory Compliance ....FCC Class B and CE

Memory (CA/V and Pro)
Frame Buffer Memory...............4 MB VRAM

Offscreen Memory.....................16MB DRAM

Memory (DTX, RTX, and SDX)
Frame Buffer Memory...............4MB VRAM

Offscreen Memory.....................32MB DRAM

Desktop Display (CA/V, Pro, DTX, RTX, and SDX)
Desktop Resolutions ....1152 x 870, 1024 x 768, 800 x 600, 640 x 480

Vertical Refresh Rate ....Max 75 Hz (non-interlaced)

Output Signals ....R,G,B, H-Sync, V-Sync

Connector ....HD 15-pin VGA Female Receptacle

VGA Loopthrough.....................Analog

DAC Resolution ....10 bits for each primary

Gamma Correction Tables.........256 x 10 bits for each primary

Pixel Depth ....24-Bit (True color)

*All specifications subject to change without notice.

Video Processor
Video Resizer ....2D filter

Video Compositor ....256 levels

Video Ports ....3 (Video In, Video Out, Compression)

Video Port Bandwidth ....640 x 480 x 30 fps (37 MB/sec)
                                              780 x 576 x 25 fps (44 MB/sec)

Hardware BLIT ....CA/V and Pro: 100 MB/sec

                                              DTX, RTX, and SDX: 160 MB/sec

On-Board DSP (Digital Signal Processor)
Processor...................................AT&T 3210 Floating Point DSP

Video Input Formats
Video Inputs ....Composite and Y/C (S-Video)
                                              Pro adds: GBRS, GsBR and Y, B-Y, R-Y
                                                    (NTSC Betacam, SMPTE/EBU)

                                              DTX/RTX adds: GBRS, GsBR, Y,B-Y,R-Y
                                                    (NTSC Betacam, SMPTE/EBU,
                                                    M II)

                                              SDX is SMPTE 259-M compliant only

Video Standards.........................CA/V: square pixel only NTSC or PAL

                                              Pro/DTX/RTX adds: CCIR-601 support

                                              SDX is CCIR-601 compliant only

Video Resolution ....CA/V: 640 x 480, 648 x 486 NTSC square pixel
                                                    768 x 576 PAL square pixel

Pro/DTX/RTX adds: 720 x 486 NTSC CCIR 601
720 x 576 PAL CCIR 601

SDX is: 720 x 486 60 Hz CCIR 601 (NTSC)
720 x 576 50 Hz CCIR 601 (PAL)

ADC Resolution ....8 bits

Sampling Structure ....CA/V: 4:2:2 YCbCr
Pro/DTX/RTX: 4:4:4 RGB
4:4:4 YUV subsampled to
4:2:2 YCbCr

Color Space Conversion ....YUV to 24-bit RGB (8:8:8)

Gamma Correction Tables.........256 x 8 bits for each primary (all models)

Genlock Input ....Genlock to input video (all models)

Video Output Formats
Video Outputs............................CA/V: Composite and Y/C (S-Video)
Pro adds: GBRS, GsBR, Y,B-Y,R-Y
(NTSC Betacam or SMPTE/EBU N10 calibrate
specific)

DTX and RTX adds: GBRS, GsBR, Y, B-Y, R-Y,
and Alpha (key) channel (NTSC Betacam, MII, and
SMPTE/EBU N10)

SDX is SMPTE 259-M compliant only

*Composite CA/V: ....RCA 1 Volt p-p, 75 Ohm

*S-Video (4 Pin DIN)................Y Signal: 1 Volt p-p, 75 Ohm
C Signal: 627 mV p-p, 75 Ohm

*Component ....Y Signal: 1 V, p-p 75 Ohm
R-Y Signal: ± 350 mV p-p, 75 Ohm
B-Y Signal: ± 350 mV p-p, 75 Ohm

*Output levels are based on NTSC 100% white 75% amplitude fully saturated bars.

Genlock Input ....Genlock to video input or via external

Video Standards.........................CA/V: NTSC or PAL

Pro/DTX/RTX adds: CCIR-601 support

SDX is CCIR-601 compliant only

Video Resolution ....CA/V: 640 x 480, 648 x 486 NTSC square pixel
                                                    768 x 576 PAL square pixel

Pro, DTX, RTX adds: 720 x 486 NTSC CCIR-601,
                                 720 x 576 PAL CCIR-601

SDX is: 720 x 486 60 Hz CCIR 601 (NTSC)
                 720 x 576 50 Hz CCIR 601 (PAL)

Gamma Correction Tables.........256 x 8 bits for each primary

DAC Resolution ....CA/V: 10 bit Cv and Y/C

Pro adds: 8 bit RGB, Betacam or SMPTE/EBU
DTX and RTX adds: 8 bits each for RGB
MII, Betacam and SMPTE/EBU have
10 bit Y resolution and 8 bit Alpha output

SDX is SMPTE 259-M 8 bit and 10 bit

Sampling Structure ....CA/V: 4:4:4 RGB

Pro: 4:4:4 RGB and 4:4:4 YUV

DTX/RTX: 4:4:4:4 RGBA and 4:4:4:4 YUVA
SDX: 4:2:2 YUV

Audio Input/Output

Audio Inputs................................CA/V and Pro: Two unbalanced input channels
configured as L&R stereo channels with 20K
nominal ohm input impedance, -10 dBu typical
input level

DTX/RTX: Two balanced input channels
configured as L&R stereo channels with 20k ohm
input impedance, +4 dBu typical input level.

SDX: Digital AES/EBU compliant

Audio Outputs ....CA/V and Pro: Two unbalanced output channels
configured as L&R stereo channels capable of
driving a 600 ohm load to -10 dBu typical

DTX/RTX: Two balanced output channels
configured as L&R stereo channels capable of
driving a 600 ohm load to +4 dBu typical

SDX: Digital AES/EBU compliant

ADC/DAC Resolution...............16 bits (all models)

Sampling Rate ....Up to 48 kHz, 64X oversampling
SDX 48 kHz, 44.1 kHz, 32 kHz

Input Gain.................................0 to 22.5 in 1.5 dB steps (all models)

Output Attenuation ....0 to -45 dB in 1.5 dB steps (all models)

Compression/Decompression

Standard.....................................Motion JPEG

Processor....................................LSI

Processor Clock Speed ....30 MHz

Fields per Second ....60 NTSC, 50 PAL

Compressed Data Rate* ....CA/V and Pro:Up to 5 MB/sec sustained on record
7MB/sec sustained on playback

DTX: 15 MB/sec sustained on record and playback

RTX :15 MB/sec (one stream) sustained on record
15 MB/sec (total for two streams) sustained
on playback

SDX: 15 MB/sec (one stream) sustained on record
15 MB/sec (total for two streams) sustained
on playback

Appendix C — Cables And Connectors

TARGA 2000 CABLES AND CONNECTORS

Input and output connectors on the TARGA 2000 card bracket are as
follows:

TARGA 2000 PCI CA/V and Pro   TARGA 2000 PCI DTX, RTX, SDX, 3D or DV

15-Pin Monitor
(Desktop Display)

15-Pin Monitor
(Desktop Display)

26-Pin Input/Output
(Audio and Video)

60-Pin Input/Output
(Audio and Video)

CA-203 CABLE DIAGRAM

The following is a diagram of the CA-203 cable. Two of these cables are
used with the TARGA 1000 Pro or TARGA 2000 Pro. The CA-203 cable is
used for hooking the CA-207 cable to S-Video jacks. Attach the CA-203
BNC receptacle labeled "Y" (Luminance) to the CA-207 BNC connector
labeled "Y." Attach the CA-203 BNC receptacle labeled "C" (Chrominance)
to the CA-207 BNC connector labeled "C."   The resulting output through the
4-pin connector on the CA-203 will be S-Video.

Y In (BNC Receptacle)

S-Video Out

C In (BNC Receptacle)
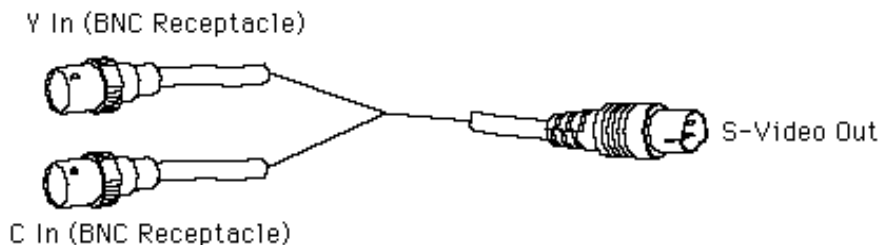
CA-210 Breakout Box Connector (RTX Only) Diagram

Pin Number	Signal	Pin Number	Signal
1	Right Audio In (-)	32	Shield (pin 52)
2	Right Audio In (+)	33	Shield (pin 13)
3	Shield (pins 4&5)	34	Shield (pin 54)
4	Left Audio In (-)	35	Shield (pin 15)
5	Left Audio In (+)	36	Shield (pin 56)
6	Ground	37	Shield (pin 17)
7	I²C Clock	38	Shield (pin 58)
8	Ground	39	Shield (pin 19)
9	Reference In	40	Shield (pin 60)
10	Ground	41	Shield (pin 21)
11	CV In	42	Shield (pin 62)
12	Ground	43	Right Audio Out (-)
13	C In (S-Video)	44	Right Audio Out (+)
14	Ground	45	Left Audio Out (-)
15	Y In (S-Video)	46	Left Audio Out (+)
16	Ground	47	Ground
17	Y/G In	48	I²C Data
18	Ground	49	Ground
19	R-Y/R In	50	Key Out
20	Ground	51	Ground
21	B-Y/B In	52	CV Out
22	Shield (pins 1&2)	53	Ground
23	Ground	54	C Out (S-Video)
24	Shield (pins 43&44)	55	Ground
25	Shield (pins 45&46)	56	Y Out (S-Video)
26	Ground	57	Ground
27	Shield (pin 7)	58	Y/G Out
28	Shield (pin 48)	59	Ground
29	Shield (pin 9)	60	R-Y/R Out
30	Shield (pin 50)	61	Ground
31	Shield (pin 11)	62	B-Y/B Out

CA-204 CABLE DIAGRAM

The diagram below shows the connector descriptions for Cable Number
CA-204. The pin assignments for the 26-pin D-type connector are displayed
on the next page. One CA-204 cable is included with the TARGA 1000 or
TARGA 2000 CA/V card.

26 Pin D type Connector

BLACK Cable
Genlock In

RED Cable
Right Audio In

WHITE Cable
Left Audio In

YELLOW Cable
CV In

GREEN/BLUE Cable
S-Video In

RED Cable
Right Audio Out

WHITE Cable
Left Audio Out

GREEN/BLUE Cable
S-Video Out

YELLOW Cable
CV Out
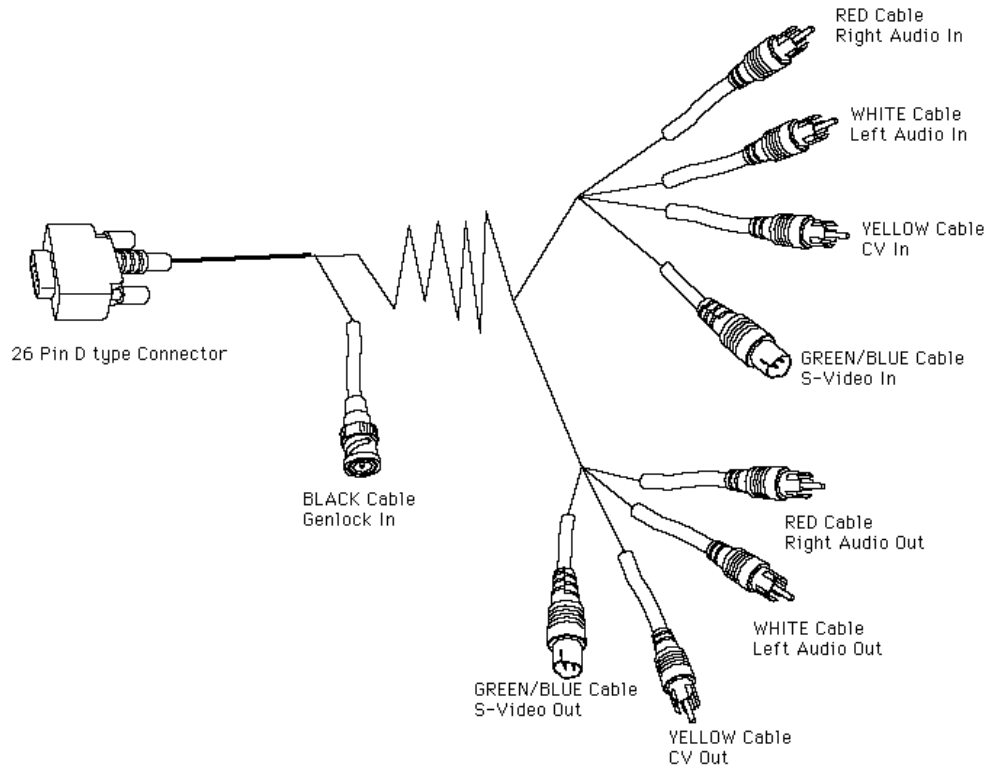
CA-204 CONNECTOR DIAGRAM

The diagram below shows the connector pin assignments for the 26-pin
D-type connector on Cable Number CA-204 (described on the previous page).

<u>**26 Pin D-type Connector:**</u>
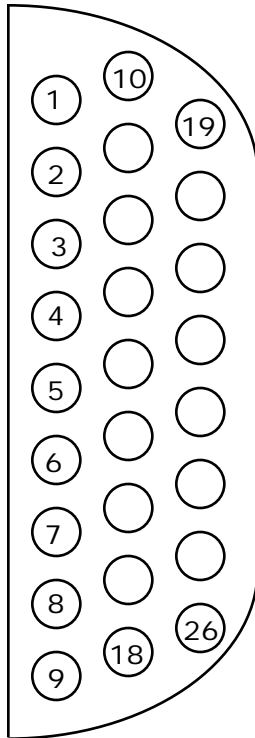
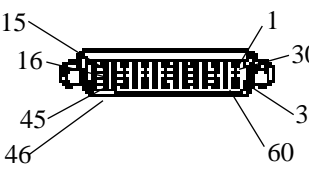| Pin Number	Signal
1	Right Audio In
2	Left Audio In
3	Spare
4	Genlock Input
5	Not Used
6	Not Used
7	Chrominance Input
8	Luminance Input
9	Composite Video Input
10	Audio Out Ground
11	Right Audio In Ground
12	Left Audio In Ground
13	Genlock Ground
14	Not Used
15	Not Used
16	Chrominance Ground
17	Luminance Ground
18	Composite Video Ground
19	Right Audio Output
20	Left Audio Output
21	Video Out Ground
22	Not Used
23	Not Used
24	Chrominance Output
25	Luminance Output
26	Composite Video Output

CA-206 CABLE DIAGRAM

The diagram below shows the connector descriptions for Cable Number CA-206. This cable is used for looping VGA signals through your TARGA 2000 board to a Windows desktop display monitor.

HD 15 Pin Female Plug

HD 15 Pin Male Plug

To Cable Supplied with Monitor

TARGA 2000
Desktop Connector

VGA Board
Connector

HD 15 Pin Male Plug
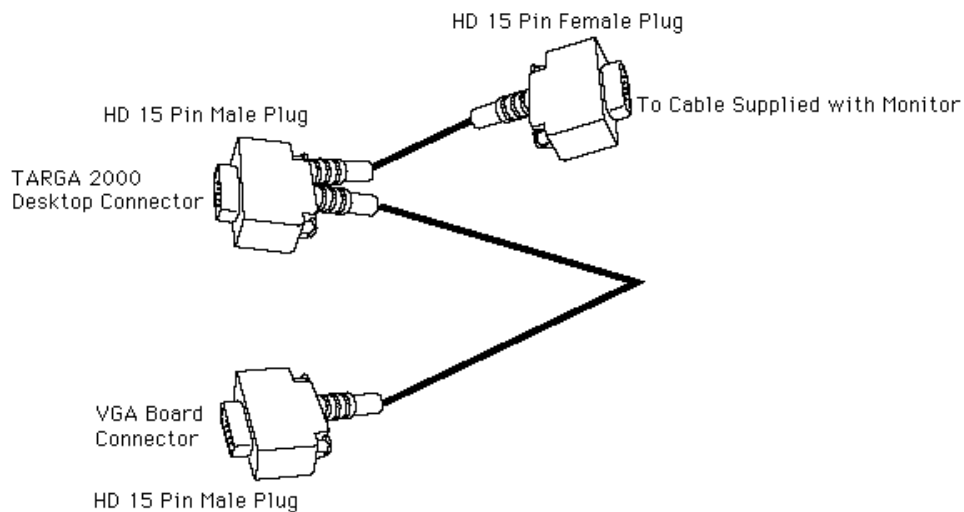
CA-206 CONNECTOR DIAGRAM

The columns below show the connectors and pin assignments for the three 15-Pin high-density video connectors on the CA-206 cable (see previous page). Pin numbers are inside the actual connectors.

Male Connectors:

Pin Number	To VGA Board	To TARGA 2000
1	VGA Red	Red
2	VGA Green	Green
3	VGA Blue	Blue
4	Shield	Monitor ID 2
5	Ground	VGA Vertical Sync
6	Ground	VGA Red
7	Ground	VGA Green
8	Ground	VGA Blue
9	Shield	VGA Horizontal Sync
10	Ground	Ground
11	Shield	Monitor ID 0
12	Shield	Monitor ID 1
13	VGA H-Sync	H-Sync
14	VGA V-Sync	V-Sync
15	Shield	Ground
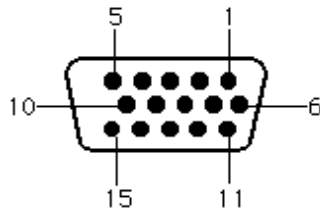
Female Connector:

Pin Number	To Desktop Monitor
1	Red
2	Green
3	Blue
4	Shield
5	Ground
6	Ground
7	Ground
8	Ground
9	Shield
10	Ground
11	Shield
12	Shield
13	H-Sync
14	V-Sync
15	Shield

CA-207 CABLE DIAGRAM

The diagram below shows the connector descriptions for Cable Number CA-207. This cable is used with the TARGA 1000 Pro or TARGA 2000 Pro, and replaces the CA-204. The pin assignments for the 26 pin D-type connector are shown on the next page.

RED Cable
Pr/R In

BLUE Cable
Pb/B/C In

YELLOW Cable
CV/CS In

GREEN Cable
Y/G In

RED Cable
Right Audio In

WHITE Cable
Left Audio In

WHITE Cable
Left Audio Out

RED Cable
Right Audio Out

GREEN Cable
Y/G Out

YELLOW Cable
CV/CS Out

BLUE Cable
Pb/B/C Out

RED Cable
Pr/R Out

BLACK Cable
Genlock

26 Pin D Type Connector
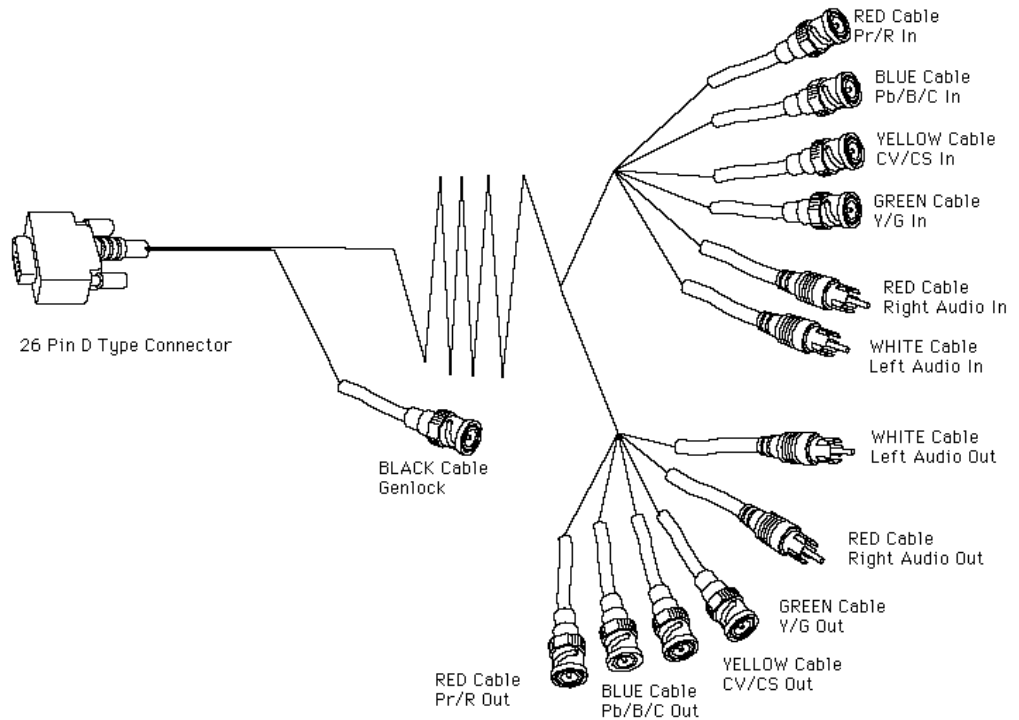
CA-207 CONNECTOR DIAGRAM

The diagram below shows pin assignments for the 26-pin D-type connector on the CA-207 cable (see previous page).

26 Pin D-type Connector:
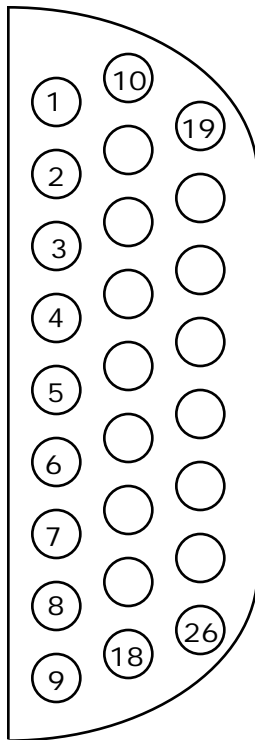
Pin Number	Signal
1	Right Audio In
2	Left Audio In
3	Spare
4	Genlock Input
5	Reserved
6	Pr/R Input
7	Pb/B/C Input
8	Y/G Input
9	CV/CS Input
10	Audio Out Ground
11	Right Audio In Ground
12	Left Audio In Ground
13	Genlock Ground
14	Reserved
15	Pr/R Ground
16	Pb/B/C Ground
17	Y/G Ground
18	CV Ground
19	Right Audio Output
20	Left Audio Output
21	Video Out Ground
22	Reserved
23	Pr/R Output
24	Pb/B/C Output
25	Y/G Output
26	CV/CS Output

CA-208 CABLE DIAGRAM

The diagram below shows the connector descriptions for Cable Number CA-208. This cable is used with the TARGA 2000 DTX or RTX. The pin assignments for the 60 pin D-type connector are shown on the next page.

The CA-208 cable does not have phono connectors for unbalanced audio. If you wish to use your TARGA 2000 DTX with unbalanced audio, you have a few options. You could use a dedicated audio support device with active circuitry designed to convert unbalanced signals to balanced, you could use a XLR-RCA adapter (and risk audio distortion and clipping), or you could upgrade to a Pinnacle Breakout Box, which is designed to work with balanced or unbalanced audio.
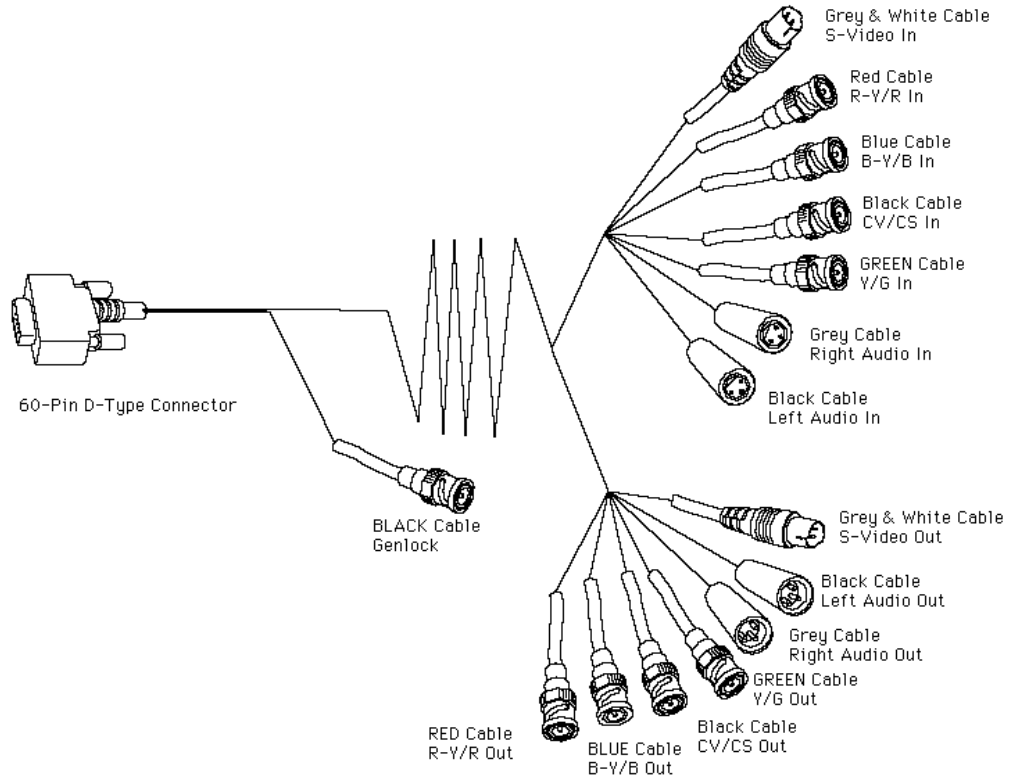
CA-208 CONNECTOR DIAGRAM

The diagram below shows pin assignments for the 60-pin D-type connector on the CA-208 cable (see previous page).

60 Pin D-Type Connector
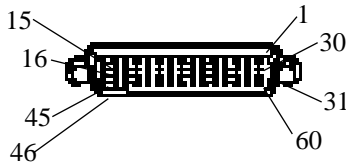
Pin	Signal	Pin	Signal
1	Right Audio In (+)	31	Right Audio Out (-)
2	Left Audio In (-)	32	Shield (Pins 31&60)
3	Left Audio In (+)	33	Shield (Pins 58&59)
4	Ground	34	Ground
5	Ref In	35	Shield (Pin 56)
6	I^2C Clock	36	Shield (Pin 55)
7	CV In	37	Shield (Pin 54)
8	Ground	38	Ground
9	C In (S-Video)	39	Shield (Pin 52)
10	Ground	40	Ground
11	Y In (S-Video)	41	Shield (Pin 50)
12	Y/G In	42	Shield (Pin 49)
13	Ground	43	Ground
14	R-Y/R In	44	Shield (Pin 47)
15	B-Y/B In	45	Shield (Pin 46)
16	Shield (Pin 15)	46	B-Y/B Out
17	Shield (Pin 14)	47	R-Y/R Out
18	Ground	48	Ground
19	Shield (Pin 12)	49	Y/G Out
20	Shield (Pin 11)	50	Y Out (S-Video)
21	Ground	51	Ground
22	Shield (Pin 9)	52	C Out (S-Video)
23	Ground	53	Ground
24	Shield (Pin 7)	54	CV Out
25	Shield (Pin 6)	55	I^2C Data
26	Shield (Pin 5)	56	Key Out
27	Ground	57	Ground
28	Shield (Pins 2&3)	58	Left Audio Out (+)
29	Shield (Pins 1&30)	59	Left Audio Out (-)
30	Right Audio In (-)	60	Right Audio Out (+)

CA-212 CABLE DIAGRAM

The diagram below shows the connector descriptions for Cable Number
CA-212. This cable is used with the TARGA 2000 DSX or SDX. The pin
assignments for the 60 pin D-type connector are shown on the next page.
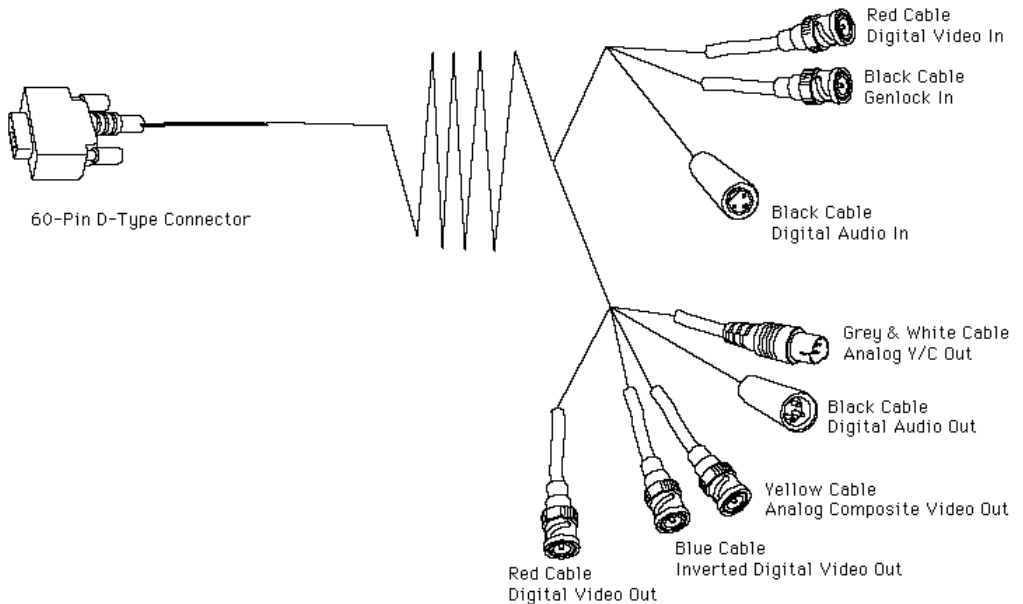
CA-212 CONNECTOR DIAGRAM

The diagram below shows pin assignments for the 60-pin D-type connector on the CA-212 cable (see previous page).

60 Pin D-Type Connector

Pin	Signal	Pin	Signal
1	Not Used	31	Not Used
2	Digital Audio In (-)	32	Not Used
3	Digital Audio In (+)	33	Shield (Pins 58&59)
4	Not Used	34	Not Used
5	Genlock In	35	Not Used
6	Not Used	36	Not Used
7	Digital Video In	37	Shield (Pin 54)
8	Not Used	38	Not Used
9	Not Used	39	Shield (Pin 52)
10	Not Used	40	Not Used
11	Not Used	41	Shield (Pin 50)
12	Not Used	42	Not Used
13	Not Used	43	Not Used
14	Not Used	44	Shield (Pin 47)
15	Not Used	45	Shield (Pin 46)
16	Not Used	46	Inverted Digital Video Out
17	Not Used	47	Digital Video Out
18	Not Used	48	Not Used
19	Not Used	49	Not Used
20	Not Used	50	Y Out (S-Video)
21	Not Used	51	Not Used
22	Not Used	52	C Out (S-Video)
23	Not Used	53	Not Used
24	Shield (Pin 7)	54	Analog Composite Video Out
25	Not Used	55	Not Used
26	Shield (Pin 5)	56	Not Used
27	Not Used	57	Not Used
28	Shield (Pins 2&3)	58	Digital Audio Out (+)
29	Not Used	59	Digital Audio Out (-)
30	Not Used	60	Not Used

Appendix D — TARGA 2000 Pro Upgrade

The standard TARGA® 2000 card can be easily upgraded to a TARGA® 2000 Pro. This is done by replacing the CA/V module (Composite Video and S-Video analog input) on the base with the Component Pro module (i.e., daughter card). The Component Pro module allows the TARGA 2000 base card to have the following analog input and output formats:

- Composite Video
- S-Video (Y/C)
- Component YUV (BetaCAM)
- RGB

Note: A standard A/V module can be identified by a smooth outer surface. A Component Pro module is identifiable by an assortment of chips, capacitors, and resistors on its outer surface.

The TARGA 2000 with Component Pro module allows you to select any of the following video standards as output:

- NTSC at 640 x 480
- NTSC 601 at 720 x 486 (NTSC CCIR-601)
- Full NTSC at 648 x 486
- PAL at 768 x 576
- PAL 601 at 720 x 576 (PAL CCIR-601)

Upgrade Installation Procedure

Component Kit Parts:
- One Component Pro Module
- 3/16" Hex Nut Driver
- Anti-Static Wrist Strap
- One CA-207 Cable
- Two CA-203 Cables
- Warranty Card

Equipment Needed:
- One pair needle-nose pliers
- Small flat-head screwdriver

1. Put on Wrist Strap and Remove Hex-head Screws from base card.

Remove the lower 3/16" hex-head screws and washers (see Figure 1) from the TARGA 2000 base card with the supplied hex-nut driver. Unfasten the stand off from base card by lifting the corner of the module. If the stand off does not come out, it may be necessary to use needle-nose pliers to squeeze the tip.
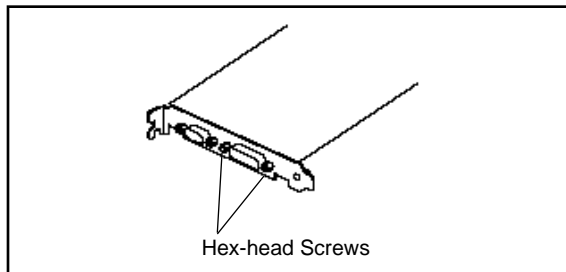
Figure 1. Remove Hex-head Screws

2. Remove CA/V Module from base card. Refer to Figure 2.

Once the stand off has been unfastened, pull module from base card to separate the video module connectors. Lift the card to clear the module's 26-pin D-type connector from the slot-connector bracket. Once removed, place the card in an antistatic bag for storage.
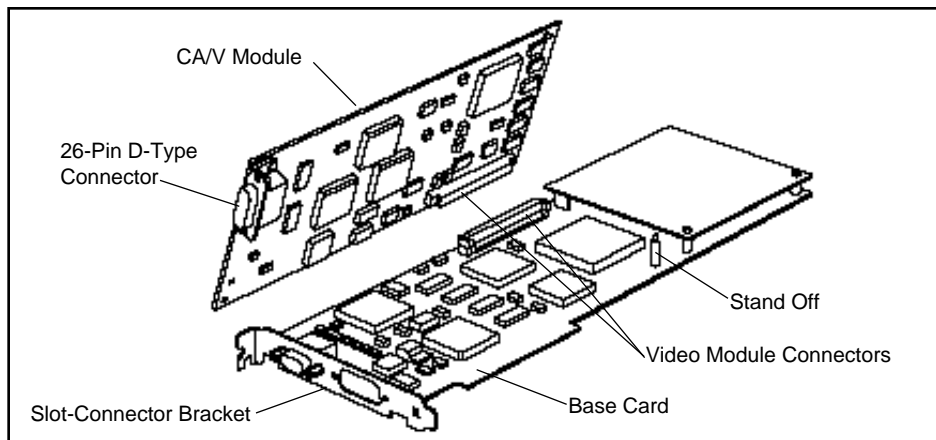
Figure 2. Remove CA/V Module

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3. **Attach Component Pro Module to base card.**

Position the 26-pin D-type connector of the Component Pro module through the slot-connector bracket (see Figure 3). Seat the module connector and stand off to connect the Pro module to base card. Use the hex-head screws and washers to secure the Component Pro module.

Pro Module

Stand Off

Slot-Connector Bracket

26-Pin D-Type
Connector
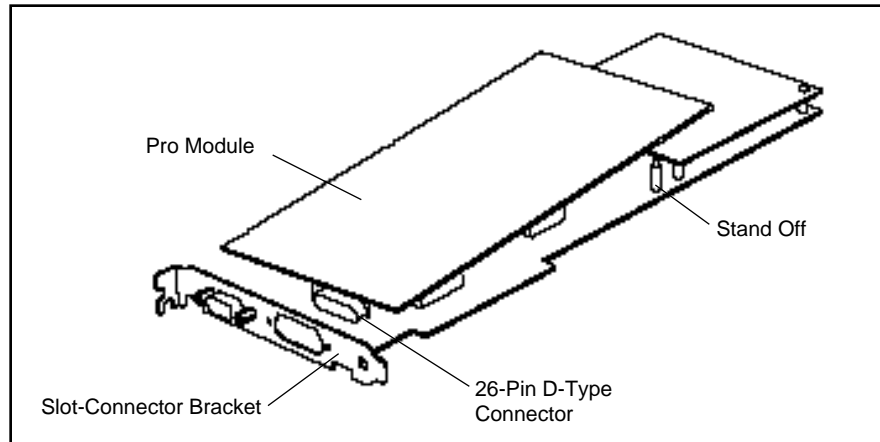
Figure 3. Attach Component Pro Module

4. **Insert TARGA® 2000 with attached Component Pro module into computer expansion slot.**

If necessary, refer to the "Installation Procedure" section in the Installation Guide.

5. **Use CA-207 Cable to connect Input and Output Devices to Component Pro.**

The CA-207 cable is designed to allow high quality video devices to be attached to your TARGA 2000 card. The BNC connectors are

individually labeled on the cable for convenience. Your peripherals should have specifically labeled BNC connectors that should be labeled either R,G,B, YPbPr, or Y,R-Y,B-Y. In the case of Y, R-Y, B-Y attach the Pb cable to the B-Y connector and the Pr cable to the R-Y connector.

The CA-207 cable also has BNC connectors for your component inputs and outputs, and RCA jacks for audio. Two CA-203 cables are provided for hooking the CA-207 cable to S-Video jacks if desired. The CA-203 consists of two BNC receptors combined to a 4-pin DIN S-Video adapter. The CA-207 connectors labeled Y and C should be hooked into the CA-203 cable connectors, also labeled for Y and C, to produce S-Video.

Note: Unused video inputs/outputs should be terminated to minimize cross talk between signals. Pinnacle recommends 75-ohm terminators.

Appendix E — TARGA 2000 RTX Upgrade

The TARGA® DTX card can be easily upgraded to the RTX version. This is done by replacing the DTX Compression module on the TARGA base with the RTX module.

Note: A DTX module can be identified by its relatively smooth outer surface. An RTX module is identifiable by an assortment of chips, capacitors, and resistors on its outer surface.

Upgrade Installation Procedure

Component Kit Parts:
- One RTX Module
- Anti-Static Wrist Strap
- Warranty Card

Equipment Needed:
- One pair needle-nose pliers

1. Put on Wrist Strap and remove DTX Module from base card. Refer to Figures 1 and 2.

Unfasten the stand offs from the base card by lifting each stand-off corner of the module. If a stand off does not come out, it may be necessary to use needle-nose pliers to squeeze the tip. Once the stand offs has been unfastened, pull the DTX module from its 120-pin base connector to separate the module from the base card.

Figure 1. TARGA 2000 DTX

Figure 2. DTX Module Removal and RTX Attachment
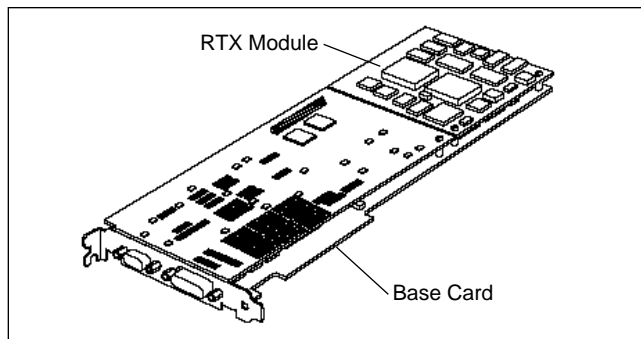
Figure 3. TARGA 2000 RTX

2. Attach RTX Module to base card. Refer to Figures 2 and 3.

Align and then seat the RTX module connector and stand offs to the 120 pin connector and stand off holes on the base card.

3. Insert TARGA® card with attached RTX Module into computer expansion slot.

If necessary, refer to the installation procedures in the Installation Guide.

Appendix F — TARGA 2000 SDX Upgrade

The TARGA® RTX card can be easily upgraded to the SDX version. This is done by replacing the RTX daughter card on the TARGA base with the SDX daughter card.

Upgrade Installation Procedure

Component Kit Parts:
• One SDX Daughter Card
• Anti-Static Wrist Strap
• Warranty Card

Equipment Needed:
• One pair needle-nose pliers

1. Put on Wrist Strap and remove RTX daughter card from base card. Refer to Figures 1 and 2.

Unfasten the stand offs from the base card by lifting each stand-off corner of the daughter card. If a stand off does not come out, it may be necessary to use needle-nose pliers to squeeze the tip. Once the stand offs has been unfastened, pull the RTX daughter card from its base connector to separate the daughter card from the base card.

RTX Daughter Card

Base Card

Figure 1. TARGA 2000 RTX

RTX Daughter Card Removal
&
SDX Daughter Card Attachment

Base Card

Appendix F
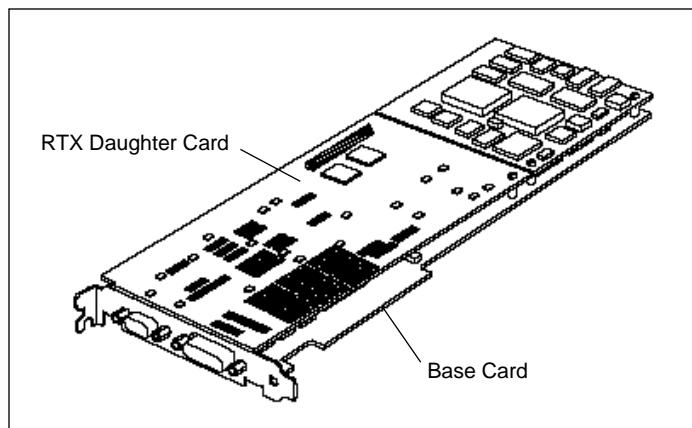
**TARGA 2000
SDX Upgrade**
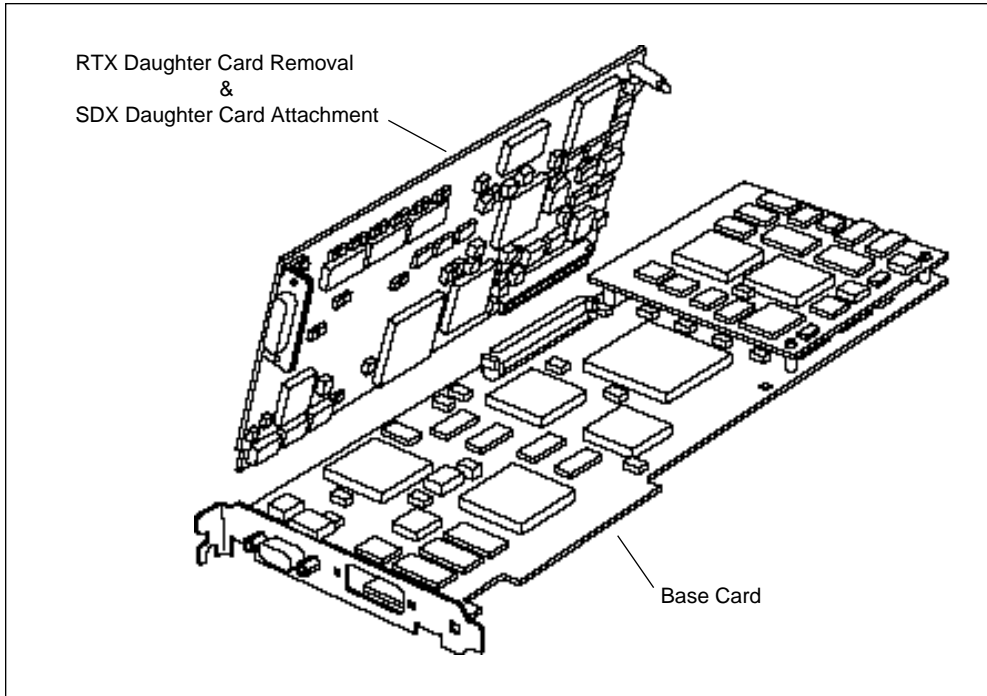
Figure 2. RTX Daughter Card Removal and SDX Attachment

2. Attach SDX Daughter card to base card. Refer to Figures 2 and 3.

Align and then seat the SDX daughter-card connector and stand offs to
the connector and stand off holes on the base card.
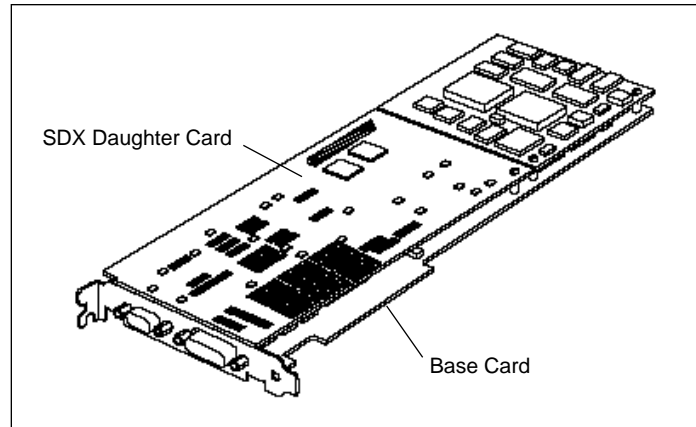
Figure 3. TARGA 2000 SDX

3. Insert TARGA® base card with attached SDX daughter card into computer expansion slot.

If necessary, refer to the installation procedures in the Installation Guide.

Appendix G — TARGA 2000 3D Upgrade

The TARGA$^{®}$ 2000 RTX or SDX card can be easily upgraded to the 3D version of that card. This is done by placing the Abekas Routing Module between the RTX or SDX Module and the TARGA 2000 base card, and then linking the TARGA 2000 card to the Abekas Upgrade card by way of a ribbon cable.

Upgrade Installation Procedure

Component Kit Parts:
- One Abekas Routing Module
- One Abekas Upgrade Card
- Anti-Static Wrist Strap
- Warranty Card

Equipment Needed:
- One pair needle-nose pliers

1. Put on Wrist Strap and remove RTX or SDX Module from base card. Refer to Figure 1 and Figure 2.

Unfasten the stand offs from the base card by lifting each stand-off corner of the module. If a stand off does not come out, it may be necessary to use needle-nose pliers to squeeze the tip. Once the stand offs has been unfastened, pull the RTX or SDX module from its 120-pin base connector to separate the module from the base card.

Figure 1. TARGA 2000 RTX or SDX

Figure 2. RTX Daughter Card Removal and
Abekas Routing Module Attachment

**2. Attach Abekas Routing Module to the TARGA 2000 base card.
    Refer to Figure 2 and Figure 3.**

Align and then seat the Abekas Routing Module connector and stand
offs to the 120-pin connector and stand-off holes on the TARGA 2000
base card. When attached, the Abekas Routing Module should look as
shown in Figure 3.

**3. Attach the RTX or SDX Module to the Abekas Routing Module. Refer to
    Figure 4.**

Align and then seat the RTX or SDX module
120-pin connector and stand off to the 120-pin connector and stand-off hole on
the Abekas Routing Module.

Abekas Routing Module

Ribbon Cable

Figure 3. Attached Abekas Routing Module

RTX or SDX Module

120-Pin Connector

Attached the RTX or SDX Module
to the Abekas Routing Module

Abekas Routing Module

120-Pin Connector
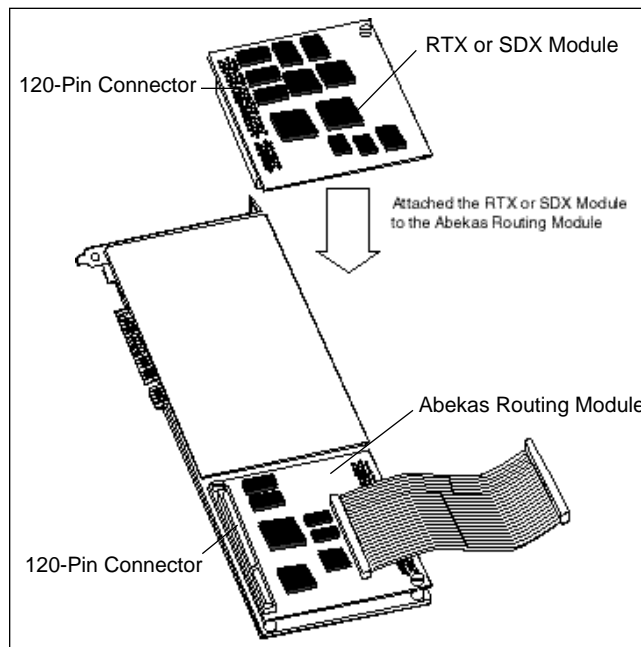
Figure 4. Attaching RTX or SDX Module to
Abekas Routing Module

4. Insert TARGA® card with attached Abekas Routing Module and Ribbon Cable into a computer expansion slot.

If necessary, refer to the installation procedures in the "TARGA® 1000 & 2000 Series Installation Guide."

5. Attach the other end of the Ribbon Cable to the Abekas Upgrade card. Refer to Figure 5.

Attach the other end of the ribbon cable to the Abekas Upgrade card so that the TARGA 2000 and Abekas Upgrade card are linked.
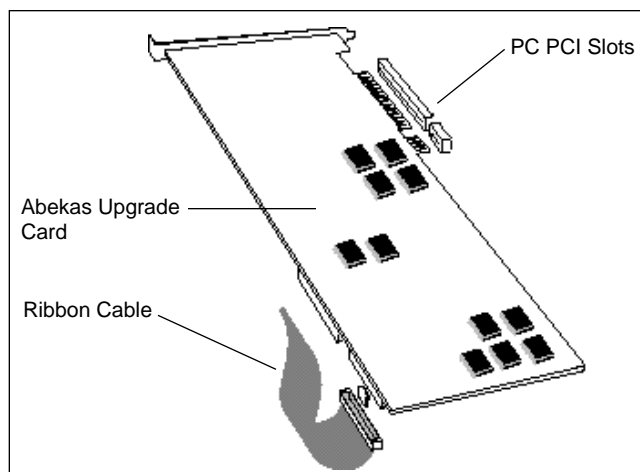
Figure 5. Ribbon Cable to Abekas Upgrade Card

6. Insert Abekas Upgrade card into a computer slot.

Insert the Abekas Upgrade card into a computer slot that is near the TARGA 2000 card. The TARGA 2000 card and Abekas Upgrade card within the computer should be linked by the ribbon cable.

7. Put the cover back on the computer and connect your Input/Output devices to the TARGA 2000 card.

Refer to the installation procedures in the "TARGA® 1000 & 2000 Series Installation Guide" for detailed information on connecting input and output devices to your TARGA 2000 card.

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