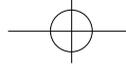


User's Guide

REALmagic™

NetStream 2000

The Plug and Play Solution for Interactive MPEG-2 Video



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June, 2000
P/N 66-000347-02

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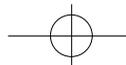
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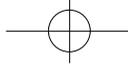
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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installation. 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 interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice

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.

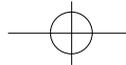
Shielded cables and I/O cords must be used for this equipment to comply with the relevant FCC regulations.

Changes or modifications not expressly approved in writing by Sigma Designs, Inc., may void the user's authority to operate this equipment.

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the radio interference regulation of the Canadian Department of Communication.

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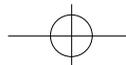
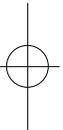
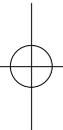
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Chapter 1. Introduction

Congratulations on purchasing your new NetStream 2000. The NetStream 2000 transforms your computer into a digital video workstation, capable of playing extremely high-quality, MPEG-1 and MPEG-2 digital video from local disks, DVD movie discs, or across a network. It's a perfect choice for entertainment, education, training and communication.

Please refer to the README.TXT file for important information not available when this manual was printed. You will find this file in the REALmagic NetStream program group after software installation.

System Requirements

The NetStream 2000 requires the following:

- 2 megabytes (MB) of free hard disk space
- 16 MB of RAM
- Pentium-based PC (or compatible), 133 MHz or higher
- VGAcad
- PCI 2.1 compliant expansion slot
- Plug and Play BIOS support
- Microsoft™ Windows 9x or NT 4.0
- Amplified stereo speakers (Optional: Dolby Pro Logic amplifier and speakers may be used for Dolby surround sound)

Additional Requirements

Depending upon your particular video network needs, you may have additional system requirements, such as:

- Additional RAM and/or faster processor speed
- Client software, such as a web browser equipped with a plug-in
- A video server, for playing video on demand
- An MPEG encoder, for creating MPEG video
- PCI-based 10BaseT, 100BaseT or ATM network adapter

Technology Overview

MPEG and MPEG-2

MPEG stands for Moving Picture Experts Group. It refers to a method of data compression optimized for video and audio data. By analyzing the changes between video "frames," an MPEG "encoder" is able to reduce the file size of the compressed video data significantly. This remarkably efficient compression method allows full-screen and full-motion video, plus CD-quality audio to be stored in a relatively small size file. Once the data has been compressed, however, it must be "de"-compressed before it can be used.

Your NetStream 2000 incorporates specialized hardware to decompress MPEG data at a very high speed, which allows MPEG "streams" to play back at a data transfer rate of 500 Kilobits (Kb) to up to 15 Megabits (Mb) per second. MPEG-2 video has a resolution of 720 x 480 in 24-bit (16.8 million) colors at 30 frames per second (fps). MPEG-1 video has a resolution of 352 x 240 in 24-bit (16.8 million) colors at 30 fps. The MPEG standard is a fully open standard and has been embraced by the computer and entertainment communities as the current standard of digital video on both television and personal computers.

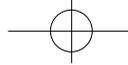
DVD

DVD is a revolutionary storage medium that is currently capable of storing up to 18 gigabytes (GB) of data on a disc the size of a standard CD. This is enough to store an entire movie encoded in the MPEG-2 format on a single side of the disc.

Dolby Digital Surround Sound

Some MPEG-2 video uses Dolby Digital Surround Sound. Dolby Digital Surround Sound incorporates six discrete digital audio channels to provide a full immersion surround sound system that is similar to that of a movie theatre. The six channels include left and right front, left and right back, center, and subwoofer.

The NetStream 2000 can output the six discrete channels of Dolby Digital audio using the S/PDIF connection. Also, it converts the six channels into Dolby Pro Logic Surround Sound, which is carried using a standard 1/8" (3.5mm) stereo connector. This lets you play the Dolby Digital sound using either standard stereo speakers or using a Dolby Pro Logic amplifier with surround sound speakers.



Dolby Pro Logic Surround Sound

Dolby Pro Logic Surround Sound uses the standard analog stereo signal to multiplex surround sound information, and requires a Dolby Pro Logic receiver/amplifier to decode the signal. Pro Logic Surround Sound differs from Dolby Digital Surround Sound by using the same audio signals for both the front and back speakers on the left and right channels.

Supported File Formats

Your NetStream 2000 supports the following MPEG file formats:

MPG Files

MPG is the extension used for files with MPEG-2 or MPEG-1 compressed full-motion video. For MPEG-2, the video resolution is 720 x 480 at 30 frames per second (fps) with 16.8 million colors (full CCIR601). For MPEG-1, the video resolution is 16.8 million colors at 352 x 240, shown at 24, 25, or 30 fps. Both MPEG-2 and MPEG-1 files may include MPEG-compressed audio (16-bit, 48kHz stereo sound). The NetStream 2000 also supports the Half-D1 format of MPEG-2.

DAT Files (Video CD 1.0 and 2.0)

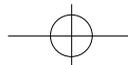
DAT is the extension for Video CD or Karaoke CD files. The NetStream 2000 can play both Video CD and Karaoke CD DAT files.

VBS and ABS Files

VBS and ABS are file extensions used for some MPEG encoded video-only bit stream and audio-only bit stream files.

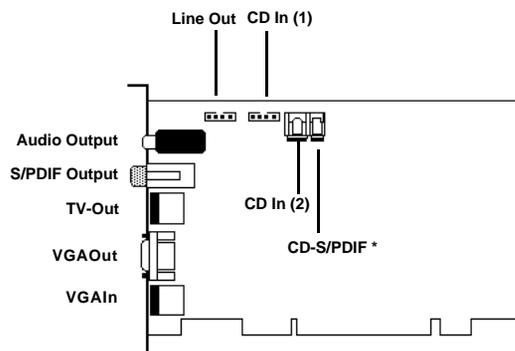
Transport and Program Streams

NetStream 2000 supports MPEG-2 files on both transport and program stream formats. It is possible to select the PID'S from a transport stream, in order to choose a different audio or video stream.



Chapter 2. Hardware Installation

This chapter describes the steps required to install the NetStream 2000 (Figure 1).



* To support audio CD and DTS audio CD through S/PDIF

Figure 1. NetStream 2000

Handling the Board

Warning: Static electricity can damage your equipment. Do not take the board out of its static protective bag until you are ready to work with it.

Follow these precautions when handling the board:

- Before you open the static protective bag, touch it to a metal expansion slot cover on the back of your computer. This drains static electricity from the package and from your body.
- Do not touch any exposed printed circuitry after opening the package.
- Keep other people from touching the board. They might have a static-electricity buildup.
- Limit your movement. Movement causes a buildup of static electricity.

Installing the Hardware

Follow the steps below to install the NetStream 2000 into your computer.

1. Turn off the power to the computer and to the VGAmoitor.
Unplug (disconnect) the power cord from the computer.
2. Disconnect the VGAmoitor cable from your PC.
3. Remove the cover from the computer. (Refer to your PC user's manual for specific instructions.)
4. Locate an available PCI expansion slot. (The NetStream 2000 will not fit into an ISAslot.)
5. Remove the slot cover screw and slot cover, if applicable.
6. Open the protective sleeve containing the NetStream 2000, grasp the circuit board by the edge of its mounting bracket, and remove it from the protective sleeve.
7. Insert the NetStream 2000 into the PCI expansion slot. Press down gently on the top edges of the board to ensure that all connecting points are seated securely. Anchor the board's mounting bracket using the screw removed earlier.
8. Replace the cover of your PC and reconnect the power cord.

Note: If you install a DVD-ROM drive at the same time as the NetStream 2000, remember to attach the CD-Audio cable from the DVD-ROM drive to your sound card. Otherwise, you will not be able to play CD-Audio titles with the DVD-ROM drive. This will not affect the audio of DVD-ROM titles.

Note: NetStream 2000 requires a bus-mastered PCI slot. Most PCI slots support PCI bus mastering, but if you experience difficulties with your NetStream 2000, you may wish to relocate the card to a different PCI slot.

Video Connection

Your NetStream 2000 must be connected to your VGACard or your PC's VGAoutput port in order to display MPEG video on your VGAMonitor. (Refer to Figure 1 earlier in this Chapter for reference.) Follow the steps to connect the NetStream 2000 to your VGA output (see Figure 2).

1. Attach the round 9-pin DIN connector of the provided External VGAPass-Through Cable to the VGAIN connector at the back of the NetStream 2000 (refer to Figure1).
2. Attach the other end (15-pin "D" shape) of the cable to the output port on your VGACard or your PC's VGAoutput port.
3. Connect the VGAcable from your VGAMonitor to the VGA OUT of the NetStream 2000.

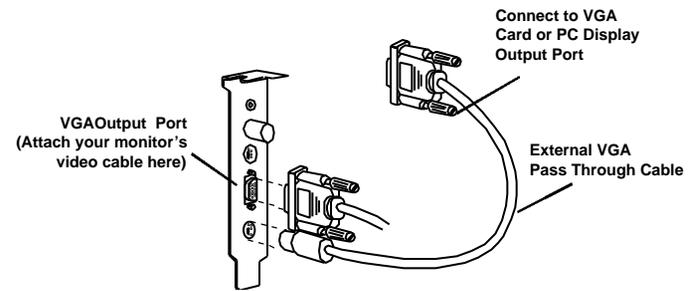


Figure 2. Video Connection

Audio Connections

The NetStream 2000 has a standard 1/8-inch (3.5mm) Stereo Output Port. The Stereo Output Port outputs a standard analog stereo signal that can be used by virtually any stereo receiver or amplified speakers. It also contains the Pro Logic Surround Sound encoding that allows you to achieve surround sound by attaching a Pro Logic receiver.

If your system has a sound card, we recommend attaching the Stereo Output signal to the LINE-IN port on your sound card, and then attach your receiver or amplified speakers to the LINE-OUT or SPEAKER port on your sound card. This will allow you to use one set of speakers to listen to both MPEG-2 audio as well as other types of audio from your sound card. It will also allow you to control the volume by using the mixer program provided with your sound card. Otherwise, attach this signal directly to your receiver or amplified speakers.

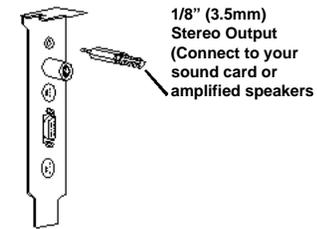


Figure 3. Audio Connection

TV Connections

There are two options for connecting your REALmagic NetStream 2000 DVD/MPEG-2 Playback Card to a television: S-Video by using a standard S-Video cable, or composite video by using an S-Video to Composite cable.

The REALmagic NetStream 2000 DVD/MPEG-2 Playback card can be connected directly to a TV using a S-Video cable. The S-Video TV Out connector on the REALmagic NetStream 2000 is a 7-pin S-Video connector, which can be connected directly to a TV using a standard 4-pin S-Video cable. If your television set does not have an S-Video input port, you may connect it to the REALmagic NetStream 2000 by using an S-Video to Composite adapter cable.

Composite Video is more common and works with most televisions. The S-Video Out connector provides better picture quality.

The component video output cable, available separately, can also be plugged into the S-Video port. With this cable attached, NetStream 2000 can display NTSC and PAL video in the component RGB and YUV (Y Pb Pr) formats. A software utility described in the next chapter can be used to switch between RGB and YUV modes.

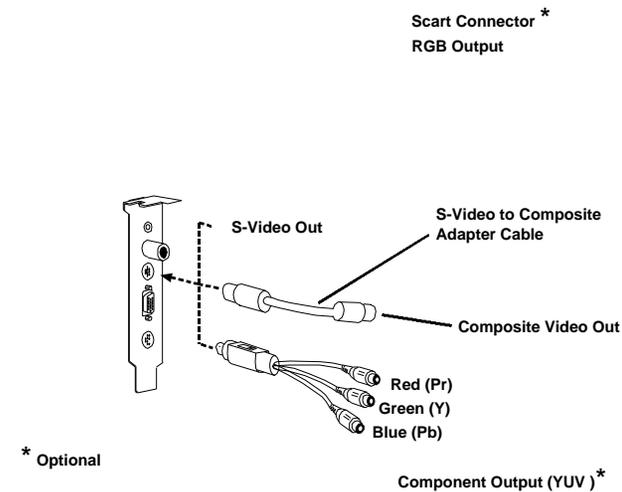


Figure 4. TV Connections

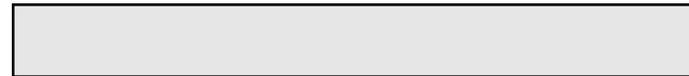
Note: This connection will not pass any audio to your TV set. Check audio connections.

Advanced Connections

The NetStream 2000 also includes an internal CD Audio In connector that allows you to pass MPEG audio through to the internal CD Audio In connector on your sound card. To do this, attach the CD Audio cable from your CD-ROM or DVD-ROM drive to the NetStream 2000, then attach another cable from the NetStream 2000's internal Line Out port to the CD Audio In connector on your sound card. Please refer to Figure 1 for the locations of these internal connectors.

The signal from the Line Out port combines the CD Audio In signal from the CD-ROM or DVD-ROM drive with the same signal that is output through the Stereo Output Port on the NetStream 2000. This solution eliminates the external audio cable that normally goes from the NetStream 2000 to your sound card.

If you are using this solution, attach your receiver or amplified speakers to the Line Out port of your sound card to obtain the audio sound signal.



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Chapter 3. Software Installation

This chapter describes the software installation procedure for the NetStream 2000. Please follow the directions carefully. Skipping steps may result in improper operation.

Note: Please make sure you have DirectX/DirectShow installed before installing this software. Otherwise the video streaming may not be available. (Depending on your video client software)

Installing Software Under Windows 9x

Turn on the power to your computer. The Plug and Play feature of the NetStream 2000 will cause Windows 9x to display the message **New Hardware Found** with the **PCI Multimedia Device** signature during boot-up. Follow the steps below to install the NetStream 2000 software:

1. When the **New Hardware Found** message appears, click the option: **Driver from disk provided by hardware manufacturer.**
2. Click **OK.**

3. The **Install From Disk** dialog appears. Insert Disk #1, the NetStream 2000 Drivers disk, into the floppy disk drive.
4. Make sure the dialog specifies the floppy disk drive letter (for example, **A:**) and click **OK.** This process will copy drivers and software for the NetStream 2000 onto your hard disk.
5. When the copying is done, the Windows 9x desktop will appear. Remove Disk #1 from the disk drive. **Run Setup from Disk # 2.**
6. Now you must reboot your system. Remove the floppy disk from your PC. Click the **Start** button, and then click **Shut Down.** Click **Restart,** and then click **OK.**
7. You must set the Border Adjustment and Color Calibration to finalize the installation. See the section below, titled "Border Adjust and Color Calibration."

Note: You need to run setup a second time to set the NetStream 2000 to your region code.

Installing Software Under Windows NT 4.0

If you are running Windows NT 4.0, follow these procedures to install REALmagic NetStream 2000 software.



Note: Please make sure you have DirectX/DirectShow installed before installing this software. Otherwise the video streaming may not be available. (Depending on your video client software)

1. Start Windows, if your system does not boot directly into Windows.
2. Insert the REALmagic NetStream 2000 Windows NT Disk #1.
3. Click **Start** on the task bar, then click **Run**.
4. Type **A:\SETUP** in the dialog box, then click **OK** (this example assumes that your floppy disk drive letter is A:).

5. You will see the **Welcome** screen. Click **Next**.
6. When prompted to choose the destination location, click **Next** to accept the default or **Browse** to select a location of your choice.
7. At the **Folder Selection** window, click **Next** to accept the default, or enter a name of your choice. The files are copied.
8. Insert REALmagic NetStream 2000 Windows NT Disk #2 when prompted. Then, click **OK**.
9. You will be prompted to restart Windows before settings will take effect. Click **OK**. You will be returned to the desktop.
10. Remove all floppy disks from the floppy disk drive.
11. Click **Start** on the task bar, click **Shutdown**, then click **Restart**.
12. To complete installation, you must run the REALmagic Border Adjust utility, as described in the next section.

BorderAdjustment and Color Calibration

You must set the Border Adjustment and Color Calibration to finalize the installation. You need to set the Border Adjustment and Color Calibration only once for each display setting (resolution, number of colors, and refresh rate). Follow the steps below to complete the Border Adjustment and Color Calibration.

1. After rebooting, start the Border Adjust Utility as follows: at the **Start** button, click **Programs**, **REALmagic**, and **BorderAdjust**. You will see the **REALmagic Configuration...** dialog (Figure 5).



Figure 5. REALmagic Configuration

2. At the REALMagic Configuration... dialog (Figure 5), click **Adjust border...**
3. You will see the **BorderAdjust** dialog (Figure 6). Use the arrow keys in the dialog or on the keyboard to align the four corners of the colored window within the gray outlined pink window. Click **+** or press the plus (+) key on the keyboard to widen the colored window. Click **-** or press the minus (-) key on the keyboard to make the colored window narrower. When aligned, click **OK**.

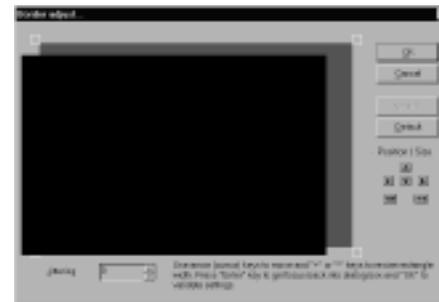
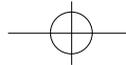
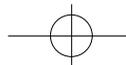
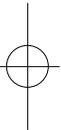
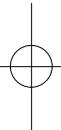


Figure 6. Border Adjust



4. The Reset Defaults button will reset the color calibration and the border adjustment values to the factory default settings.
5. From the REALmagic Configuration dialog (refer to Figure 5), click Auto Calibration, and then click OK. The screen will flicker as the software automatically calibrates the colors.
6. If the Auto Color Calibration function fails, please reboot your system and try the Auto Color Calibration function again. If the Auto Color Calibration function still fails, you will need to perform a manual color calibration. See Appendix A, Advanced Configuration Options.



The Display Panel (Figure 8) provides specific information about the current video or audio track, such as its track number, play time, and aspect ratio. A progress bar at the bottom indicates the progression of the clip as it plays. You can click on the Progress Bar to jump to a particular part of the track being played. Depending on the type of disc you are playing, additional information may appear.



Aspect Ratio

Figure 8. Display Panel

The Volume Control (Figure 9) increases or decreases the audio level. With the mouse, move the lever up and down to adjust the volume. Click the Mute Sound Button to mute the audio. To un-mute the audio, click the Mute Sound Button again.

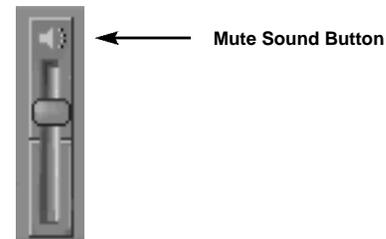


Figure 9. Volume Control

Standard Buttons

DVD Station has controls similar to those of a VCR. See Figure 10.

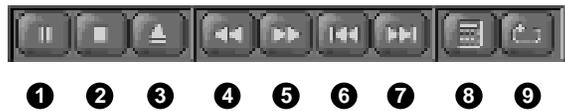


Figure 10. Standard Buttons

- ➊ is the **Pause and Play** button. Click this button to pause play, to start playing the first track on the DVD or CD, or to resume play after pausing.
- ➋ is the **Stop** button. Click this button to stop play.
- ➌ is the **Eject** button. Click this button to operate the ejection mechanism (if supported by your DVD or CD-ROM drive).
- ➍ is the **Rewind** button. Click this button to play the current track backwards at 2x speed, click again for 8x speed, and click again to resume normal playback.
- ➎ is the **Fast Forward** button. Click this button to fast forward the current playing track at 2x speed, click again for 8x speed, and

click again to resume normal playback.

- ➏ is the **Previous Track** button. Click this button to skip to the previous track on the CD.
- ➐ is the **Next Track** button. Click this button to skip to the next track on the CD.
- ➑ is the **Play Mode** button. Click this button to select from three play modes: **All**, **Random**, and **Play List**. The Display Panel will show which play mode is currently active. The default play mode is **All**. To select **Play List**, you must first create a play list. (See "Creating a Play List" later in this chapter.) Selecting **Random** will cause DVD Station to play the tracks in random order.
- ➒ is the **Repeat Mode** button. Click this button to toggle between Play Once and Continuous Play modes. Click once to repeat the current chapter, and twice to repeat the title.

Custom Buttons

Custom Buttons (Figure 11) perform additional functions within DVD Station.



Figure 11. Custom Buttons

Clicking the **Counter** button displays the playtime of the current clip, and the name of the file (or the title & chapter numbers of a DVD movie in the upper left-hand corner of the VGAvewing window. Clicking the **Counter** button again disables this feature.

Clicking the **TV Mode** button will switch the video out to a TV. The MPEG window will vanish from the computer monitor and the DVD/MPEG-2 Playback Card will output the video only on the TV screen. If the video out is on TV, clicking this button will switch the video to the computer monitor. In this case, the REALmagic NetStream 2000 DVD/MPEG-2 Card will display the MPEG video only on the computer monitor. For details, please see section for TV Out.

Clicking the **Open File** button allows you to open and play MPEG files from your hard disk, DVD-ROM, or CD-ROM drive. You will see a standard Open Video File dialog window.

 Clicking the Options Dialog button brings up the DVD Station Options window (Figure 12).

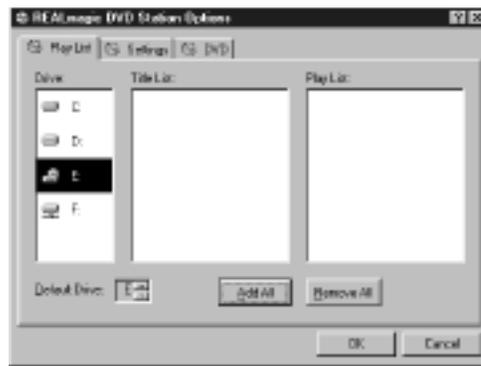


Figure 12. Options Dialog

Play List

The **Play List** feature allows you to create a list of your favorite MPEG clips for the DVD Station's Play List mode. In Figure 12, drive D: is the DVD-ROM and drive E: is the CD-ROM. Since the DVD/MPEG-2 Playback Card is capable of playing both MPEG-1 and MPEG-2 files, you may choose to play MPEG-1 and MPEG-2 files from the CD-ROM drive or from your hard disk drive.

The Title List window displays the filenames of MPEG clips DVD Station was able to locate on the hard disk, DVD-ROM, or CD-ROM drive. The Play List window displays the clips that are currently on the Play List.

Perform the following steps to create a Play List:

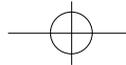
1. Select the clip's icon that you wish to add to the Play List from the Title List window and drag it to the Play List window. To move all of the clips in the Title List to the Play List, click the **Add All** button. To clear the Play List, click the **Remove All** button.
2. To remove a clip from the Play List, click on the clip's icon and drag it to the Title List box. To change a clip's playing order, drag and reposition its icon in the Play List box.
3. Click **OK** when you have finished adding, removing, and/or changing the order of the clips to the Play List.
4. Click the **Play Mode** button  in the main window (refer to Figure 10) until the word **Play List** is highlighted in the Display Panel. All clips included in the Play List will play in order.

Settings

Click on the **Settings** tab to display the DVD Station Settings (Figure 13). This section allows you to choose the various DVD Station settings to enable and disable.



Figure 13. DVD Station Settings

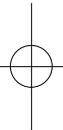


General

Feature

Explanation

Start Detached:	Displays the DVD Station Control detached from the movie window on startup. Press F2 to toggle this feature.
Tool Tips:	Enables pop-up Tool Tips that display the function of each DVD Station button.
Keep Aspect Ratio:	Maintains the movie's correct aspect ratio (either 4:3 or 16:9) when re-sizing a movie window. Prevents distortion of the movie. Press F4 to resize the movie window to the movie's standard (non-scaled) resolution.
Always on Top:	Displays the movie window on top of all other windows. With this feature enabled, other programs will not appear on top of the movie window.
AutoPlay:	Allows you to enable and disable the Windows AutoPlay feature of the DVD Station

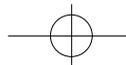
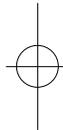


Audio Output

The Audio Output allows you to select between analog (surround) or digital audio output. For digital output, if you just select this audio button you get the Dolby AC-3 out of S/PDIF port. If the title supports DTS, then clicking on DTS option in the movie menu will output the DTS stream to the S/PDIF output.

TV

The REALmagic NetStream 2000 can output MPEG video to the computer monitor or to a TV. If you select TV for video output, check the appropriate box for PAL or NTSC.



DVD

Click on the DVD tab to display the DVD Station's DVD settings.



Figure 14. DVD Settings

Rating Control

Some DVD movie titles support a voluntary movie rating system. With a rated title, this feature allows you to play an edited version of the movie, with violent and other objectionable scenes removed. For instance, a title may come with R, PG-13, and PG-rated versions of the same movie.

When DVD Station is first installed, the password box is grayed out. To enable this feature, check the Set box and enter a password. Enter a password of your choice into the New box and again in the **Confirm** box. Click on **Apply** to enable the password.

Important Note: This feature has no effect on titles that do not support the Parental Lockout feature. Most DVD movie titles do not use this voluntary rating system. You cannot rely upon this feature to prevent your children from viewing objectionable titles. The only way to prevent children from playing such movies is to physically keep those movies out of reach of children.

Default Language

Most DVD movies support multi-lingual audio. You may select the default language of your choice under the Default Language selection. If the chosen default language is not available on that DVD movie title, DVD Station will use the default language on that particular DVD movie disc, which may differ depending on the origin of the disc.

Note: You must restart the movie after changing the Default Language in order for it to take effect.

Picture Controls

Click the More Controls button (see Figure 15) to toggle the display of more features.

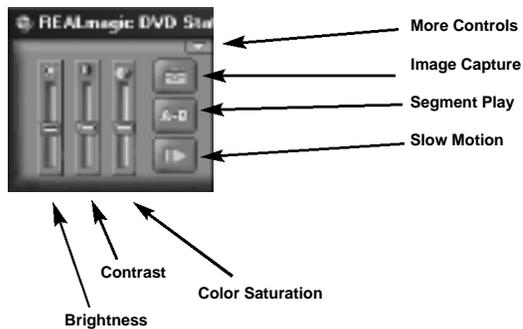


Figure 15. Additional Custom Buttons

- **Picture Control sliders**

Move the sliders to adjust the Brightness, Contrast, and Color Saturation of the movie window. These adjustments affect the movie window only; they are designed so that they will not affect other VGAgraphics on your computer monitor. Audio may be muted when using the sliders.

- **Image Capture**

Click the Image Capture button to save a BMP image of a movie frame to disk. Note that, because of copyright restrictions, this feature does not work with DVD Video titles.

- **Segment Play (A-B)**

This feature lets you loop playback between any two points in a movie. Click this button on the progress bar once during movie playback to set the start point. Click the button a second time to set the end point. The movie will now loop between the two points until you press another button (for example: Rewind or Stop).

- **Slow Motion Play**

Click this button to play back the movie at half speed. Click the button again to return to normal playback speed. Audio is muted when Slow Motion is selected.

DVD Navigation Buttons

There are five DVD Navigation buttons and a joystick controller on the right-hand side of the DVD Station (Figure 16). Use the mouse to click on the button to activate the desired function.



Figure 16. Navigation Buttons



Audio Soundtrack Language Selector

This operation only functions with a DVD movie disc that contains multiple language soundtracks. Press the Audio Soundtrack Language Selector during play. Click and select the language you want. Figure 17 shows an example where English is the selected language. The language selected is momentarily displayed in the upper-right corner of your movie window.



Figure 17. Language Selector



Camera Angle Selector

This operation only functions with a DVD movie disc that contains multiple camera angles. Press the Camera Angle Selector during play. Move the mouse UP or DOWN to highlight the camera angle you wish to view (Figure 18). Click on the angle you wish to view. The camera angle number is momentarily displayed in the upper-right corner of your movie window.



Figure 18. Language Selector



Subtitle Selector

This operation only functions with a DVD disc that contains multiple language subtitles or closed captions. Refer to Figure 19.

Press the Subtitle Selector during play. The language selected is momentarily displayed in the upper-right corner of your movie window. If the selector is divided (the languages appear more than once, as shown in Figure 19), the first selection provides normal subtitles for the selected language. The second language selection identifies subtitles with extra functions.



Figure 19. Subtitle Selector



Menu Selector

Some DVD discs have a unique menu structure called DVD menu. For example, some discs allow you to access the multiple language soundtrack, multiple camera angles, and subtitle options in the DVD menu.



Title Selector

Some DVD discs, such as movies or Music Videos, have more than one title and contain a Title menu. If the disc has a Title menu, press the Title Selector during play to activate the menu. Operate the joystick to highlight the desired title. Click on the Select button or the Play button to play the title.



Joystick Controller

The joystick controller is a group of five buttons nested together. The joystick is used to navigate around the possible choices offered in the DVD menus. Click on the UP, DOWN, LEFT, or RIGHT arrows to highlight the option you wish to select, and click on the Select button in the center of the joystick to select the highlighted item.

DVD Playback

Basic DVD Playback

1. Turn on the PC and press OPEN/CLOSE button on the DVD-ROM drive to open the disc tray.
2. Insert a DVD disc onto the tray and press the OPEN/CLOSE button on the DVD-ROM drive to close the disc tray.
3. Start DVD Station by selecting the following from the taskbar: **START - PROGRAMS - DVD – DVD Station**. A DVD control panel and a Video Screen should appear (Figure 20).
4. If the Auto-Play feature of DVD Station is enabled, the DVD-Video will begin to play.
5. Initially, the DVD Station Control panel is detached from the MPEG Video screen. You can attach the DVD Station to the MPEG Video screen by pressing the F2 key on the keyboard. Pressing F2 again will detach the DVD Station Control panel.
6. If the DVD Station Control Panel is behind the MPEG Video screen and is not visible, click the right mouse button will bring the Control Panel to the foreground.



Figure 20. DVD Control Panel and Video Screen

7. If a DVD movie disc is in the DVD-ROM drive, and the DVD-ROM is the first logical drive after the hard disk (for example, the hard disk is drive C: and the DVD-ROM is drive D:), click **PLAY** on the DVD station. The DVD movie should start.
8. If the DVD-ROM is **NOT** the first logical drive after the hard disk, click the **Options Button** on the DVD Station. In the Options dialog (Figure 21), select the drive that represents your DVD-ROM drive. DVD Station will automatically search for all available DVD files on the selected drive. A DVD information file "Vts_01_0.ifo" (for a DVD-Video disc) should appear on the Title List. Click **OK** to close the dialog.

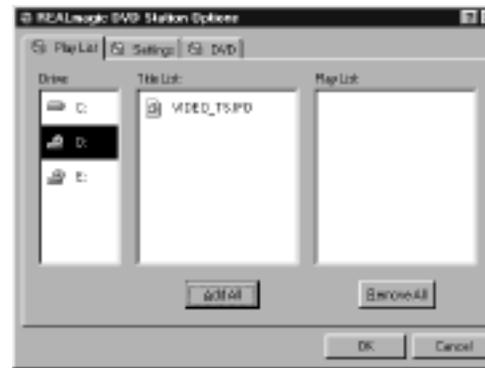


Figure 21. Options Dialog

9. Click the **PLAY** button on the DVD station.

10-Key Keypad

If DVD Station detects that a DVD movie disc is in the DVD-ROM drive, it will display the 10-Key Key Pad button in place of the Mode button. Clicking on this button will bring up a floating 10-key keypad that will allow you to interact with some DVD movie titles that have menu selections and other options. Figure 22 shows the two 10-key keypads available.



Figure 22. 10-key Keypads



Click on this button to toggle between the two 10-key keypads.



Use this button to make corrections.



This button returns to the previous menu.



Click on this button will execute whatever option you have chosen.



If the 10-key keypad is hidden by another window, clicking on the button again will bring it back to the foreground. During full-screen video playback, use the right mouse button to hide and unhide the 10-key keypad.

Video CD Playback

1. Press the OPEN/CLOSE button on the DVD-ROM drive or the CD-ROM drive to open the disc tray.
2. Insert a Video CD 2.0 disc onto the tray and press the OPEN/CLOSE button on the DVD-ROM drive to close the disc tray.
3. Initialize DVD Station by selecting the following from the taskbar: **START - PROGRAM - DVD – DVD Station.**
4. DVD Station will detect the Video CD in the DVD-ROM drive or the CD-ROM drive and display the Video CD 2.0 Control Panel (Figure 23). If the disc is a Video CD 1.0 disc, the 10-key pad will not appear and the display will show **VCD** instead of **VCD2.**



Figure 23. Video CD 2.0 Control Panel

Select Buttons (Video CD 2.0 Only)

Video CD 2.0 discs feature embedded playback controls. When you play a Video CD 2.0 disc, you can experience a whole new level of interactivity. You may play a disc that prompts you with questions. For example, you may be asked if you want to play the disc in (1) English or (2) Japanese. If you are playing a Video CD 2.0 disc, DVD Station will show a series of number buttons (Figure 24) on the screen next to the Standard Buttons. Use these buttons to make your selection.



Figure 24. Menu Key Pad

Click on the number that you want to select. The number will be displayed in the display panel.

Playing a Video CD 2.0

DVD Station will display a 10-key pad for Video 2.0 CD. To play the CD, select the **Play** button on the DVD Station application. For most Video 2.0 CDs, you will see a menu of songs appear on the viewing screen. The viewing screen will show only the first half of the songs on the CD. To select a song from the second half of the viewing screen, you must click the **Next Track** button to view the next set of titles on the screen. Once you have decided on a song, use the keypad on DVD Station's control panel to select the song number and click the **Menu Select** key on the control panel using your mouse.

Note: Some Video CDs have different formats and do not require the **Menu Select** key. Some formats will work by using the **Next Track** button to select the song, followed by clicking the **Play** button.

Audio CD Playback

1. Press the OPEN/ CLOSE button on the DVD-ROM drive or the CD-ROM drive to open the disc tray.
2. Insert an Audio CD disc onto the tray.
3. Start DVD Station by selecting the following from the taskbar: **START - PROGRAM - DVD - DVD Station.**
4. DVD Station will detect the Audio CD in the DVD-ROM drive or the CD-ROM drive and display the Audio CD Control panel (Figure 25).



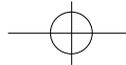
Figure 25. Audio CD Control Panel

5. Click the **Play** button to start playing the Audio CD, or use the Play List function to choose your own selection. The **Open File** feature is not supported for Audio CD.

Note: If you do not hear any music during playback, check to see if you can hear music with a headphone connected to the headphone jack in front of the CD-ROM or DVD-ROM drive. If you can hear music from the headphones, check to see if you have connected the stereo cable from the DVD-ROM drive to your sound card.

Shortcut Keys

Key:	Description:
Double-click on movie window	Toggle movie playback between full-screen and window mode.
Press any key	Return from full-screen to window playback mode
Right-click on movie window	Display playback controls (window playback mode only)
Move mouse to bottom of screen	Display mini-controls (full-screen mode only)
F1	Help
F2	Toggle to detach/attach playback controls to movie window
F3	Display DVD movie information (window playback mode only)
F4	Size window to the movie's standard resolution (without scaling or stretching)



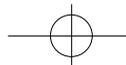
Key:	Description:
F5	Switch between VGA and TV mode
Alt-F4	Quit
ctrl+a	Activate angle menu
ctrl+c	Activate frame capture
ctrl+d	Toggle display timer
ctrl+e	Eject disk
ctrl+f	Fast-forward (cycles from 2x, 8x, then normal)
ctrl+g	Segment (A-B) play
ctrl+l	Cycle playback mode (All, Random, Play List)
ctrl+m	Display DVD menu
ctrl+n	Next track or chapter
ctrl+o	Open options dialog
ctrl+p	Play/pause toggle
ctrl+q	Activate closed caption/sub-title menu
ctrl+r	Rewind
ctrl+s	Stop
ctrl+t	Display DVD title menu
ctrl+v	Previous track or chapter
ctrl+w	Slow motion playback
ctrl+z	Zoom to Full Screen

Video CD 2.0 Shortcut Keys:

ctrl+0-9	Select numbers on Video CD 2.0 keypad
ctrl+←	Backspace on Video CD 2.0 keypad
ctrl+<Enter>	Apply or enter selection on Video CD 2.0 keypad
ctrl+→	Play default Video CD 2.0 track

DVD Menu Shortcut Keys:

 <Enter>	Select menu option (active when DVD menu is on-screen)
	Activate selection (active when DVD menu is on-screen)



Chapter 5. Windows Media Player & DirectShow Support

The NetStream 2000 fully supports the Windows Media Player and DirectShow. The Windows Media Player is an application which can play a variety of digital video, animation and audio files, including MPEG-1 and MPEG-2 video, by using a mechanism called DirectShow. The Windows Media Player can run as a standalone application, or it can be embedded as an ActiveX control, and used inside of web pages or other Windows programs. Windows Media Player will automatically select and use the NetStream 2000 to play back MPEG-1 and -2 files on your computer.

Windows Media Player and DirectShow work in all 32-bit versions of Windows, including Windows 95, 98, NT 4.0 and 2000. For best results, you should download and install the newest version of Windows Media Player from the Microsoft website. To do this, visit www.microsoft.com, click "Search" and enter the phrase "Windows Media Player." This will lead you to the download pages, as well as other pages which describe how to write HTML, Visual Basic and C programs which can control the Windows Media Player.

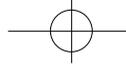
Note: Some versions of Windows, such as Windows 95 and NT 4.0,

shipped with an outdated Media Player. For this reason, you should always download and install the latest version of the Windows Media Player from the Microsoft website.

DirectShow and the Windows Media Player are used with the NetStream 2000 to support streaming video playback from video server products from many companies. For a detailed compatibility list, please visit us on the web at www.sigmadesigns.com. Each NetStream 2000 video server product has its own unique client software. This client software is available from the company which makes the video server.

Streaming MPEG video over a network is accomplished using many different types of techniques, which have different advantages, depending upon what goals you are trying to accomplish. The design of a streaming video server for 10,000 simultaneous users is different than a video server for 50 users. In addition, playing MPEG over a network can make substantial drains on the network's resources, which might require upgrading. Because MPEG video consumes 1 to 8 Mbits per second of sustained bandwidth, it is easy to saturate a 100 Mbit/sec (100BaseT) network. Using high quality network adapters and Ethernet switches is essential for good streaming video.

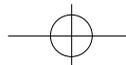
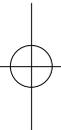
One technique which reduces the strain on the network is called "multicasting." Instead of each person on the network watching his



own video stream, every person can watch the same stream, as if it were a TV broadcast. This reduces the strain on the network considerably, even if 5 or 10 channels are available. This technique can be used with either stored or live video feeds, and can also be used to combine live and stored video together, so that MPEG video can be watched "live" or paused and replayed.

Sigma Designs works with many partner companies to provide highly dependable streaming video solutions of all kinds. These partners are experts at digital video and network design and can help to create a solution perfectly suited for your needs.

Software development documents are available from Sigma Designs for programmers wishing to create their own streaming and interactive video products. The Sigma Designs tool kit is based completely on DirectShow, but uses Sigma-developed filters and special function calls to offer additional functionality not available in the standard Microsoft DirectShow release. For information on purchasing these software development tool kits, send e-mail to sales@sigmadesigns.com.



Appendix A. Advanced Configuration Options

Manual Color Calibration

If the Auto calibration feature displays an error message, follow the steps below to manually calibrate the color:

1. From the **REALmagic Configuration...** dialog (refer to Figure 3), click **Advanced >>>** and then **Manual calibration**.
2. From the **Dialog** (Figure 26), use your mouse to move the bar (marked R) slowly up or down to a point where the image of the big box on the right-hand side of the Dialog window appears similar to the image of the "GOOD" box. You can use the UP or DOWN arrow keys on the keyboard to make fine adjustments. Click Next. You must perform this procedure three more times for the colors red, green, and blue. After the last adjustment, click **OK**.

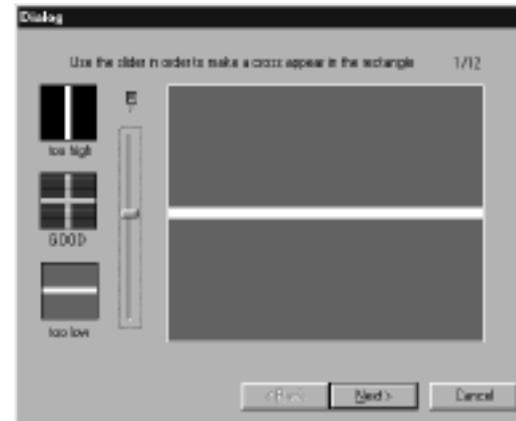


Figure 26. Dialog

Advanced ColorAdjustments

When you move the mouse or a window on top of the DVD or MPEG video, the VGAgraphics need to appear on top of the video window. To do this, the DVD/MPEG-2 Playback Card uses a well-established method called chroma key. This method is similar to the "blue-screen" effect often used in television. A special color is chosen as the "chroma key" color, and video will only display where the chroma key color appears. For practical reasons, the chroma key color is usually a rarely used color that is very unlikely to be used by other Windows programs.

The DVD/MPEG-2 Playback Card software defaults to a dark green color as the chroma key color. You might prefer to use a different color if the default color conflicts with one of your application programs. When there is a conflict, you will see MPEG video displayed "through" an area of you application. There may also be instances where the default color is not compatible with your VGAdisplay.

Follow the steps below to set your own chroma key color if:

- You want to use a different chroma key color, or
- You are not able to view any MPEG video on your VGAscreen, or
- If the VGAgraphics seems to "bleed through" the MPEG video

Note: If you are not able to view MPEG video at all, there are several things you should try before changing the chroma key color: make sure that the monitor is connected to the DVD/MPEG-2 Playback Card, powering off the computer and try again after restarting, or double check the Border Adjust and Color Calibration procedures.

1. Start DVD Station and play an MPEG video. Even if the video is not visible, you should be able to hear the audio.
2. Click on the **Options** button, click on the **Settings** tab, and then click the Configure button. Next, click the **Advance>>>** button and select **ColorAdjustment**.
3. Select a key color from the **Choose key color to set** menu.

4. If you would like to select a key color that is not in the menu, select **Add Custom Color**, which is the last item on the menu. This will bring up a dialog box that allows you to enter the red (R), green (G), and blue (B) values of the color you want. There are 256 levels for each color. Enter a value between 0 and 255. (Figure 27).

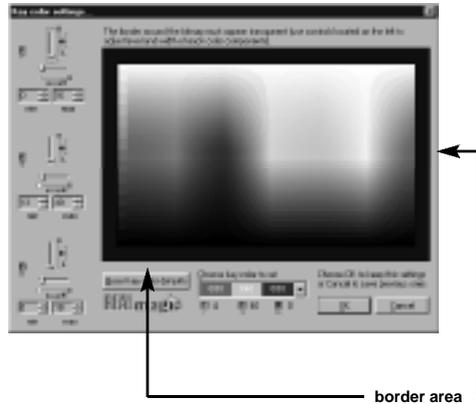


Figure 27. Key Color Settings

5. MPEG video should appear in the border surrounding the color chart. There should also be a "hole" in the color chart where MPEG video will show through.

6. If MPEG video does not appear in BOTH the border and the "hole," then you must adjust the R, G, and B values with the sliders until you can see the video in both regions. Do this by adjusting the width (W) and length (L) slider bars of each color to make the video appear both inside and outside of the color chart.

Normally, adjusting these sliders can easily make a very large hole in the color chart that displays MPEG video. Once you can see video in both the inside and the outside area, you should adjust the sliders to reduce the size of the hole so that it is about 40 x 40 pixels, which is roughly the size of a Windows icon. Making the hole too small will cause video "jittering" and "bleeding." Making the hole too large will cause MPEG video to play "through" areas within a larger range around the chroma key color.

7. If necessary, click the **Reset Key Color Defaults** button to reset the key color back to the factory default value.
8. Click **OK** to exit the **Key Color Settings** window.

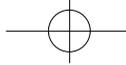
BorderAdjustments

Follow the steps below to fine-tune the position and size of the MPEG video within its display window.

1. From the **REALmagic Configuration...** dialog (refer to Figure 5) click **Advanced >>>** and then **BorderAdjust**. In the resulting dialog box, click the **Expert** button.
2. In the **Expert Settings** dialog (Figure 27), the four **Cropping** region values crop the MPEG video image from the Left, Right, Top, and Bottom. This allows you to position the video with greater precision. The **In delay** value delays the display of the video pixel on the left-hand side of the MPEG video. The **Out delay** value delays the display of the video pixel on the right-hand side of the MPEG video. Adjusting these values can reduce flutter and jitter which may appear with rare display adapter and resolution combinations.



Figure 27. Expert Settings



Appendix B. Customer Service

If you encounter problems installing or using your REALmagic NetStream 2000 MPEG-2 Playback Card, contact your dealer. If you need additional assistance, Sigma Designs has a full-time Customer Service staff available to assist you over the telephone, by FAX, or via the Internet

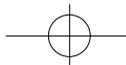
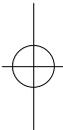
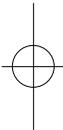
Customer Service Hours: 8:00 A.M. to 5:00 P.M. (Pacific Time)
Monday through Friday

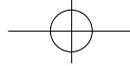
Telephone Number: (408) 957-9866

FAX: (408) 957-9740

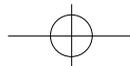
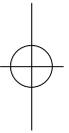
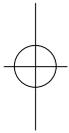
Email: tech_support@sdesigns.com

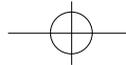
World Wide Web: www.sigmadesigns.com





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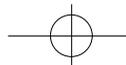
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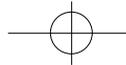
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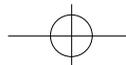
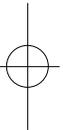
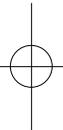
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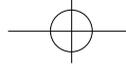
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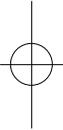


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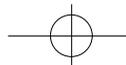
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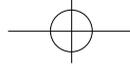
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