User's Guide

ZP-330

ZP-230

Real-Time/Off-Line Encoder for
MPEG-2 Video and Dolby® Digital/MPEG/PCM Audio

zapex
a brother company

DOLBY
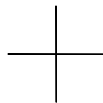DIGITAL

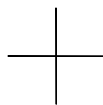The following are trademarks of Zapex Technologies, Inc.:
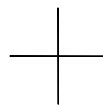
Version 4.02

User's Guide

ZP-330

ZP-230

**Real-Time/Off-Line Encoder for
MPEG-2 Video and Dolby® Digital/MPEG/PCM Audio**

or

or

Important Safety Instructions

1. Installing and operating your Zapex Encoder.
2. Retain this User's Guide for future reference.
3. The Zapex Encoder operates as software and hardware that is installed inside a personal computer. Read these safety instructions before connecting computer to a power supply as described by its manual or as marked on the computer.
4. Carefully read and adhere to special symbols and associated statements that accompany the operating instructions described in this User's Guide. The following special symbols are used in this manual:

SAFETY
In this User's Guide the electrostatic discharge hazard symbol warns of static electricity safe guards. Static electricity can damage your Zapex Encoder. Before opening the anti-static bag that contains the encoder, assure your PC is turned off, then ground yourself by touching any exposed metal on your PC chassis or connector brackets while the computer is plugged in. Avoid simultaneously touching components of your encoder and any monitor, even if the monitor is turned off. Some monitors build up and retain a static charge that could damage your encoder.

ATTENTION
The use of this symbol serves as a procedural notice. Read before proceeding.

IMPORTANT
This symbol provides the user important information to be aware of.

NOTE
These notes provide additional subject information.

5. Appendix E provides statements for all applicable regulatory approvals.

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APPENDIXES

Preface

Thank you for purchasing the Zapex ZP-230 or ZP-330 Encoding System for MPEG-2 video, Dolby® Digital, MPEG, and PCM audio encoding.

This User's Guide describes precautions, specifications, connections, parameters and commands for using your ZP-230 or ZP-330 encoder. Please read carefully through this User's Guide. It describes how to correctly operate your encoder.

Changes for Version 4.0

Your Zapex ZP-230 or ZP-330 Encoding System now includes the following features:

- Program Stream Multiplex using *ZP-Controller*

- Program Stream Multiplex using Adobe Premiere Plug-In or AVI files

- Transport Stream Multiplex using *ZP-Controller*

    Video + Audio

        or

    Video + Audio 1 + Audio 2

Encoded output format on each model.

MODEL	ENCODER OUTPUT	
	REAL-TIME	OFF-LINE
ZP-230 and ZP-330DD		
ZP-230 and ZP-330CD	ES, VOB, PS, TS	ES, VOB, PS
ZP-230 and ZP-330CA		
ZP-230 and ZP-330SA		
ZP-230 and ZP-330NN	N/A	ES, VOB, PS

These are explained in detail in Chapter 1, "System Overview and Requirements."

Special Note Concerning Use of Dolby® Digital Trademark

Dolby Laboratories encourages use of the Dolby® Digital trademark to identify soundtracks that are encoded in Dolby® Digital. This is an effective way to inform listeners of the soundtrack format, and the use of a standard logo promotes easy recognition in the marketplace. However, like any trademark, the Dolby® Digital logo may not be used without permission. Dolby Laboratories therefore provides a standard trademark license agreement for companies who wish to use Dolby trademarks. This agreement should be signed by the company that owns the program material being produced. Recording studios or production facilities which provide audio production or encoding services for outside clients generally do not require a trademark license. If you would like more information on obtaining a Dolby trademark license, please contact Dolby Laboratories Licensing Corporation. Information on trademark licensing plus instructions for using the Dolby® Digital trademark and marking audio formats can also be found on-line at http://www.dolby.com. See Appendix F, "Use of Dolby Trademarks," for more information.

C H A P T E R

1

SYSTEM OVERVIEW AND REQUIREMENTS

This chapter contains the following information:

✓ **Product Inventory**
✓ **System Components**
  - Zapex Encoder Board Models
  - *ZP-Controller* Software
  - Media Cable
  - RS-232C/RS-422 Converter and VTR Control Cable
  - User's Guide
  - Audio Level Converter
✓ **System Requirements**
✓ **Real-Time and Off-Line Encoding**
  - Real-Time Encoding
  - Off-Line Encoding

1.1   PRODUCT INVENTORY

Check the contents of the shipping container to ensure that all components of your new encoding system are included. Figure 1-1 shows all of the components available for the Zapex encoders. The model number, serial number, and options are indicated on the side of the shipping container.

The NN encoder models do not contain the Media Cable, RS-232C/RS-422 Converter, VTR Control Cable, or Audio Level Converter.

Figure 1-1. Inventory of Shipped Components
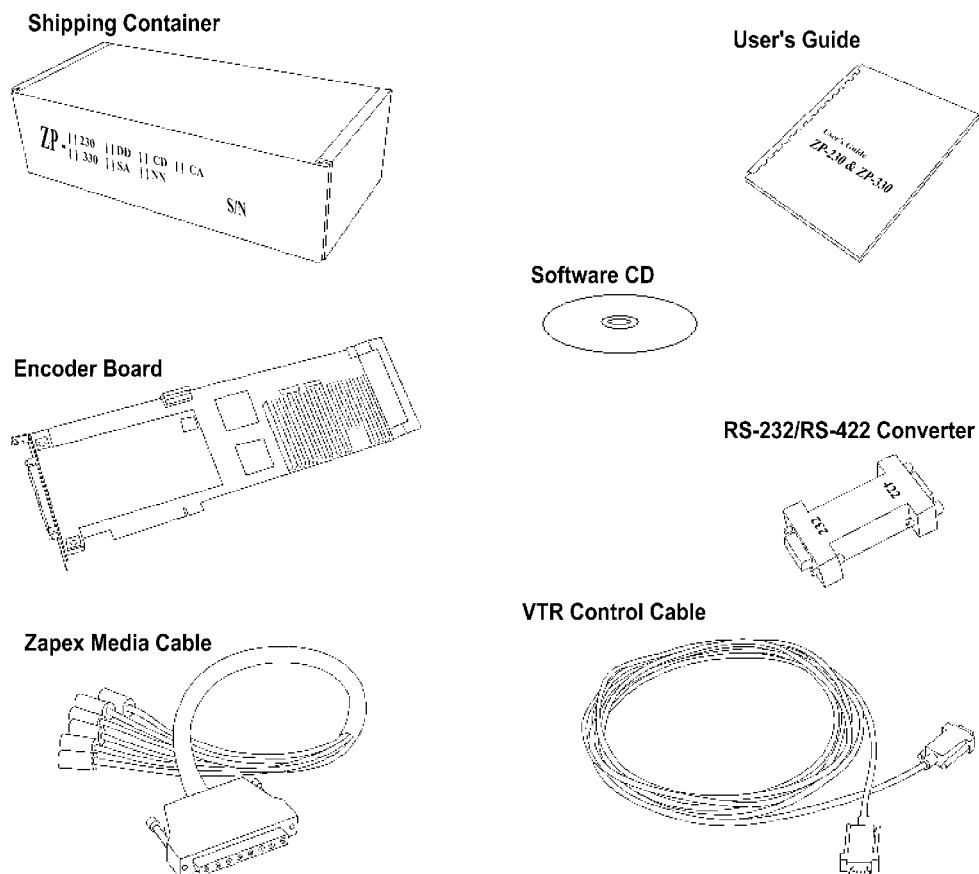
1.2   SYSTEM COMPONENTS

This section describes the components that make up your new Zapex encoding system. Depending on the encoder model purchased, some components may not be included.

1.2.1   ZAPEX ENCODER BOARD MODELS

The encoder is a full-length board that fits into a Peripheral Component Interface (PCI) slot of a personal computer. It is specially designed to accept audio and video data from a Video Tape Recorder (VTR) or computer hard drive. It can encode source video into the following types:

- Program Stream (PS) (video + audio)

- Transport Stream (TS) (video + audio)

- VOB (DVD Video Object)

  (or)

- MPEG-2 Video Elementary Stream (ES)

  (and either)

- Dolby® Digital, MPEG Layer 2 or PCM Audio Elementary Stream

See Table 1-1 and Table 1-2.

Table 1-1.   ZP-230 Encoder Models

MODEL	EXTERNAL INPUT CONNECTIONS			ENCODED OUTPUT		
	VIDEO	AUDIO	TIME CODE	VIDEO	AUDIO	SYSTEM
ZP-230DD	D1 Serial	Digital	LTC	MPEG-2	PCM, MPEG Layer 2	VOB, PS, TS
ZP-230CD	Component (Y, R-Y, B-Y)	Digital	LTC	MPEG-2	PCM, MPEG Layer 2	VOB, PS, TS
ZP-230CA*	Component (Y, R-Y, B-Y)/ S-Video	Analog (L, R)	LTC	MPEG-2	PCM, MPEG Layer 2	VOB, PS, TS
ZP-230SA	S-Video	Analog (L, R)	LTC	MPEG-2	PCM, MPEG Layer 2	VOB, PS, TS
ZP-230NN	N/A**	N/A**	N/A**	MPEG-2	PCM, MPEG Layer 2	VOB, PS

*   *Includes Audio Level Converter*

**   *The base ZP-230NN has no external physical connector for accepting video, audio, and time-code. It only accepts video and audio files stored on a hard drive.*

Table 1-2. ZP-330 **Encoder Models**

MODEL	EXTERNAL INPUT CONNECTIONS			ENCODED OUTPUT		
	VIDEO	AUDIO	TIME CODE	VIDEO	AUDIO	SYSTEM
ZP-330DD	D1 Serial	Digital	LTC	MPEG-2	PCM or Dolby® Digital, MPEG Layer 2	VOB, PS, TS
ZP-330CD	Component (Y, R-Y, B-Y)	Digital	LTC	MPEG-2	PCM or Dolby® Digital, MPEG Layer 2	VOB, PS, TS
ZP-330CA*	Component (Y, R-Y, B-Y)/ S-Video	Analog (L, R)	LTC	MPEG-2	PCM or Dolby® Digital, MPEG Layer 2	VOB, PS, TS
ZP-330SA	S-Video	Analog (L, R)	LTC	MPEG-2	PCM or Dolby® Digital, MPEG Layer 2	VOB, PS, TS
ZP-330NN	N/A**	N/A**	N/A**	MPEG-2	PCM or Dolby® Digital, MPEG Layer 2	VOB, PS

*   *Includes Audio Level Converter*

**   *The base* ZP-330NN *has no external physical connector for accepting video, audio, and time-code. It only accepts video and audio files stored on a hard drive.*

1.2.2   *ZP-CONTROLLER* SOFTWARE

The *ZP-Controller* software controls the audio and video encoding parameters. It is required that this software be installed on your computer hard drive.

The *ZP-Scheduler* software performs sequential real-time encoding sessions.

The *ZP-Decker* software remotely controls a VTR.

1.2.3   MEDIA CABLE

A media cable is supplied with every encoder model except the NN models. It is used to connect the encoder to a VTR and/or audio player. Since encoder models vary in the type of external input connections they can accept, the supplied cable is unique to a model and is not interchangeable with other models.

The cable is 20 inches long. One end has a single connector that fastens to the encoder, and the other end has 3 to 6 connectors that connect to the VTR. Each connector is identified with a label that matches the connectors on the VTR.

1.2.4   RS-232C/RS-422 CONVERTER AND VTR CONTROL CABLE

The RS-232C/RS-422 Converter and VTR Control Cable are used to connect a VTR to your personal computer. *ZP-Controller* can remotely control a VTR if the VTR has RS-422 interface protocol control function. The Zapex encoder (models DD,CD, CA, and SA) canls can remotely control a VTR for frame accurate encoding.

1.2.5   USER'S GUIDE

This Zapex User's Guide covers using and installing the Zapex Encoding solutions.

1.2.6   AUDIO LEVEL CONVERTER

The Audio Level Converter is a third-party hardware product providing a dual, bi-directional buffer amplifier designed to provide level and impedance matching between consumer hi-fi equipment and professional, as well as industrial, audio systems. Many consumer electronic devices can be very useful in the professional environment, but interconnection is difficult due to differences in operating levels, impedances, and unbalanced line operation. The Audio Level Converter solves these problems through its simple, high-quality interface design without the added noise, distortion and instability that can result from an improper hookup.

The Audio Level Converter provides exceptionally wide bandwidth and dynamic range, flawless square wave response, good common-mode rejection and low distortion. It is ideal for interfacing with the new digital disc and tape machines in the studio. Other consumer devices that may be used in the professional environment are video cassette recorder, audio cassette recorders, graphic equalizers, reverb and ambience devices, noise reduction systems, electronic crossovers and power amplifiers.

1.3   SYSTEM REQUIREMENTS

The Zapex encoder must be installed in a personal computer. The minimum system configuration for the computer is listed below.

- Pentium II 266 MHz processor (Pentium II 350 MHz or higher processor is recommended)

- An available full-length PCI slot

- 64 megabytes (MB) of RAM. (128 MB is recommended)

- Two hard disk drives are required:

  One hard drive must be used as a system disk drive with 2 MB of free space for the *ZP-Controller* software

  One hard drive must be used for storing the encoded capture files (Ultra-Wide SCSI disk drive, formatted in the Windows NT file system (NTFS)

- Microsoft Windows® NT operating system version 4.0

- Windows NT Service Pack 3 or higher

1.4   REAL-TIME AND OFF-LINE ENCODING

The following is a brief explanation of the difference between Real-Time and Off-Line encoding. Chapters 3 and 4 provide specific information on how to configure and start an encoding session for each encoding method.

1.4.1   REAL-TIME ENCODING

> **Real-Time Encoding cannot be performed with the ZP-230NN and ZP-330NN encoders.**

Real-Time Encoding is the capture and encoding of content as it is being played from a tape or video capture source such as a video camera. Real-Time Encoding usually involves using a VTR (Video Tape Recorder) for the playback of the content you want to encode. The video is referred to as the source video. The encoder receives the source video and/or audio, then encodes it based upon the encoding parameters configured in the *ZP-Controller* software.

The encoding process creates *output files* and saves them to a hard disk. These output files contain the actual encoded video and audio source. Output files are sometimes referred to as *streams*.

Depending on how the *ZP-Controller* is configured, a single encoding session can encode a source video into a PS (Program Stream), a TS (Transport Stream), a VOB (DVD Video Object), an ES (MPEG-2 Video Elementary Stream), and/or a Dolby® Digital, MPEG Layer 2, or PCM Audio Elementary Stream (depending on the encoder model). VOBs contain both the encoded video and audio streams that can be viewed with a DVD decoder. DVD authoring software uses both video and audio elementary streams to create final DVD titles.

1.4.2   OFF-LINE ENCODING

Off-Line encoding involves opening one or more source files located on a hard disk, then encoding them. In this method, a video/audio capture card is used to transfer the source material from a VTR to the hard disk. There are two kinds of Off-Line encoding. One that can be performed from the *ZP-Controller* main window (see Chapter 4, "Off-Line Encoding"), and the other that can be done within Adobe Premiere (see Chapter 5, "Off-Line Encoding Using Adobe® Premiere®" for instructions).

The Off-Line encoding modes produce the same types of output files as the Real-Time encoding mode. Depending on the content and system configuration, Off-Line encoding may require more time than a Real-Time encoding.

C H A P T E R

2

HARDWARE AND SOFTWARE INSTALLATION

This chapter contains the following information:

- ✓ **Installation Overview**
- ✓ **What is Needed to Install the Zapex Encoder**
- ✓ **Installing the Zapex Encoder**
- ✓ **Connecting the Media Cable and VTR Control Cable**
- ✓ **Zapex Software Installation**
- ✓ **Configuring the Drastic RS-422 VCR Control**
- ✓ **Configuring the *ZP-Controller* Properties Dialog Box**

2.0   HARDWARE AND SOFTWARE INSTALLATION

This chapter provides the information that you will need to install your Zapex Encoder.

2.1   INSTALLATION OVERVIEW

The following installation procedures must be performed to install your Zapex encoding system. Each procedure is listed below and described in detail in the following sections.

- Installing the Zapex Encoder

- Connecting the Media Cable and VTR Control Cable

- Installing the Zapex software

- Configuring the Drastic RS-422 VCR Control

- Configuring the *ZP-CONTROLLER* **Properties** dialog box

If you have questions during the installation process, technical support is available from your local dealer or distributor.

2.2   WHAT IS NEEDED TO INSTALL THE ZAPEX ENCODER

1. A screwdriver.

2. Your computer Owner's Manual.

3. Your VTR Owner's Manual.

4. An available internal power connector. This is the same type of power connector that is used for a hard drive or CD-ROM drive.

If an internal power connector is not available, a Y-connector can be purchased from a local electronics supplier.

5. An available COM port for the VTR Control Cable.

6. A VTR that supports RS-422 remote control.

7. Appropriate video and audio cables to connect the VTR to the Zapex encoder. Please refer to the VTR Owner's Manual for VTR connector specifications.

SA Models

- One S-Video cable
- One Time-Code (LTC) cable with a male BNC connector
- Two Audio cables with male BNC connectors for unbalanced input

   Additional Items (Provided By Customer)

- One "Y" power cable adapter (10-inch minimum)
- Two BNC to RCA connector adapters

CA Models

- Three Video cables with male BNC connectors
- One Time-Code (LTC) cable with a male BNC connector
- Two Audio cables with male BNC connectors for unbalanced input
- Four Audio cables: two balanced audio cables with male XLR connectors, and two unbalanced audio cables with male RCA to male BNC connectors for balanced input
- One S-Video cable

   Additional Items (Provided By Customer)

- One "Y" power cable adapter (10-inch minimum)
- Two BNC to RCA connector adapters

CD Models

- Three Video cables with male BNC connectors
- One Time-Code (LTC) cable with a male BNC connector
- One Digital Audio cable with a male BNC connector

   Additional Items Provided By Customer

- One "Y" power cable adapter (10-inch minimum)
- One BNC to XLR adapter (passive converter unbalanced to balanced audio)
- One BNC to XLR (straight through) adapter

DD Models

- One Digital Video cable with a male BNC connector
- One Time-Code (LTC) cable with a male BNC connector
- One Digital Audio cable with a male BNC connector

Additional Items Provided By Customer

- One "Y" power cable adapter (10-inch minimum)
- One BNC to XLR adapter (passive converter unbalanced to balanced audio)
- One BNC to XLR (straight through) adapter

8. Adobe Premiere 5.0 (or higher), if you are planning to use the Adobe Premiere plug-in. Premiere must be installed before installing the *ZP-Controller* software.

2.3 INSTALLING THE ZAPEX ENCODER

The Zapex encoders are full-length PCI boards designed to be installed in most personal computers (PC).

ELECTROSTATIC DISCHARGE: **Static electricity can damage your Zapex Encoder. Before opening the anti-static bag that contains the encoder, assure your computer is turned off, then ground yourself by touching any exposed metal on the computer chassis or connector brackets while the computer is plugged in. Avoid simultaneously touching components of your encoder and any monitor, even if the monitor is turned off. Some monitors build up and retain a static charge that could damage your encoder.**

ZAPEX ENCODER INSTALLATION

1. Turn off the computer and disconnect it from any power source.

2. Disconnect all external devices from the computer.

3. Remove the cover from your computer to access a PCI slot. For detailed instructions, refer to your computer hardware manual.

4. Unscrew and remove the metal filler plate from the selected PCI expansion slot.

5. Insert the Zapex encoder into the available PCI slot. Make sure that the board is firmly seated.

6. Secure the encoder board to the slot with the screw removed in step 4.

7. Connect an internal power cable from the computer's power supply to the main board of the encoder. Refer to Figure 2-1.

The computer should have an available internal power cable that can be plugged directly into the power connector on the encoder board. This is the same type of cable used for connecting power to a hard drive or CD-ROM drive.

Figure 2-1. Encoder Internal Power Connection

Connect power to Encoder Board here.
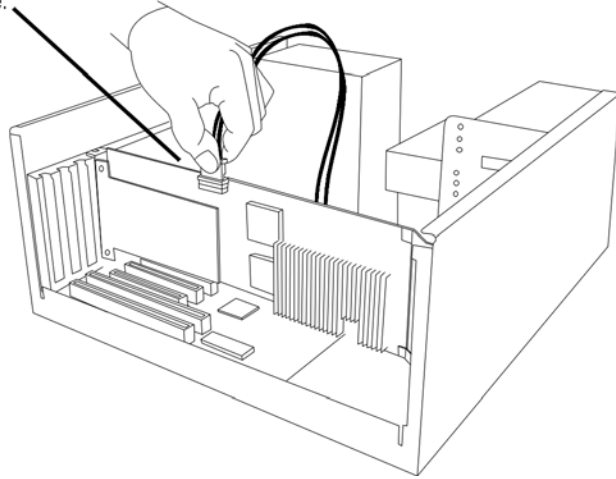
8. Replace the computer cover as described by its manual.

9. Connect external devices.

2.4   CONNECTING THE MEDIA CABLE AND VTR CONTROL CABLE

If you have models ZP-330NN or ZP-230NN, you can skip this section because a VTR can not be connected to these models. Only the DD, CD, CA, and SA models can be connected to, and remotely control a VTR. The Media Cable is specific to your encoder model and can not be used on other encoder models.

CONNECTING THE MEDIA CABLE TO THE ENCODER

IMPORTANT: Before attempting any cable connections, make sure all units involved in your system are off.

1.   The media cable has a large single connector on one end. Attach this to the connector on the encoder. Refer to Figure 2-2.

Figure 2-2. The Media Cable

Media Cable
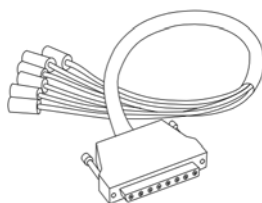
2.   Secure the connection by tightening the screws.

To do frame accurate encoding the VTR's Time-Code Out needs to be connected to the LTCIN connector on the Media Cable.

For references to connections made to the VTR, refer the VTR Owner's Manual for details.

3.   Select the appropriate encoder model from the list below, and follow the instructions for that model:

- SA Model Encoders

- CA Model Encoders

- CD Model Encoders

- DD Model Encoders

SA Models

The SA cable has four connectors: S-Video for video, AAUD-L and AAUD-R for analog audio (female BNC), and LTCIN for time code input (female BNC).

Video

Connect one end of the S-Video cable to the S-Video out of the Zapex Media Cable. Connect the other end to the S-Video connector on the VTR.

Time Code

Connect the male BNC connector of the Time Code cable to the LTCIN connector of the Zapex Media Cable. Connect the other end to the Time Code out on the VTR.

Audio

Connect the male BNC connectors of the Unbalanced audio cables to the AAUD-L and AAUD-R connectors of the Zapex Media Cable. Connect the other ends of these cables to the VTR's left and right audio outputs.

CA Models

The CA cable has seven connectors: Y, CR, and CB for Video (female BNC); C for the S-video adapter (female BNC); AAUD-L and AAUD-R for analog audio (female BNC); LTCIN for time code input (female BNC). The S-Video adapter is a special connector that connects to the Y-connector and C-connector to create an S-Video input option on the CA model encoders.

Video

a)   Connect the male BNC connector of the Y-video cable to the Y-connector of the Zapex Media cable. Connect the other end of this cable to the Y-video out connector on the VTR.

b)   Connect the male BNC connector of the R-video cable to the CR-connector of the Zapex Media cable. Connect the other end of this cable to the R-video out connector on the VTR.

c)   Connect the male BNC connector of the B-video cable to the CB-connector of the Zapex Media cable. Connect the other end of this cable to the B-video out connector on the VTR.

Time-code

Connect the male BNC end of the Time-Code cable to the LTCIN connector of the Zapex Media Cable. Connect the other end of this cable to the Time-Code out connector on the VTR.

Audio

a)   If you are connecting to an unbalanced audio source, connect the male BNC connectors of the unbalanced audio cables to the AAUD-L and AAUD-R connectors of the Zapex Media Cable. Connect the other ends of these cables to the VTR's left and right audio outputs.

b)   If you are connecting to a balanced audio source, connect the male XLR connectors of the balanced audio cables to the Audio Level Converter. Connect the other ends of these cables to the VTR's left and right audio ouput. Connect the male RCA connectors of the unbalanced audio cables to the Audio Converter. Connect the male BNC ends of these cables to the AAUD-L and AAUD-R connectors of the Zapex Media Cable.

c)   Interconnect cables between the Audio Level Converter and the balanced audio source are provided by the customer.

CD Models

The CD cable has six connectors: Y, CR, and CB for Video (female BNC); DAUDIN for digital audio (female BNC); LTCIN for time code input (female BNC).

Video

a)   Connect the male BNC connector of the Y-video cable to the Y-connector of the Zapex Media cable. Connect the other end of this cable to the Y-video out connector on the VTR.

b)   Connect the male BNC connector of the R-video cable to the CR-connector of the Zapex Media cable. Connect the other end of this cable to the R-video out connector on the VTR.

c)   Connect the male BNC connector of the B-video cable to the CB-connector of the Zapex Media cable. Connect the other end of this cable to the B-video out connector on the VTR.

Time-code

Connect the male BNC connector of the Time-Code cable to the LTCIN connector of the Zapex Media Cable. Connect the other end of this cable to the Time-Code out connector on the VTR.

Audio

Connect the male BNC connector of the Digital audio cable to the DAUDIN connector of the Zapex Media Cable. Connect the other end of this cable to the Channel 1/2 digital audio out connector on the VTR.

Connecting — DD Model Encoders

The DD cable has three connectors: D1 IN serial digital Video (female BNC), DAUDIN for digital audio (female BNC), LTCIN for time-code input (female BNC).

Video

Connect the male BNC connector of the Digital video cable to the D1 IN connector of the Zapex Media Cable. Connect the other end of this cable to the Serial Digital video out connector on the VTR.

Time-code

Connect the male BNC connector of the Time-Code cable to the LTCIN connector of the Zapex Media Cable. Connect the other end of this cable to the Time Code out connector on the VTR.

Audio

Connect the male BNC connector of the Digital audio cable to the DAUDIN connector of the Zapex Media Cable. Connect the other end of this cable to the Channel 1/2 digital audio out connector on the VTR.

CONNECTING THE RS-232C/RS-422 CONVERTER AND VTR CONTROL CABLE

1.   Connect the RS-232C side of the RS-232C/RS-422 Converter to a serial port on the computer (COM1 or COM2). Make sure the connector screws are snug. Refer to Figure 2-3.

Figure 2-3. RS-232C/RS-422 Converter and VTR Control Cable
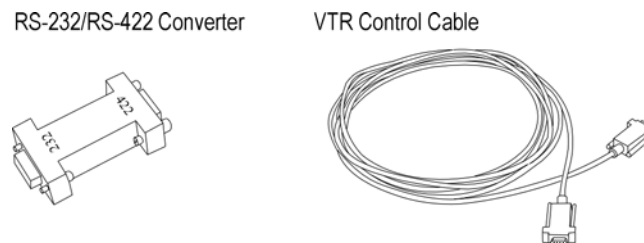
2.   Connect the VTR Control Cable to the RS-422 side of the RS-232C/RS-422 Converter. Connect the other end to the remote control connector on the VTR.

3.   Make sure that the connector screws on both ends of the VTR Control Cable are tightened securely to their respective devices.

2.5   ZAPEX SOFTWARE INSTALLATION

This section describes the software installation process. The software CD contains a setup program that checks your system with a series of questions about how to install the software.

The software installation may require that the system be restarted in the middle of the installation process. Please close all Windows applications before installing the Zapex software.

If you plan to do Off-Line Encoding using Adobe® Premiere®, then the Adobe® software needs to be installed prior to performing the procedures in this section. For more information about Off-Line Encoding, see Chapter 1, "Real-Time and Off-Line Encoding Described."

STOP

ATTENTION: **If you use a virus protection program on your system, turn it off before running the setup program. The software may not work correctly if a virus protection program is running. After running Setup and completing the install, you can restart your virus protection program.**

INSTALLING THE ZAPEX SOFTWARE

1.   Insert the Installation CD into the CD-ROM drive. The installation CD automatically starts the setup program.

2.   Click **Next** to continue past the **Welcome** dialog box.

3.   Select the encoder model you are installing. You can locate the encoder model on the outside of the product box, then click **Next** to continue.

4.   Some system configurations require a supplemental PCI configuration utility. If you are installing the Zapex encoder into one of the systems listed in Table 2-1, select the **PCI Configuration Utility** and click **Next** to continue.

Table 2-1.   PCI Configuration Utility Applications

MANUFACTURER	MODEL	MODEL NUMBER
Compaq	Proliant	2500
		1200
		1600
		1850R
	Professional Workstation	6000
	AP	400
		500
Intergraph	TDZ2000	Realizm2
Tyan		Thunder 100 BX Motherboard
Gateway		GP7-500

> **! IMPORTANT:**   **If you have selected the PCI Configuration Utility for installation, your system will be restarted before completing the installation of the Zapex Controller software. Please close all open applications after the PCI Utility is installed.**

5.   Click **Finish** to continue with the installation. If you selected the **PCI Configuration Utility** for installation, your system will be restarted before proceeding to the *ZP-Controller* software installation.

6.   Click **Next** to continue past the **Welcome** dialog box.

7.   Click **Yes** to agree to the license agreement.

8.   Click **OK** to accept the user information.

9.   Select the software components desired, and click **Next** to continue. Refer Table 2-2.

Figure 2-4. Select Components Dialog Box

Table 2-2.   Software Installation Component Selections

ITEM	DESCRIPTION
ZP *Encoder* **Driver**	Installs communication software used by *ZP-Controller*.
ZP *Encoder* **Control Application**	Installs the *ZP-Controller* application.
VTR Control Driver	Installs the VTR Control Driver and *ZP-Decker*, a tool that can remotely control a VTR from your computer.
	NOTE: **If you are using an NN model encoder, do not select this component.**
Adobe® Premiere® Plug-ins	Installs software which can be used for performing Off-Line encoding from inside Adobe® Premiere®, Version 5.x. This software must be installed prior to the Zapex Encoder installation in order to function correctly.

10.   To change the Destination Folder, click **Browse** and choose a new folder.

11.   Click **Yes** to allow the setup program to create the Zapex encoding software directory.

12.   Select the COM port the VTR control cable is connected to and click **Next**.

13.   Setup is now complete. Remove any disks from the drives.

14.   Select **Yes, I want to restart my system now** to restart your system, then click **Finish**.

2.6   CONFIGURING THE DRASTIC RS-422 VCR CONTROL

Depending on which encoder model you have, your VTR can be remotely controlled by *ZP-Controller*. For VTR control, you must configure the Drastic RS-422 VCR Control in the Multimedia Control Panel.

If you have an NN encoder model, please skip this section.

CONFIGURING THE DRASTIC RS-422 VCR CONTROL

1.   From the Microsoft taskbar, click **Start**, select **Settings**, then select **Control Panel**.

2.   Double-click the **Multimedia** icon and the Multimedia Properties window will appear. Refer to Figure 2-5.

Figure 2-5. Multimedia Properties Window
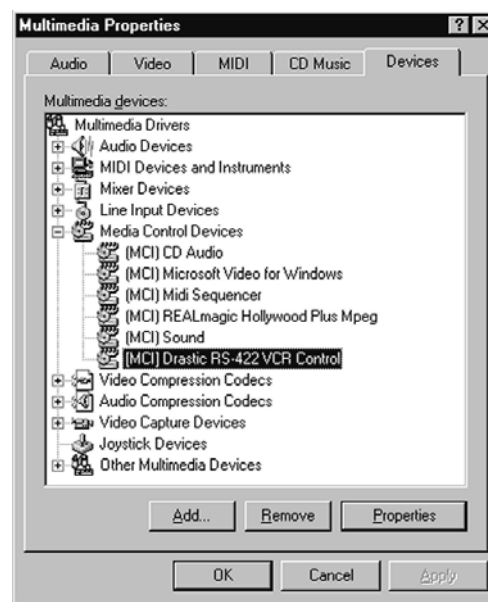
3.   Click the **Devices** tab.

4.   Expand **Media Control Devices**, and select **[MCI] Drastic RS-422 VCR Control**.

5.   Click **Properties** to open the **MCI Drastic RS-422 VCR Control** properties box.

6.   Click **Settings** to access the **Drastic Driver Config** dialog box. Refer to Figure 2-6.

Figure 2-6. MCI Drastic RS-422 VCR Control Properties Box
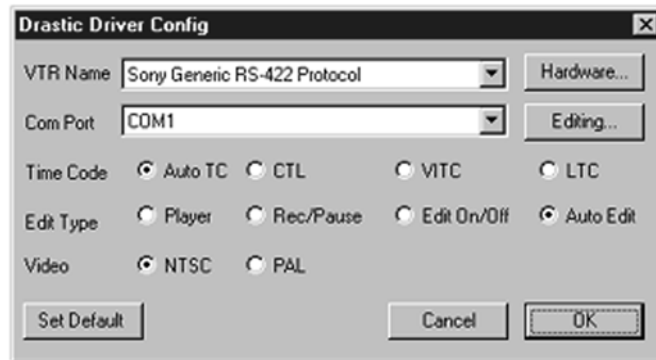
7.   From the **Drastic Driver Config** dialog box, make the following selections:

7.a   From the **VTR Name** drop-down list, select the model of the VTR.

If your VTR is not listed, select Sony Generic RS-422 Protocol. This protocol is supported by most VTR manufacturers.

7.b   From the **COM Port** drop-down list, select the COM port (serial port) the VTR Control Cable is attached to.

7.c   Select the **Auto TC** option button.

7.d   Select the **Auto Edit** option button.

7.e   Select the **NTSC** or **PAL** option button.

8.   Click **OK** to accept the changes.

2.7   CONFIGURING THE *ZP-CONTROLLER* PROPERTIES DIALOG BOX

The main purpose of the *ZP-Controller* **Properties** dialog box is to configure the Zapex encoder.

CONFIGURE THE PROPERTIES DIALOG BOX

1.   Click the **Start** button, select **Programs**, then **ZP-330** or **ZP-230**, and then click on **ZP-Controller** to start *ZP-Controller*.

2.   From the **Options** menu, select **Properties** to open the **Properties** dialog box. Refer to Figure 2-7.

Figure 2-7. Properties Dialog Box
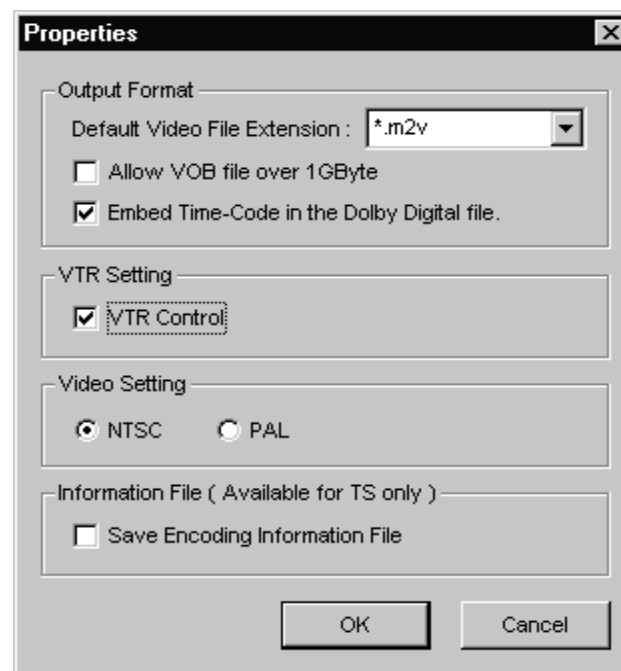
3.   To configure the **Properties** dialog box, refer to Table 2-3. When finished, click **OK** to accept the changes.

Table 2-3.   Properties Dialog Box Options

ITEM	DESCRIPTION
Default Video File Extension	If a filename extension is omitted when naming your video output file, the extension defaults to the extension selected here.
	Usually the M2V, VBS, MPG, and MP2 are used by DVD authoring software. You can select an appropriate filename extension based on your DVD authoring and/or MPEG-2 decoding environment. Although the extensions are different, the encoded stream always meets the MPEG-2 standard.
Allow VOB file over 1GByte	Select this check box if you are capturing VOB files over 1 Gigabyte.
Embed Time-Code in the Dolby Digital file	Deselect this check box if you do not want to embed time-code in the Dolby® Digital file.
VTR Control	Select this check box if you want *ZP-Controller* to remotely control the VTR during an encoding session (requires that the VTR Control Cable be installed). This feature is not available with the ZP-230NN or ZP-330NN encoders.
NTSC	Select if encoding video sources recorded in the NTSC format.
PAL	Select if encoding video sources recorded in the PAL format.
Save Encoding Information File	Select if you want to save an Encoding Information File. This function is only available if TS is selected.

INFORMATION FILE (TS ONLY)

If this check box is selected, the information file for capture stream is made automatically. The information file is saved into the same directory that is specified for the output TS file directory. This information file includes:

- VideoNumber: 000000000
- Checksum: 000000000
- DataType:
- VideoFrame: 000001500
- Title: test1
- SpotID: test1
- Bitrate: 4000000
- Seconds: 000000060
- Format: 000000000

- Resolution: 000000000
- Composition: 000000000
- FrameRate: 000000000
- CreateDate: 06/30/2000 11:39:47AM
- ExpireDate:
- AudioFrames: 000000000
- VCodeID:
- MarkIn: 00:00:00:00
- ExpectedVideoFrames: 000000000

C H A P T E R

3

REAL-TIME ENCODING

This chapter contains the following information:

- ✓ **Starting *ZP-Controller***
- ✓ **Encoding Session — Configuring The *ZP-Controller***
- ✓ **The *ZP-Controller* Main Window**
- ✓ **The Encode Process**
    - ▪ Manual Encoding
    - ▪ Duration Based Encoding
    - ▪ Time-Code Encoding With VTR Control
    - ▪ Time-Code Encoding Without VTR Control
- ✓ **Encoding Window for Multi-Audio TS Output**
- ✓ **Saving Your Work as a Project File**
- ✓ **Default Encoding and Control Values**
- ✓ **Opening an Existing Project File**
- ✓ **Updating an Existing Project File**
- ✓ **Quitting *ZP-Controller***

3.0   REAL-TIME ENCODING

This chapter describes the *ZP-Controller* main window and explains how to perform Real-Time encoding.

3.1   STARTING ZP-CONTROLLER

TO START *ZP-CONTROLLER*

Click the Windows **Start** button, click **Programs**, click **ZP-230** or **ZP-330**, select *ZP-Controller*.

3.2   ENCODING SESSION — CONFIGURING THE *ZP-CONTROLLER*

This section provides steps to configure the *ZP-Controller* software for an encoding session. For additional information about the encoding parameters discussed in this section, see the following topics.

- Chapter 2, "Hardware and Software Installation"
- Appendix A, "Advanced Video Encoding Parameters"
- Appendix B, "Dolby® Digital Encoding Parameters"
- Appendix C, "MPEG Audio Encoding Parameters"
- Appendix D, "Advanced System Parameters"

Depending on the model you have, some features may not be available.

3.3   THE *ZP-CONTROLLER* MAIN WINDOW

When you start *ZP-Controller*, the main window appears. Figure 3-1 shows a detail of this main window.

Figure 3-1. *ZP-Controller* **Main Window**
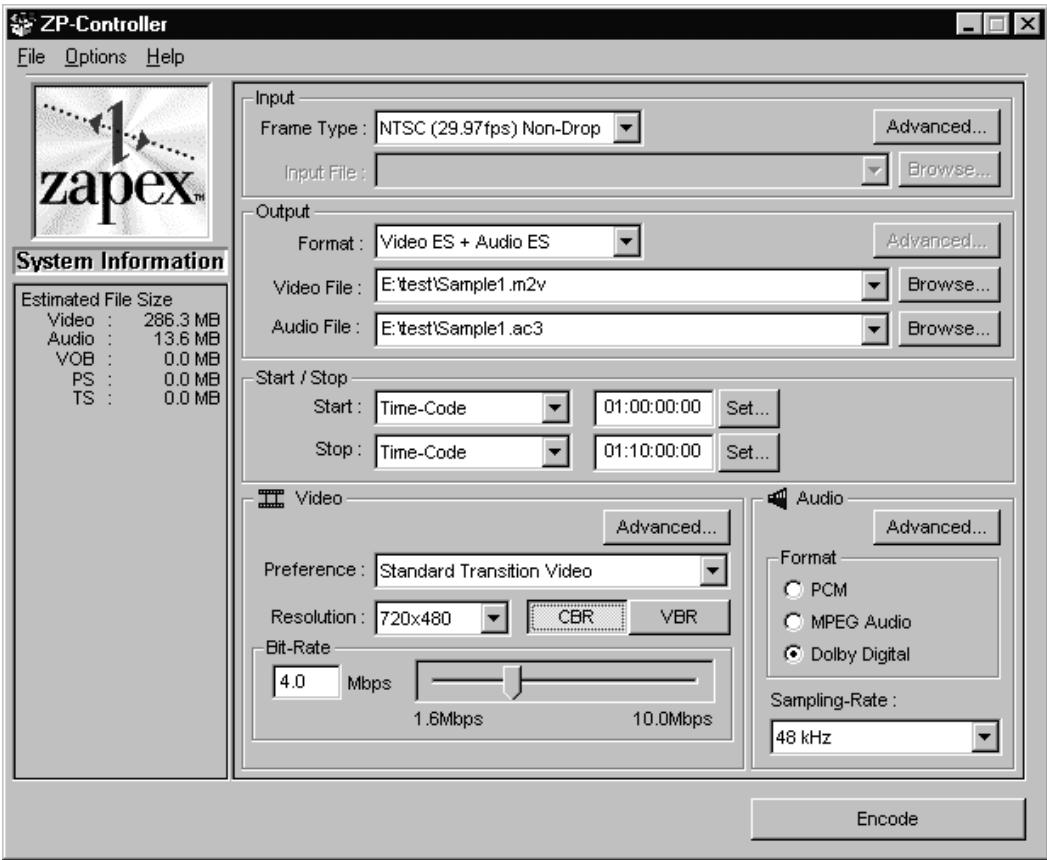
CONFIGURING *ZP-CONTROLLER (DETAILED)*

1.   Configuring the Input Parameters.

Input parameters provide the encoder information about the source video to be encoded.

FRAME TYPE

Use the **Input Frame Type** drop-down list for selecting the type of time-code used by the source video. The NTSC video frame is the standard used in the United States and Japan. It has a rate of 29.97 frames per second. A video recorded with NTSC Non-Drop frame is more common in the United States than NTSC Drop frame. The PAL video format is the standard used throughout Europe and Asia. It has a frame rate of 25 frames per second. Input frame types that can be selected are described in the following options table.

The Input Frame Type parameter does not have to be configured when you select Manual as the start method.

INPUT FRAME TYPE SELECTION OPTIONS

OPTION	DESCRIPTION
NTSC (29.97 fps) Non-Drop	Choose for source videos recorded with non-drop time-code.
NTSC (29.97 fps) Drop	Choose for source videos recorded with drop time-code.
PAL (25 fps)	Choose for source videos recorded in PAL format.
	NOTE: Use the Properties dialog box to switch to PAL mode.

ADVANCED [INPUT] BUTTON

This button is only available on the CD, CA, and SA encoder models. See Appendix A, section A.2, "Advanced [Input] Button" for more information.

2. Configuring the Output Parameters:

Output parameters determine the type of (encoded) output files that are produced.
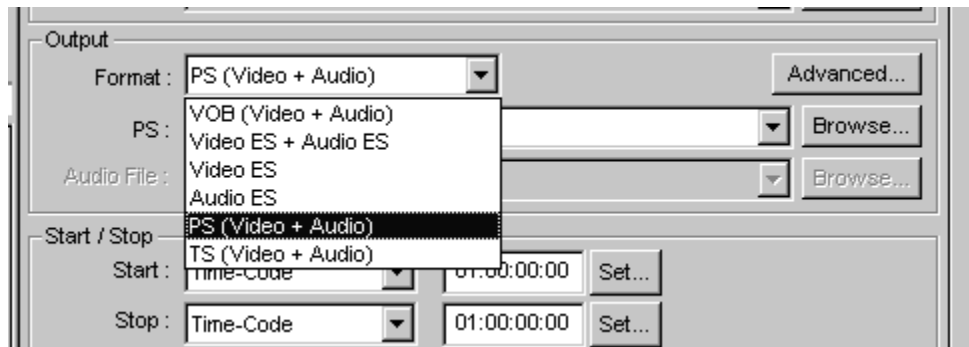
FORMAT

Use the **Output Format** drop-down list for choosing VOB, MPEG-2 Video Elementary Streams (Video ES), Program Streams (PS), or Transport Streams (TS) and/or Dolby® Digital, MPEG Layer 2 or PCM Audio Elementary Streams (Audio ES) as the output file formats. DVD authoring software accepts Video ES and Audio ES output files for creating DVD video titles. The following options table describes the format selections.

OUTPUT FORMAT SELECTION OPTIONS

OPTION	DESCRIPTION
VOB (Video + Audio)	Choose to encode a VOB (DVD Video Object) file.
Video ES + Audio ES	Encodes an MPEG-2 Video Elementary Stream and Dolby® Digital*, MPEG Layer 2, or PCM audio Elementary Stream.
Video ES	Encodes an MPEG-2 Video Elementary Stream only.
Audio ES	Encodes a Dolby® Digital*, MPEG Layer 2, or PCM audio Elementary Stream only.
PS (Video + Audio)	Choose to encode a PS (Program Stream) file.
TS (Video + Audio)	Choose to encode a TS (Transport Stream) file.

*   *Applicable to ZP-330 encoder models only.*

The name of the **Output Format** drop-down list changes depending on the output format selected. Examples are shown below:

OUTPUT FORMAT — VOB

OUTPUT FORMAT — ES

OUTPUT FORMAT — PS

OUTPUT FORMAT — TS

> **In TS Mode, the file information for an encoded stream can be saved by specifying the title of the information file. The default setting for saving the information file is set to OFF in properties menu.**

2.a   From the **Output Format** drop-down list, select **Output file format(s)**.

2.b   Name the output files:

OUTPUT FILE

Use the **Video File/VOB/PS/TS** and **Audio File** drop-down lists for naming the output files and provide a path location on your hard drive. The availability of the **Audio File** drop-down list is dependent on what item is selected in the **Output Format** drop-down list; for example, if VOB is selected, the **Audio File** drop-down list is not available because VOBs include both video and audio data.

The output filename includes the destination path.

> **For example:**   D:\workfolder\filename
> (has the destination path *D:\workfolder*)

Video output files can have a specific filename extension automatically added by configuring the **Properties** dialog box. The **Properties** dialog box can be opened from the **Options** menu.

OUPUT FILES SELECTION OPTIONS

OPTION	DESCRIPTION
Video File/VOB/PS/TS*	Type in a *path* and *name* for your video/VOB/PS/TS output file or **Browse.**
Audio File/Title	Type in a *path* and *name* for your audio output file or **Browse.**
	For Title, type in a *name* for Encoding Information file.

*   *When the output format is TS, multiple audio streams are selectable (Dolby® Digital and MPEG audio). If **Single Audio** is selected, the encoding process will be in Real-Time Encoding. If **Multiple Audio** is selected, the encoding process will be in Real–Time and Offline Encoding.*

BROWSE BUTTONS

Located next to the **Video File** and **Audio File** drop-down lists are the **Browse** buttons. Use these buttons for selecting a destination path and/or existing output filename. If an existing output file is selected, it is overwritten.

3.   Configuring the **Start** and **Stop** Methods:

> **When using the VTR remote control feature, the VTR Control check box must be selected in the Properties dialog box. For more information, see Chapter 2, "Configuring the *ZP-Controller* Properties Dialog Box."**

Select start and stop methods here

For auto-start and auto-stop, type time-codes into these text boxes
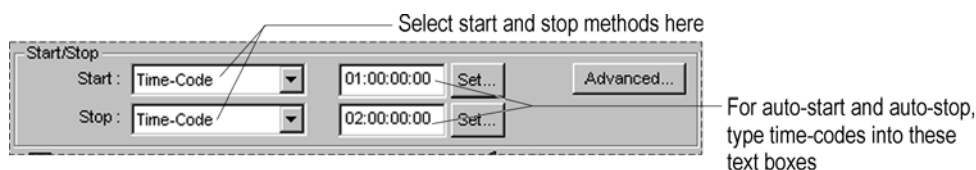
The **Start** and **Stop** parameters determine if the encoding process is manually or automatically started and stopped. The start and stop parameters are not available for the NN encoder models.

Frame accurate time-code based encoding can only be performed if the VTR supports Time-Code out, and is connected to the LTCIN connector of the Zapex Media Cable.

Remote VTR control can only be performed if the VTR supports RS-422 remote control, and the VTR control cable is connected and configured correctly. For additional information, see:

- Chapter 2, section 2.5, "Connecting the Media Cable and VTR Control Cable."

- Chapter 2, section 2.7, "Configuring the Drastic RS-422 VCR Control."

- Chapter 2, section 2.8, "Configuring the *ZP-Controller* Properties Dialog Box."

START
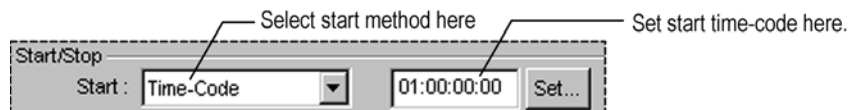
Use the **Start** control for determining if the encoding process begins automatically or manually. The following options table describes the items that can be selected.

When typing in time-code, use the HH:MM:SS:FF format (HH is hours, MM is minutes, SS is seconds, and FF is a frame number).

3.a   From the **Start** drop-down list, select a start method.

START SELECTION OPTIONS

OPTION	DESCRIPTION
Time-Code	This method automatically starts the encoding process at a specific time supplied by the VTR in LTC format. The start time must be typed into the text box.
	Choose to automatically start encoding at a specific time-code supplied by the VTR.
Manual	This method requires the encoding process to be started manually. A start button, located in the Real-Time Encoding window, is used for starting the process.
	Choose to manual start the encoding process from the Real-Time Encoding window.

STOP
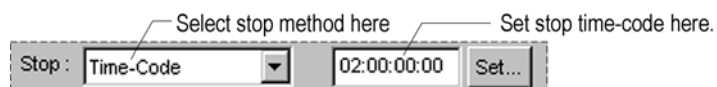
Use the **Stop** control for determining whether the encoding process is stopped manually or automatically (time-code or duration methods). The following options table describes the items that can be selected.

When typing in time-code, use the HH:MM:SS:FF format (HH is hours, MM is minutes, SS is seconds, and FF is a frame number).

3.b   From the **Stop** drop-down list, select a stop method.option.

STOP SELECTION OPTIONS

OPTION	DESCRIPTION
Time-Code	This method automatically stops the encoding process at a specified time. The time-code is supplied by the VTR in LTC format. Type the stop time into the text box.
	Choose to automatically stop encoding at a specific time supplied by the VTR.
Manual	This method requires the encoding process to be stopped manually. A stop button, located in the Real-Time Encoding window, is used for stopping the process.
	Choose to manually stop the encoding process from the Real-Time Encoding window.
Duration	This method automatically stops the encoding process after a specified period of time has passed. It performs like a timer.
	Choose to automatically stop the encoding process after a specified period of time has passed. Type the duration (length of time) into the text box using the HH:MM:SS format.

The encode process length is based upon the information supplied for the Start and Stop Time-Codes, by either the VTR or typed into the text box. The Zapex encoder will encode from the Start to the Stop Time-Code, less one frame.

Start Time-Code						Stop Time-Code
01:30:00:00						01:35:00:00
Frame 1	Frame 2	Frame 3		Frame 8,999	Frame 9,000	Frame 9,001
Start Encode	→	→		→	**Stop Encode**	
↑					↑	
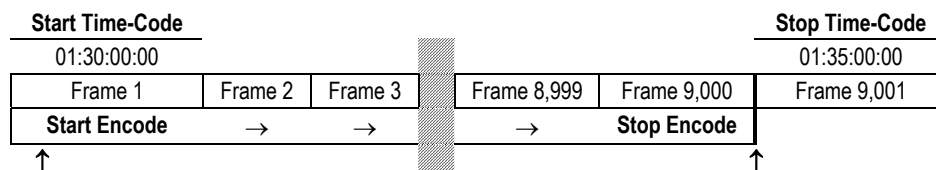
SET BUTTON

The **Set Time-Code** dialog box appears when the **Set** button is clicked. It provides an alternative, and sometimes faster, method for entering and selecting time-code (see Figure 3-2). The following options table describes the controls in this dialog box.

Figure 3-2. Set Time-Code Dialog Box
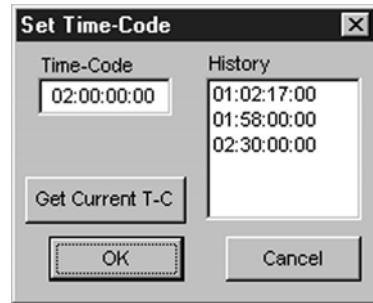
SET TIME-CODE OPTIONS

OPTION	DESCRIPTION
Time-Code	Displays the time-code currently selected.
Get Current T-C	If a VTR is connected to the encoder and the **VTR Control** check box is selected in the **Properties** dialog box (from the **Options** menu), use this button to enter the current time-code (supplied by the VTR) into the **Time-Code** text box.
History	Lists previously used time-codes. Double-click a time from this list to enter it into the **Time-Code** text box.
OK	Click to accept the time displayed in the **Time-Code** text box.

4. Configuring the Video Encoding Parameters:

Video parameters determine the techniques used for encoding the video stream.
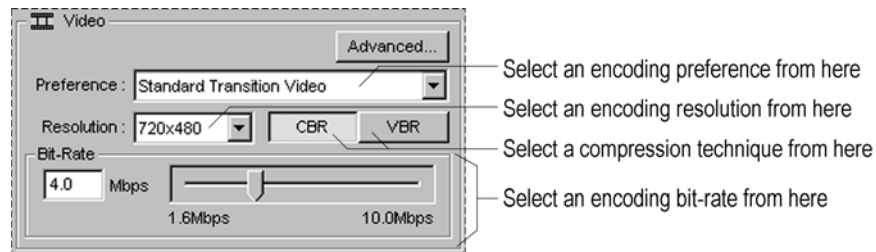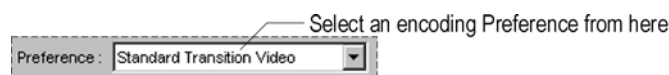
Select an encoding preference from here
Select an encoding resolution from here
Select a compression technique from here
Select an encoding bit-rate from here

PREFERENCE

Select an encoding Preference from here

Configuring the video parameters for an encoding session can be complex because of the many advanced MPEG-2 parameters to be considered. Zapex consolidated many of these parameters into a single command called **Preference**, then optimized it for the most common types of video content. The five video encoding preferences available are described in the following options table.

4.a From the Video **Preference** drop-down list, select an encoding preference:

VIDEO ENCODING PREFERENCE SELECTION OPTIONS

OPTION	DESCRIPTION
Standard Transition Video	Optimized for encoding source video containing an even balance of slow, moderate, and quick moving images.
Slow Transition Video	Optimized for encoding source video that predominately have slow moving images.
Quick Transition Video	Optimized for encoding source video that predominately have scenes of fast moving.
Animation/CG	Optimized for encoding source video containing cartoon or computer generated images.
Adaptive (with SCD, Filter)	If this mode is selected, the Zapex encoder dynamically changes the type of **Transition Video** per GOP by analyzing the characteristic of the source video image. In this mode, the **Scene Change Detection (SCD)** and **Adaptive Softness Filter** are always activated. See Appendix A, section A.3, "Advanced [Video] Button" for more information.

The source video image GOP (Group of Pictures) is characterized by two numbers 'N' and 'M' plus three types of pictures:

> 'N'   The number of pictures in the GOP
>
> 'M'   The frequency of 'P' pictures within the GOP
>
>
> 'I'   Picture coded with full picture information
>
> 'P'   Picture coded with respect to the previous 'I' or 'P' pictures
>
> 'B'   Picture coded with respect to the previous 'I' or 'P' picture, and/or the immediately next 'I' or 'P' picture

---

Adaptive mode uses a combination of Standard, Slow, and Quick Transition modes. When Adaptive mode is selected, the SCD (Scene Change Detection) and Adaptive Softness Filter are always activated. When SCD is selected in combination with Standard, Quick, or Animated/CG options, 'N' can range from 1 to 16.   When SCD is selected in combination with Slow Transition option, 'N' can range from 1 to 15.

The Video Encoding Preference Selection Options correspond to the following 'M' and 'N' numbers:

	NTSC		PAL	
Standard Transition Video	N = 16	M = 2	N = 14	M = 2
Slow Transition Video	N = 15	M = 3	N = 15	M = 3
Quick Transition Video	N = 15	M = 1	N = 15	M = 1
Animation/CG	N = 16	M = 2	N = 14	M = 2
Adaptive (with SCD, Filter)	N = 1 to 16	M = 1, 2, or 3 *	N = 1 to 14	M = 1, 2, or 3 *

*   'M' is adaptive and automatically adjusted according to the detected scene changes.

RESOLUTION

Select encoding resolution from here

Resolution : 720x480 ▼ | CBR | VBR

Use this control for selecting an encoding compression technique based on resolution. Choosing a higher resolution keeps the original video image quality in the output file. Choosing a lower resolution slightly reduces the video image quality in the output file. The following table describes the resolutions that can be selected.

4.b   From the **Video Resolution** drop-down list, select an encoding resolution:

VIDEO RESOLUTION SELECTION OPTIONS

OPTION	DESCRIPTION
720x480 (NTSC)./. 720x576 (PAL)	Also known as Full D1 Resolution. At this resolution, the entire source video frame is scanned and encoded. The encoded video resolution is equal to the source video resolution. Choose for sampling and encoding the entire video frame.
704x480 (NTSC)./. 704x576 (PAL)	Also known as Full D1 Resolution. At this resolution, the entire source video frame is scanned and crops 8 pixels on left side and 8 pixels on right side during encoding.
352x480 (NTSC)./. 352x576 (PAL)	Also known as Half D1 Resolution. At this resolution, the entire source video frame is scanned, and approximately every other pixel in the horizontal (left to right) resolution is encoded. During playback, an algorithm is used by the decoder to expand the video data to the full horizontal resolution. This slightly reduces the video quality for the gain of reducing the video output file size.

CBR AND VBR

Select a compression technique from here

Resolution : 720x480 ▼ | CBR | VBR

Use the **CBR** (Constant Bit-Rate) and **VBR** (Variable Bit-Rate) buttons to select an encoding compression technique based on bit-rate. The CBR and VBR compression techniques are described below.

CBR./.VBR SELECTION OPTIONS

OPTION	DESCRIPTION
CBR	This technique creates a video output file compressed at a constant bit-rate. The rate is set in the Bit-Rate options box. CBR compression gives you better control over the quality and size of the output file. Higher bit-rates increase the image quality, but also increase the output file size. Choose for compressing the video data at a constant bit-rate specified in the Bit-Rate controls
VBR	This technique creates a video output file compressed at a variable bit-rate. The maximum rate is set in the Bit-Rate options box. During VBR compression, the encoder automatically lowers the compression rate for scenes that are of slow transition type, and raises it for scenes of quick transition type, but not higher than the maximum set bit-rate. Using VBR optimizes the video quality-to-output file size relationship. Choose for compressing the video data at a variable bit-rate with the maximum rate specified in the Bit-Rate controls.

4.c   Use the **CBR** (Constant Bit-Rate) and **VBR** (Variable Bit-Rate) buttons to select an encoding compression technique based on bit-rate.

BIT-RATE
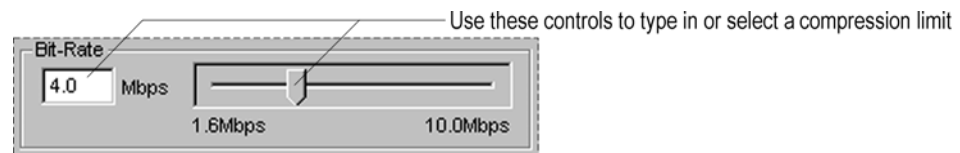
Use these controls to type in or select a compression limit

The Bit-Rate parameter controls the compression limits for the CBR and VBR encoding techniques. The selected value can be constant for CBR output files or the maximum rate for VBR output files. Type a value into the **Mbps** text box or use the slider to set the compression limit.

4.d   From the **Bit-Rate** controls, select the constant or maximum bit-rate:

ADVANCED [VIDEO] BUTTON

Please section A.3, "Advanced [Video] Button" in Appendix A.

5.   Configuring the Audio Encoding Parameters:

Figure 3-3. Audio Encoding Parameters

AUDIO FORMATS WITH PS, ES AND VOB   **AUDIO FORMATS WITH TS**
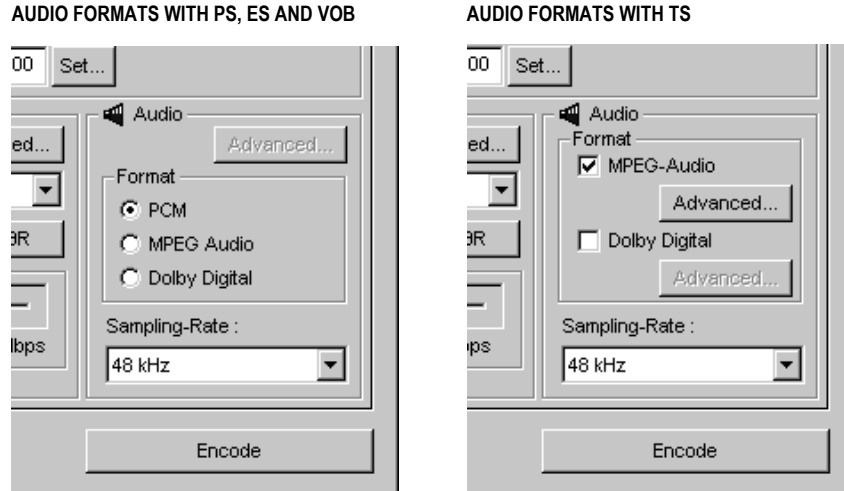
FORMAT
Use the Format parameter to set the type of audio output file to create. The audio encoding format is based on the encoder model you have and the output format selected. The following options table describes the formats that can be selected. Table 3-1 shows the audio parameter selection limitations.

AUDIO ENCODING FORMAT SELECTION OPTIONS

OPTION	DESCRIPTION
PCM	Choose for encoding an audio source into stereo PCM audio.
MPEG Audio	Choose for encoding an audio source into MPEG Audio.
Dolby® Digital	Choose for encoding an audio source into Dolby® Digital audio (applicable to ZP-330 encoder models only).

Table 3-1.   Audio Parameter Selection Limitations

	OUTPUT FORMAT			
	ES	**VOB**	**PS**	**TS**
Sampling Frequency	48/44.1/32 kHz	48 kHz	48 kHz	48/44.1/32 kHz
NTSC Format	Dolby® Digital MPEG Audio PCM	Dolby® Digital PCM	Dolby® Digital MPEG Audio	Dolby® Digital MPEG Audio
PAL Format	Dolby® Digital MPEG Audio PCM	Dolby® Digital MPEG Audio PCM	Dolby® Digital MPEG Audio	Dolby® Digital MPEG Audio
DOLBY® DIGITAL				
Bit-Rate	56k-640 kbps	64k-448 kbps	112k-384 kbps	128k-384 kbps
Encoding Mode	1/0, 2/0	1/0, 2/0	2/0	2/0
MPEG AUDIO				
Bit-Rate	56k-384 kbps	64k-384 kbps	112k-384 kbps	128k-384 kbps
Encoding Mode	1/0, 1+1, 2/0	1/0, 2/0	1/0, 1+1, 2/0	1+1, 2/0

5.a   From the **Audio Format** option buttons group, select an audio encoding format.

SAMPLING-RATE

The **Sampling-Rate** drop-down list provides various sampling frequencies for Dolby®
Digital or MPEG output audio stream. For digital audio input select the sampling frequency
of source audio stream.

SAMPLING-RATE SELECTION OPTIONS

OPTION	DESCRIPTION
32 kHz	Choose for encoding an audio source into 32 kHz Dolby® Digital* or MPEG Layer 2 audio.
44.1 kHz	Choose for encoding an audio source into 44.1 kHz Dolby® Digital* or MPEG Layer 2 audio.
48 kHz	Choose for encoding an audio source into 48 kHz Dolby® Digital*, MPEG Layer 2 or PCM audio.
AUTO	If Auto is selected, the encoder automatically detects the sampling frequency of the source digital audio stream. The Auto mode appears for the Zapex DD and CD encoder models only.

*   *Applicable to ZP-330 encoder models only.*

5.b   From the **Sampling-Rate** drop-down list, select the sampling frequency of the Dolby®
Digital or MPEG output audio stream. For digital audio input select the sampling
frequency of source audio stream.

ADVANCED PARAMETERS

Please see:

- Appendix B, "Dolby® Digital Encoding Parameters"
- Appendix C, "MPEG Audio Encoding Parameters"
- Appendix D, "Advanced System Parameters"

3.4   THE ENCODE PROCESS

This section describes the encode process, after the encoding parameters and controls in the *ZP-Controller* main window have been configured.

Encoding is controlled and monitored from the Real-Time Encoding window. Depending on how the Start/Stop options in the *ZP-Controller* window are configured, encoding can be controlled manually or by using time-code. Figure 3-4 shows the Real-Time Encoding window in detail.

Figure 3-4. Real-Time Encoding Window
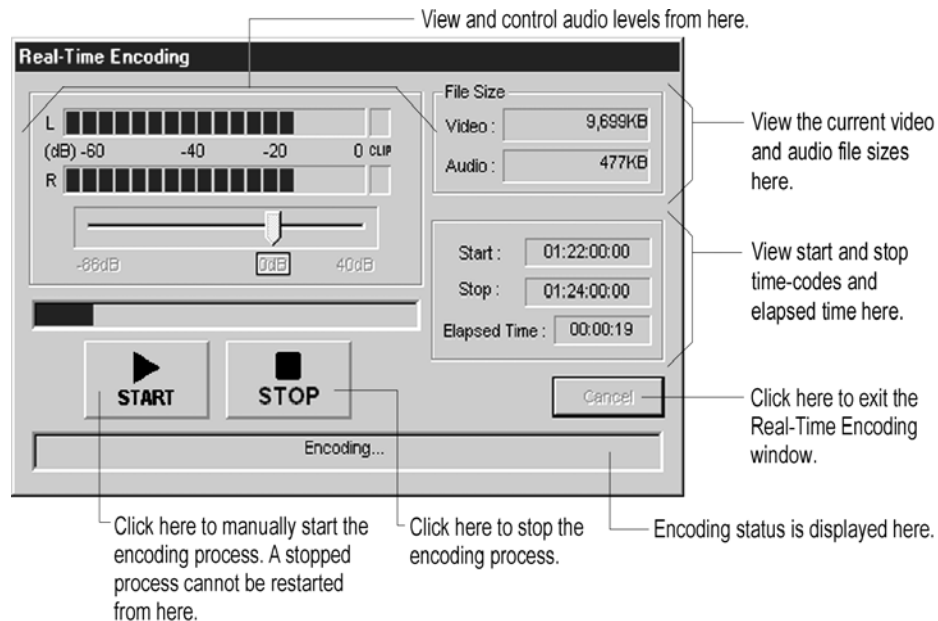
3.4.1   MANUAL ENCODING

This procedure is used when Manual has been selected in the Start/Stop settings.

TO START AND STOP MANUAL ENCODING PROCESS

1.   From the *ZP-Controller* window, click the **Encode** button to open the Real-Time Encoding window.

2.   Queue the VTR to a position about **10 seconds before** the place you want to begin encoding. This ensures that the encoder has enough time to analyze the video and audio sources before encoding.

3.   From the VTR, begin playing the video.

4.   From the Real-Time Encoding window, click **START** to start the encoder.

5.   When the desired amount of video has been encoded, click **STOP**.

6.   Click **OK** to return to *ZP-Controller's* main window.

Your encoded video and audio files are stored at the file locations specified in the **Video File** and **Audio File** drop-down lists in the *ZP-Controller* window.

3.4.2   DURATION BASED ENCODING

This procedure is used when Manual has been selected in the Start setting and Duration has been selected in the Stop setting. Duration encoding works like a timer, automatically stopping the encoding process after a specified period of time. Duration encoding uses the HH:MM:SS (Hours:Minutes:Seconds) format.

STARTING AND STOPPING DURATION BASED ENCODING

1.   From the *ZP-Controller* window, click the **Encode** button to open the Real-Time Encoding window.

2.   Queue the VTR to a position about **10 seconds before** the place you want to begin encoding. This ensures that the encoder has enough time to analyze the video and audio sources before encoding.

3.   From the VTR, begin playing the video.

4.   From the Real-Time Encoding window, click **START** to start the encoder.

5.   When the duration time has been reached the encoder will automatically stop.

6.   Click **OK** to return to *ZP-Controller's* main window.

Your encoded video and audio files are stored at the file locations specified in the **Video File** and **Audio File** drop-down lists in the *ZP-Controller* window.

3.4.3   TIME-CODE ENCODING WITH VTR CONTROL

This procedure can only be performed when the Start/Stop settings are set to time-code and if:

- Your encoder model is connected to the VTR using the VTR Control Cable
- The **VTR Control** check box is selected in the **Properties** dialog box
- The Time-Code cable is connected to the LTCIN connector of the Zapex Media Cable

The **Properties** dialog box can be opened from the **Options** menu.

The VTR Control checkbox must be selected in the Properties dialog box, and the VTR set to remote control. For more information, see Chapter 2, and your VTR User's Guide.

TO AUTOMATICALLY START AND STOP THE ENCODING PROCESS WITH VTR CONTROL

1. From the *ZP-Controller* window, click the **Encode** button to open the Real-Time Encoding window.

2. The *ZP-Controller* automatically queues the VTR to **10 seconds before** the beginning of the segment of video that must be encoded, then begins the encoding process. When the end of the segment has been reached, *ZP-Controller* automatically stops the encoding process and the VTR.

3. Click **OK** to return to *ZP-Controller's* main window.

Your encoded video and audio files are stored at the file locations specified in the **Video File** and **Audio File** drop-down lists in the *ZP-Controller* window.

3.4.4   TIME-CODE ENCODING WITHOUT VTR CONTROL

This procedure is for VTRs that do not support RS-422 remote control. The encoder model's LTCIN connection is made to the VTR's Time-Code out connector (see Chapter 2, section 2.4, "Connecting the Media Cable" for connection instructions), and the Start/Stop settings are set to time-code.

TO AUTOMATICALLY START AND STOP THE ENCODING PROCESS

1. Manually rewind (Queue) the VTR to approximately **10 seconds prior** to the beginning of the clip that is to be encoded.

2. Press play on the VTR.

3. From the *ZP-Controller* window, click the **Encode** button to open the Real-Time Encoding window. *ZP-Controller* automatically starts and stops the encoding process when the start and stop time codes are reached.

4. Click **OK** to return to the *ZP-Controller* main window.

Your encoded video and/or audio files are stored at the file locations specified in the **Video File** and **Audio File** drop-down lists in the *ZP-Controller* window.

3.5   ENCODING WINDOW FOR MULTI-AUDIO TS OUTPUT

Two encoding processes are running in multi-audio TS Output Format. One process is the Real-Time encoding process and another is a TS MUX Process. In thr Real-Time encoding process, the Video stream and PCM Audio stream are captured and saved in a specified directory on the hard disk drive.

Once the Real-Time encoding process is complete, the TS MUX Process window opens. (See Figure 3-5.)

Figure 3-5. TS MUX Process Window
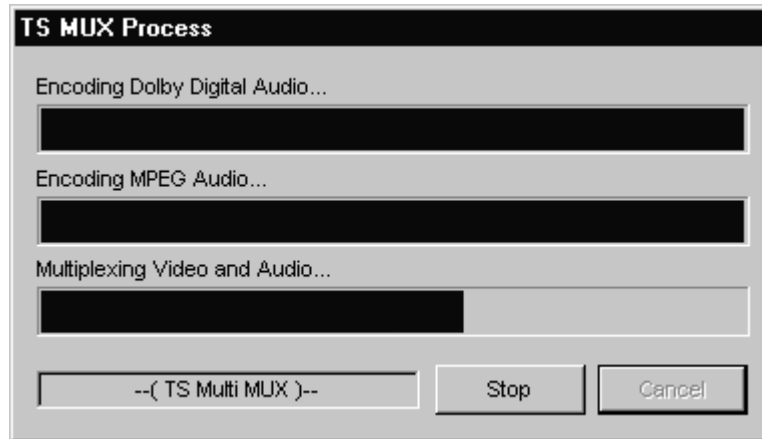
The process to multiplex multiple audio for TS output requires three steps.

1. Convert PCM audio to Dolby® Digital (Encoding Dolby Digital Audio)
2. Convert PCM audio to MPEG audio (Encoding MPEG Audio)
3. Multiplex Video Stream, Dolby® Digital Stream and MPEG Audio Stream (Multiplexing Video and Audio).

3.6   SAVING YOUR WORK AS A PROJECT FILE

Encoding parameter values can be saved in a project file so that the encoding configuration can be recalled for another session. Project files have a ZAP filename extension

TO SAVE A PROJECT FILE

1.   Configure *ZP-Controller* as described in section 3.4, "Configuring *ZP-Controller* for a Simple Encoding Session."

2.   Click **File** and select **Save Project As**.

3.   In the **Save in** drop-down list, select a destination (path) where the project file is to be saved.

4.   In the **File name** drop-down list, type in a name for your project file.

5.   Click **Save** to exit the **Save as** dialog box.

3.7   DEFAULT ENCODING AND CONTROL VALUES

All the encoding parameters and control values in the *ZP-Controller* window can be set to specific values you choose, so that every time you begin a new encoding session, you can start with values used most frequently.

TO SET INITIAL ENCODING VALUES TO YOUR OWN PREFERENCE

1.   From the *ZP-Controller* window, choose the encoding parameter and control values that you prefer to set as default values.

2.   From the **File** menu, select **Set As User Default**.

The Advanced buttons that appear in the *ZP-Controller* main window open various windows to advanced encoding parameters. Some of these advanced windows have a default button. This default button sets those advanced parameters to factory default values. The default buttons do not set the values you chose.

3.8 OPENING AN EXISTING PROJECT FILE

The encoding values stored in an existing project file can be reused in *ZP-Controller* for new encoding sessions.

TO OPEN A PROJECT FILE

1. From the *ZP-Controller* window, click **File,** and select **Open Project**. The **Open** dialog box appears.

2. Use the **Look in** drop-down list to navigate to the location of the project file. Project files have the ZAP filename extension.

3. Select the project file then click **Open**.

3.9 UPDATING AN EXISTING PROJECT FILE

TO UPDATE THE CHANGES MADE TO AN EXISTING PROJECT FILE

1. Open the project file you want to use and make the required encoding parameter and control changes.

2. From the **File** menu, select **Save Project**.

3.10 QUITTING *ZP-CONTROLLER*

!

You can quit *ZP-Controller* any time except during the encoding process.

TO QUIT *ZP-CONTROLLER*

From the **File** menu, select **Exit**.

C H A P T E R

4

OFF-LINE ENCODING

This chapter contains the following information:

- ✓ **Starting *ZP-Controller***
- ✓ **Encoding Session — Configuring the *ZP-Controller***
- ✓ **The *ZP Controller* Main Window**
- ✓ **The Encode Process**
- ✓ **Saving Your Work as a Project File**
- ✓ **Default Encoding and Control Values**
- ✓ **Opening an Existing Project File**
- ✓ **Updating an Existing Project File**
- ✓ **Quitting *ZP-Controller***

4.0   OFF-LINE ENCODING

Off-Line encoding is similar to Real-Time encoding. The main difference is that the source video is not supplied by a VTR. Off-Line source video is obtained from a file stored on a hard disk. Source file types that can be encoded are AVI and WAV.

Off-Line encoding supports 24-bit color AVI files. If the AVI file is compressed, it must be uncompressed using a 24-bit codec.

4.1   STARTING *ZP-CONTROLLER*

STARTING *ZP-CONTROLLER*

Click the Windows **Start** button, point to **Programs**, then **ZP-230** or **ZP-330**, select *ZP-Controller*.

4.2   ENCODING SESSION — CONFIGURING THE *ZP-CONTROLLER*

This section describes how to configure *ZP-Controller* for an encoding session. For detailed information about the encoding parameters discussed in this section, see the following topics.

- Chapter 1, "System Overview and Requirements"

- Appendix A, "Advanced Encoding Parameters"

- Appendix B, "Dolby® Digital Encoding Parameters"

- Appendix C, MPEG Audio Encoding Parameters"

Depending on the model you have, some features may not be available.

4.3   THE *ZP-CONTROLLER* MAIN WINDOW

When starting *ZP-Controller*, the main window appears. Figure 4-1 shows the major elements found on the main window.

Figure 4-1. *ZP-Controller* **Main Window**
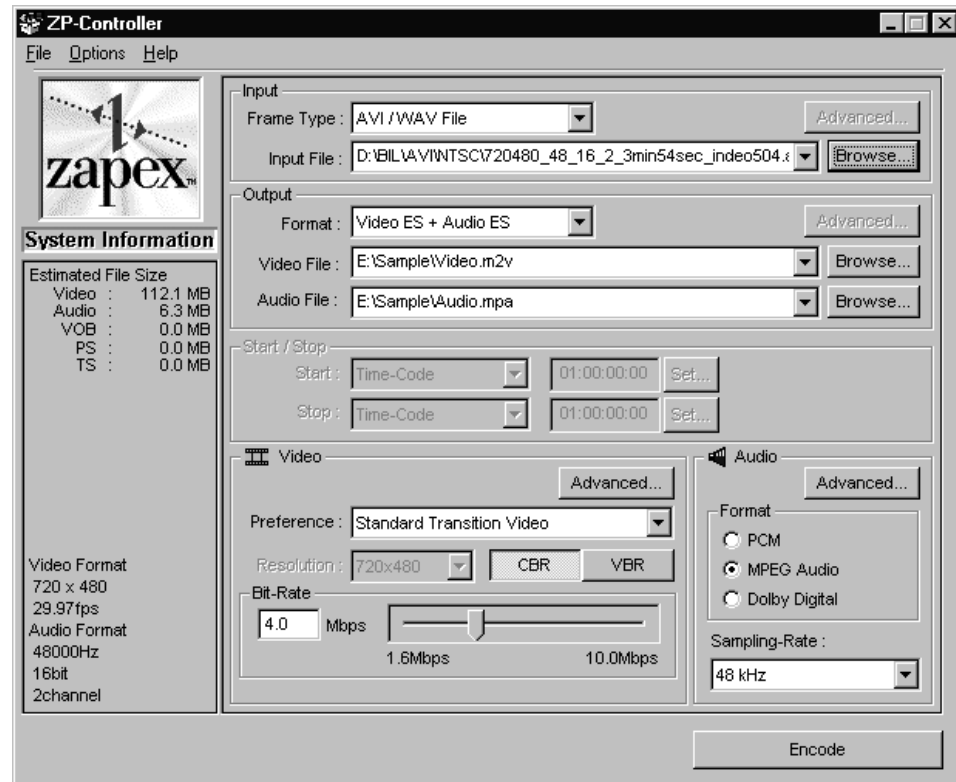
CONFIGURING THE *ZP-CONTROLLER* FOR AN ENCODING SESSION

1.   Configuring the **Frame Type** and Input File.

Input parameters tell the encoder information about the source video to be encoded.

FRAME TYPE

Select AVI/WAV file from here
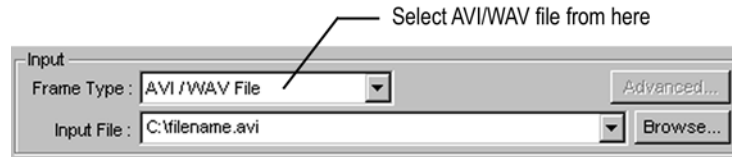
Use the **Frame Type** drop-down list for selecting **AVI / WAV** source files.

1.a   From the **Frame Type** drop-down list, select **AVI / WAV File**.

1.b   Click **Browse** to select the source file you want to encode.
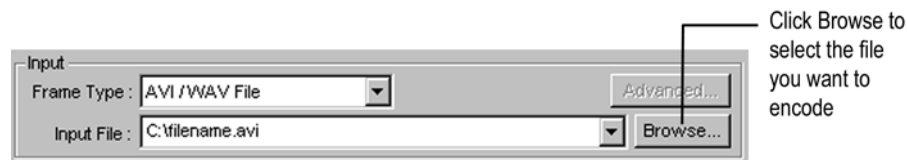
Click Browse to select the file you want to encode

2.   Configuring the Output Parameters:

Output parameters determine the type of encoded output files that are produced.

FORMAT

Use this drop-down list to select the type of [encoded] output file(s) you want to produce

Type in a name for your output files in these text boxes
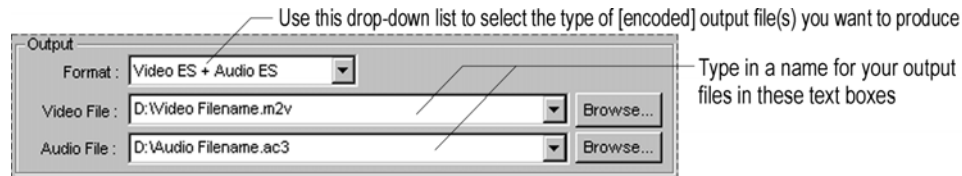
Use the **Format** drop-down list for choosing VOB, MPEG-2 video elementary streams, PS, and/or Dolby® Digital, MPEG Layer 2, or PCM audio elementary streams as the output files. DVD authoring software accepts Video ES and Audio ES output files for creating DVD video titles.

2.a   From the **Output Format** drop-down list, select the output file format(s):

OUTPUT FORMAT SELECTION OPTIONS

OPTION	DESCRIPTION
VOB (Video + Audio)	Choose to encode a VOB (DVD Video Object) file.
Video ES + Audio ES	Encodes an MPEG-2 Video Elementary Stream and a Dolby® Digital*, MPEG Layer 2, or PCM audio Elementary Stream.
Video ES	Encodes an MPEG-2 Video Elementary Stream only.
Audio ES	Encodes a Dolby® Digital, MPEG Layer 2, or PCM audio Elementary Stream only.
PS (Video + Audio)	Choose to encode a PS (Program Stream) file.

*   *Applicable to ZP-330 encoder models only.*

To select *VOB (Video + Audio), PS (Video + Audio),* **or** *Video ES + Audio ES***, the source file must be a single AVI file containing both video and audio.**

VIDEO FILE AND AUDIO FILE

Use the **Video File** and **Audio File** drop-down lists for naming the output files and providing them a path location on your hard drive. The availability of the **Audio File** drop-down list is dependent on what format is selected in the **Format** drop-down list. For example: if VOB is selected, the **Audio File** drop-down list is not available because VOBs include video and audio data.

The output filename includes the destination path.

>   **For example:**   `D:\workfolder\filename`
>   (has the destination path *D:\workfolder*)

Video output files have specific filename extensions automatically added by configuring the **Properties** dialog box. The **Properties** dialog box can be opened from the Options menu.

BROWSE BUTTONS
Located next to the **Video File** and **Audio File** drop-down lists are the **Browse** buttons. Use these buttons for selecting an existing output file. If an existing output file is selected, it is overwritten.

2.b   Name the output files:

OUPUT FILES SELECTION OPTIONS

OPTION	DESCRIPTION
Video File./.VOB./.PS	Type in a *path* and *name* for your video/VOB/PS/TS output file or **Browse.**
Audio File./.Title	Type in a *path* and *name* for your audio output file or **Browse.** For Title, type in a *name* for Encoding Information file.

3.   Configuring the Video Encoding Parameters:

Video parameters determine the method used for encoding the video stream.
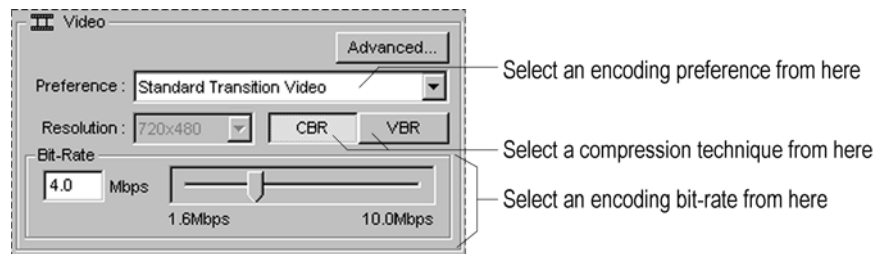
PREFERENCE
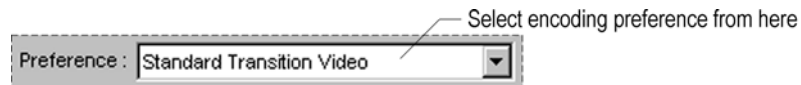
Configuring the video parameters for an encoding session can be complex because of the many advanced MPEG-2 parameters that must be considered. Zapex has consolidated many of these parameters into a single command called **Preference**, then optimized it for the most common types of video content. The video encoding preferences available are described in the options table below.

3.a   From the **Video Preference** drop-down list, select an encoding preference:

VIDEO ENCODING PREFERENCE SELECTION OPTIONS

OPTION	DESCRIPTION
Standard Transition Video	Optimized for encoding source videos containing an even balance of slow, moderate, and quick moving images. Choose for source video having an even balance of slow, moderate, and quick moving images.
Slow Transition Video	Optimized for encoding source videos that predominately have slow moving images. Choose for source video that predominately have slow moving images.
Quick Transition Video	Optimized for encoding source videos that predominately have scenes of fast moving images. Choose for source video that predominately have fast moving images.
Animation/CG	Optimized for encoding source video containing cartoon or computer generated images. Choose for source video containing cartoon or computer generated images.
Adaptive (with SCD, Soft. Filter)	If this mode is selected, the Zapex encoder dynamically changes the type of **Transition Video** per GOP by analyzing the characteristic of the source video image. In this mode, the **Scene Change Detection (SCD)** and **Adaptive Softness Filter** are always activated.

The source video image GOP (Group of Pictures) is characterized by two numbers 'N' and 'M' plus three types of pictures:

'N'   The number of pictures in the GOP

'M'   The frequency of 'P' pictures within the GOP

'I'   Picture coded with full picture information

'P'   Picture coded with respect to the previous 'I' or 'P' pictures

'B'   Picture coded with respect to the previous 'I' or 'P' picture, and/or the immediately next 'I' or 'P' picture

Adaptive mode uses a combination of Standard, Slow, and Quick Transition modes. When Adaptive mode is selected, the SCD (Scene Change Detection) and Adaptive Softness Filter are always activated. When SCD is selected in combination with Standard, Quick, or Animated/CG options, 'N' can range from 1 to 16. When SCD is selected in combination with Slow Transition option, 'N' can range from 1 to 15.

The Video Encoding Preference Selection Options correspond to the following 'M' and 'N' numbers:

	NTSC		PAL	
Standard Transition Video	N = 16	M = 2	N = 14	M = 2
Slow Transition Video	N = 15	M = 3	N = 15	M = 3
Quick Transition Video	N = 15	M = 1	N = 15	M = 1
Animation/CG	N = 16	M = 2	N = 14	M = 2
Adaptive (with SCD, Filter)	N = 1 to 16	M = 1, 2, or 3 *	N = 1 to 14	M = 1, 2, or 3 *

*   'M' is adaptive and automatically adjusted according to the detected scene changes.

RESOLUTION

The encode resolution cannot be adjusted in the Off-Line encoding mode. The source AVI file is transcoded into MPEG at the source file's resolution. The table below identifies the resolutions supported.

SUPPORTED RESOLUTIONS (VOB OR PS)		SUPPORTED RESOLUTIONS (ES)	
NTSC RESOLUTIONS	PAL RESOLUTIONS	NTSC RESOLUTIONS	PAL RESOLUTIONS
720 x 486		720 x 486	
720 x 480	720 x 576	720 x 480	720 x 576
352 x 480	352 x 576	640 x 480	640 x 576
352 x 240	352 x 288	352 x 480	352 x 576
		320 x 480	320 x 576
		352 x 240	352 x 288
		320 x 240	320 x 288

Source files with the NTSC resolution of 720 x 486 will have the top 2 lines and the bottom 4 lines cropped.

START/STOP PARAMETERS

The Start and Stop controls are not available for Off-Line encoding.

3.b   Use the **CBR** (Constant Bit-Rate) and **VBR** (Variable Bit-Rate) buttons to select an encoding compression technique based on bit-rate.

CBR AND VBR

Select a compression technique from here

Resolution : 720x480   CBR   VBR

CBR/VBR SELECTION OPTIONS

OPTION	DESCRIPTION
CBR	This technique creates a video output file compressed at a constant bit-rate. The rate is set in the Bit-Rate options box. CBR compression gives you better control over the quality and size of the output file. Higher bit-rates increase the image quality, but also increase the output file size. Choose for compressing the video data at a constant bit-rate specified in the Bit-Rate controls. CBR provides greater video quality control, but increases the video output file size.
VBR	This technique creates a video output file compressed at a variable bit-rate. The maximum rate is set in the Bit-Rate options box. During VBR compression, the encoder automatically lowers the compression rate for scenes that are of slow transition type, and raises it for scenes of quick transition type, but not higher than the maximum set bit-rate. Using VBR optimizes the video quality-to-output file size relationship. Choose for compressing the video data at a variable bit-rate with the maximum rate specified in the Bit-Rate controls. VBR provides lower video quality control, but decreases the video output file size.

BIT-RATE

The Bit-Rate parameter controls the compression limits for the CBR or VBR encoding techniques. The selected value is constant for CBR output files or the maximum rate for VBR output files. Type a value into the **Mbps** text box or use the slider to set the compression limit.
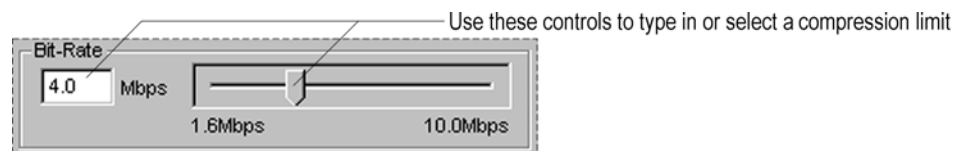
Type a rate into the **Mbps** text box, or use the slider to select a rate.

3.c From the **Bit-Rate** controls, select the constant or maximum bit-rate.

ADVANCED [VIDEO] BUTTON

See Appendix A, section A.3, "Advanced [Video] Button" for detailed information.

4.   Configuring the Audio Encoding Parameter:

FORMAT

From the Audio Format option buttons group box, select an audio encoding format. The audio formats that are available depend on the encoder model you have. The format types are described in the following option selection table.
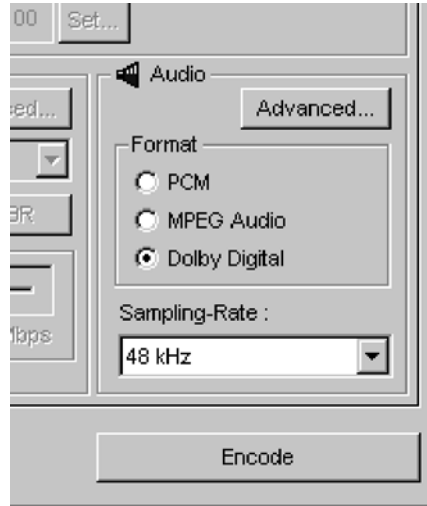
AUDIO ENCODING FORMAT SELECTION OPTIONS

OPTION	DESCRIPTION
PCM	Choose for encoding AVI or WAVE data into stereo PCM audio.
MPEG Audio	Choose for encoding AVI or WAVE data into MPEG Layer 2.
Dolby Digital	Choose for encoding AVI or WAVE data into Dolby® Digital audio*.

*   Applicable to ZP-330 encoder models only.

SAMPLING-RATE

From the **Sampling-Rate** drop-down list, select the sampling frequency of the Dolby® Digital or MPEG output audio stream. For digital audio input select the sampling frequency of source audio stream. The sampling-rate of audio data in AVI and WAV files are converted to 48 kHz if you specify a sampling rate of 48 kHz in the Sampling-Rate drop-down list. Audio sampling rates of 22.05 kHz, 32 kHz, and 44.1 kHz are supported for sampling-rate conversion.

SAMPLING-RATE SELECTION OPTIONS

OPTION	DESCRIPTION
32 kHz	Choose for encoding a 32 kHz AVI or WAVE data into 32 kHz Dolby® Digital* or MPEG Layer 2 audio.
44.1 kHz	Choose for encoding a 44.1 kHz AVI or WAVE data into 44.1 kHz Dolby® Digital* or MPEG Layer 2 audio.
48 kHz	Choose for encoding a 48 kHz AVI or WAVE data into 48 kHz Dolby® Digital* or MPEG Layer 2 audio.
AUTO	If Auto is selected, the Zapex encoder automatically detects the sampling frequency of the source audio stream, and encodes a Dolby® Digital*, or MPEG Layer2 audio stream.

* *Applicable to ZP-330 encoder models only.*

The sampling-rate of audio data in AVI and WAV files are converted to 48 kHz if you specify a sampling rate of 48 kHz in the Sampling-Rate drop-down list. Audio sampling rates of 22.05 kHz, 32 kHz, and 44.1 kHz are supported for sampling-rate conversion.

ADVANCED [AUDIO] BUTTON

Please see:

- Appendix B, "Dolby® Digital Encoding Parameters"

- Appendix C, "MPEG Audio Encoding Parameters"

4.4   THE ENCODE PROCESS

Click **Encode** to begin encoding.

When the encoding process begins the Off-Line Encoding window appears. This window allows you to monitor or stop the encoding process. Your encoded video and audio files can be found at the path shown by the **Video File and Audio File** drop-down lists in the *ZP-Controller* window.
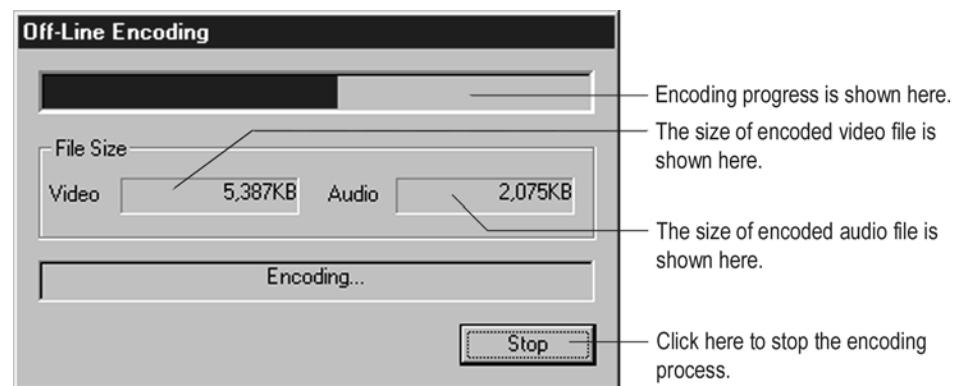
4.5   SAVING YOUR WORK AS A PROJECT FILE

The value of each encoding parameter can be saved in a project file so that the encoding configuration can be used for other sessions. Project files have the ZAP filename extension

TO SAVE A PROJECT FILE

1.   Configure *ZP-Controller* as described in Chapter 2, "Configuring the *ZP-Controller* Properties Dialog Box."

2.   Click **File** and select **Save Project as** to open the **Save As** dialog box.

3.   In the **Save in** drop-down list, select a destination (path) where the project file must be saved.

4.   In the **File name** drop-down list, type in a name for your project file.

5.   Click **Save** to exit the **Save As** dialog box.

4.6   DEFAULT ENCODING AND CONTROL VALUES

All the encoding parameters and control values in *ZP-Controller* can be set to specific values you choose, so each time you begin a new configuration, you can start with the values most frequently used.

TO SET INITIAL ENCODING VALUES TO YOUR OWN PREFERENCE

1.   From the *ZP-Controller* window, choose the encoding parameters and control values that you prefer to set as default values.

2.   From the **File** menu, select **Set As User Default**.

Located in the *ZP-Controller* main window are Advanced buttons that open windows to advanced encoding parameters. Some of these advanced windows have a default button. The default button sets the advanced parameters to a factory default value. The default buttons do not set the values you chose.

4.7   OPENING AN EXISTING PROJECT FILE

The encoding values stored in an existing project file can be opened in *ZP-Controller* and used for a new encoding session.

TO OPEN A PROJECT FILE

1.   Click **File** and select **Open Project**. The **Open** dialog box appears.

2.   Use the **Look in** drop-down list to navigate to the location of the project file. Project files have the ZAP filename extension.

3.   Select the project file then click **Open**.

4.8   UPDATING AN EXISTING PROJECT FILE

TO UPDATE THE CHANGES MADE TO AN EXISTING PROJECT FILE

1.   Open the project file you want to use and make the required encoding parameter and control changes.

2.   From the **File** menu, select **Save Project**.

4.9   QUITTING *ZP-CONTROLLER*

You can quit *ZP-Controller* any time except during the encoding process.

TO QUIT *ZP-CONTROLLER*

From the **File** menu, select **Exit**.

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C H A P T E R

5

OFF-LINE ENCODING USING ADOBE® PREMIERE®

This chapter contains the following information:

- ✓ **An Off-Line Encoding Session**
- ✓ **Selecting a Video Project**
- ✓ **Export Movie Settings**
  - ▪ Export Movie Settings Dialog Box - General Settings
  - ▪ Export Movie Settings Dialog Box - Audio Settings
  - ▪ Export Movie Settings Dialog Box – Special Processing
  - ▪ How to Crop a Video in Adobe® Premiere®
- ✓ **Configuring Zapex Encoder Parameters**
  - ▪ Configuring the Zapex Encoder Parameters Audio Tab
  - ▪ Configuring Zapex Encoder Parameters System Tab
- ✓ **Apply the Configurations and Begin Encoding**

5.0 OFF-LINE ENCODING USING ADOBE® PREMIERE®

This section describes how to configure the Zapex Plug-in of Adobe® Premiere® for an encoding session. No advanced configurations are described. For detailed information about the basic and advanced encoding parameters, see the following topics.

- Appendix A, "Advanced Encoding Parameters"

- Appendix B, "Dolby® Digital Encoding Parameters"

- Appendix C, "MPEG Audio Encoding Parameters"

Video and audio source files that have been edited in Adobe® Premiere® can be encoded into a PS/VOB or MPEG-2 Video Elementary Stream, and/or a Dolby® Digital, MPEG Layer 2, or PCM audio elementary stream.

Depending on the model you have, some features may not be available.

5.1 AN OFF-LINE ENCODING SESSION

The following instructions provide the information needed to do a step-by-step off-line encoding session.

- Selecting a Video Project

- Export Movie Settings Dialog Box – General Settings

- Export Movie Settings Dialog Box – Video Settings

- Export Movie Settings Dialog Box – Audio Settings

- Configuring Zapex Encoder Parameters Window – Video Tab

- Configuring Zapex Parameters Window – Audio Tab

- Configuring Zapex Parameters Window – System Tab

- Applying the Configuration and Beginning Encoding

5.2   SELECTING A VIDEO PROJECT

1.   From Adobe® Premiere®, open the video project you want to encode.

2.   From the **File** menu, click **Export** and select **Movie** to open the **Export Movie** dialog box. Refer to Figure 5-1.

Figure 5-1. Export Movie Dialog Box
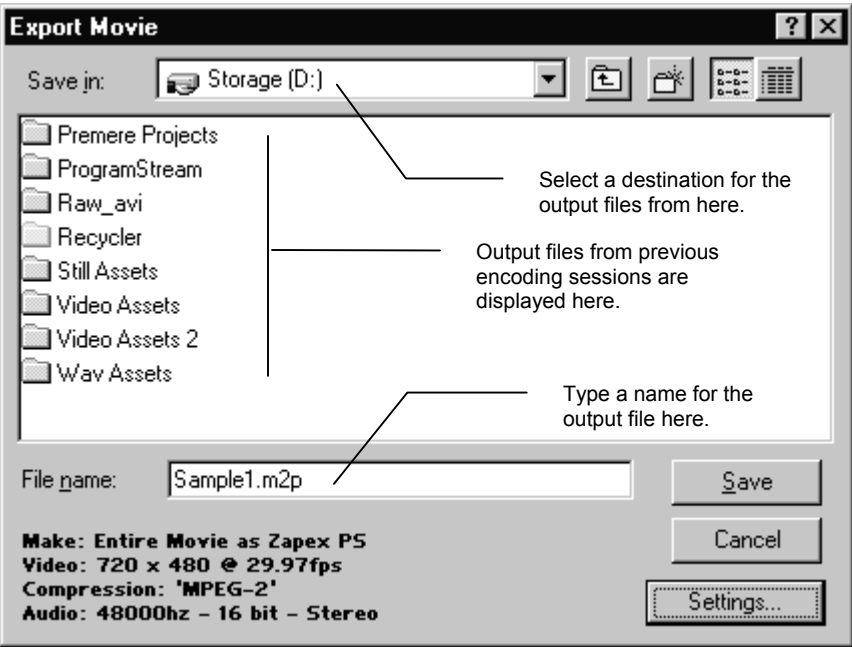
SAVE IN

From the **Export Movie** dialog box, use the **Save in** drop-down list to select a destination (path) for your output files. The destination can be any directory on any local hard drive that has space for the files.

3.   From the **Save in** drop-down list select the destination for the output file by selecting a drive and directory.

FILE NAME

Type in a name of your output file here

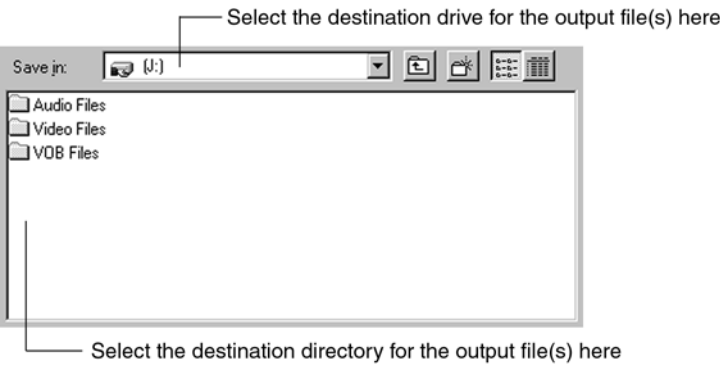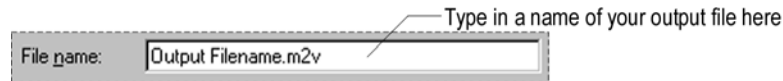File name: Output Filename.m2v

From the **Export Movie** dialog box, use the **File name** text box for typing in a name for the output file. If video and audio output files are to be encoded as separate files, the name is incorporated into both output files. Depending on selections made in the **Export Movie Settings — Audio Settings** dialog box, the output filename extension is added automatically: VOB for DVD Video Object files; MPG, MP2, M2V, or VBS for video output files; MP2 for PS (program stream), and AC3, MPA or WAV for audio output files.

4.   In the **File name** text box, type the name of the output file.

5.3 EXPORT MOVIE SETTINGS

The **Export Movie Settings** dialog box is opened by clicking **Settings** from the **Export Movie** dialog box. Four types of source file and encoding settings can be configured:

- General Settings

- Video Settings

- Audio Settings

- Special Processing

5.   Click **Settings** to open the **Export Movie Settings** dialog box. Figure 5-2 shows a detail of the **Export Movie Settings** dialog box as it first appears. **General Settings** is the first set of parameters that are available.

Figure 5-2. Export Movie Settings Dialog Box – General Settings
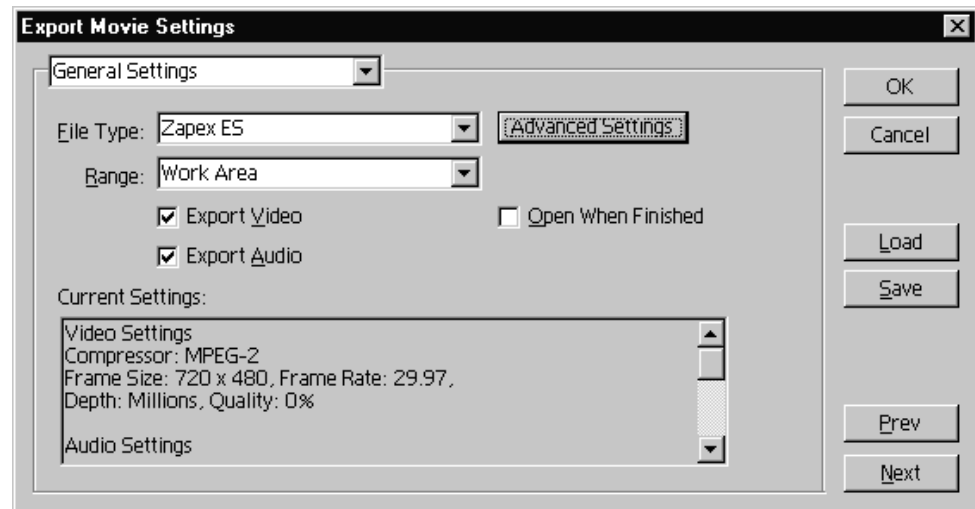
GENERAL SETTINGS

General Settings provides controls for configuring the type of video output file that is created (encoded). The Zapex Encoder Parameters window can also be opened here.
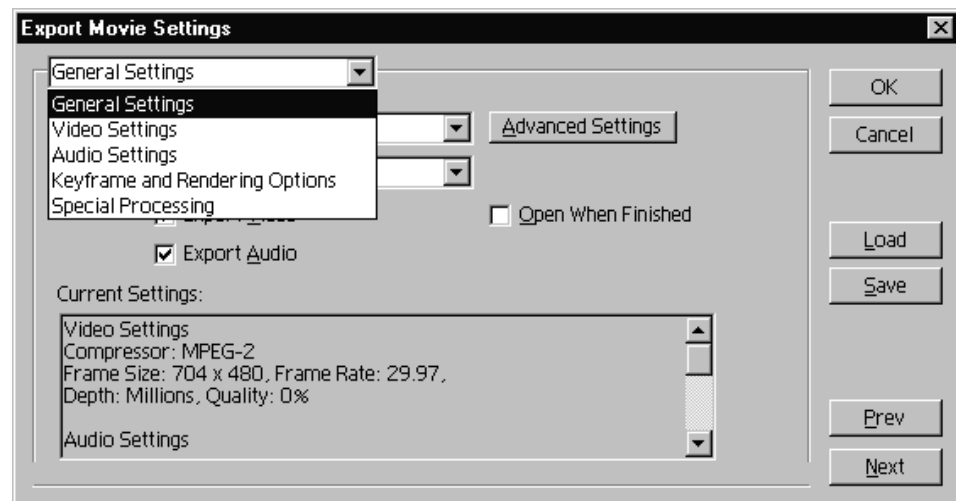
5.3.1   EXPORT MOVIE SETTINGS DIALOG BOX - GENERAL SETTINGS

In the Export Movie Settings dialog box — General Settings view there is a **File Type** drop-down list. See Figure 5-3.

Figure 5-3. General Settings —File Type Drop-down List
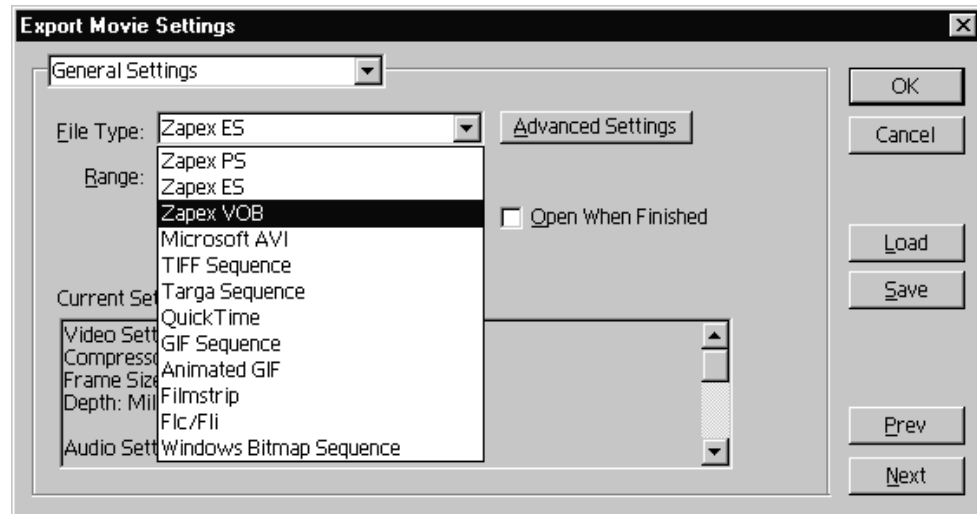
FILE TYPE

Select the type of output file to encode from here.

Use the **File Type** drop-down list to select the type video and audio output file to encode. DVD authoring software accepts ES (Elementary Stream) output files. The following table describes the File Type options available.

FILE TYPE SELECTION OPTIONS

Option	DESCRIPTION
ZAPEX PS	Encodes an MPGE-2 Program Stream (multiplexed video and audio).
ZAPEX ES	Encodes an MPEG-2 Video Elementary Stream, and a Dolby® Digital, or MPEG Layer 2, or PCM audio Elementary Stream.
ZAPEX VOB	Encodes a DVD Video Object file that can be viewed by a DVD decoder.

1.   From the **File Type** drop-down list, select the encoding format. Refer to the following File Type selections table:

VIDEO AND AUDIO EXPORT

Use the video and Audio export check box options to export video only, audio only, or video and audio. Export options are determined by the selected file type (VOB or ES). For example: a file type of VOB requires that both **Export Video** and **Export Audio** are selected.

RANGE

Use the Range drop-down list to select the encoding range.

RANGE SELECTION OPTIONS

Option	DESCRIPTION
Entire Project	Encodes all the source material on the project time-line.
Work Area	Encodes the source material that is in the work area.

2.   In the **Range** drop-down list, select the desired range to be encoded. Select Entire project or work area.

3.   Depending on the format of the video stream(s) you want to export, select the **Export Video** and/or **Export Audio** check box(es).

Always keep the Open When Finished check box clear.

4.   Clear the **Open When Finished** check box.
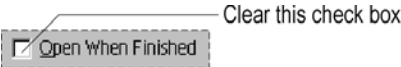
Since the Zapex plug-in for Adobe® Premiere® only supports encoding, if this parameter is checked, the following error message will appear at the end of exporting process:

"Unable to open that file. File is an unsupported type."

ADVANCED SETTINGS BUTTON

This button to opens the Zapex Encoder Parameters window. See "Zapex Encoder Parameters Window" later in this chapter.

Click **Advanced Settings** button to open the Zapex Encoder Parameters window. Refer to Figure 5-6.

5.3.2   EXPORT MOVIE SETTINGS DIALOG BOX - VIDEO SETTINGS

1.   From the **Export Movie Settings** drop-down list (**General Settings** is currently selected), select **Video Settings**. Figure 5-4 shows a detail of the **Export Movie Settings – Video Settings** dialog box.

Figure 5-4. Export Movie Settings – Video Settings
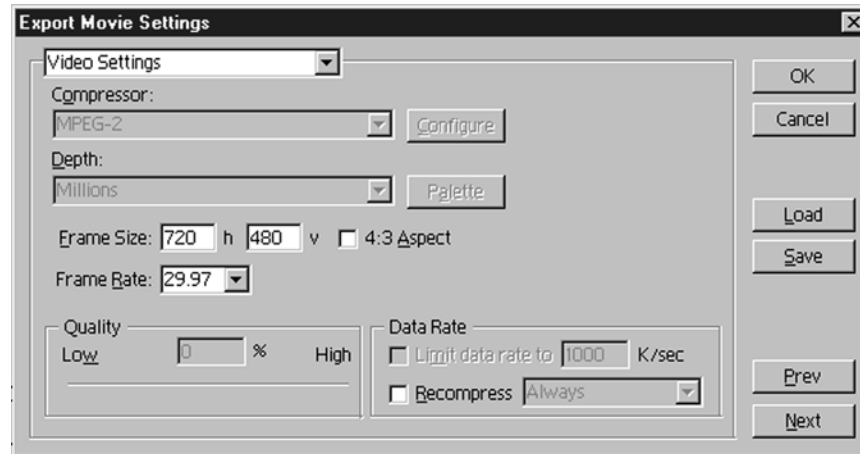
VIDEO SETTINGS

The Video Settings provides the controls for configuring resolution and frame rate of the source and output video files.

FRAME SIZE
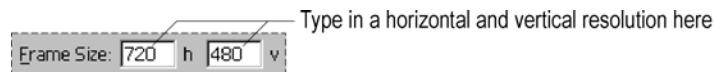
2.   Use the horizontal and vertical **Frame Size** text boxes for configuring the resolution of the video output. The table below identifies the resolutions that are supported.

SUPPORTED RESOLUTIONS (VOB OR PS)		SUPPORTED RESOLUTIONS (ES)	
NTSC RESOLUTIONS	PAL RESOLUTIONS	NTSC RESOLUTIONS	PAL RESOLUTIONS
720 x 480	720 x 576	720 x 480	720 x 576
352 x 480	352 x 576	640 x 480	640 x 576
352 x 240	352 x 288	352 x 480	352 x 576
		320 x 480	320 x 576
		352 x 240	352 x 288
		320 x 240	320 x 288

If the source video is smaller than the selected resolution, the final image is stretched.

If the source video resolution is greater than the resolutions shown in the above tables, the image can be scaled down or cropped. For more information, see "Special Processing."

FRAME RATE

Select a frame rate from here

Frame Rate: 29.97

3.   Set the **Frame Rate** drop-down list to **29.97** for NTSC and **25** for PAL.

5.3.3   EXPORT MOVIE SETTINGS DIALOG BOX - AUDIO SETTINGS

AUDIO SETTINGS

The Audio Settings provide controls for configuring the basic parameters for the *source* audio and *output* audio files.

1.   From the **Export Movie Settings** drop-down list (**Video Settings** is currently selected), select **Audio Settings**. Refer to Figure 5-5.

Figure 5-5. Export Movie Settings – Audio Settings

RATE

Select the sampling frequency of the audio output from here

Rate: 48000Hz
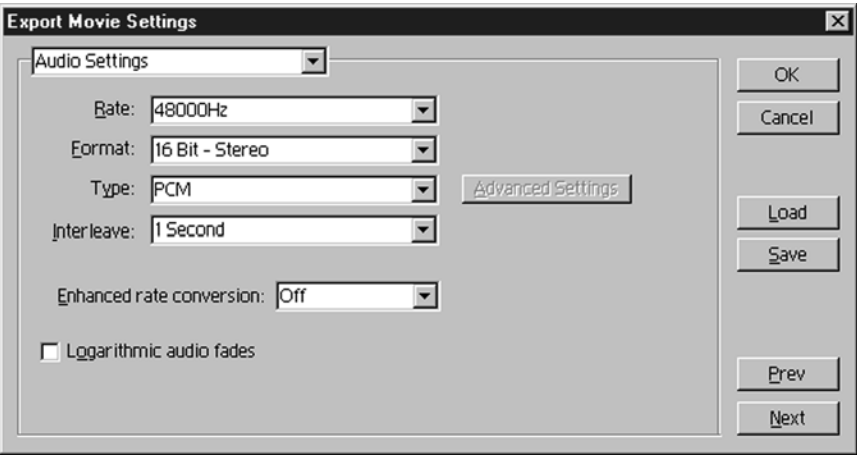
Use the **Rate** drop-down list for setting the sampling rate of the audio output. 48 kHz sampling rate is available for both PCM, MPEG-1 Layer 2 and Dolby® Digital audio (DVD compatible). The 32 kHz and 44.1 kHz sampling rates are available for Dolby® Digital, MPEG Layer 2 audio.

When either Zapex PS or Zapex VOB has been selected in File Type under General Settings, 48000 Hz is the only sampling rate available.

2.   From the **Rate** drop-down list, select the sample rate of the audio output.

When either Zapex PS or Zapex VOB has been selected in File Type under General Settings, 48000 Hz is the only sampling rate available.

FORMAT

Select the format of the audio output from here

Format: 16 Bit - Stereo
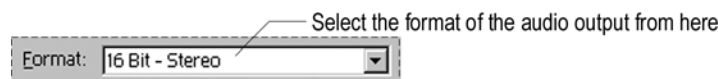
Use the **Format** drop-down list for setting the bit resolution and number of channels of the source audio. Always choose a setting that matches the source audio.

3.   From the **Format** drop-down list, select the bit resolution and number of channels of the audio output.

TYPE

Select the encoding type of audio output

Type: PCM
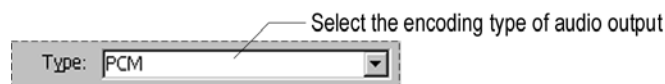
Use the **Type** drop-down list for setting the type of audio output file you want to create.

AUDIO SETTINGS – TYPE SELECTION OPTIONS

Option	DESCRIPTION
PCM	Choose for encoding the source audio into stereo PCM audio.
Dolby Digital	Choose for encoding the source audio into Dolby® Digital* audio.
MPEG Audio	Choose for encoding the source audio into MPEG audio.

* Applicable to ZP-330 encoder models only.

4.   From the **Type** drop-down list, select an audio encoding type. The audio encoding types available are dependent on the encoder model you have.

5.   From the **Export Movie Settings** drop-down list (**Audio Settings** is currently selected), select **General Settings**.

5.3.4   EXPORT MOVIE SETTINGS DIALOG BOX – SPECIAL PROCESSING

Special Processing is used to crop source video that has a resolution greater than 720x480 for NTSC and 720x576 for PAL. This means that Premiere® does not have to scale the source to 720x480 for NTSC or 720x576 for PAL prior to encoding.
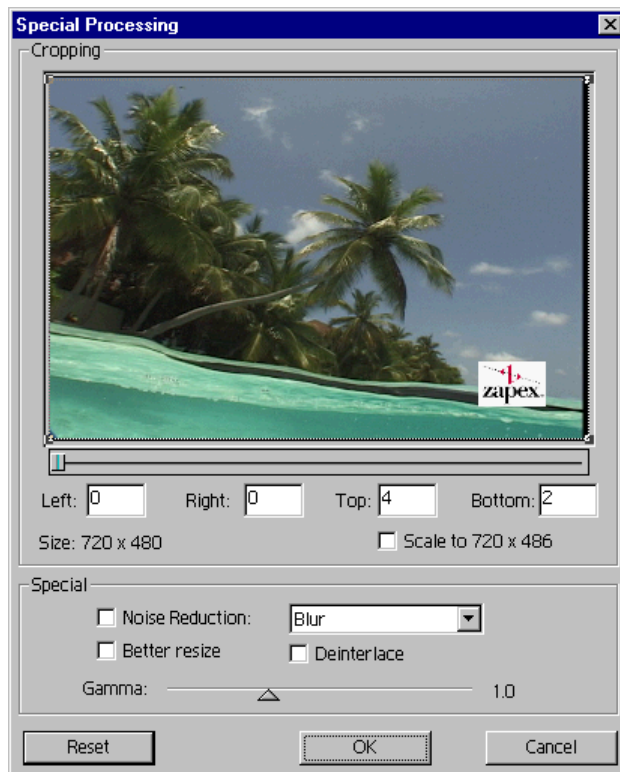
5.3.5   HOW TO CROP A VIDEO IN ADOBE® PREMIERE®

1.   In the **Export Settings Video Frame Size** text boxes, type the resolution of the source video.

2.   From the **Export Settings** drop-down list, select **Special Processing**.

3.   Click the **Modify** button.

4.   In the **Top** and **Bottom** text boxes, type in the number of lines you want cropped from the top and bottom of the video frame. Use only even numbers, for example, 2, 4, and 6.

5.   Click **OK**.

5.4   CONFIGURING ZAPEX ENCODER PARAMETERS

There are three tabs available through the Zapex Encoder Parameters window: the Video Tab, the Audio Tab, and the System Tab. All three are discussed in this section.

Figure 5-6. Zapex Encoder Parameters Window – Video Tab

Click these tabs to select video or audio encoding controls.

Click here to see more information about the Parameters window.

Click here to accept the encoding configuration.

Output file Resolution Min-Max bit-rate table.
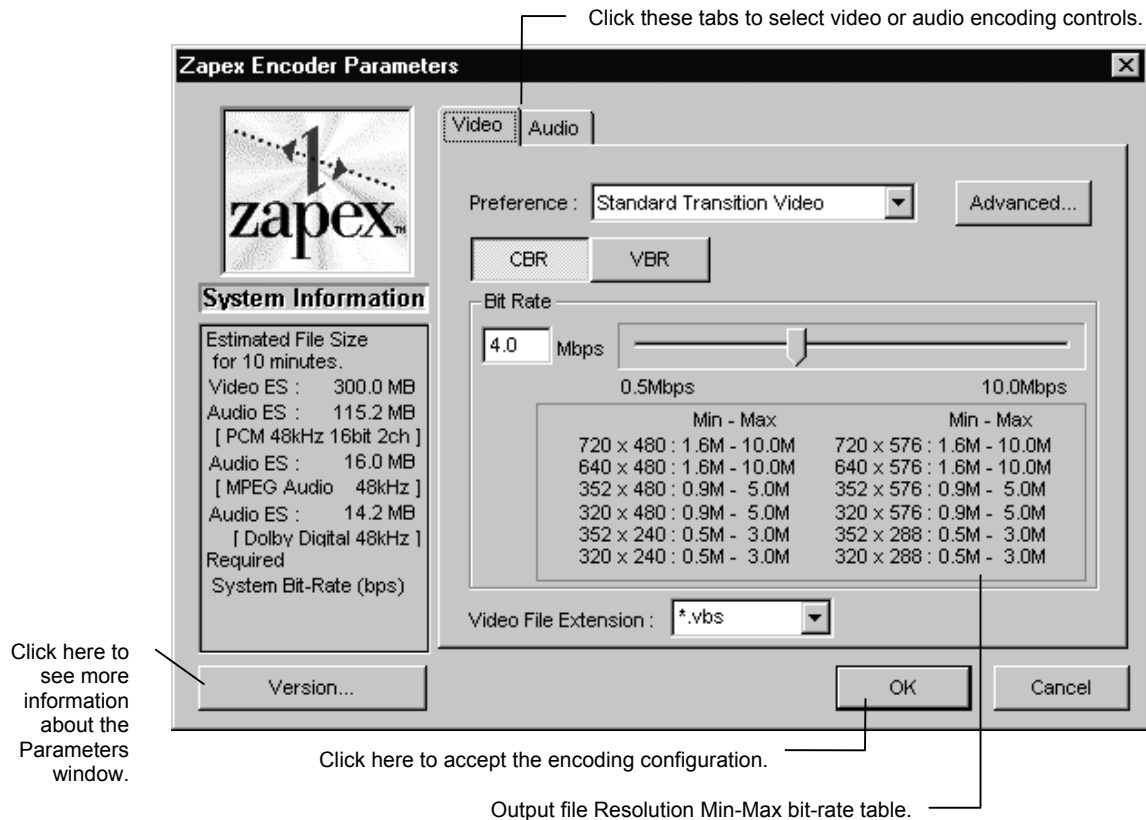
5.4.1   CONFIGURING THE ZAPEX ENCODER PARAMETERS VIDEO TAB

VIDEO [TAB]

Parameters in the Video tab are used for specifying the video output you want to encode.

PREFERENCE

Select an encoding Preference from here

Preference : Standard Transition Video
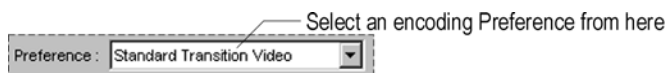
Configuring the video parameters for an encoding session can be a complex job because of the many advanced MPEG-2 parameters that must be considered. Zapex has consolidated many of these parameters into a single command called *Preference*, then optimized it for the most common types of video content. The four video encoding Preferences available are described in the following options table.

ENCODING PREFERENCE SELECTION OPTIONS

Option	DESCRIPTION
Standard Transition Video	Optimized for encoding source videos containing an even balance of slow, moderate, and quick moving images.
Slow Transition Video	Optimized for encoding source videos that predominately have slow moving images.
Quick Transition Video	Optimized for encoding source videos that predominately have scenes of fast moving images.
Animation/CG	Optimized for encoding source videos containing cartoon or computer generated images.
Adaptive (with SCD and Soft. Filter)	If this mode is selected, the Zapex encoder dynamically changes the type of **Transition Video** per GOP by analyzing the characteristic of source video image. In this mode, the **Scene Change Detection (SCD)** and **Adaptive Softness Filter** are always activated.

The source video image GOP (Group of Pictures) is characterized by two numbers 'N' and 'M' plus three types of pictures:

- 'N'   The number of pictures in the GOP

- 'M'   The frequency of 'P' pictures within the GOP

- 'I'   Picture coded with full picture information

- 'P'   Picture coded with respect to the previous 'I' or 'P' pictures

- 'B'   Picture coded with respect to the previous 'I' or 'P' picture, and/or the immediately next 'I' or 'P' picture

Adaptive mode uses a combination of Standard, Slow, and Quick Transition modes. When Adaptive mode is selected, the SCD (Scene Change Detection) and Adaptive Softness Filter are always activated. When SCD is selected in combination with Standard, Quick, or Animated/CG options, 'N' can range from 1 to 16. When SCD is selected in combination with Slow Transition option, 'N' can range from 1 to 15.

The Video Encoding Preference Selection Options correspond to the following 'M' and 'N' numbers:

	NTSC		PAL	
Standard Transition Video	N = 16	M = 2	N = 14	M = 2
Slow Transition Video	N = 15	M = 3	N = 15	M = 3
Quick Transition Video	N = 15	M = 1	N = 15	M = 1
Animation/CG	N = 16	M = 2	N = 14	M = 2
Adaptive (with SCD, Filter)	N = 1 to 16	M = 1, 2, or 3 *	N = 1 to 14	M = 1, 2, or 3 *

* 'M' is adaptive and automatically adjusted according to the detected scene changes.

1.   From the **Preference** drop-down list, select an encoding preference.

CBR AND VBR

Use the **CBR** (Constant Bit-Rate) and **VBR** (Variable Bit-Rate) buttons to select an encoding compression technique based on bit-rate.

CBR/VBR SELECTION OPTIONS

OPTION	DESCRIPTION
CBR	This technique creates a video output file compressed at a constant bit-rate. The rate is set in the Bit-Rate options box. CBR compression gives you better control over the quality and size of the output file. Higher bit-rates increase the image quality, but also increase the output file size.
VBR	This technique creates a video output file compressed at a variable bit-rate. The maximum rate is set in the Bit-Rate options box. During VBR compression, the encoder automatically lowers the compression rate for scenes that are of slow transition type, and raises it for scenes of quick transition type, but not higher than the maximum set bit-rate. Using VBR optimizes the video quality-to-output file size relationship.

2.   Use the **CBR** or **VBR** button to select an encoding technique. Refer to the selection options table.

BIT-RATE
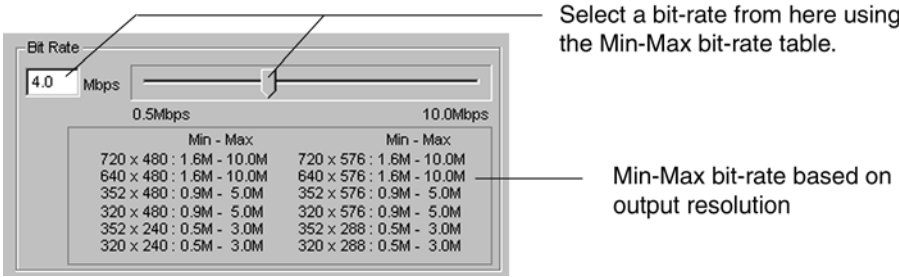
Select a bit-rate from here using the Min-Max bit-rate table.

Min-Max bit-rate based on output resolution

The Bit-Rate parameter controls the compression limits for the CBR and VBR encoding techniques. The selected value can be constant for CBR output files or the maximum rate for VBR output files. Type a value into the **Mbps** text box or use the slider to set the compression limit.

3.   From the **Bit-Rate** controls, select a constant or maximum bit-rate. Type a bit-rate into the **Mbps** text box, or use the slider to select a bit-rate using the output resolution min-max bit-rate table.

ADVANCED BUTTON
Use this button for accessing advanced video encoding parameters. See Appendix A, section A.3, "Advanced [Video] Button" for more information.

VIDEO FILE EXTENSION
When encoding separate audio and video output files, use the Video File Extension drop-down list to set the video output file extension: M2V, VBS, MPG, MP2.

5.4.2   CONFIGURING THE ZAPEX ENCODER PARAMETERS AUDIO TAB

AUDIO [TAB]
Controls in the Audio tab are used for configuring the parameters for the audio output file.

1.   Click the **Audio** tab to bring it to the front.

2.   Configure the audio output parameters. Refer to Figure 5-7.

Figure 5-7. Zapex Encoder Parameters Window – Audio Tab
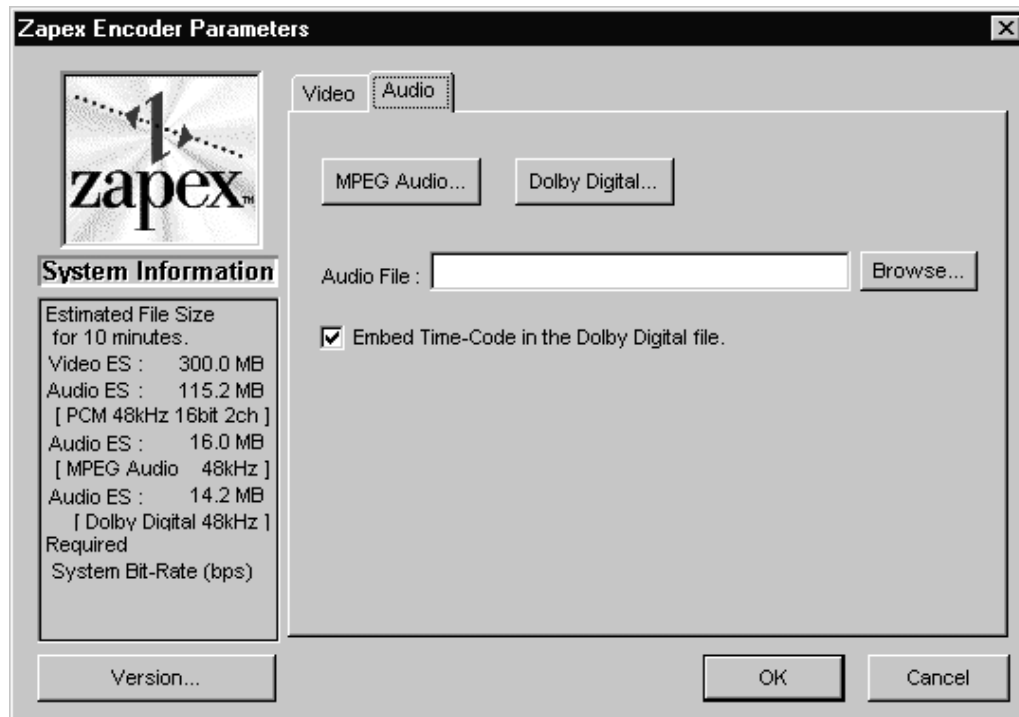
MPEG AUDIO BUTTON

The **MPEG Audio** button is used to access MPEG Audio encoding parameters. Available only if **MPEG Audio** is the audio **Type** selected from the Audio Settings. See Appendix C, "MPEG Audio Encoding Parameters" for more information.
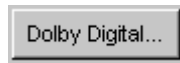
DOLBY DIGITAL BUTTON

The **Dolby Digital** button is used to access Dolby® Digital encoding parameters. Available only if **Dolby** Digital is the audio **Type** selected from the Audio Settings. See Appendix B, "Dolby® Digital Encoding Parameters" for more information (only applicable to ZP-330 encoder models).

AUDIO FILE (APPLICABLE TO ES ENCODING ONLY)

The **Audio File** text box is available only if the audio output file is to be captured in a different location from video output file. Use this text box for naming and configuring a destination path for the audio output file. The destination can be any directory on any local hard drive that has enough space. Use the **Browse** button for selecting existing output files if you want to overwrite them. If an **Audio File** is not specified, the Zapex encoder captures the audio output file in the same location as video output file and automatically adds: WAV filename extension for PCM audio, MPA for MPEG Audio, or AC3 for Dolby® Digital audio.

5.4.3   CONFIGURING ZAPEX ENCODER PARAMETERS SYSTEM TAB

The System tab is the parameter window for PS output format. See Figure 5-8.

Figure 5-8. Zapex Encoder Parameters Window – System Tab
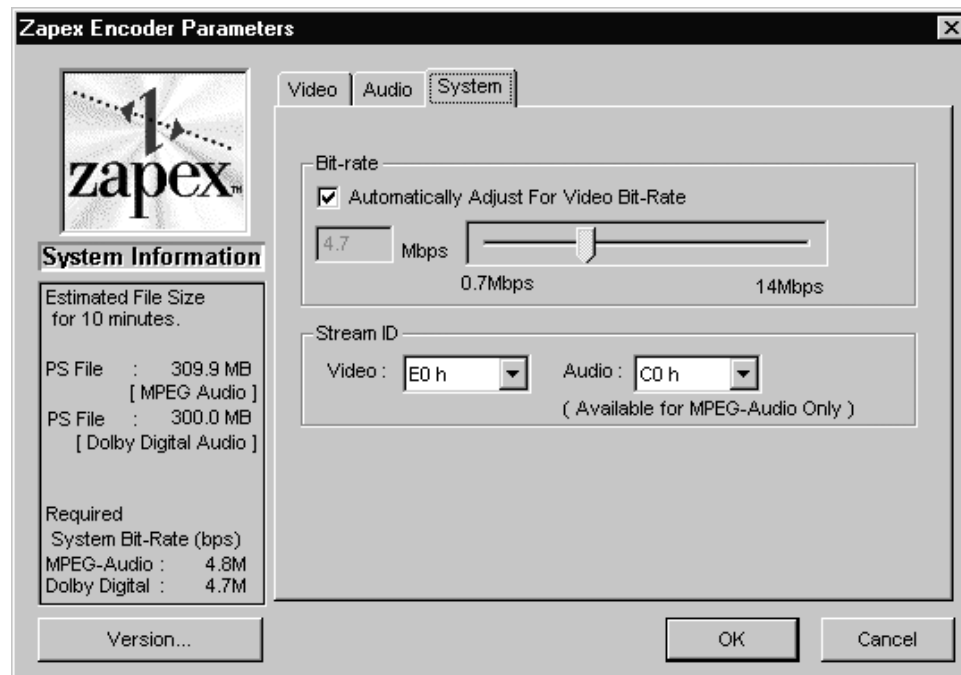
SYSTEM BIT-RATE

If the **Automatically Adjust For Video Bit-Rate** check box is selected, *ZP-Controller* calculates the suitable System Bit-rate automatically and the Bit-rate (**Mbps**) text box is not activated. The **Mbps** text box displays the calculated Bit-rate.

If the **Automatically Adjust For Video Bit-Rate** check box is not selected, Bit-rate (Mbps) text box becomes active and System Bit-rate can be specified using the slider. The **Mbps** text box displays the Bit-rate value.

> **If the System Bit-rate specified exceeds the minimum requirement, the System Information field on the Zapex Encoder Parameters window shows the <u>required</u> System Bit-rate.**

1.   Check the **Automatically Adjust For Video Bit-Rate** check box or manally set the Bit-rate using the slider and the Mbps text box.

> **STREAM ID**
> **Video drop-down list** — Stream ID for video stream is specified using this list. The range of Stream ID for video is between E0 hex and EF hex.
>
> **Audio drop-down list** — Stream ID for MEPG audio is specified using this list. The Stream ID range for MPEG audio is between C0 hex and DF hex. Stream ID for Dolby Digital is not available. The value is fixed at BD hex.

2.   Set the **Stream ID** from the **Video drop-down list** and **Video drop-down list**.

3.   When you are finished configuring the Zapex Encoder Parameters window – **Video**, **Audio**, and **System** tabs, click **OK** to accept the encoding configuration and return to General Settings.

5.5   APPLY THE CONFIGURATIONS AND BEGIN ENCODING

1. From the **Export Movie Settings** dialog box, click **OK** to accept and return to the **Export Movie** dialog box.

2. Click the **Save** button to begin encoding (Figure 5-9).

Figure 5-9. Export Movie Dialog Box
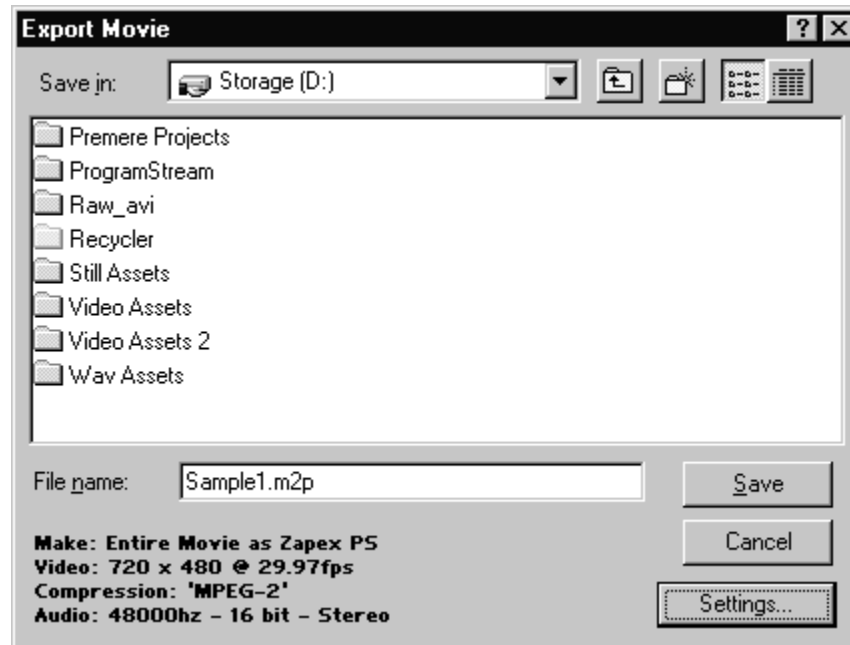
3. The Exporting progress indicator appears showing the encoding progress and estimated time remaining.

Your encoded output file(s) can be found in the path selected in "Selecting A Video Project," and "Configuring The Zapex Encoder Parameters Audio Tab."

C H A P T E R

6

BATCH ENCODING

This chapter contains the following information:

✓ **The Batch Encoding Window**
- Starting ZP-Scheduler
- *ZP-Scheduler* Menus
- Project List
- *ZP-Scheduler* Buttons
- Information

✓ **Adding and Importing Job Files**

✓ **Pausing the Batch Process**

✓ **Removing a Job File**

✓ **Moving Job Files in the Project List**

✓ **Saving a Project List**

✓ **Start Batch-Encoding**

✓ **Opening a Project List**

✓ **Editing Job Files**

6.0   BATCH ENCODING

This chapter provides information about the batch encoding process.

6.1   THE BATCH ENCODING WINDOW

Batch Encoding operates with a group of job files that are encoding sessions and their unique parameters. Sequentially encoding these job files (*.ZAP) in real-time is the function of the *ZP-Scheduler* application. Job files are imported into *ZP-Scheduler* and originate in the *ZP-Controller* section of the Zapex software. Figure 6-1 shows the *ZP-Scheduler* window.

6.1.1   STARTING *ZP-SCHEDULER*

STARTING *ZP-SCHEDULER*

1.   Click the Windows' **Start** button, click **Programs**, click **ZP-230** or **ZP-330**, and select *ZP-Scheduler*.

Figure 6-1. The *ZP-Scheduler* Window
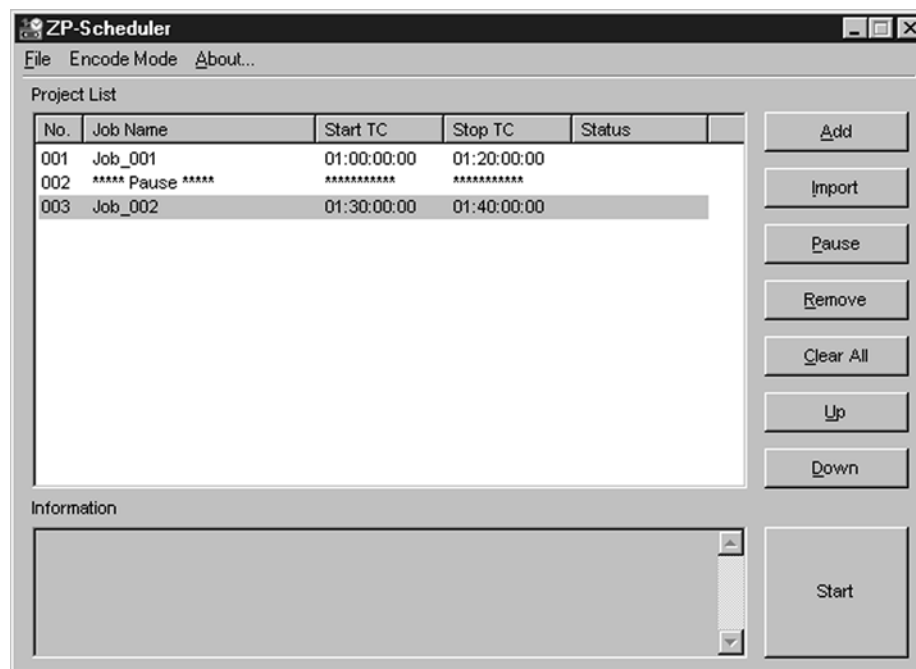
6.1.2   *ZP-SCHEDULER* MENUS

FILE
Saves and opens project files.

ENCODE MODE
Encode Mode specifies the starting position of the batch process.

ABOUT
The current software version is obtained from this menu.

6.1.3   PROJECT LIST

The Project List displays the job number (No.), file name (Job Name), start time-code (Start TC), stop time-code (Stop TC), and status of all the job files in the open project. Job file numbering determines the encoding sequence.

6.1.4   *ZP-SCHEDULER* BUTTONS

On the right side of the *ZP-Controller* window are eight buttons. Refer to Figure 6-1.

ADD
The **Add** button inserts a new Job File at the cursor location in the project file list.

IMPORT
Import appends the Project List by inserting a previously saved job file at the cursor location.

PAUSE
Pauses the batch encoding process.

REMOVE
The **Remove** button deletes the Job file from the Project List.

CLEAR ALL
Click **Clear All** to remove all the Job files listed in the Project List.

UP AND DOWN
The **Up** and **Down** buttons move the position of the selected Job file up or down in the Project list. To reposition the file, select the file and click **Up** or **Down**.

START
Starts the batch encoding process.

6.1.5   INFORMATION

The **Information** pane displays status messages during the batch encoding process. These messages can be saved in a log file. The Log File resides in the same directory as *ZP-Scheduler*.

6.2   ADDING AND IMPORTING JOB FILES

There are two ways to add a Job file to the Project List: Add and Import. Add creates a new Job file in the Project List. Import appends existing Job Files to the Project List. Added and Imported Job files are appended to the Project list at the cursor location.

ADDING A JOB FILE

The **Add** button opens *ZP-Controller*. The **Job name** text box, **Set Job** button, and **Cancel** button show up along the lower portion of the *ZP-Controller* window. The job file name is saved automatically when the **Set Job** button is selected. If you click **Cancel**, the job file is not added to the project list.

You can encode using the parameters as configured in the *ZP-Controller* window. Click the Encode button located at the bottom of the window.

---

1.   Click the **Add** button. This opens *ZP-Controller*.

2.   Set the encoding parameters.

Batch encoding only supports Time-Code Start/Stop control mode.

---

3.   Enter a job name in the **Job name** text box, click the **Set Job** button. Refer to Figure 6-2.

> The Job name text box always shows the default job file as *Job_nnn*.

Figure 6-2. ZP-Controller Window — Bottom Portion

IMPORTING A JOB FILE

1.   Click the Import button.

2.   Select the job file you wish to import from the Open File dialog box.

6.3   PAUSING THE BATCH PROCESS

The batch encoding process can be paused for content that spans multiple takes. This process is described below.

INSERTING A PAUSE

1.   Select the location in the Project List where the pause is to be inserted.

2.   Click the **Pause** button.

CONTINUING AFTER A PAUSE

When the batch process is paused, the following message is displayed:

"Batch encode is pausing. Do you begin the next job. YES or NO"

YES — continues to the next job.

NO — asks if you have finished. If you have not finished, you are prompted to begin the next job. If you are finished, you are returned to *ZP-Scheduler*.

6.4   REMOVING A JOB FILE

This function removes the selected job file from the project list.

REMOVING A JOB FILE

1.   Select the Job file that is to be deleted from the Project List.

2.   Click the **Remove** button.

6.5   MOVING JOB FILES IN THE PROJECT LIST

Job files are sequentially real-time encoded in the order that they appear in the Project List. Job files can be arranged in any order.

6.6   SAVING A PROJECT LIST

You can save a batch-encoding session as a file. All of the job files and the sequence is saved. To save the Project List select **Save** from the **File** menu.

Job files are temporary files until the project is saved, and are saved in the same directory.

To eliminate the confusion of project specific job names and overwritten job files, when saving a project, it is best to save each project to its own project directory.

6.7   START BATCH-ENCODING

To start Batch-Encoding click *ZP-Scheduler's* **Start** button. The **Start** button opens the Real-Time Encoding window (Figure 6-3) and automatically starts sequential batch encoding using the job files that are currently in the project list.

To stop batch encoding, click the **Stop** button in the Real-Time Encoding window.

Figure 6-3. Real-Time Encoding Window
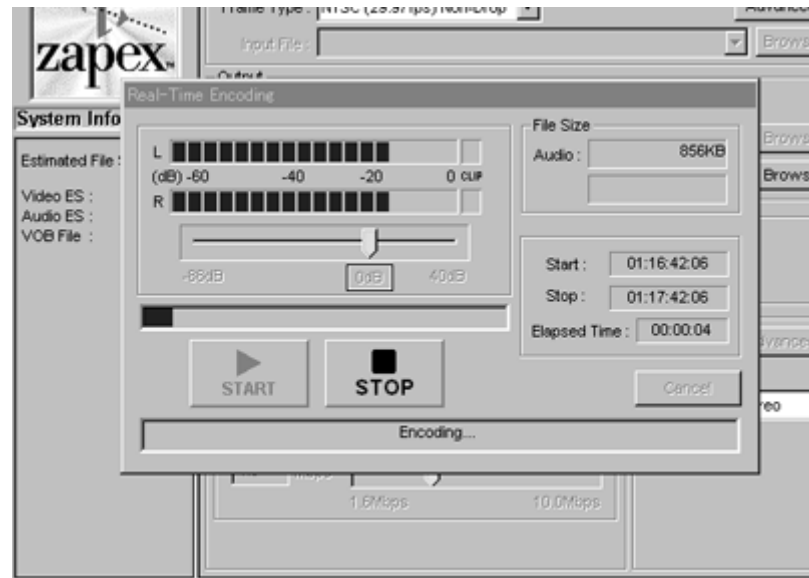
6.8   OPENING A PROJECT LIST

You can open a previously saved project list. To open a project list, select **Open** from the **File** menu. When a project list is opened a list of all job files in the project are displayed. The job files can be edited or you can start encoding.

6.9   EDITING JOB FILES

After a project has been saved, the job files can be modified. Open the project file as explained above. Double-click on the job you want to modify. Make your modifications and click the Set Job button.

When a job file is double-clicked in the project list, *ZP-Controller* re-appears. Any time the *ZP-Controller* window appears, you can reconfigure any of the parameters. Clicking **Set Job** saves the modifications.

C H A P T E R

7

USING *ZP-DECKER*

This chapter contains the following information:

✓ **ZP-Decker**
✓ **The *ZP-Decker* Window**
✓ **Starting *ZP-Decker***
✓ **Drag and Drop Features**
✓ **Main Menu**
- File Menu
- Time-Code Menu
- Options Menu

7.0   ZP-DECKER

ZP-Decker is a tool that remotely controls a VTR from your computer. It provides all the controls that are common to a VTR. *ZP-Decker* is installed when the **VTR Control Driver** option is selected during the software installation (see Chapter 2, "Connecting the Media Cable and VTR Control Cable" and "Software Installation").

7.1   THE *ZP-DECKER* WINDOW

Figure 7-1 shows the *ZP-Decker* window with descriptions of the control functions.

Figure 7-1. *ZP-Decker* Window
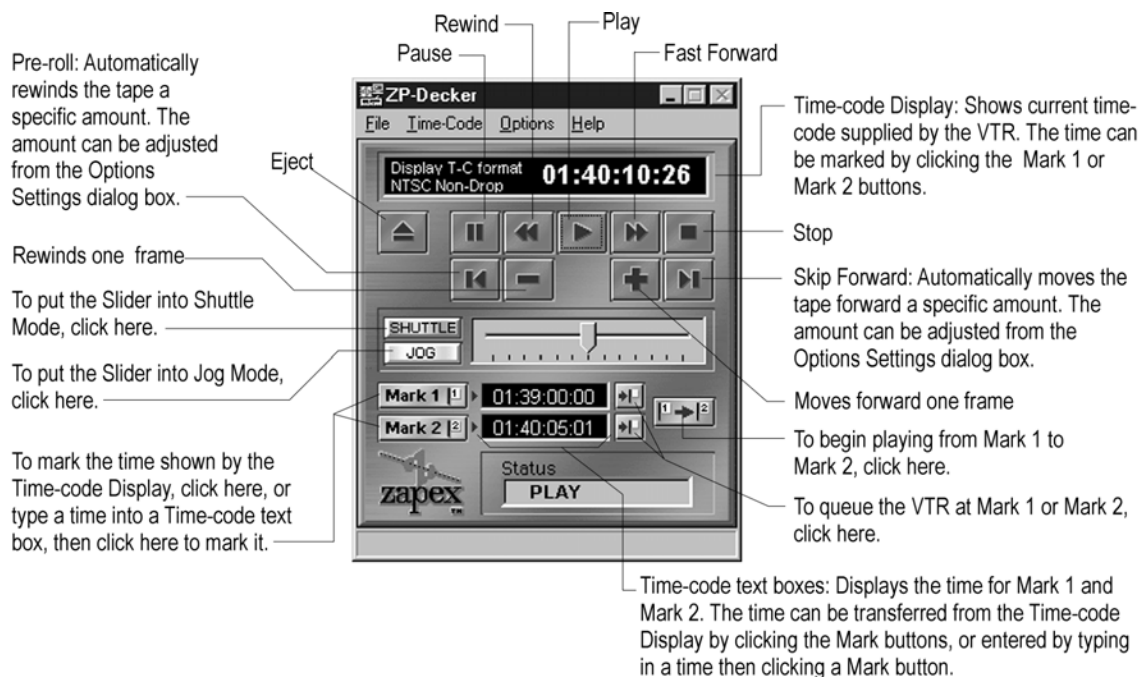
7.2   STARTING *ZP-DECKER*

ZP-Decker automatically appears when the *ZP-Controller* is started.

7.3   DRAG AND DROP FEATURES

Using a mouse, the time seen in the **Time-Code Display**, and the **Mark 1** and **Mark 2 Time Code Display** can be dragged to the **Start** and **Stop** text boxes in *ZP-Controller's* main window, and to the **Time-Code Start** and **Time-Code/Entry Points** text boxes in the **Advanced Video Settings** dialog box.

7.4   MAIN MENU

The *ZP-Decker* has a **File**, **Time-Code**, **Options**, and **Help** menu.

7.4.1   FILE MENU

Use the **File** menu to exit *ZP-Decker*.

7.4.2   TIME-CODE MENU

Use the **Time-Code** menu for selecting which time-code format is being supplied by the VTR. NTSC Non-drop, NTSC Drop, and PAL can be selected.

These options are not available while the *ZP-Controller* application is running.

7.4.3   OPTIONS MENU

Use the **Options** menu for opening the **Optional Settings** dialog box or for displaying context sensitive hints.

HINTS
When **Hints** is selected, hover the mouse pointer above a control and help information about that control appears.

OPTIONAL SETTINGS DIALOG BOX

Use the **Optional Settings** dialog box for configuring **Skip** and **Pre-roll**. The middle mouse button can be configured to toggle from JOG to SHUTTLE Mode. Refer to Figure 7-2.

Figure 7-2. Optional Settings Dialog Box
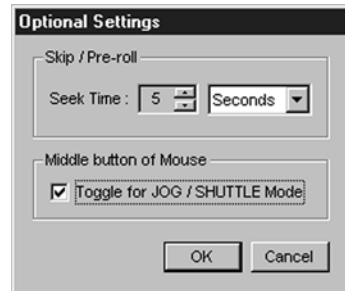
SKIP/PRE-ROLL

Use the Seek Time drop-down combo boxes to select the seek time in frames, seconds or minutes.

MIDDLE BUTTON OF MOUSE

A mouse or pointing device equipped with a middle button can be defined to toggle between JOG and SHUTTLE mode. Select the check box to define the middle mouse button toggle JOG/SHUTTLE mode. Refer to Figure 7-2.

A P P E N D I X

A

ADVANCED VIDEO ENCODING PARAMETERS

This appendix contains the following information:

✓ **Advanced Button (Input)**

- S-Video/Component Video Input
- Setup Level
- Video Type

✓ **Advanced Button (Video)**

- Generate Time-Code
- Time-Code Format
- Start Time-Code
- Softness Filter
- NTSC Start Line
- CCIR 601 Clipping
- Closed GOP
- Scene Change Detection (SCD)
- Splicing Mode
- Aspect Ratio Flag
- Entry Points

A.0   ADVANCED VIDEO ENCODING PARAMETERS

The *ZP-Controller* main window displays **Advanced** buttons for configuring more complicated encoding parameters. This appendix provides information about parameters available through these buttons. Some Advanced buttons may not be available for your encoder model.

A.1   ADVANCED BUTTON (INPUT)

The **Advanced [Input]** button feature is only available with the CD, CA, and SA encoder models. This button opens the **Advanced Input** dialog box. Use it for configuring the setup values of the source video.

Figure A-1. The Advanced Input Dialog Box

A.1.1   S-VIDEO/COMPONENT VIDEO INPUT

This toggle button is only available on Zapex CA encoder models. From the
S-Video/Component toggle buttons, select either **S-Video** or **Component** Video Input.

A.1.2   SETUP LEVEL

The VTR sends the source video that is received by the encoder. One of the video signals
is the luminance/chrominance signal—the component that contains the video information
to be encoded.

The intensity of the luminance/chrominance component is measured on a scale that is
from black to white. Some videos may have some black removed to lighten the overall
video image, but some videos may not. Videos produced in the United States commonly
remove the first 7.5% of the black end of the scale, while in Japan it is more common to
retain the entire black to white scale.

SETUP LEVELS

| VALUE	DESCRIPTION
7.5	Source videos having the first 7.5% of the black end of the luminance/chrominance scale clipped off.
0	Source videos using the entire intensity scale (0% removed).

A.1.3   VIDEO TYPE

This drop-down list appears for Zapex CA and CD encoder models only. There are two
standards for component video format. One is Beta, which was defined by Sony. The
other one is MII, which was defined by Matsushita/JVC. Make sure that the VTR sends
Beta or MII, and then select the appropriate video type accordingly from the **Video Type**
drop-down list.

A.2   ADVANCED BUTTON (VIDEO)

The **Advanced [Video]** button opens the **Advanced Video** dialog box (Figure A-2). Use this feature to configure specific MPEG-2 encoding parameters. Each parameter is described below.

Figure A-2. Advanced Video Dialog Box
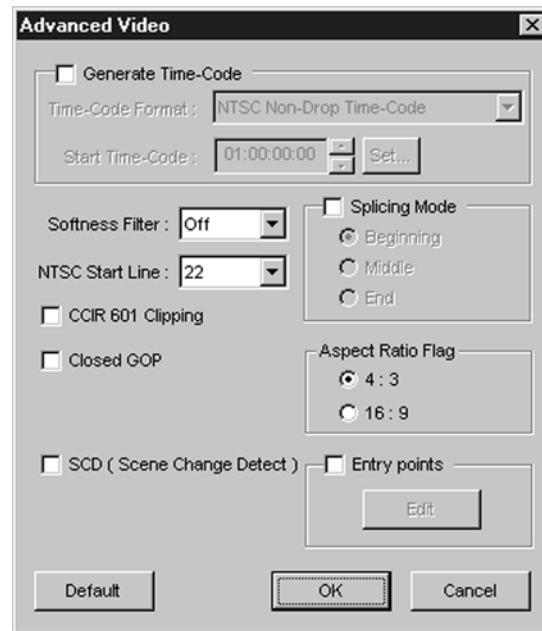
A.2.1   GENERATE TIME-CODE

This check box activates the Start Time-Code parameter and the Time-Code Format parameter. Use this check box to embed specific time-code into the stream. If it is not selected, the time-code supplied by the VTR is embedded. Whenever manual start is selected as the Start/Stop parameter or AVI/WAV File is selected as the Input Frame Type, generate time-code is automatically selected (set).

A.2.2   TIME-CODE FORMAT

This drop-down list allows you to select the time-code format to be used on the embedded time-code. This configures the time-code to meet the NTSC drop frame type, 29.97 fps, NTSC Non-drop frame type, 30 fps, or PAL, 25 fps.

A.2.3   START TIME-CODE

The **Start Time-Code** text box allows you to enter the starting time-code that is incorporated into the encoded stream. Enter time-code using the HH:MM:SS:FF (hour:minute:second:frame) format.

A.2.4   SOFTNESS FILTER

This is a filter that can be incrementally selected for reducing the sharpness of the video image: **Off**, **Weak**, **Medium**, and **Strong**, and **Adaptive**. If **Adaptive** is selected, the Zapex encoder dynamically changes the type of softness filter per video frame by analyzing the characteristic of source video image.

A.2.5   NTSC START LINE

This control is available only when the *ZP-Controller* is in NTSC mode. An NTSC frame contains two fields (top and bottom) and 525 video lines. The fields contain the actual video content, but are separated by 22 unused lines (not encoded). Both fields provide 486 lines of video content.

The encoder automatically crops the top and bottom of the video fields so that the 480 line vertical resolution for MPEG-2 video is met.

If **21** is selected, the encoded portion of each frame is lines 21–523, **22** is 22–524, and **23** is 23–525. Lines 262–284 that separate the fields are not encoded.

A.2.6   CCIR 601 CLIPPING

Video signals consist of luminance and chrominance that have 254 different levels making a scale from 1 to 254. The CCIR601 uses the luminance range from 16 (0% black level) to 235 (100% white level). The chrominance range is from 16–240. However, some video source has less than 0% black level and/or more than 100% white level. Use this check box for clipping luminance and chrominance of video source to comply with CCIR601 specification.

A.2.7   CLOSED GOP

Use this check box to encode an MPEG-2 video stream that has a closed GOP structure. If this check box is selected, the final picture data of a GOP (group of pictures) and the beginning picture data of the GOP that follows do not share the same video data.

A.2.8   SCENE CHANGE DETECTION (SCD)

An encoded video stream contains Group of Pictures (GOP) that meets the MPEG-2 standard. If Scene Change Detection (SCD) is selected, the Zapex encoder automatically detects a scene change and starts a new GOP that is a closed GOP. Starting a new GOP at the scene change improves video quality.

A.2.9   SPLICING MODE

Select this check box to activate the **Beginning**, **Middle**, and **End** buttons. Use splicing mode when multiple video tapes must be encoded into a single stream or when a stream must be merged with other streams.

BEGINNING MODE

This mode encodes an MPEG-2 video stream that is spliced later to another stream, and is always located at the beginning of the completed video.

MIDDLE MODE

This mode encodes an MPEG-2 video stream that is to be spliced into another stream, and is always located at the middle of the completed video.

END MODE

This mode encodes an MPEG-2 video stream that that is to be spliced to another stream, and is never located at the beginning or middle of the completed video.

Splicing mode works with Elementary Streams only.

Splicing mode does not encode the last frame of the Beginning and the Middle Modes. To concatenate the spliced files so that they will link properly, using the DOS "copy" command, the Middle Start Time-Code will be the same entry as the Beginning Stop Time-Code. In addition, the End Start Time-Code will be the same entry as the Middle Stop Time-Code.

If different tapes (with non-sequential time-codes) are used for the source input video, then the option to Generate Time-Code in the Advanced Video dialog box should be selected. This will ensure that the time-code for the final output video stream (the concatenated files) will be seamless.

SPLICING MODE EXAMPLE

First Tape Time-Code: 01:00:00:00 to 01:30:00:00

Second tape Time-Code: 01:30:00:00 to 02:00:00:00

Third tape Time-Code: 02:00:00:00 to 02:30:00:00

1.   Select **Beginning** in Splicing Mode

2.   Enter the first tape's timecode in the **Start/Stop** window

Start Time-Code: 01:00:00:00
Stop Time-Code: 01:30:00:00

3.   Start the encoding process

4.   Once first tape encode is complete, switch to second tape

5.   Select **Middle** in Splicing Mode

6.   Enter the second's tape's timecode in the **Start/Stop** window

Start Time-Code: 01:30:00:00
Stop Time-Code: 02:00:00:00

7.   Start the encoding process

8.   Once second tape encode is complete, switch to third tape

9.   Select **End** in Splicing Mode

10.   Enter the third's tape's timecode in the **Start/Stop** window

Start Time-Code: 02:00:00:00
Stop Time-Code: 02:30:00:00

11.   Start the encoding process

12.   Once third tape encode is complete, concatenate files into one file with a DOS level "copy" command. Execute the "copy" command from the directory where the video and audio files are stored

```
D:\video>  copy  /b  tape1.m2v + tape2.m2v + tape3.m2v  all_tapes.m2v
D:\audio>  copy  /b  tape1.ac3 + tape2. ac3 + tape3. ac3  all_tapes. ac3
```
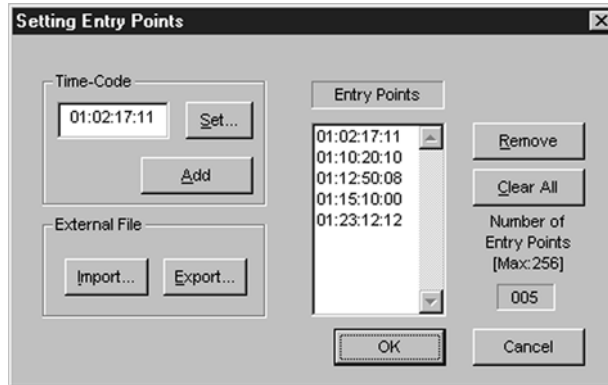
The concatenated files then may be played as one file using a standard decoder.

A.2.10   ASPECT RATIO FLAG

Use this control to set aspect ratio information in encoded video stream. 16:9 can be used to encode a letter-boxed source.

A.2.11   ENTRY POINTS

Click **Edit** to open the **Setting Entry Points** dialog box.

An encoded video stream contains Group of Pictures (GOP) that meets the MPEG-2 standard. In this user's guide, an entry point is defined as the beginning of a GOP.

Entry points can be used to prepare chapter settings during the DVD authoring process with a maximum of 256 entry points. Because entry points start a new GOP, setting an entry point at the beginning of a scene change can improve video quality. This involves examining the content.

TIME-CODE

Use the **Time-Code** text box for entering a specific time-code for an entry point. Time-Code can be typed in using the HH:MM:SS:FF (hour:minute:second:frame) format or dragged in from *ZP-Decker*.

SET

Opens the **Set Time-Code** dialog box. It provides an alternative, and sometimes faster, method for entering and selecting time-codes.
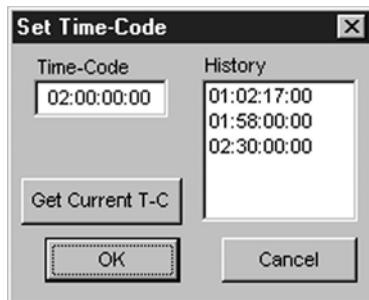
SET TIME-CODE SELECTION OPTIONS

OPTION	DESCRIPTION
Time-Code	Displays the time-code currently selected.
Get Current T-C	If a VTR is connected to the encoder and the **VTR Control** check box is selected in the **Properties** dialog box (from the Options menu), use this button for entering the current time-code (supplied by the VTR) into the **Time-Code** text box.
History	Stores previously used time-codes. As a time saver, double-click a time from this list to enter it into the **Time-Code** text box.
OK	Click this button to accept the time displayed in the **Time-Code** text box.

ADD
Click this button to transfer a time-code to the Entry Points list.

EXTERNAL FILE
This feature allows you to import and export a text file that lists all entry points.

IMPORT
Using a word processor, you can create a text file that lists all the entry points. The format is HH:MM:SS:FF where each entry point is on a different line. Click this button to select that file.

EXPORT
Click this button to save your entry points as a text file. The format is HH:MM:SS:FF where each entry point is on a different line.

ENTRY POINTS
Shows a list of all the entry points.

REMOVE
Select a time-code from the Entry Points list then click this button to remove it.

CLEAR ALL
Click this button to delete all entry points from the Entry Points list.

OK
Click to apply your entry point list.

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B

DOLBY® DIGITAL ENCODING PARAMETERS

This appendix contains the following information:

✓ **ZP-330 Dolby® Digital Dialog Box**
✓ **Audio Service Configuration Tab**

- Audio Coding Mode
- Channel Assignment
- Bit Stream Mode
- Bit-Rate

✓ **Processing Tab**

- Dynamic Range Compression Group Box
- Preprocessing Group Box

✓ **Bit Stream Information Tab**

- Dolby® Surround Mode
- Copyright Bit
- Original Bit Stream
- Audio Production Information Group Box
- Dialog Normalization

B.0   DOLBY® DIGITAL ENCODING PARAMETERS

This appendix provides information about the coding parameters required with Dolby® Digital audio. Only the ZP-330 encoder models can encode Dolby® Digital audio.

B.1   ZP-330 DOLBY® DIGITAL DIALOG BOX

The **Dolby® Digital Parameters** dialog box is common to both *ZP-Controller* and the Adobe® Premiere® Plug-in. To view the Dolby® Digital parameters in the *ZP-Controller* main window, click the **Advanced** [Audio] button to open the **Dolby® Digital Parameters** dialog box. To view the Dolby® Digital parameters in Adobe® Premiere®, select **Advanced Settings** under **General Settings** in the **Export Movie Settings** dialog box, click the **Audio** tab to bring it to the front. Click the **Dolby® Digital** button to open the **Dolby® Digital Parameters** dialog box.

B.2   AUDIO SERVICE CONFIGURATION TAB

Figure B-1 shows a detail of the **Audio Service Configuration** tab.

Figure B-1. Dolby® Digital Parameters – Audio Service Configuration Tab
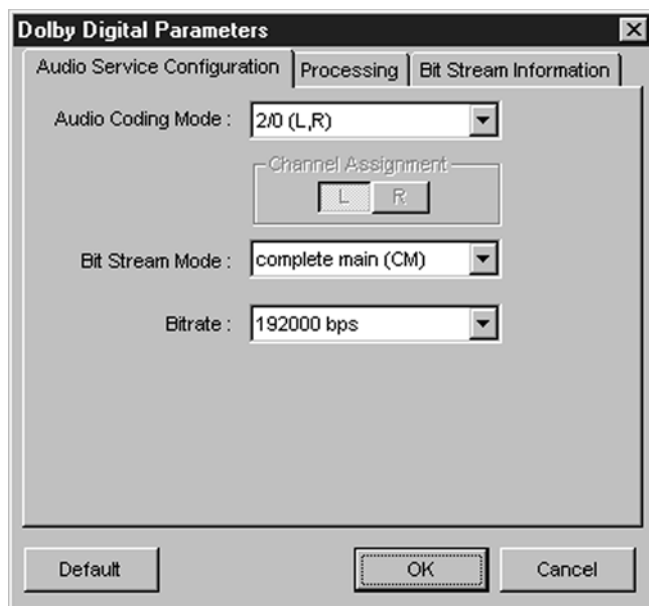
B.2.1   AUDIO CODING MODE

The **Audio Coding Mode** drop-down list configures the number of audio channels to encode.

AUDIO CODE SELECTION OPTIONS

OPTION	DESCRIPTION
1/0 Mode	Encodes an audio source into a Dolby® Digital audio containing a monaural center channel.
2/0 Mode	Encodes an audio source into a Dolby® Digital audio containing left and right channels.

B.2.2   CHANNEL ASSIGNMENT

Selects either the Left (L) or Right (R) channel to be encoded for 1/0 Audio Coding Mode. Channel Assignment is disabled when the Audio Coding Mode is 2/0.

B.2.3   BIT STREAM MODE

Use this parameter to select the type of service that the Dolby Digital (AC-3) bit stream conveys. The service types are *Complete Main (CM), Music and Effects (ME), Visually Impaired (VI), Hearing Impaired (HI), Dialog (D), Commentary (C), Emergency (E), and Voice Over (VO)/Karaoke*. Most streams use *Complete Main.* For karaoke, use *Voice Over (VO)/Karaoke.*

B.2.4   BIT-RATE

Use this parameter to select a bit-rate to encode. The table shows what bit-rates can be used for specific audio coding modes.
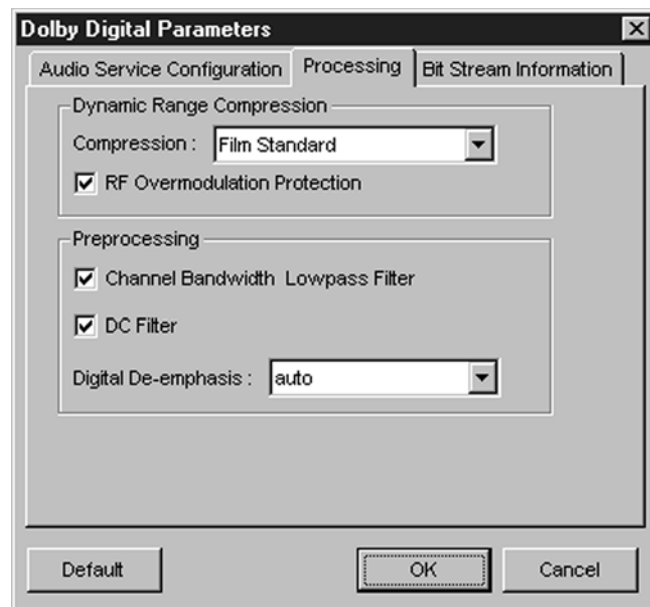
BIT-RATE RANGES

AUDIO CODING MODE	BIT-RATE RANGE
1/0 (C)	56000 to 640000 bps
2/0 (L, R)	96000 to 640000 bps

B.3 PROCESSING TAB

Figure B-2 shows a detail of the Processing tab.

Figure B-2. Dolby® Digital Parameters – Processing Tab

The choices in this tab allow you to adjust the dynamic range compression and preprocessing for the Dolby® Digital audio stream.

B.3.1 DYNAMIC RANGE COMPRESSION GROUP BOX

COMPRESSION

Use this parameter to select the type of dynamic range compression for your Dolby® Digital (AC-3) bit stream. The types of compression that can be selected are *None, Film Standard, Film Light, Music Standard, Music Light, Speech.*

RF OVERMODULATION PROTECTION

Use this parameter to prevent over modulation if heavy compression is needed. Heavy compression is targeted for listening situations such as movie delivery to a hotel room, or to an airline seat.

A Dolby® Digital (AC-3) decoder uses the dynamic range compression and RF over-modulation protection information to reduce the audio program's dynamic range unless the feature is disabled on the decoder by the end user.

B.3.2   PREPROCESSING GROUP BOX

CHANNEL BANDWIDTH LOW-PASS FILTER

Use this parameter to apply a low-pass filter to the main input channels. The filter cut-off frequency is automatically set.

Since the low-pass filter reduced high frequency signal information, the reduction in signal information increases encoding efficiency, achieving better sound quality at lower bit-rates.

DC FILTER

Use this parameter to apply a DC filter to all input channels. Since the removal of a DC component in source input signal increases the encoding efficiency, the quality of the sound increases.

DIGITAL DE-EMPHASIS

Use this parameter to apply a digital de-emphasis filter to all input channels. If the source audio stream is emphasized, it should be de-emphasized before it is enclosed.

If *Auto* is selected, the Zapex encoder automatically detects whether or not the source audio stream is emphasized. If the source audio stream is emphasized, the encoder automatically activates the digital de-emphasis filter (applicable to DD and CD encoder models only).

B.4   BIT STREAM INFORMATION TAB

Figure B-3 shows a detail of the Bit Stream Information tab.

Figure B-3. Dolby® Digital Parameters – Bit Stream Information Tab
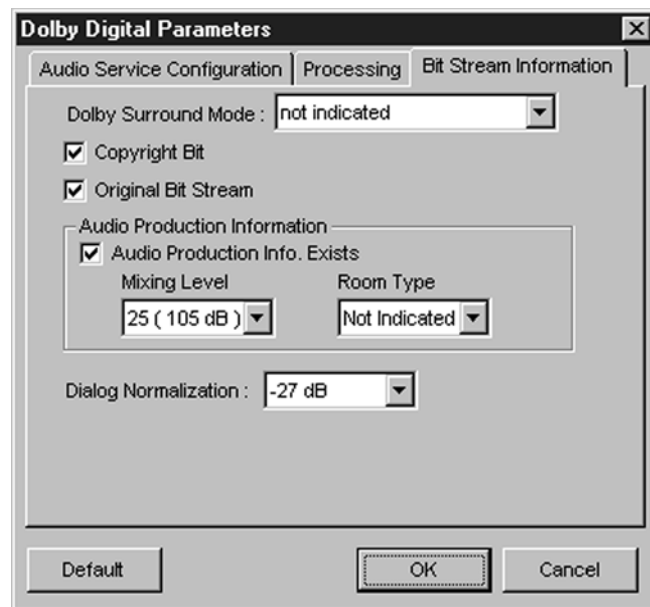
Controls in this tab allow you to add data to specific information fields of the Dolby® Digital audio stream.

B.4.1   DOLBY® SURROUND MODE

Use this parameter to indicate whether or not the Dolby® Digital (AC-3) bit stream is conveying a Dolby® Surround encoded program. This parameter is available only using Audio Coding Mode 2/0. The parameter can be set to *Dolby Surround encoded, Not Dolby Surround encoded,* or *not indicated*

Dolby® Surround Mode information is not used by Dolby® Digital decoders, but may be used by Dolby® Surround decoders.

B.4.2 COPYRIGHT BIT

Use this parameter to copyright protect the Dolby® Digital (AC-3) bit stream.

B.4.3 ORIGINAL BIT STREAM

Use this parameter to flag the Dolby® Digital (AC-3) bit steam as original material.

B.4.4 AUDIO PRODUCTION INFORMATION GROUP BOX

This group of parameters determines whether or not the Dolby® Digital (AC-3) bit stream contains *mixing level* and *room type* information. Select the **Audio Production Info. Exists** check box to activate the parameters.

MIXING LEVEL

Use this parameter to select the acoustic sound pressure level of the dialog during final audio mixing. Values from 0 *(80 dB)* to 31 *(111 dB)* can be selected.

ROOM TYPE

Use this parameter to select the type and calibration of the mixing room used for the final audio mixing. Values of *Not Indicated*, *Large Room*, and *Small Room* can be selected.

If the source audio is to be encoded for a movie theater, choose *Large Room.* If the source audio is to be encoded for consumer equipment, choose *Small Room.* If the encoding program is unknown, chose *not indicated.* The *Room Type* is not typically taken into account in Dolby® Digital (AC-3) decoders, but may be used by other audio reproduction equipment.

B.4.5 DIALOG NORMALIZATION

Use this parameter to select the average dialog sound pressure level. Values from *–1 dB to –31 dB* can be selected

Be aware that Dolby® Digital (AC-3).decoders automatically adjust the average dialog level to –31 dB. For example, if –27 dB is used for dialog normalization, the sound pressure level of the dialog will be reduced by 4 dB by the decoder. If 0 dB is used, the sound pressure level of the dialog is reduced by 31 dB by the decoder. If –31 dB is used, the sound pressure level of the dialog is not be reduced by the decoder.

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A P P E N D I X

C
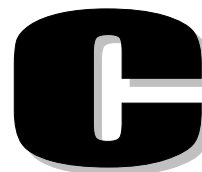
MPEG Audio Encoding Parameters

This appendix contains the following information:

- ✓ **Basic Parameter Tab**
- ✓ **Processing Tab**
- ✓ **Header Information**

C.0   MPEG AUDIO ENCODING PARAMETERS

This appendix describes MPEG Audio Encoding procedures. These parameters are set through the **MPEG Audio Parameters** dialog box, which is common to both the *ZP-Controller* and the Adobe® Premiere® Plug-in. To view the MPEG Audio parameters in the *ZP-Controller* main window, click the **Advanced [Audio]** button.

To view the MPEG Audio parameters in Adobe® Premiere®, select **Advanced Settings** under **General Settings** in the **Export Movie Settings** dialog box, click the **Audio** tab to bring it to the front, then click the **MPEG Audio** button to open the **MPEG Audio Parameters** dialog box.

C.1   BASIC PARAMETER TAB

The **Basic Parameter** tab is used to adjust the most fundamental MPEG encoding parameters. Figure C-1 shows a detail of the **MPEG Audio Parameters** dialog box with the **Basic Parameter** tab selected.

Figure C-1. MPEG Audio Parameters Dialog Box – Basic Parameter Tab
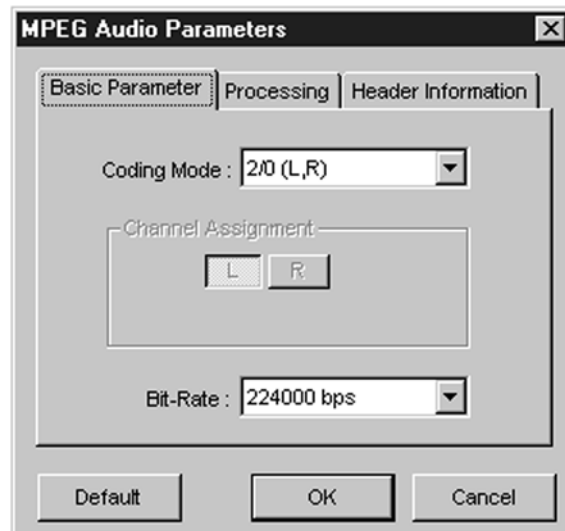
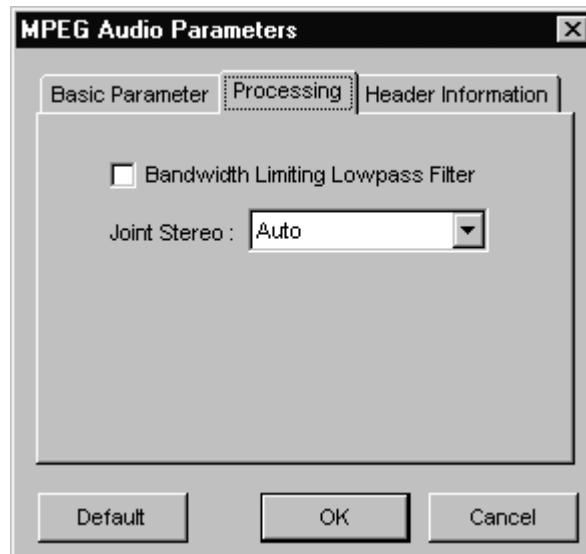The following options table describes the items that can be selected.

BASIC PARAMETER TAB SELECTION OPTIONS

OPTION	DESCRIPTION
Coding Mode	Use this parameter to configure the channel format and the number of audio channels to encode. **Mode** **Description** 1/0 single (C) Encodes a center monaural channel 1+1 dual (Ch1, Ch2) Encodes Ch1 and Ch2 2/0 stereo (L, R) Encodes left and right channels
Channel Assignment	Selects either the Left (L) or Right (R) channel to be encoded for 1/0 Coding Mode. Select either the Left (L) or Right (R) channel for Ch1 for 1+1 Coding Mode. The ZP-Controller automatically assigns the other channel to Ch2. Channel Assignment is disabled when the Coding Mode is 2/0.
Bit-Rate	Use this parameter to select a bit-rate for the MPEG Audio bit stream. The bit-rates available for specific audio coding modes are: **Mode** **Bit-Rate Range** 1/0 single (C) 56000–192300 bps 1+1 Dual (L/Ch1, R/Ch2) 112300–384000 bps 2/0 stereo (L, R) 112300–384000 bps

C.2   PROCESSING TAB

Use the processing parameters to optimize the sound qualities of the MPEG audio encoding. Figure C-2 shows a detail of the **Processing** tab.

Figure C-2. Processing Tab

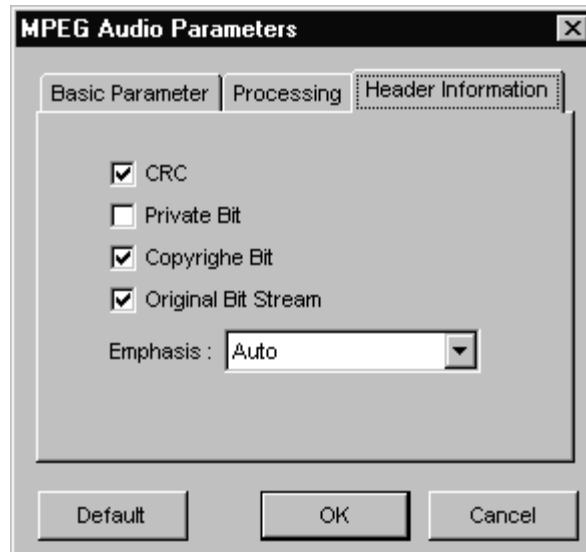The following options table describes the items that can be selected.

PROCESSING TAB SELECTION OPTIONS

OPTION	DESCRIPTION
Joint Stereo	Use this parameter to activate the dynamic joint stereo coding algorithm.
	Joint Stereo coding utilizes the cross-correlation between left and right channel data to provide better sound quality. Higher cross-correlation increases sound quality. The increase in sound quality by Joint Stereo coding depends on how much left and right channel data are correlated. In general, it provides better sound quality for low bit-rates.
	Three modes can be used:
	▪ **Auto** The encoder dynamically activates or deactivates Joint Stereo coding depending on the characteristics of source input signal, sampling frequency, bit-rate, and so on
	▪ **On** Joint Stereo coding is always activated
	▪ **Off** Joint Stereo coding is always deactivated
Bandwidth Limiting Low-Pass Filter	Use this parameter to apply a bandwidth limiting low-pass filter to the source input signal. The filter cut-off frequency is automatically set depending on the sampling frequency, bit-rate, and so on.
	At higher bit-rates (greater than 80,000 bps per channel for 44.1 kHz and 48 kHz), the filter is not activated. At 32 kHz, the filter is never activated.
	Since the low-pass filter reduces high frequency signal information, the reduction in signal information increases encoding efficiency, achieving better sound quality at lower bit-rates.

C.3   HEADER INFORMATION TAB

Use the header information parameters to add data to specific information to MPEG Audio bit stream fields. Figure C-3 shows a detail of the **Header Information** tab.

Figure C-3. Header Information Tab

The following options table describes the items that can be selected.

HEADER INFORMATION TAB SELECTION OPTIONS

OPTION	DESCRIPTION
CRC	Use this parameter to activate the CRC check. If selected, CRC check word is generated and buried into the MPEG Audio bit stream
Private Bit	This parameter sets the private bit value within the MPEG Audio bit stream. ■ If selected, a bit of value "1" is set. ■ If not selected, a bit of value "0" is set.
Copyright	Use this parameter to copyright protect the MPEG Audio bit stream.
Original Bit Stream	Use this parameter to flag the MPEG Audio bit stream as original material.
Emphasis	Use this parameter to select the emphasis type of the source input signal. If **Auto** is selected, the encoder automatically detects the emphasis type of the source input signal (applicable to DD and CD encoder models only). Only three emphasis types are supported: ■ None ■ 50/15 microseconds ■ CCITT J.17

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A P P E N D I X

D

ADVANCED SYSTEM PARAMETERS

This appendix contains the following information:

✓ **Advanced System Parameters – PS Output Format**
- System Bit-rate
- Stream ID

✓ **Advanced System Parameters – TS Output Format**
- System Bit-rate
- Program ID(PID)
- Audio Selection
- PAT/PMT Interval

D.0 ADVANCED SYSTEM PARAMETERS

This appendix describes advanced system parameters for both PS and TS output formats.

D.1 ADVANCED SYSTEM PARAMETERS – PS OUTPUT FORMAT

The **Advanced** button becomes active in the **Output** group box when either **PS** or **TS** output format is selected from the drop down list. This button opens the System Parameters window.

Figure D-1 shows the System Parameters window when PS Output Format is selected.

Figure D-1. Advanced System Parameters — PS Output Format
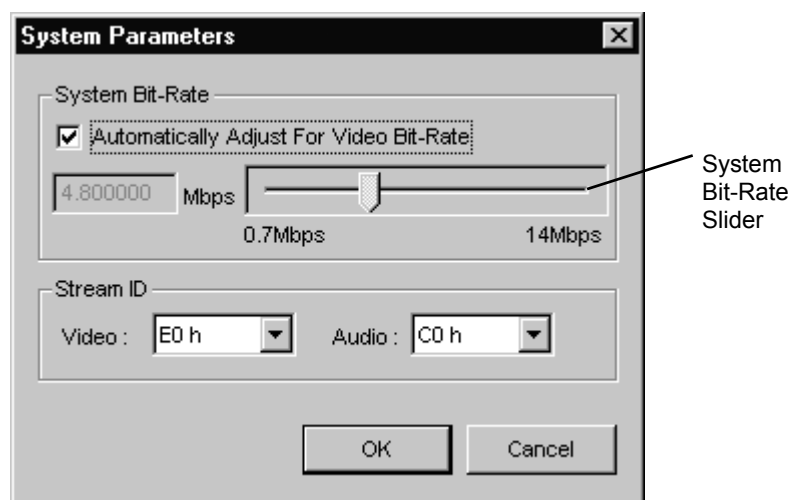
D.1.1 SYSTEM BIT-RATE

If the **Automatically Adjust For Video Bit-Rate** check box is selected, *ZP-Controller* calculates the suitable System Bit-rate automatically and the Bit-rate (**Mbps**) text box is not activated. The **Mbps** text box displays the calculated Bit-rate.

If the **Automatically Adjust For Video Bit-Rate** check box is not selected, Bit-rate (Mbps) text box becomes active and System Bit-rate can be specified using the slider or in the text box. The **Mbps** text box displays the Bit-rate value. One of two conditions may occur if the bit-rate is changed using this method. The System Bit-Rate will either exceed the Specified System Bit-rate or be under the Specified System Bit-rate. The results of these two selections are explained in the following paragraphs.
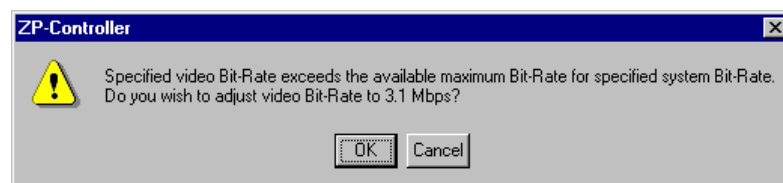
!

If the System Bit-rate specified with the slider <u>exceeds</u> the (calculated) Required Bit-Rate, then the System Bit-rate displayed in the System Information field of the *ZP-Controller* main window will be in red text (see Figure D-2).

Figure D-2. *ZP-Controller* **Window – System Bit-Rate Exceeded**
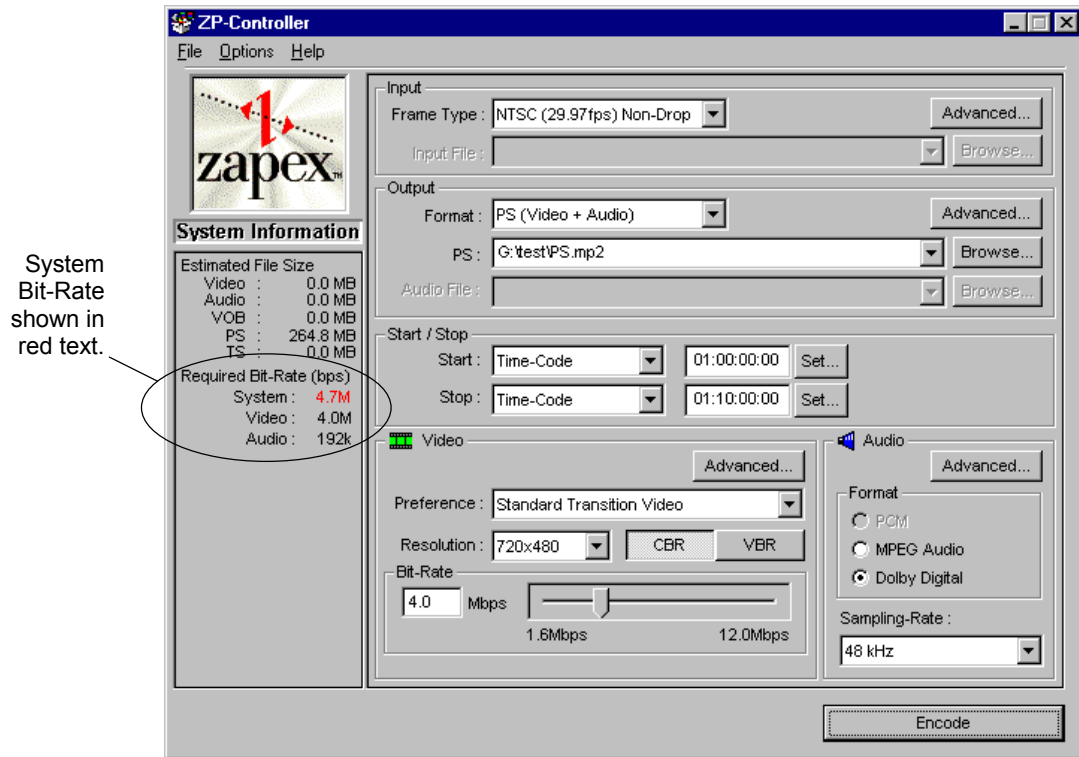
System Bit-Rate shown in red text.

If the **Encode** button is pressed, a warning message will appear requesting the operator if they would like to adjust the video bit-rate?

If the **OK** button is pressed, the bit-rate will be adjusted by the software and the encode process will continue. Cancel will return the operator to the previous screen.

!

If the System Bit-rate specified with the slider is <u>below</u> the (calculated) Required Bit-Rate, then padding bits will be added to the output stream.

Padding bits consist of null bits (zeros) that have been added to the output encode Program Stream to keep the stream compliant with MPEG-2 standards.

!

Warning – Certain decoders cannot accept or decode the added padding bits with satisfactory results. When this occurs, the decoder may display distorted video that encounters erratic motion and the video may seem unstable.

D.1.2   STREAM ID

Video drop-down list — Stream ID for video stream is specified using this list. The range of Stream ID for video is between E0 hex and EF hex.

Audio drop-down list — Stream ID for MEPG audio is specified using this list. The Stream ID range for MPEG audio is between C0 hex and DF hex. Stream ID for Dolby Digital is not selectable. The value is fixed at BD hex.

# D.2   ADVANCED SYSTEM PARAMETERS – TS OUTPUT FORMAT

The **Advanced** button becomes active in the **Output** group box when either **PS** or **TS** output format is selected from the drop down list. This button opens the System Parameters window.

Figure D-3 shows the System Parameters window when TS Output Format is selected.

Figure D-3. Advanced System Parameters Windows — TS Output Format

MULTIPLE AUDIO (AUDIO1 AND AUDIO2) OUTPUT   **SINGLE AUDIO (AUDIO1) OUTPUT**
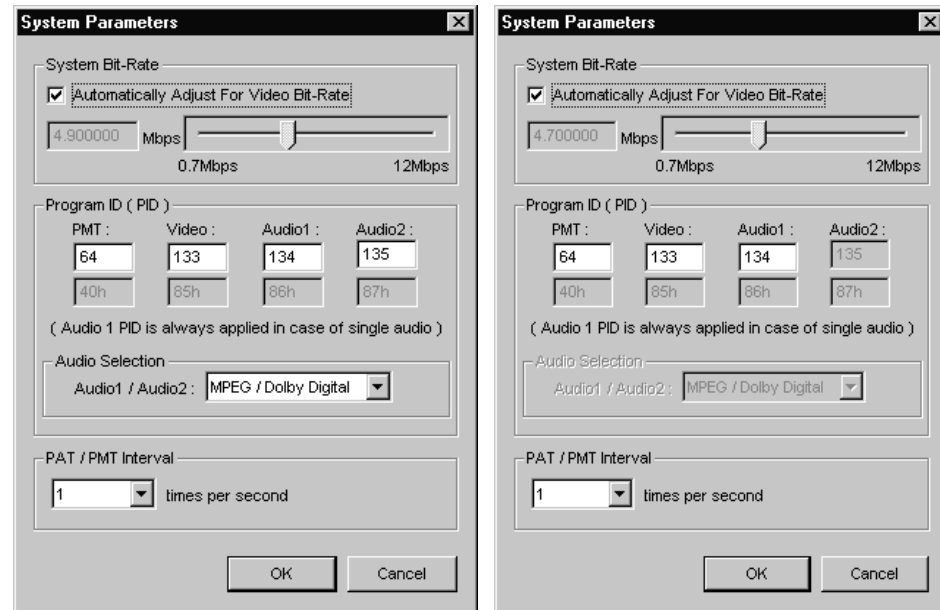

D.2.1   SYSTEM BIT-RATE

If the **Automatically Adjust For Video Bit-Rate** check box is selected, *ZP-Controller* calculates the suitable System Bit-rate automatically and the Bit-rate (**Mbps**) text box is not activated. The **Mbps** text box displays the calculated Bit-rate.

If the **Automatically Adjust For Video Bit-Rate** check box is not selected, Bit-rate (Mbps) text box becomes active and System Bit-rate can be specified using the slider or the text box. The **Mbps** text box displays the Bit-rate value. The System Bit-rate range is 0.7–12 Mbps. One of two conditions may occur if the bit-rate is changed using this method. The System Bit-Rate will either exceed the Specified System Bit-rate or be under the Specified System Bit-rate. The results of these two selections are explained in the following paragraphs.

!

If the System Bit-rate specified with the slider <u>exceeds</u> the (calculated) Required Bit-Rate, then the System Bit-rate displayed in the System Information field of the *ZP-Controller* main window will be in red text (see Figure D-4).

Figure D-4. *ZP-Controller* **Window – System Bit-Rate Exceeded**
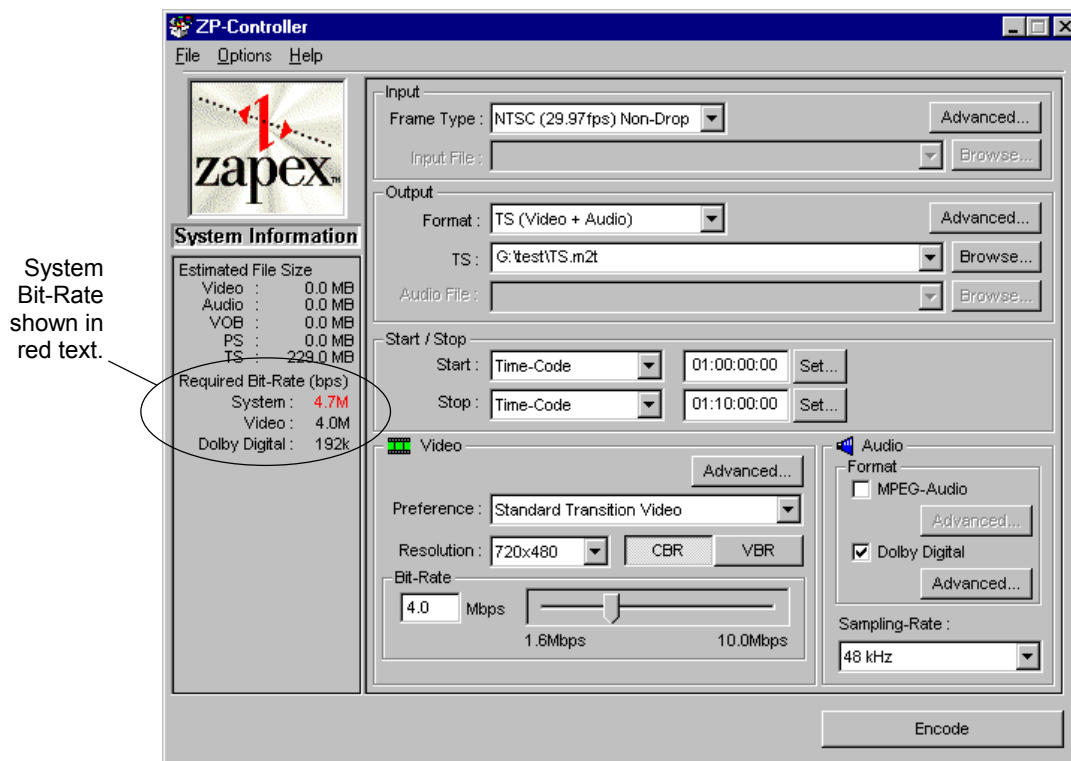
System Bit-Rate shown in red text.

If the **Encode** button is pressed, a warning message will appear requesting the operator if they would like to adjust the video bit-rate?

If the **OK** button is pressed, the bit-rate will be adjusted by the software and the encode process will continue. Cancel will return the operator to the previous screen.

!

If the System Bit-rate specified with the slider is <u>below</u> the (calculated) Required Bit-Rate, then padding bits will be added to the output stream.

Padding bits consist of null bits (zeros) that have been added to the output encode Transport Stream to keep the stream compliant with MPEG-2 standards.

!

Warning – Certain decoders cannot accept or decode the added padding bits with satisfactory results. When this occurs, the decoder may display distorted video that encounters erratic motion and the video may seem unstable.

D.2.2   PROGRAM ID(PID)

The PID decimal value is specified for PMT, Video, Audio1, and Audio2 in the text box associated with each type. The PID range is between 16 (10hex) and 8190 (1FFEhex).

D.2.3   AUDIO SELECTION

When multiple audio (Audio1 and Audio2) output is selected, a drop-down assignment list becomes active. When single audio (Audio1) output is selected, this option is not activated.

D.2.4   PAT/PMT INTERVAL

The **PAT/PMT Interval** is specified in this list. Select **1**, **2**, or **4** times per second.

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A P P E N D I X

E

REGULATORY APPROVALS

This appendix contains the following information:

- ✓ **Radio Frequency Interference (RFI) Ratings**
- ✓ **FCC Statement**
- ✓ **VCCI**
- ✓ **CE Statement**
- ✓ **ACA Statement**

E.0   REGULATORY APPROVALS

E.1   RADIO FREQUENCY INTERFERENCE (RFI) RATINGS

FCC Part 15 Class A, CE (EN 55022A, EN 50082-1), VCCI Class A, AS3548 Class A

E.2   FCC STATEMENT

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15, subpart B, of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

Modifications or changes to this product not expressly approved by Zapex Technologies, Inc. could void the user's authority to operate the equipment.

To insure compliance with FCC non-interference regulations, shielded interface cables should be used to attach all peripherals.

If this equipment does harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and the receiver.

- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

- In case of TV or radio interference, turn the antenna until the interference stops, or consider installing an antenna with coaxial cable lead-in between the antenna and TV.

- Consult Zapex Technologies, Inc. technical support.

E.3   VCCI

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

E.4   CE STATEMENT

Marking by the symbol CE indicates compliance of this device to the EMC directive of the European Community. Such marking is indicative that this Zapex system meets or exceeds the following technical standards:

EN 50082-1
"Electromagnetic compatibility - Generic immunity standard Part 1: Residential, Commercial and Light industry."

EN 55022 A
"Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment."

E.5   ACA STATEMENT

This device has been tested and found to comply with the limits for Class A digital device, pursuant to the Australian/New Zealand Standard AS/NZS 3548 set out by the Spectrum Management Agency.

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A P P E N D I X

F

PHYSICAL AND ENVIRONMENTAL SPECIFICATIONS

This appendix contains the following information:

- ✓ **Board**
- ✓ **Power**
- ✓ **Temperature**
- ✓ **Standard EMC**

F.0   PHYSICAL AND ENVIRONMENTAL SPECIFICATIONS

The Physical Dimensions and Operating Environment Conditions Summary for the ZP-230 and ZP-330 MPEG 2 Encoder Families provides physical dimensions, and operating environment parameters to Zapex Technologies' customers. Zapex stipulates that these are the accepted environmental parameters for normal board operation.

F.1   BOARD

Dimensions (Main Board)	W346.5mmXD126mmXH22mm
Mass (Main Board and Interface Card)	DD 13.00oz
	CD 13.45oz
	CA 13.45oz
	SA 13.45oz
	NN 10.15oz

F.2   POWER

Distribution on the PCB of 5V	$5V \pm 0.1V$
Regulator for Input Voltage from the PC	$\pm 5V \pm 5\% @ \pm 12V \pm 10\%$
Regulator for Input Voltage to the AIF from the Main Board	$\pm 8V \pm 5\% @ \pm 12V \pm 10\%$
Maximum Power Current from the PC	5V max 2.9A
	12V max 0.31A
	Max 17.72W
DC Voltage	$5V \pm 5\%$
	$12V \pm 10\%$
	$-12V \pm 10\%$

F.3   TEMPERATURE

Operating Temperature	+10°C to +40°C (+50°F to 104°F)
Operating Humidity	20% to 80%
Storage Temperature	-20°C to +50°C (-4°F to +122°F)
Storage Humidity	Less than 90% (non-condensing)

F.4   STANDARD EMC

FCC	FCC Class A
VCCI	VCCI Class A
CE E50082-1 EN55022	Passed
UL,CSA Level	N/A
Electro-static Discharge, Contact	7KV without operating failure 10KV without system failure

F.5   PACKAGING

Dimensions (Individual Package)	W537mmXD232mmXH150mm
Mass (Individual Package)	DD 4.7lb CD 4.8lb CA 4.8lb SA 4.8lb NN 3.5lb
Dimensions (Master Package)	W543mmXD488mmXH332mm
Mass (Master Package)	DD 22lb CD 23lb CA 23lb SA 22lb NN 18lb
Vibration (Packed)	1.5G @ 5-55Hz
Drop Packed	Surface 1m Edge 80cm Corner 80cm

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A P P E N D I X

G

USE OF DOLBY® TRADEMARKS

This appendix contains the following information:

- ✓ **Introduction**
- ✓ **Trademark and Standardization Agreements**
    - ▪ **Who Should Sign the Trademark and Standardization Agreement**
    - ▪ **Licensing Procedure**
    - ▪ **A Note to Replicators and Studios**
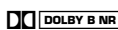
G.0   USE OF DOLBY® TRADEMARKS

This appendix contains information about the use and licensing of the Dolby® Trademarks.

G.1   INTRODUCTION

Dolby® Laboratories owns the trademarks "Dolby®" and the double-D symbol "◧◧," which are registered in over 90 countries in the world. The marks are used on a variety of prof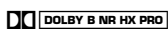essional noise reduction products, cinema equipment and signal processor manufactured and sold by Dolby® Laboratories, Inc.

Use of the Dolby® Trademarks is licensed to manufacturers of audio and video equipment. The appearance of one or more of the trademarks on a licensed product indicates that the product contains technology developed by Dolby® Laboratories and that it meets performance standards set by Dolby® Laboratories Licensing Corporation (DLLC).

Use of the Dolby® Trademarks is also licensed to prerecorded audio and video companies whose products are made using technology developed by Dolby® Laboratories. The appearance of any of the Dolby® Trademarks on prerecorded media indicates that it was produced using one or more Dolby® technologies and that it meets performance standards set by DLLC. Examples of the Dolby® Trademarks available to licensees for identifying the specific technologies used in production and manufacturing are:

DOLBY TRADEMARK LOGO:	FOR SOUNDTRACKS RECORDED USING:
◧◧ DOLBY DIGITAL	Dolby® Digital (AC-3) audio coding
◧◧ DOLBY SURROUND	Dolby® Surround or when the soundtrack have been transferred from a Dolby® theatrical release
◧◧ DOLBY NET	Dolby® Net audio coding
	For audio tapes recorded using:
◧◧ DOLBY B NR (or) ◧◧ B NR	Dolby® B-type noise reduction
◧◧ DOLBY S NR (or) ◧◧ S NR	Dolby® S-type noise reduction
◧◧ DOLBY B NR HX PRO (or) ◧◧ HX PRO B NR	both Dolby® B-type noise reduction and Dolby® HX Pro headroom extension
◧◧ DOLBY S NR HX PRO (or) ◧◧ HX PRO S NR	both Dolby® S-type noise reduction and Dolby® HX Pro headroom extension

G.2   TRADEMARK AND STANDARDIZATION AGREEMENTS

Like any material property, a trademark may not be used by others without permission of the trademark owner. Also, if a trademark is licensed to others, the trademark owner must set quality standards and see that they are adhered to so that the use of the trademarks by others does not undermine the good reputation of the marks. In addition to these rather straightforward requirements, trademark law also demands that trademarks be used in somewhat restricted ways.

So that it and its licensees can comply with requirements of trademark licensing law, DLLC provides Trademark and Standardization Agreements for companies who wish to use the Dolby Trademarks on their audio and video media. These Agreements are royalty-free, and as a special incentive to promote the use of the Dolby® Surround, Dolby® Digital, and Dolby® Net Trademarks, there is currently no processing fee for those trademark licenses. All other trademark licenses require a one-time $330 fee for processing the trademark license application. This fee is reduced to $250 in the case of audio cassettes manufactured by a Dolby® Approved Duplicator.

A separate Agreement must be signed for each technology prior to use of the corresponding Dolby® Trademark. The main points of the Agreements are as follows:

1. An authorization for the licensee to use the Dolby® Trademarks on prerecorded media produced with Dolby® noise reduction and/or Dolby® HX Pro headroom extension, Dolby® Surround, Dolby® Digital or Dolby® Net technologies;

2. Specifications for the correct use of the Dolby® Trademarks and for acknowledging the ownership of the marks;

3. Specifications of the quality control arrangements, which involve the licensee providing occasional samples for quality appraisal.

G.2.1   WHO SHOULD SIGN THE TRADEMARK AND STANDARDIZATION AGREEMENT

A company that owns the rights to a piece of music or other recording, and is involved in the preparation, production and sale of prerecorded media incorporating Dolby® technology must sign an Agreement if it wishes to use the Dolby® Trademarks on the media released under the company's own labels.

A company which, under contract, simply manufactures prerecorded media for one or more customers (Dolby® licensees), and/or is only involved in the preparation of artwork (labels, boxes, jackets, insert cards) need not sign an Agreement.

Responsibility for the quality of recordings and proper trademark usage rests with the licensee.

G.2.2   LICENSING PROCEDURE

A company interested in using Dolby® Trademarks on its prerecorded video or audio media should contact DLLC for licensing information and to request a license.

DLLC sends a questionnaire and the appropriate Agreements to licensee for review and completion.

Licensee returns the completed questionnaire, signed Agreements and the appropriate processing fee (payable to Dolby® Laboratories Licensing Corporation) to DLLC. In the case of tape-based formats such as audio and video cassette, a sample recording must also be submitted for quality evaluation. Test samples are acceptable, but only if they are manufactured using the same processes and equipment as the product which will eventually be distributed to the public. Samples of non-tape formats may be sent later, once the final product has been completed.

DLLC countersigns and returns one copy of each Agreement along with the appropriate trademark artwork.

Subsequent to signing an Agreement, we ask that licensees provide us with sample copies of materials which incorporate the Dolby® Trademarks, such as discs, cassettes, insert cards, catalogs and advertisements, so that we can verify that our trademarks are being used correctly. If licensees have any doubts about correct trademark usage, we ask that they please contact us. We are always happy to check drafts of material to be printed or used in advertising and promotion, and to give advice on the correct use of our trademarks. We may also require the licensee to periodically submit product samples so that we may check the soundtrack quality and verify proper trademark use.

G.2.3   A NOTE TO REPLICATORS AND STUDIOS

Your clients may not be aware of the fact that a license Agreement with DLLC is required before Dolby® Trademarks may be used on their products. Strictly speaking, it is our responsibility to provide information to new customers, but we need to know who those customers are. Accordingly, if your clients wish to use our trademarks we must rely on your cooperation to refer them to us so that licensing formalities can be completed.

Dolby Laboratories Licensing Corporation   Phone: 415-558-0230
100 Potrero Avenue   Fax: 415-863-1373
San Francisco, CA 94103-4813   E-mail: tsa@dolby.com
USA   http://www.dolby.com

or at

Wooton Bassett   Phone: 01-793-842100
Wilshire SN4 8QJ   Fax: 01-793-842101
England