



PIXELTOOLS

TransMux

TransMux □

Version 3

Users Manual

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Congratulations on
your purchase of **PixelTools' TransMux.**

You now have the ability to combine elementary MPEG video
and audio streams into an MPEG multiplexed bitstream.

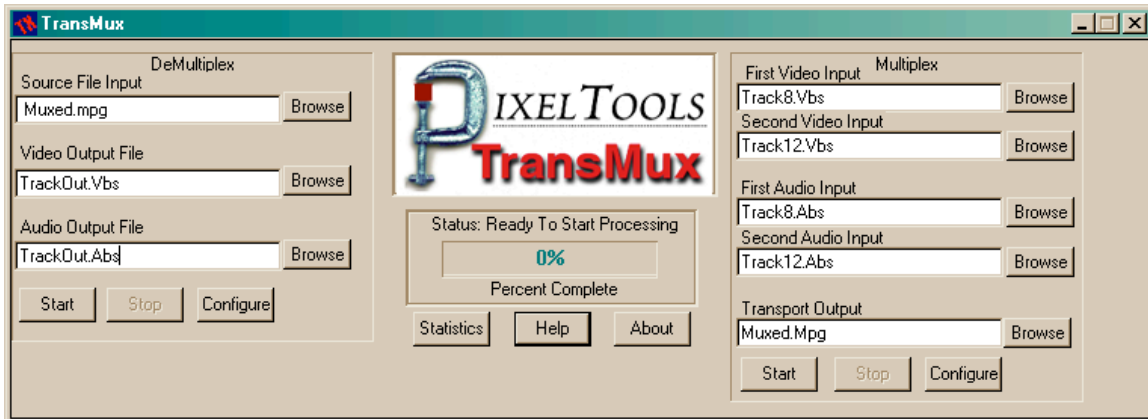
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1.0 General

1.1 What the MPEG Transmit Does



The MPEG Transmit is a software Microsoft Windows program that combines elementary MPEG video and audio streams into an MPEG multiplexed bitstream. The elementary streams can be obtained from the PixelTools MPEG Expert video encoder and Expert Audio encoder or from any other quality source of MPEG. AC3 and AAC audio streams can be used when creating transport streams. The MPEG TransMux encoded output stream is a fully compliant MPEG-1 or MPEG-2 transport, system or program stream and can be played on any compliant MPEG player.

The MPEG TransMux can also be used to de-multiplex a MPEG transport, program, or system stream into its elementary video and audio encoded MPEG components. And these elementary components can be fed back into TransMux to create a new multiplexed stream with different characteristics. For example, TransMux can be used to transcode a transport stream into a program stream or increase the bit-rate of a multiplexed stream.

Version 3 of TransMux adds the capability to multiplex up to two video and two audio streams into a single Transport stream. This version can create a video only or audio only transport stream. Support for AAC audio added.

1.2 How this Document Helps

This document details the capabilities and operations of the MPEG TransMux to give you a thorough understanding of the usage of the product.

The first sections of this document list the requirements of your computer system and describe the MPEG TransMux installation procedure. A Jumpstart Tutorial presents a step-by-step example of a multiplexing operation. The last sections detail the functionality of the multiplexing and de-multiplexing options that are provided with the product.

1.3 System Requirements

Your system needs to be at least a 386 IBM-PC compatible computer with 16 Mbytes of memory and 32 Mbytes of disk storage to multiplex MPEG video and audio streams. The MPEG TransMux runs on the Windows XP, Windows 2000, WindowsNT, WindowsME Windows98, or Windows95 or operating systems.

1.4 Installation

Simply insert the MPEG TransMux disk into your CD-ROM drive and double click on the TransMux Install program icon in the main directory of the CD. The MPEG TransMux installer will prompt you for program loading options.

1.5 Jump Start Tutorial

The MPEG TransMux CD-ROM contains a sample audio file and a video file for this multiplexing demo. This tutorial will lead you through a multiplexing session. You will combine the video and audio elementary streams into an MPEG system stream in this example.

Start the MPEG TransMux by selecting the MPEG TransMux ICON on the windows toolbar. The MPEG TransMux Main Window should appear as depicted above. Select the name of the video stream and audio stream using the browse buttons in the Multiplexing (right hand) side of the TransMux. You can use the sample video and audio files stored in the \source\mux directory for this exercise. Select the name of the system stream to be created using the output browse button. (Make sure that the output file is not on the CD-ROM drive) Click start and the multiplexing will begin.

During the multiplexing session, the MPEG TransMux will first analyze the video bit-stream and store pointers to the start of each frame in a temporary file on your computer. The MPEG TransMux will next analyze the audio bitstream and store pointers to the audio access units in another temporary file on your computer. Finally, MPEG TransMux will combine the video and audio streams into the target multiplexed stream and remove the temporary files. That's all there is to it! Your new MPEG file can be viewed on any hardware or software MPEG player, or the MpegRepair decoder.

2. Launching the MPEG TransMux

The MPEG TransMux can be started in several ways. This provides flexibility in using the MPEG TransMux by itself or in the more automated batch mode.

2.1 Toolbar

You can start the MPEG TransMux by selecting the MPEG TransMux program icon in the Windows toolbar, double-clicking on a TransMux shortcut you have created on your desktop, or selecting the MPEG TransMux icon in the Windows *run* toolbar dialog.

2.2 Drag and Drop

The MPEG TransMux can also be launched by highlighting the *video* file that is to be multiplexed and dragging the file to the MPEG TransMux shortcut on the desktop. All of the multiplexing parameters can be saved in the TransMux.ini initialization file located in the MPEG TransMux's directory prior to program launch. Also the name of the audio file to be multiplexed with the video file can be stored in the initialization file. You can not modify the multiplexing parameters in this mode as the program comes up running with the parameters selection options disabled. The MPEG TransMux combines the video and audio files using the parameters specified in the expmux.ini file and exits upon completion. If the TransMux.ini file is not found, MPEG TransMux will utilize its own default parameters

2.2.1.1 Batch Mode Operation

The MPEG TransMux can also be launched from a command line batch file. You just need to call the TransMux and give it the name of the video file to be multiplexed.

For example:

2.2.1.1.1.1.1.1 Call TransMux Test.vbs

will multiplex Test.vbs with the audio file specified in the ini file. If no audio or output file names are given in the TransMux.ini file, the multiplexer will create an audio file name by taking the video source file name and adding the .abs extension and will also create the output file name by adding the .mpg extension to the video source file. All of the multiplexing parameters can be saved in the TransMux.ini initialization file located in the MPEG TransMux's directory. You cannot modify the multiplexing parameters in this mode as the program comes up running with the parameters selection options disabled. The MPEG TransMux combines the video and audio files using the parameters specified in the ini file and exits upon completion. The batch file can multiplex multiple system streams, each with different parameters, by copying the appropriate initialization parameters into the TransMux.ini file just prior to the multiplexing.

The MPEG TransMux can also de-multiplex from a command line batch file. Add a **-d** option to the command line and include the source multiplexed file to be de-multiplexed in the command line. The TransMux.ini file should contain the names of the elementary files to be created in the de-multiplexing process.

For example:

2.2.1.1.1.1.1.2 Call TransMux -d MuxedFile.Mpg

will split the MuxedFile.Mpg into its elementary video and audio components and store the elementary files using the file path names in the TransMux.ini file

3. Multiplexing

MPEG multiplexing consists of partitioning the audio and video elementary bitstreams into packets, placing stream header data in a pack header, adding timing information (obtained by analyzing the elementary streams) to the packet header, and combining the video and audio packets in an order appropriate for any MPEG player to decode properly.

Different MPEG systems require different pack and pack sizes and audio/video timing relationships. These parameters are completely adjustable in the Expert Multiplexer.

The MPEG TransMux first performs an analysis pass on the video file and an analysis on the audio file to identify the video and audio access locations and to make an estimate of the system overhead needed. The MPEG TransMux then combines the video and audio files into the selected system stream.

3.1 File Selection

3.1.1 Multiplex: First Video Input

You can enter the full path name of the source video file to be multiplexed in this edit box or use the associated Browse button to bring up the windows browser to help you select the appropriate file and directory.

The video file name can have any name and extension. PixelTools recommends .vbs for the video file extension.

The video file must be a MPEG-1 or MPEG-2 elementary file IE not already multiplexed with audio.

Leaving the Input Video File text edit box blank can create an audio only transport stream.

3.1.2 Multiplex: Second Video Input (Transport Only)

You can enter the full path name of the second video file to be multiplexed in this edit box or use the associated Browse button to bring up the windows browser to help you select the appropriate file and directory.

The video file name can have any name and extension. PixelTools recommends .vbs for the video file extension.

The video file must be a MPEG-1 or MPEG-2 elementary file IE not already multiplexed with audio.

The second video input file is only supported with the Multiplex | Configure is set to Transport. Leave this field blank if a second video input file is not utilized.

3.1.3 Multiplex: First Audio Input

You can enter the full path name of the source audio file to be multiplexed in this edit box or use the associated Browse button to bring up the windows browser to help you select the appropriate file and directory.

The audio file name can have any name and extension. PixelTools recommends .abs for the MPEG audio file extension and .ac3 for Dolby AC3 audio (in the Transport mode).

The audio file name can have any name and extension. PixelTools recommends .abs for the MPEG audio file extension, ac3 for Dolby AC3 audio (in the Transport mode) and .aac for AAC audio (in the Transport mode).

Leaving the Input Audio File text edit box blank can create a video only transport stream.

3.1.4 Multiplex: Second Audio Input

You can enter the full path name of the second audio file to be multiplexed in this edit box or use the associated Browse button to bring up the windows browser to help you select the appropriate file and directory.

The audio file name can have any name and extension. PixelTools recommends .abs for the MPEG audio file extension, ac3 for Dolby AC3 audio (in the Transport mode) and .aac for AAC audio (in the Transport mode).

The audio file must be a MPEG-1 or MPEG-2 elementary file IE not already multiplexed with video. The audio file can be a Dolby AC3 file or an AAC file when multiplexing to a transport stream.

The second audio input file is only supported with the Multiplex | Configure is set to Transport. Leave this field blank if a second audio input file is not utilized

3.1.5 Multiplex: Output System File

You can enter the full path name of the output multiplexed file in this edit box or use the associated Browse button to bring up the windows browser to help you select the appropriate file and directory.

The output file name can have any name and extension. PixelTools recommends .mpg for the output MPEG-1 or MPEG-2 file extension.

Settings in the configure dialog will determine whether the output file will conform to MPEG-1 or MPEG-2.

3.2 Configure

The Configure button allows complete customization of the multiplexing process. The MPEG specification allows a rather wide variety of multiplexing options.

3.2.1.1.1.1.1 Select Multiplexing Parameters

3.2.2 Pack Structure

This group box allows you to specify the packing arrangement of the video and audio elementary bitstreams for non-transport streams.

In the multiplexing process, MPEG video and audio elementary data is broken (with complete disregard to the elementary data structure) into packets of either video or audio data of the length you select. The packets themselves are grouped into Packs and each pack containing one or more packets of both video and/or audio data. Generally packs define one program. Multiple programs can appear in the same stream with different pack headers.

3.2.2.1 Bytes Per Packet (Non Transport)

This option specifies the number of bytes of video or audio data that will be included in each packet.

Packets contain either video or audio data. The video and audio data is placed in the packets of the size selected by the number of **bytes per packet**. The data in each pack is an arbitrary chunk of either video or audio data and is unrelated to the video or audio elementary stream structure. One frame can be spread across hundreds of packets, several frames can be placed in a single packet, and packets do not align with

frame boundaries. Each packet contains a packet header that include timing information of the enclosed data if the enclosed data contains the *start* of a new frame or the *start* of an audio access unit.

3.2.2.2 System Header Each Pack (Non Transport)

System headers, containing in depth data about the pack (such as video data rates, audio data rates, and system flags) follow each Pack Header if System Header Each Pack is checked. The system header occurs only once in the bitstream, after the first pack header, if the check box is unchecked.

3.2.2.3 Packets per Pack (Non Transport)

This edit box allows you to enter the number of packets (both video and audio) that will follow each pack header.

A **Pack** contains a pack header followed by one or more packets of both video and audio data that are described by that pack header. Pack headers include the System Clock Reference (the main system clock used for audio-video synchronization) and the multiplexed bit rate for all of the packets in the pack.

3.2.2.3.1.1.1.1 Why?

Different MPEG systems require different packetization. CD-ROMS and DVD usually require a fixed number of bytes per sector, and one packet per sector. Noisy transmission systems perform better with smaller packets, and relatively error free stored media system will provide the highest bit-rate (encoding quality) with large packets i.e. less overhead.

3.2.3 Multiplexed Bit Rate

This button allows you to enter the desired resultant bit rate of the multiplexed stream. If the **minimum** (default) option is selected, the Multiplexer computes the lowest bit-rate that will contain the video, audio, and system overhead. This bit-rate value is added to the system header and used for the multiplexing. If the **custom** option is selected, the bit-rate edit box is enabled and you can enter your desired multiplexed bit-rate. The bit rate entered should be at least equal to the sum of the video and audio bit rates and the system overhead. The multiplexer sums the video and audio rates and estimates the system overhead during the analysis pass. If the sum is less than the selected bit rate, the multiplexer will add padding packets to increase the bit rate to that specified. If the multiplexer calculates that the video and audio rates are too high to be multiplexed into the desired bit-rate, a dialog box will be presented providing the option of canceling the job, or continuing with the multiplexer producing a bit stream with the multiplexed rate as close to the selected bit-rate as possible.

3.2.3.1.1.1.1.1 Why?

Different MPEG situations require different bit-rates MPEG-2 broadcast video is frequently in the 10Mbits per second range; Internet broadcast is sometimes as low as 200Kbits per second.

3.2.4 Video/Audio/System Starting Delay

This edit box allows you to change the video and audio timing relationships to the System Clock Reference or the Program Clock Reference. The Clock Reference (which is the timing for both the video and the audio streams) starts at time 0 and increments every $1/90,000^{\text{th}}$ of a second for MPEG-1 or $1/27,000,000^{\text{th}}$ of

a second for MPEG-2. Presentation time stamps are added to the video and audio packets to specify when the enclosed video frame or audio presentation unit is to be displayed. The video and audio delays add time, in milliseconds, between the Clock Reference and the display times of all of the video and/or audio packets. The System Starting delay adds an offset to the system clock.

3.2.4.1.1.1.1.1 Why?

Different decoding situations have different buffering pipelines and decoding delays. The starting delays can be used to assure that the data will get through the pipeline and decoded in time prior to the time it is to be displayed.

3.2.5 System Starting Delay

This edit box allows you to change the starting offset for the MPEG-1 System Clock Reference or the MPEG -2 Program Clock Reference. This Clock Reference starts at time 0 and increments every 1/90,000 of a second for MPEG-1 or 1/27,000,000 of a second for MPEG-2. The number entered in this box is converted into units of 1/90,000 for MPEG -1 or 1/27,000,000 for MPEG -2 and added to each system time stamp as it is written to the stream

3.2.5.1.1.1.1.1 Why?

In editing system files, for example, the system time codes must be matched with the adjacent video. This edit box allows you to start the system clock at any value.

3.2.6 Multiplex Type

You can select either MPEG-1 Video CD, MPEG-1, MPEG-2 Program, or MPEG-2 Transport multiplexing specifications. MPEG-1 and MPEG-2 have slightly different header structures. You can also select the Variable Bit Rate option if your elementary video source is encoded with Variable Bit Rate encoding.

MPEG-1 Video CD is MPEG-1 with specific bit rates and packet structures and custom data in some of the packets for creating streams that play back on all VideoCD players. The VideoCD pack size must be 2324 and a Custom | Multiplexed bit-rate of 1411200 must be utilized when you select the Video CD multiplex type.

Variable Bit Rate multiplexing does not add the Constant Bit-Rate stuffing that assures that the multiplexed stream is of constant bit-rate. The Variable Bit Rate mode is appropriate for DVD and desktop encoding applications that do not rely on a constant bit-rate channel for transmission of the compressed video. The VideoCD specification does not include Variable Bit Rate.

3.2.6.1.1.1.1.1 Why?

MPEG-2 has slightly different packet headers and pack headers than MPEG-1. MPEG-2 systems usually require MPEG-2 headers. Transport streams are created in 188 byte packets.

3.2.7 Timing (Non Transport)

Options in this control section can cause the multiplexer to create streams without timing information.

3.2.7.1 Include Video PTS

Checking the Include Video PTS check box will add appropriate time-stamps to those video packets that contain the start of a picture. (This is the normal mode of operation.) If the box is not checked, no video packets will contain PTS's or DTS's.

3.2.7.1.1.1.1.1 Why?

MPEG packets normally include accurate timing information that indicate when the particular video frame is to be decoded and when it is to be displayed. In cases where exact timing is not critical, un-checking the check box will prevent time codes from being included thus leaving more bandwidth for video data for the highest quality.

3.2.7.2 Include Audio PTS

Checking the Include Audio PTS check box will add appropriate time-stamps to those audio packets that contain the start an audio access unit. (This is the normal mode of operation.) If the box is not checked, audio packets will not contain PTSs or DTSS.

3.2.7.2.1.1.1.1 Why?

MPEG packets normally include accurate timing information that indicate when the particular audio access unit is to be decoded and when it is to be presented. In cases where exact timing is not critical, un-checking the check box will prevent time codes from being included thus leaving more bandwidth for video data for the highest quality.

3.2.8 Stream Terminations (Non Transport)

Options in this control area allow you to make the output multiplexed stream duration the same as the video or audio components.

3.2.8.1 Terminate stream at end of video

Checking the **Terminate Stream at end of Video** will cause the multiplexer to add the end of sequence header to the output stream and close the output stream after the last video data has been multiplexed into the system or program stream. Remaining audio data will not be included in the multiplexed stream.

Note that if both the **Terminate Stream at end of Video** and the **Terminate Stream at end of Audio** options are checked, the Multiplexer will add the end of sequence header to the output stream and close the stream at the end of the shortest (in time) video or audio stream.

This function is not supported when generating transport streams.

3.2.8.2 Terminate stream at end of audio

Checking the **Terminate Stream at end of Audio** will cause the multiplexer to add the end of sequence header to the output stream and close the output stream after the last audio data has been multiplexed into the system or program stream. Remaining video data will not be included in the multiplexed stream.

Note that if both the **Terminate Stream at end of Video** and the **Terminate Stream at end of Audio** options are checked, the Multiplexer will add the end of sequence header to the output stream and close the stream at the end of the shortest (in time) video or audio stream.

This function is not supported when generating transport streams.

3.2.9 Transport PIDs (Transport Only)

These edit boxes allow you to specify the specific Program Identification codes (PIDs) that you wish to be assigned to the video and the audio streams. You can also specify the PID that will contain the Program Clock Reference (PCR) time code and the PID that will contain the Program Map Table (PMT).

The PCR Interval sets the number of milliseconds between PCR time stamps. .

3.2.9.1.1.1.1.1 Why?

In editing system files, for example, the system time codes must be matched with the adjacent video.

3.3 Operating Controls

3.3.1 Multiplex: Start Button

The Start button starts the multiplexing operation. Prior to depressing the Start button, you should have entered the name of the input video bit-stream, the name of the input audio bit-stream, and the name of the final multiplexed output bit-stream in the associated edit box. You can enter the names directly by selecting the edit box with the mouse and typing in the file name, or select the browse button and graphically select the file names.

3.3.2 Multiplex: Stop Button

The stop button is enabled once the multiplexer has been started. The Stop button aborts the multiplexing operation before it has finished the multiplexing process.

4. De-Multiplexing

4.1 File Selection

4.1.1 De-multiplex: Input Multiplexed File

You can enter the full path name of the source multiplexed file to be de-multiplexed in this edit box or use the associated Browse button to bring up the windows browser to help you select the appropriate file and directory.

The multiplexed file name can have any name and extension. PixelTools TransMux analyzes the multiplexed file content to determine what type of demuxing to do.

The Multiplexed file can be MPEG2 or MPEG2 Transport, Program, or System files.

4.1.2 De-Multiplex: Output Video File

You can enter the full path name of the output elementary video file in this edit box or use the associated Browse button to bring up the windows browser to help you select the appropriate file and directory.

The output audio file name can have any name and extension. PixelTools recommends .vbs for the output MPEG-1 or MPEG-2 file extension.

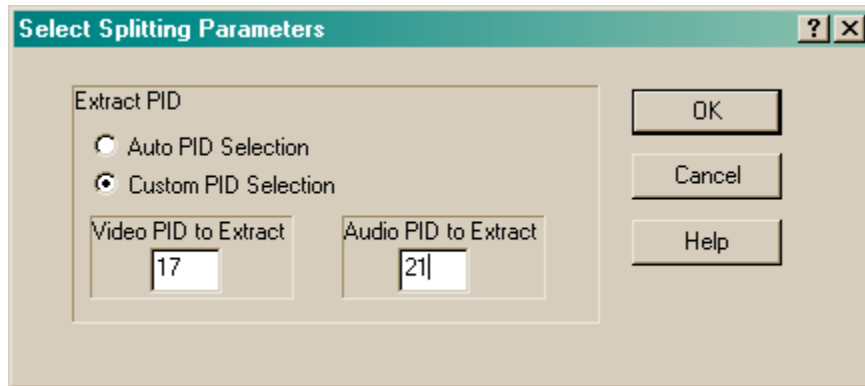
4.1.3 De-Multiplex: Output Audio File

You can enter the full path name of the output elementary audio file in this edit box or use the associated Browse button to bring up the windows browser to help you select the appropriate file and directory.

The output audio file name can have any name and extension. PixelTools recommends .abs for the output MPEG-1 or MPEG-2 file extension.

4.2 Configure

The Configure button allows customization of the de-multiplexing process.



4.2.1 Select PIDs to Decode

These two edit boxes allow you to enter a specific Transport Video PID and a specific Transport Audio PID for you to extract from the multiplexed transport stream. Entering a value of 0 for the Video PID and/or Audio PID instructs TransMux to extract the first Video PID and first Audio PID that are encountered in the stream.

TransMux will extract the elementary video stream if it is stored in the Video PID and will extract the elementary audio stream if it stored in the Audio PID specified.

These selections have no effect when splitting other than transport streams.

4.2.1.1.1.1.1.1 Why?

For most applications, the default values of 0 will pull the single elementary streams out of the transport streams. TransMux gives you the power to extract one of many elementary video streams and one of many elementary audio streams from transport streams that have multiple elementary streams.

4.3 Operating Controls

4.3.1 De-Multiplex Start Button

The Start button starts the de-multiplexing operation. Prior to depressing the Start button, you should have entered the name of the multiplexed file that you wish to be de-multiplexed and the names of the files used to hold the resultant elementary video and audio components. You can enter the names directly by selecting the edit box with the mouse and typing in the file name, or select the browse button and graphically select the file names.

4.3.2 De-Multiplex Stop Button

The stop button is enabled once the de-multiplexer has been started. The Stop button aborts the de-multiplexing operation before it has finished the de-multiplexing process. The resultant incomplete elementary files may not be usable.

5. Advanced Features

5.1 Initialization File

The MPEG TransMux looks for an initialization file called TransMux.ini in the directory from which it was launched. The ini file contains default settings for all of the multiplexing and de-multiplexing parameters. If the MPEG TransMux cannot find the ini file, it will load its default parameters.

Once you have launched the MPEG TransMux from the Windows environment, you can modify each of the parameters via the Configure dialogs. If you frequently use the same parameters, editing the TransMux.ini with those parameters in the will provide an easier and more reliable interface.

If the MPEG TransMux is launched from a batch file or via drag and drop, you will not have the opportunity to modify the multiplexing parameters. Therefore it is important that the appropriate parameters be stored in the TransMux.ini file prior to launch.

The initialization file provided with the MPEG TransMux appears as below. The words between the * and *\ character pairs are comments and are ignored by the MPEG TransMux.

```

2324    \*    PackSize                *\
1       \*    PacksPerPacket         *\
6000000 \*    MuxRate                 *\
0       \*    AudioDelay (milliseconds) *\
0       \*    VideoDelay (milliseconds) *\
0       \*    Systemheaders 0 at start only *\

5.1.1.1.1.1.1.1 1    \*mode0=MPEG1;1=MPEG2;2=VCD;3=MPEG2VBR;4=MPEG1VBR;6=Tra
n*\
0       \*    Disable Video PTS's and DTS's        *\
0       \*    Disable Audio PTS's and DTS's        *\
-       \*    InputVideoFilename - if none          *\
-       \*    InputAudioFilename - if none          *\
-       \*    OutputFilename - if none              *\
1       \*    Terminate Stream at end of Video      *\
1       \*    Terminate Stream at end of Audio      *\
33      \*    Video PID                            *\
34      \*    Audio PID                            *\
33      \*    PCR PID                               *\
0       \*    System delay                          *\
-       \*    File to be split                      *\
-       \*    Split video file output               *\
-       \*    Split audio file output               *\
0       \*    Video PID for Extraction 0= Auto      *\
0       \*    Audio PID for Extraction 0= Auto      *\
0       \* Video PID for Extraction 0= Auto          *\
0       \* Audio PID for Extraction 0= Auto         *\
16      \* Transport PMT PID                        *\
90      \* Transport PCR Interval (ms)              *\

```

18	* 2nd Transport Video PID	*\
21	* 2nd Transport Audio PID	*\
-	* 2nd InputVideoFilename - if none	*\
-	* 2nd InputAudioFilename - if none	*\

5.2 Statistics Window

The *Statistics Button* opens a text window into which detailed information of the video and audio streams is written. Multiplexing statistics are also printed in the window. The information in this window is supplemental to the multiplexing process and is provide for confirmation only.

5.2.1.1.1.1.1.1 Why?

The statistics of the audio and video files provide a means for verifying that the source elementary video and audio streams are as expected.

5.3 Audio-Video Synchronization

The MPEG TransMux produces MPEG multiplexed streams that have perfect synchronization between the audio and video bit-streams for hours and hours ... if the elementary audio and video streams are taken from the exact same time period and have exact video and audio frame rates.

The decoding audio and video synchronization is accomplished with the use of the Presentation Time Stamps (PTS) and Display Time Stamps (DTS) that MPEG TransMux inserts into the Packet Headers. These time stamps are computed on the exact video and audio frame rates as reported in the elementary stream headers.

Less than professional video playback and frame capturing equipment will have less exact frame rates. The typical low cost PC board oscillators are rated at 50PPM (50 parts of variation for every million samples). This error can produce about a 2 second difference in audio and video after a 2hour encoding! Also, Microsoft's original AVI specification did not specify fractional frame rates. Typical (in the US) frame rates of 29.97 frames per second are reported as 30 frames per second. This 1/1000 error will result in a 1/10 second synchronization error (enough to star to see Lip Sync problems) after about two minutes of encoding.

6. Run Time Errors

6.1 Mpeg1 Elementary Video with Mpeg2 System Selected

This warning message indicates that you have checked the MPEG2 Configure selection and the multiplexer has determined that the video stream you have selected in the Input Video edit box is of MPEG-1 format. This combination will produce a legal MPEG stream. The message is just a warning to verify that you are multiplexing the correct elementary video stream into the correct system stream.

Depressing the YES button will cause the Multiplexer to continue with the multiplexing. Depressing the NO button will terminate the multiplexing session and allow you to select the appropriate Configuration or Video file.

6.2 Mpeg2 Elementary Video with Mpeg1 System Selected

This warning message indicates that you have checked the MPEG1 Configure selection and the multiplexer has determined that the video stream you have selected in the Input Video edit box is of MPEG-2 format. This combination will produce a legal MPEG stream. The message is just a warning to verify that you are multiplexing the correct elementary video stream into the correct system stream.

Depressing the YES button will cause the Multiplexer to continue with the multiplexing. Depressing the NO button will terminate the multiplexing session and allow you to select the appropriate Configuration or Video file.

6.3 Bit Rate Selected too Low

This dialog is a warning that the analysis of the video and audio streams has determined that the stream resulting from the multiplexing operation will exceed the bit-rate selected in the Configure dialog. The details of the analysis appear in the dialog window. The bit-rate of the video, the audio, and of each of the headers is listed in the window. The minimum bit-rate predicted is listed in the Multiplexed Bit-rate window.

Depressing the YES button will cause the multiplexer to multiplex the video and audio files at the bit-rate listed in the Multiplexed Bit-rate window.

Depressing the NO button will terminate the multiplexing session in order for you to change the file name or configure parameters.

Note that when the dialog appears, you can enter any bit-rate in the Multiplexed Bit-rate window. The multiplexer will enter this value in the system header (to inform the decoder of the bit-rate) and attempt to multiplex the stream at this bit-rate. The multiplexer will add stuffing packets if this bit-rate is higher than that of the elementary streams and the system overhead. If the selected bit-rate is lower than the sum of the elementary streams and the overhead, the multiplexer will multiplex with no stuffing packets, will not discard video or audio elements, but will exceed the selected bit-rate.

Note that the multiplexing statistics in the dialog box are useful in determining what, if any system multiplexing options can be changed in order to attain the desired bit-rate. Increasing the pack and packet sizes, for example, result in a lower system overhead and a lower system bit-rate.

6.4 Video Start Code Not Found

The Multiplexer cannot find Video Start Code message is an error condition that will result in the termination of the multiplexing operation. You need to select a different video file and restart the multiplexer. The most common cause of this message is the selection of a non-MPEG file as input video source.

TransMux searches the Input Video File for the Video Start Code of 0x000001B3. Although most video encoders start the video file with this header, some encoders add stuffing data at the start of video files. TransMux looks a ways into the stream and, if it cannot find this header, outputs this message and terminates the multiplexing.

6.5 Invalid Picture Rate Code

The Invalid Picture Rate Code message is a warning message that indicates that the frame rate code found in the elementary video stream is a reserved code and the multiplexer can-not determine the frame rate from this value. Selecting YES will cause the multiplexer to continue with the multiplex operation using a default frame rate of 29.97 frames per second. Selecting NO will terminate the multiplexing operation and allow you to select another video file for multiplexing.

Invalid Picture Rate Codes are most frequently the result of a corrupt video stream. Some encoders, like those from PixelTools, have the capability create video with non-standard picture rates (like 15 frames per second). In this case, you may want the multiplexer to process the video even though it includes a reserved picture rate.

7. TransMux Detailed Specifications

8. Inputs:

Accepts MPEG1 and MPEG2 video elementary streams (including streams of > 4Gytes in length.)

Accepts MPEG1 and MPEG2 layer one and layer two audio elementary streams, Dolby AC3, and AAC in the transport mode

Accepts 0 – 2 Video streams in transport mode.

Accepts 0 – 2 Audio streams in transport mode..

9. Multiplexing:

Produces ISO 11172-1 MPEG-1 Streams and ISO 13818-1 MPEG-2 Streams

Provides complete user control over multiplexing parameters

10. Observability of

Audio and Video Statistics