

Doc. PSIP Pro-001r4  
March 15, 2006



# PSIP PRO USER GUIDE



1208 W. Northwest Hwy Palatine IL 60067  
Telephone 847.919.3550 Fax 847.991.9550  
[www.dtvinnovations.com](http://www.dtvinnovations.com)

## REVISION HISTORY

<b>REVISION</b>	<b>DESCRIPTION</b>	<b>DATE</b>
Preliminary	Preliminary Chapters	July 1, 2003
Revision 2	Additional Chapters	January 20, 2004
Revision 3	Version 2.1 Update	November 4, 2004
Revision 4	Version 2.2 Update	March 15, 2006

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## 1. OVERVIEW

### 1.1 Informative

The Advanced Television System Committee (ATSC) A/65B specification describes the program and system information protocol (PSIP) as a collection of tables designed to operate within the DTV transport stream. Its purpose is to describe the information at the system and event levels for all virtual channels carried in a particular transport stream to allow program schedule information to be displayed on ATSC-compatible DTV receivers.

For detailed information, refer to the A/65B specification found at [www.atsc.org](http://www.atsc.org). Annex D has an informative overview of PSIP for terrestrial broadcast with examples.

PSIP is System Information (SI) and Program Guide (PG) data, is compatible with digitally multiplexed bit streams and is constructed in accordance with ISO/IEC 13818-1 (MPEG-2 Systems) standard. Specific information can be found at [www.iso.org](http://www.iso.org).

### 1.2 PSIP Pro

PSIP Pro is a PSIP generator with a comprehensive and easy to use interface which allows generation, editing, navigation, and searching of DTV program schedules. It provides all ATSC required PSIP tables and supports FCC and ATSC recommended practices. Advanced functions such as recurring events, default event, search event gaps, search event overlap and event overrun control are provided to minimize user input. PSIP Pro has the ability to import information about the audio and video services directly from the encoding system and insert them automatically into PSIP tables. PSIP Pro outputs PSIP transport packets utilized in the multiplexer. Users have the flexibility to customize the output such as setting the number of days of program schedules to be sent and cycle times for various PSIP tables. PSIP Pro also includes a password feature to protect virtual channel information from unauthorized modification.

## 2. SYSTEM REQUIREMENTS

### 2.1 PC Requirements

PSIP Pro requires a PC that meets the following minimum requirements before beginning installation.

- 1) Windows 2000/XP operating system.
- 2) 400MHz Pentium II
- 3) 128MB RAM
- 4) CD-ROM
- 5) 4 GB Hard Drive
- 6) 1024 x 768 Display, 16 Bit Color
- 7) 10/100 BaseT Ethernet Card (depending on configuration)
- 8) 1 PCI Bus Slot (required for optional ASI card only)

## 2.2 Network requirements

PSIP Pro may require a 10/100 BaseT Ethernet (IP) connectivity between the PC and the MPEG-2 encoder utilizing a 10/100 BaseT Ethernet hub or switch (depending on configuration).

## 3. INSTALLATION

### 3.1 Before Installation

Before installing PSIP Pro, determine if you have the optional ASI, PCI card. Only Harris encoding systems DO NOT require the optional ASI cards, all other encoding systems DO. If not, skip to section 3.3.

If so, Please refer to your personal computers user manual for instructions on installing PCI cards into available PCI card slots.

After you have completed installation of the PCI card, install the PCI card drivers located on a separate disc labeled “PSIP Pro PCI Drivers”.

### 3.2 PCI Card Driver Installation

Follow the steps below to install the PSIP Pro PCI card driver software.

- 1) After you have installed the PCI card. Turn your computer on.
- 2) The Add Hardware Wizard will automatically launch if not, launch it from the control panel directory. Click next to continue.

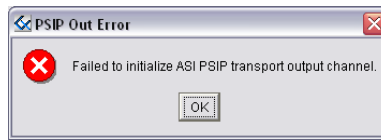


- 3) Insert the PCI card Driver Software disk into the CD drive.

- 4) Using the wizard, continue the installation by browsing to locate the driver files located on the disk. Please refer to your PC user manual for instructions on installing new hardware.

**Congratulations!** PSIP Pro PCI card drivers are now installed on your computer.

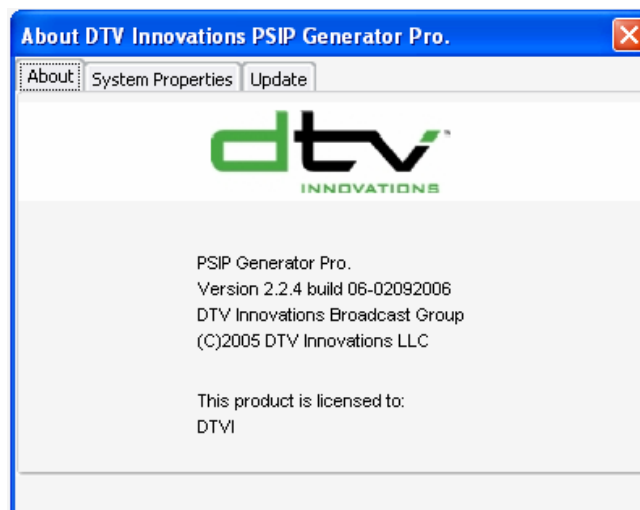
**NOTE!** If the PCI card drivers are not properly installed you will see the following errors in succession. In this case, re-install the PCI card drivers as described in this section. Also refer to your computer's user manual on installation of PCI cards.



### 3.3 Verify Previous Versions

**IMPORTANT!** Before installing PSIP PRO, determine if you have a previous version of PSIP Pro installed on the destination PC. If so, use the “NEW” PSIP Pro software installer to remove the old version first.

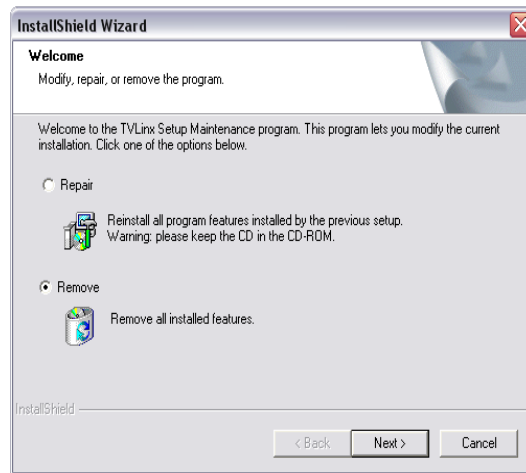
To determine which version you have installed, from the main menu pull down on Help, About.



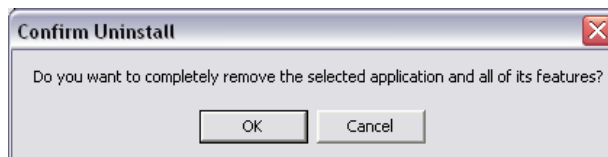
### 3.4 Un-Install Previous Versions

Follow the steps below to Un-install PSIP Pro PSIP software.

- 1) Insert the PSIP Pro PSIP CD into CD-ROM drive.
- 2) The install wizard will automatically launch. Click next to continue.
- 3) The install wizard will prompt you upon initial install. Check “Remove” Click next to continue.



- 4) The install wizard will prompt you to confirm. Click OK to continue.

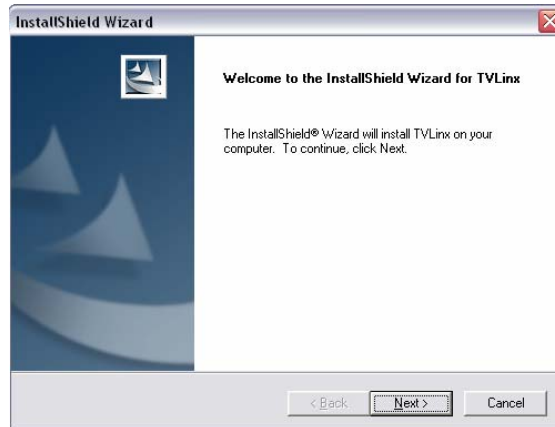


- 5) The install wizard will remove the previous version. Click Finish to continue.

### 3.5 PSIP Pro Installation

Follow the steps below to install PSIP Pro software.

- 1) Insert the PSIP Pro CD into CD-ROM drive.
- 2) The install wizard will automatically launch. Click next to continue.

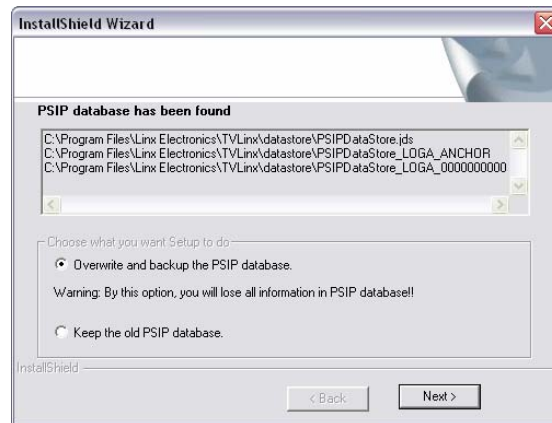


- 3) Enter the appropriate user information and check the appropriate radio button. Click next to continue.

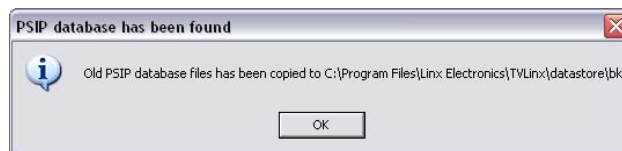


- 4) Read the license agreement. Click yes to continue.
- 5) Select the appropriate Setup. Click next to continue.

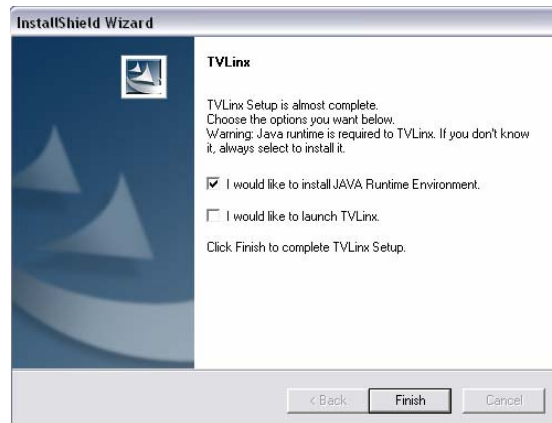
- 6) The Install Shield wizard offers you an opportunity to review selections before installation. Click next to continue.
- 7) Install Shield will install the PSIP Pro software.
- 8) During installation, PSIP Pro will look for previous versions database information. If found you will be prompted to Overwrite or Keep. Make the appropriate selection. Click next to continue.



- 9) If a previous versions database is found and you have checked Overwrite, a back up copy will be saved and you will be prompted with the directory location where the files will be kept. If you have checked Keep, the database will be located in the same directory as the application. Click OK to continue.



**NOTE!** The Install Shield wizard will prompt you to install JAVA Runtime Environment and/or to proceed to launch PSIP Pro. JAVA Runtime Environment is required in order to run PSIP Pro. If it is not already installed on your computer, you should check the JAVA Runtime Environment box and continue the installation.



10) Read the license agreement. Click yes to continue.

11) Choose the destination location. Click next o continue.

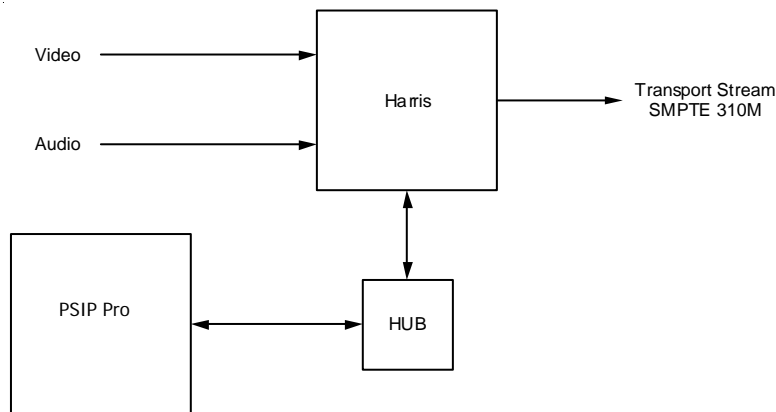
**Congratulations!** PSIP Pro is now installed on your computer and a shortcut has been added to your desktop.

#### 4. SYSTEM CONFIGURATION

Determine which encoder you are using Harris, Tandberg, Tiernan or Harmonic. There are two types of systems, single or multi-encoder systems. The PSIP Pro application communicates with the encoder in two cases, all of the Harris configurations and the Tandberg, single encoder only version. In these configurations the PSIP Pro PSIP application will acquire the audio and video service information from the encoder and populate the appropriate PSIP tables automatically. In all other cases the audio and video service information will have to be entered into the PSIP Pro PSIP application manually.

##### 4.1 Harris Encoding System

The Harris encoding system is unique in comparison with other encoding systems. The Harris encoder was designed to interconnect to a PSIP generator in the same way, whether it's a single or multi-encoder system. The Harris encoding system is physically configured by connecting the NIM-100 Ethernet port to an open port on a 10/100baseT Ethernet hub or switch utilizing a standard RJ45 Ethernet cable. Connect the PSIP Pro's PC Ethernet port to an open port on the same hub.



Two settings on the Harris encoding system need to be configured to allow passage of PSIP data. Under the trunk properties set the “Auxiliary Data Bitrate” to 250,000bps and turn off “Carousel Streaming”. Also, take note of the Harris encoder IP address, it will be used later to communicate with the PSIP Pro software.

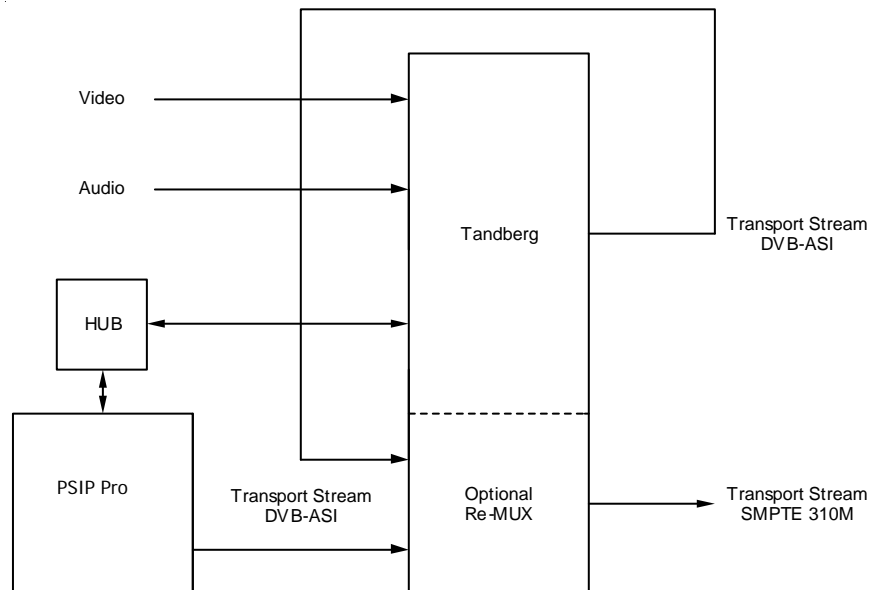
##### 4.2 Tandberg Encoding Systems

The Tandberg encoding system can be configured many different ways, from a single encoder to a multi-encoder system utilizing an external multiplexer. The single encoder system will require a Re-MUX card.

**NOTE!** Not all models of Tandberg encoders can utilize the Re-MUX card. Check with your authorized dealer to determine which model and version of software you have to determine if the Re-MUX card will work with your encoder. If not, you will have to utilize an external multiplexer.

### 4.3 Tandberg – Single Encoder System

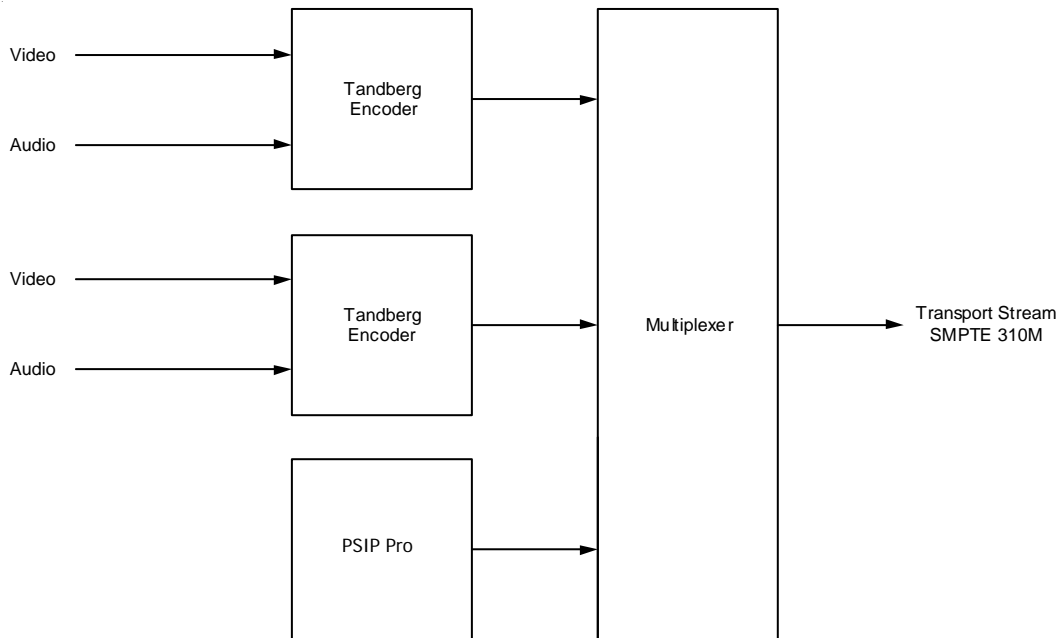
The Tandberg single encoder system can be configured physically by connecting the encoder Ethernet port to an open port on a 10/100baseT Ethernet hub or switch utilizing a standard RJ45 Ethernet cable. Connect the PSIP Pro PC Ethernet port to an open port on the same hub. The DVB-ASI transport stream output from the Tandberg encoder is fed back into the optional Re-MUX card along with the DVB-ASI output of the PSIP Pro Software.



Configuration settings on the Tandberg encoder need to be configured to allow passage of PSIP data. Please refer to the encoder user manual or contact your authorized Tandberg technical support center. Also, take note of the Tandberg encoder IP address, it will be used later to communicate with the PSIP Pro Software.

#### 4.3.1 Tandberg – Multi Encoder System

The Tandberg multi encoder system can be configured physically by connecting the DVB-ASI outputs of the Tandberg encoders to an external multiplexer along with the DVB-ASI output of the PSIP Pro utilizing 75ohm BNC cables.



Configuration settings for the Tandberg or Non-Tandberg multiplexer need to be configured to allow passage of PSIP data. Please refer to the multiplexer user manual or contact your authorized multiplexer technical support center.

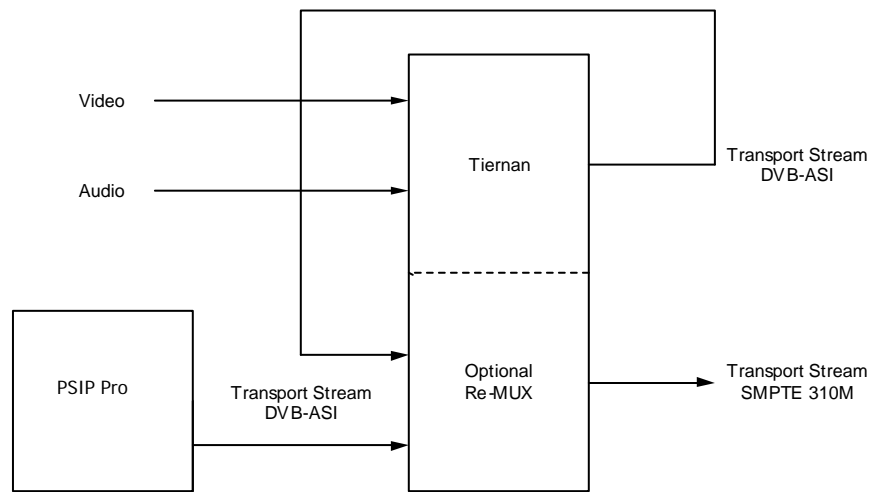
#### 4.4 Tiernan Encoding Systems

The Tiernan encoding system can be configured many different ways, from a single encoder to a multi-encoder system utilizing an external multiplexer. The single encoder system will require a Re-MUX card.

**NOTE!** Not all models of Tiernan encoders can utilize the Re-MUX card. Check with your authorized dealer to determine which model and version of software you have to determine if it will work. If not, you will have to utilize an external multiplexer.

##### 4.4.1 Tiernan – Single Encoder System

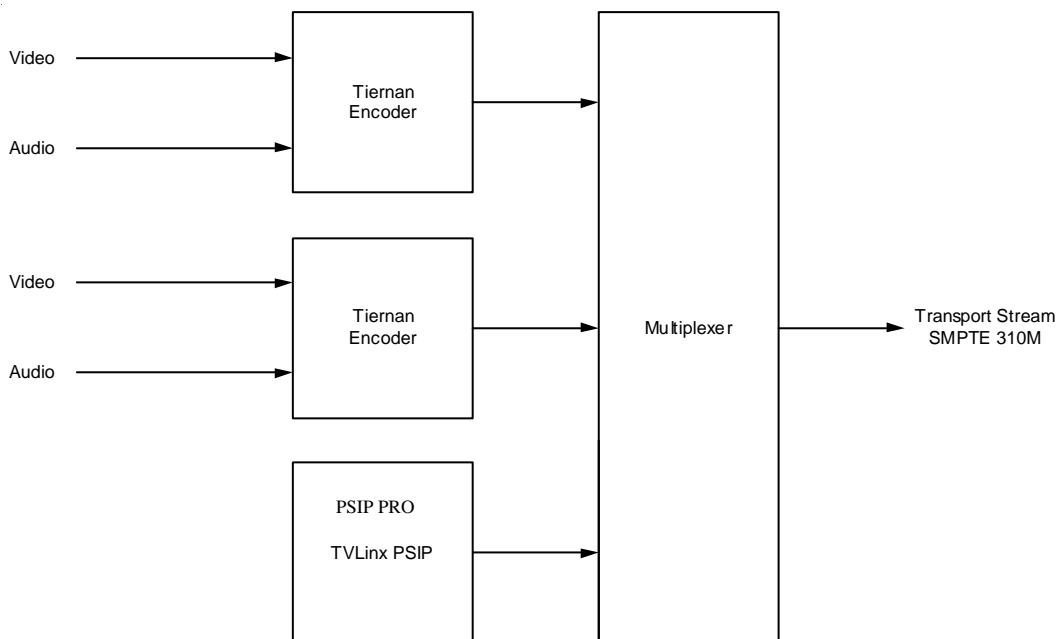
The Tiernan encoder can be configured physically by connecting the DVB-ASI outputs of the Tiernan encoder back into the optional Re-MUX card along with the DVB-ASI output of the PSIP Pro utilizing 75ohm BNC cables.



Configuration settings on the Tiernan encoder need to be configured to allow passage of PSIP data. Please refer to the encoder user manual or contact your authorized Tiernan technical support center.

#### 4.4.2 Tiernan – Multi Encoder System

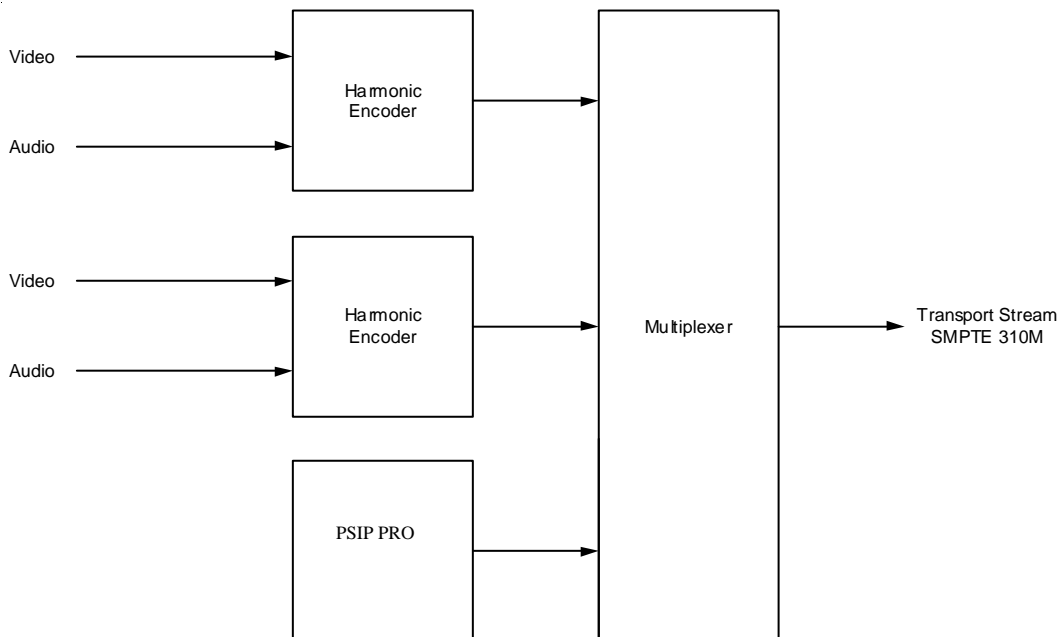
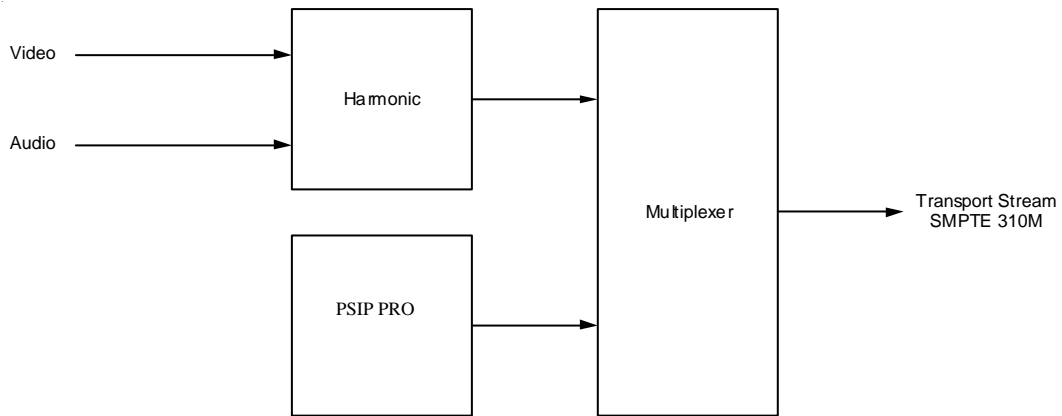
The Tiernan multi encoder system can be configured physically by connecting the DVB-ASI outputs of the Tiernan encoders to an external multiplexer along with the DVB-ASI output of the PSIP Pro utilizing 75ohm BNC cables.



Configuration settings for the Tiernan or Non-Tiernan multiplexer need to be configured to allow passage of the PSIP data. Please refer to the multiplexer user manual or contact you authorized multiplexer technical support center.

#### 4.5 Harmonic Encoding Systems

The Harmonic encoding system whether it is a single or multi encoder system is configured the same utilizing an external multiplexer. Either of the Harmonic encoding systems can be configured physically by connecting the DVB-ASI outputs of the Harmonic encoder/s to an external multiplexer along with the DVB-ASI output of the PSIP Pro utilizing 75ohm BNC cables.



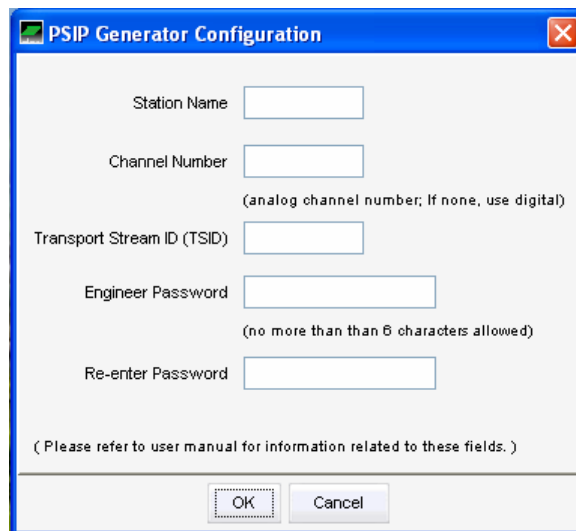
Configuration settings for the Harmonic or Non-Harmonic multiplexer need to be configured to allow passage of the PSIP data. Please refer to the multiplexer user manual or contact you authorized multiplexer technical support center.

### 5. BEFORE STARTING PSIP PRO

Before launching PSIP Pro, verify the encoder and multiplexer have been turned on and properly configured (See Chapter 4, System Configuration).

### 6. STARTING PSIP PRO

- 1) Turn on the computer. The Java runtime environment will start automatically.
- 2) Double click the PSIP icon located on desktop.
- 3) If it is your first time launching PSIP Pro, the PSIP Pro Configuration interface will be displayed. Fill in the requested information (section 6.1).



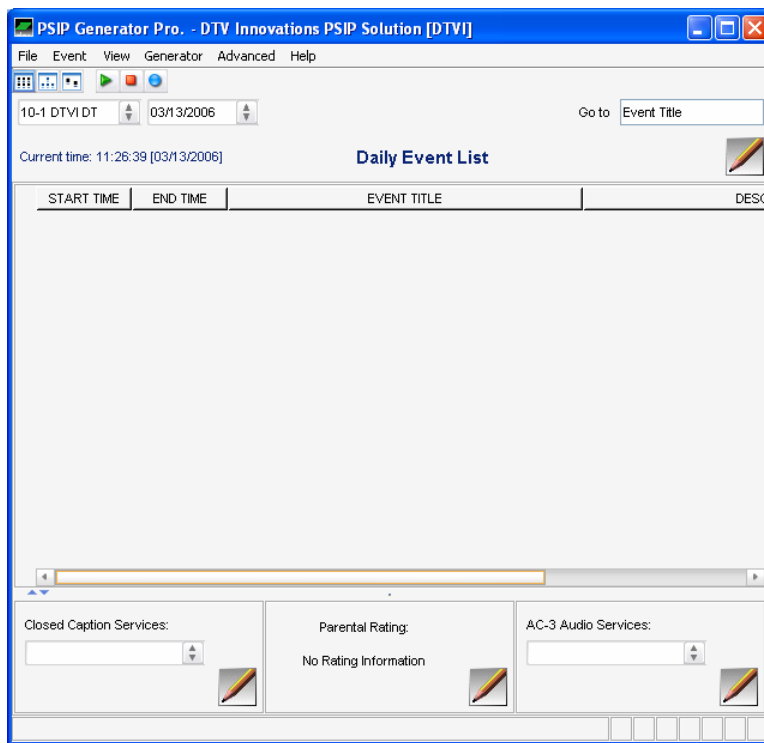
- 4) If it is not the first time you launched PSIP Pro, the main interface screen of PSIP Pro will be presented.

#### 6.1 PSIP Pro Configuration

- 1) *Station Name*: Enter your stations “Analog” call letters without extensions for example WTOL. NOT WTOL-TV or WTOL-DT. If you have three letters, only use three letters for example WIS. NOT WIS-TV or WIS-DT. **Important**: The Station Name must match the call letters printed on the CD (all cap’s).
- 2) *Channel Number*: Enter your stations “Analog” channel number. If none, enter Digital.

- 3) *Transport Stream ID*: Enter your stations “Digital” transport stream ID. You will find a list of transport stream ID’s at [www.mstv.org](http://www.mstv.org) under engineering papers. Look for your city and state then look for your analog channel number to locate your TSID. Note you will find both your analog and digital channels TSID’s, use the Digital TSID.
  
- 4) *Engineering Password*: Enter and re-enter an engineering password. This will protect the system settings from unauthorized persons.

Once you have finished, the main interface screen of PSIP Pro will be presented.



**IMPORTANT!**

At this point several elements need to be configured before proceeding to chapter 7. See list below.

- 1) Generator – Table Cycle Time & Table Features (Chapter 8.4.4)
- 2) Virtual Channels & Service Elements (Chapter 8.5.3.1)
- 3) Environments (Chapter 8.5.3.2)

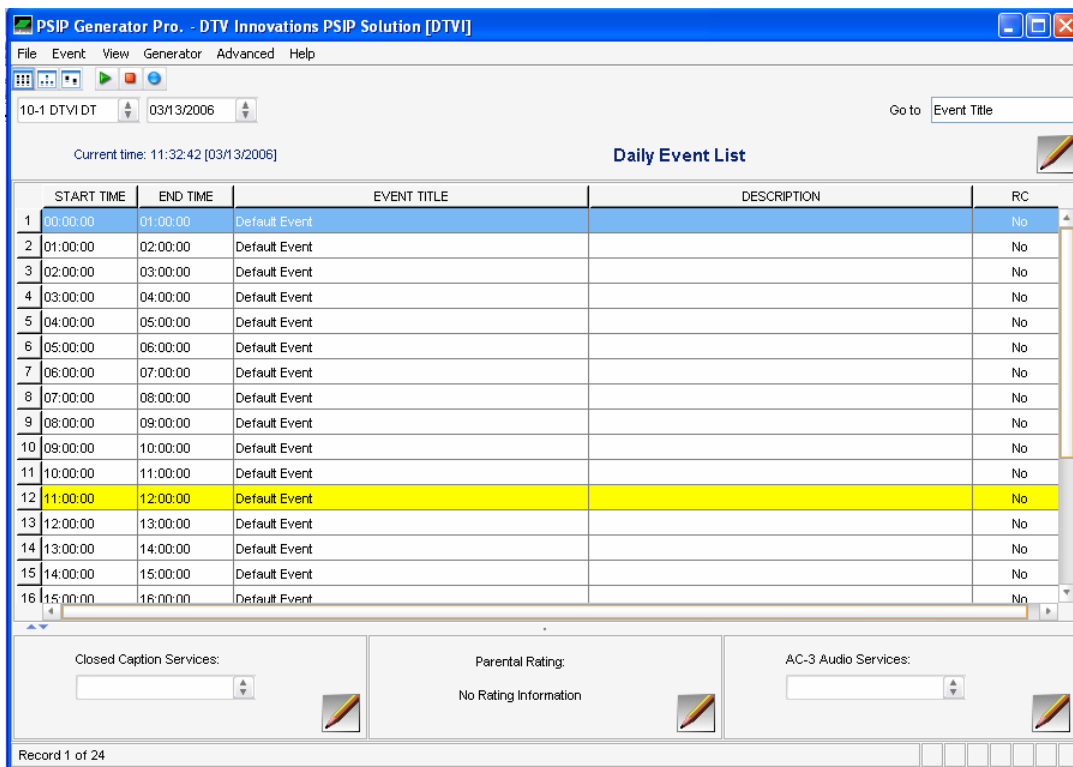
Now that you have completely configured the PSIP Pro system, you are ready to create events. Creation of events, either automatically or manually will require you to add the Closed Caption, Rating and Audio descriptors (Chapter 9).

PSIP Pro will populate the descriptors in two ways. The first way is by manually entering descriptors for each event. The second way is by setting up a default event with descriptors. If an event is On Air and the descriptor fields are blank, PSIP Pro will insert the descriptors defined in the default event.

### 7. PSIP PRO MAIN INTERFACE SCREEN

When you start PSIP Pro, the main interface displays the Daily Event List for the selected virtual channel and date. The event list for different virtual channels and dates can be displayed by selecting the channel and/or date from the pull down menus in the top left corner. In the top right corner is a Go To window. Start typing the name of the event you wish to find and the highlight bar goes to the desired event. Under the Go To window is the Edit Event button.

The Daily Event List shows the Start and End times for each event. The Event Title and Description for each event follows the times. The last column indicates whether the event has Redistribution Control.



The yellow highlighted bar indicated the current event. Below are the Closed Caption, Content Advisory and AC-3 Audio Descriptors display window for the currently selected event.

Notice the selected event has a highlight color of grey and the current event has a highlight color of yellow.

## 8. PSIP PRO MENUS

The following text is intended to describe the functions associated with each menu selection.

### 8.1 File

There are two submenus Import From and Exit.

#### 8.1.1 Import From

The “Import From” menu imports the associated files from any of the three Environments, found in the Import From submenu Automation, Encoder and TMS Server. This should be done at the conclusion of the configuration process. If no data is ingested, please check your network connections and refer to System Configuration (Chapter 4) and Environments (Chapter 8.5.3.2).

#### 8.1.2 Exit

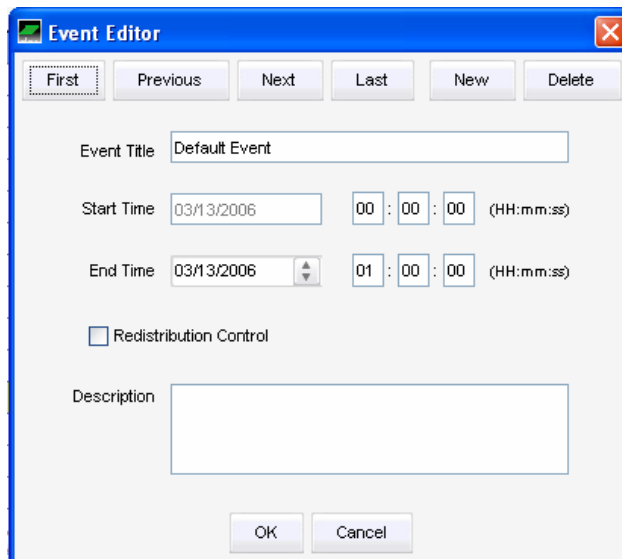
To “Exit” the application, select Exit.

### 8.2 Event

There are nine submenus Edit, Delete All, Default Fill, Over Run, Go To Current, Find, Populate, Populate All and De-Populate. Find has two submenus Over Lap and Gap.

#### 8.2.1 Edit

Edit opens the Event Editor. In the Event Editor you will see buttons, input fields and a check box.



#### 8.2.1.1 First, Previous, Next and Last

These buttons are basic navigation buttons. Observe the PSIP Pro main interface screen in the background. When you select Previous and Next, you will see the grey highlight selection bar cycle up and down the event list. The First button will take you to the first event. The Last button will take you to the last event in the list.

#### 8.2.1.2 New, Delete

The New button will create a new event in the event list. The new event will be indicated by the grey highlight selection bar. The Delete button will delete the grey highlighted event.

#### 8.2.1.3 Event Title

The Event Title is generally the name of the program. Next are the start and end, Date and Times for the event. The Description is generally episode related information describing the event in detail.

**NOTE!** This information will be seen in the program guide and displayed on ATSC-compatible DTV receivers.

#### 8.2.1.4 Start and End (Date and Time)

Each event has a Start and End, Date and Time. Events can cross the day boundary. You will notice the Start Day is grayed out because you can not enter a date before the current day.

#### 8.2.1.5 Redistribution Control (Descriptor)

The Redistribution Control (sometimes referred to as the Broadcast Flag) is described in the ATSC A/65B specification. The descriptor's existence within the ATSC stream shall mean: "technological control of consumer redistribution is signaled."

#### 8.2.1.6 OK, Cancel

OK accepts the changes and Cancel ignores any changes and backs out of the Event Editor.

### 8.2.2 Delete All

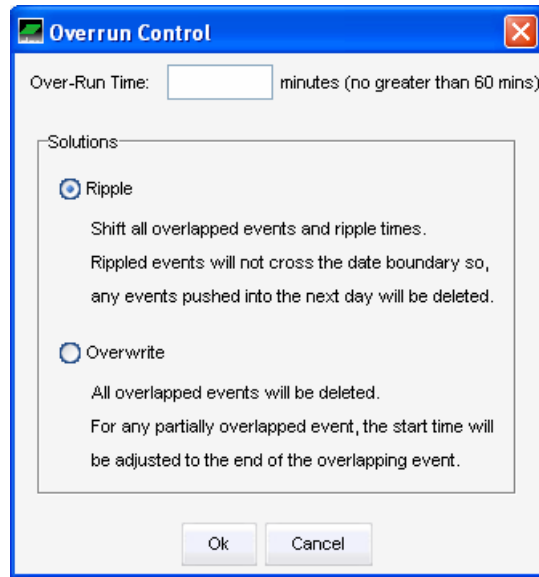
Delete All will delete all events from the selected list. Select the virtual channel and date for the list you want to delete. A confirmation window will appear. Click "Yes" to continue.

### 8.2.3 Default Fill

Default fill will fill the selected daily event list with default events. Select the virtual channel and date for the list you want to fill. To change the duration of the default event, see (Chapter 8.3.3).

### 8.2.4 Overrun

The event Overrun control will allow you to manage events that run over their normal event time. Select Overrun from the event pull down menu. The Overrun control window will appear. Enter the time (in minutes) that the event will over run. Select how you want to deal with the event being over run Ripple or Overwrite. The definition for each is displayed on the Overrun Control window.

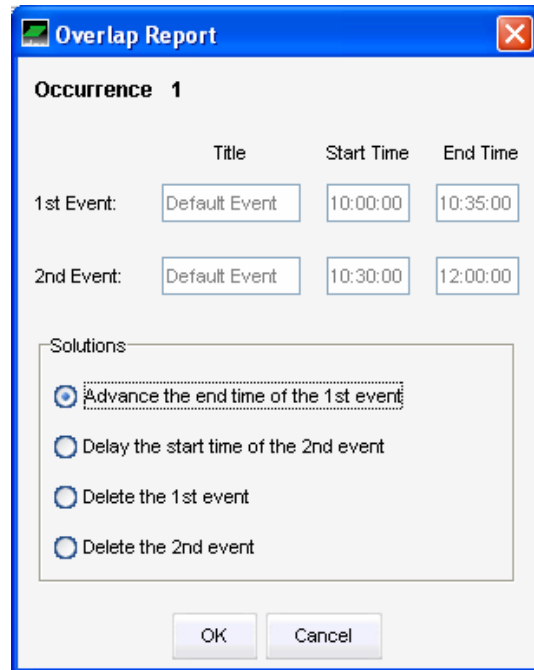


### 8.2.5 Go To Current

“Go To” takes you to the current event with reference to time of day.

### 8.2.6 Find – Overlap

“Find Overlap” locates events with durations that overlap. When an overlap is found the Overlap Report window appears.



The Overlap Report window allows four options for correcting the overlap.

#### 8.2.6.1 Advance the End Time of the 1st Event

This option corrects the end time of the 1st event with reference to the 2nd event start time.

#### 8.2.6.2 Delay the Start Time of the 2nd Event

This option corrects the start time of the 2nd event with reference to the 1st events end time.

#### 8.2.6.3 Delete the 1st Event

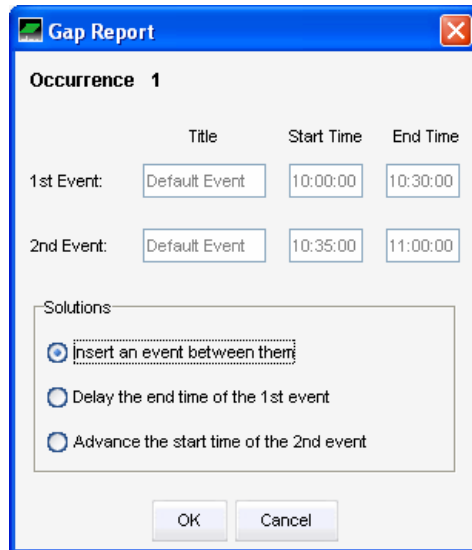
This option deletes the 1st event. After the event is deleted a gap will remain and further correction is required.

#### 8.2.6.4 Delete the 2nd Event

This option deletes the 2nd event. After the event is deleted a gap will remain and further correction is required.

#### 8.2.7 Find – Gap

Find Gap locates gaps between events. When a Gap is found the Gap Report window appears.



The Gap Report window allows three options for correcting a gap.

#### 8.2.7.1 Insert an Event between them

This option inserts a new event between the 1st event and 2nd event.

#### 8.2.7.2 Delay the End Time of the 1st Event

This option corrects the end time of the 1st event with reference to the 2nd event start time.

#### 8.2.7.3 Advance the Start Time of the 2nd Event

This option corrects the start time of the 2nd event with reference to the 1st events end time.

### 8.2.8 Populate

Populate is only active in the pull down menu while in the Recurring Event view. “Populate” inserts the selected event into the Daily Event list for the duration defined in the Recurring Event editor.

### 8.2.9 Populate All

Populate All is only active in the pull down menu while in the Recurring Event view. “Populate All” inserts the all of the events from the Recurring Events view window into the Daily Event list for the duration defined in the Recurring Event editor for each event.

### 8.2.10 De-Populate

De-Populate is only active in the pull down menu while in the Recurring Event view. “De-Populate” removes selected event Recurring Event, from the Daily Event list for the original duration defined when the recurring event was created.

### 8.3 View

“Views” switches between three windows Daily Events, Recurring Events and Default Events. While each window may appear the same, they have completely different functions, explained below.

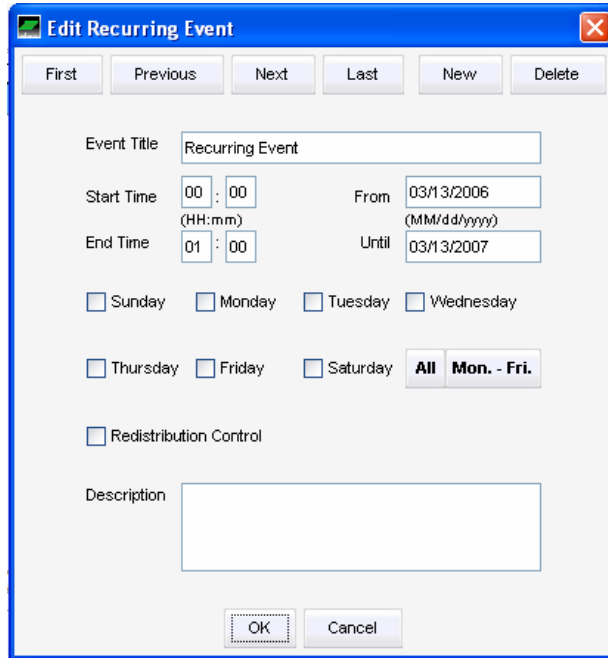
#### 8.3.1 Daily Events

The “Daily Events” window is the main GUI interface window. It will be the screen that is displayed after you are finished entering and editing events. The Daily Events list displays a yellow highlighted bar to indicate the current “On Air” event.

You will enter all events from this screen with the exception of Recurring and Default Events.

#### 8.3.2 Recurring Events

The edit “Recurring Events” window allows you to enter events that Re-occur during the broadcast week over a defined period of time i.e. a soap opera or news at noon. After a Recurring Event is entered and accepted you will need to populate the Daily Event list as discussed in (Chapter 8.2.8).



#### 8.3.2.1 First, Previous, Next and Last

These buttons are basic navigation buttons. Observe the PSIP Pro main interface screen in the background. When you select Previous and Next, you will see the grey highlight selection bar cycle up and down the event list. The First button will take you to the first event. The Last button will take you to the last event in the list.

#### 8.3.2.2 New, Delete

The “New” button will create a new event in the event list. The new event will be indicated by the grey highlight selection bar. The “Delete” button will delete the grey highlighted event.

#### 8.3.2.3 Event Title

The “Event Title” is generally the name of the program. Next are the start and end, Date and Times for the event. The Description is generally episode related information describing the event in detail.

**NOTE!** This information will be seen in the program guide and displayed on ATSC-compatible DTV receivers.

#### 8.3.2.4 Start and End (Date and Time)

Each event has a “Start and End, Date and Time”. Events can cross the day boundary. You will notice the Start Day is grayed out because you can not enter a date before the current day.

### 8.3.2.5 Recurrence

In the edit “Recurring Event” window, you will notice check boxes for each day of the week along with buttons for All and Mon -Fri. You can manually check the days for which the event will repeat or select one of the two buttons.

### 8.3.2.6 Redistribution Control (Descriptor)

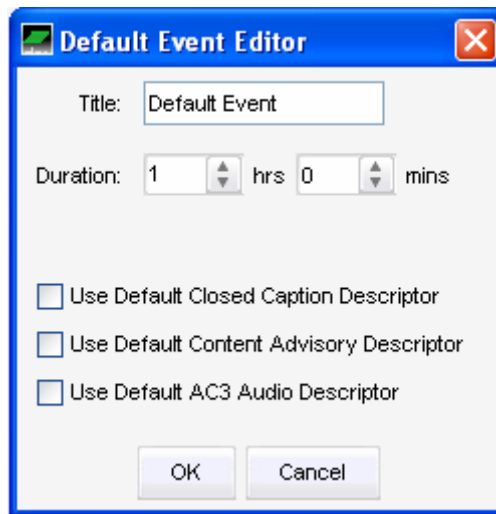
The “Redistribution Control” (sometimes referred to as the Broadcast Flag) is described in the ATSC A/65B specification. The descriptor’s existence within the ATSC stream shall mean: “technological control of consumer redistribution is signaled.”

### 8.3.2.7 OK, Cancel

“OK” accepts the changes and “Cancel” ignores any changes and backs out of the Edit Recurring Event editor.

## 8.3.3 Default Events

The “Default Events” editor allows you to define the Default Event used in (Chapter 8.2.3).



### 8.3.3.1 Title

Enter a title for the “Default Event”. This may be whatever

### 8.3.3.2 Duration

Enter the default duration in increments of half hour or one hour.

### 8.3.3.3 Descriptors

Select the descriptors you want the default event to use. For more information on descriptors see (Chapter 9).

## 8.4 Generator

From the “generator” menu, you control the PSIP Pro.

### 8.4.1 Start

Starts the PSIP Pro. The PSIP information will be output from the appropriate output (UDP/IP or ASI).

### 8.4.2 Stop

Stops the PSIP Pro from outputting PSIP data.

### 8.4.3 Update

Update, updates the PSIP data with any changes and outputs the new or “Updated” information.

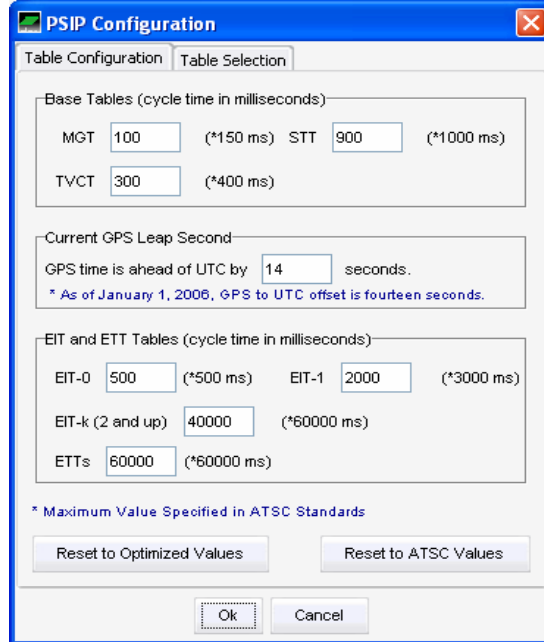
### 8.4.4 Configuration

Configuration allows set up of the Table Cycle Times and Table Features.

#### 8.4.4.1 Setting Up Table Cycle Time

The “Table Cycle Times” are set to the ATSC A/65B specification default values. It is recommended you not change these setting unless you completely understand what is being affected. If it is necessary to change the cycle times, follow the steps below.

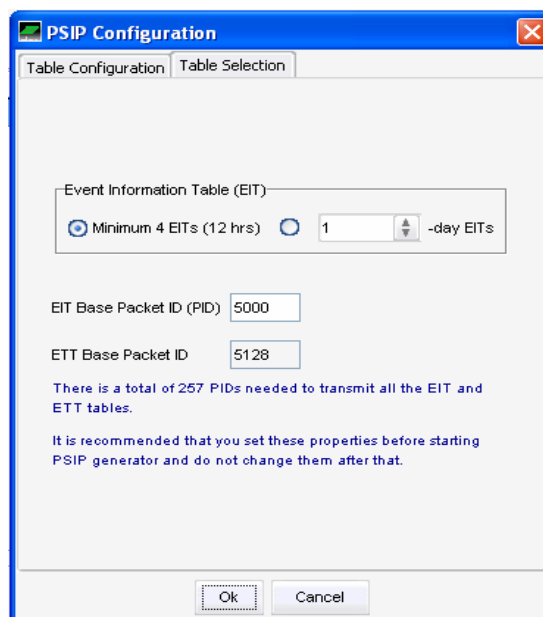
- 1) From the main menu pull down on Generator, Configuration. The PSIP Configuration window appears.
- 2) Click the Table Configuration tab.
- 3) Change the desired cycle times or select one of the reset values (ATSC or Optimize)
- 4) Click OK to accept or Cancel to escape.



#### 8.4.4.2 Setting Up the Table Features

This function allows you to set the number of Event Information Tables (EIT). The ATSC A/65B specification allows a minimum of 4 EITs (4 hours) up to a maximum of 16 days. You have the ability to set the Packet ID (PID) for the EIT and Extended Text Table (ETT).

- 1) From the main menu pull down on Generator, Configuration. The PSIP Configuration window appears.
- 2) Click the Table Selection tab.



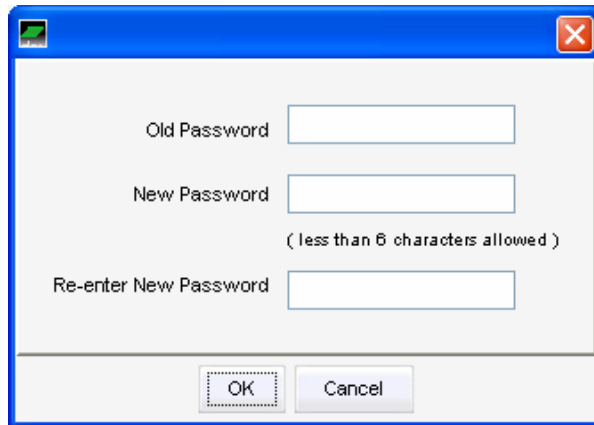
- 3) Select the number of EITs you desire to send.
- 4) Enter PIDs for the EIT and ETT or use the default values.
- 5) Click OK to accept or Cancel to escape.

## 8.5 Advanced

### 8.5.1 Change Password

To change the engineering password, follow the steps below.

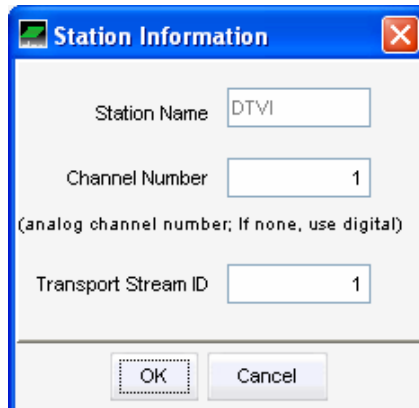
- 1) From the main menu pull down on, Advanced, Change Password.
- 2) Enter the Old Password, Enter and Re-enter a New Password and click OK.



### 8.5.2 Station Configuration

To change the station configuration (after it's already been configured during the initial setup) follow the steps below.

- 1) From the main menu pull down on, Advanced, Station Configuration.
- 2) Enter the engineering Password. Click OK to continue.



Notice, you will not be allowed to change the Station Name. The PSIP Pro utilizes your stations call letters as part of a security system to prevent unauthorized use.

To change the Major channel number, enter the new number in the Channel Number field. This will be your stations Analog channel number. If you DO NOT have an analog channel, enter the Digital channel number.

To change the Transport Stream ID (TSID), enter your stations “Digital” transport stream ID. You will find a list of transport stream ID’s at [www.mstv.org](http://www.mstv.org) under engineering papers. Look for your city and state then look for your analog channel number to locate your TSID. Note you will find both your analog and digital channels TSID’s, use the Digital TSID.

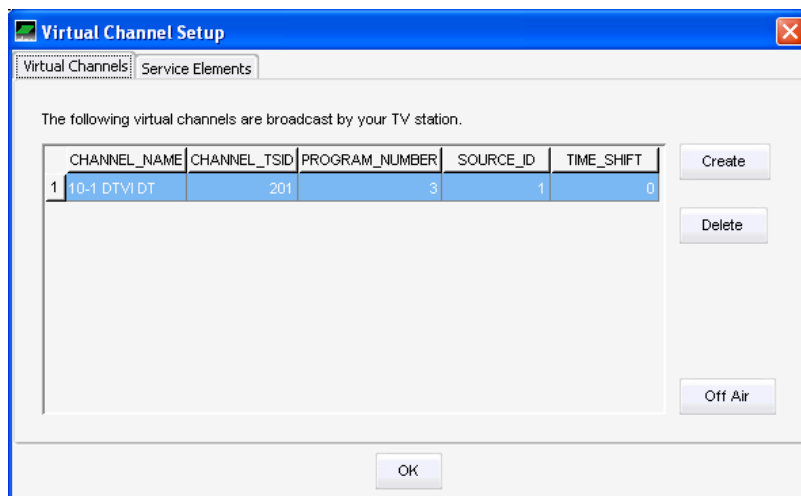
### 8.5.3 Setup

Set Up configures the Virtual Channels (including service elements) and Environments (including Encoder, Crispin, MediaStar, PMCP File Import and Tribune Media Service) When PSIP Pro is launched for the first time, a default virtual channel is created utilizing information you have provided in (Chapter 6.1). If your station has more than one virtual channel or you want to change the properties of the default virtual channel or services, open the virtual channel setup window.

#### 8.5.3.1 Virtual Channels and Service Elements

To open the virtual channel setup window, follow the steps below.

- 3) From the main menu pull down on, Advanced, Setup, Virtual Channels.
- 4) Enter the engineering password, Click OK to continue. The virtual channel setup window appears.



### 8.5.3.1.1 Virtual Channels

Under the Virtual Channels tab, you have four choices Create, Delete, Off Air and OK. Notice, there is NO Edit button. To make changes to a virtual channel you have to re-create it.

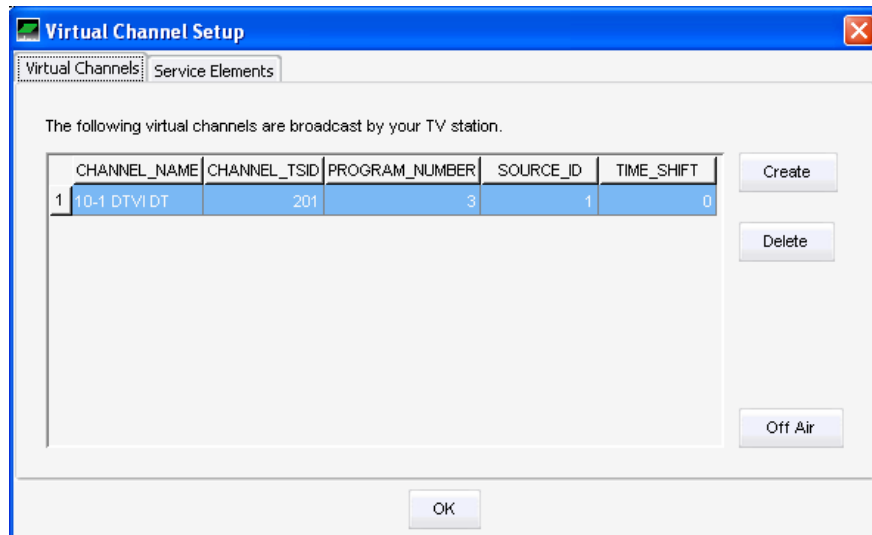
Create – Creates a new virtual channel.

Delete – Deletes the selected virtual channel.

Off Air – Makes the channel Hidden (Inactive or Active). Refer to (Chapter 8.5.3.1.2).

OK – Accepts changes.

You will notice several elements in the Virtual Channel window. Major/Minor Channel, Short Name, TSID (above), Program Number, Source ID, Time Shift and Broadcast Flag (below).



For information on these elements, refer to (Chapter 8.5.3.1.3) - Create Virtual Channel.

### 8.5.3.1.2 Active or inactive channels

As defined in the ATSC A/65B specification,

**hidden** — A 1-bit Boolean flag that indicates, when set, that the virtual channel is not accessed by the user by direct entry of the virtual channel number. Hidden virtual channels are skipped when the user is channel surfing, and appear as if undefined, if accessed by direct channel entry. Typical applications for hidden channels are test signals and Nvod services. Whether a hidden channel and its events may appear in EPG displays depends on the state of the `hide_guide` bit.

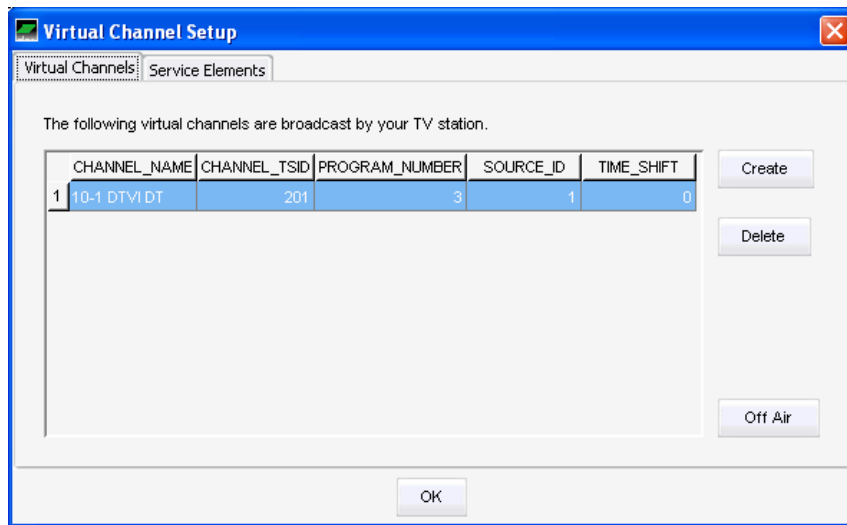
**hide\_guide** — A Boolean flag that indicates, when set to 0 for a hidden channel, the virtual channel and its events may appear in EPG displays. This bit shall be ignored for channels which do not have the `hidden` bit set, so that non-hidden channels and their events may always be

included in EPG displays regardless of the state of the hide\_guide bit. Typical applications for hidden channels with the hide\_guide bit set to 1 are test signals and services accessible through

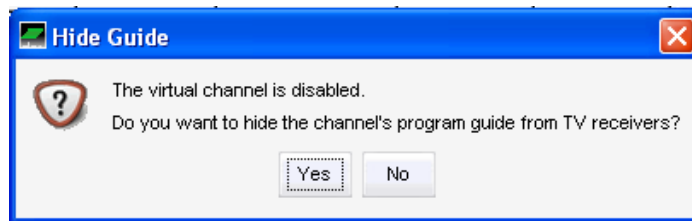
8.5.3.1.2.1 Hidden

In other words, you can make a channel inactive (Hidden) and decide whether or not to display (Hide) its guide information. To make a channel Hidden follow the steps below.

- 1) From the Virtual Channel set up window, select Off Air.



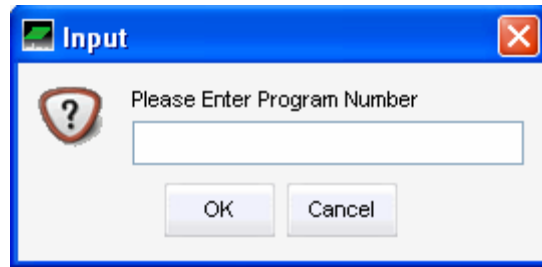
- 2) The Hide Guide window will appear. Select whether or not to Hide the guide.



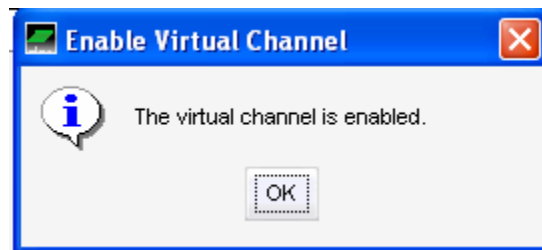
8.5.3.1.2.2 Un-Hidden

To make a channel Active, follow the steps below.

- 1) From the Virtual Channel Set up window select On Air.
- 2) You will be asked to enter a program number. Make sure you enter a program number that is not already in use. Click OK to continue.



A confirmation window will appear indicating the virtual channel is enabled. Click OK to continue.



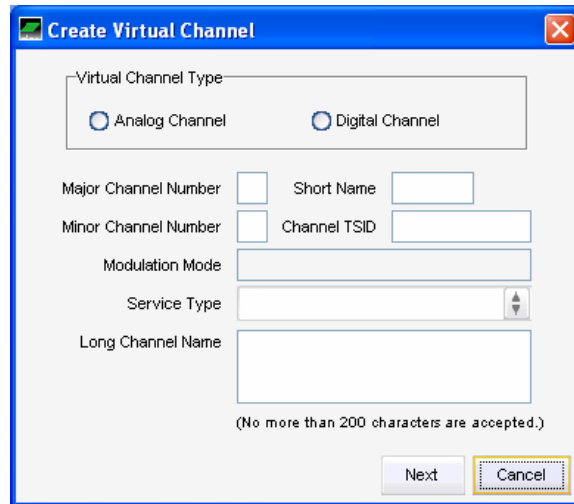
#### 8.5.3.1.3 Create Virtual Channel

To create a new virtual channel, follow the steps below.

- 1) From the virtual channel setup window as described in (Chapter 8.5.3.1), Click Create.

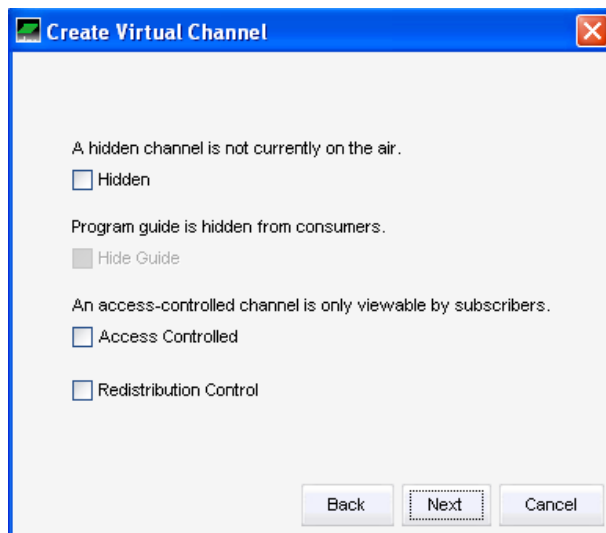
**NOTE!** Whichever existing virtual channel that is highlighted when selecting “Create”, will create the next highest minor channel number, when selecting digital. Example: if you highlight virtual channel 1, click create and select digital, you will notice that a minor channel 2 is generated. If you have more than virtual channel and select create while virtual channel 1 is highlighted, you will notice that a minor channel 2 is generated while minor channel 2 may already exist. To avoid this, be sure to highlight the last virtual channel in the list before selecting the create button.

- 2) In the virtual channel setup window, click the Create button. You will be presented with the Create Virtual Channel window.
- 3) Choose analog or digital.
- 4) If you select analog, your major, minor channel numbers, short name, TSID, modulation mode and service type will be set for you. You have the ability to input a long name. Click next to continue. If you choose Analog skip to step (9)



Please refer to the FCC Report & Order. Example: WTOL would be; “Toledo, OH” as a long name.

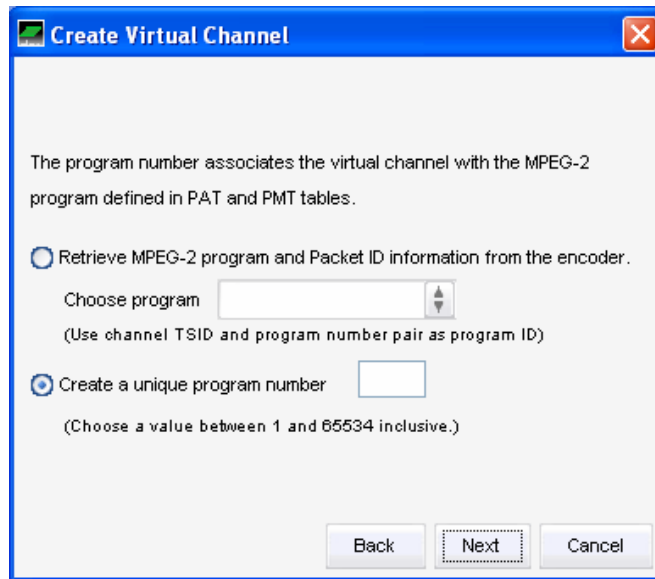
- 5) If you select Digital, your major channel, short name, TSID and modulation mode will be set for you but, you will have to input your minor channel number, service type and long name. Click next to continue.
- 6) The Hidden, Hide Guide & Access Controlled window will appear. Refer to (Chapter 8.5.3.1.2) for more information on Hidden & Hide.



**NOTE!** Please refer to the ATSC, A/65B specification for a description of Hidden, Hide Guide & Access Controlled. The specification can be found a [www.atsc.org](http://www.atsc.org).

- 7) Make your selections and/or click next to continue.

8) The Program Number window will appear.



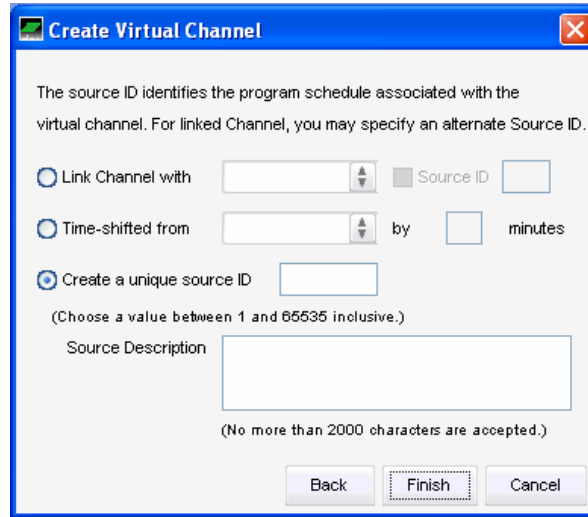
In the program number window, select whether you will retrieve the program number from the MPEG-2 encoder or create it yourself.

If you choose to retrieve the program from the encoder you “must” have one of the configurations mentioned in (Chapter 4) “System Configuration” that allows communication between the encoder and PSIP Pro. Check the “Retrieve” radio button and pull down on the “Choose Program” menu and select the program you desire to use from the list.

If you enter the program number manually, check the “Create” radio button and enter a value between 1 and 65532 inclusive. Please refer to the ATSC A/65B specification for more information.

If you are confused, a simple rule to follow is to keep the program number and virtual channel number the same. This is not part of the specification but, it will help to keep things clear until a complete understanding of the ATSC A/65B specification is achieved. Click next to continue.

9) The Source ID window will appear.



The ATSC specification defines the Source ID as a 16-bit unsigned integer number that identifies the programming source associated with the virtual channel.

The choices are “Simulcast”, “Time-shifted” or “Create”.

**Simulcast** – This is a unique feature that allows one virtual channels program guide to be broadcast on two virtual channels simultaneously. There are a number of stations that are broadcasting a standard definition and a high definition virtual channel with identical programming with the exception that one is up-converted or high definition. In cases where this is true and the two virtual channels programming never deviates, this would be a good option to choose. To choose Simulcast, select the radio button and select the virtual channel from the pull down menu that you would like to simulcast with.

**Time-shifted** – This feature allows time shifting between the virtual channel you are creating and whichever virtual channel you select from the pull down menu. To choose Time-shifted, check the radio button and select a virtual channel from the pull down menu and enter the time (in minutes) you want to time shift by.

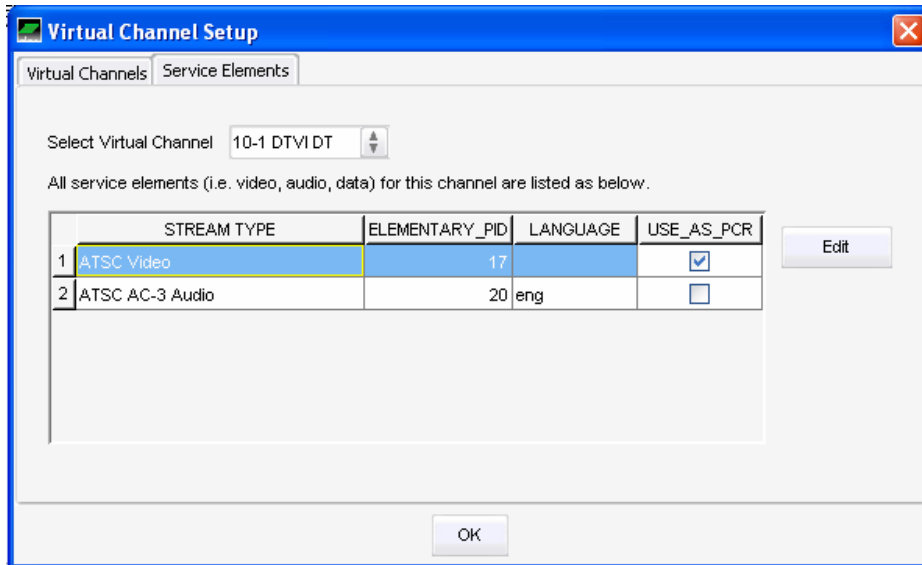
**Create** – This option creates a new and unique source ID. To create a new source ID, check the “Create” radio button and enter a value between 1 and 65535 inclusive. Please refer to the ATSC A/65B specification for more information.

If you are confused, a simple rule to follow is to keep the source ID and virtual channel number the same. This is not part of the specification but, it will help to keep things clear until a complete understanding of the ATSC A/65B specification is achieved.

10) Click Finished.

### 8.5.3.1.4 Service Elements

Under the Service Elements tab you have two choices Edit and OK.



Edit – Opens the Service Element Editor.

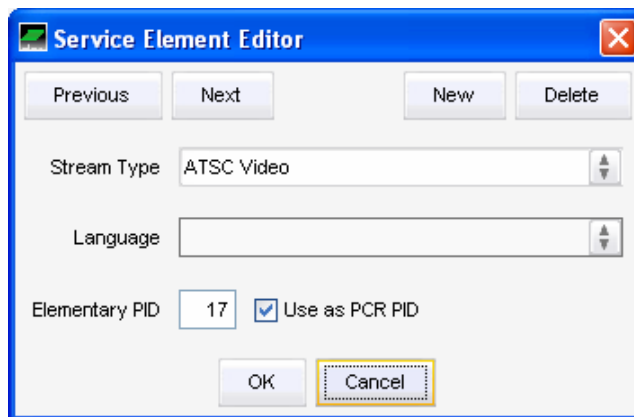
OK – Accepts changes.

For information on Service Elements, refer to (Chapter 8.5.3.1.5) – Edit Service Elements.

### 8.5.3.1.5 Edit Service Elements

Select the Service Elements tab from the Virtual Channel setup window. Select the virtual channel from the pull down menu for which you desire to edit service elements.

- 1) To edit the service elements, select and highlight the desired element and press Edit. The service element editor appears.



In the service element editor, you have ten choices Previous, Next, New, Delete, Stream Type, Language, Elementary PID, Use as PCR, Cancel and OK.

Previous and Next – Select these buttons to step up or down the list of service elements without backing out and highlighting the desired service element.

New – New creates a new service element.

Delete – Deletes the selected service element.

Stream Type – Defines what type of service element (Video, Audio or Data).

Language – You need to define a Language for the audio and data stream types. Select from the pull down menu.

Elementary PID – You can define the packet ID (PID) for this service. When you manually configure this, you will need to retrieve the PID from the audio, video and data encoders and enter it here.

This is done automatically when you have a system with a communication link between the encoder and PSIP Pro as described in section 4, System Configuration.

Use as PCR – ATSC defines the PCR-PID as a 13 bit field indicating the PID of the transport stream packets which shall contain the PCR fields valid for the program specified by `program_number`. If no PCR is associated with a program definition for private streams then this field shall take the value of 0x1FFF. The value of PCR\_PID shall be the same as the PCR\_PID field of the `TS_program_map_section()` currently being transmitted for that program number.

Cancel – Cancel backs out of Edit Service Elements.

OK – OK's edits made to the service elements.

**Congratulations!** You have created a virtual channel/s with service elements.

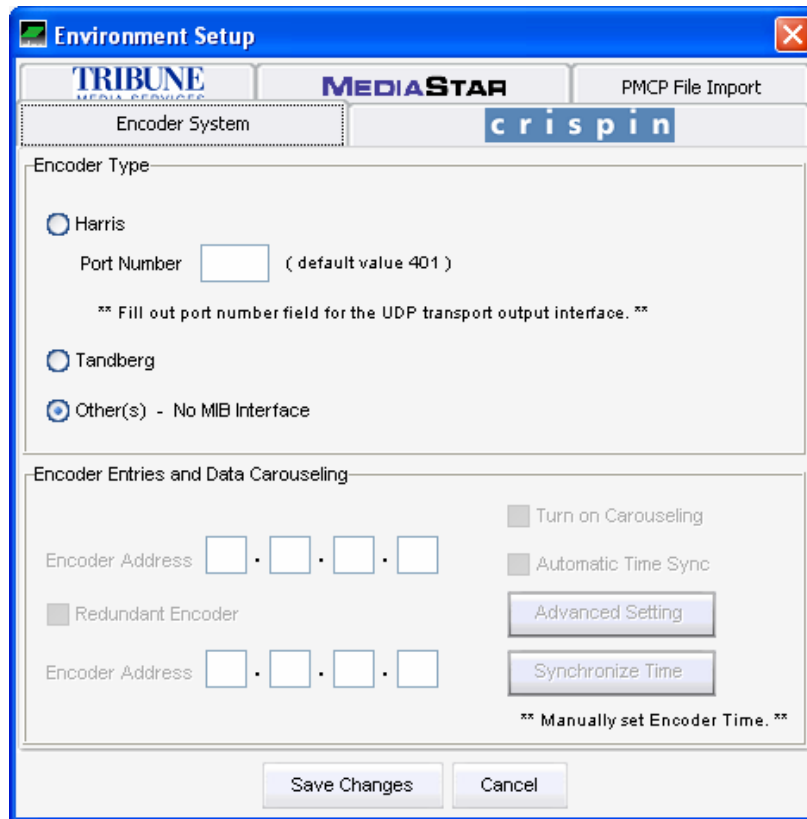
### 8.5.3.2 Environments

When PSIP Pro is launched for the first time, you need set up the environments, section 10.1.

#### 8.5.3.2.1 Environment Setup Window

To open the environment setup window, follow the steps below.

- 1) From the main menu pull down on, Advanced, Setup, Environment.
- 2) Enter the engineering password, Click OK to continue. The environment setup window appears.

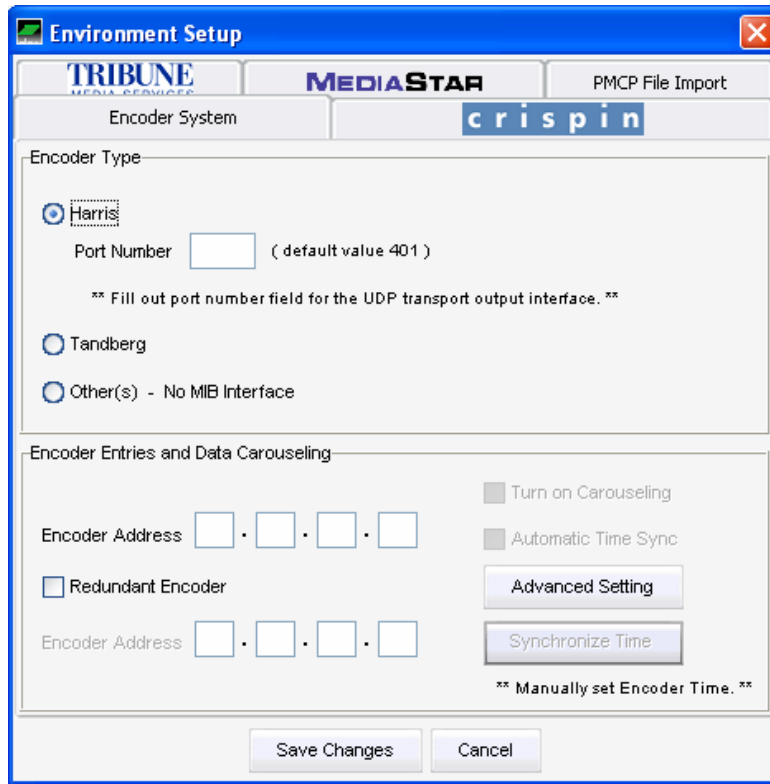


Notice there are five tabs, Encoder System, PMCP file Import, MediaStar, Crispin, and Tribune Media Service (TMS).

**NOTE!** It is important to understand your stations physical configuration before setting up the environments.

### 8.5.3.2.2 Encoder System Environment

The Encoder System will need to be configured by selecting the appropriate radio button. Please refer to (Chapter 4), System Configuration and determine which configuration you have.



Notice, there are three choices, Harris, Tandberg and Other.

#### 8.5.3.2.2.1 Harris

For all Harris encoders, select the Harris radio button and enter the Port number of the NIM-100 card. Please refer to the Harris encoder user manual or contact your authorized Harris technical support center.

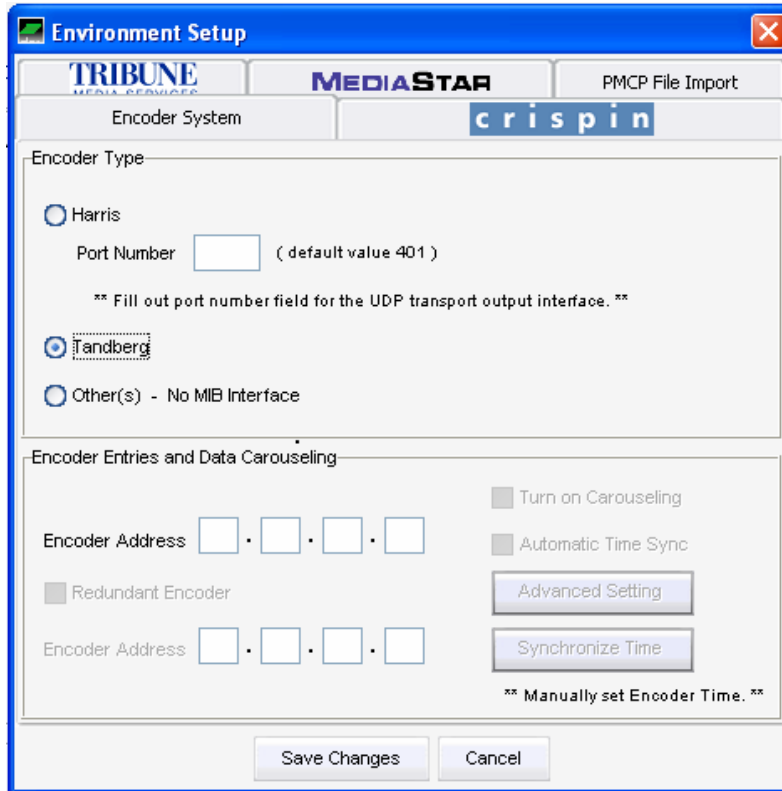
Enter the encoder IP address and press Test. It will return one of two responses, Successful or Error. If successful, continue with the Automation or TMS environment set up or click OK to accept. If not, please check your network connections and refer to your Harris user manual or contact your Harris technical support center.

Once you have successfully configured the Encoder interface, from the main menu select, File, Import From, Encoder. You will see MIB Reading Status indicator turn green (lower right corner of main window) and the Service Elements populate with PIDs automatically from the Encoder. You will notice the Virtual Channel configuration allows the retrieval of PIDs for the audio, video and data programs in addition to the source IDs for simulcasting.

### 8.5.3.2.2.2 Tandberg – Single Encoder

For the Tandberg encoding system, determine if you have a single or multi encoder system. If you are using a single Tandberg encoder, select the Tandberg radio button.

Enter the encoder IP address and press Test. It will return one of two responses, Successful or Error. If successful, continue with the Automation or TMS environment set up or click OK to accept. If not, please check your network connections and refer to your Tandberg user manual or contact your Tandberg technical support center.



Once you have successfully configured the Encoder interface, from the main menu select, File, Import From, Encoder. You will see MIB Reading Status indicator turn green (lower right corner of main window) and the Service Elements populate with PIDs automatically from the Encoder. You will notice the Virtual Channel configuration allows the retrieval of PIDs for the audio, video and data programs in addition to the source IDs for simulcasting.

### 8.5.3.2.2.3 Tandberg – Multi Encoder

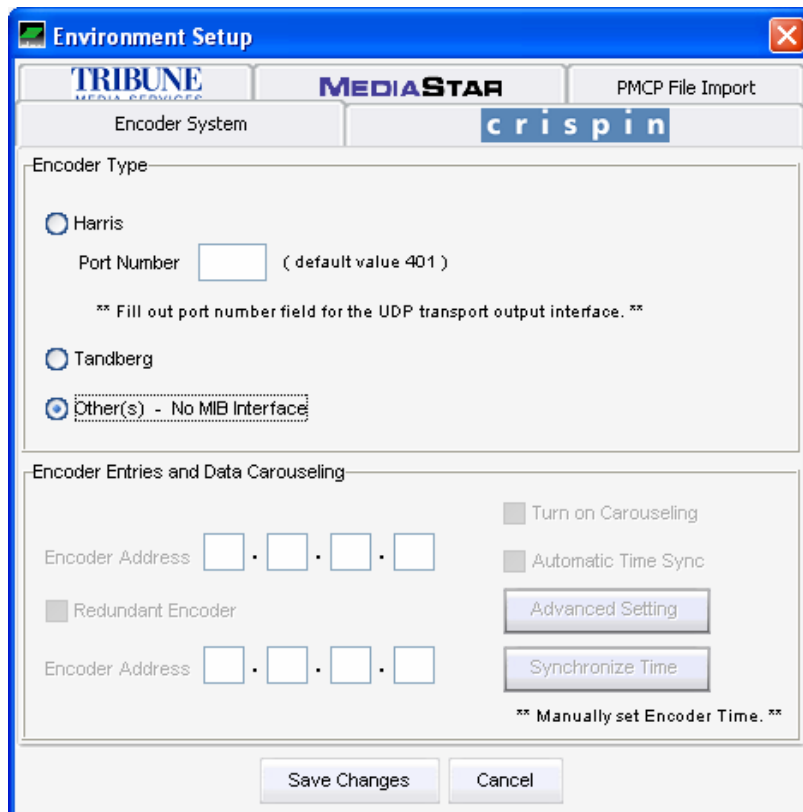
Tandberg encoding systems utilizing multi encoders, select the Other radio button. The IP address is not required.

**NOTE!** You will have to enter the Service Elements manually as described in (Chapter 8.5.3.1.4) and the MIB Reading Status will NOT turn green, therefore the events will have to be entered manually.

Continue with the Automation or TMS environment set up or click OK to accept.

#### 8.5.3.2.2.4 Other Encoders

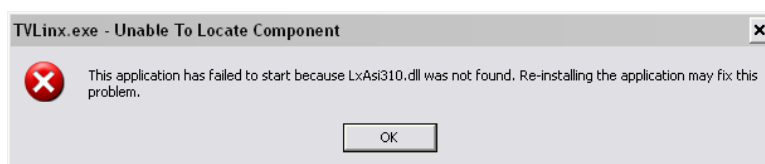
For all other encoding systems (Harmonic or Tiernan) utilizing single or multi encoders, select the radio button labeled “Other”. The IP address is not required.

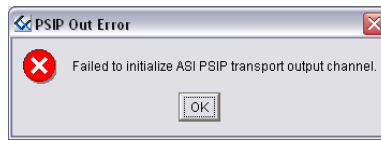


**NOTE!** You will have to enter the Service Elements manually as described in section 8.5.3.1.4 and the MIB Reading Status will NOT turn green, therefore the events will have to be entered manually.

Continue with the Automation or TMS environment set up or click OK to accept.

**NOTE!** If the PCI card drivers are not properly installed you will see the following errors in succession. In this case, re-install the PCI card drivers as describer in this section. Also refer to your computers user manual on installation of PCI cards.





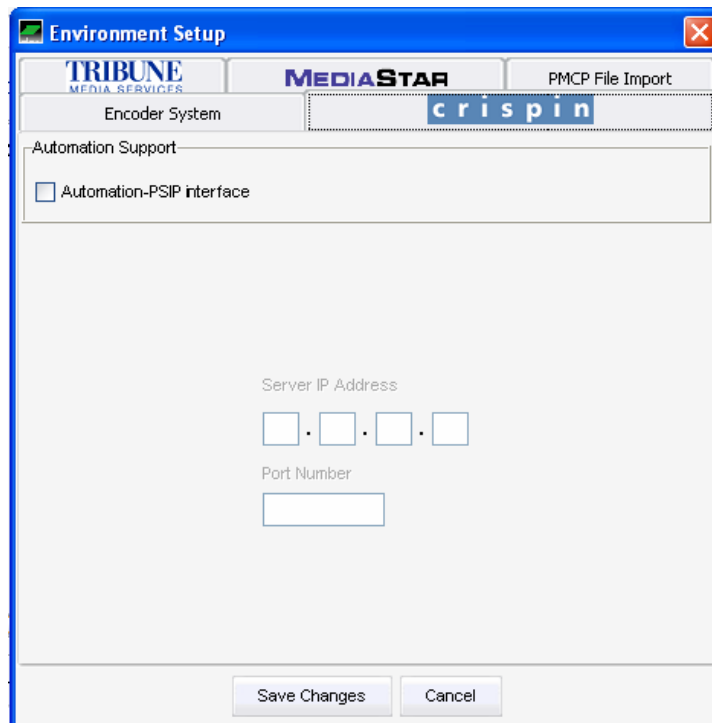
### 8.5.3.2.3 Automation System Environment

Currently the only Automation system supported is Crispin Corporation. If you have an interest in developing an interface to you automation system, have your automation company contact DTV Innovations for further information.

#### 8.5.3.2.3.1 Automation System Environment

To interface to the Crispin automation system, select the Automation – PSIP Interface check box. Enter the automation servers IP address and Port number.

Press Test, It will return one of two responses, Successful or Error. If successful, continue with the Encoding System or TMS environment set up or click OK to accept. If not, please check your network connections and refer to your Crispin user manual or contact your Crispin technical support center.



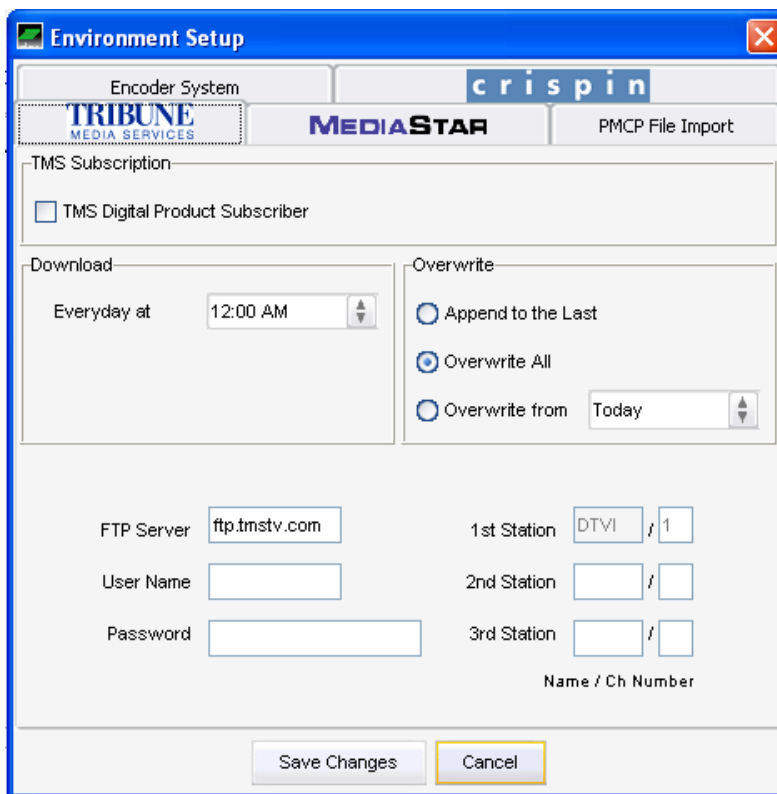
Once you have successfully configured the Automation interface, from the main menu select, File, Import From, Automation Server. You will see the Daily Event Log populate with Events automatically from the Automation Server and the Automation Reading Status indicator turn green (lower right corner of main window).

#### 8.5.3.2.4 Tribune Media Service Environment

To interface to the Tribune Media Service (TMS), select the TMS Digital Product Subscriber check box. Follow the steps below.

- 1) Select the time of day from the Download pull down menu.
- 2) Select which Overwrite option from the Overwrite pull down menu.
- 3) Enter the FTP Server, User Name and Password.

You now have the choice to Download Now or click OK to allow the TMS to download at the designated time. Continue with the Encoding System or Automation System set up or click OK to accept.



Once you have successfully configured the TMS interface, from the main menu select, File, Import From, TMS Server. You will see the Daily Event Log populate with Events automatically from the TMS Server and the TMS Downloading Status indicator turn green (lower right corner of main window).

**NOTE!** You must have a 10/100 BaseT network connection to the outside world in order to use this feature. Please use the appropriate security when interfacing your network to an external ISP. Contact Tribune Media Service directly for the subscription service.

#### 8.5.4 Enable Logging

In the event you discover an error with the PSIP Pro application. We have included a logging feature to allow the capture of errors, which will allow us to better understand what is occurring with your PSIP system. To activate Logging follow the steps below.

- 1) From the main menu pull down on, Advanced, Enable Logging. A check mark will appear next to Enable Logging to inform you that is active.

When Enable Logging is active, a file will be created and stored on your hard drive. You can locate the Log files under Program Files, DTV Innovations PSIP Pro, Log.

A log will be created for each day and it will be named for the day of the week for which it was captured. When you have captured seven days of logs, it will start over and overwrite the existing file for that day.

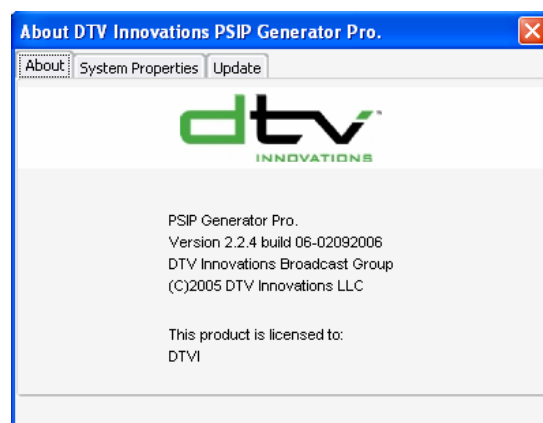
If an error persists and it is captured in a log file, you can email it to [info@dtvinnovations.com](mailto:info@dtvinnovations.com) for further analysis. Please contact our technical support center at (847) 919-3550.

## 8.6 Help

Currently there are no help files. Please refer to the PSIP Pro User Guide.

### 8.6.1 About

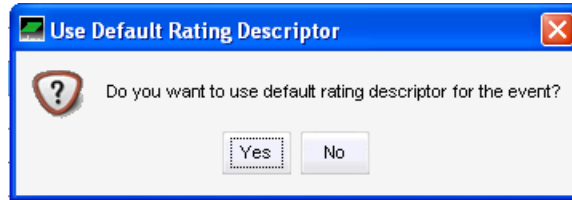
About displays the DTV Innovations PSIP Pro splash screen showing the software version currently installed on your computer.



## 9. TABLE DESCRIPTORS

The Closed Caption, Content Advisory (Rating) and Audio descriptors are elements of the PSIP tables. The ATSC A/65B specification does not mandate broadcaster use, but rather requires that broadcasters that choose to provide this information do so by following the A/65B PSIP protocol.

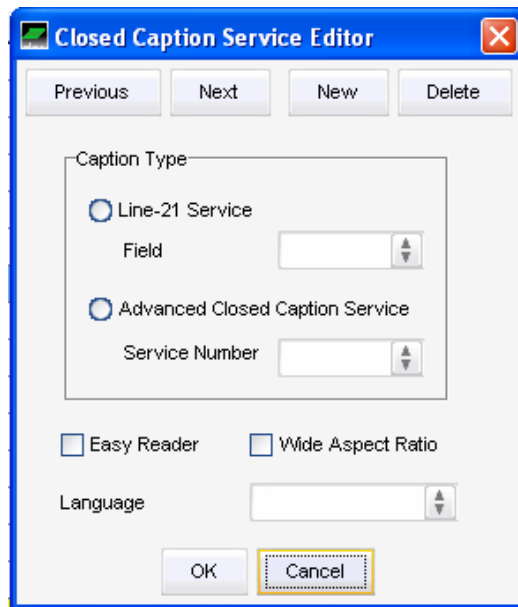
To enter event descriptors, select the event (grey highlight) you wish to add a descriptor to and select any descriptor Edit button, the Use Default Descriptor window appears.



The default descriptors have been defined in (Chapter 8.3.3). If you want to use the default, select yes, if not, select no. If no, the descriptor editor window (for the descriptor chosen) appears.

### 9.1 Caption Descriptor Editor

The Closed Caption Service Editor is described below.



Previous and Next – Steps through the closed caption services.

New – New creates a new service element.

Delete – Deletes a service element.

Click OK to accept or Cancel to escape

### 9.1.1 Caption Type

A flag that indicates, when set, that an advanced television closed caption service is present.

#### 9.1.1.1 Line 21

A flag that indicates, when set, that the line 21 closed caption service is associated with the field 2 of the NTSC waveform. When the flag is clear, the line-21 closed caption service is associated with field 1 of the NTSC waveform.

#### 9.1.1.2 Advanced

A value in a range that identifies the Service Number within the closed captioning stream that is associated with the language.

### 9.1.2 Easy Reader

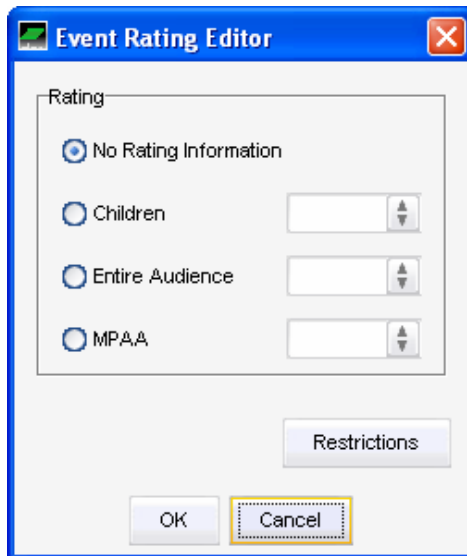
Indicates, when set, that the closed caption service contains text tailored to the needs of beginning readers.

### 9.1.3 Language

Select the language for the service.

## 9.2 Rating Descriptor Editor

To set the rating for the event select one of the four rating radio buttons and select from the pull down menu.

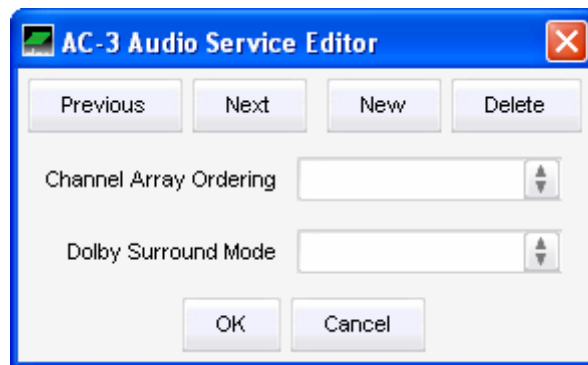


After you have selected the rating, select the Restrictions button and check any restrictions applicable to the event.

Click OK to accept or Cancel to escape

### 9.3 Audio Descriptor Editor

AC-3 Audio description provides details about the individual AC-3 elementary streams included in the program services. Information is provided to the ATSC compatible receiver in the format the audio was encoded.



Previous and Next – Steps through the closed caption services.

New – New creates a new service element.

Delete – Deletes a service element.

Click OK to accept or Cancel to escape

#### 9.3.1 Audio Service ID

This is a 3-bit field which contains a number in the range 0-7 which identifies a main audio service. Each main service should be tagged with a unique number. This value is used as an identifier to link associated services with a particular main service

#### 9.3.2 Channel Array Ordering

Describes the configurations of audio, stereo or surround.

#### 9.3.3 Dolby Surround Mode

If you select the surround option above, the Dolby surround mode field is automatically set to Dolby surround.



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