

User Manuals

REALmagic™ DVR

CREATE DVD VIDEO INSTANTLY, WHILE YOU WATCH

DVDit!™ LE



SIGMA DESIGNS®

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REALmagic™

DVR

CREATE DVD VIDEO INSTANTLY, WHILE YOU WATCH

The REALmagic DVR is a PCI add-in-card for Windows PCs that allows you to create your own flawless-quality digital video. DVR encodes pure digital video into MPEG-1 and MPEG-2, the world standard for broadcast-quality video.

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FCC Compliance Statement

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.

Table of Contents

Chapter 1. Introduction

System Requirements	1
Technology Overview	1
Supported File Formats	2

Chapter 2. Hardware Installation

Handling the Board	3
Installing the Hardware	3
VGA Video Connection	4
Attaching REALmagic DVR I/O Cable	4
Internal Connectors	5
REALmagic DVR I/O Cable	5
Advanced Connections	6

Chapter 3. Software Installation

Software Installation For Windows 9x	7
Software Installation For Windows NT 4.0	8
Border Adjustment and Color Calibration	8
Changing DVD Region Codes	9

Chapter 4. Using the DVR Station

Starting the DVR Station for Encoding	10
Starting the DVR Station for Playback	10
Standard Buttons	11
Custom Buttons	12
Encoding Options	12
Capture Properties	12
Compatibility Dialog	13
Multiplexer Dialog	13
Audio Format	14
Video Compression	14
Video Input	15
Image Controls	15
Play List	16
Option Settings	16
Audio Output	17
TV	17
DVD	17
Rating Control	17
Default Language	18
Preferred Display Mode	18
More Controls	18
DVD Navigation Buttons (Playback Mode)	19
DVD Playback	20
Select Buttons (Video CD 2.0 Only)	21
Playing a Video CD 2.0	21

Encoded Volume Playback	22
Audio CD Playback	22
Shortcut Keys	23

Appendix A. Advanced Configuration Options

Manual Color Calibration	24
Advanced Color Adjustments	24
Index	26

Chapter 1. Introduction

Congratulations on purchasing your new REALmagic DVR Encoder/Decoder Card. Your REALmagic DVR transforms your computer into a full-function DVD player, and provides you with uncompromising high performance hardware MPEG-2 digital video recording, for creating MPEG-2 files or your own DVD's.

The REALmagic DVR includes input and output connectors which let you connect S-Video and Composite video sources, such as VCR's, camcorders and TV sets, as well as stereo and Dolby Digital receivers. You can also display video onto your computer's VGAMonitor.

REALmagic DVR includes software applications for playing DVD's, recording MPEG video, editing MPEG, and creating DVD-Video titles. This user guide will step you through the procedure of installing the hardware in your PC and using the software.

System Requirements

The REALmagic DVR requires the following:

- 16 megabytes (MB) of free hard disk space (additional 100 MB for other bundled software)
- 2 GB of defragmented hard disk space for each hour of captured DVD-quality video, (4 GB if authoring the MPEG into DVD format)
- 64 MB of RAM
- Pentium-based PC (or compatible), 233 MHz or higher with Plug and Play BIOS support
- PCI 2.1 compliant expansion slot
- VGAcad
- DVD-ROM drive (for playing DVD-Video titles)
- Microsoft™ Windows 98 or NT 4.0 SP4
- Microsoft DirectX
- Microsoft DirectX Media 6.0
- Amplified stereo speakers (Dolby Digital or Dolby Pro Logic amplifier and speakers required for surround sound playback)
- A video source, such as a VCR or Camcorder, with Composite (RCA) or S-Video video output connections
- DVD-RAM drive if mastering on DVDs

Sigma Designs recommends you to visit our web site <http://www.sigmadesigns.com/> for improvements updates to the REALmagic DVR software.

For proper video playback, make sure to obtain the latest DirectX and DirectX Media driver update from Microsoft. Visit <http://www.microsoft.com/directx/homeuser/downloads/default.asp> for

downloads.

Technology Overview

MPEG-1 and MPEG-2

MPEG stands for Moving Picture Experts Group. It is an international, standard 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 much smaller size file. The MPEG-2 compression and decompression standard is used world-wide for studio transmissions, digital satellite, digital cable, and DVD video, and a higher resolution version has been adopted as the standard for HDTV.

MPEG compression and decompression is used so extensively because it can obtain higher audio and video quality than existing analog techniques, while at the same time offering tremendous compression rates, of about 50 to 1 ratio. However, the methods used to compress and decompress video with MPEG are extremely complex, and require enormous amounts of processing power to properly accomplish.

Your REALmagic DVR Encoder/Decoder Card incorporates specialized hardware to compress and decompress MPEG data with perfect quality. It allows you to create and playback MPEG files at a data transfer rate of 500 Kilobits (Kb) to up to 15 Megabits (Mb) per second. This "speed" is called the bitrate, and the higher the bitrate, the higher the video quality. When you create MPEG files with REALmagic DVR, you can select the bitrate you want to meet your goals of higher quality or lower file sizes.

MPEG-2 video has a resolution of 720 or 704 x 480 in 24-bit (16.8 million) colors at 30 frames per second (fps) for NTSC, and 720 or 704 x 576 at 25 fps for PAL. For low bitrate video, such as 1.5 Mb per second and lower, MPEG-1 is typically used instead. MPEG-1 video reduces the resolution of the video by 50% horizontally and vertically, which produces better quality results at low bitrates than MPEG-2. MPEG-1 has a resolution of 352 x 240 in 24-bit (16.8 million) colors at 30 fps for NTSC, and 352 x 288 at 25 fps for PAL. 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 disc.

Dolby Digital Surround Sound (AC-3)

Your REALmagic DVR can play the Dolby Digital audio tracks used on most of today's DVD titles. Dolby Digital Surround sound is the audio compression standard for DVD. Also known as AC-3, Dolby Digital Surround sound is designed specifically to code multi-channel digital audio. It incorporates five discrete digital audio channels to provide a full immersion surround sound system that is similar to that of a movie theatre. The five channels include left and right front, left and right back, center, and subwoofer. The frequency range of the main channels is 20 Hz to 20 kHz (+/- 0.5 dB). In addition, a crossover circuit supports a subwoofer channel, at a range of 20 Hz to 120 Hz (+/- 0.5 dB). The Dolby Digital Surround Sound requires a Dolby Digital receiver/amplifier to decode the signal.

To achieve Dolby Digital sound, connect your REALmagic DVR to a Dolby Digital amplifier using the optional S/PDIF connector. Although this connector looks like a standard RCA jack, it carries six channels of digital audio to your digital amplifier.

Dolby Pro Logic Surround Sound

Dolby Pro Logic Surround Sound is a popular and inexpensive surround sound format which has been available for over ten years. Pro Logic adds surround sound information to a standard analog stereo signal. This signal can be played by any stereo amplifier, but a Dolby Pro Logic receiver/amplifier must be used to decode and play the surround signals. Pro Logic Surround Sound differs from Dolby Digital Surround Sound by using the same audio signals for both back speakers, and channel separation is not quite as good. The REALmagic DVR automatically converts the Dolby Digital audio track found on most of today's popular DVD titles into Dolby Pro Logic, so you can still enjoy the surround sound effects.

PCM Audio

PCM (Pulse-Code Modulated) audio is a very high-quality, uncompressed digital audio format. It offers higher quality than CD-Audio, with sampling rates of up to 48 kHz, compared to CD's 44.1 kHz rate. REALmagic DVR can encode MPEG with PCM audio.

MPEG Audio

MPEG Audio covers a wide spectrum of compressed audio formats. Your REALmagic DVR card supports all of the stereo formats of Layer I and II MPEG Audio, as well as PCM and Dolby Digital audio. REALmagic DVR can encode MPEG with MPEG audio compression.

Supported File Formats

Your REALmagic DVR supports the following MPEG file formats:

DVD

DVD files have various file extensions such as IFO and VOB. MPEG-2 files are at full CCIR601 resolution of 720 x 480 at 30 fps.

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 or 704 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).

DAT Files (Video CD 1.0 and 2.0)

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

Elementary Stream or PES (Program Elementary Streams)

Elementary streams or also called PES is the name given to MPEG which is encoded as separate files (or streams) of audio and video. Elementary streams are the format used by most DVD authoring programs. When you encode MPEG with the REALmagic DVR, you can select the Elementary format. This will create two separate MPEG files – one video and one audio.

Program Streams

A Program Stream is an MPEG file which contains both audio and video. Program Stream is the format used for creating interactive MPEG video, and can be played back by the Windows Media Player. When you encode MPEG with the REALmagic DVR, you can select the Program Stream format. This will create one MPEG file, with both video and audio. Program stream is used by most MPEG-2 editor programs.

Transport Streams

A Transport Stream is very similar to a Program Stream, except for additional pieces of information used for error-correction. Transport Streams are used for MPEG video which is transmitted over networks, such as satellite television, because sometimes these networks accidentally lose or scramble parts of the transmission. Transport Streams are not used for DVD authoring, and are not necessary for video which is played back from a hard disk.

Chapter 2. Hardware Installation

This chapter describes the steps required to install the REALmagic DVR Encoder/Decoder Card (Figure 1).

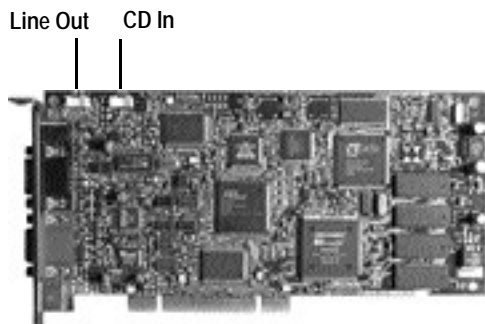


Figure 1. REALmagic DVR Encoder/Decoder Card

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 REALmagic DVR Encoder/Decoder Card into your computer.

1. Turn off the power to the computer and to the VGAmonitor. Unplug (disconnect) the power cord from the computer.
2. Disconnect the VGAmonitor 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.
5. Remove the slot cover screw and slot cover, if applicable.
6. Open the protective sleeve containing the REALmagic DVR Encoder/Decoder Card, grasp the circuit board by the edge of its mounting bracket, and remove it from the protective sleeve.
7. Insert the REALmagic DVR card 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: REALmagic DVR includes two internal audio connectors, which are listed in the section below. You should review these connector choices before replacing your PC's cover. If you are installing a DVD-ROM drive at the same time as the REALmagic DVR Encoder/Decoder Card, 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-Video or DVD-ROM titles.

VGA Video Connection

Your REALmagic DVR Encoder/Decoder Card must be connected to your VGA card or your PC's VGA output port in order to display MPEG and DVD video on your VGA monitor. Follow the steps to connect the DVR Encoder/Decoder Card to your VGA output (see Figure 2).

1. Attach the round 9-pin DIN connector of the provided External VGA Pass-Through Cable to the VGAIN connector at the back of the REALmagic DVR Encoder/Decoder Card (refer to Figure 2).
2. Attach the other end (15-pin "D" shape) of the cable to the output port on your VGAcards or your PC's VGAoutput port.
3. Connect the VGAcable from your VGAmonitor to the VGAOUT of the REALmagic DVR card.

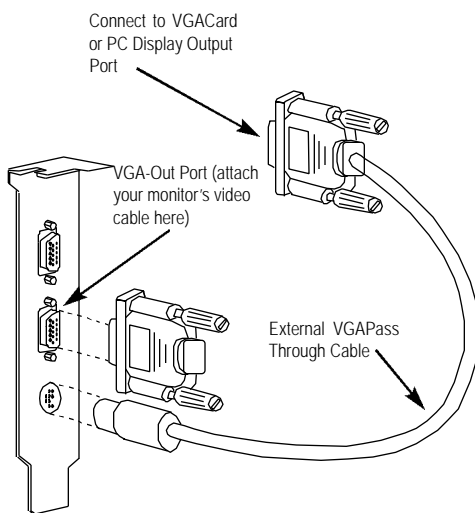


Figure 2. Attaching VGA and VGA Input Cable

Attaching REALmagic DVR I/O Cable

Your REALmagic DVR Encoder/Decoder Card has a complete set of connectors for getting audio and video in and out of your computer. Most of these connectors are found on the REALmagic DVR I/O cable which is included with your REALmagic DVR.

Attach the (15-pin "D" shape) end of the REALmagic DVR I/O cable to the connector labeled I/O.

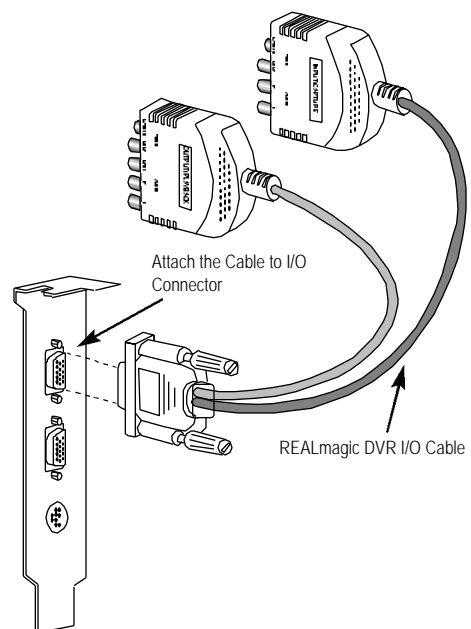


Figure 3. Attaching the DVR I/O Cable

Internal Connectors

Your REALmagic DVR Encoder/Decoder Card has two internal connectors. This allows PCM audio that is played from your CD or DVD drive to be input into the card.

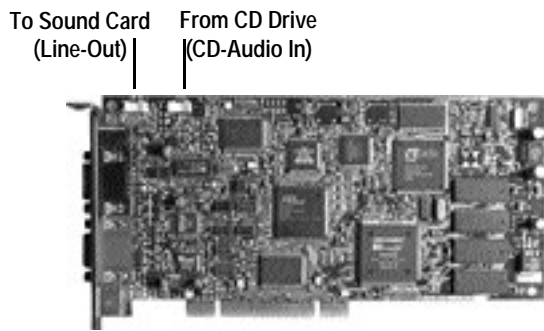


Figure 4. Internal Connectors

CD IN: Use this connector to connect the stereo audio of your CD or DVD drive to your REALmagic DVR card. This sound will be sent through the DVR's stereo outputs.

LINE OUT: Use this to connect your DVR card to your sound card's Line In or CD In connector.

REALmagic DVR I/O Cable

Your REALmagic DVR Encoder/Decoder Card has a complete set of connectors for getting audio and video into and out of your computer. The REALmagic DVR I/O Cable has two parts, which are labeled INPUT and OUTPUT.

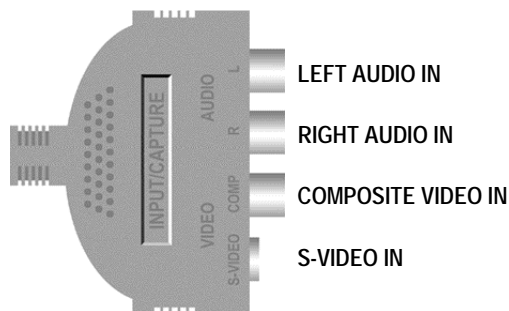


Figure 5. I/O Cable for A/V Input

Input Connectors:

1. **COMPOSITE IN:** Use a standard RCA cable to connect a camcorder or VCR's Video Out connector to this connector.
2. **S-VIDEO IN:** Connect a camcorder or VCR video out connector to this connector.
3. **LEFTAUDIO IN and RIGHTAUDIO IN:** These connectors are used to provide stereo audio input. Match the colors of the cables - the Right channel connector is colored red and the Left is colored white. Connect the other end of the cables to your camcorder or VCR audio outputs.

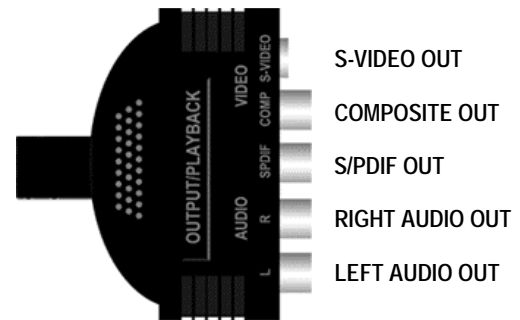


Figure 6. I/O Cable for A/V Output

Output Connectors:

1. **S-VIDEO OUT:** Connect a S-Video cable to a television set to display video. If available, use this connection since it provides better quality than Composite.
2. **COMPOSITE OUT:** Connect a RCA cable to a television set to display video.
3. **S/PDIF OUT:** Use a standard RCA-type cable to send digital audio to a compatible Dolby Digital amplifier. This feature is included for listening to the full surround sound audio track when playing back DVD titles.
4. **LEFTAUDIO OUT and RIGHTAUDIO OUT:** These connectors are used to provide stereo audio output. Match the colors of the cables - the Right channel connector is colored red and the Left is colored white.

Note: REALmagic DVR converts all supported types of audio for both the stereo and S/PDIF connectors. For example, if you connect the S/PDIF connector to a Dolby Digital amplifier, you will be able to play any file encoded by DVR through your Dolby Digital amplifier.

If your system has a sound card, we recommend attaching the REALmagic DVR internal connector LINE OUT signal to the LINE-IN port on your sound card, and then attach your Pro Logic receiver or 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 DVD/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. The supplied Stereo RCA cable to mini jack audio cable can be used for this audio connection of the REALmagic DVR to the sound card. Otherwise, attach this signal directly to a Pro Logic receiver or speakers.

Advanced Connections

The REALmagic DVR also includes an internal CD Audio In connector that allows you to pass CD audio from the DVD-ROM drive through to the internal CD Audio In connector on your sound card. To do this, attach the CD Audio cable from the DVD-ROM drive to the REALmagic DVR Encoder/Decoder Card CD Audio In, then attach another cable from the internal Line Out port from the REALmagic DVR to the CD Audio In connector on your sound card. Please refer to Figure 4 for the locations of these internal connectors.

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

If you are using this solution, attach the Pro Logic receiver to the Line Out port of your sound card to obtain the surround sound signal.

Note: With this solution, the volume for both CD audio and MPEG audio will be controlled by the CD Audio portion of your mixer.

Note: Due to the copyright protection circuit in use by this product, recording device, such as a VCR, connected to the Composite Video Out or the S-Video Out connectors of the REALmagic DVR may affect the playback or recording of copyrighted material. For best playback, make sure the copy protected DVD title is played directly from the REALmagic DVR onto a TV, not through a VCR.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only, unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

Chapter 3. Software Installation

This chapter describes the software installation procedure for the REALmagic DVR Encoder/Decoder Card. Follow the directions carefully. Skipping steps may result in improper operation.

Please make sure to install DirectX & DirectX Media before installation. You can obtain the latest DirectX and DirectX Media driver update from Microsoft. Visit <http://www.microsoft.com/directx/homeuser/downloads/default.asp> for downloads.

Software Installation For Windows 9x

Follow the steps below to install the REALmagic DVR Encoder/Decoder Card software:

Driver Installation

1. If you have not already done so, complete Chapter 2 Hardware Installation before proceeding.
2. After the Windows logo screen, a dialog box will appear to inform you that the system has found a **PCI Multimedia Device**.
3. Click **Next** or **OK** to go on to the next dialog box. For some Windows 95 versions, another dialog box will appear with the option to select **Other Locations...** Click on this button as well.
4. There should now be a **Browse** button on the dialog box to allow you to specify the location of the drivers. Insert the *REALmagic DVR Installation CD-ROM* into the DVD-ROM drive or the decoder diskette in the floppy disk drive.
5. Click the **Browse** button and locate the folder called **WIN95_98** on the DVD-ROM drive, or point to your floppy drive where you inserted the decoder floppy disk.
6. Click **OK**, **Next**, and/or **Finish** to continue until the decoder drivers are installed. On some versions of Windows 95, another **Browse** dialog box may appear to ask for the location of the driver a second time. Click the **Browse** button again to locate the proper folder.
7. Steps 2-6 should be repeated for the encoder driver (Insert the encoder driver diskette this time if you are using diskette installation).
8. Execute the section titled **DVR-Station Installation**

DVR-Station Installation

1. The Windows desktop will appear when the driver installation is complete. You must now continue to the DVR-Station and Applications installation.
2. A Sigma Designs Installation Screen will appear. Click on the **Install** button to initiate the DVR Station and Applications installation program. If using diskettes, insert the application disk in the floppy drive and run set-up.
3. Click **Next** when the **Welcome** dialog box appears. Setup will now ask you to select one of the following options:
 - Install the REALmagic applications
 - Change the DVD Region Code
4. Select **Install the REALmagic applications** and click **OK**.
5. By default, Setup will install the DVR-Station applications into a directory called **REALmagic**. Click the **Next** button to accept this directory. You may choose another directory by selecting **Browse** and entering the path information.
6. After copying the necessary files, a **DVD Region Update** dialog box will appear so you can set the DVD Region Code for your DVR card. Click **OK** and the **DVD Region Selection** dialog box will appear. Select a region code from 1 to 6 depending on the country you are in. Click **OK** and then **Yes** to confirm the Region you have chosen. Click **OK** to continue. (See the section Changing DVD Regional Codes on how to change regional codes if you relocate to a different region.)
7. An **Automatic Color Calibration** dialog box will appear next. If you have already done the Automatic Color Calibration during the first phase of the driver installation, you may skip this process at this time by clicking **No**. If you click **Yes**, the **Configuration Info** dialog box will appear. Click **OK** to perform the Automatic Color Calibration. *Your screen will blink several times during this process*

Note: Color Calibration must be done on each display mode you use, for display resolution, refresh rate so if you change your display mode, you must perform the Auto Calibration again to ensure that DVR will work properly with the new video mode.
8. Clicking on the **Finish** button on the **Setup Complete** dialog box will complete the installation process.

Software Installation For Windows NT 4.0

Follow the steps below to install the REALmagic DVR Encoder/Decoder Card software:

Driver Installation

1. If you have not already done so, complete Chapter 2 Hardware Installation before proceeding.
2. After Windows starts up and the desktop appears, insert the REALmagic DVR Installation CD-ROM into the DVD-ROM drive. If the AutoPlay feature is enabled, a menu screen will appear which will prompt you to install the DVR drivers and DVR-Station software. Or alternatively, insert Disk 1 of the NT driver and go to step 4.
3. Double-click the My Computer icon on the Windows desktop, and locate the folder called WIN_NT on the CD-ROM disc or diskette.
4. Double-click SETUP.EXE to install the DVR drivers and DVR-Station software. (If using diskettes, insert disk 2 when asked)
5. By default, Setup will install the DVR-Station applications into a directory called REALmagic. Click the Next button to accept this directory. You may choose another directory by selecting Browse and entering the path information.
6. Windows NT will ask you to reboot. Upon restart, proceed to Border Adjustment and Color Calibration.

Border Adjustment and Color Calibration

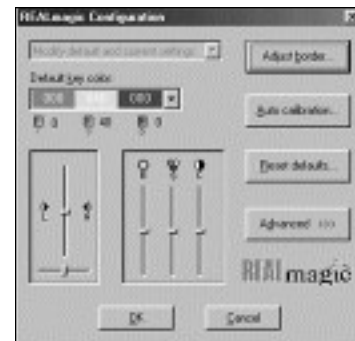
REALmagic DVR uses overlay technology to display MPEG video on top of the normal VGA graphics. This technology uses a "key color" to determine where to overlay video. If the video window does not match the designated area exactly, a "border" around the video window will appear. Due to the wide range of video modes available in today's VGAcards, you must adjust the position and size of the video window for each display mode you use. Border Adjustment is required to finalize the installation and to adjust the MPEG video window on the Windows desktop.



The MPEG video that appears within the overlay window is also independent of your normal VGA graphics. Color Calibration allows you

to make adjustments to the color attributes of the video. You need to perform the Border Adjustment and Color Calibration only once for each of the display mode you use. A single display mode consists of a particular display resolution and vertical refresh rate. Follow the steps below to complete the Border Adjustment and Color Calibration. Skip Step 1 if you are adjusting the border during installation for REALmagic DVR.

1. Start DVR Station as follows: click the **Start** button and select **Programs**, and then select **REALmagic DVR**. You will see the **REALmagic Configuration** dialog (figure 7).

Figure 7. REALmagic Configuration



2. At the REALmagic Configuration... dialog (Figure 7), click **Auto calibration...** Your display will flicker for about 30 seconds. If auto calibration fails to adjust the border properly, proceed to the next step.
3. From the REALmagic Configuration dialog box, click **Adjust border** (Figure 7). You will see the **Border adjust** dialog (Figure 8). Use the arrow keys in the dialog or on the keyboard to align the placement of the colored window within the 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. The colored window must cover the pink window exactly. When aligned, click **OK**.

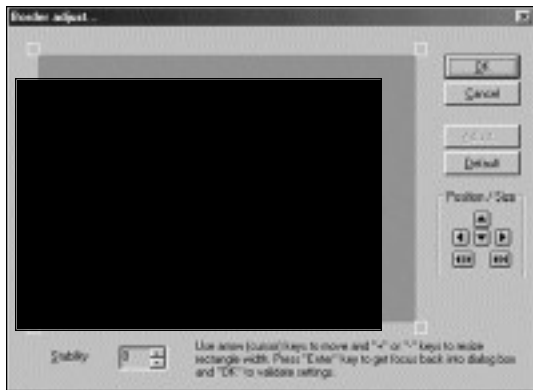


Figure 8. Border Adjust

4. The **Default** button will reset the color calibration and the border adjustment values to the factory default settings.
5. If the auto calibration function fails, please reboot your system and try the auto calibration function again. If the auto calibration function still fails, you will need to perform a manual color calibration. See Appendix A: Advanced Configuration Options.

Changing DVD Region Codes of the DVR

If you are using an RPC1 DVD-ROM drive (region free drive), run set-up as mentioned in step 2 the of Win9x installation or steps 2-4 in WinNT installation and select option 2 to change the DVD region code of the DVR.

Changing DVD Region Codes of the RPC2 drive

Some DVD-ROM drives are also region sensitive (i.e. they only work with DVDs of a particular region). This type of drive is called RPC2 drives. RPC stands for Regional Protection Code. Like the REALmagic DVR card, you can change this setting up to five times. Sigma Designs includes a program to change the regional codes for your DVD-ROM drive. To run this program, click on the **Start** button on the Task Bar, select the **REALmagic program** group, and select **DVD-ROM Drive Region**. A dialog box will appear showing the various regions and allowing you to choose a new one. Select a new region and click **OK**.

If you want to reset the Region Code after setting it five times please contact Sigma Designs or Sigma's authorized distributor or service center. Nominal handling charges will be required for this service.

Note: Regionalization and Copy Protection (DVD Region Code) uses the Content Scramble System (CSS) standard to prevent unauthorized duplication of the intellectual property distributed on DVDs. It was originally requested by the Motion Picture Association of America (MPAA) to address video piracy, but is applicable to any content. CSS works by inhibiting the transmission of unencrypted data of the PCI bus. Playback systems must license CSS in order to decode the encrypted data.

The CSS specification divides the world into six unique regions. Content designated for one region cannot be read by playback systems in another region.

While CSS is used to prevent digital copies of the DVD content, another technology devised Macrovision is used to prevent analog copies of the DVD content. The Macrovision standard is a scrambling system that has been widely used by the movie industry to prevent unauthorized duplication of video content using commercial VCRs.

DVD playback systems must support both CSS and Macrovision copy protection standards.

Chapter 4. Using the DVR Station

The DVR Station is a versatile Windows utility that allows you to play and record DVD-Video, VideoCD and MPEG videos. DVR Station can digitally encode NTSC and PALvideo into MPEG video in real-time. DVR Station can be used to playback the video it creates as well as full-length feature films recorded in the DVD, Video CD formats, MPEG files, and Audio CDs.

Note: First time users should locate the Configure button found on the Encoding tab of the Options Dialog Box. Go to the Video Input tab to select the Video Source settings. There you can select either Composite or S-Video as the connector source as well as settings for NTSC or PAL input formats.

Starting the DVR Station for Encoding

Follow the steps below to start the DVR Station (DVR Station looks best if Windows has 256 or more colors.):

1. Start Windows, if you have not already done so.
2. Remove any DVD-ROM disc or Video CD inside the DVD/CD drive to avoid playback, since you are encoding.
3. From the taskbar, click Start, and then click Programs. Click REALmagic DVR and then click DVR Station.
4. The DVR Station for Encoding (Figure 9) is displayed on the screen which is used to record, preview and playback files.



Figure 9. DVR Station for Encoding

The Recording and File Playback Display Panel (Figure 10) provides specific information about capturing and recording video.

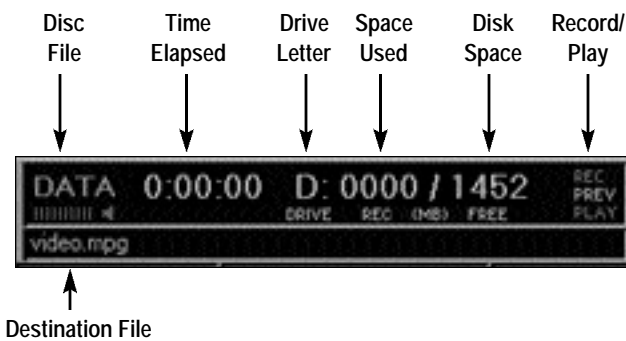


Figure 10. Recording and File Playback Display Panel

Starting the DVR Station for Playback

If a DVD is inserted with the Auto-Play feature enabled, DVR Station will begin playing the disc or when a disc is inserted.

1. Start Windows, if you have not already done so.
2. Insert a DVD disc, a Video CD, or a CD-ROM containing MPEG files into your DVD drive.
3. From the taskbar, click Start, and then click Programs. Click REALmagic DVR and then click DVR Station.
4. The DVR Station for Disc Playback (Figure 11) used to play DVDs and Video CDs will appear on the screen.
5. To switch to encoding mode if a disc is in the drive, eject the DVD disc from the drive.



Figure 11. DVR Station for Disc Playback

The Disc Playback Display Panel (Figure 12) 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 or alternatively drag the red dial to the desired playback position. Depending on the type of disc you are playing, additional information may appear.

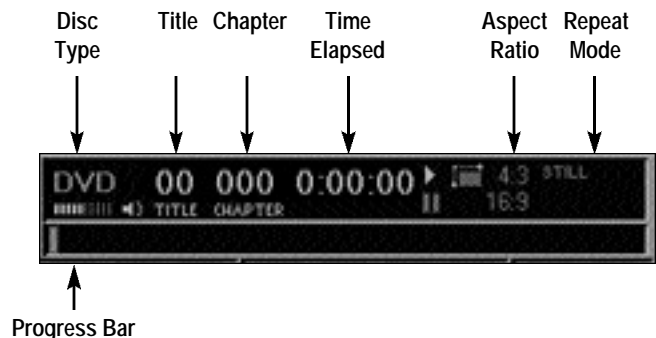


Figure 12. Disc Playback Display Panel

The Volume Control (Figure 13) 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.

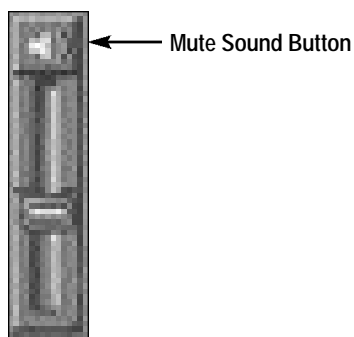


Figure 13. Volume Control

Standard Buttons

DVR Station has controls similar to those of a VCR. See Figure 14.



Figure 14. Encoding Buttons

1 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.

2 is the **Stop** button. Click this button to stop play.

3 is the **Eject** button. Click this button to operate the ejection mechanism (if supported by your DVD or CD-ROM drive).

4 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.

5 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.

6 is the **Previous Track** button. Click this button to skip to the previous track on the DVD/CD.

7 is the **Next Track** button. Click this button to skip to the next track on the DVD/CD.

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 DVR Station to play the tracks in random order. The Play Mode button does not work with DVD movies.

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 when using DVD Video discs.

is the **Record Mode** button. Click this button to begin Record/Preview mode. This mode captures and encodes video into MPEG and stored onto your hard disk or other recordable storage media. The selected destination file, which is selectable under "Options" "Encoding" tab, will appear as in Figure 17.

9 is the **Preview Mode** button. Click this button to start Preview only mode. This mode captures and encodes video into MPEG to be immediately displayed in real-time. The digitized video is not recorded/stored to disk in this mode.



Figure 15. Preview Mode

Custom Buttons

Custom Buttons (Figure 16) perform additional functions within DVR Station.



Figure 16. Custom Buttons



Clicking the Display button displays the playtime of the current preview clip and the name of the file in the upper left-hand corner of the VGA viewing 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 REALmagic DVR 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 DVR 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 DVR Station Options Encoding window.



Clicking the More Controls button gives access to image controls and screenshot image capture. See the More Controls description in this chapter for description.

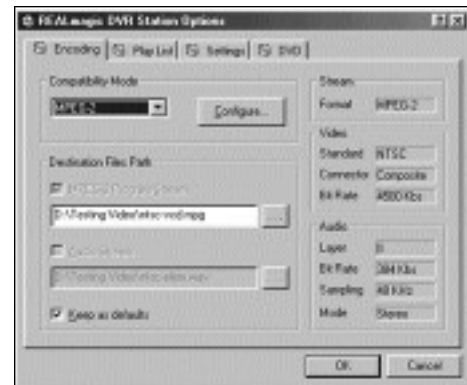


Figure 17. Options Encoding Dialog

Important Note: First time users should click the Options dialog button, click the Configure button, and go to the Video Input tab to select the Video Source settings. There you can select either Composite or S-Video as the connector source as well as settings for NTSC or PAL input formats.

Encoding Options

The **Encoding** tab allows you to see the encoding options that have been selected for the REALmagic DVR on the right panels.

On this screen you can change the "Destination File" recording file name and path. Choose a recording destination drive that has the high capacity and that has 1.5MB/sec sustained transfer rate performance.

Click the "Configure" box to enter encoding menus to **Capture Properties** dialog box. The changes to the settings will be reflected on the right panels of this current window as in Figure 17.

Capture Properties

Some of the **Capture Properties** are advanced settings. Unless you are an advanced user we recommend to use the **Compatibility** setting which chooses default settings that work with DVD and other media formats.

Compatibility Dialog

The **Compatibility** tab allows for one click of pre-configured encoding parameters. The highest quality setting button is **DVD**, followed by **Super VCD** and **Video CD**. Choose the format which matches the type of media you are creating. These buttons will modify the other pages to give the correct settings. If a setting is modified that is out of the range of the media format, it will be listed as Custom.

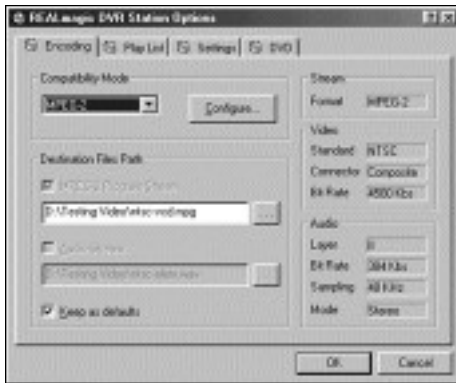


Figure 18. Capture Compatibility

Note: The additional Capture Properties tab settings are advanced users. Customizing these options may affect the compatibility to the desired media format you wish to create.

The following table lists the compatibility of different media formats and their recommend settings.

	Video CD	DVD Elementary	Digital VR	MPEG-1	MPEG-2
Format	MPEG-1 System	MPEG-2 Program	MPEG-2 System	MPEG-1 System or Elementary	MPEG-2 Program or Elementary
NTSC	352 x 240 @29.97fps	704 x 480 @29.97fps	704 x 480 @29.97fps	160 320 x 112 352 240	704 640 x 480 544
PAL	352 x 288 @25fps	704 x 576 @25fps	704 x 576 @25fps	160 320 x 144 352 288	480 704 640 x 576 544 480
VBR/CBR	Constant	Variable	Variable	Constant	Variable/Constant
Video Stream Bit Rate	1150	2000-7000	2000-7000	750-3000	2000-9000
Audio Bit Rate KBS	224	384	384	192	384
Sampling Rate	44.1KHz	48KHz	48KHz	44.1KHz	48KHz
Audio Format	MPEG Layer II	PCM	MPEG Layer II	MPEG Layer II	MPEG Layer II

Table 1. Media Format Compatibility

Note that the DVD preset is for use with editing programs. To skip the editing steps and output streams compatible with authoring programs, you may use custom settings of PCM Audio and Elementary Streams.

Multiplexer Dialog

Under Capture Properties, the **Multiplexer** tab shows the available choices of audio/video stream options. Here you may choose different output streams including Program, System, and Elementary streams.



Figure 19. Program and System Stream Settings

Under the **Format** pulldown menu, you may select from MPEG-2 Program, Elementary or MPEG-1 System streams. These streams may have more than one audio and/or video streams multiplexed together. Data tags are used to identify the different streams.

For **MPEG-2 Program** and **MPEG-1 System** streams, two parameters can be modified which should only be attempted by advanced users:

Video Stream ID – Enter the Video Stream ID

Audio Stream ID – Enter the Audio Stream ID

Stream ID – Use this parameter to define the format of the Program Elementary Stream.

Program Map ID – This parameter is used to identify which program the audio or video packets correspond to.

Video Program ID – Enter the Video Stream ID

Audio Program ID – Enter the Audio Program ID

Audio Format

Under Capture Properties, the **Audio Format** tab allows for different compression rates. The REALmagic DVR can support non-compressed PCM and MPEG Layer I and II compression rates.

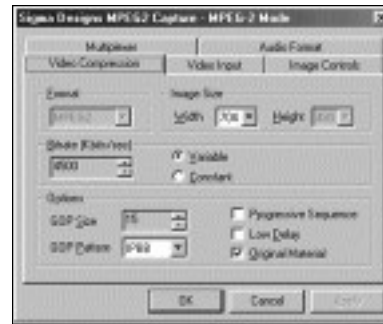


Figure 21. Audio Compression

Format – Select from non-compressed PCM, or MPEG audio Layer II or Layer I. PCM audio is used for DVD Audio.

Bitrate – For MPEG Audio, select a value for the audio rate. Higher bitrates would use less compression. Note that MPEG Layer II allowable rates are different from Layer I rates. This selection is greyed out when PCM (non-compressed audio) is selected.

Sampling Rate – Select from 32kHz, 44.1kHz, or 48kHz.

Mode – Select from Stereo, Mono (combined Left and Right), or Dual (for Karaoke VideoCDs).

CRC Recording - On/Off

Video Compression

Under Capture Properties, clicking the **Video Compression** tab allows customizing the bit rate and amount of compression of encoded MPEG video.



Figure 22. Video Compression

Format – Select the compression format for encoding. Select from MPEG-2, MPEG-1.

Image Size – Determine the **Image Size** pixel **Width** and **Height**.

Bitrate –Select the bitrate in Kbits/sec for MPEG video compression. A higher number should have less compression.

Max Bitrate – When **Variable** bitrate is selected, the **Max** parameter sets the highest video bitrate selected by the REALmagic DVR encoder.

Constant / Variable – **Constant** bitrate (CBR) is a fixed bitrate which is used on VideoCD format. **Variable** bitrate (VBR), which is used on DVD and SVCD formats, allows flexible bit rate for video with motion.

GOP Size – Sets the **Group Of Pictures** size to increase the number of pictures to be in a sequence header. Pictures within the **GOP** can be randomly accessed to apply compression algorithms. 15 is the typical **GOP Size** setting.

GOP Pattern – Select from IP, IPBB frames to form **GOP Patterns**. They describe the type of picture frames that are used in the compression algorithms. IP frames provide the least compression while IPBB frame pattern will provide more. If the video requires frame accurate seeking or lower delay, IP frame should be used. Otherwise IPBB would be the most efficient compression pattern.

Progressive Sequence – When checked, it sets a flag in the video to indicate to the decoder that the video is progressive like a film source. When unchecked, the decoder will not attempt to display progressive frames from the encoded video.

Low Delay – When checked, it sets a flag when encoding the video to indicate there are no B frames in the video. When the decoder sees this flag during playback, it will then skip the B frame detection process which further reduces delay.

Original Material – Checking this setting sets a flag to indicate that the encoded video is original and not a duplicate. When unchecked, it indicates it is a copy.

Video Input

Under Capture Properties, clicking the **Video Input** tab allows customize the bit rate and amount of compression of encoded MPEG video. First time users must configure the Video Source correctly to receive video from the Camcorder or VCR used.



Figure 23. Video Input

Video Source – Under the Connector setting, select from either S-Video or Composite. Under Standard, configure either NTSC or PAL TV standards.

Device –The default Device source used from VCR, Film, or Camera. Depending on the NTSC or PAL setting, the frame rate will appear in parenthesis. For example, NTSC Film source (like from most Laser disc or DVD) will be listed as Film (24FPS).

Image Controls

Under Capture Properties, clicking the **Image Controls** tab to modify picture quality settings. These can made during encoding in real-time.



Figure 24. Image Controls

Brightness – Adjusts the Brightness of the captured video.

Hue – Adjusts the Hue of the captured video.

Contrast – Adjusts the Contrast of the captured video.

Saturation – Adjusts the Saturation level of the captured video.

Comb Filter – Toggles the video noise filter.



Load Defaults – This sets the sliders to the middle, and Comb filter OFF

Play List

The Play List feature allows you to create a list of your favorite MPEG clips for the DVR Station's Play List mode. In Figure 25, drive D: is the DVD-ROM and drive E: is the CD-ROM. Since the REALmagic DVR is capable of playing both MPEG-1 and MPEG-2 files from the DVD/CD drive or hard disk drive.

The Title List window displays the filenames of MPEG clips DVR 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. Note, if an authored volume is to be tested

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 re-position 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 14) until the word **Play**  highlighted in the Display Panel. All clips included in the Play List will play in order.

To test or play a DVD Volume created by an authoring program and stored onto hard disk, refer to the Encoded Volume Playback section for information.

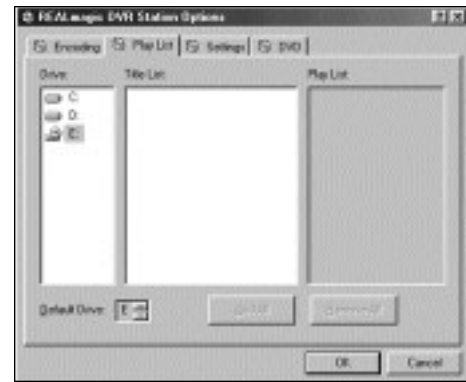


Figure 25. Play List

Option Settings

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



Figure 26. Options Settings

General

Feature

Explanation

Start Detached: Displays the DVR Station Control detached from the movie window on startup. Press F2 to toggle this feature.

ToolTips: Enables pop-up ToolTips that display the function of each DVR 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 on the DVD-ROM drive.

Audio Output

The Audio Output allows you to select between analog or digital audio output. It also allows you to choose either AC-3 (Dolby Digital 5.1 channel) or PCM (Pro Logic) surround sound. DTS output to S/PDIF is enabled only by selecting it in the movie menu.

TV

The REALmagic DVR can output MPEG video to the computer monitor or to a TV. Select either 1:1 scale or choose the appropriate box for your TV.

DVD

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



Figure 27. 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 DVR 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.

When you want to change the rating level, enter the password into the Enter box and then make your selection.

Note: Make sure the password is something you can remember or record it at a secret place. If you forget the password, you must reinstall the DVR Station software to enter a new 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, DVR 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.

Preferred Display Mode

Set the display mode to your preference. Wide screen is for newer 16x9 ratio monitors. Letterbox adds black bars on top and bottom of the video to show movie content on standard 4:3 monitors. Pan and Scan mode will deliver fullscreen video on 4:3 monitors but will chop off the sides of the video.

More Controls

Click the  More Controls button (see Figure 16) to toggle the display of movie atures.

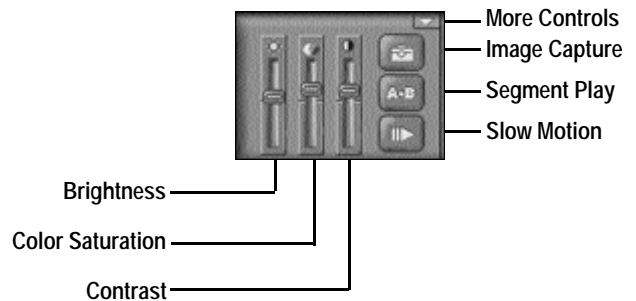


Figure 28. Additional Custom Buttons

- 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. The DVR software saves a set of values for the VGA and another set for the TV set.
- Image Capture**
 Click the Image Capture button to save a BMP screenshot image of a captured video or 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/Fast Motion Play**
 Click this button to play back the movie at half, 2x and 8x speed. Click the button again to return to normal playback speed. Audio is muted when these modes are selected.

DVD Navigation Buttons (Playback Mode)

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



Figure 29. 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 30 shows an example of languages available in the title. The language selected is momentarily displayed in the upper-right corner of your movie window and marked in the shown list.



Figure 30. 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 31). Click on the angle you wish to view. The camera angle number is momentarily displayed in the upper-right corner of your movie window and marked in the shown list and marked in the shown list.



Figure 31. Camera Angle Selector



Subtitle Selector

This operation only functions with a DVD disc that contains multiple language subtitles or closed captions. Refer to Figure 32.

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) the first selection provides normal subtitles for the selected language, and the second language selection identifies subtitles with extra functions.



Figure 32. 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. Or you could click the numeric keypad button (located on the left of the repeat button) and select the title numerically.



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 DVR Station by selecting the following from the taskbar: **START - PROGRAMS - DVD – DVR Station**. A DVD control panel and a Video Screen should appear (Figure 33).
4. If the Auto-Play feature of DVR Station is enabled, the DVD-Video will begin to play.
5. Initially, the DVR Station Control panel is detached from the MPEG Video screen. You can attach the DVR Station to the MPEG Video screen by pressing the F2 key on the keyboard. Pressing F2 again will detach the DVR Station Control panel.
6. If the DVR 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 33. DVR Control Panel and Video Screen

7. If a DVD movie disc is in the DVD-ROM drive, and the DVD-ROM is the selected default DVR Station drive, click PLAY on the DVR Station. The DVD movie should start.

8. If the DVD-ROM is NOT the default drive, click the **Options Button** on the DVR Station. In the Options dialog (Figure 34), select the drive that represents your DVD-ROM drive. DVR 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.

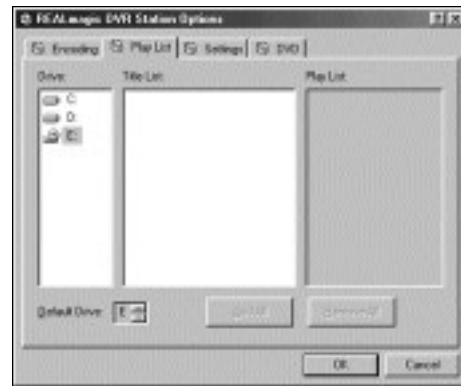


Figure 34. Options Dialog

9. Click the **PLAY** button on the DVR Station.



10-Key Keypad

If DVR 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 35. 10-Key Keypads



Click on this button to toggle between the two 10-key keypads. (one for "menu", the other for "title/chapter")




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 DVR Station by selecting the following from the taskbar: **START - PROGRAM - DVD – DVR Station**.
4. DVR 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 36). 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 36. 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, DVR Station will show a series of number buttons (Figure 37) on the screen next to the Standard Buttons. Use these buttons to make your selection.



Figure 37. 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

DVR Station will display a 10-key pad for Video 2.0 CD. To play the CD, select the **Play** button on the DVR 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 DVR 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.

Encoded Volume Playback

When a disc volume is authored it is typically stored onto hard disk. If it is on a root directory, follow the instructions under **Play List** section for playback.



When volumes are stored in a subdirectory, click the **Open File** button and select the .IFO file ("Vts_01_0.IFO" is default for a DVD-Video disc) to launch a disc.

Or, use the SUBST command to have a sub-directory containing the volume become a drive with its own letter. The volume name should appear on the Title List. Click OK to close the dialog and Press the Play button to view the video.

SUBST drive1: [drive2:]path

SUBST drive1: /D

drive1: Specifies a virtual drive to emulate a drive

[drive2:]path Specifies the subdirectory in which the authored volume resides.

/D deletes an emulated drive letter

To run the SUBST command, open a command prompt or click Run from the START button and enter the command and parameters.

Use this drive letter as your current drive in DVD Station

Example: Make H: a virtual drive volume with files from C:\NewVolume\ directory. From the **START** button, click **Run** and type "SUBST H: C:\NewVolume"

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 DVR Station by selecting the following from the taskbar: START - PROGRAM - DVD - DVR Station.
4. DVR Station will detect the Audio CD in the DVD-ROM drive or the CD-ROM drive and display the Audio CD Control panel (Figure 38).



Figure 38. 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)

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+`

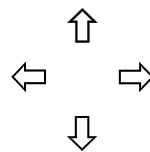
Backspace on Video CD 2.0 keypad

ctrl+<Enter>

Apply or enter selection on Video CD 2.0 keypad

ctrl+Æ

Play default Video CD 2.0 track



Select menu option (active when DVD menu is on-screen)

<Enter>

Activate selection (active when DVD menu is on-screen)

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**.

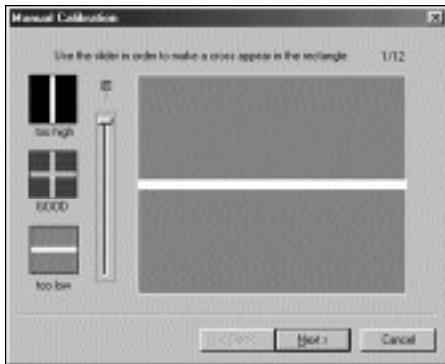


Figure 39. Dialog

Advanced Color Adjustments

When you move the mouse or a window on top of the DVD or MPEG video, the VGA graphics need to appear on top of the video window. To do this, the REALmagic DVR 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 REALmagic DVR 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 your 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 VGA screen, 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 REALmagic DVR, powering off the computer and try again after restarting, or double check the Border Adjust and Color Calibration procedures.

1. Start DVR 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 **Color Adjustment**.
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).

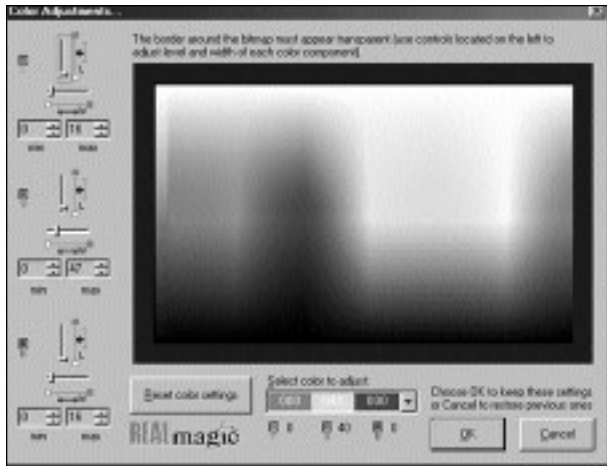


Figure 40. Key Color Settings

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.

Index

A

Audio output, 5, 17
Advanced color adjustments, 24
Advanced connections, 6
Amplifier, 1, 2, 5, 6
Audio CD, 22
Auto calibration, 7, 9, 24

B

Border Adjustment, 8
Bus-mastering IDE controller,
Bus-mastering IDE drivers,

C

Capture Properties, 12, 13, 14, 15
CD Audio In, 6
CD IN, 3, 5, 21, 22
Chroma key, 24, 25
Color Calibration, 8, 9, 24
Comb Filter, 15, 16
 Compatibility, 12, 13
 Super VCD, 13
 Video CD, 2, 9, 10, 13, 21, 23
Compression, 1, 2, 14, 15
Constant bitrate, 15
Continuous Play, 11
CRC, 16
Custom, 112, 13, 18, 24
Custom Buttons, 12, 18

D

DAT Files, 2
Data transfer rate, 1
Default Language, 18
destination file, 10, 11, 12
DirectX, 1
Discrete digital audio channels, 2
Display button, 12

Display Panel, 10, 11, 16, 21
Dolby Digital Surround Sound, 21
Dolby Pro Logic, 1, 2
Dual, 14
DVD Playback, 9, 20
DVD Station, 7
DVD-Video, 1, 3, 4, 9, 18, 20, 22

E

Elementary stream, 2, 14
Eject, 10, 11, 23
Encoder, 1, 3, 4, 5, 6, 7, 8, 15

F

Fast Forward, 11
File Formats, 2
Frames per second, 1, 2

G

GOP Pattern, 15

H

Handling the Board, 3
Hardware Installation, 3, 8

I

I/O cable, 4, 5
I/O Cable, 9
IFO, 2, 12, 20, 22
Image Capture, 12, 18
Installing the Hardware, 3
Introduction, 1

K

Karaoke CD, 2

L

Language, 2
LINE OUT, 3, 5, 6
LINE-IN, 5, 6
Low Delay, 15

M

Macrovision Copyright Notice, 6
Manual calibration, 24
Media Format Compatibility, 13
More Controls button, 12, 18
Moving Picture Experts Group, 1
MPEG, 1, 2, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17
MPG Files, 2
Multiplexer, 13

N

Navigation Buttons, 19
Next Track, 11, 21, 23

O

Open File button, 12, 22
Options Dialog button, 12
Original Material, 15

P

Parental Lockout, 18
Pass-through Cable, 4
Pause, 11, 23
Picture Control sliders, 18
Play List, 11, 16
Play Mode, 11, 16
Play Mode button, 11, 16
Preview Mode, 11
Previous Track, 11, 23
Progressive Sequence, 15

R

Random, 11, 23

Receiver, 2, 6
Record Mode, 11
Rewind, 11, 18, 23

S

S/PDIF, 2, 5, 6, 17
Screenshot, 12, 18
Segment Play, 18
Select Buttons, 21
Settings, 9, 12, 13, 14, 15, 16, 17, 24, 25
Shortcut Keys, 23
Slow Motion Play, 8, 23
Software Installation, 7, 8
Standard Buttons, 11, 21
Static electricity, 3
Stop, 11, 18, 23
SUBST, 22
System Requirements, 1

T

Technology Overview, 1
Transport stream, 2, 14

V

Variable bitrate, 15
Video CD, 2, 9, 10, 13, 21, 23
Video Connection, 4
Video Source, 1, 9, 12, 15

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