

Osprey Multimedia Capture Cards

AVStream Driver Version 3.1

User's Guide For Windows XP

Osprey-100
Osprey-200
Osprey-210
Osprey-220
Osprey-230

Releases 3.1 and later.

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FCC Notice

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device 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 device does cause harmful interference to radio or television reception, 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 computer and the receiver.
- ◆ Connect the computer 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.

Shielded Cables

Connections between this device and peripherals must be made using shielded cables in order to maintain compliance with FCC radio emission limits.

Modifications

Modifications to this device not approved by Osprey Technologies, Inc. could void the authority granted to the user by the FCC to operate the device.

Note to CATV Installer

This reminder is provided to call to the CATV installer's attention Section 820-40 of the NEC, which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

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Chapter 1 - Getting to Know the Osprey Multimedia Capture Cards

The Osprey Multimedia Capture Cards User's Guide provides practical information for installing and configuring the hardware and software for the Osprey Multimedia Capture Cards. This guide has been designed with the needs of the end user in mind, particularly first-timers and those working with existing applications.

- ◆ **Symbols**
- ◆ **Introduction**
- ◆ **Features**
- ◆ **Software Included**
- ◆ **Compatible Third-Party Applications**
- ◆ **Getting Help**

Symbols



This symbol denotes an important note or warning.



This shortcut icon points more experienced users to sections or chapters that summarize step-by-step instructions.

Introduction

Osprey Multimedia Capture Cards provide economical solutions for capturing video images in an uncompressed digital format. All formatting and scaling of images are processed within the hardware, allowing for maximum system efficiency and speed. The Osprey-200 series also provides on-board audio capture capability.

This User's Guide covers all of the Osprey Multimedia Capture Card models:

- ◆ Osprey-100 – Basic video capture
- ◆ Osprey-200 – Entry-level audio and video capture
- ◆ Osprey-210 – Advanced audio and video capture
- ◆ Osprey-220 – Audio and video capture with professional audio inputs
- ◆ Osprey-230 - Universal 3.3V/5V 64-bit PCI card with audio and video capture with professional audio inputs for Windows 2000 and Windows XP only

These products consist of a PCI board (based on the Conexant Bt878A single-chip video capture device) and DirectShow compliant software drivers for Windows XP.

Features

The driver supports all DirectShow capture driver capabilities that are available to the Bt878 / Ct878A hardware device. It is compatible with software video compressors, sound boards, video editing applications, and video conferencing applications.

Audio/Video Specifications

Video Frame Rates and Performance

Audio/Video Specifications

All cards in the Osprey Multimedia Capture family have the following characteristics in common.

- ◆ NTSC/PAL/SECAM video standards
- ◆ RGB32, RGB24, RGB15, Greyscale, YUY2, UYVY, I420 and YVU9 color formats
- ◆ Installs under Windows XP or Windows 2000 (Limited Support)
- ◆ Multiboard support
- ◆ Closed captioning
- ◆ Cropping and scaling
- ◆ Logos
- ◆ Software deinterlacing
- ◆ VBI

The specific types of Osprey Multimedia Cards have the following individual characteristics.

	Osprey-100	Osprey-200	Osprey-210	Osprey-220	Osprey-230
Video In					
Composite (RCA)	3	1	1	1	1
S-Video (Mini-DIN)	1	1	1	1	1
Audio In					
Unbalanced Stereo (RCA)	0	1	1	1	1
Balanced (XLR)	0	0	0	1	1
3.5mm Stereo	0	0	1	0	0
Audio Out					
3.5mm Stereo	0	0	1	1	1
Audio Processing					
Auto Sample Rate Selection (32kHz, 44.1kHz, 48kHz)		■	■	■	■
Audio Sample Rate Down Conversion		■	■	■	■
Hardware					
32-bit/5-volt PCI Card	■	■	■	■	
Full 2.2 PCI Compliance	■	■	■	■	
32 or 64-bit/5 or 3.3-volt PCI Card operates up to 66 MHz					■
Full 2.3 PCI Compliance					■

Video Frame Rates and Performance

The Osprey Multimedia Capture Cards can deliver to the host 30 frames per second (fps) full resolution NTSC (720x480) as well as 25 fps full resolution PAL (720x576). The Osprey Multimedia Capture Cards use Direct Memory Access (DMA) to efficiently perform this delivery of data to the host. Once the data is in host memory, performance is directly affected by how the data is processed, transmitted or saved.

The Osprey Multimedia Capture Cards also support Direct Show compatible overlays for displaying video with minimal load on the system processor.

Software Included

The products for Windows XP include:

- ◆ A DirectShow compatible video capture driver
- ◆ A DirectShow compatible audio mixer and audio wave (capture) driver
- ◆ SwiftCap – An audio/video capture application
- ◆ Applets for device control, closed captioning, cropping, logo setup and VBI viewing. (Source available in the Software Developers Kit)

Compatible Third-Party Applications

The Osprey Multimedia Capture Cards work with any DirectShow based application and has limited functionality with Video for Windows applications. For the latest product news, please continue to visit our ViewCast Corporation web site <http://www.ospreyvideo.com/> for the Osprey Multimedia Capture Cards.

Getting Help

Before contacting support, please do the following:

- ◆ Work through the section Chapter 4 entitled **Testing the Installation**.
- ◆ Read through **Chapter 9 - Troubleshooting**.
- ◆ Visit our web site at <http://www.ospreyvideo.com/> and read the Osprey Multimedia Capture Cards FAQs by selecting **Osprey-200**, then clicking on the **FAQ** button.

If you have done that and you're still having problems, contact the Osprey Support Group at:

Voice, toll free	(888) 684-6622
Voice	(919) 319-9200
Fax	(919) 319-9814
Email	http://www.ospreyvideo.com

When you contact support, especially if it is by email, please include the following information:

- ◆ Which product you have – Osprey-100, Osprey-200, Osprey-210, Osprey-220 or Osprey-230.
- ◆ Which operating system you are using.
- ◆ Which version of the Osprey driver you are using. The version information can be found in the ReadMe.Txt file under the **Start > Programs > Osprey MultiMedia Capture** menu item.
- ◆ The type of audio and video sources being used (for example: S-Video and composite audio) and the type of equipment being used as the source (for example: a DVD player).
- ◆ Any additional details about your system configuration would be helpful – for example, the system speed, processor type, motherboard chipset, whether you have a SCSI or IDE hard drive, whether you have a network adapter card, and the type of display adapter card.
- ◆ A detailed description of the problem.

Chapter 2 – Osprey Multimedia Capture Cards Hardware

The Osprey-100, Osprey-200, Osprey-210 and Osprey-220 Capture Cards are 32-bit, 5-Volt PCI cards. They are compliant with version 2.2 of the PCI hardware specification.

The Osprey-230 Capture Card is a universal 3.3V/5V PCI card that will operate in either 32-bit or 64-bit slots, and is compliant with version 2.3 of the PCI hardware specification.

- ◆ **System Requirements**
- ◆ **Configuring the Video Capture Driver**
- ◆ **Installing the Card**
- ◆ **Connecting Cables**

System Requirements

The minimum capability of the computer required for the capture card itself is fairly low. It is typically the application being used with the capture card that sets the minimum requirements of the computer. For example, pure video capture applications typically do not require hefty machines. Yet the various streaming encoding applications, for example RealProducer or Windows Media Encoder, may require up to dual 2 GHz processor for some of their challenging encoding profiles.

For x86 PCs, the minimum system requirements are as follows:

- ◆ 300 MHz Pentium II processor or higher with at least 128Mb RAM
- ◆ One available PCI slot
- ◆ Windows XP
- ◆ Approximately 7.5 megabytes of storage for system files

For optimum performance, we recommend at least the following additional features.

Video display adapter with:

- ◆ 4 MBytes memory minimum (16 Mbytes or more recommended)
- ◆ Direct Draw capability
- ◆ An up-to-date display device with DirectDraw capability
- ◆ DirectX version 9.0a or later

Configuring the Video Capture Driver

Use the video capture application SwiftCap to access the Osprey driver properties described in [Chapter 4 - Video Driver Properties](#).

SwiftCap is included with the Osprey package. It is useful for testing the installation and for general purpose viewing of video. Refer to [Chapter 7](#) for instructions on using this applet.

Installing the Card

All computer cards are sensitive to electrostatic discharge. Slight discharges from clothing or even from the normal work environment can adversely affect these cards. By following these simple guidelines, however, you can minimize the chance of damaging your Osprey card.

To be used only with UL Listed computers that include instructions for user installed accessories.



- ◆ Handle cards only by the non-conducting edges.
- ◆ Do not touch the card components or any other metal parts.
- ◆ Wear a grounding strap while handling the cards (especially when located in a high static area).
- ◆ Provide a continuous ground path by leaving the power cord plugged into a grounded power outlet.
- ◆ Ensure that the workstation is powered OFF before installing any components.



If you are not familiar with how to install a PCI bus card, refer to your system's documentation for more complete, step-by-step instructions.

You should install the Osprey card before installing the software driver. However, with Windows 2000 and Windows XP you also have the option to pre-install the software before installing the hardware.

Use the following steps to install the Osprey card:

2. Power down the computer. Make sure that the computer's power switch is turned OFF. Read caution note above for grounding precautions.
3. Remove the computer's cover.
4. Locate an empty PCI slot.
5. Remove the slot-cover screw from the empty PCI slot's cover, set the screw aside, and remove the slot cover.
6. Remove the card from its anti-static bag.
7. Install the Osprey card into the empty slot and make sure that it is seated evenly in the slot.
8. Secure the back panel of the card with the slot's cover screw.
9. Replace the computer cover.
10. Connect video and audio cables to the Osprey card. Refer to **Connecting Cables** for details of the card's back panel connector.
11. Turn the computer on.

Connecting Cables

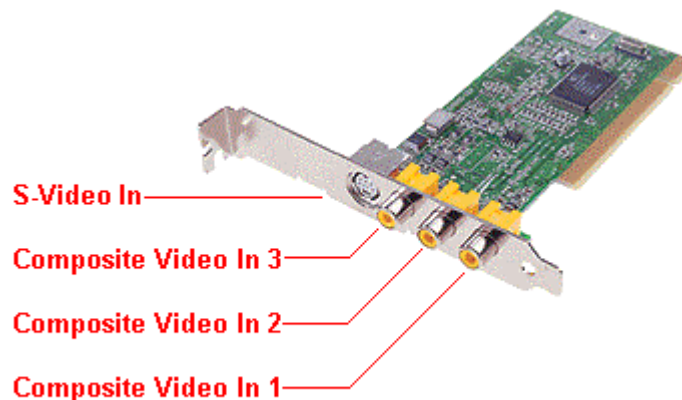
Connecting a Composite Source

Connecting an S-Video Source

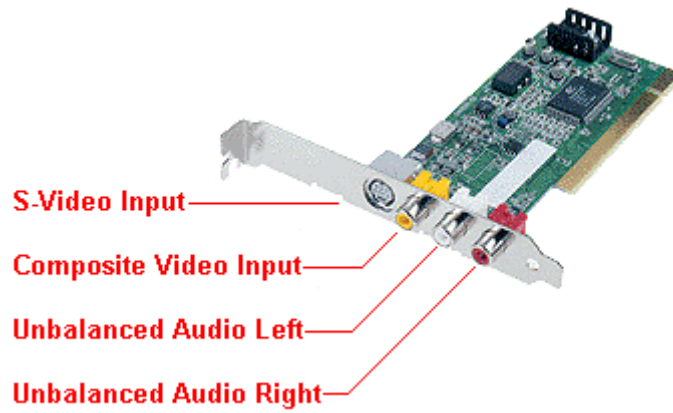
Connecting Audio with the Osprey-210, Osprey-220, or Osprey-230

The Osprey-210 and 220 now have the same connectors on the backplane for audio and video. The Osprey-210 has a new design to incorporate improvements to the board.

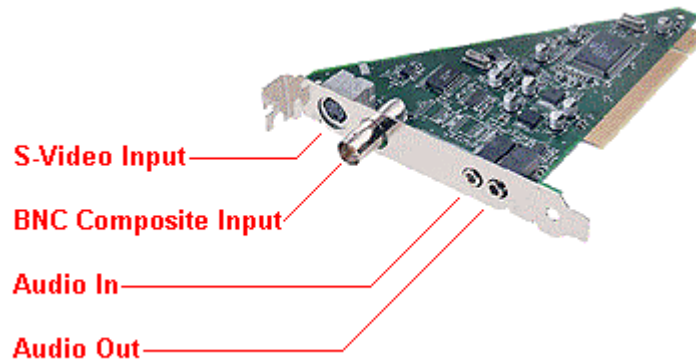
Osprey-100 Back plate



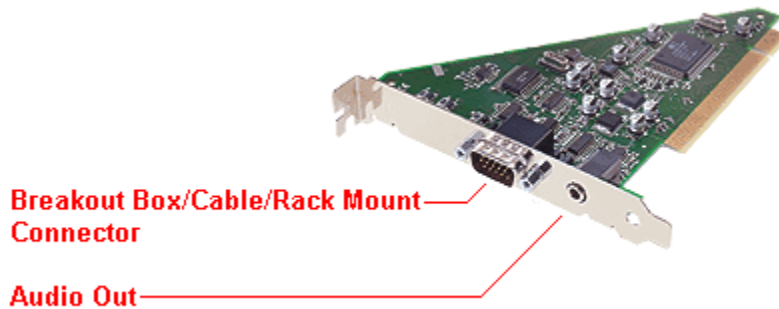
Osprey-200 Back plate



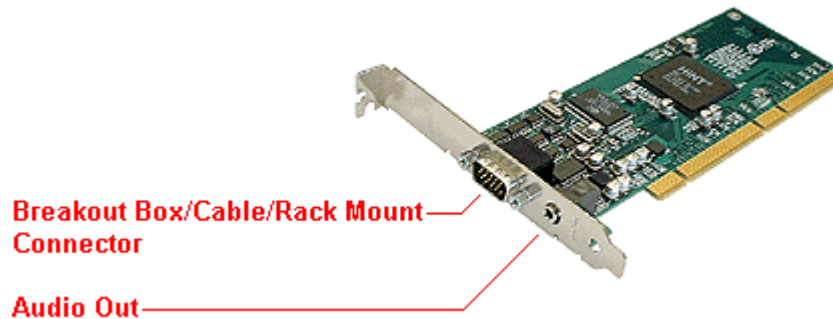
Osprey-210 Classic Back plate



Osprey-220 and redesigned Osprey-210 Back plate



Osprey-230 Back plate



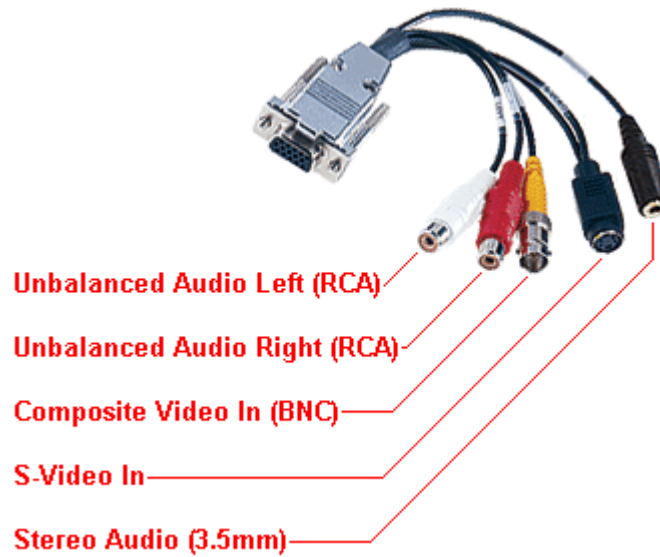
The Osprey-230 is assembled with a back plate for standard systems. However, the package also includes an additional back plate designed for low profile systems.



Do not try to utilize the low profile back plate in standard systems.

To use the low profile back plate, remove the standard back plate by removing the screws that connect the back plate to the board. Position the low profile back plate and replace the screws.

Osprey-210 Input Breakout Cable



The breakout connector has inputs for composite video, S-Video and unbalanced audio.



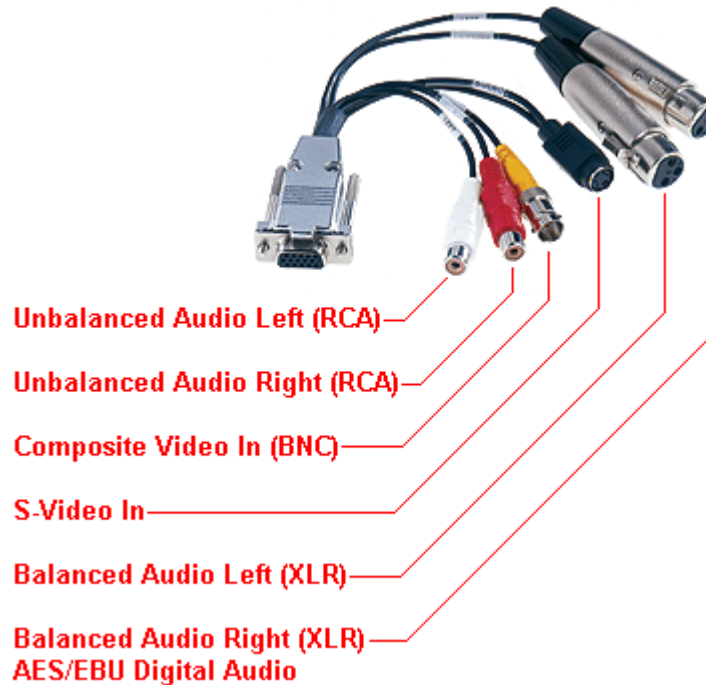
The Osprey-210 breakout cable includes three audio inputs. You should not connect an audio source simultaneously to all three connections. Either connect a stereo 3.5 mm cable to the input or an RCA-style audio cable.



The input breakout cable is ViewCast Part Number 34-05010-01.

Osprey-220 and Osprey-230 Input Breakout Cable

The Osprey-220 card previously included a breakout box. Now the breakout box has been replaced with the breakout cable.

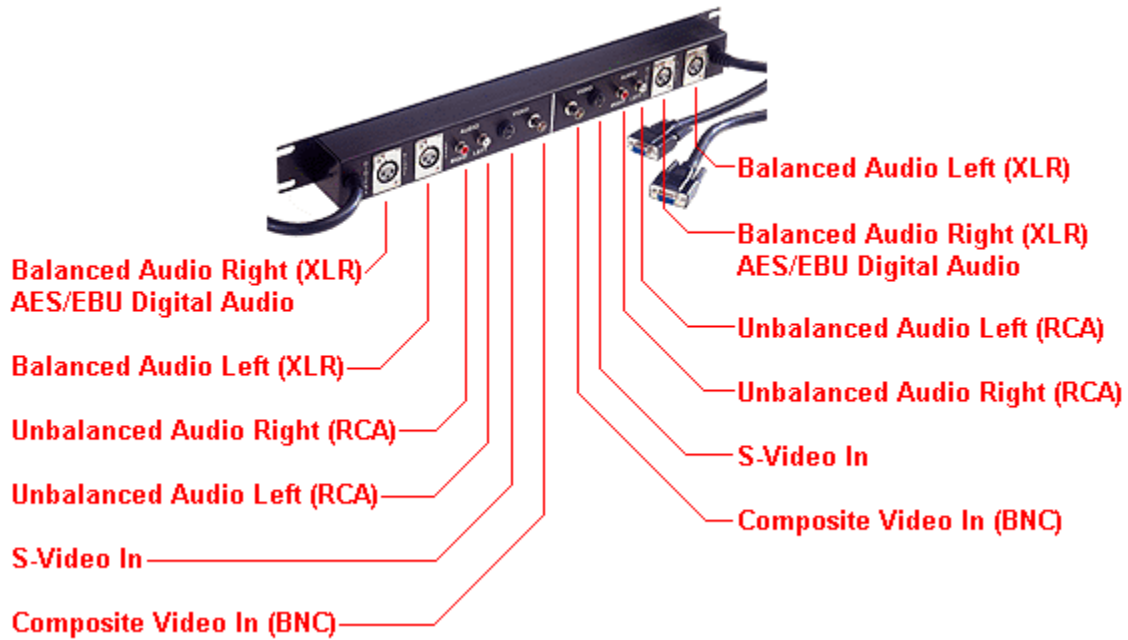


The breakout connector has inputs for composite video, S-Video, balanced and unbalanced audio, and professional digital audio. The breakout cable has a set (L/R) of unbalanced RCA style audio connectors and a set (L/R) of balanced (XLR) audio connectors. Additionally, the right XLR balanced input also is used as the professional digital audio input.



The input breakout cable is ViewCast Part Number 34-05009-01.

Osprey-220 and Osprey-230 Input Rack-mount Panel



A rack mount version of the breakout box is also available. The 1 unit high rack mount input box has the same inputs as the breakout box but includes two sets of inputs. Thus a single rack mount input unit provides for two Osprey-210, Osprey-220, or Osprey-230 cards. The rack mount unit is pictured above.



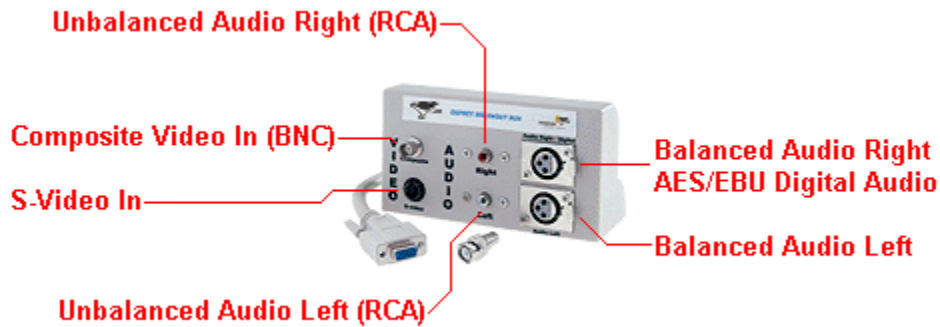
The rack-mount breakout box is ViewCast Part Number 95-00151-02.



Exact connector layouts are subject to change.

Osprey-220 Input Breakout Box

The Osprey-220 card previously included a breakout box. Now the breakout box has been replaced with the breakout cable.



The breakout connector has inputs for composite video, S-Video, balanced and unbalanced audio, and professional digital audio. The breakout cable/box has a set (L/R) of unbalanced RCA style audio connectors and a set (L/R) of balanced (XLR) audio connectors. Additionally, the right XLR balanced input also is used as the professional digital audio input for the Osprey-500 PRO and Osprey-500 DV PRO.



The input breakout box is ViewCast Part Number 95-00157-01.

Connecting a Composite Source

If your video source provides only composite video, connect the source's output cable to the Composite Video In connector.

Connecting an S-Video Source

If your video source supports S-Video, connect the source's output cable to the S-Video In connector. Compared to composite signals, S-Video provides a sharper image with better color separation. S-Video uses a four-pin mini-DIN connector that provides separate Y (luminance) and C (chrominance) signals. Refer to **Chapter 6 - Osprey-210, Osprey-220 and Osprey-230 Video Control Dialog** for instructions on configuring the driver for S-Video.

Connecting Audio with the Osprey-200, Osprey-210, Osprey-220, or Osprey-230

The Osprey-200, Osprey-210, Osprey-220 and Osprey-230 audio connectors are made for line level audio stereo equipment, such as VCR or DVD outputs and can also take headphone level outputs when the volume is adjusted midway between high and low settings. It should be noted that if you are using a camcorder or VCR with only a single audio output, the volume needs a slight adjustment.

Although the Osprey-200, Osprey-210, Osprey-220 and Osprey-230 accept line level inputs, the standard microphone shipped with most soundcards is not compatible. You need to use a powered microphone using connectors with 1-volt peak-to-peak output.

The following connector types are used on the boards:

- ◆ Osprey-200 – RCA-style connectors for left and right line-level audio
- ◆ Osprey-210 - 3.5 mm stereo connector and RCA-style connectors for line-level audio
- ◆ Osprey-220 and Osprey-230 - RCA-style connectors for left and right line-level audio

The selection of audio input to capture is independent of the video input selection.



The Osprey-210 breakout cable includes three audio inputs. You should not connect an audio source simultaneously to all three connections. Either connect a stereo 3.5 mm cable to the input or an RCA-style audio cable.

Chapter 3 – Installing the Software – Windows XP

The Osprey Multimedia Capture Card products contain a single CD for Windows 2000, Windows XP, Windows NT 4.0 and Windows 95/98. The Windows NT 4.0 and Windows 95/98 driver is an entirely separate driver that is not covered by this User's Guide.

After you've installed the software, you can test the card and software by running the included application program, SwiftCap.

Basics: Installing From CD

Basics: Downloading and Installing Updated Drivers

Two Installation Scenarios

Scenario 1: Osprey Card(s) not Physically Installed in the PC

Scenario 2: Osprey Card(s) Physically Installed, but Osprey Software not Installed

Testing the Installation

Uninstalling the Software

Basics: Installing From CD

1. Insert the Osprey CD into your CDROM drive. The installation instructions assume this is the "D:" drive. Substitute the proper drive name as it appears on your system where appropriate.
2. Run the installation program:
 - a. Click the **Start** button.
 - b. Click **Run....**
 - c. Enter **d:\winxp\setup.exe** in the dialog box.
 - d. Click **OK**.

Basics: Downloading and Installing Updated Drivers

1. The latest software drivers for Osprey Multimedia Capture Cards are available via FTP (file transfer protocol), at the following locations:
<ftp://ftp.ospreyvideo.com/pub/OSP-200/winXP/latest>

The same driver is used for the all of the Multimedia Capture Cards so these links point to the same download file.

There are also links to the drivers from our web site,
<http://www.ospreyvideo.com/>

2. Use your web browser, such as Microsoft Internet Explorer or Netscape Navigator, to find our FTP site and download the file. Type the FTP address shown above into the address box at the top of your browser window. You may find it simpler to type just the first part of the address - **ftp://ftp.ospreyvideo.com** - and then click on the list of directories that display until you have reached the **...winXP/latest** location. Refer to your browser's help files for more specific and detailed assistance.
3. Download the web package file in **...winXP/latest** to your hard disk.
4. Run the web package program:
 - a. Click the **Start** button.
 - b. Click **Run...**
 - c. Enter *<pathname>* in the dialog box, where *<pathname>* is the location and name of the file that you have downloaded.
 - d. Click **OK**.
 - e. The program prompts you for a temporary location to unpack the install files to.



These files are not be automatically deleted after setup has run. This is so that you can perform the manual Plug and Play install if you want to. So make a note of where these files are located, and delete them after the install if you want to conserve disk space.

Two Installation Scenarios

There are three main situations that might apply to you:

Scenario 1: Osprey Card(s) not Physically Installed in the PC

Scenario 2: Osprey Card(s) Physically Installed, but Osprey Software not Installed

In all cases, the most efficient and complete installation method is to run the **setup.exe** program on the product CD or in the web package that you downloaded. The setup program automates the Plug and Play steps required to install the drivers and ensures that they are performed correctly. It also installs the bundled applets and *User's Guide*. If you have multiple Osprey capture cards in the system it configures all of the boards at the same time.



You can skip the detailed instructions if you are upgrading from one Osprey driver version to another. Just run the setup.exe file, and all the updated components will be installed.

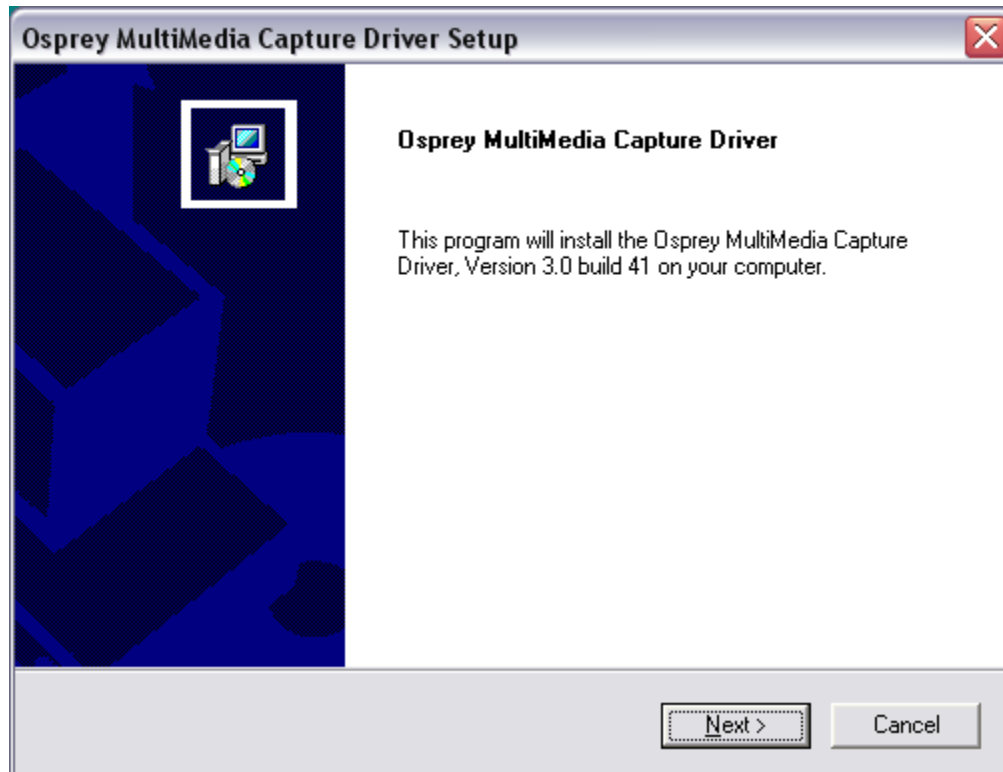
Scenario 1: Osprey Card(s) not Physically Installed in the PC

This is the method that we recommend if you are installing an Osprey card for the first time on a system, and the Osprey software has not yet been installed. This scenario is called the "Preinstall Scenario". After the install is run, as soon as an Osprey card is installed in the PC, it is detected and its drivers are started automatically.

To preinstall the Osprey drivers:

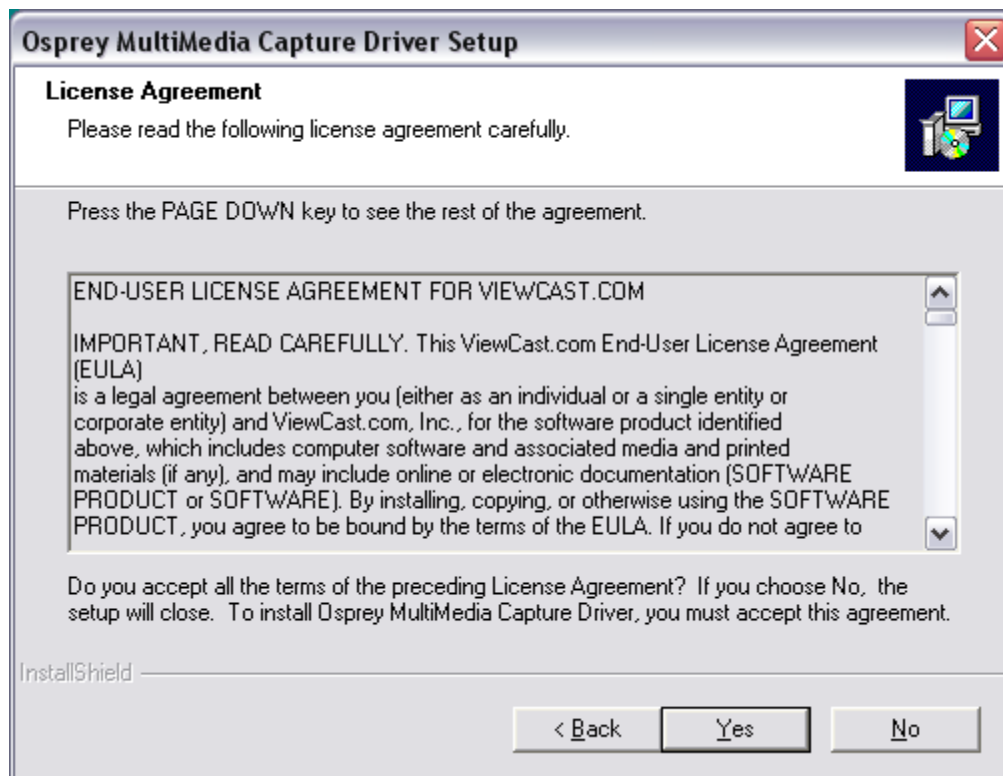
6. Using Windows Explorer, locate and access the CD-ROM drive containing the Osprey Installation CD-ROM.
7. Navigate to the **WINXP** directory.
8. Double-click **SETUP.EXE**.

The Osprey Multimedia Capture Driver window displays.



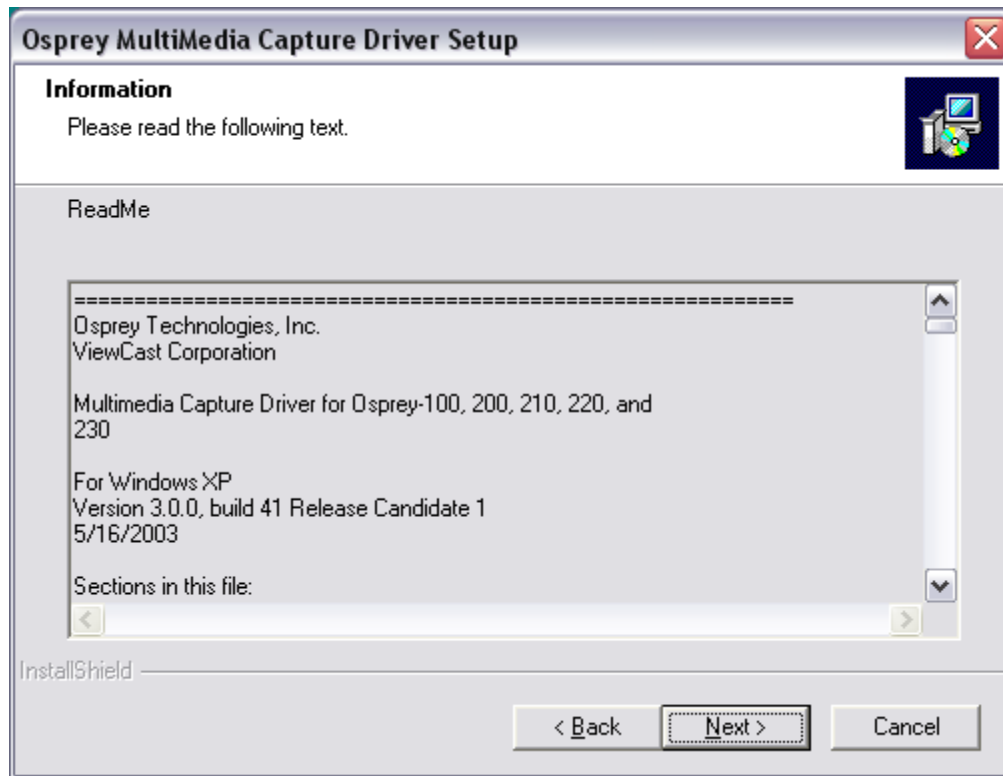
9. Click **Next**.

The Software License Agreement window displays.



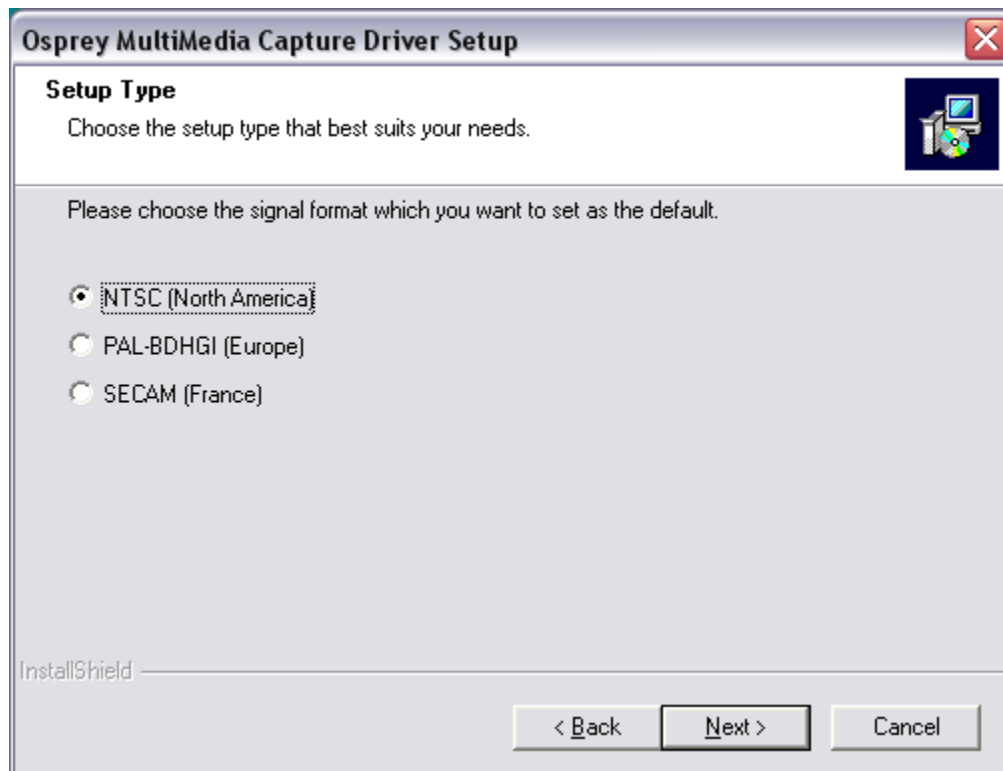
10. Click **Yes** to accept the End User Software Agreement. If you do not wish to accept the agreement, click **No** to terminate the installation routine.

The Information window displays.

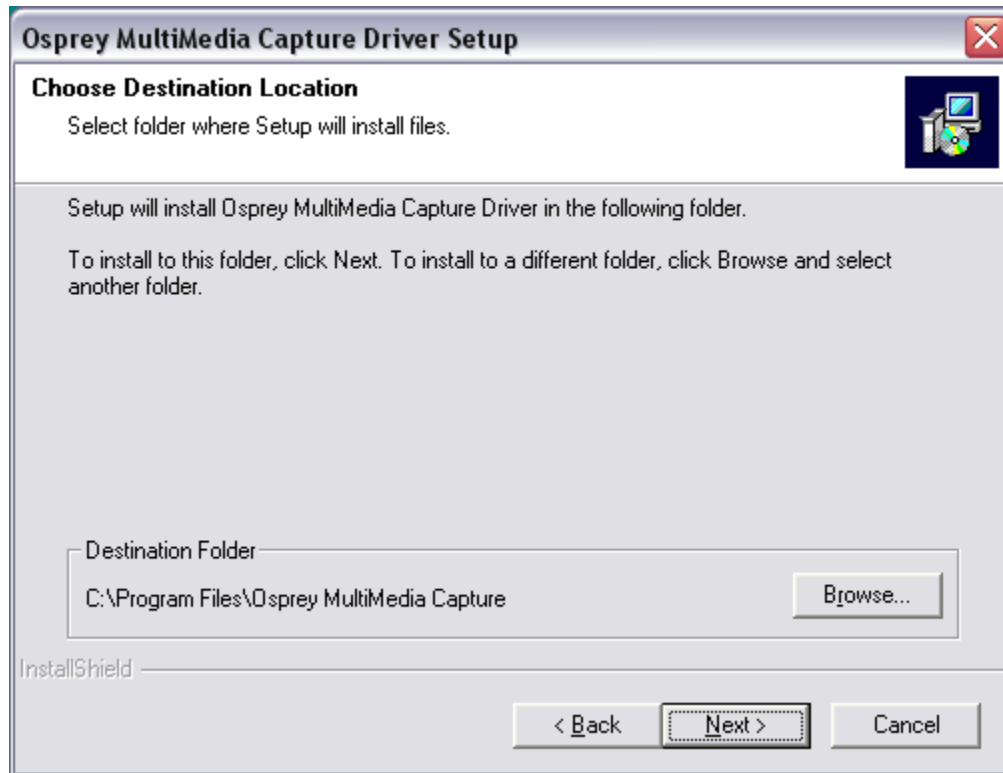


11. Click Next.

The Select Components window displays.

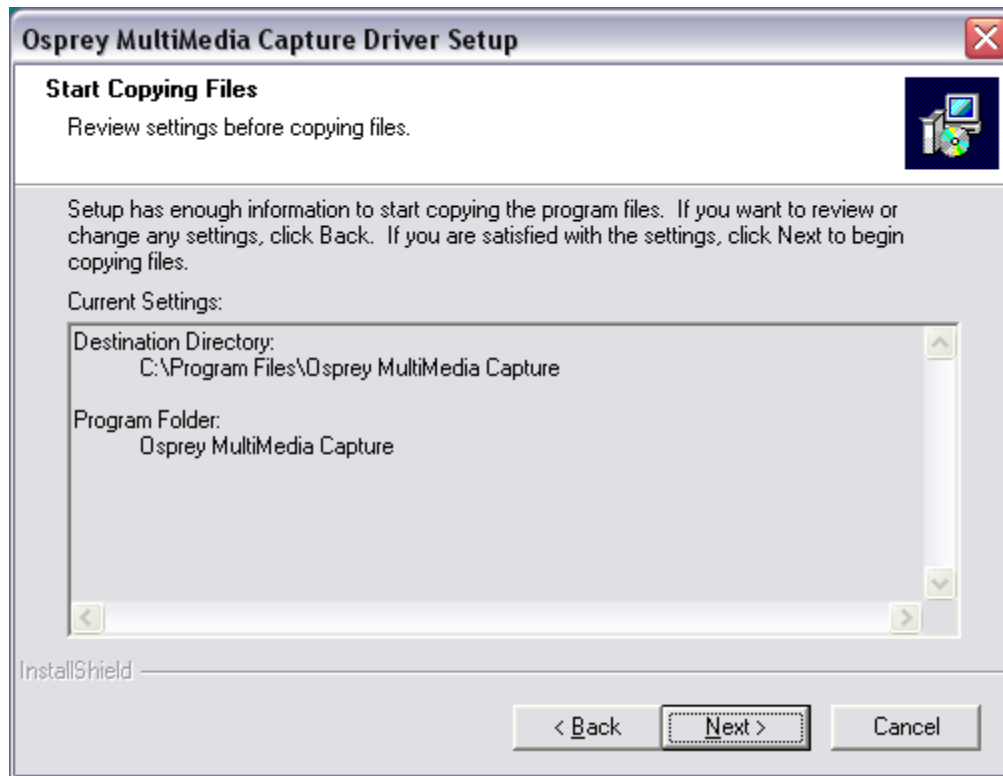


12. Click the radio button to select the default signal format. See **Video Standard** for more information about signal formats.
13. Click Next.
The Choose Destination Location window displays.



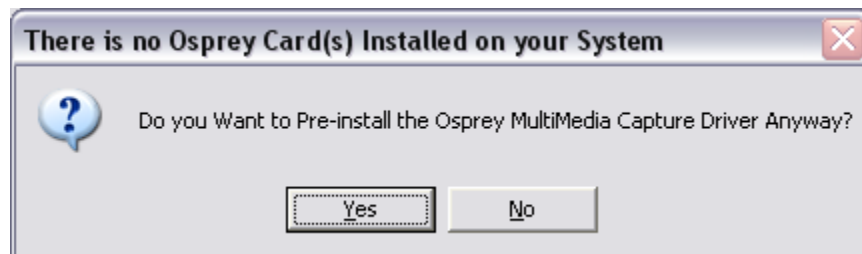
14. If you wish to change the destination location for the files, click **Browse**. Click **Next**.

The Start Copying Files window displays.



15. Click **Next**.

The Pre-installation question window displays.



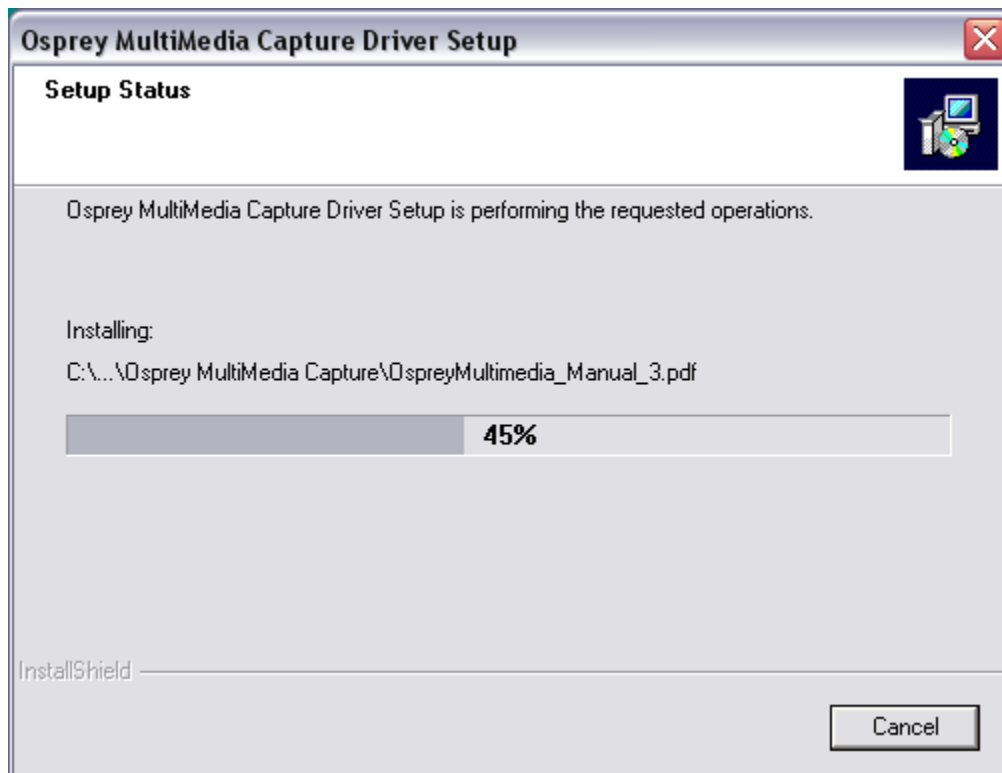
16. Click **Yes**.

The Hardware Installation window displays.



17. Click **Continue Anyway**. (This window will only be displayed on drivers that have not been WHQL Certified; WHQL Certified drivers will skip this step)

The files begin copying to the computer.

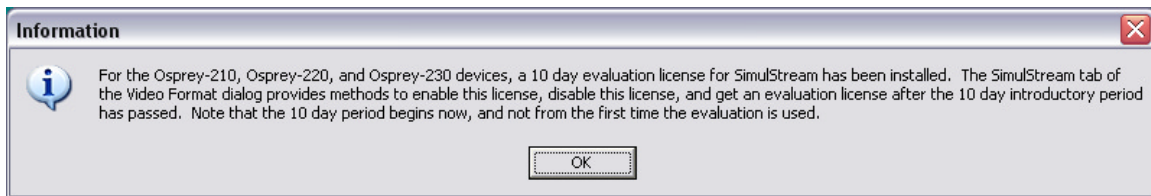


The ViewCast Corporation/Osprey Video Division Special Offers Shortcut window displays.



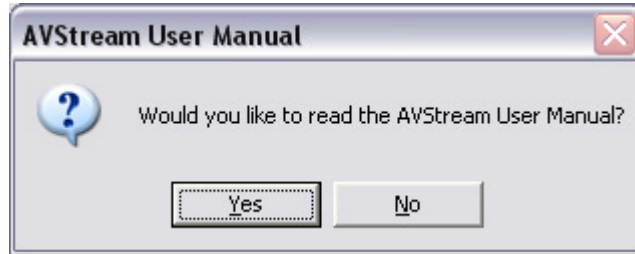
18.	If you would ...	then ...
	like a shortcut installed on your desktop,	click Yes . <i>A shortcut is created on the desktop.</i>
	not like a shortcut installed on your desktop,	click No . A Special Offers link is also available on the Programs menu.

An information window displays.



19. Click **OK** to continue the installation.

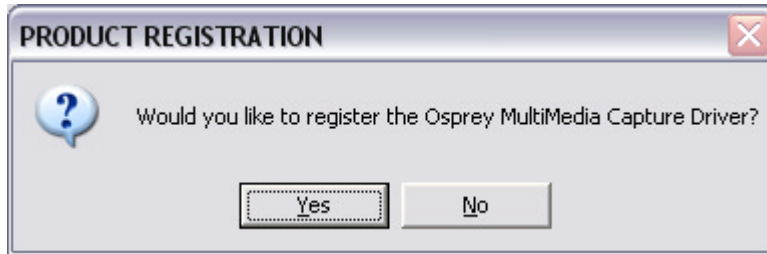
The AVStream User Manual window displays



20.	If you would ...	then ...
	like to view the AVStream User Manual,	click Yes . <i>An Acrobat Reader window opens.</i>
	not like to view the AVStream User Manual,	click No . An AVStream User Manual link is also available on the Programs menu.

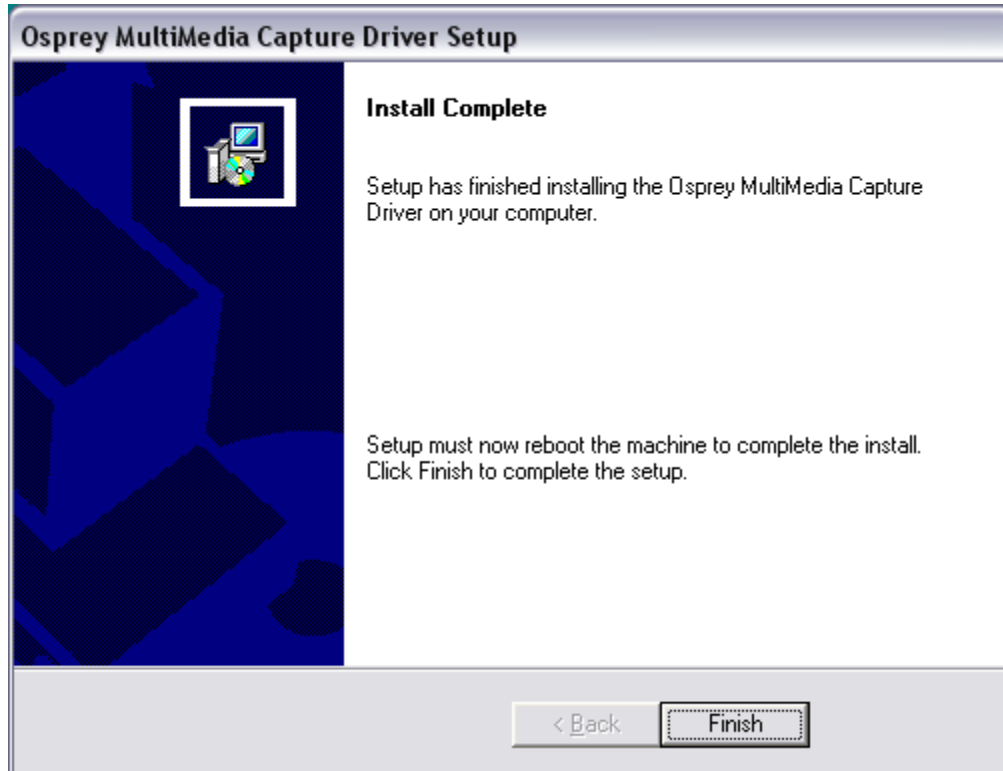
21. Click **OK**.

The Product Registration window displays.



22.	If you would ...	then ...
	like to register your Osprey Multimedia Capture card,	click Yes . <i>A browser window opens.</i>
	not like to register your Osprey Multimedia Capture card,	click No . A product registration link is also available on the Programs menu or on the Osprey Video web site (http://www.ospreyvideo.com/)

The Setup Complete window displays.



23. Click **Finish**.



When you start your computer after physically installing the Osprey hardware, the Found New Hardware Wizard runs upon detecting new hardware. The sequence of windows are similar to that in [Appendix H - Adding/Moving Boards in Windows 2000 and XP](#).

Scenario 2: Osprey Card(s) Physically Installed, but Osprey Software not Installed

In this case you have two options:

Option A: Run the Installation Program (Recommended)

Option B: Use the New Hardware Found Wizard (Not Recommended)

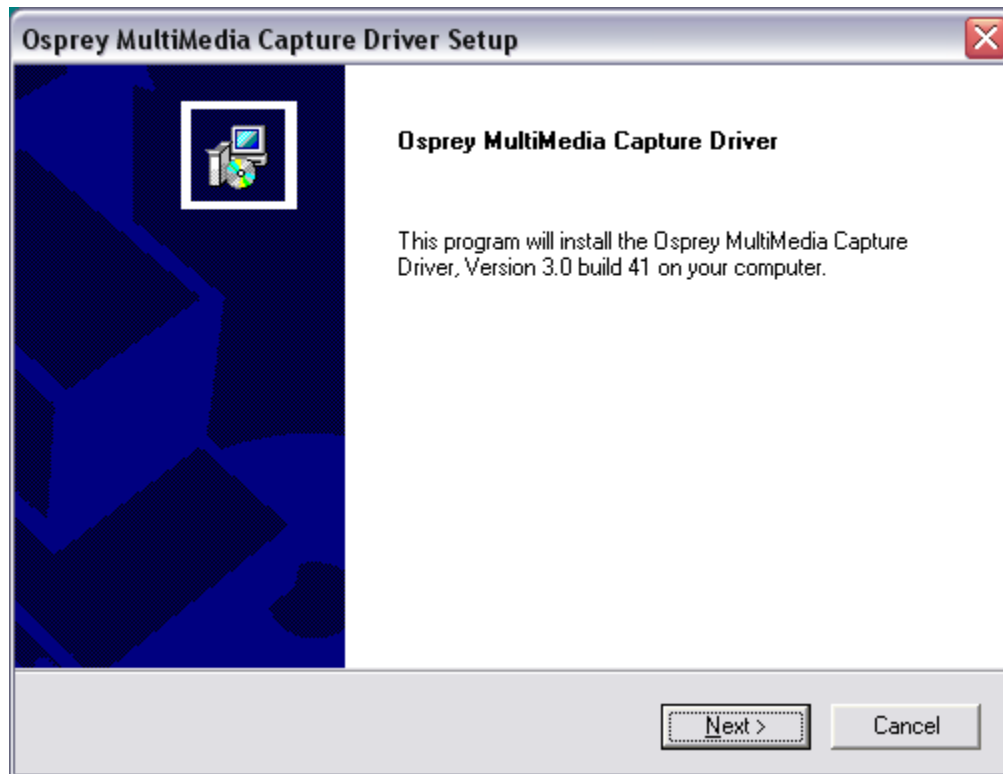
Option A: Run the Installation Program (Recommended)

When Windows XP is first started for the first time after the Osprey card is installed, the *New Hardware Found* wizard displays one or more times. Cancel out of these wizards. After Windows XP has finished starting, perform the following steps.

To install the Osprey drivers:

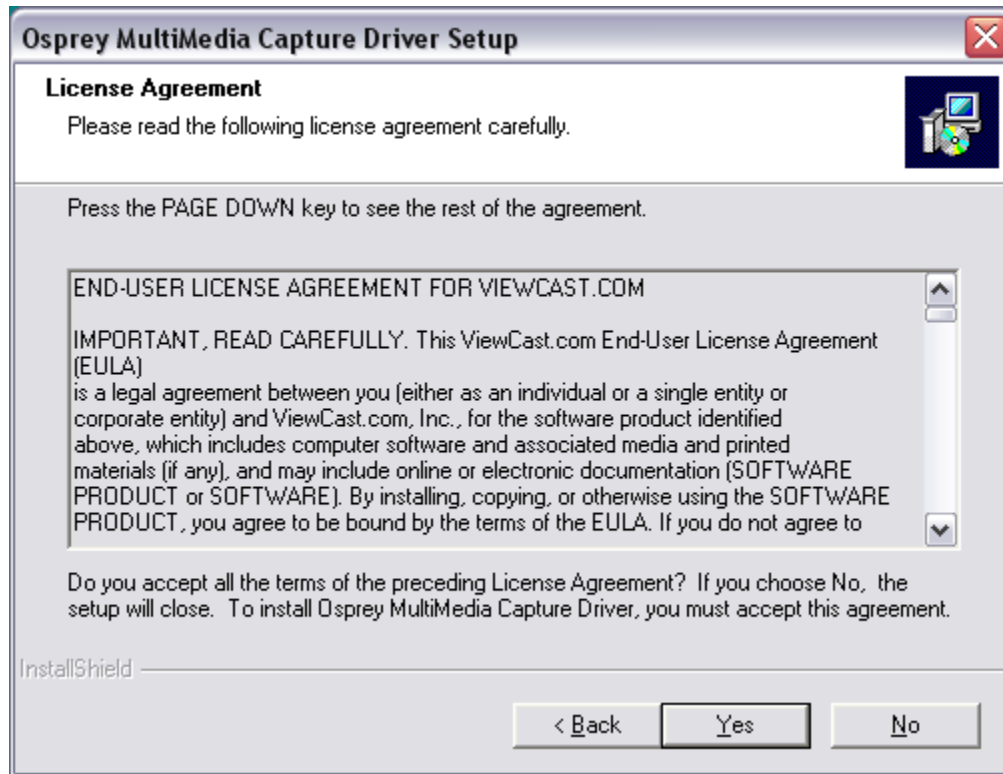
25. Using Windows Explorer, locate and access the CD-ROM drive containing the Osprey Installation CD-ROM.
26. Navigate to the **WINXP** directory.
27. Double-click **SETUP.EXE**.

The Osprey Multimedia Capture Driver window displays.



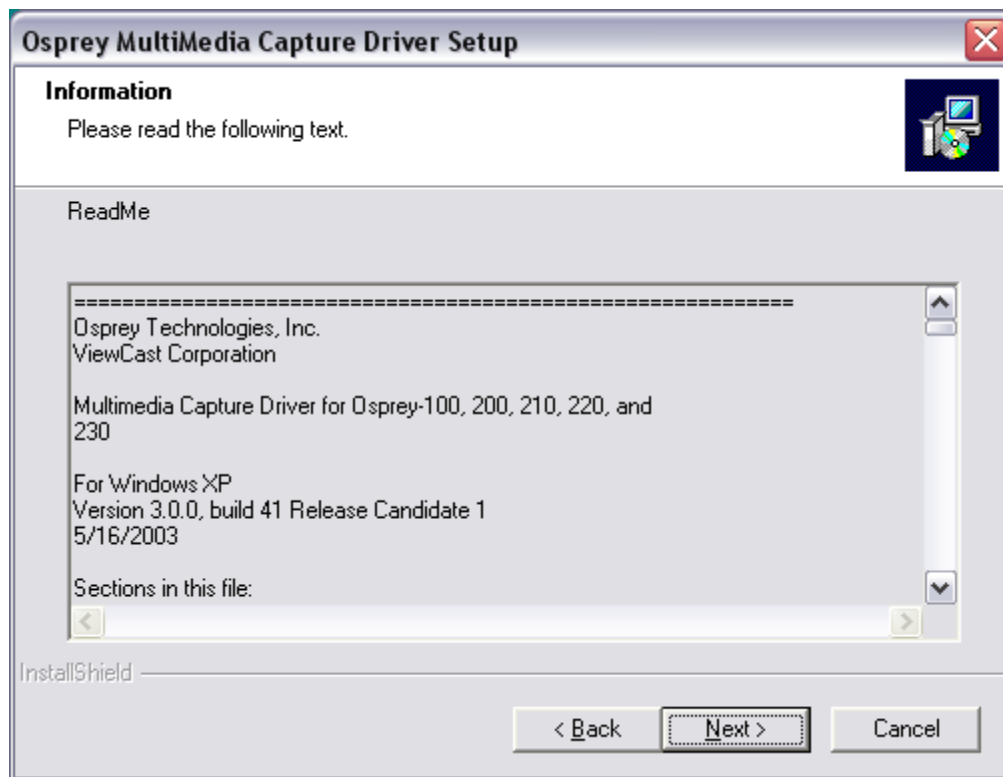
28. Click **Next**.

The Software License Agreement window displays.



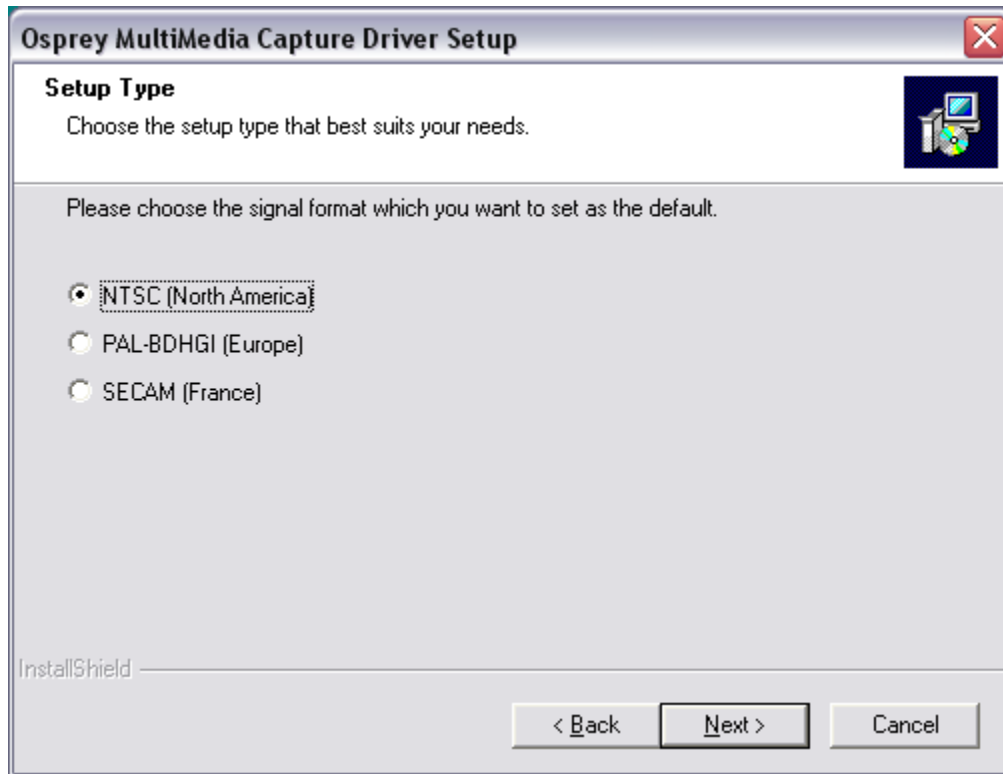
29. Click **Yes** to accept the End User Software Agreement. If you do not wish to accept the agreement, click **No** to terminate the installation routine.

The Information window displays.



30. Click Next.

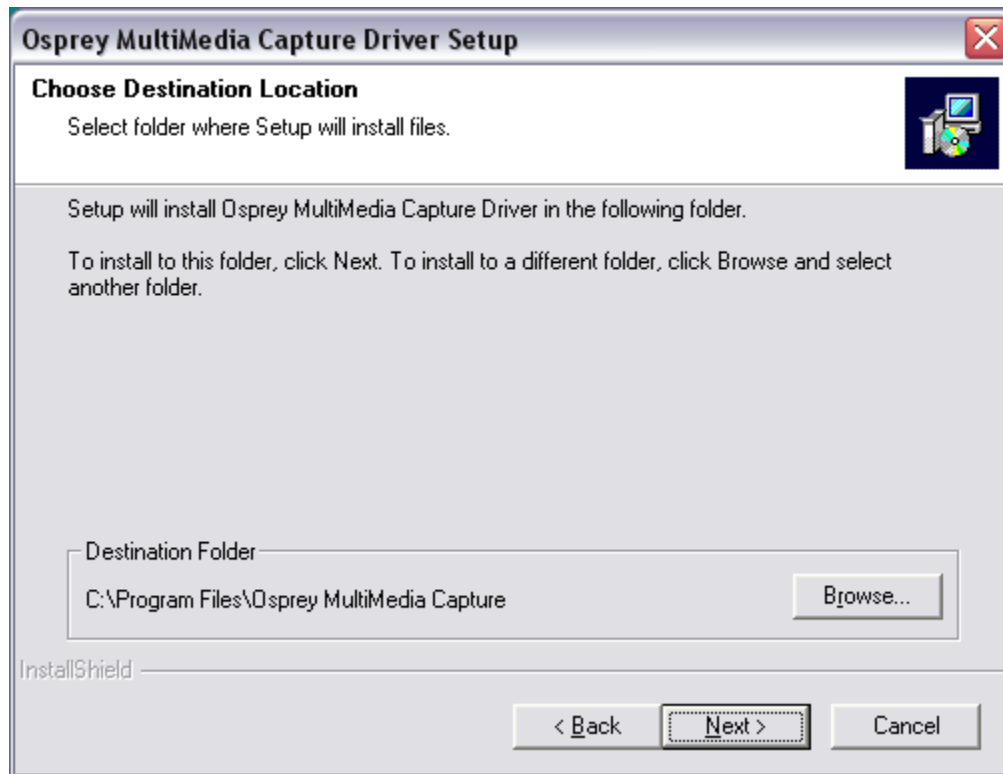
The Select Components window displays.



31. Click the radio button to select the default signal format. See [Video Standard](#) for more information about signal formats.

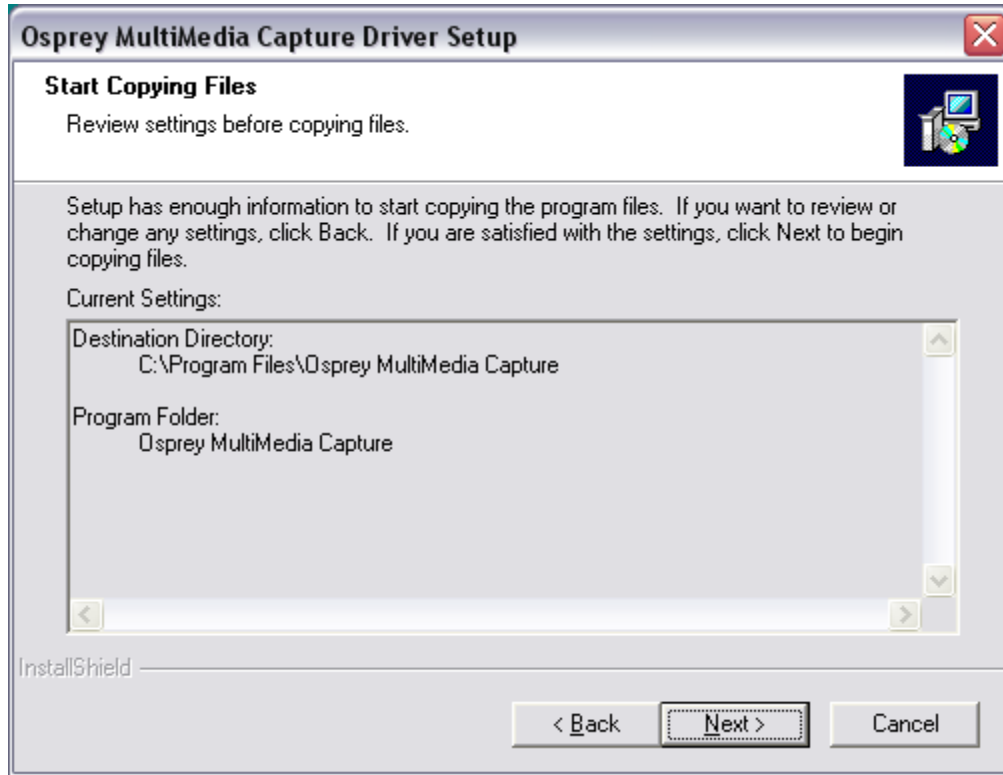
32. Click Next.

The Choose Destination Location window displays.



33. If you wish to change the destination location for the files, click **Browse**.
34. Click **Next**.

The Start Copying Files window displays.



35. Click **Next**.

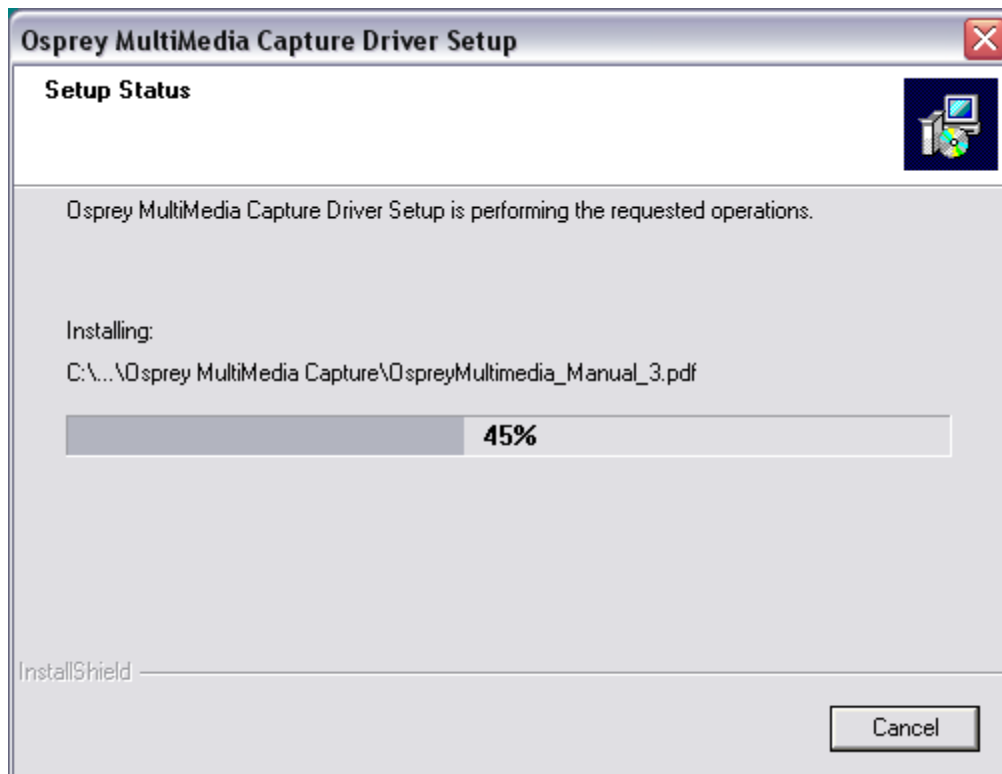
The Hardware Installation window displays.



36. Click **Continue Anyway**. (This window will only be displayed on drivers that have not been WHQL Certified; WHQL Certified drivers will skip this step)
The Hardware Installation window displays.



37. Click **Continue Anyway**. (This window will only be displayed on drivers that have not been WHQL Certified; WHQL Certified drivers will skip this step)
The files begin copying to the computer.

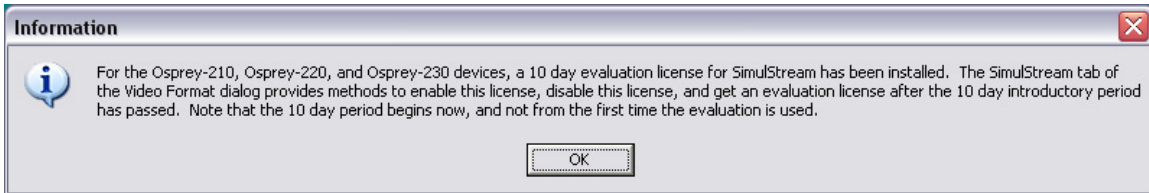


The ViewCast Corporation/Osprey Video Division Special Offers Shortcut window displays.



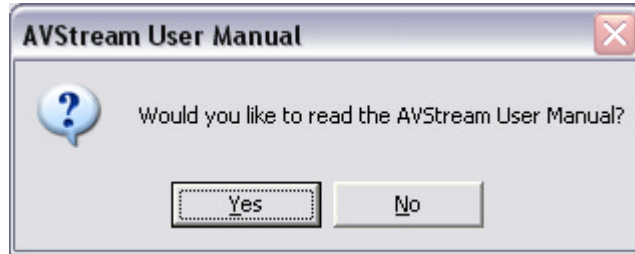
38.	If you would ...	then ...
	like a shortcut installed on your desktop,	click Yes . <i>A shortcut is created on the desktop.</i>
	not like a shortcut installed on your desktop,	click No . A Special Offers link is also available on the Programs menu.

An information window displays.



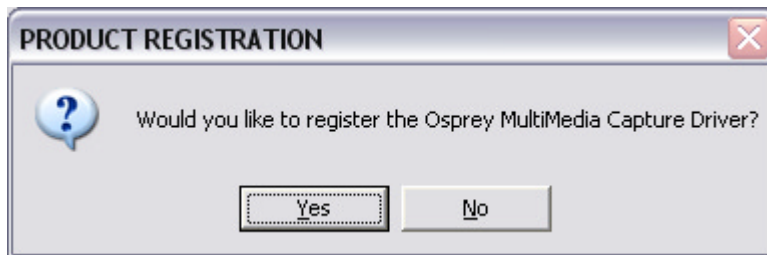
39. Click **Next**.

The AVStream User Manual window displays



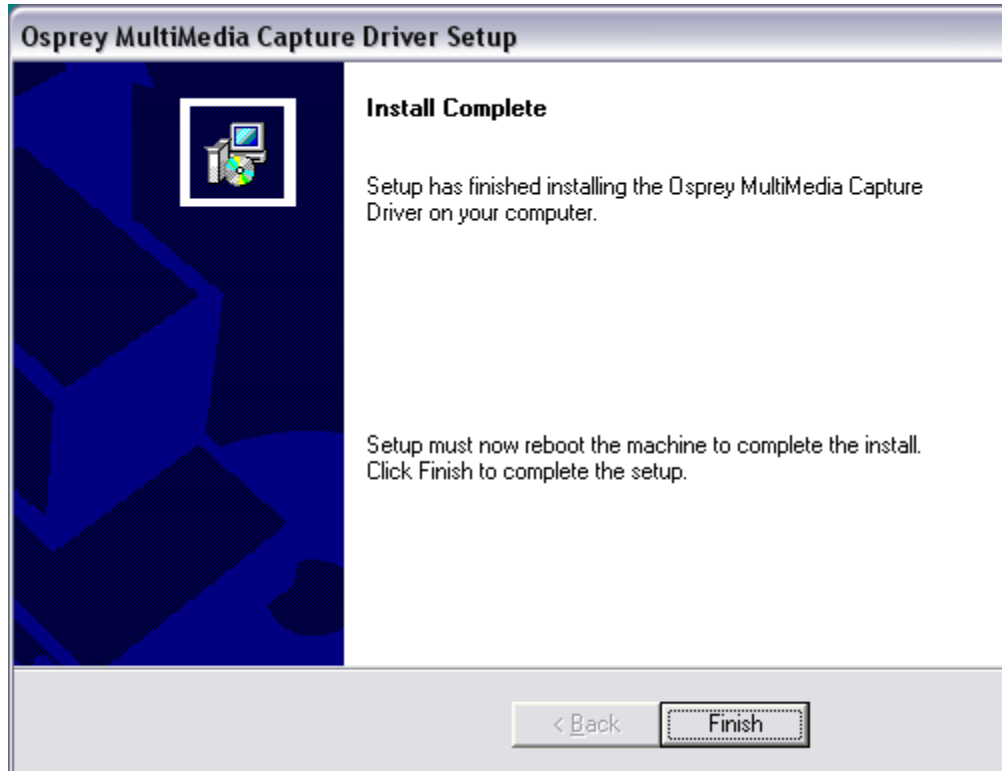
40.	If you would ...	then ...
	like to view the AVStream User Manual,	click Yes . <i>An Acrobat Reader window opens.</i>
	not like to view the AVStream User Manual,	click No . An AVStream User Manual link is also available on the Programs menu.

The Product Registration window displays.



41.	If you would ...	then ...
	like to register your Osprey Multimedia Capture card,	click Yes . <i>A browser window opens.</i>
	not like to register your Osprey Multimedia Capture card,	click No . A product registration link is also available on the Programs menu or on the Osprey Video web site (http://www.ospreyvideo.com/)

The Setup Complete window displays.



42. Click **Finish** to restart the computer.



You must restart your computer to complete the installation. Do not attempt to use your Osprey card until after restarting the system.

Option B: Use the New Hardware Found Wizard (Not Recommended)

This method is more complicated than Option A. It is particularly inconvenient if you are installing multiple cards at once, since each card has to be set up separately.

When Windows XP starts, it detects the new card(s) and starts the *Found New Hardware* wizard.



For all **Osprey-100, 101, 200, 210 and 220 cards**, the *Wizard* detects two logical devices for each card - a *Multimedia Video Controller* device and a *Multimedia Controller* or *Osprey Function 1 Placeholder* device. The

Multimedia Video Controller is the video section of the Osprey video/audio capture device; the *Multimedia Controller* is the audio section; the *Osprey Function 1 Placeholder* is present on Osprey-100 and 101 cards, and is a method for telling Windows XP that this is a video-only device. The audio logical device may be present on some Osprey-100 and Osprey-101 cards that have video or power connectors in place of the audio inputs.

When the *Found New Hardware Wizard* detects a device:

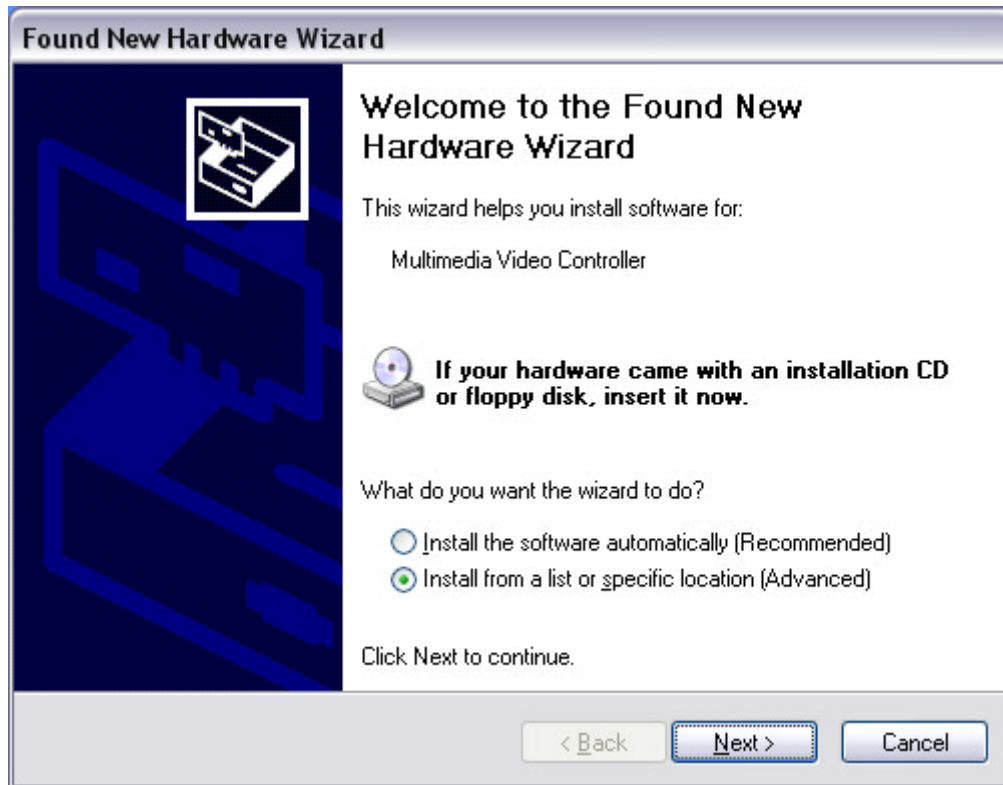


Please note the terminology in the Wizard. It displays either *Multimedia Video Controller* or *Multimedia Controller*.

The *Found New Hardware Wizard* first detects one of the following 3 devices:

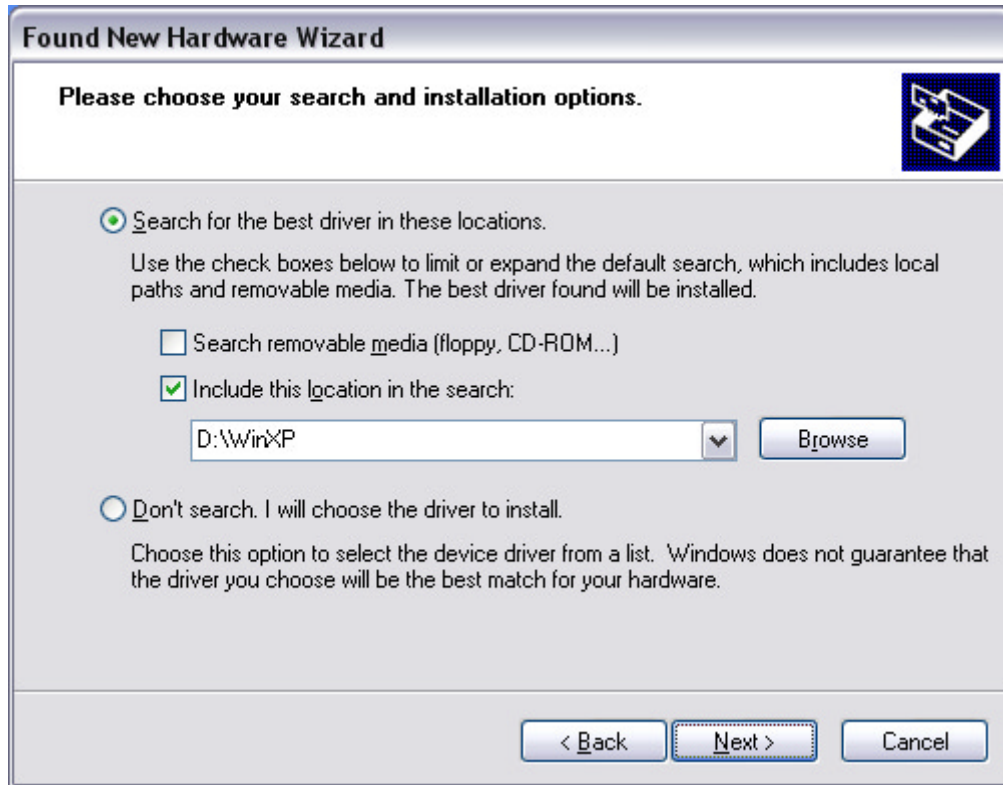
- ◆ Osprey Video Capture Device
- ◆ Osprey Audio Capture Device
- ◆ Osprey Function 1 Placeholder

The Found New Hardware Wizard window displays.



1. Click to select **Install from a list or specific location** and click **Next** to continue.

The Found New Hardware Wizard window displays.

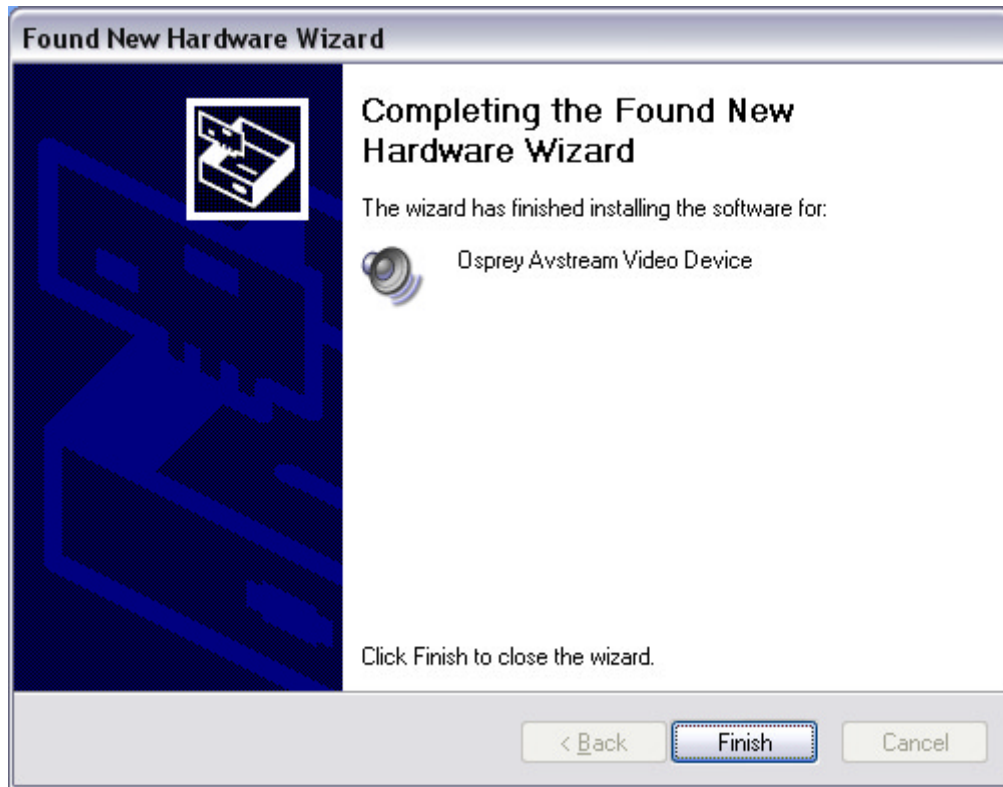


2. Click to select **Search for the best driver in these locations**.
3. Click to select the checkbox **Include this location in the search**, and type in the drive letter of your CD-ROM drive followed by "\WinXP" to provide the location of the Windows XP driver on your distribution CD.
4. Click **Next** to continue.

The Please wait while the wizard searches... window displays briefly, and then is covered by the Hardware Installation window.



5. Click **Continue Anyway**. (This window will only be displayed on drivers that have not been WHQL Certified; WHQL Certified drivers will skip this step)
The Setting System Restore Point window displays briefly, and then is replaced by the Completing the Found New Hardware Wizard window.



6. Click **Finish**.
Next the Wizard finds and installs the audio portion of the device.

The Found New Hardware Wizard window displays.

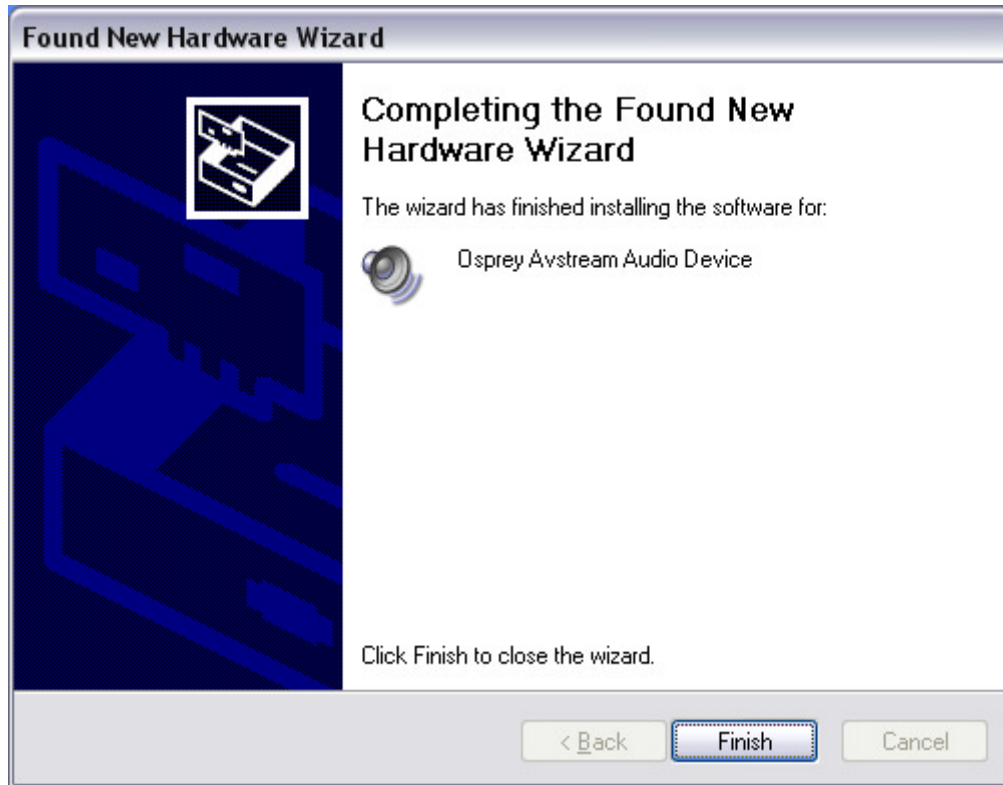


7. Click to select **Install the software automatically** and click **Next** to continue.

The Hardware Installation window displays.



8. Click **Continue Anyway**. (This window will only be displayed on drivers that have not been WHQL Certified; WHQL Certified drivers will skip this step)
The Completing the Found New Hardware Wizard window displays.



Click **Finish**.



If you are installing a single Osprey card, you do not need to restart the computer. If you are installing more than one Osprey card, you are required to restart the computer.

After completing the Found New Hardware Wizard, the applications for the Osprey driver must also be installed. To do this, navigate to the directory containing the Windows XP driver for your Osprey card, and run **SETUP.EXE**. For detailed steps, please refer to **Option A: Run the Installation Program (Recommended)**.

Testing the Installation

1. Verify the hardware installation is complete, in accordance with the directions in **Chapter 2**.
2. Connect a camera, VCR, or other video signal source to the Osprey card's connectors.
3. Open the Osprey Multimedia Capture group in the Start menu.
4. Click the **SwiftCap** icon.
5. Verify the screen displays a still video frame from the Osprey card. Click the **Preview** button. The screen should display moving video frames.
6. If the video area is a plain blue field, it could be for one of the following reasons:
 - f. The driver is looking for video on the wrong input connector. You can either move the video cable to another connector, or reconfigure the driver using its Control Dialog (refer to **Chapter 6 - Osprey-210, Osprey-220 and Osprey-230 Video Control Dialog**).
 - g. The video source is not turned on or activated.
7. If the video area is scrambled or has bad color, the signal format of your video source may be different from the signal format selected in the driver software. Since the driver defaults to NTSC-M signal format, users of PAL and SECAM equipment always need to change the driver's signal format the first time they run the driver. Please see **Video Standard** in **Chapter 6 - Osprey-210, Osprey-220 and Osprey-230 Video Control Dialog**.

Uninstalling the Software

If you ever need to remove the Osprey driver from your system, proceed as follows:

1. Open the Control Panel.
2. Double-click Add/Remove Programs.
3. Click to select Change or Remove Programs.
4. Highlight the Osprey Multimedia Capture Driver entry.
5. Click Change/Remove in the Osprey entry.
The uninstall program begins.
6. Click **Yes** to proceed.
7. Click **OK** when the process is complete.
8. Reboot your computer to complete the uninstall process.

Chapter 4 – Video Driver Properties

Overview: Filters, Pins, FilterGraphs, and Properties

In DirectShow the words “Filter” and “Pin” are frequently used.

A “Filter” is a component that performs a processing step on an audio or video (or closed caption, or VBI...) stream. A video capture device such as the Osprey AVStream driver is a filter that has associated hardware. Other types of filters such as compressors, mixers, and renderers are software-only – they have no associated hardware.

A filter has input and / or output “Pins” where multimedia streams enter and exit.

A “FilterGraph” is a set of filters connected together with their pins. All DirectShow applications create an implied, invisible filtergraph to carry out their functions. The GraphEdit developers’ application takes this a step further by showing the organization of the filtergraph visually. The screenshot below shows the simplest possible filtergraph based on the Osprey AVStream driver, displaying Preview video on the screen.



Both filters and pins may have associated “Properties”. Properties are control parameters that can be read from or written to the component. As a user, you interact with them as visual “Property Sheets”, or “Property Pages”, or “Tabs” that are part of a tabbed dialog. If you are a programmer, you might set properties directly from the code of your application.

The block labeled “Osprey-220 Device 1” in the center of the filtergraph is the Osprey capture filter, and the “Filter Properties” about to be described are the properties and controls for that component. On the o200avs cap filter there are four pins. Two of these pins, Capture and Preview, have associated user-settable properties that are described below in the section entitled “Pin Properties”.

The block labeled “Osprey Crossbar” performs input selection for the driver. The main Osprey capture filter has an “Input” property sheet that performs the same input selection function.

Osprey Video Capture Device Properties

Selecting the Device

If you have multiple audio/video capture devices installed, the Filter Properties are organized on a per-device basis. The Filter Properties that are displayed are for the currently selected device.

Windows Media Encoder 9:

- In the View menu, select Properties Panel.
- Make sure that under Source from:, the Devices radio button is selected.
- Check Video:
- Select the device you want from the Video: drop box.
- Check Audio: and select the audio device you want from the Audio: drop box.

Helix Producer Plus:

- Click the Devices radio button at the left of the main window.
- Select the desired devices using the drop boxes on the left half of the main window labeled “Audio:” and “Video:”.

SwiftCap:

- Pull down the Capture menu, select Settings...
- Select the device from the drop list in the upper left corner of the Capture Settings dialog box.

Real Producer 8, VidCap32, and other Video for Windows applications:

Refer to Using the Osprey AVStream Driver with Video for Windows Applications, below.

Accessing the Property Pages

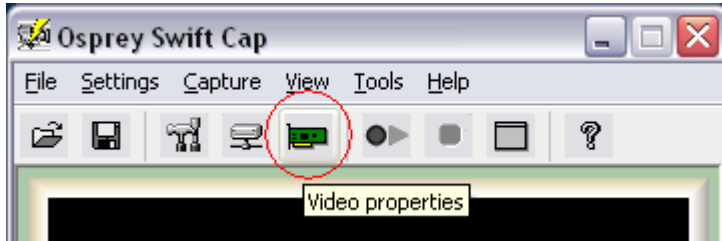
From Windows Media Encoder 9:

- In the View menu, select Properties Panel.
- Click the Configure... button to the right of the video device name.
- You can select the input to the device directly from the ensuing dialog. For other device settings, click the Video Properties button.

From Helix Producer Plus:

- For audio, click “Settings” to the right of the “Audio:” drop box, and select “Vendor-Provided Controls” from the drop list.
- For video, click “Settings” to the right of the “Video:” drop box. Select “DirectShow Filter Video Capture” from the drop list to set up the Osprey device. Select “DirectShow Pin” to set up the capture pin on the Osprey device. Set up “DirectShow Filter Video Capture” the way you want it before you set up the capture pin.

From SwiftCap:



- Click the Video Properties toolbar icon.

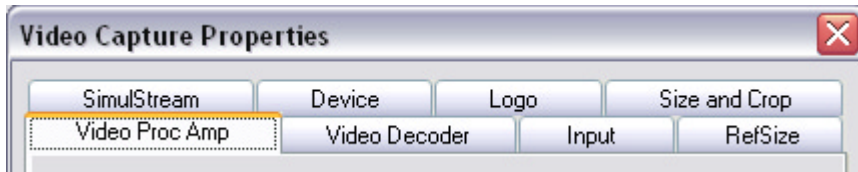
From Real Producer 8, VidCap32, and other Video for Windows applications:

Refer to *Using the Osprey AVStream Driver with Video for Windows Applications*, below.

Common Dialog Features

The Properties are organized as tabs or pages in a dialog box entitled o200avs cap Properties. The tabs are as follows:

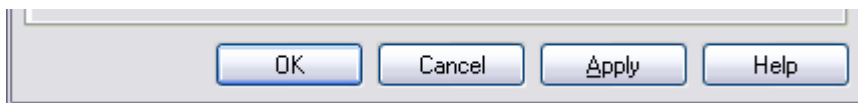
Note that these property tabs are not where you set frame size and frame rate. These are part of the “pin properties”, and are explained in *Pin Properties*, below.



The tabs across the top of the Filter Properties Dialog select the specific “tabs”, or “property sheets”, or “pages” described below.

- **Video Proc Amp** – set brightness, contrast, saturation, hue.
- **Video Decoder** – select the video standard – NTSC, PAL, SECAM.
- **Input** – select the video input and NTSC / PAL / SECAM video standard.
- **Device** – miscellaneous, less frequently used controls.
- **RefSize** – set the reference size for cropping.
- **Size and Crop** – set output size, enable cropping, set cropping rectangle.
- **Logo** – set up on-video logos.
- **SimulStream** – control the SimulStream option.

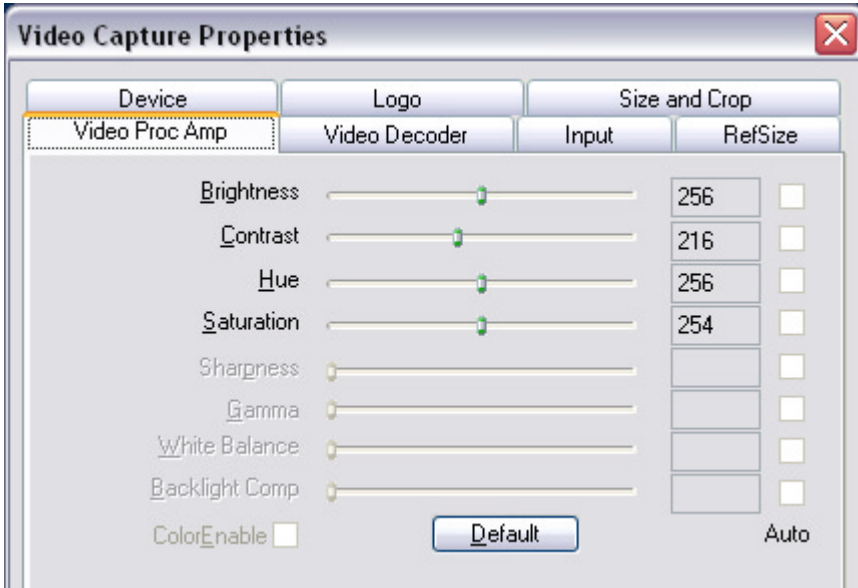
On some systems you may see additional tabs besides the six shown above. The additional tabs are system-supplied, for-your-information only, and contain no controls that you can set.



- The **OK** button commits the changes you have made on the currently displayed page, and exits the dialog.
- The **Cancel** button exits the dialog without committing the changes you have made on the currently displayed page. Changes made before the most recent click of the Apply button are not cancelled.
- The **Apply** button commits the changes you have made on the currently displayed page, without exiting the dialog.
- The **Help** button accesses online help.

Note that the **OK** and **Apply** buttons commit only the changes on the currently displayed page. To set changes on three different pages you would have to click Apply twice and OK once.

The Video Proc Amp Tab

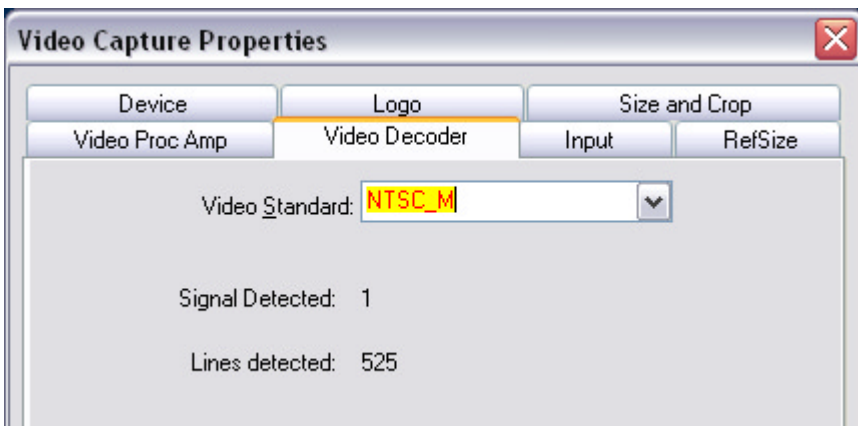


Use the four slider controls to set Brightness, Contrast, Hue, and Saturation. If preview video is running when you access this page, you can see your adjustments interactively. The Hue adjustment does not function for PAL video and should be left at the default setting.

Changes made on this page apply to all video preview and capture pins on the currently selected device.

[\[the tabs\]](#)

The Video Decoder Tab



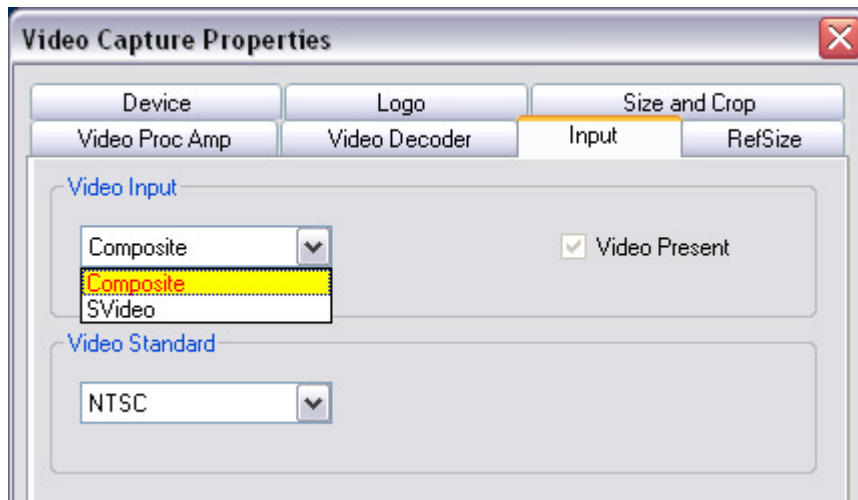
The VideoDecoder Tab is a DirectShow standard control for setting the NTSC/PAL/SECAM video standard. Note that these controls are also on the Input Tab. Most users will find the Input Tab more convenient to use. Refer to the **Input Tab** description below, and to Video Driver Topics, **Video Standards and Sizes**.

Changes apply to all video preview and capture pins on the currently selected device. If you have multiple Osprey cards, set the input individually for each of them.

Changes made with this control take effect immediately – the Apply button really has no function on this tab. If video is running and a standard is selected that does not match the incoming signal, the video is likely to freeze or glitch until the signal matches again.

[the tabs]

The Input Tab



The Video Input control is a drop list for selecting the video signal source. The inputs shown on the list are tailored to the inputs available on your hardware.

The read-only button marked Video Present shows whether the hardware is detecting a video signal on the currently active input. This control is updated only when you make a change to the Video Input or Video Standard and click the Apply button.

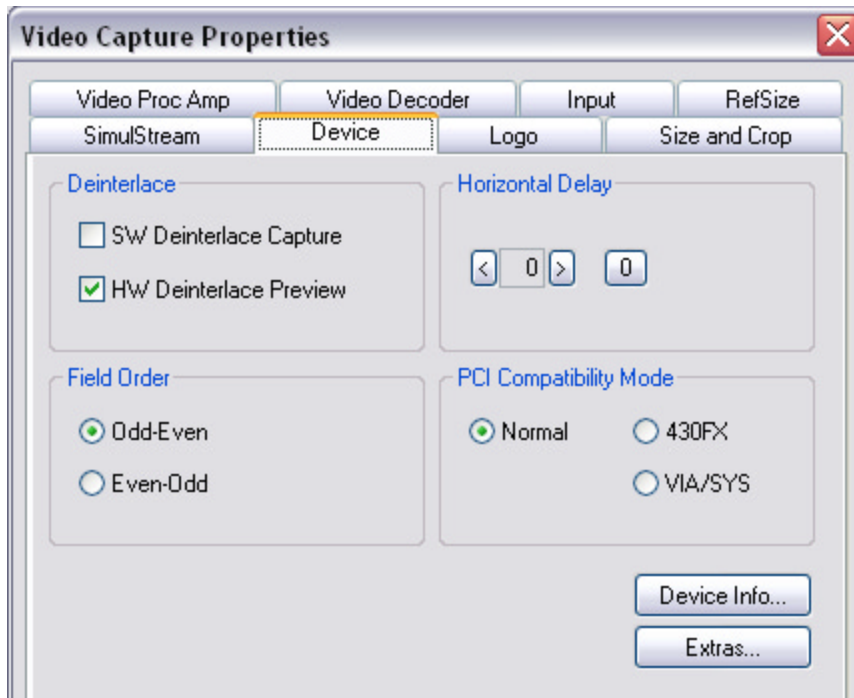
The Video Standard control group is the same as the corresponding control on the Video Decoder tab. The North American standard is NTSC. The Japanese standard is NTSC-Japan. The five PAL standards, B, D, G, H, I are almost identical to each other, and are treated the same way by the Osprey driver. The driver also supports SECAM video. Refer to Video Driver Topics, **Video Standards and Sizes**, for more information.

Changes made to these settings apply to all video preview and capture pins on the currently selected device. If you have multiple Osprey cards, set the input individually for each of them.

Changes take effect only when you click the Apply button. If video is running, there may be a brief glitch while the settings take effect.

[the tabs]

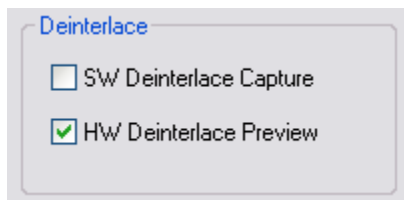
The Device Tab



These controls set important low-level operating parameters for the driver.

Changes made on this page apply to all video preview and capture pins on the currently selected device.

Deinterlace



When you capture interlaced video that has high motion content, you will see horizontal “comb” artifacts that reduce the apparent quality. Deinterlacing will remove the comb effects and produce a better looking high motion image. Deinterlacing has little if any effect on still or low motion images.

The Osprey AVStream driver uses two different deinterlace methods for Capture and Preview.

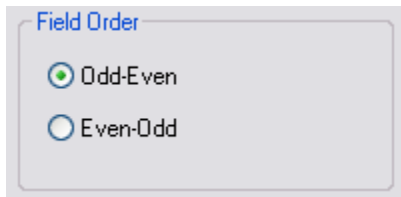
For Capture, a software-based deinterlacing function is used. Since the deinterlacing is done in software, it does use CPU bandwidth and thus may have a performance impact on your video processing depending on the speed of your machine.

For Preview, the driver exploits the hardware-based deinterlacing capability that resides in most display adapters. No CPU bandwidth is used; however, our experience so far is that the quality of the deinterlacing is not quite as high as that offered by the software-based capture pin method. When Preview Pin deinterlace is enabled, the only video color formats available for preview are YUY2 and RGB8 greyscale, since hardware deinterlace only works only for YUY2.

The deinterlace controls have no effect when captured video is from a single field only. Video is captured only from a single field if the capture height before cropping is less than or equal to the field height.

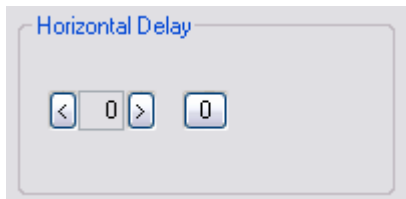
For more information about interlacing and deinterlacing, refer to [De-Interlacing](#) in the Video Driver Topics chapter.

Field Order



This control is useful only if you are capturing video from a digital camera, routed through the Osprey card's analog composite or s-video input. The normal field pairing order for NTSC cameras is Odd-Even. However, some progressive video cameras and video footage that originated on film may have a different field dominance that requires pairing of even/odd fields into frames. If you notice that there are problems with interlaced video such as "comb" effects, see if the Even-Odd setting clears up the problem.

Horizontal Delay

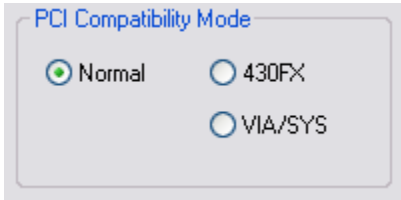


This control adjusts the left-right position of the image. The horizontal delay from horizontal sync to start of video is different from the standard for some input devices. If this is a problem you may see a vertical black line at the left or right edge of the video.

You can use this control to reposition the video. If you start video preview running before you use this control, repositioning will be interactive. Use the arrow buttons to move the video, and the "0" button to reset it to the normal position. With uncropped video, the video will shift only on every second increment 0, 2, 4... .

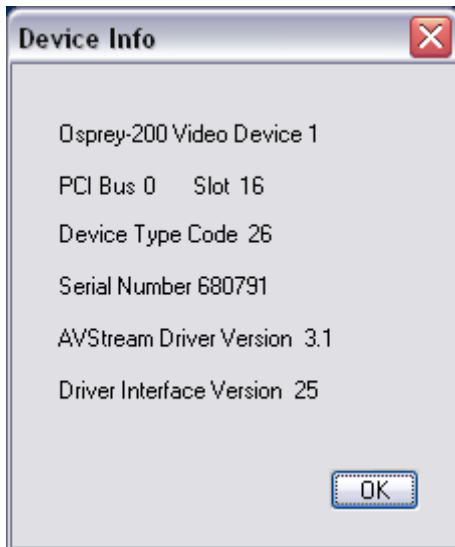
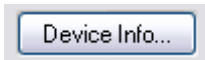
This control affects all inputs on the currently selected device.

PCI Compatibility Mode



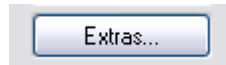
Some PCI bridges present compatibility problems for the Osprey hardware, especially systems using the 430FX chipset. The symptom will be dropping of a significant amount of audio and/or video data. Use the "Normal" setting unless you are seeing this symptom, but if you are seeing it, try setting this control to "430FX", or, possibly, to "VIA/SYS". The change will take effect as soon as you click "Apply" or "OK".

Device Info...

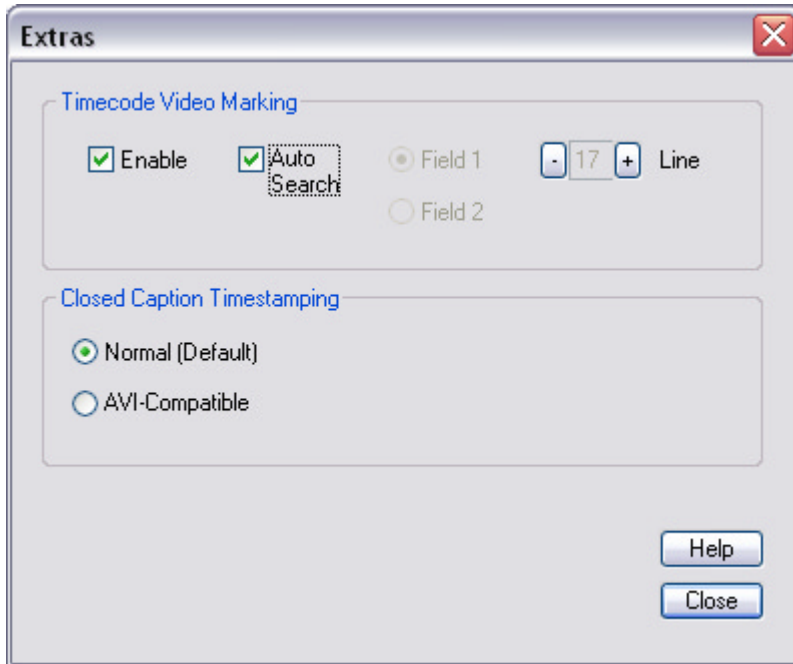


Device Info... displays basic information about an Osprey device – what model it is, its location on the PCI bus, its type code and serial number, and the version of the driver.

Extras...



“Extras” are features of the AVStream driver that are new or subject to change. Extras may also include workarounds to apparent DirectShow issues that are expected to be resolved fairly soon. Extras should be expected to change more frequently than other aspects of the driver. The current Extras are the following:

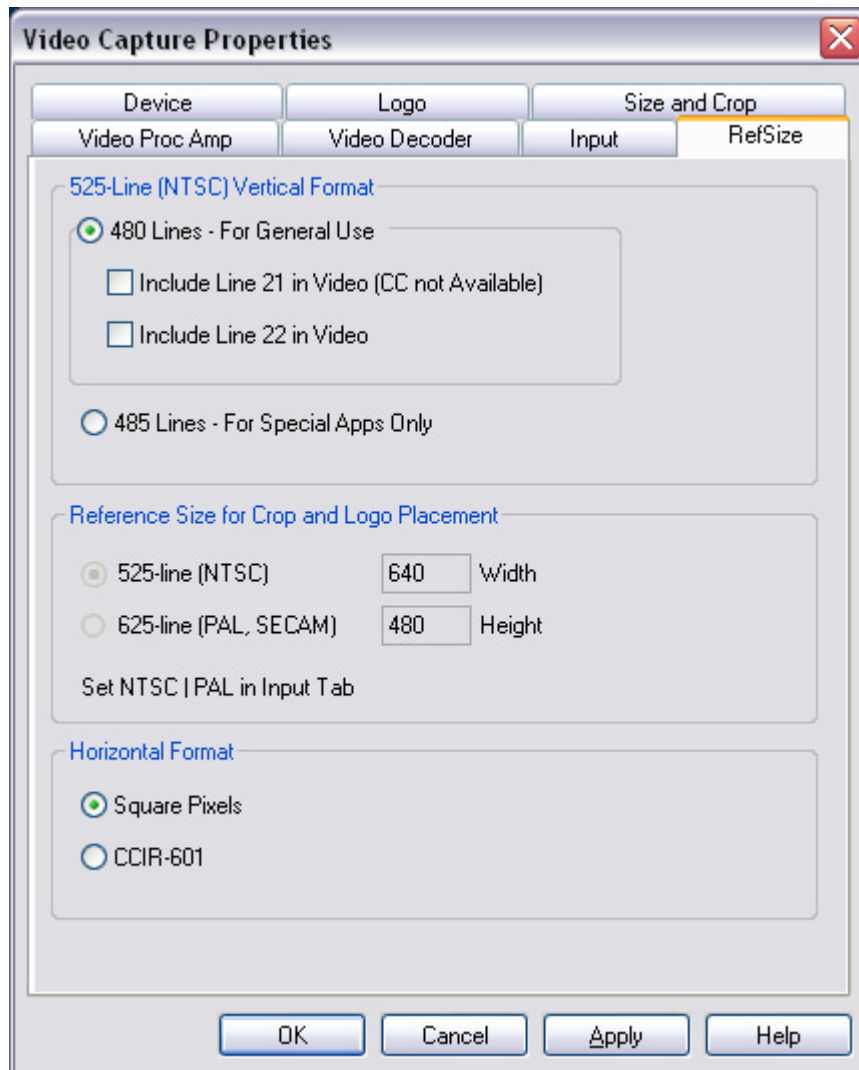


Both of these control groups are quite specialized.

- For information about Timecode Video Marking, refer to the [Timecode](#) section of the Video Capture Topics chapter.
- For an explanation of the Closed Caption Timestamping issue, refer to the [Closed Captioning](#) section of the Video Capture Topics chapter.

[the tabs]

The RefSize Tab



The RefSize tab controls features related to the reference size, format, and proportions of the video. These controls are not commonly used. Most users can set up this page once and never refer to it again. Note that this page does not provide everyday control of the final output size of your video. Control final output size either from your application, from the Crop tab, or from the Pin Properties dialog described in the next section.

Changes made on this page apply to all video preview and capture pins on the currently selected device.

525-Line (NTSC) Vertical Format

This control is only meaningful for NTSC users. It has no effect for PAL and SECAM 625-line video standards.

Select 480-line video for all normal applications. Select 485-line video for specialized applications.

When 480-line video is selected, you have the option of treating the Closed Caption line, Line 21, as video or as Closed Caption data. If you want to capture or display decoded Closed Captions, you must uncheck the box titled Include Line 21 in Video. If you are seeing an unwanted stripe of black and white bands at the top of your video, you will also want to uncheck this box. With this box unchecked, the start and end of the 480-line range of captured video are both bumped down by two lines.

The checkbox titled Include Line 22 in Video controls whether Line 22 is captured and displayed. Some broadcast material encodes data in this line. This checkbox removes that data from your video; however, the driver currently does not support decoding of this data.

Horizontal Format

Use the Square Pixels setting for video that will be viewed via a computer monitor. This setting results in a square aspect ratio sampling of the source video. This results in a source image of 640x480 for 525-line standards and 768x576 for 625-line standards.

Use the CCIR-601 setting if the captured video will be later viewed on a dedicated video monitor. This setting results in a CCIR-601 aspect ratio sampling of the source video. It results in a video input horizontal size of 720 pixels for both 525-line and 625-line standards. This sizing is standard for dedicated monitors but results in video that appears horizontally stretched (525-line) or squeezed (625-line) on a computer monitor.

Reference Size for Crop and Logo Placement

This part of the dialog is read-only because you do not set it directly – rather, it shows the results of settings made elsewhere in the dialog.

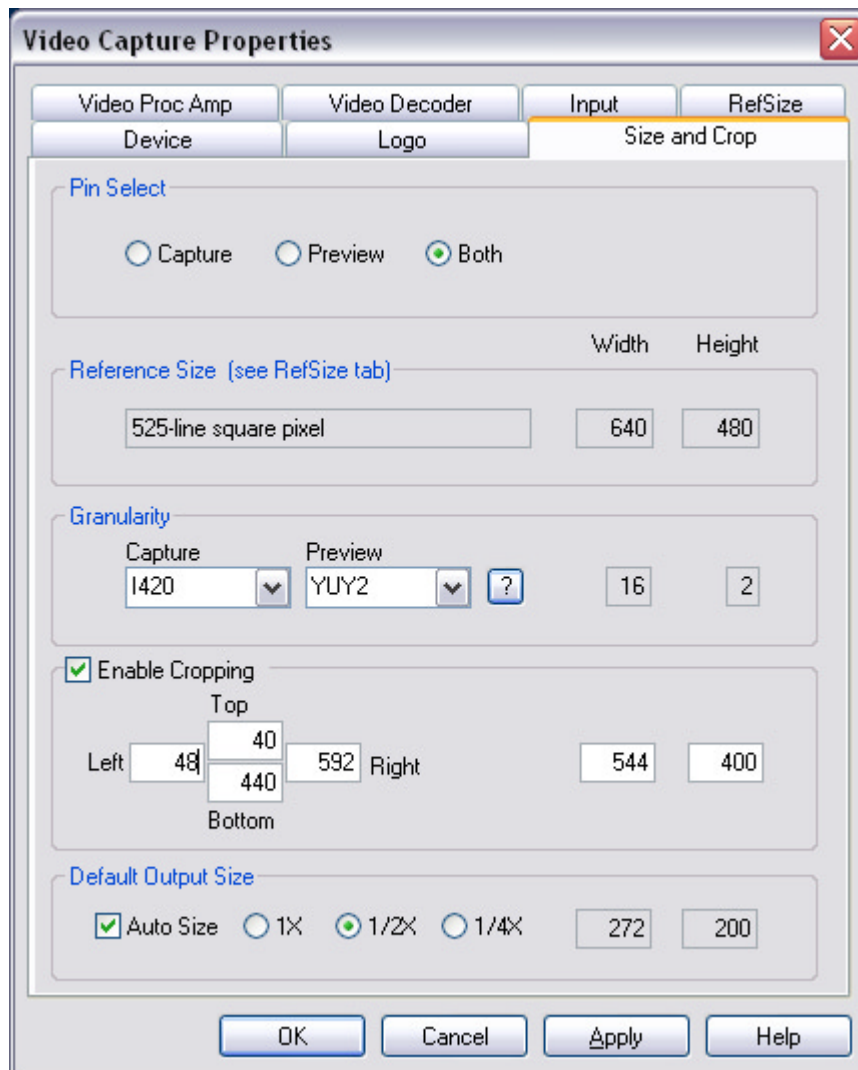
The settings shown by the 525-line / 625-line buttons reflects the video standard selected in the Input or Video Decoder tab. NTSC and PAL-M formats result in 525-line, 29.97 frame per second video. PAL (other than -M) and SECAM formats result in 625-line, 25 frame per second video.

The Height and Width boxes show the reference size of the incoming video based on all the settings you have made.

Refer to Video Driver Topics, [Video Standards and Sizes](#), for more information on how the reference size is determined.

[\[the tabs\]](#)

The Size and Crop Tab



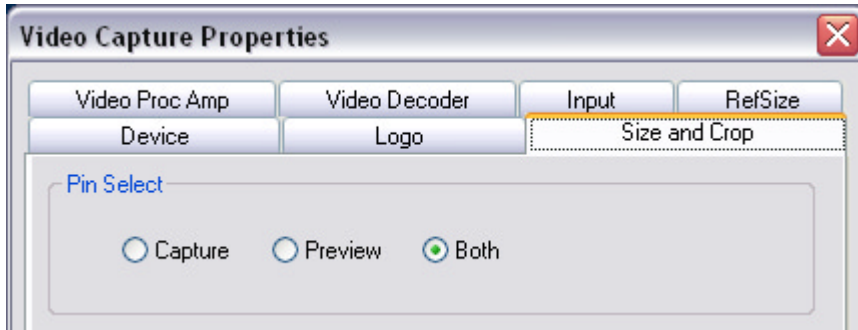
This tab has two functions.

- It sets the default output size, whether or not cropping is enabled.
- It enables and disables cropping, and sets the cropping rectangle.

The default output size is the video size that appears in the DirectShow pin properties dialog as the “default” choice. It is a pathway for setting a custom or nonstandard video size in applications that do not have a custom video sizing controls built into them.

“Cropping” means removal of unwanted video around the edges of the incoming image. For example, if the incoming video is letterboxed, with an aspect ratio wider than 4:3, you can crop away the black slivers at the top and bottom of the image and capture just the active portion.

Pin Select for Size and Crop



When the "Both" radio button is selected, changes you make to the crop setup apply to both the capture and preview pins.

If you like, however, you can have different setups for the two pins. For example, you could enable the cropping on the capture pin but not on the preview pin. When you select the "Capture" radio button, the current crop settings for the capture pin are loaded, and changes you make apply only to the capture pin, not to the preview pin. The "Preview" button works analogously.

Note to SimulStream users: The Pin Select control group is different when SimulStream is enabled. Refer to the SimulStream section of this guide for a description.

Another note: The Osprey SwiftCap capture application greys out the Pin Select choices and forces the "Both" selection. This application expects the Size and Crop settings for Capture and Preview to be locked together. Some other Osprey applications may do this, by intention, as well.

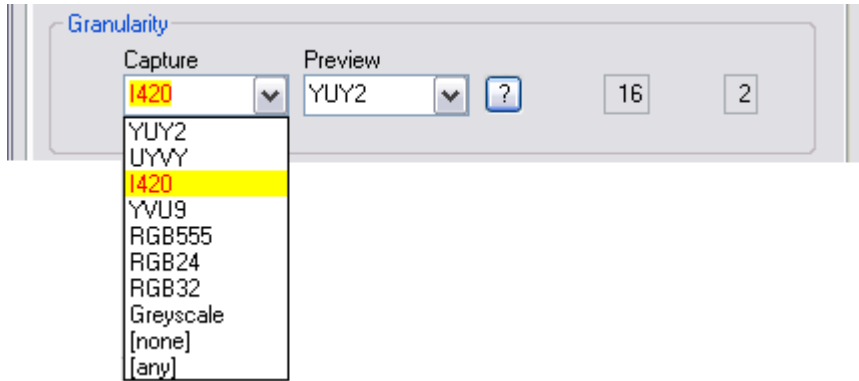
Reference Size



The reference size information is always read-only on this dialog tab. It is determined by settings made on other tabs – specifically, the Input tab, where a 525-line or 625-line standard is selected, and the RefSize tab, where Square Pixel or CCIR proportioning is selected. The read-only text box describes which of these options is currently governing the reference size.

The reference width and height represent the full uncropped size of the incoming video. Your crop settings are interpreted relative to this reference size. For example, if you are capturing 525-line video, with a reference size of 640x480, and your crop rectangle is (0, 0, 640, 480), then your video is effectively uncropped. But if you are capturing 625-line video, with a reference size of 768x576, the same (0, 0, 640, 480) crop specification will truncate the right and bottom edges of the video.

Granularity



Most video data capture formats impose restrictions on the possible width and/or height of the video, referred to as "granularity" restrictions. For example, the I420 capture format requires that the capture width be a multiple of 16 and the capture height be a multiple of 2. The Rgb32 format, on the other hand, imposes no restrictions at all.

The granularities of the supported color formats are as follows:

Format	Horz	Vert
YUY2	2	1
UYVU	2	1
I420	16	2
YVU9	16	4
RGB555	2	1
RGB24	4	1
RGB32	1	1
Greyscale	4	1
[none]	1	1
[any]	16	4

The Granularity controls show you the granularity restrictions for the selected video format, and assist you in choosing crop and output sizes that observe those restrictions.

When the Crop tab is opened, the drop boxes are initialized to the current or most recently used formats for the selected pins.

- If Pin Select is set to Capture or Preview, only the corresponding drop box is selected. The two small read-only edit boxes to the right of the group show the horizontal and vertical granularities for that pin's format.

- If Pin Select is set to Both, both the capture and preview drop boxes are enabled for editing. The two small read-only edit boxes to the right of the group show the worst-case horizontal and vertical granularities required by both formats.

Values you subsequently enter for crop width, crop height, and default output width and height will be adjusted to these granularities. Adjustments are made when you click on another control.

You can change the video format in the drop box, so that granularities are set for a different format. Note that this does not automatically cause the pin to have this format – you still have to select that format using the Pin Properties dialog or via your application.

If you set up your crops with a less restrictive granularity (for example, YUY2) and then capture with a more restricted granularity (for example, I420), the driver may automatically adjust the video crop and/or output size without notifying you. You may also find that in the Pin Properties dialog the default size you wanted is not listed – because it is not a legal size for this format.

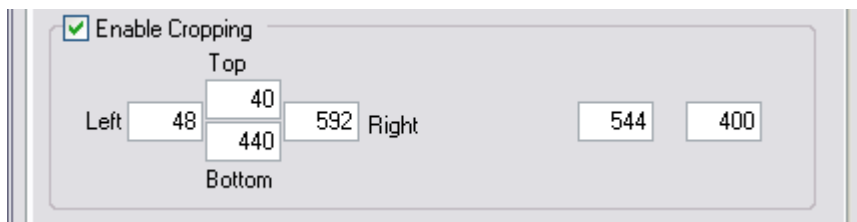
If you select “[none]” as the video format, no granularity adjustments are applied to your crop and size data. In practice, “[none]” is the same as RGB32. Note that the driver may silently adjust your crop or output sizes if the video format actually in use requires it.

If you select “[any]” as the video format, the coarsest granularity required by any of the available formats is applied to your crop and size data. In practice, “[any]” is the same as YVU9. You are guaranteed that your crop and output sizes will never be adjusted, regardless of what video format you select now or in the future.

If in the Pin Select controls you select “Capture”, all of the formats in the table above are listed in the drop box. If you select “Preview”, the only format available is YUY2 (as well as “[none]” and “[any]”) – because the Osprey AVStream driver delivers all preview video in YUY2 format.

If you select “Both”, the horizontal granularity is at least 2, because the Preview YUY2 format has horizontal granularity 2. You would notice this only if you select RGB32.

Enable Cropping



If you uncheck the Enable Cropping checkbox, your video will not be cropped regardless of any crop settings you might previously have made. The edit boxes showing the edges, height, and width of your crop will be read-only and will show settings for full-frame, uncropped video.

If you check the Enable Cropping checkbox, your video will be cropped to the indicated boundaries. Previously stored crop settings will be recovered.

Note that the crop width and height are subject to the granularity requirements of the selected video format, as explained in the previous section. For example, if your video format is I420 and you try to set a crop width of 360, it will get adjusted down to 352.

It will be useful to understand when cropping is performed in the hardware. The following diagram shows an overview of typical video processing:



The input to cropping is considered a full resolution frame. Thus, although one may think of video as being composed of fields, the cropping parameters assume operation on a full resolution interlaced frame (composed of two fields) or a full resolution progressive frame. Cropping then sets up a region of interest (ROI) for further scaling and processing. Once cropped, all other video operations are processed on the cropped resolution.

If you check Enable Cropping, the six edit-boxes are enabled. The Top and Left boxes are always used to set the top left corner of the ROI. The Right and Bottom boxes can be used to set the bottom right corner of the ROI. The Right and Bottom boxes implicitly set the width and height of the ROI and modifications to these values are reflected in the Width and Height boxes. Optionally, you may set the Width and Height boxes, which is often more natural anyway, and let the driver implicitly change the Right and Bottom values.

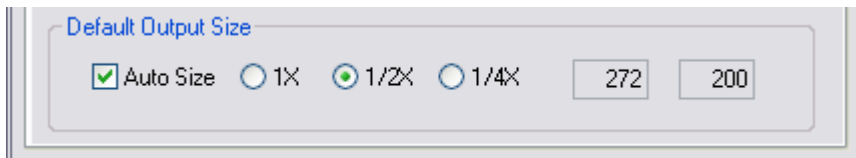
If you enable cropping, key in some custom settings, and then disable cropping, an uncropped specification will be displayed and your settings will disappear from view. However, the driver does remember your custom settings, and if you enable cropping again, they will reappear.

An important note: The Osprey AVStream driver only downscales video; it never up-scales it. That is, the output video must be equal-sized or smaller than the raw size of the incoming video. If your crop specification would result in up-scaling, the driver will ignore it and will capture or display uncropped video.

For example, if your reference size is 640x480, and the left, top, right, and bottom edges of your cropping rectangle are 160, 120, 480, and 360, so that the cropped size is 320x240, then your video cannot be larger than the cropped size, 320x240.

Finally, recall that the cropped ROI is based on a frame. Thus if a cropped ROI is setup defining a 320x240 area, for example, then a capture of video sized at 320x240 will result in video being captured from two fields. If the source was interlaced you may see interlacing artifacts in the captured video. This may be initially confusing since most users typically think of 320x240 video capture only coming from a single field and thus would not have interlaced artifacts. However, in this case, the source video is only 320x240 in size (i.e. the cropped ROI) and thus any captured video that is greater than the field height within the cropped ROI (equal to 1/2 cropped ROI height) will result in a scaled capture of multiple fields. Any capture less than or equal to the field height within the cropped ROI will result in a scaled capture of just a single field within the ROI. Thus for this example, video sizes greater than 120 in height to 240 in height results in video from both fields being processed by the scaler. In this example video sizes less than or equal to 120 in height will result in video being processed only on a single field.

Default Size



The standard DirectShow Pin Properties dialog allows you to select the height and width of captured video from a dropdown list. The dropdown list has a particular range of choices that may or may not fit your needs. The dropdown list includes one default size that is provided by the capture driver. The Default Size control allows you to set up what default size will be shown.

If you check the Auto Size checkbox, your default video size will be automatically sized to your crop settings. The three radio buttons, 1X Crop, 1/2X Crop, and 1/4X Crop, determine whether the output size is scaled down from the crop size.

- Example 1: If you are running standard 640x480 NTSC video, and the Enable Cropping checkbox is not checked, your crop size is 640x480. With Auto Size checked, and the 1X Crop radio button selected, your default size will be 640x480; with 1/2X Crop, 320x240; and with 1/4X Crop, 160x120.
- Example 2: If you have enabled cropping with size 320x240 (one quarter of the full video area), the default Auto Sizes are as follows: 1X, 320x240; 1/2X, 160x120; 1/4X, 80x60.

If you leave Auto Size unchecked the default size radio buttons are disabled and the height and width edit boxes are enabled. You can set any default size with the following three restrictions:

- Since the driver does not upscale video, the default size must be smaller than the crop size. For example, if the crop size is 320x240, you cannot set default size 400x300. If you try to specify an output size that would result in upscaling the video, a warning message appears when you try to exit the Size and Crop page telling you to correct the size before proceeding further.
- Sizes are subject to the granularity requirements of the selected video format, as explained in the Granularity section above. For example, if your video format is I420 and you try to set a default width of 360, it will get adjusted down to 352 as soon as you click on another control.

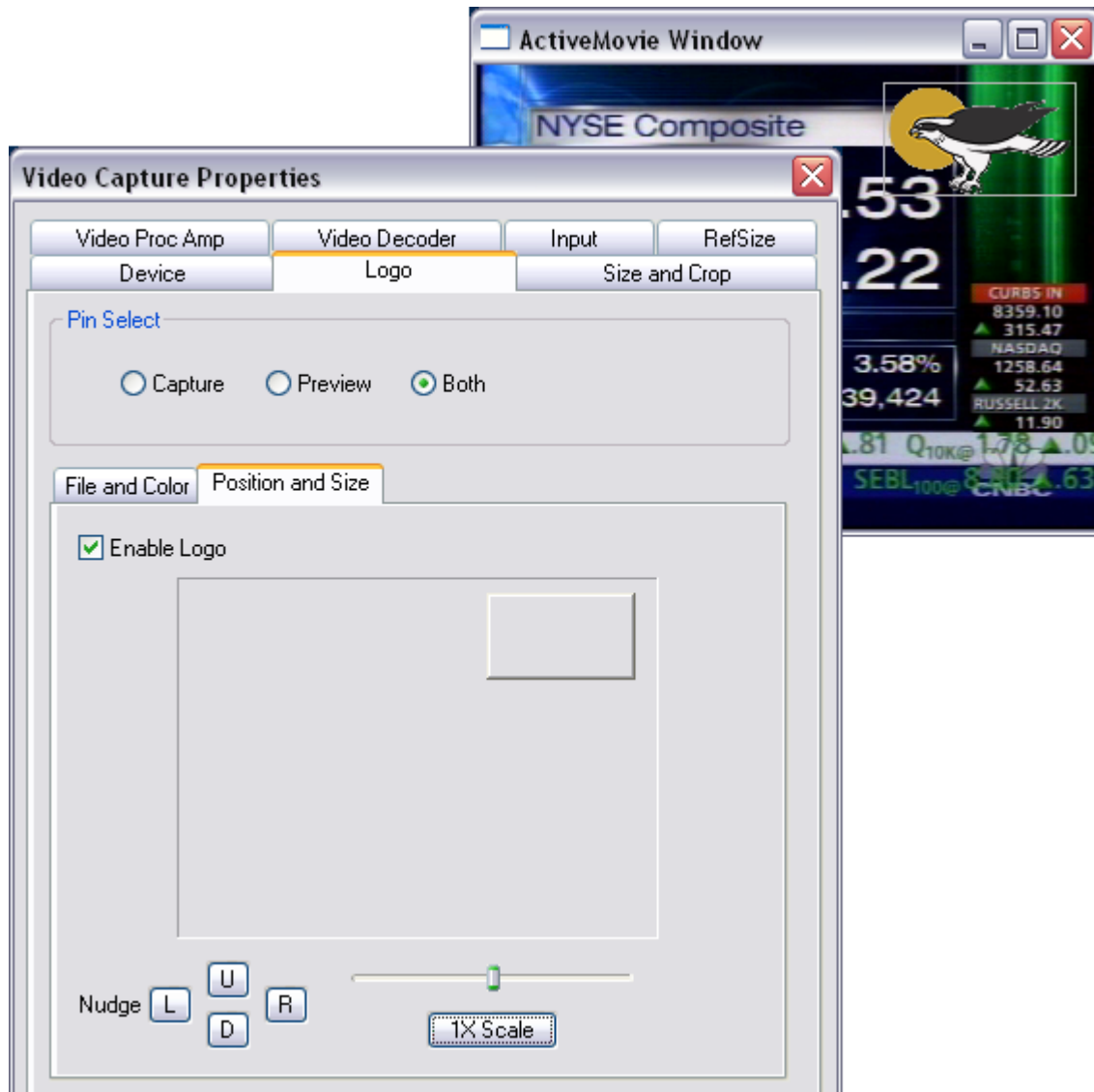
- The driver will not accept sizes below a set minimum. For the Osprey-MM 3.1 release, the minimum size for captured video is 48 wide by 36 high. The Size and Crop page will not accept output size selections that would make the video too small.

The VMR7 video renderer imposes the following further minimum size restriction: If hardware deinterlace is selected, the minimum size that can be rendered is 88x72. If a smaller default size is set, it will not be available for selection for the preview pin. For example, for applications that use the standard Pin Properties pages, the default will not be displayed there as a possible selection in the Output Size list.

Note that Pin Properties dialog default entry does not appear in the default VFW/DirectShow mapper dialog. Thus, unless a VFW application, like Virtual Dub, specifically allows for custom resolutions, the VFW app will only be able to select from the options the VFW/DirectShow mapper lists.

[the tabs]

The Logo Tab



The logo property superimposes a graphic over captured video. In the illustration above, the Osprey graphic has been interactively positioned at the top right of the video using the logo property controls.

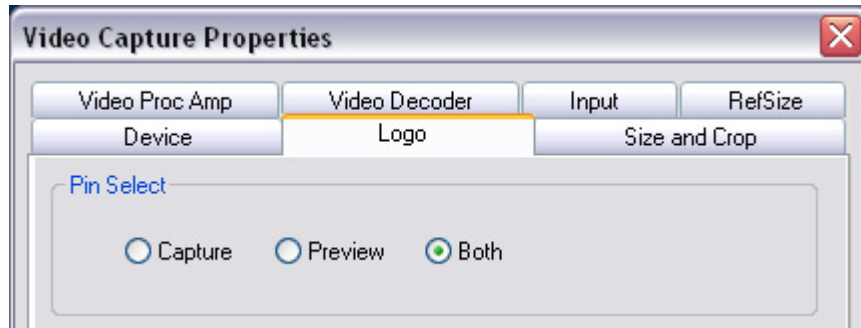
Logos have the following characteristics:

- Any RGB-24 bitmap in .bmp file format can be used.
- A selectable key color can be specified; all parts of the logo graphic with that color are not drawn on the video.
- A transparency control can be used to blend the logo graphic with the background video.
- The logo can be interactively positioned and scaled.
- The logo appears on both captured and previewed video. If the capture and preview video are different sizes, the logo is scaled to look the same on the preview video.

The logo property controls work best when you are already running preview video. With preview video running, you can view your changes interactively. (If your application displays capture video in real time, capture video can be used instead.)

The logo property is organized as three sub-pages – File, Color, and Position. The Pin Select control group and Enable Logo are common to all three. For other controls, click the File, Color, or Position radio button to bring up the right sub-page.

Logo Pin Select



When the "Both" radio button is selected, changes you make to the logo setup apply to both the capture and preview pins.

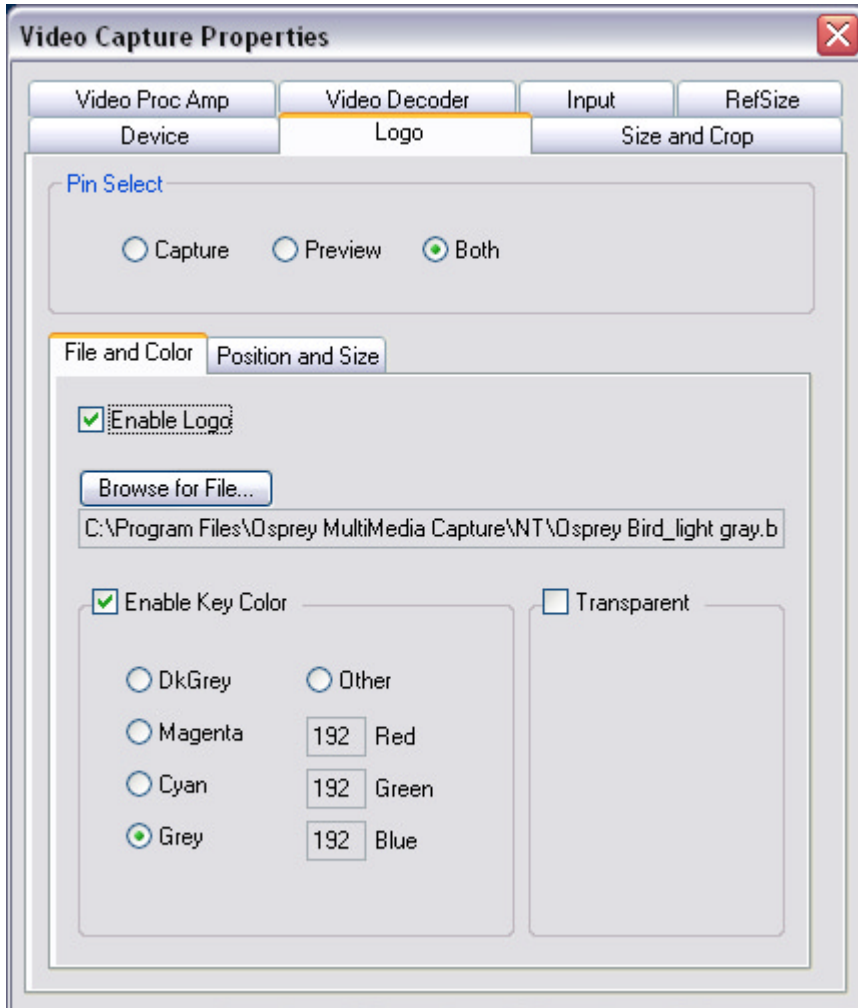
If you like, however, you can have different setups for the two pins. For example, you could enable the logo on the capture pin but not on the preview pin, and thereby save some cpu time. When you select the "Capture" radio button, the current logo settings for the capture pin are loaded, and changes you make apply only to the capture pin, not to the preview pin. The "Preview" button works analogously.

Note to SimulStream users: The Pin Select control group is different when SimulStream is enabled. Refer to the SimulStream section of this guide for a description.

Another note: The Osprey SwiftCap capture application greys out the Pin Select choices and forces the "Both" selection. This application expects the Logo settings for Capture and Preview to be locked together. Some other Osprey applications may do this, by intention, as well.

[the tabs]

Logo File and Color



The Enable Logo checkbox, which is repeated on both sub-pages, enables or disables logos. If you disable logos, all your other logo settings are retained for when you re-enable logos again.

The [Browse...] button brings up a standard file select dialog. Logo files must be:

- In .bmp format with a .bmp filename extension.
- In RGB-24 format.

If you have a graphic that is in another format, edit it with a drawing or photo edit program such as Windows Paint, and save it as RGB-24.

You can control the key color and the transparency effect. If preview video is running, you will see your changes interactively.

A "key color" is a color that disappears from the graphic so that the underlying video shows through unchanged.

If the Enable Key Color checkbox is unchecked, all colors are displayed.

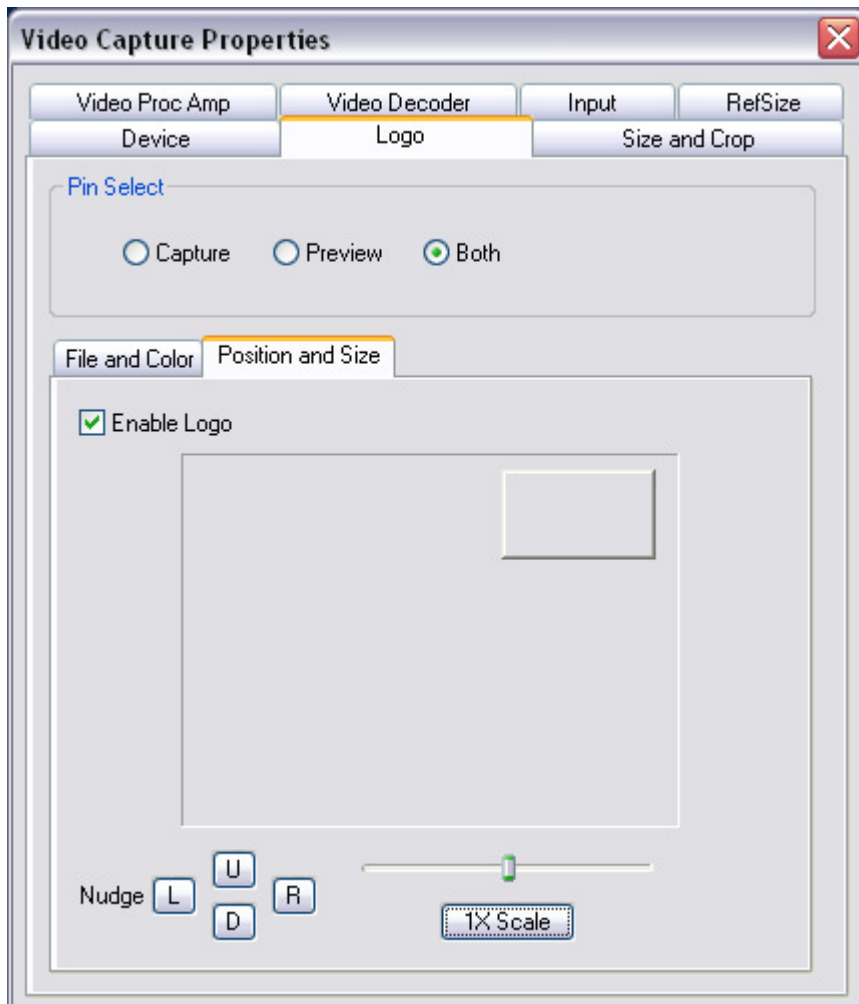
If the checkbox is checked, key coloring is activated. The five radio buttons are activated. You can select one of four standard colors – dark grey, medium grey, cyan, or magenta – or a custom color. If you select Other, for a custom color, the three edit boxes – Red, Green, Blue – are activated, and you can enter any color value into these boxes.

The key color specification must be exact – visual similarity is not enough. If you have a pre-existing graphic with an unknown background color, you will have to either get the exact RGB value from you draw or photo program, or fill the key-colored regions with a known color of your choosing.

The Transparent checkbox enables a translucency effect in which the color of each pixel of the logo is averaged with the color of the underlying video. This effect can be used in combination with a key color – key coloring is applied first, then the transparency effect is applied to the remaining non-key-colored logo pixels.

[the tabs]

Logo Position and Size



The Logo Position and Size sub-page lets you position and scale the logo. It is strongly recommended that you have preview video running when you use these controls.

The large indented rectangular area at the top of this sub-page represents the video area where the logo can be positioned. The smaller rectangle represents the logo. To position the logo, click on the logo rectangle and drag it to the new position.

The four “Nudge” buttons, L, R, U, and D, move the logo left, right, up, or down exactly one pixel at a time on the output video. Since the positioning rectangle may be scaled down from the full video size, the Nudge buttons allow more accurate positioning of the logo.

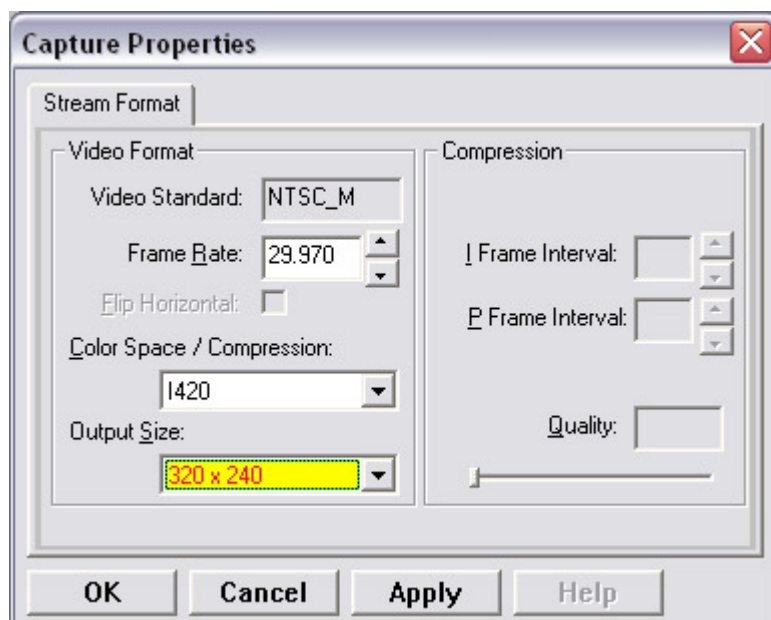
The slide control at the bottom right of this sub-page controls the scaling of the logo. The [1X Scale] button returns the size to the original size of the .bmp graphic. The quality of a scaled image will not be as good as the quality of the 1X image. We recommend that wherever possible for production work you prepare artwork of the exact size at which it will be used.

Notes on Logos

1. Because the logo properties tab is used to set up a logo interactively on live video, its behavior is different from the behavior of the other tabs. The driver updates the controls on the logo tab immediately, without waiting for you to click [Apply]. You will see that [Apply] enabled only right after you select a different pin spec. As soon as you make any change to any logo control, [Apply] becomes disabled and stays that way until you change to another pin spec.
2. If you set up a logo with video set to one size, then resize video, the logo is scaled correspondingly. For example, if the logo is originally set up for 320x240 video, and you change to 640x480 video, the logo displays at twice the size of the original bitmap. Click the [1X Scale] button to restore the logo to its unscaled size.

[the tabs]

Capture and Preview Pin Properties



This dialog is the default DirectShow way for obtaining a user's settings for the output format of captured video.

Changes made in this dialog apply to the currently selected pin only. The settings for the capture and preview pins are independent; in applications like GraphEdt or AMCap, both must be set before both pins are used.

Access to the Pin Properties dialogs is application-specific. For example, in the AMCap capture application, access is by two entries in the Options menu, Video Capture Pin... and Video Preview Pin.... In GraphEdit, right click on the pin you wish to set the properties for.

Many applications do not use these dialogs; they instead have their own built-in ways of setting these parameters.

The three active fields of the dialog set the Color Space or pixel format of captured video; Output Size of the video, and Frame Rate. The recommended order for setting these parameters is: First, Color Space; second, Output Size; third, Frame Rate. If you set the frame rate before the other two, it may be lost so that you have to reset it.

The Output Size drop box displays a selection of standard size settings plus one additional setting designated as "default" that DirectShow obtains from the capture driver. You can obtain specialized video sizes by a two-step process: First, go to the Filter Properties Crop tab described above and set the Default Size to a custom value. Then, enter the Pin Properties dialog and select the default entry, which will now be set to your custom value.

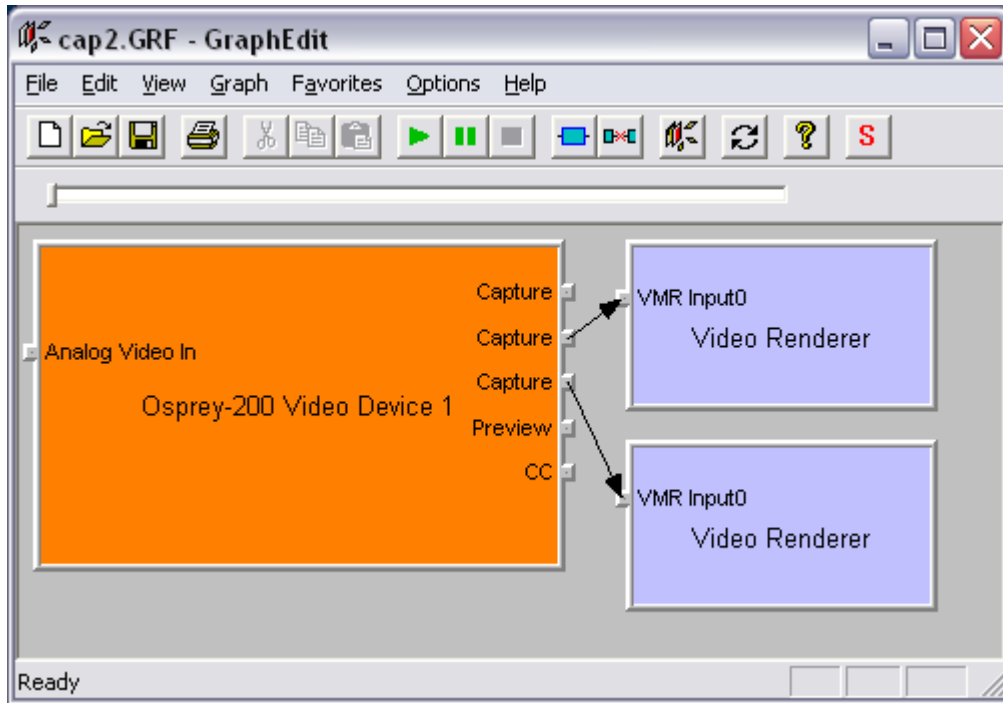
For more information about the supported color formats, refer to Video Driver Topics, [Color Formats](#).

The area of the dialog marked Compression is not relevant for the Osprey AVStream driver.

The Video Standard setting is read-only in this dialog. To set the video standard, go to the Video Decoder tab of the filter property pages.

Chapter 5 - Video Driver Topics

SimulStream



SimulStream is a separately priced software option to the Osprey AVStream driver that enables capture of multiple streams from a single device. Specifically, you can have multiple video capture streams in a single application, or multiple applications each with one or more capture streams. You can have just one preview stream per application, but multiple applications can each have their own preview stream.

Each stream can have its own color format, size, frame rate, crop, and logo specifications.

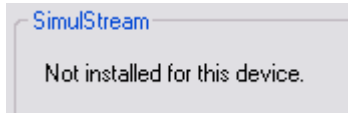
For details about purchasing and installing SimulStream, refer to www.ospreyvideo.com. When you first install this driver, a 10-day evaluation is installed as part of it.

This section describes the capabilities of SimulStream, and explains additions and changes to the filter properties interface.

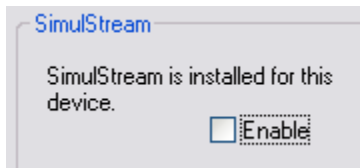
The SimulStream Tab

[the tabs]

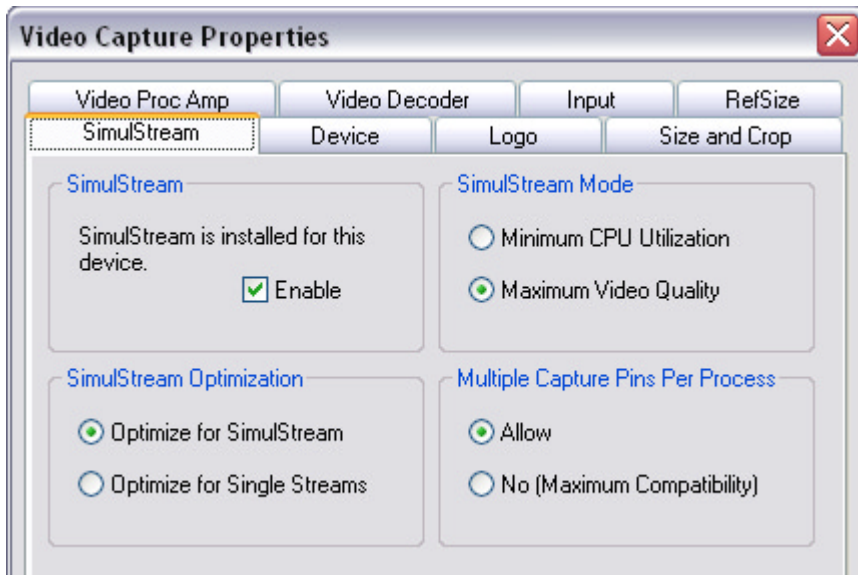
The global SimulStream controls are grouped on a separate property page. This page will say “Not installed for this device” until you install either an evaluation version or full version of SimulStream.



When SimulStream is installed it will indicate the status of the license. With both the full and evaluation versions you have the option to enable or disable SimulStream. When it is disabled, the only control on the property page is the following:



When you enable SimulStream, the property page changes to appear as follows:



SimulStream Mode



This control determines how the driver performs scaled copying of video frames. Some SimulStream scenarios involve software-based copying of video. There is a tradeoff to be made between maximizing video quality and minimizing the cpu bandwidth used by the copy process.

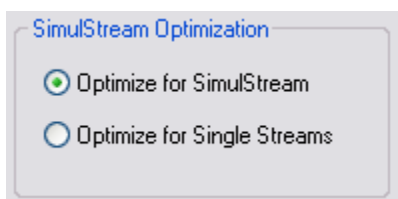
Most users using machines with gigahertz and higher clock rates can use Maximum Video Quality, which is the default setting. With the high-quality setting the driver performs interpolated scaling, which results in smoother edges and features.

If you are working with many streams, large formats, or a slower machine, you may need to select Minimum CPU Utilization in order to achieve your throughput target.

The differences in quality between the two modes are most evident when software deinterlace is turned off. There are subtle improvements from the high-quality setting even with software deinterlace enabled.

If the horizontal and vertical scaling factors between the captured raw video and the scaled output are exactly integral (2:1, 3:1, 4:1 ...), the driver does not interpolate and this setting has no effect.

SimulStream Optimization



This control affects the way the driver enters SimulStream mode when multiple streams are run.

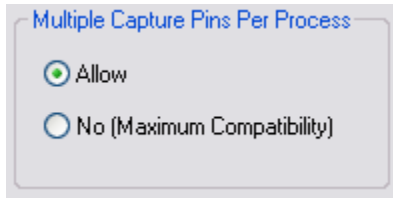
When "Optimize for Single Streams" is selected, the Osprey driver is configured for minimum cpu usage and bus bandwidth utilization when possible. It switches to more cpu-intensive SimulStream processing only when additional pins start running. When it does make this switch, there could be a slight transition in the appearance of the video. In this mode you have the option to run with Software Deinterlace either enabled or disabled.

When "Optimize for SimulStream" is selected, the driver always runs in SimulStream mode, and will use more system bandwidth to do so if necessary. With the setting, Software Deinterlace is always turned on, and the Software Deinterlace control is disabled.

The Optimize for SimulStream setting is advantageous only when you are actually running multiple video capture pins. With just a single capture pin running, there is no quality advantage, and a slight system bandwidth penalty.

Changes to this control take effect when you restart the application.

Multiple Capture Pins Per Process



A few applications do not work correctly when they see multiple capture pins on the same device. Specifically, RealNetworks Helix Producer Plus 9.0 has a known problem.

When you select the "No" setting, only one capture pin is visible to each application instance. You can have multiple applications, each with one capture pin, including multiple instances of the same application. But a single instance of an application is not allowed to use more than one capture pin.

When you select "Allow", each instance of each application can have multiple capture pins.

This control does not affect the preview pin. Applications can always use one preview pin in conjunction with one or more capture pins.

Changes take effect when you restart the application.

Per-Device Controls and Per-Pin Controls

Some controls operate on the device as a whole, while other controls operate on individual pins. Specifically, controls on the following tabs are per-device:

- Video Proc Amp
- Video Decoder
- Input
- Device
- RefSize.

Controls on the following tabs are per-pin:

- Crop
- Logo.

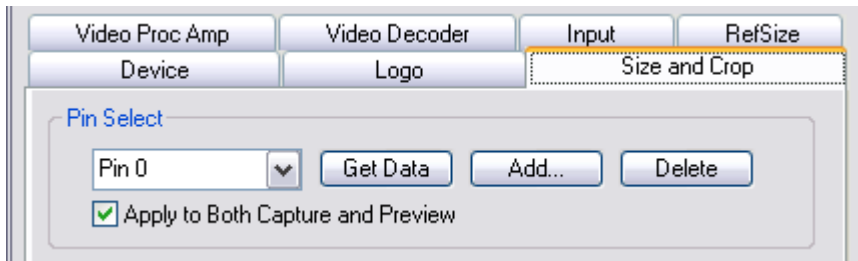
The DirectShow Capture and Preview Pin Properties are also per-pin.

With SimulStream not enabled, the per-pin controls are per-pin only in the sense that the single capture pin and single preview pin can have different settings.

With SimulStream enabled, it is possible for each of multiple capture and preview pins to have a different cropping specification, a different logo with its own placement and color keying, and a different color format, video size, and frame rate.

Defining and Selecting Pins

When SimulStream is enabled, the Pin Select control group at the top of the Crop and Logo property tabs is modified as follows:



The following three general points are important about this control group:

3. When you are working with a per-pin control, changes you make apply only to the currently selected pin. It is easy to copy changes from one pin to another (as explained below), but doing so does require a separate operation. If you have checked "Apply to Both Capture and Preview", changes you make apply only to the currently select Capture and Preview pin pair.
4. When you define a pin, you give it a number, so it is "Capture Pin 0", "Capture Pin 1", etc. These numbered pin specifications do not map absolutely to particular pins belonging to a particular application. They map only to the startup order of the pins. If you always start application "A" first, then application "B", you will get consistent results. But if you reverse that order, the applications will pick up one another's pins and pin specifications. This problem exists because DirectShow and the AVStream programming model do not provide a concept of persistent pin identities – software pin objects are dynamically created as needed – and about the only way they can be identified is by the order in which they are created.
5. Throughout this section the terms "pin specification" ("pin spec" for short), and "pin" will be used. They are not the same. A "pin specification" is a static or persistent group of per-pin settings that you can define using the driver's property pages. A "pin" is a transient instantiation of a DirectShow capture or preview stream. When a "pin" is created, the driver will look for a "pin spec" defining the settings to apply to the "pin".

Adding a Pin Specification ("Add...")

When you enable SimulStream and open the Cropping or Logo property tab for the first time, you will see that two default pins are created for you – "Capture Pin 0" and "Preview Pin 0". To add definitions for other pins, click the Add... button to bring up the following dialog.



Click Capture or Preview to determine which type of pin you want to define, and provide an instance number for the pin.

If you had checked the "Apply to Both Capture and Preview" button before entering this dialog, "Both" will be selected, and all three radio buttons will be grayed out. You will be in this case be creating a numbered capture / preview pin pair rather than an individual pin.

Although you can enter any pin number, you will probably want to provide the next unused instance number in sequence – for example, if you already have Capture Pins 0 and 1 defined, the next capture pin should be 2. When applications are opened (or multiple pins are started in a single application), they will each take on the next available sequential pin number 0, 1, 2... – *regardless of whether you have provided a numbered definition for that pin*. If the driver doesn't find in the registry a specification for a new pin it is creating, it will create the pin with default settings. It will also create a new pin definition in the registry initialized to that data. Thus, if you explicitly define capture pins 0, 1, and 3 - but not 2 – a default definition for pin 2 will soon appear anyway, as soon as an application creates a capture pin 2.

If you try to define a new pin for which a specification already exists, the new definition will be ignored, and the existing data will not be altered.

When you click OK to exit this dialog, the data for the pin that was selected before you entered the Add Pin dialog will apply to the new pin definition. If you click the **GetData** button (see below) before any data has been saved for the new pin, you will get the driver's defaults for this pin.

The new pin definition is not actually saved in the registry until you click **Apply** or **OK**.

Deleting a Pin Specification ("Delete")

Use the drop box to select the pin specification you want to delete, and click **Delete**. The data for this pin specification will be removed from the registry.

As noted above, however, if you delete a pin specification – let's say, Capture Pin 1 – and then start an application that has two capture pins and will therefore be looking for the Capture Pin 1 data, the driver will recreate the registry data with default values. The main purpose of **Delete** therefore is to get rid of high-numbered pin specs that you do not expect ever to use.

Get Data

Select a pin specification using the drop box, then click **Get Data** to read that pin spec's data from the registry.

If the "Apply to Both Capture and Preview" box is checked, the data for the capture pin will be read and applied to both pins. If the data for the preview pin is different, that data will be replaced by the capture pin's data as soon as you apply changes.

NOTE: It is not enough just to select the pin specification in the drop box. If you do not also click **Get Data** you will be applying the previous data on the property tab to the newly selected pin spec. It is helpful to pay attention to the **Apply** button at the bottom of the property tab. When you select a new pin spec, the **Apply** button is turned on. If you click **Get Data**, the **Apply** button is turned off again.

The interface is designed this way so that you easily and flexibly copy settings from one pin spec to another. For example suppose you have four pin specs defined – for two capture pins and two preview pins, and you want to copy the crop settings from Preview Pin 0 to the two capture pins (but not the other preview pin). The sequence of operations is:

- Select Preview Pin 0 in the Pin Select drop box.
- Click Get Data.
- Select Capture Pin 0 in the Pin Select drop box.
- Click Apply.
- Select Capture Pin 1 in the Pin Select drop box.
- Click Apply.

If you do this while on the crop property tab, these operations will propagate the crop settings only. To propagate logo settings as well, go to the logo tab and repeat this sequence.

Using the Osprey AVStream Driver with Video for Windows Applications

Video for Windows applications control the driver's most important functions via compatibility mode dialog boxes. You cannot access the complete Osprey AVStream Filter Properties directly from these older applications. The compatibility mode dialogs do not have all the controls that are accessible from DirectShow applications. We therefore recommend that, before first use of a Video for Windows application, you set up and check out the driver using AMCap or a similar DirectShow application.

Selecting the Capture Device

If you have multiple DirectShow video capture devices on the system, selecting the capture device may be a two-step process. The details will differ slightly with different applications. With VidCap32:

Pull down the Options menu, select from the list of devices at the bottom. The Osprey AVStream device will be listed as "Microsoft WDM Image Capture".

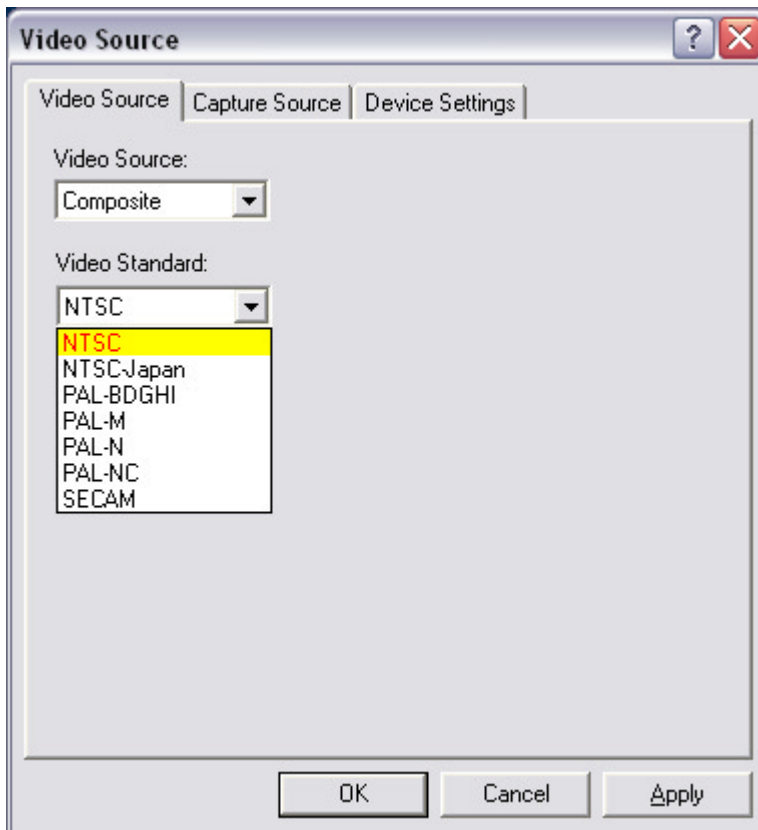
Pull down the Options menu again, and select Video Source...

You will see the following dialog. Select the Capture Source tab. Select the device from the drop list, and click Apply or OK.



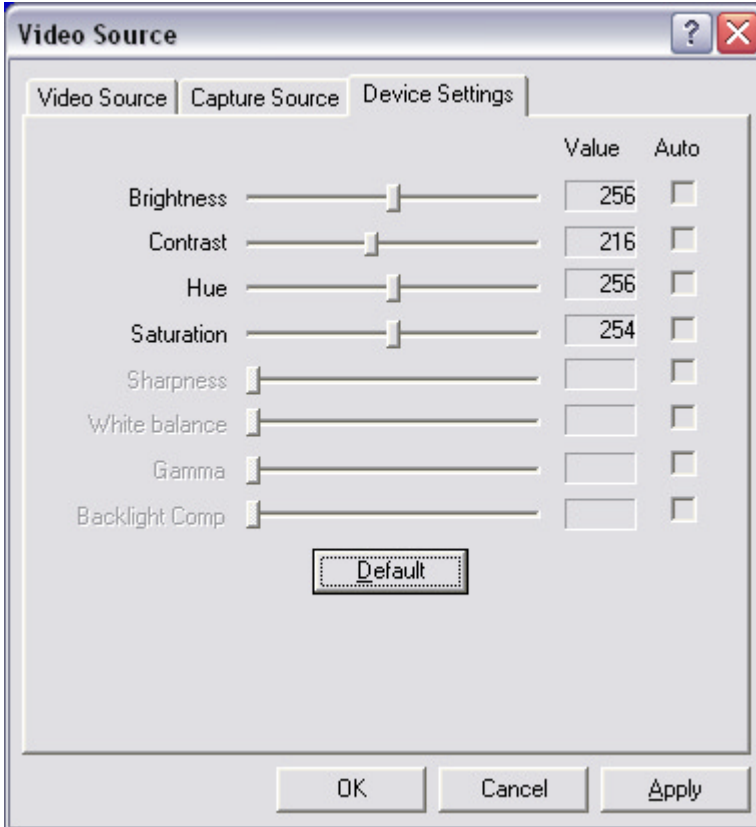
Selecting the Video Source and Standard

In the same Video Source dialog, select the Video Source tab. The upper drop list shows the list of inputs for the card. The lower drop list shows the supported video formats. Select these two items and click Apply or OK.



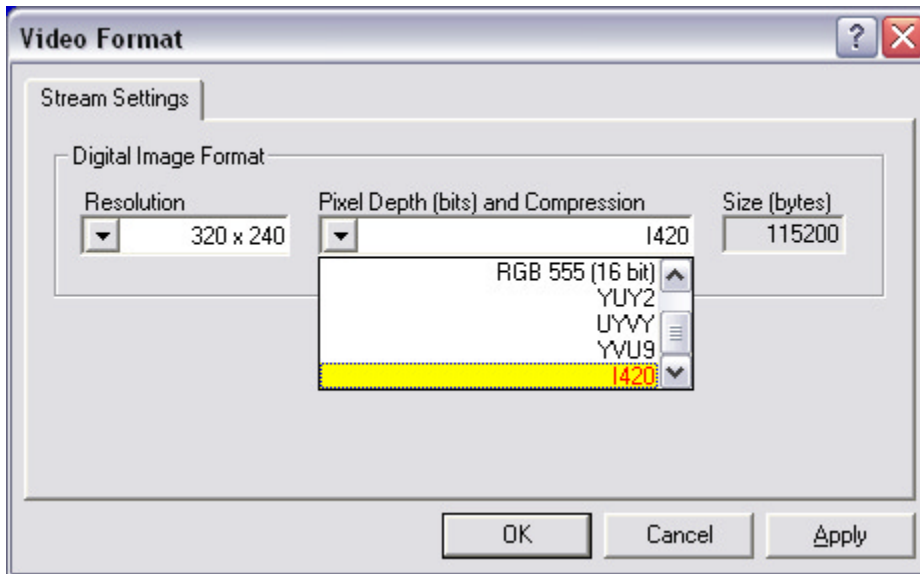
Brightness, Contrast, Hue, Saturation

In the Video Source dialog, select Device Settings. If you have preview or overlay video already running, you can see the effects of the four sliders interactively. For PAL video, keep Hue at its default value.



Video Format

The Video Format dialog is separate from the dialog pages shown previously. Access it from a menu entry or button titled Video Format... or Format..., depending on the application. Select from a list of standard resolutions and video formats and click Apply or OK to save the selections.



Video for Windows Issues

The mapper from Video for Windows applications to DirectShow drivers presents several problems that are beyond the control of driver implementers. The following comments are derived from tests with VidCap32, but should apply by and large for other Video for Windows applications as well.

1. "Overlay" video (in DirectShow this is called "preview" video) always runs when VidCap32 is loaded – even if overlay video is turned off.
2. There is no way to set the size of overlay video from the application. It is sized to the default size that is set for the DirectShow preview pin by a DirectShow application such as AMCap or GraphEdt. The size setting in the Video Format dialog shown above has no effect on the size of overlay video.

If overlay video is sized to 640x480 because that is the DirectShow default setting, and the capture video is sized by VidCap32 to 160x120, then overlay will be captured at 640x480 and scaled down 4:1 in software to the 160x120 size of the VidCap32 overlay window – wasting substantial system bandwidth in the process.

On the other hand, if overlay video is sized to 160x120 because that is the DirectShow default setting, and the capture video is sized by VidCap32 to 640x480, then overlay will be

captured at 160x120 and scaled up 1:4 in software to the 640x480 size of the VidCap32 overlay window – resulting in a very graining image with 4x4 cells.

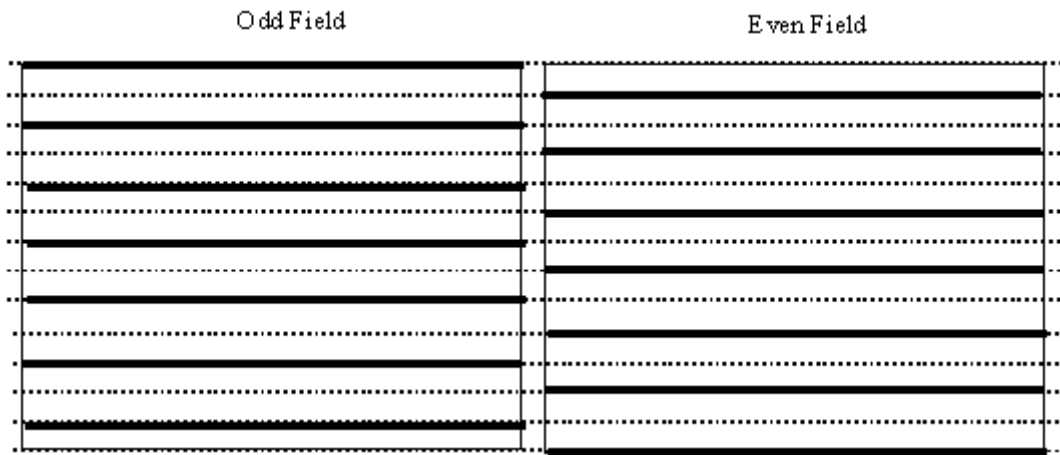
3. With VidCap32, video capture runs all the time, even when no video is being previewed or captured. The reason is perhaps so that the mapper can support Video for Windows “preview”, which is derived from the DirectShow capture stream.

In short,

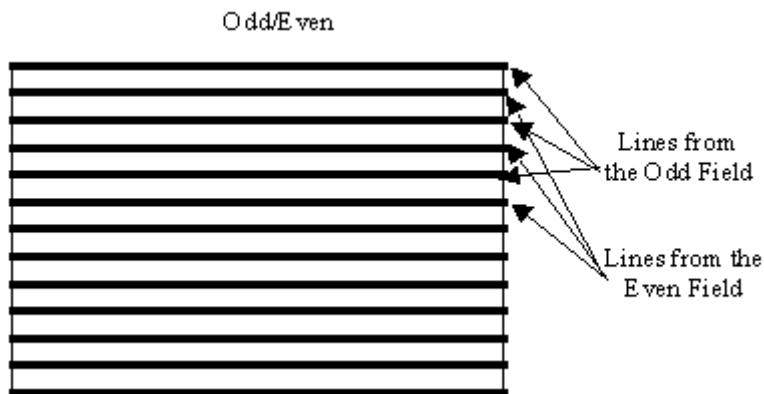
4. A Video for Windows application running over a DirectShow driver consumes 25 to 50 percent of system bandwidth even when it is doing nothing.
5. If you are going to extensively use a Video for Windows application with a DirectShow driver, make sure that the DirectShow preview pin’s default size is correctly set. As explained, you have to use a native DirectShow application to do this. Open the driver’s filter dialog, go to the Crop tab, and set Default Size there. Most often, you would want to set the preview pin to the capture size you plan to use. But if you aren’t going to use Video for Windows overlay, or are not concerned about its quality, then set the preview pin to a very small size such as 160x120.

De-Interlacing

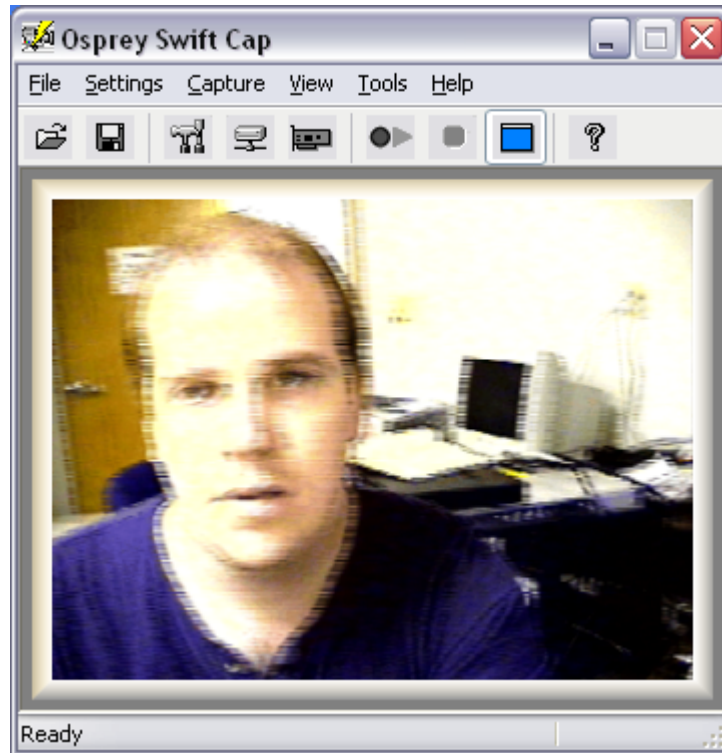
Most video is provided for viewing in an interlaced format. For simplicity, NTSC is used in the following explanation of an interlaced format. NTSC video is basically composed of images taken 60 times a second. Each image is called a field, and there are odd and even fields. While these odd and even fields are temporarily adjacent to each other in time, the horizontal lines that make up these fields are spatially different.



The figure above is a simplistic view of interlaced video and fields. The two fields are taken 1/60th of a second apart, and the lines of each field are not aligned, but staggered. Most televisions are interlace display devices, where the 60 fields are displayed individually and the viewer sees only one field at a time. However, most computer monitors are progressive and not interlaced display devices. On a computer monitor where video is viewed at its full resolution, viewers see both the odd and even fields at once:

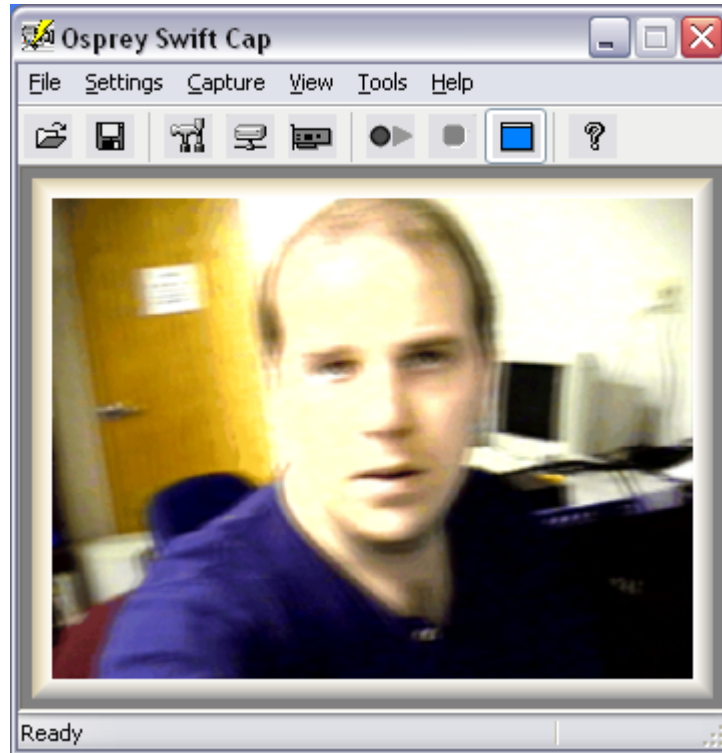


The problem with progressive display devices is that if an object is moving, its position is not the same in both the odd and even fields. When odd and even fields are merged together, interlaced artifacts occurs. The artifacts are seen and commonly described as streaking or feathering.



The screen above illustrates the streaking or feathering problem that occurred when the interlaced odd and even fields in this video were captured. Only a slight amount of motion took place, yet streaking is obvious in the overall result. Note the prominent horizontal lines outlining all the objects on this screen.

When feeding such images to an encoder, the encoder has a significantly harder time processing and compressing such interlaced video. The result is loss of overall quality and perhaps a loss of frame rate as well. While the encoding process may smooth out some of these artifacts, the resultant compressed video may still display somewhat streaked or feathered and may not play back smoothly.



The Osprey AVStream driver provides two separate approaches to deinterlacing:

- For capture pins, there is a software de-interlacing motion filter built into the driver.
- For preview pins, the driver supports the hardware deinterlacing that is built into many display adapters.

The Osprey-2XX's software de-interlacing can be applied to any video capture stream to eliminate streaking or feathering and maintain motion content. In the screen above, where the Osprey-2XX's de-interlace motion filter has been turned on, note that the strong horizontal streaking or feathering around the subject's head have been smoothed to a slight blur. While the blur is noticeable in a single screen snapshot, the human eye perceives only natural motion when the video is played back at normal frame rates.

Feeding the de-interlaced image in the screen above to an encoder significantly improves output of the encoder in terms of overall quality and smoothness. The encoder has an easier time compressing the de-interlaced video and thus can expend saved bits and CPU cycles to produce higher quality streams.

The hardware deinterlacing provided for preview pins resides in the display adapter. The availability and quality of this function depends on the display adapter and its driver. The implementations we are familiar with are cruder than the software-based capture de-interlace, but are nonetheless quite helpful with high-motion content.

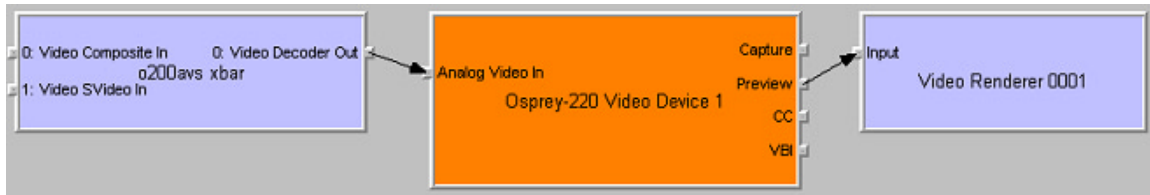
Efficient Video Rendering

The following information is primarily useful to developers, but may also be helpful for those who want to fine-tune existing applications. If you are seeing poor rendering performance, in terms of either excessive cpu utilization or jerky, stuttering video, read this section.

There are at least four basic ways to render video from the capture driver onto the screen. They vary greatly in their efficiency, and applications do not always make the best choice of renderer.

In these descriptions it is assumed that the AVStream driver's Preview Pin is being used. The results would be the same if the Capture Pin were used instead.

Preview Pin to Video Renderer



This is the oldest, simplest, and usually least efficient way of rendering video. It does not use DirectDraw in the rendering process. It is the default rendering pathway that will be chosen when an application says "Render" without specifying a preferred pathway. For this reason, many applications, especially older ones, deliver unnecessarily poor rendering performance.

The fastest video format to use with this pathway is whatever RGB format corresponds to your screen depth – RGB32 for a 32-bit screen, or RGB555 for a 16-bit screen. But it is even better to avoid using this pathway altogether.

Preview Pin to Overlay Mixer to Video Renderer



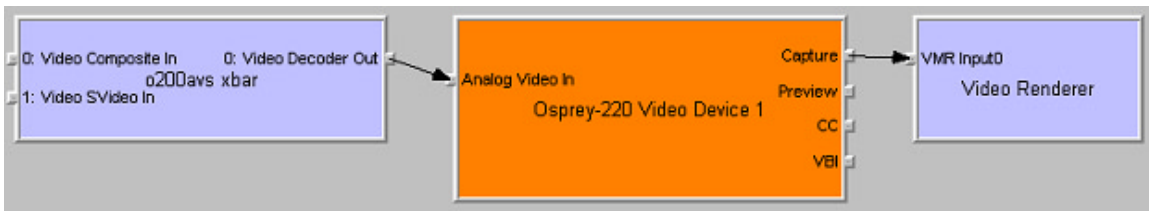
The combination of Overlay Mixer plus Video Renderer provides much better performance than a direct connection of Preview Pin to Video Renderer.

At present this is the only pathway that renders closed captioning correctly. For CC rendering, the output of the Line 21 filter connects to an input of the Overlay Mixer.

A curious illustration of the effect of the Overlay Mixer is seen with AMCap, a Microsoft DirectShow reference application that is available in object and source form. If the application is configured to preview at a full 640x480, with closed captioning turned off, the cpu will be swamped and on a slow machine the video will be jerky. In this case it uses the direct Preview Pin to Video Renderer pathway. If closed captioning is turned on, AMCap adds Overlay Mixer to the rendering pathway, and cpu utilization drops to 25 percent of what it was, and the video is perfectly smooth.

The best video format to use with Overlay Mixer is YUY2.

Preview Pin to VMR7



VMR7 is short for "Video Mixing Renderer 7". VMR7 is a newer renderer that is generally much faster than the old Video Renderer. It uses an efficient DirectDraw configuration to render with almost no cpu overhead, so long as the correct video format is used.

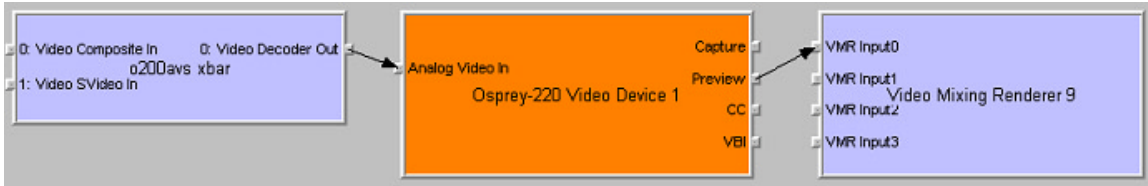
Unfortunately, VMR7 is not the default video renderer in building a filtergraph – an application must explicitly ask for VMR7 in its graph in order for it to be used. This causes many older or quick-and-dirty applications to render video much less efficiently than they might.

VMR7 will work about equally well with either the YUY2 video format, or with the RGB format – RGB32, or RGB555 – that matches the current screen depth. Since YUY2 uses less PCI bandwidth (2 bytes per pixel) than RGB24 or RGB32 (3 or 4 bytes per pixel), it is the best choice. We recommend, though, letting DirectShow choose the video format. It will generally make the correct choice. Also, if two video frames are to be rendered with VMR7 at the same time, only one can be YUY2; other(s) will be RGB.

We do not provide an RGB24 option for use with 24-bit screens because on at least some display adapters the rendering of RGB24 to VMR7 is incorrect.

It is important to note that VMR7 cannot be used when closed captions must be rendered – use the Overlay Mixer to Video Renderer pathway instead.

Preview Pin to VMR9



Video Mixing Renderer 9 is the newest video rendering method and the one on which Microsoft will base its future development. The intent is to combine the functionality of the Overlay Mixer plus Video Renderer in one module that takes advantage of the latest developments in DirectShow. We are finding that at its present stage of development, with our hardware, VMR9 does not achieve the very high efficiency of YUY2-to-VMR7, but its overall performance is consistently quite good.

One specific problem: VMR9 at present does not currently render closed captioning correctly, at least on our particular test machines. Although it is possible to connect the output of the Line 21 Decoder to a VMR9 input, the captions will not be positioned or displayed correctly.

Some Data Points

The following measurements are cpu percent utilization on a fairly old, 600 MHz machine – the relative performances of the pathways are more important than the absolute percents. The video size is 640x480. The screen depth is 32 bits, so that RGB32 renders more than RGB555 in this case. The following abbreviations are used:

- VR = Video Renderer
- VMR7 = Video Mixing Renderer 7
- VMR9 = Video Mixing Renderer 9
- AVI = AVI Decompressor
- CSC = Color Space Converter

Rendering Pathway	CPU % Utilization
Video Renderer	
YUY2 -> AVI -> VR	100%
RGB32 -> VR	22%
RGB555 -> VR	unable to render at 30fps
Overlay Mixer + Video Renderer	
YUY2 -> OVL -> VR	20%

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RGB32 -> OVL -> VR	25%
RGB555 -> CSC -> OVL -> VR	24%
VMR7	
YUY2 -> VMR7	2%
RGB32 -> VMR7	2%
RGB555 -> CSC -> VMR7	20%, format changed to RGB32
VMR9	
YUY2 -> VMR7	10%
RGB32 -> VMR7	15%
RGB555 -> CSC -> VMR7	25%, format changed to RGB32

Video Standards and Sizes

Video Standard refers to whether the video signal format is NTSC, PAL, or SECAM. Depending on the exact product version you have, some or all of the following standards will be available:

525-line formats:

- NTSC-M – North America
- NTSC-J – Japan
- PAL-M – Brazil

625-line formats:

- PAL-B, D, G, H, I – many countries in Europe and elsewhere. B, D, G, H, and I refer to five nearly identical subformats.
- PAL-N, NC – Argentina, Paraguay, Uruguay
- SECAM – France and some other countries.

Full-sized NTSC-M, NTSC-J, and PAL-M have 525 lines total, 480 lines visible, per frame and a display rate of 59.94 fields per second, or 29.97 interlaced frames per second. Although capture-to-PC applications normally use only 480 video lines, the full NTSC frame actually contains 485 video lines, and the AVStream driver provides a control to capture all 485 lines. The control is located on the RefSize property tab.

Full-sized PAL (other than PAL-M) and SECAM have 625 lines total, 576 lines visible, per frame and a display rate of 50 fields per second, or 25 interlaced frames per second.

The standard frame sizes are different for NTSC and PAL. For example, the half-frame size in pixels is 320x240 for NTSC, and 384x288 for PAL. The driver automatically adjusts the reference size and default size for the video standard you are using.

In addition you can choose between normal square pixel proportioning and CCIR601 proportioning. CCIR601 is a video proportioning standard in which the maximum horizontal resolution of the CCIR601 mode is 720 pixels for both NTSC and PAL.

Standard Video Sizes (Width x Height:)

	525-line (Sqr Pixels)	525-line (CCIR601)	625-line (Sqr Pixels)	625-line (CCIR601)
Full	640x480	720x480	768x576	720x576
1/2 (CIF)	320x240	360x240	384x288	360x288
3/8	240x180	270x180	288x216	270x216
1/4 (QCIF)	160x120	180x120	192x144	180x144

Color Formats

The Color Format is the arrangement of data bits representing the colors of each pixel. For example, in the RGB555 format, each pixel of data is stored as 5 bits of red, 5 bits of green, and 5 bits of blue color information.

Video delivered by the Osprey board to the system is in uncompressed format. It is possible to compress the video at a subsequent stage of processing. However, this dialog field refers specifically to the uncompressed raw video that the board delivers to the system.

The Osprey AVStream driver supports the following capture pin formats.

- **YUY2 and UYVY** - Each pixel is represented with a total of 2 bytes (16 bits) of data. The data is encoded as separate data for luminance (intensity) and chrominance (color). This mode is mainly used as an input to software compressors. See YUV Format Details below.
- **YUV12 planar** - Also known as **I420**. This is a complex format in which there are in the aggregate 12 bits of data per pixel. Each pixel has 8 bits of luminance data. Each group of 4 adjacent pixels arranged in a 2x2 square shares two bytes of chrominance data. See YUV Format Details.
- **YVU9 planar** - Similar to YUV12 planar, except that there are in the aggregate 9 bits of data per pixel, and each byte pair of chrominance data is shared by 16 adjacent pixels arranged in a 4x4 square. See YUV Format Details.
- **RGB32** - Each pixel has four bytes (32 bits) of data - one each for red, green, and blue, plus one byte that is unused. The pixel has 256 shades of each of the three colors, for a total of 16.7 million colors.
- **RGB24** - Each pixel has three bytes (24 bits) of data - one each for red, green, and blue. This is another “true color” mode with 16.7 million colors.
- **RGB555** - Each pixel has two bytes (16 bits) of data. There are 5 bits each of red, green, and blue data; the sixteenth bit is unused. This is a “high color” mode, also known as “5:5:5.”
- **RGB8 (Greyscale)** – The Osprey AVStream driver uses the RGB8 format for greyscale video. RGB8 is a palletized format. Each pixel is represented by one byte, which indexes one of 256 colors in a color palette specified by the driver. The Osprey driver sets the color palette to greyscale entries, and captures “Y8” luminance-only data.

YUV Format Details

YUY2, UYVY, YVU9, and YUV12 are YUV formats. In these formats, each pixel is defined by an intensity or luminance component, Y, and two-color or chrominance components, U and V. Since the human eye is less sensitive to color information than to intensity information, many video formats save storage space by having one luminance byte per pixel while sharing the chrominance byte among two or more pixels. YUV is also very similar to the color encoding used for analog color television broadcast signals.

YUY2 mode, sometimes referred to as 4:2:2 packed mode, consists of a single array of mixed Y, U, and V data. Each pixel has one Y (intensity) byte. Each pixel shares its U and V bytes with one of the pixels horizontally next to it:

pixels 1 and 2: byte 1 = y1 byte 1 intensity
 byte 2 = u1/2 shared U color information for bytes 1 and 2
 byte 3 = y2 byte 2 intensity
 byte 4 = v1/2 shared V color information for bytes 1 and 2

pixels 3 and 4: byte 5 = y3
 byte 6 = u3/4
 byte 7 = y4
 byte 8 = v3/4

YUY2 uses the same number of aggregate bytes per pixel as RGB15, which is two. However, YUY2 is more efficient than RGB15 because it stores relatively more of the intensity information to which that the human eye is most sensitive.

UYVY mode is very similar to YUY2 except that the bytes are swapped as follows:

pixels 1 and 2: byte 1 = u1/2 shared U color information for bytes 1 and 2
 byte 2 = y1 byte 1 intensity
 byte 3 = v1/2 shared V color information for bytes 1 and 2
 byte 4 = y2 byte 2 intensity

pixels 3 and 4: byte 5 = u3/4
 byte 6 = y3
 byte 7 = v3/4
 byte 8 = y4

YVU9 and **YVU12** are "planar" modes - the Y, U, and V components are in three separate arrays. It is easiest to explain the format with an example: Let's say you have a 320x240 YVU9 format. The buffer has 320x240 bytes of Y data, followed by 80x60 bytes of V data, followed by 80x60 bytes of U data. So each U and each V byte together contain the color information for a 4x4 block of pixels.

Similarly, a 320x240 YUV12 format has a 320x240 Y array, followed by a 160x120 U array, and then a 160x120 V array.



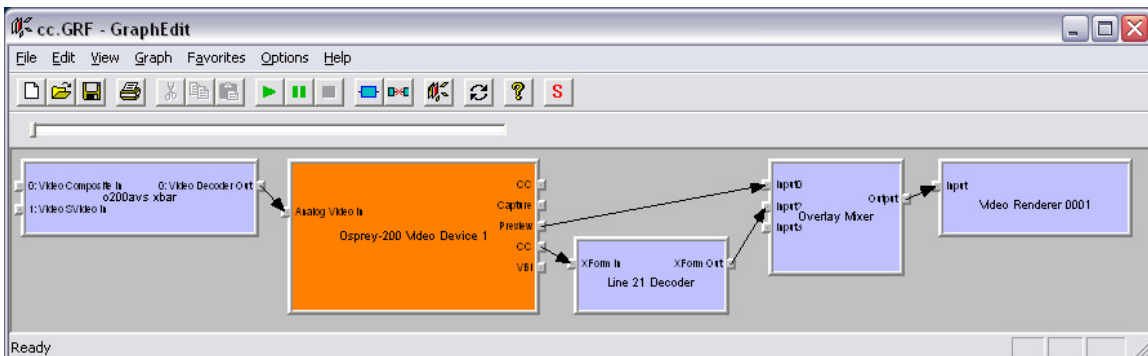
Note that in the I420 format used by Osprey, the order of the U and V arrays is reversed from the order in the YVU9 format.

Closed Captioning



The Osprey AVStream driver performs raw capture of NTSC closed caption (CC) character pairs. The character pairs are emitted as a raw, uninterpreted, DirectShow-standard CC Category stream. Downstream filters can capture this data or render it onto video. "CCApp", pictured above, is included with the driver as a simple example of CC functionality, and its source code is provided in the Osprey AVStream SDK. Osprey CC pins work with Windows Media Encoder 9.

The driver also provides PAL/SECAM closed caption data in raw form via the VBI pin (not through the CC pin). Refer to the next section on Vertical Blanking Interval (VBI) Capture for more information. The rest of this section is specific for NTSC captioning only.



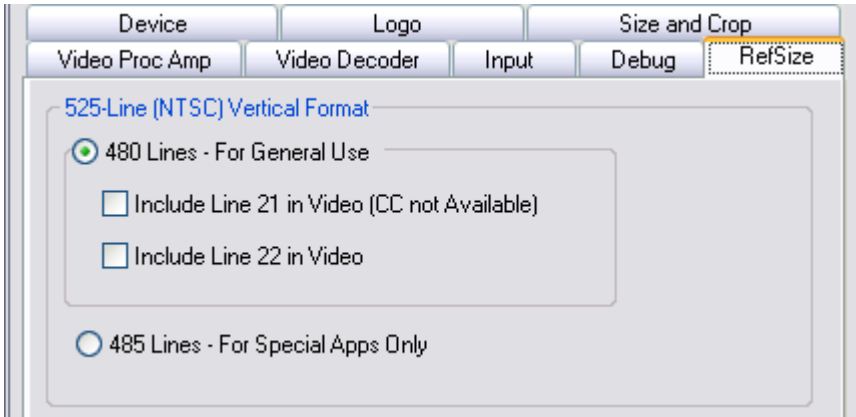
The GraphEdit filtergraph shown here displays CC on preview video. The Line 21 Decoder downstream of the Osprey-200 capture filter interprets the CC pairs and renders an overlay of the characters. The Overlay Mixer combines the CC overlay with the preview video, which is then rendered onscreen. It is also possible to capture the character pair stream as a standard stream of an avi file; or, to directly manipulate the CC stream in a standard way with a custom application.

Our testing with the current version of DirectX 9 indicates that closed captions do not render properly with the VMR9 renderer in place of the Overlay Mixer / Video Renderer combination. They appear on a horizontal stripe across the middle of the video rather than in a block at the correct location. Therefore, the default Video Renderer in combination with Overlay Mixer should be used.

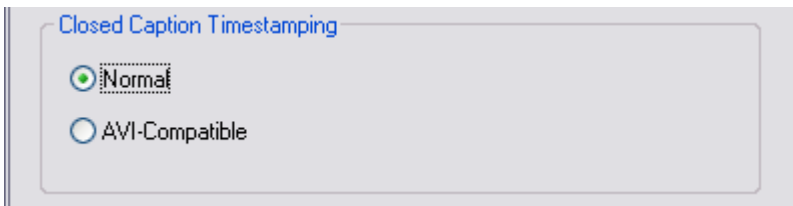
When SimulStream is not installed, the driver supports two CC pin instances. One could be associated with the video capture stream, the other with the preview stream. In practice, a DirectShow Smart Tee Filter can be inserted into the graph to make any number of VBI pins. When SimulStream is installed, any number of CC pins are allowed.

There are two user-accessible controls built into the driver that affect Closed Captioning.

On the RefSize property page, in the control group shown below, 480-line video must be selected and the checkbox "Include Line 21 in Video" must be unchecked.



On the Device -> Extras... property page, you have the choice to set with "Normal" or "AVI-Compatible" timestamping of Closed Caption samples.

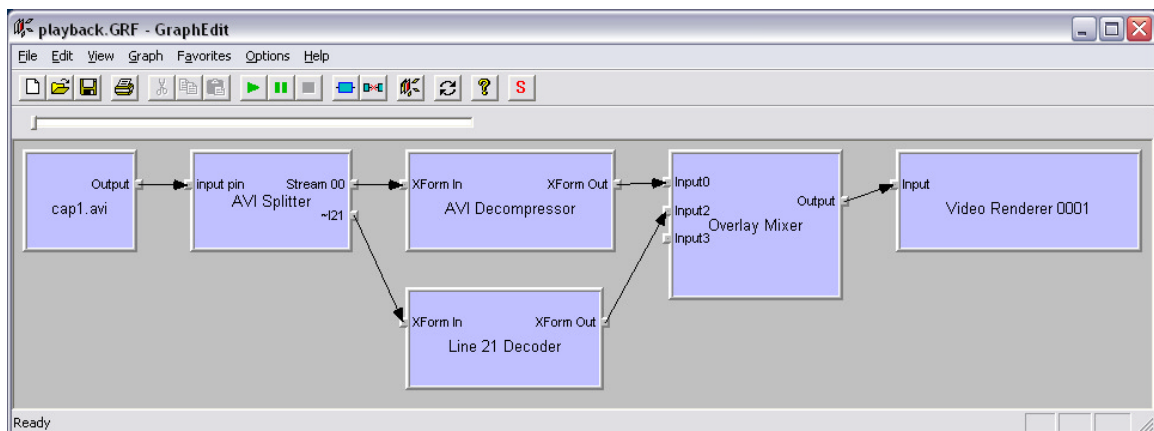


This control is a workaround to what we currently believe to be a problem in DirectShow – if you attempt to capture a CC character pair stream to an AVI file with “Normal” timestamping, the file will become extremely large and the capture will fail within a few seconds. The “AVI-Compatible” mode allows capture of CC to AVI. Unfortunately, the problems with timestamping mean that time synchronization between the video and CC streams depends on their physical interleaving in the file, so that time synchronization will be quite poor. If the AVI file is set up to be “non-interleaved”, synchronization is not very good. If the AVI file is set up to be “interleaved”, synchronization is very poor.

For all applications other than capture to AVI, this control should be set to “Normal”. WME9 among others requires the “Normal” setting if CC is used.

Application notes:

1. Windows Media Player will not play back an AVI file with an embedded CC stream. The following GraphEdit filtergraph will play back an AVI file containing a video stream plus a CC stream, with the CC rendered on the video:

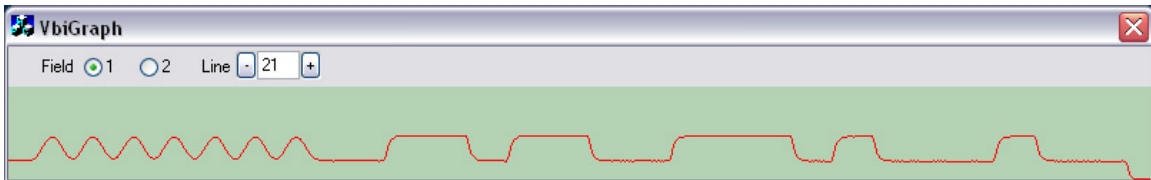


2. AMCap, the DirectShow sample capture app, will render closed captions in its preview window. It will also capture them to AVI (But, remember, Windows Media Player will not play back the CCs.). There is a “Closed Captioning” item in the Capture menu. There are two restrictions:
 - a. You have to turn off Preview in the AMCap Options menu before starting capture; otherwise, AMCap will say, “Cannot start graph”.
 - b. AMCap does not capture audio and CC at the same time – although from the points of view of DirectShow and the driver, this is perfectly possible. You have to turn off “Capture Audio” in AMCap’s Capture menu.

Vertical Blanking Interval (VBI) Capture

The Osprey AVStream driver provides DirectShow-compatible VBI pins. VBI data includes Vertical Interval Timecode (VITC) in both the NTSC and PAL worlds. In NTSC, line 21 Closed Captioning, although it is strictly speaking part of the video interval rather than true VBI data, is commonly treated as VBI data. In PAL, World Standard Teletext (WST) is encoded in the VBI data region.

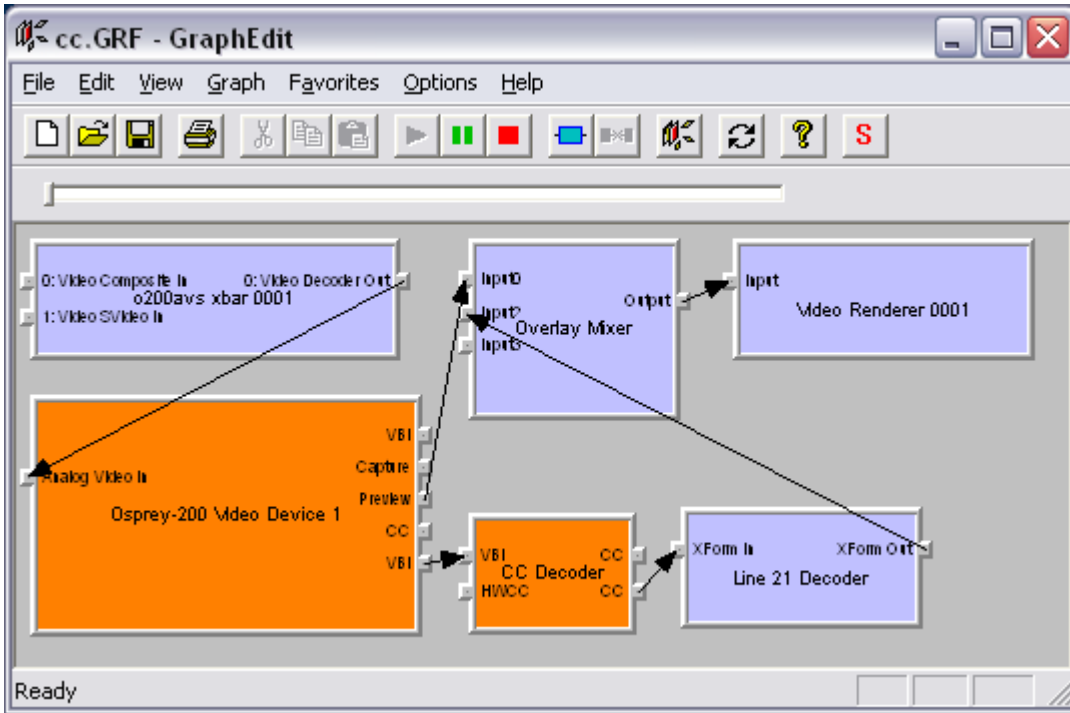
The illustration above shows an NTSC CC waveform. This illustration is made using the VbiGraph sample app that is included with the driver and also available in source form in the Osprey AVStream SDK.



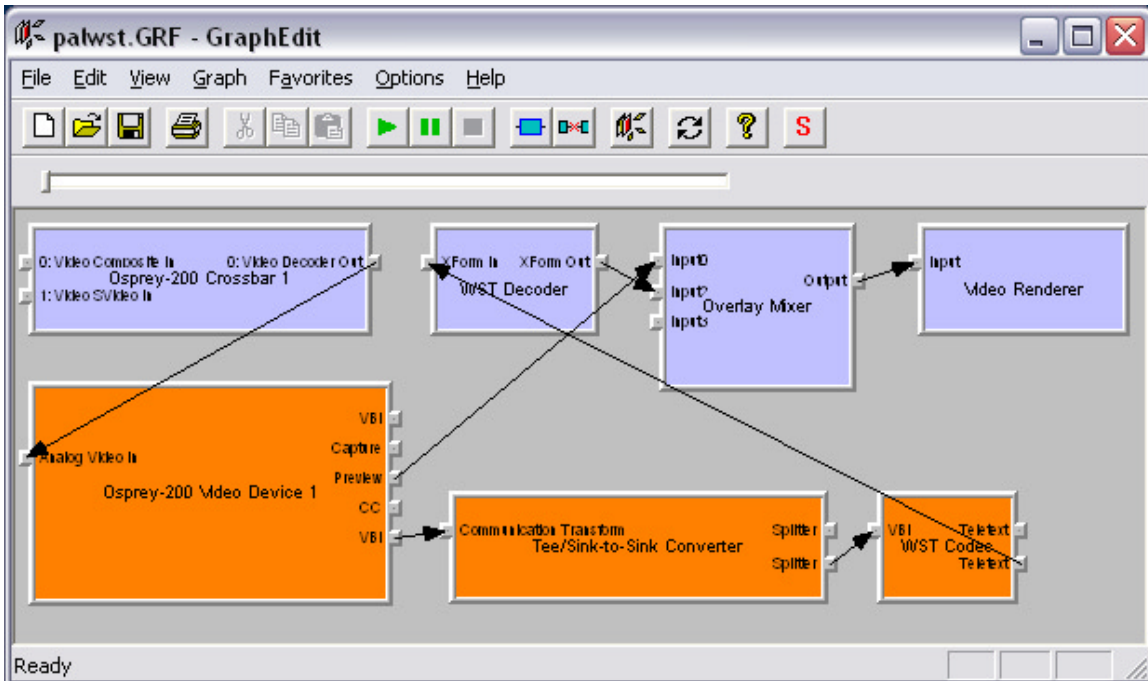
The driver delivers VBI data as raw waveforms, which are then decoded by external DirectShow filters. DirectShow provides three filters under the classification "WDM Streaming VBI Codecs" that will decode data from VBI pins:

- CC Decoder
- NABTS/FEC VBI Codec
- WST Codec

With the Osprey AVStream driver, either the CC pin or the VBI pin can be used to obtain closed caption data. If the VBI pin is used, an extra filter is required to turn the raw waveform into CC character pairs. The filtergraph below shows NTSC CC using the VBI pin; the graph in the CC section above shows CC from the CC pin; in the graph below, a CC Decoder filter must be inserted into the graph.



For PAL/SECAM, the following graph will display teletext and CC. (In this graph, to view CCs you have to select the CC page – probably page 801 - in the WST Decoder properties.)



When SimulStream is not installed, the driver supports two VBI pin instances. In practice, a DirectShow Smart Tee Filter can be inserted into the graph to make any number of VBI pins. When SimulStream is installed, any number of VBI pins are allowed.

Timecode

Vertical interval timecode (VITC) data is embedded in the Vertical Blanking Intervals (VBIs) of some video content. Timecodes mark each frame with an hour / minute / second / frame number marking that can be used for frame-precise editing.

The illustration below shows a VITC timecode waveform.

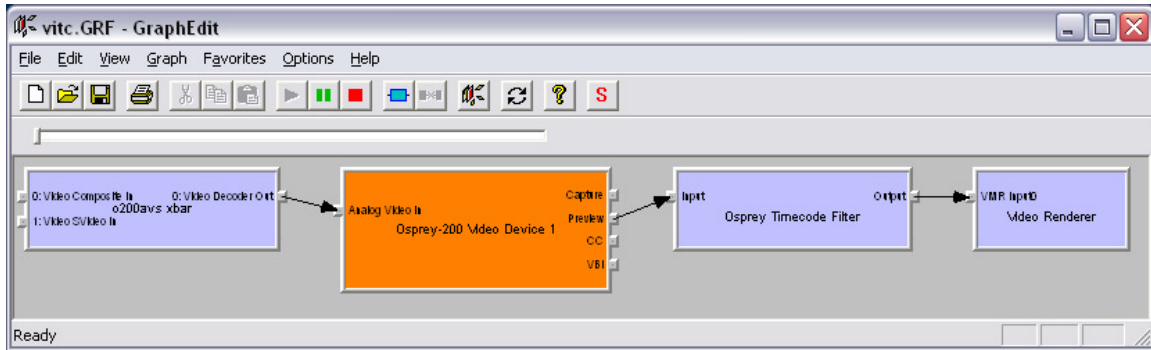


The current Osprey VITC implementation is preliminary in nature. The features and method of implementation are subject to change. We invite comments on the timecode-related capabilities that you need for your application.



Osprey's approach to VITC is to invisibly watermark the video bits of each outgoing video frame with its timestamp data. The illustration shows a timecode extracted from a watermarked frame and rendered as text on the video. Four elements are used to produce it:

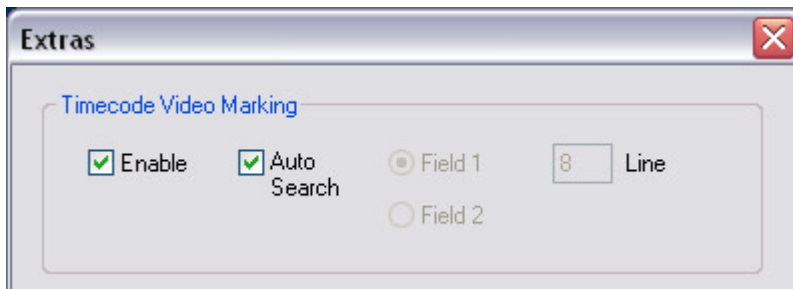
- The driver extracts timecode data from the vertical blanking interval (VBI) waveform.
- The driver watermarks timecode into the video preview or capture pin's output data.
- A custom filter decodes the watermark from the video and renders it.
- A GraphEdit graph combines the required filters. The filtergraph is as follows:



The Osprey Timecode Filter resides in the module TCOverlay.ax and is installed and registered as part of the standard driver installation. The source code for this filter is included in the Osprey AVStream SDK.

The Osprey Timecode Filter also exposes to applications a custom property and callback function that allows it to return the VITC data for each frame along with the frame's timestamp to the application. Since use of this capability requires custom programming it will not be further discussed here. Refer instead to the Osprey AVStream SDK Users' Guide. A sample SDK applet named TCApp illustrates the interface.

Timecode stamping must be enabled in the driver before it can be used. To access the controls, go to the Device property tab and click the Extras... button.



When Enable and Auto Search are both selected, when video capture starts the driver initially searches all VBI lines for a valid timecode. It locks on to the first timecode that it finds in either field. Typically, the timecode will be repeated on the same line of the two fields of each frame. In subsequent frames the driver will look for a timecode only on the locked-to line. If at any point a timecode cannot be decoded on that line the driver will reenter hunt mode for the next frame, and attempt to lock on to the VITC line again.

When Enable is on and Auto Search is off, the driver decodes timecode only on the VBI field and line that is selected by the field and line controls.

It is recommended that timecode marking be disabled when not in use, especially the auto search feature – on a slow machine it uses several percent of cpu bandwidth - *especially* if timecodes are *not* present.

Note that VITC and LTC – Longitudinal Timecode – are two distinct encoding systems, and this driver supports only VITC.

A suggested reference on timecode is *Timecode: a user's guide – 3rd ed.*, John Ratcliff, Focal Press, 1999.

Chapter 6 – The Audio Driver

Setup and control for audio are much simpler than for video. The basic steps are covered in the following topics:

Select the Audio Source and Input Volume

Audio Formats

Audio Playback

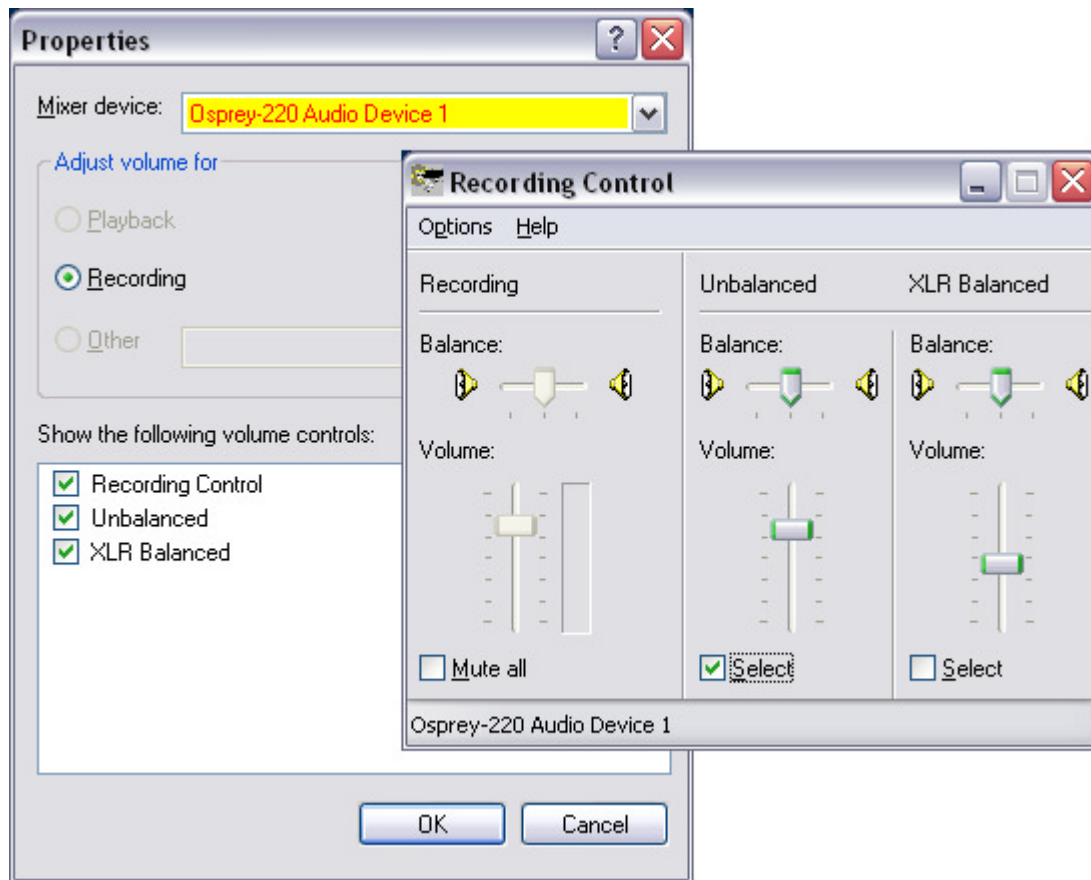
Selecting the Audio Source and Input Volume

The audio source is set using the Osprey-2XX's mixer driver interface. Most applications, including the Windows Media Encoder applications, interface to the mixer driver directly and expose the look and feel specific to that application. However, the default Windows interface to the mixer driver can also be used. There are two simple methods for getting to the mixer source and volume control dialog box.



1. The easiest method for accessing this interface is to right click the **speaker symbol** on your taskbar (typically on the bottom right-hand side of your screen). Then select the **Open Volume Controls** option. (There is a checkbox in **Control Panel -> Sounds and Audio Devices** to make this icon appear.)
2. If you do not see the speaker symbol, click the **Start** button on the Start Menu, select **Start -> All Programs -> Accessories -> Entertainment -> Volume Control**.

Either of these two methods brings up the audio mixer interface for the audio playback device. The interface looks like this for the Osprey-220 and -230; for the Osprey-200 and -210 the "Balanced" control group will not be present.



To get to the Osprey-2XX audio capture (recording) device, select **Properties** under Recording Control’s **Options** menu. This pops up the Properties dialog. Click on the **Mixer device** list at the top to see the list of audio input and output devices, including one or more Osprey-2XX(s). When you have chosen the device, click OK, and you will be returned to the Recording Control display.

The Osprey-2XX device is not a mixer in that it does not allow for mixing the various audio sources. Therefore, when one audio input is selected, any other input previously selected becomes unselected. The **Select** checkbox at the bottom of each source sets which source is actually being used.

The Osprey-210, Osprey-220 and Osprey-230 have hardware gain control. To control the hardware gain for these cards use the volume slider in the mixer applet. The unity gain setting is when the volume slider is in approximately the middle of the range.



The quick-access volume control (left click on the speaker symbol) on the task bar controls recording volume and playback volume. To change record levels, go to Options, then Properties, and select Recording.

Audio Formats

The Osprey-210, Osprey-220 and Osprey-230 hardware supports sampling of analog audio at 32, 44.1 and 48 kHz in 16-bit PCM format. The Osprey-200 hardware always samples at 44.1 kHz, 16-bit PCM format. Captured audio data is down-sampled and reformatted if necessary, allowing an application to capture audio data in 8-bit and 16-bit mono or stereo formats at any of the following data rates:

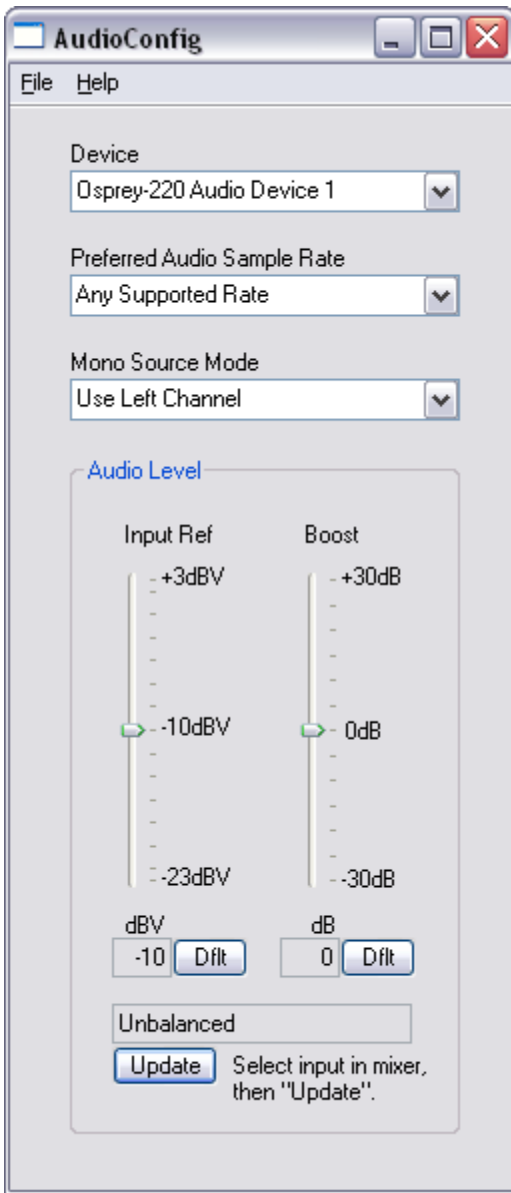
- 8 kHz
- 11.025 kHz
- 16 kHz
- 22.05 kHz
- 32 kHz
- 44.1 kHz
- 48 kHz

Audio Playback

The Osprey-200 provides audio capture only, not audio playback. Continue to play back captured audio using your system soundcard.

The Osprey-210, -220 and -230 provide a monitoring capability for the audio input. A 3.5mm stereo plug on the back of the card provides a hardware loopback (post gain) signal. Connecting headphones or speakers to this plug allows the user to monitor the audio input.

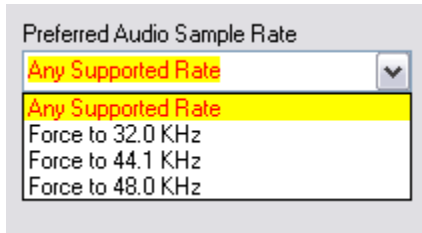
Audio Configuration



The AudioConfig applet is included as part of the Osprey AVStream driver package. It is also provided in source form in the Osprey AVStream SDK. It provides supplementary controls that are not available via the standard system properties.

AudioConfig's controls apply only to Osprey devices. Use the Device menu list at the top of the applet's window to select which device you are controlling.

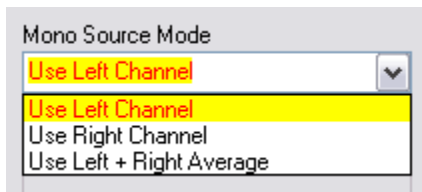
Preferred Audio Sample Rate



The audio sample rate is the rate at which the hardware samples the incoming audio, which may differ from the sample rate delivered to the client application.

The choices are to allow “Any Supported Rate”, or to force the sampling rate to be 32 kHz, 44.1 kHz, or 48 kHz. If “Any Supported Rate” is selected, the all three rates, 32, 44.1, and 48 kHz are available for selection by the Microsoft kmixer driver. Kmixer, however, does not necessarily select the optimum hardware rate for a given software rate. It may specify a 44.1 kHz hardware rate when supplying 16 kHz software rate to the application, for example. In this case it would be better to set the Preferred Audio Sample Rate 32 kHz, so that downsampling is exactly 2:1.

Mono Source Mode



This control determines which audio channel will be the source when monaural audio is selected.

- If set to Use Left Channel, the mono channel contains audio from the left input.
- If set to Use Right Channel, the mono channel contains audio from the right input.
- If set to Average Left and Right, the mono channel contains the average of the two inputs.

Note that in order to get mono audio you have to select mono mode in your application. For example, in SwiftCap you have to select mono 8-bit or mono 16-bit in the Capture Settings -> Audio -> Format control group.

Because of the way DirectShow chooses audio modes, mono mode only works correctly when the sample rate you select is an exact match for an available hardware sample rate. That is, the sample rate must be 32, 44.1, or 48 kHz for all products except the Osprey-200, and 44.1 kHz, only, for the Osprey-200.

Audio Level



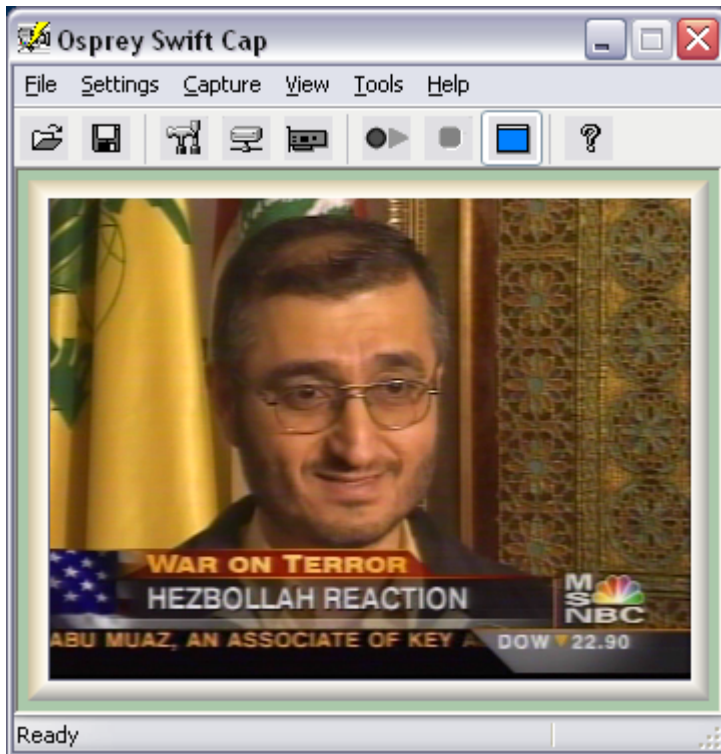
This control sets the hardware Input Reference level and software-based Boost factor. The settings are separate for each input of each device, and are applied to whichever input is selected in the current application or in the system mixer. The settings displayed do NOT automatically update when you change inputs in the application or mixer – click the “update” button to refresh the settings.

The Input Reference level is settable only on the Osprey-210 and higher, not on the Osprey-200. The default level is chosen such that the expected amplitude of a full volume input signal will have adequate headroom without clipping. If you do experience clipping, or are working with very low-level signals, you can adjust this level. On this control, a higher reference level results in lower gain, so the quietest setting is at the top of the scale. The units, default value and range are different for unbalanced and balanced signals. Click the “Dflt” button to restore the default value.

The Boost setting can be set individually for each input. It supplements the system mixer volume controls by providing a very wide adjustment range. You can use it to calibrate or normalize input levels across multiple inputs; or to accommodate microphones or other non-line inputs that have nonstandard signal levels.

Chapter 7 - Applications

SwiftCap



SwiftCap is a video capture application that is included with the Osprey AVStream package. It is included in source form in the Osprey AVStream SDK. SwiftCap is useful for general purpose capture and viewing of video, as well as for testing the installation. The following instructions take you through some basic scenarios for using this application.

Preview



Click the Preview button for a quick basic test of your video setup, or for basic video viewing. If you do not see motion video right away, make sure

- The correct device is selected
- An input to that device with a live video feed is selected
- The right NTSC, PAL, or SECAM video standard is set.

The descriptions below include instructions to correct these items if necessary.

The steps below will also show how to adjust the size of the video display.

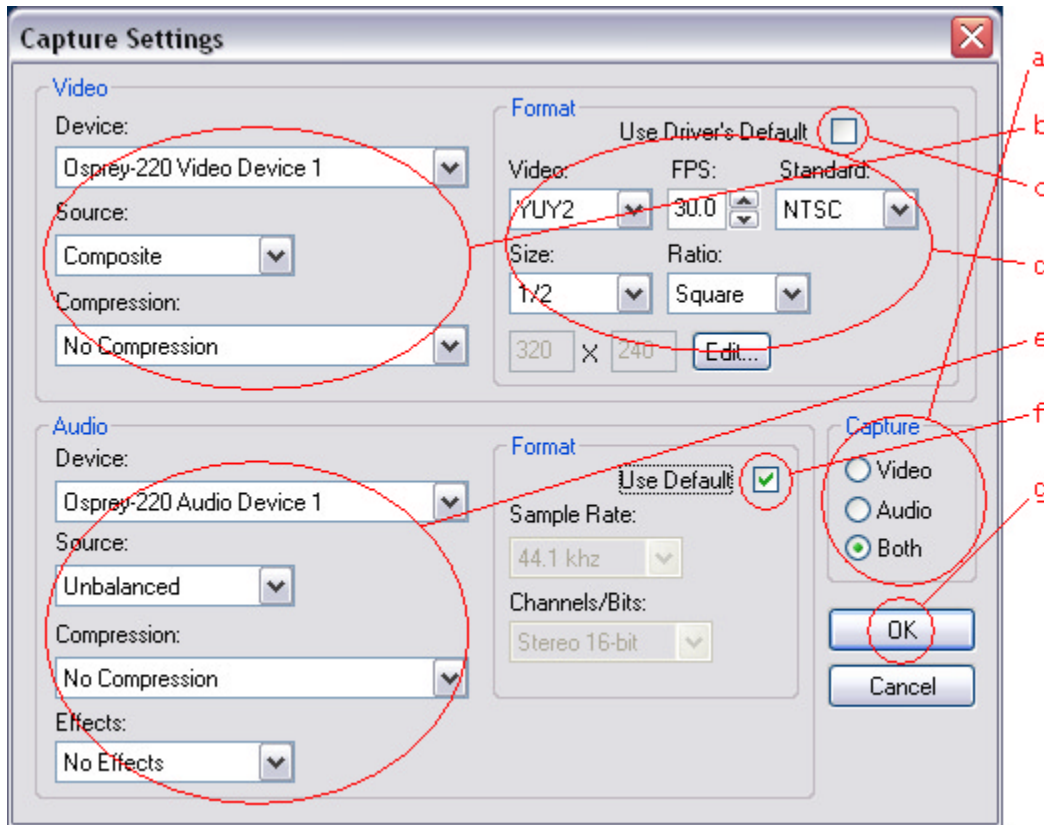
Setup Sequence

SwiftCap has many possible scenarios and pathways. The following steps illustrate a few of the most useful possibilities.

1. Click the "Tools" button to open the capture settings dialog:



2. Set up the dialog as shown below. The numbers and circles show the suggested order of setup.

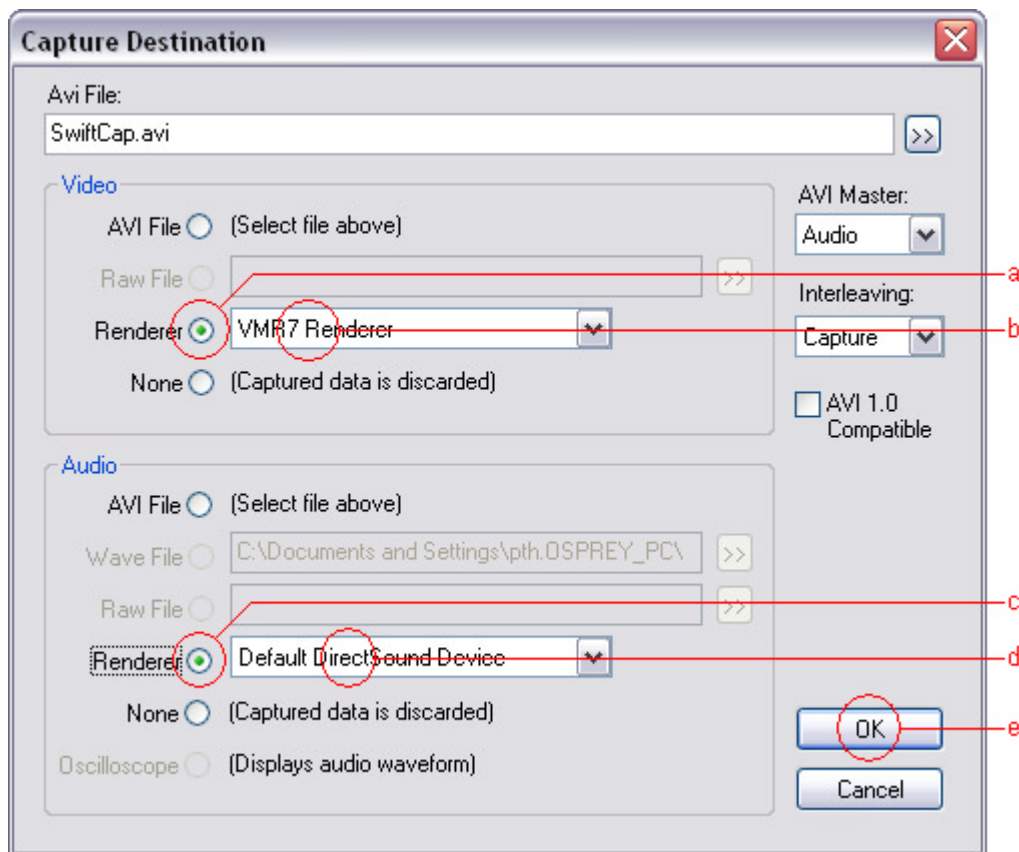


- a. First decide whether you want to capture video only, audio only, or both; unselected controls will be disabled – the following assumes you have selected "Both".
- b. Select your video device and source. Select "No Compression".
- c. In the Video Format group, uncheck "Use Driver's Default".

- d. Select the video standard, color format, frame rate, and video size you want to use.
 - e. Select your audio device and source. Select "No Compression".
 - f. In the Audio Format group, check "Use Default" for this experiment.
 - g. OK.
3. Next, click the Destination button to open the Capture Destination dialog:

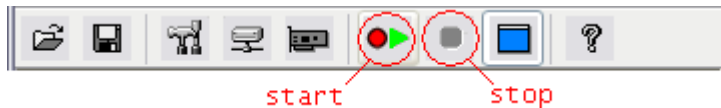


4. In the Destination dialog, set the items marked in red.



- a. In the video section, select "Renderer".
- b. Select "VMR7 Renderer". Note that there is a discussion of renderers in the Video Capture Topics chapter.
- c. In the audio section, select "Renderer".
- d. Select your sound card as the rendering device.
- e. OK.

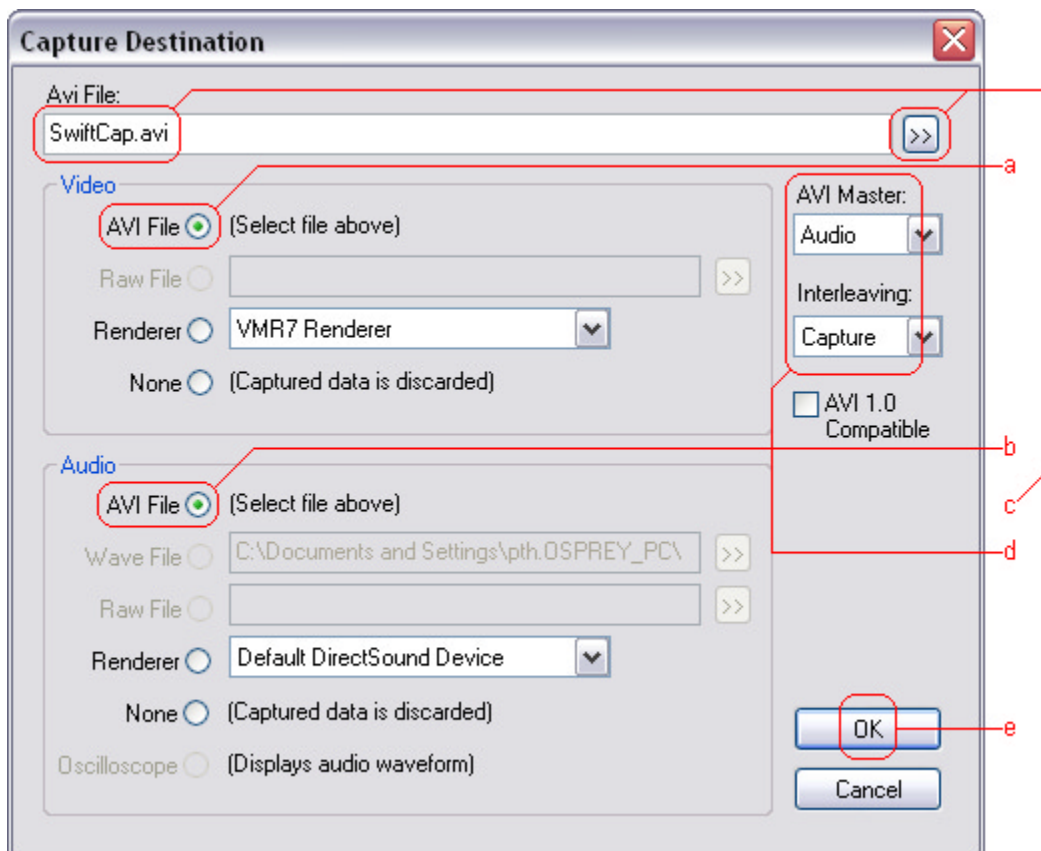
5. Click the Capture or Start button.



An "Active Movie" video window will open on your screen, and you will hear audio from the capture source, until you click Stop.

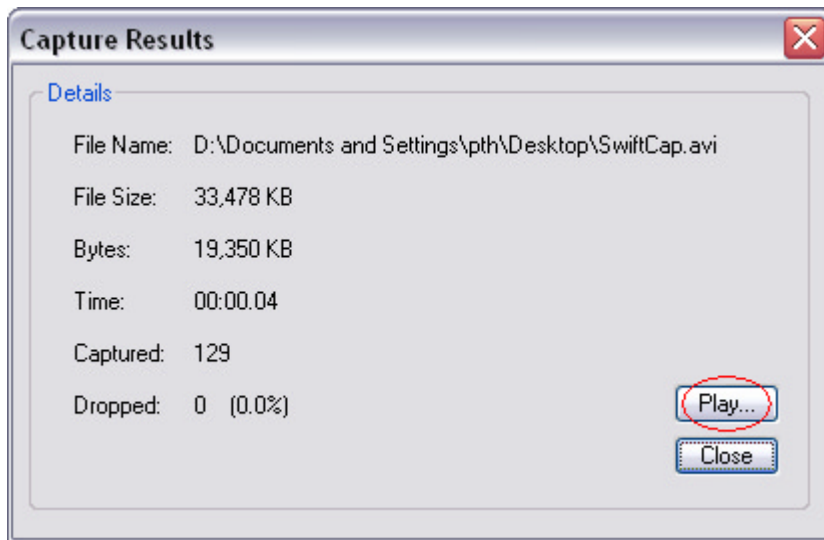
A Capture-to-File Scenario

1. No changes are mandatory from the previous setup the Capture Settings dialog. However, you may want to select a video and/or audio compressor to obtain a much more compact capture file.
2. In the Capture Destination dialog, make changes as shown below.



- a. In the video section, click the AVI File button.
- b. Do the same in the audio section.
- c. Select an AVI file. Click the >> button on the right to browse for a file.

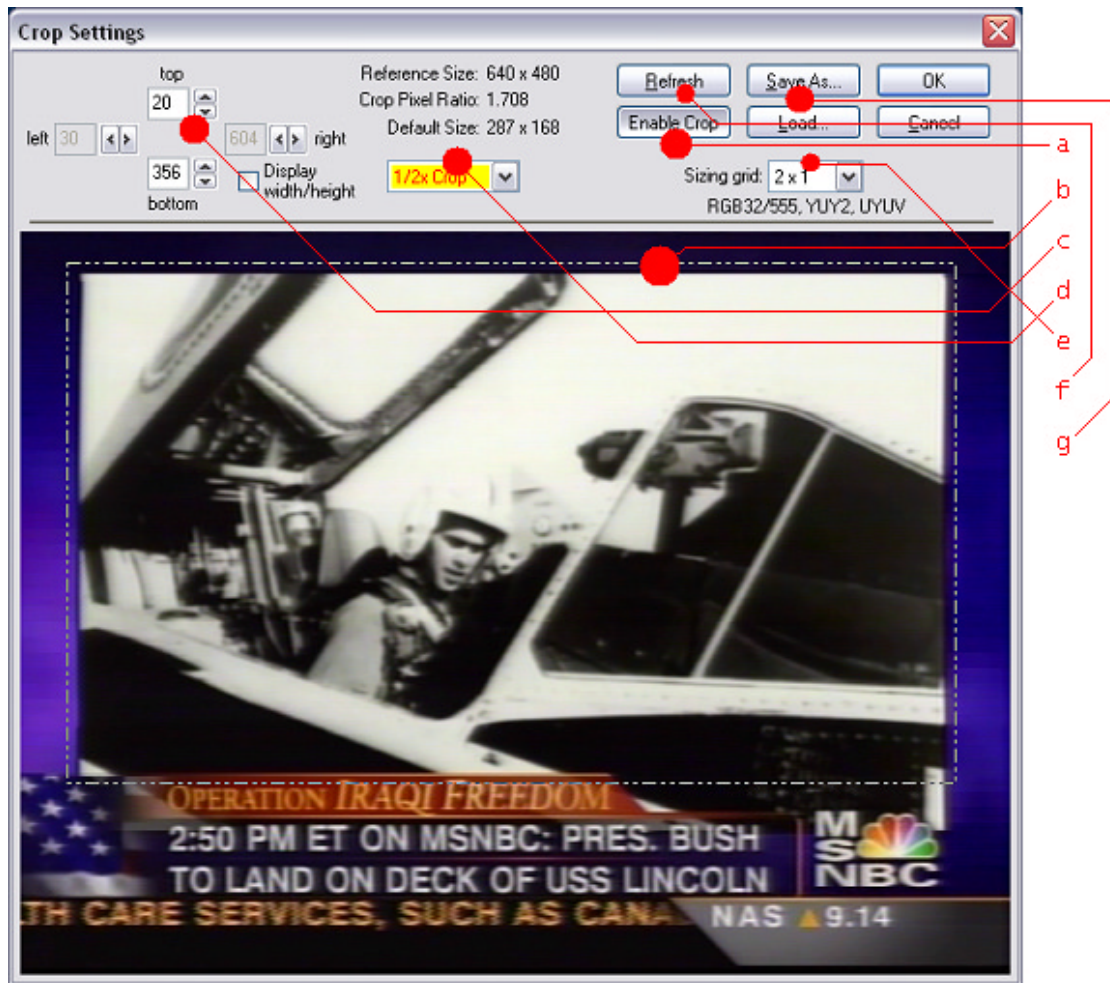
- d. Select Audio as the AVI Master, and Capture as the Interleaving Mode. If you are capturing video only or audio only, these settings are not used and the controls are greyed.
 - e. OK.
3. Click Start, then Stop after a few seconds. The Capture Results dialog shows capture statistics, including file size, duration of capture, number of frames captured and number of frames dropped. It also has a Play button. Click this to play back the AVI file with your default media player.



Cropping

The crop settings obtained in SwiftCap are compatible with the settings obtainable from the driver property pages. Once set up in SwiftCap, they can be applied to other applications as well.

The menu item Settings -> Crop Settings... brings up the following dialog:



- a. Click Enable Crop to enable or disable cropping. There is also a direct menu item Settings -> Crop Enable to turn cropping on using the current crop, or to turn cropping off.
- b. Drag the edges or corners of the cropping rectangle to resize it, or drag its center to move it.
- c. The top / bottom / left / right edit boxes give a readout of the current crop boundaries. You can also edit these boxes directly to obtain a precise size or position.
- d. The output size, which is the final size of the captured video, can be 1X, 1/2X, or 1/4X the crop size. There is also an entry in this drop box by which you can set a custom size.
- e. The sizing grid sets the granularity of your crop width settings. For example, if you are capturing in YVU9 format, crop width must divide evenly by 16 and crop height must divide evenly by 4. Setting the sizing grid to 16x4 ensures that your crop settings will be correct for the capture format. The text line below the drop list shows which color formats your selected granularity applies to.
- f. Click Refresh to update the image from the video source.

- g. Save As... and Load... allow you to save multiple crop specifications for future reference.

Note that there are minimum values for crop size and output size; SwiftCap will reject smaller values. Also, you cannot specify an output size that is larger than the crop size.

Other Features

1. Logo setup: SwiftCap has the menu item Settings -> Logo Settings... . This selection directly accesses the driver's logo property page; for details, refer to the driver properties description. There is also a Settings -> Logo Enable control to directly turn the logo on or off.
2. Accessing driver properties: Click the circuit board icon on the toolbar.



NOTE: If you use the driver's "Size and Crop" or "Logo" property pages, you will not have the option of saving different settings for capture and preview. The Pin Select radio buttons will be greyed out and forced to the "Both" position.

3. Cpu meter: Turn on via the menu item View -> CPU Meter.



4. Load and save configuration: These two buttons enable you to save SwiftCap settings for future use.



Limitations and Peculiarities of SwiftCap

The current version of SwiftCap does not capture or display closed captions.

If you select RGB8 greyscale as your color format, SwiftCap captures in greyscale, but continues to preview in color. Also, if you capture to the VMR7 Renderer or VMR9 Renderer, you will get color video; you will only see greyscale video with the "Video Renderer" selection.

The current version of SwiftCap does not handle Video for Windows devices very well. The buttons to access the driver's Source and Format dialogs do not work.

CCApp



The Osprey AVStream driver performs raw capture of NTSC closed caption character pairs. The character pairs are emitted as a raw, uninterpreted, DirectShow-standard CC Category stream.

CCApp renders Closed Captioning on video, and also displays it as line mode text in a separate text box. The View options permit viewing of no video, video without captions, or video with captions; and allow the text box to be shown or removed.

CCApp requires that the filter CCFilter.ax be present on the system. The driver setup program installs this filter.

CropApp



CropApp sets up crops visually and interactively. Its functionality is similar to the driver's Size and Crop property page, but it has the added dimension of graphical placement of the cropping rectangle on live video. It has about the same functionality as SwiftCap's crop setup dialog.

The functions of the controls on the left hand side of the video are as follows:

- If multiple Osprey devices are in the system, you can select the device of interest from the dropdown list at the top of the control groups. Click "Device Properties..." to access controls that are not explicitly addressed by CropApp.
- All operations affect both the Capture and Preview pin on the device. The driver's Size and Crop property page is capable of setting the Capture and Preview pins differently. If SimulStream is enabled, CropApp is hardwired to set up pin pair 0 only – to set up other pins you will have to go to the driver's Size and Crop property page.
- The Reference Image group shows the video height and width that are the reference size for cropping operations. For example, if the reference size is 640x480 and the cropping spec is 640x480, then the video is effectively uncropped. This group also states the basis for this reference size – that is, whether the video standard is NTSC (640x480 or 720x480) or PAL/SECAM (768x576 or 720x576). If CCIR601 sizing is selected, the video width is 720 for NTSC, PAL, and SECAM.

- The Cropping Parameters group is where the current cropping parameters are shown. When the Enable button is Off, the entire video field is shown, with the crop as an overlaid rectangle. You can modify the crop in three ways:
 - By editing the X, Y, Width, and Height boxes.
 - With the two sets of arrows adjacent to these boxes.
 - By dragging the center, edges, or corners of the crop rectangle on the video.

When the Enable button is On, only the crop field is shown, and the crop settings are not editable.

CropApp will not let you set crops that are smaller than a minimum width and/or height. The minimum size with the Osprey-MM 3.1 driver is 48 wide by 36 high.

- The Default Output Size group sets a default size that applications may choose. Use the slider to set the approximate size you want, and then if necessary use the [<] and [>] buttons to fine tune the setting.

The sizes available in CropApp will always retain a 1:1 height:width proportion. If you want to stretch the video to other proportions, use the driver's Size and Crop property page, or SwiftCap's crop dialog.

Not all applications use the driver's default output size or present it as a choice; you may have to manually enter the settings calculated by CropApp into the application.

CropApp will not let you set an output size that is smaller than a minimum width and/or height. The minimum size with the Osprey-MM 3.1 driver is 48 wide by 36 high.

- The Granularity group allows you to determine the allowed sizing increments for the selected video format. For example, if you select YVU9 in the drop list, you will see that the video widths allowed in this format are modulo-16, that is, 320, 336, 352, etc., and the video heights allowed are modulo-4 – 240, 244, 248, etc. All editing of the crop size will snap to the nearest allowed size.

There are no restrictions on placement of the left and top of the video – for example, in YVU9 the width must be 320, 336, etc, but the left side can be 0, 1, 2, etc.

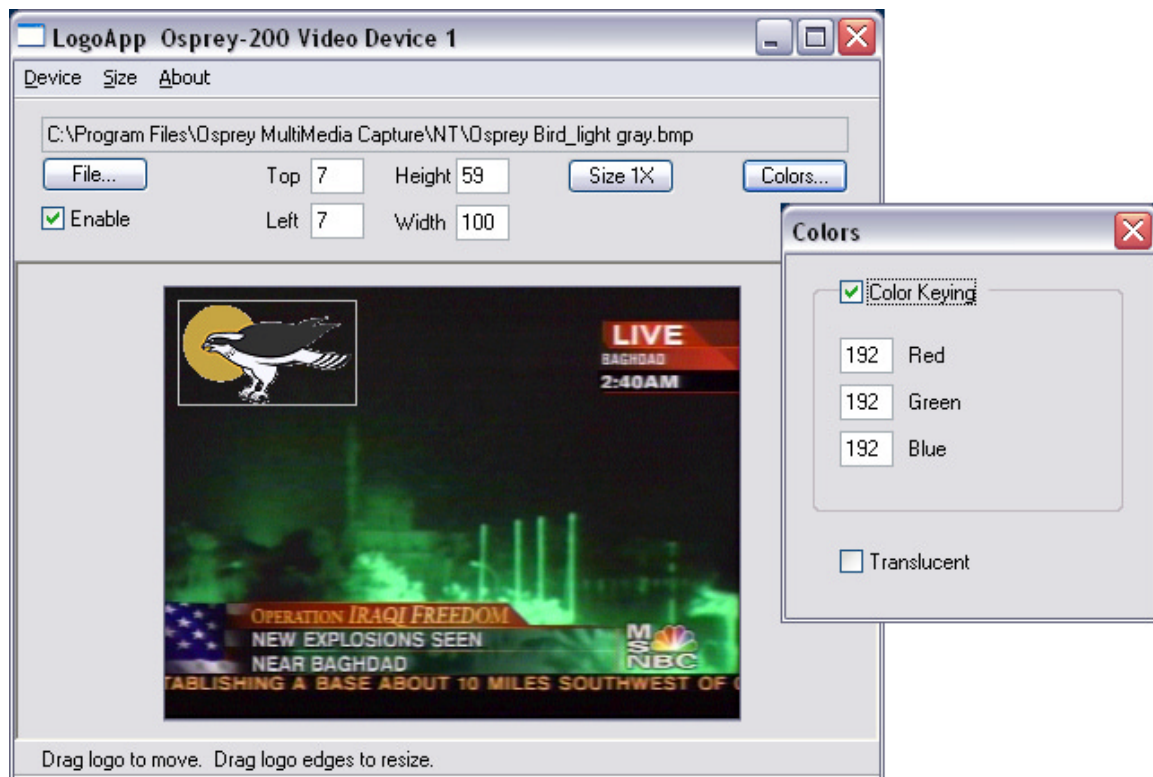
Selecting a format here causes CropApp to use that format for its own rendering, but it does not cause that same color format to be selected in your application. It only ensures that your crop size will work with that color format when it is used.

We are finding that the default I420 codec will not render many output sizes, so when I420 granularity is selected, CropApp will observe the I420 granularity rule but render the video as YUY2. Since you may see this problem in other applications, CropApp puts up a reminder message when it encounters this situation.

If you exit CropApp with the crop Enabled, that is, the center checkbox checked, the crop parameters will be set in the driver for any other application to use. If you exit CropApp with the crop disabled, the crop parameters will be set for other applications to use, but cropping will not be enabled until it is turned on as a separate step.

CropApp requires that the filter OverlayRect.ax be present on the system. The driver setup program installs this filter.

LogoApp

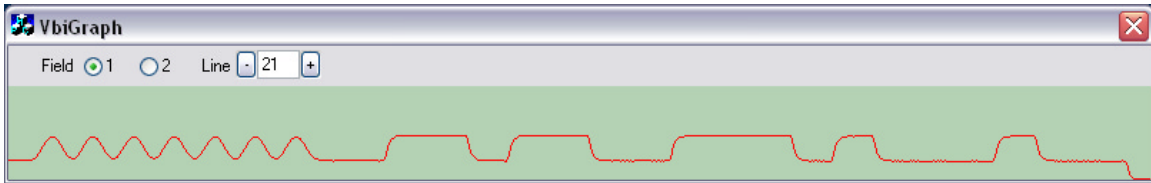


LogoApp interactively positions and resizes a logo on live video. The functionality is similar to that of the driver's Logo property page, but you can place and size the logo by dragging its center, sides, or corners directly on live video.

The control bar across the top allows you to Enable/Disable logo display and select the 24-bit .BMP logo file. You can size and place the logo graphically on the video, or you can directly edit the top/left/height/width boxes. Use the Size 1X button to snap the logo to its original size. The Colors... button brings up a dialog to enable color keying, select the key color, and enable translucent mode.

The Size menu allows you to select full or half-size video. The Device menu displays a list of enabled devices and provides access to the selected device's property pages. LogoApp sets the same logo spec for both the Capture and Preview pin. If SimulStream is enabled, LogoApp will set only Pin Pair 0. To set up other pin instances, or to set the capture and preview pins differently, use the driver's Logo property page.

VbiGraph



VbiGraph is a demo of DirectShow VBI streaming. The current version of VbiGraph only works with the first video capture device enumerated. It will detect whether 525- or 625-line video is currently playing and configure itself accordingly. The controls let you display any VBI line from either video field.

Refer to the VBI section of the Video Driver Topics chapter for more information about VBI.

VidControl



VidControl controls the video source, standard, and settings of Osprey AVStream Capture Devices. It is useful for initial setup of devices. Use the Devices menu to select among multiple devices.

Chapter 8 - Troubleshooting

Blue/Pink/Black/Orange Video Screen

Scrambled Video Image

Poor Video Quality at Large Frame Sizes

Multiple Horizontal Lines Across Video Image

Cannot Play Back Audio Recorded by the Osprey Card

Audio Recording Control Comes Up With Wrong Device and Wrong Inputs

Interrupt Conflicts

Blue/Pink/Black/Orange Video Screen

The currently selected video input is not receiving an active video signal. Different inputs may provide a different symptom when a video source is not supplied.

- Check that the camera, VCR, or other video source is powered and that its output is connected to the Osprey card's input.
- Check that the correct video input is selected in the Control Dialog's Source page.

Scrambled Video Image

You may have set the wrong video signal format for the signal input you are using. For example, you may have told the driver to look for NTSC-M video but are using a PAL-BDGHI video source. Make sure you know what signal format your video source is generating. Go into the **Video Standard** field of the Control Dialog's Source page, and click the button for that signal format.

Poor Video Quality at Large Frame Sizes

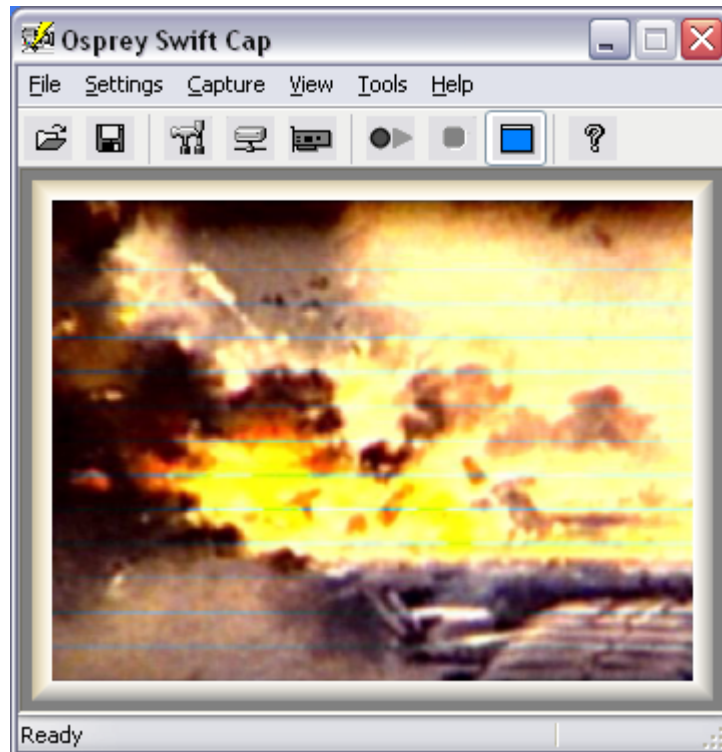
Large frame sizes with the deep pixel depth (24- or 32-bit), or complex format (YVU9 or YUV12 planar), impose heavy demands on the PCI bus's data transfer capacity. Our experience is that some systems cannot handle these formats at full frame sizes.

Systems vary in their data transfer limits. The characteristics of the PCI bridge are often more important than processor speed. If you are having problems, we recommend that you:

- Use a smaller frame size (480x320 or less).
- Use a shallower color format (RGB15 or RGB24 instead of RGB32).
- Try an RGB format instead of a YVU format, and a packed format instead of a planar format.
- If you have a choice of PCs for video capture, try using another system with a different system board chipset.

Multiple Horizontal Lines Across Video Image

If there are multiple, regularly spaced, horizontal lines across your video image and your source material is copyrighted and copy-protected, you are seeing Macrovision™ copy protection. It looks like this:



The lines can vary in color from yellow to blue to green. These lines are not present in every frame of video. There may also be a black band at the top of the frame.

The Osprey Multimedia Capture Cards cannot eliminate these video artifacts. These artifacts will only be present when you are using a copy-protected source, such as a high-quality DVD for testing a card.

Cannot Play Back Audio recorded by the Osprey Card

If you have a sound card installed, you should be able to hear audio when you play back recorded audio.

- Verify that the volume control for your playback device is not muted.
- Verify that the selected playback device is your sound card, and not the Osprey-200, Osprey-210, Osprey-220 and Osprey-230 Placeholder device. The Placeholder device exists in order to handle the situation where there is an Osprey-200, Osprey-210, Osprey-220 and Osprey-230 present without a sound card. Some Windows applications cannot use a recording device unless a playback device is also installed. The Placeholder device cannot play back recorded audio. You can use the same method to select playback device that you use when [selecting the audio source](#).

Audio Recording Control Comes Up With Wrong Device and Wrong Inputs

The cause of this problem may be that you currently have or have had previously, a Video for Windows audio capture driver installed in the system. The Osprey AVStream install process normally removes a previous Video for Windows driver, but if you have multiple Osprey cards installed you do have the option of running the Video for Windows driver on some cards and the AVStream driver on others. Unfortunately the Recording Control does not work smoothly in this situation. The Video for Windows device will always try to act like it is the selected device even if it is not. You have to manually enter Recording Control's Options -> Properties dialog to select your device.

If you no longer have need for the Video for Windows driver, you can uninstall it using instructions obtainable from Osprey technical support. If you are comfortable using RegEdit to edit your registry, you can instead go to the following location

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Drivers32

and delete all REG_SZ entries named "mixer" or "mixer1" .. "mixer9" that have the name of an Osprey mixer as their data. These names will be o2ca_mix.dll, o5ca_mix.dll, or o540_mix.dll.

Interrupt Conflicts

Failed network connections, failure of a device drive to initialize during start-up, or failure of the Osprey card and driver to operate properly are often traced to interrupt (IRQ) conflicts. In our experience, IRQ conflicts are most commonly seen when a PCI SCSI adapter, or possibly a PCI network adapter, is present in the system.

Conflicts Between PCI Cards

Conflicts of PCI Cards with ISA Cards

Conflicts Between PCI Cards

PCI cards and drivers do not choose which IRQs they use; rather, the operating system assigns IRQ lines to PCI cards. The IRQ configuration for the Osprey card or cards is determined by Windows XP and the Osprey driver cannot change this configuration. However, you can cause the operating system to assign IRQs differently by rearranging cards or changing BIOS settings.

Multiple PCI cards are supposed to be able to share the same IRQ line. In practice, occasionally you may encounter a device driver that is not implemented correctly for interrupt sharing. If this problem arises, you have to rearrange the PCI cards so that the non-compliant card does not share its IRQ line with any other device.

Another problem is that some PCI device drivers expect to use a particular IRQ line. When a new card is added, it causes the system to assign IRQs differently. If the IRQ assignment for a particular card is changed and its device driver does not detect the change, this causes the system to work incorrectly.

The simple answer to this problem is it can sometimes be solved by physically rearranging the PCI cards such that their arrangement in the PCI slots is different. When doing this, keep careful notes of the arrangements you have tried.

Another approach to PCI card conflicts is at the BIOS level. Depending on what kind of system BIOS you have, you may be able to change which IRQ lines are allocated to PCI devices versus ISA devices. You may be able to allocate more IRQ lines for PCI devices and thereby solve a PCI conflict.

If these approaches do not work, see [Getting Help](#) in Chapter 1.

Conflicts of PCI Cards with ISA Cards

A PCI card and an older-style ISA card can never share IRQ lines.

Unfortunately, if a device driver for an ISA card has failed to initialize because of an IRQ conflict, the card's IRQ does not appear in the list. To find the conflict, you have to examine all your ISA cards with the Control Panel to find out what IRQs they are trying to use.

Appendix A - Hardware Specifications

The physical specifications for the Osprey Multimedia Capture Cards are as follows.

Table A-1 Physical Dimensions – Osprey-100 and Osprey-200

Length	122 mm
Width	18 mm
Height	56 mm
Weight	63 grams

Table A-2 Physical Dimensions – Osprey-210 and Osprey-220

Length	131 mm
Width	18 mm
Height	126 mm
Weight	63 grams

Table A-3 Physical Dimensions – Osprey-230

Length	168 mm
Width	18 mm
Height	126 mm
Weight	63 grams

Table A-4 Environmental Specifications

Operating temperature range	0° to 40° C
Non-operating temperature range	-40° to +75° C (RH)
Operating humidity range	Between 5% and 80% (non-condensing) @ 40° C
Non-operating humidity range	95% RH (non-condensing); gradient 30% per hour
Operating altitude range	0 to 3,048 meters (10,000 feet)
Non-operating altitude range	0 to 15,240 meters (50,000 feet)

Appendix B - Adding/Moving Boards

When the Osprey MultiMedia Capture driver has been installed and another Osprey board is put into a slot that has not previously contained a board, the following sequence is initiated. This can happen because an Osprey board has been moved to a different PCI slot or when a board is being added to the machine. It occurs because of the manner in which Windows XP enumerates devices.

The New Hardware Wizard runs and displays the Found New Hardware window followed by the Digital Signature Not Found window.

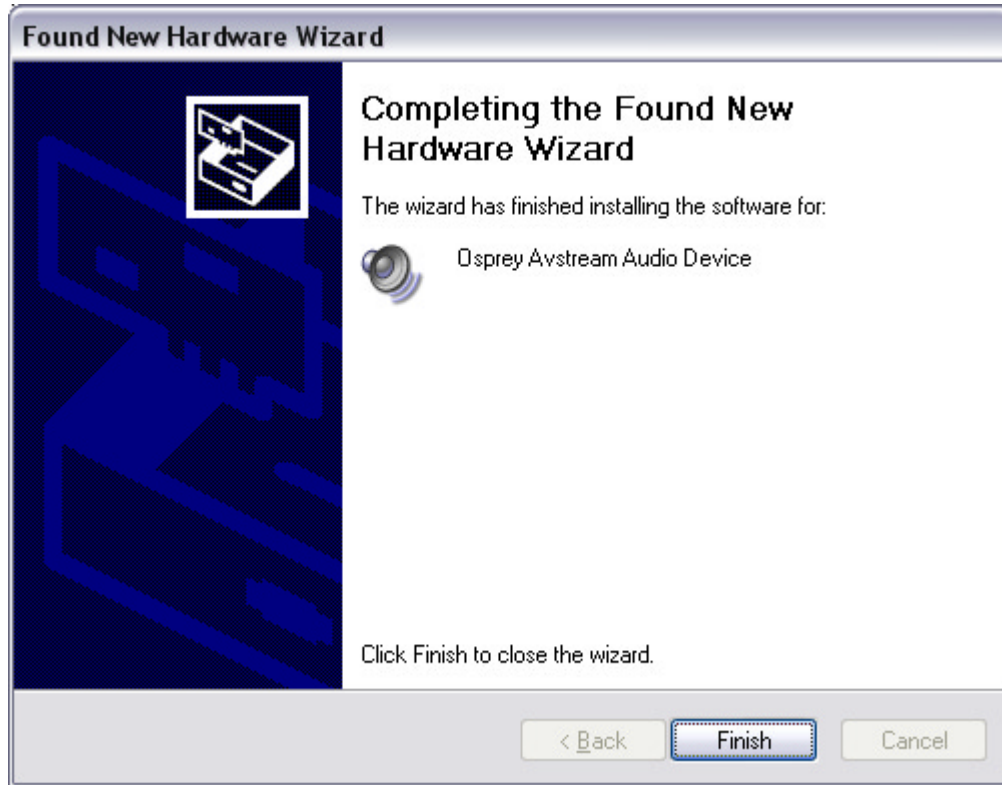




1. Click **Continue Anyway**. (This window will only be displayed on drivers that have not been WHQL Certified; WHQL Certified drivers will skip this step)
The Multimedia Controller installing window (not shown) displays, and the text inside this window changes to "Osprey Video Capture Device, Installing ...". Then the Digital Signature Not Found window appears on top of it.



2. Click **Continue Anyway**. (This window will only be displayed on drivers that have not been WHQL Certified; WHQL Certified drivers will skip this step)
The Completing the Found New Hardware window displays.



3. Click **Finish**.
The Digital Signature Not Found window displays.
4. This window displays once for each Osprey board you are installing.
The Systems Setting Change window displays.
5. Click **Finish** to restart the computer.



You must restart your computer to complete the installation. Do not attempt to use your Osprey card until after restarting the system.

Appendix C - Developer Support

The Osprey Technologies group has a software developers' kit (SDK) that provides a programming interface to the Osprey AVStream driver's custom properties. Inquire at <http://www.ospreyvideo.com> for further information. This kit is different from the Osprey SDK for Video for Windows – so make sure you obtain the correct one.