

Harmonic Media Tools

DelayTool

RELEASE 2.3

User Guide

Manual Part No. 28-0043. April 2010.

March 2013

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DANGER: The Danger symbol calls your attention to information that, if ignored, can cause physical harm to you.



CAUTION: The Caution symbol calls your attention to information that, if ignored, can adversely affect the performance of your Harmonic product, or that can make a procedure needlessly difficult.



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NOTE: The Note symbol calls your attention to additional information that you will benefit from heeding. It may be used to call attention to an especially important piece of information you need, or it may provide additional information that applies in only some carefully delineated circumstances.



IMPORTANT: The Important symbol calls your attention to information that should stand out when you are reading product details and procedural information.



TIP: The Tip symbol calls your attention to parenthetical information that is not necessary for performing a given procedure, but which, if followed, might make the procedure or its subsequent steps easier, smoother, or more efficient.

In addition to these symbols, this guide may use the following text conventions:

Convention	Explanation
Typed Command	Indicates the text that you type in at the keyboard prompt.
<Ctrl>, <Ctrl>+<Shift>	A key or key sequence to press.
<i>Links</i>	The <i>italics in blue</i> text to indicate Cross-references, and hyperlinked cross-references in online documents.
Bold	Indicates a button to click, or a menu item to select.
ScreenOutput	The text that is displayed on a computer screen.
<i>Emphasis</i>	The <i>italics</i> text used for emphasis and document references.



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Chapter 1

Introduction

Harmonic MediaTools are low cost, easy-to-use utilities, designed to ensure greater operability for broadcast customers. Each MediaTool is tightly integrated with the Harmonic Spectrum System, and each runs on a Windows 2000[®] or XP[®] platform.

The DelayTool adds realtime program delay capability to the Harmonic Spectrum System. For each input, up to six simultaneous delayed outputs can be provided.

The document provides installation and operating instructions for the DelayTool in the following sections:

- [*Installing DelayTool*](#)
- [*Using DelayTool*](#)

Chapter 2

Installing DelayTool

The following topics are discussed:

- [System Requirements](#)
- [System Compatability](#)
- [What Gets Installed](#)
- [DelayTool Installation](#)
- [DelayTool Licensing](#)

System Requirements

Prior to installing DelayTool, your PC must conform to the following minimum requirements, and must be connected via Ethernet to your facility's LAN:

- 850 MHz Pentium III or better (450 MHz minimum)
- 256 MB RAM (128 MB minimum)
- 20 GB hard drive
- At least 10 Megabytes of free disk space
- Windows 2000 or Windows XP
- Display resolution should be set to 1024 x 768 High Color (16 bit)
- 100 BaseT (10 BaseT minimum)

System Compatability

Ensure the Harmonic Spectrum System is running the latest version of software.

What Gets Installed

A DelayTool executable file gets installed. Supporting documentation is also provided on CD-ROM.

DelayTool Installation

Use the following steps to install DelayTool on your PC:

1. Ensure that the PC on which the DelayTool application will be installed is booted and connected via Ethernet to your Harmonic MediaDirector when running the application. It is also *highly recommended* that you exit all Windows programs at this point.
2. Unpack the DelayTool CD-ROM and insert the CD-ROM into the PC's CD-ROM drive.
3. To begin the DelayTool installation, click on the **Start** menu and then select **Run** to display the **Run** dialog. In the **Run** dialog, type the correct path to the CD-ROM drive followed by the setup program name (for example, **E:\DelayTool.exe**).

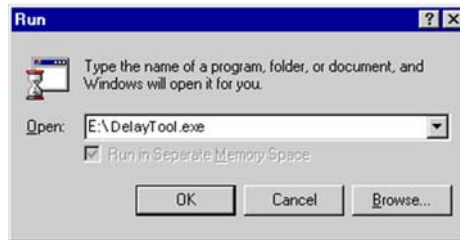


Figure 2–1: DelayTool Run Dialog

4. Click **OK** to run the setup program and display the **Welcome** dialog.
5. From the **Welcome** dialog box, click **Next**. The **License Agreement** window appears. \
6. Click **Yes** to accept the license and continue with the installation.
7. Click **Next** to display the **Choose Destination** dialog, which allows you to set where the executables are placed. Leave the default folder as **C:\ProgramFiles\Harmonic\DelayTool** (recommended) or select **Browse** and choose a different folder.
8. Click **Next** to display the **Select Program Folder** dialog, which allows you to set where shortcuts are placed. Leave the default folder as **Harmonic Program DelayTool** (recommended) or choose a different folder.
9. Click **Next** to begin the DelayTool installation. After all files have been copied, the **Setup Complete** dialog appears. Click **OK** to close the dialog.
10. Eject the CD-ROM and store it in a safe place for later use.

This completes the DelayTool installation procedure.

DelayTool Licensing

A license file (provided by Harmonic) supplies the licenses for the MTD 1016 DelayTool components. This file gets installed on the “license server” computer.

One license will be required for each instance of DelayTool that is in use. These are “floating licenses” so any connected computer can run the application, until the total number of purchased (and licensed) copies are active.

For example: If you have purchased 4 DelayTool licenses and you have installed the product on 20 computers, you can run up to 4 instances of DelayTool at any one time. The remaining 16 installations cannot run the tool until one of the first four exits.

A variety of dialogs may appear at startup time if the application encounters licensing issues (i.e. the license server is down, the license file can not be found, all licenses are used, etc.). [Figure 2–2](#) shows examples of some of the possible messages you may encounter.

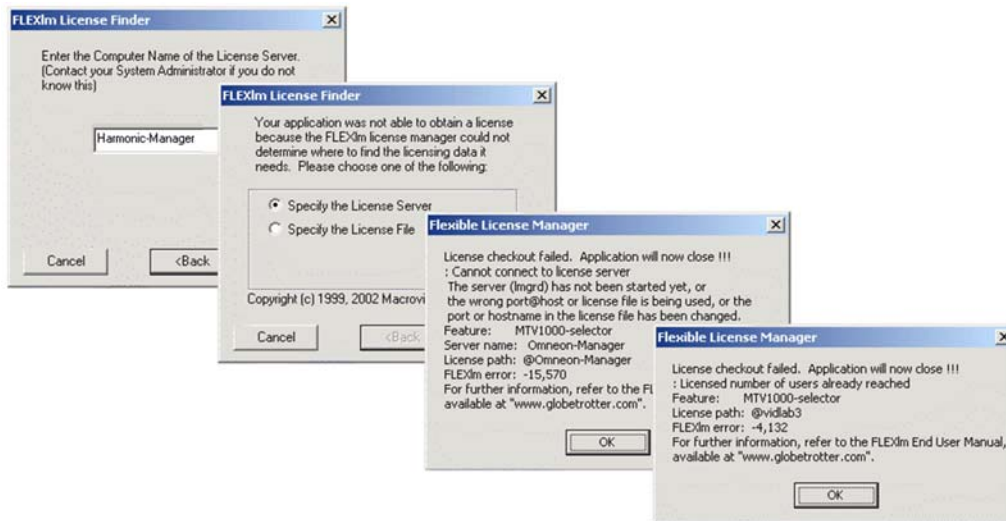


Figure 2–2: DelayTool Licensing Screens

Follow the directions in these dialogs and/or contact your Network Administrator as required to resolve any issues that arise. To purchase additional licenses, contact Harmonic Sales.

Chapter 3

Using DelayTool

The following topics are discussed:

- [DelayTool Description](#)
- [DelayTool Reference](#)
- [DelayTool Operating Procedure](#)
- [DelayTool Notes](#)

DelayTool Description

The DelayTool adds realtime program delay capability to the Harmonic Spectrum System. A single window is provided for controlling an ingest record feed, and from one to six playout channels.

DelayTool can be used in a number of new scenarios, in addition to the standard applications. For example, the maximum delay has been increased to 200 hours or 8.3 days, allowing DelayTool to be used as a simple form of disaster recovery.

In addition, DelayTool allows the delay time for an individual player to be dynamically set by the operator using a familiar “slider” based interface. One of the uses for a dynamically adjustable delay allows a television station to opt out of a network ad break or feed and insert a live event or their own ad break (which may be of different duration than the network break) and dynamically adjust the point at which playback will resume.

DelayTool provides a **Save In/Out** feature, which allows DelayTool to be used in Loop Record applications, such as the recording of a satellite feed for news. In this mode, the delay loop can be used to minimize the total disk space needed to record a feed from which you need only selected sections; once the loop is recording, you can use the slider to find and mark the in and out points of a story and export the material to another directory for editing.

Please note the following points about DelayTool:

- Each playout channel may be delayed by an independent (user settable) amount of delay.
- Each playout channel must be attached to a “Player” that is configured identically to the Record Channel Player.
- Each Player must be configured on a MediaDirector which has access to the same file system to which the Record Player is continuously recording the ingest feed.

DelayTool Reference

This section describes the **Main** DelayTool window, and covers each control function and feature. The following topics are discussed:

- [Main Window](#)
- [Status Window](#)
- [File Menu](#)
- [Commands Menu](#)
- [Options Menu](#)
- [Help Menu](#)

- *Shuttle Dialog*

Main Window

The DelayTool **Main** window provides a central control panel for recording an ingest feed, and for creating up to six playout channels, each of which can be delayed by an independent amount.

[Figure 3-1](#) shows an example of the **Main** window.

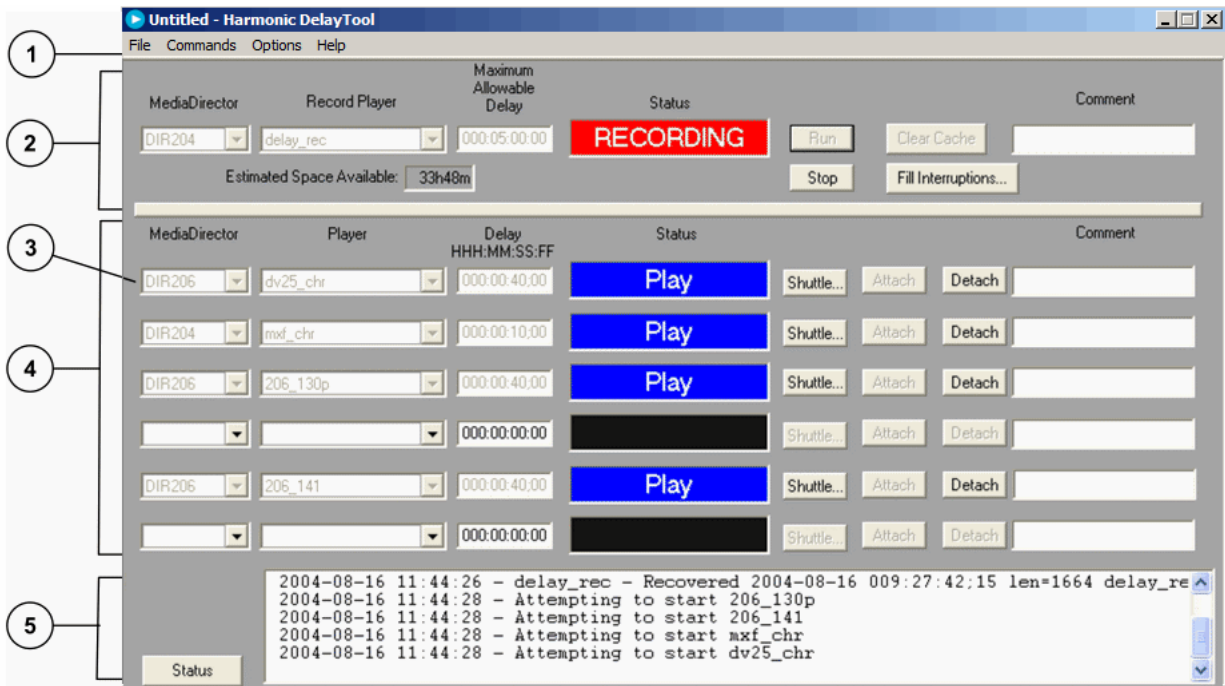


Figure 3-1: DelayTool Main Window

1. Menu Bar	3. Playout Control	5. Status Log
2. Record Control	4. Channel Playout Control	

Following are descriptions of each section as itemized above:

1. Menu Bar

The **Menu Bar** provides menus for **File**, **Commands**, **Options**, and **Help** that are used to access and operate the DelayTool application.

Refer to [File Menu](#), [Commands Menu](#), [Options Menu](#), and [Help Menu](#) for complete details.

2. Record Control

The **Record Control** area provides a variety of fields used for setting record parameters as follows:

- **MediaDirector:** In the **MediaDirector** field, a drop-down list is used to specify the MediaDirector on which the ingest feed is recorded. All MediaDirectors that have been configured using the “**Add MediaDirector**” function (in the **Commands** menu) will automatically appear in the list.

- **Record Player:** In the **Record Player** field, drop-down list is provided to specify the Player to which the ingest feed is connected. All available record-capable Players (configured on the selected MediaDirector) will automatically appear in the list.
- **Maximum Allowable Delay:** The **Maximum Allowable Delay** field specifies the length of the temporary ingest file that the Harmonic system creates and loops within. This value determines the maximum amount of delay that can be set on *any* of the selected playout channels. The maximum limit is 200 hours.



IMPORTANT: Sufficient space must be provided on the Harmonic file system attached to the “record” MediaDirector to accommodate the delay as specified.

- **Status:** The **Status** field displays the current status of the record channel: **Recording** or **Stopped**. Note the background color of the status field and some status text changes depending on whether or not DelayTool is attached to the player.

If DelayTool is attached to the player, the status field will display a red background when recording.

Recording

If DelayTool is not attached to the player, the status field will display a black background and status text will appear in parentheses.

(Recording)



DANGER: Having multiple instances of DelayTool simultaneously connected to the same player can result in problems with the timeline and is neither recommended nor supported.

- **Run:** Click **Run** to commence recording. The button is mutually exclusive with the **Stop** button, and grayed out once pressed. When you click **Run**, a progress bar will appear as DelayTool automatically searches for previously recorded clips before it begins recording.
- **Stop:** Click **Stop** to stop recording. The button is mutually exclusive with the **Run** button, and grayed out once pressed.
- **Clear Cache:** Click **Clear Cache** to erase everything currently recorded in the cache.
- **Comment:** The **Comment** field (text based) allows the operator to enter information about the record channel.
- **Estimated Space Available:** The **Estimated Space Available** field provides a system estimate of how much storage space (in hours and minutes) remains on the connected Harmonic file system.
- **Fill Interruptions...:** For any reason, the DelayTool is accidentally stopped, “interruptions” will occur. The **Fill Interruptions** feature allows you to substitute selected clips for the duration of the interruption. Click **Fill Interruptions...** to bring up the **Fill Interruptions** dialog.

The **Fill Interruptions** dialog as shown in [Figure 3-2](#) lists:

- All known interruptions for the 200 hours recorded in the cache, and
- Whether or not a clip has been selected to fill an interruption.

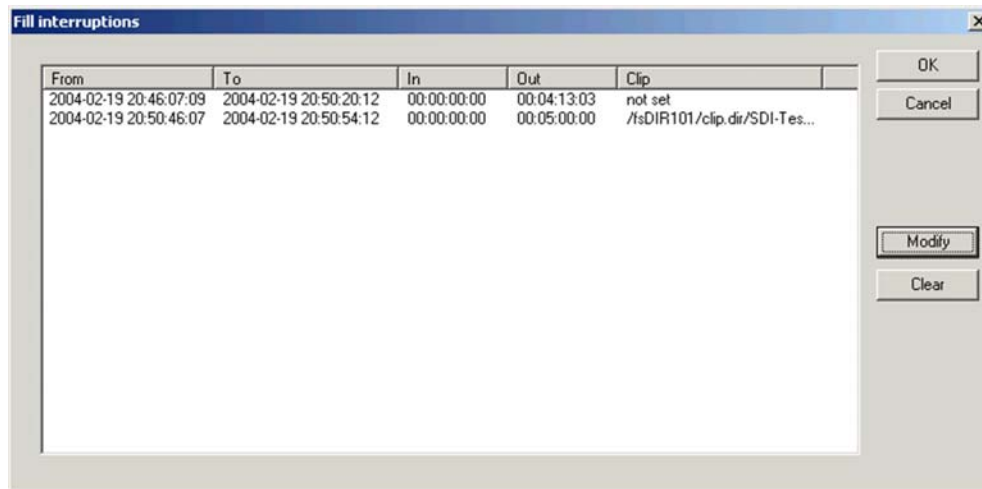


Figure 3–2: Fill Interruptions Dialog

These interruptions, or gaps in recording, will occur if recording has been stopped then restarted for any reason. The following columns of information are provided for each interruption:

- ❑ **From** – The date and time stamp for the beginning of the interruption.
- ❑ **To** – The date and time stamp for the end of the interruption.
- ❑ **In** – The In point for the selected clip to begin playing. The In point is specified using the **Select Clip** dialog.
- ❑ **Out** – The Out point that the selected clip stops playing. The Out point is specified using the **Select Clip** dialog.
- ❑ **Clip** – The clip specified to fill the interruption. If no clip is specified, “not set” will be displayed.

To specify a clip to fill an interruption:

- a. Highlight an interruption on the **Fill Interruptions** dialog.
- b. Click the **Modify** button.
- c. Use the **Select Clip** dialog to specify a clip for that interruption. The specified clip will fill that gap in recording (that is, if specified, the screen will display “We are experiencing technical difficulties”).

The following rules apply when selecting a clip to fill an interruption:

- ❑ Only one clip can be specified for each interruption.
- ❑ If the selected clip is longer than the interruption time, the entire clip will not be played. Instead, the clip will play for the amount of interruption time, then the player will return to the original recorded material.
- ❑ If the selected clip is shorter than the interruption time, the clip will be looped until the interruption time is completed and the player returns to the original recorded material.
- ❑ **Modify button:** Click the **Modify** button to display the **Select Clip** dialog. Use the **Select Clip** dialog to specify a clip for an interruption, as shown in [Figure 3-3](#).

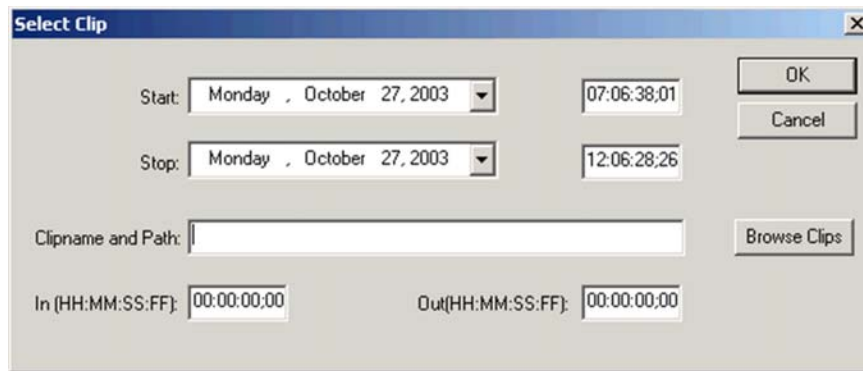


Figure 3–3: Select Clip Dialog

- ❑ **Start:** The **Start** date and time for the highlighted interruption is displayed. The Start date and time fields are information only and cannot be changed.
- ❑ **Stop:** The **Stop** date and time for the highlighted interruption is displayed. The Stop date and time fields are information only and cannot be changed.
- ❑ **Clipname and Path:** This field displays the path and the clip name for the clip selected to fill the interruption.
- ❑ **Browse Clips button:** Use this button to browse directories of attached media Players and select a clip to fill an interruption.
- ❑ **In (HH:MM:SS:FF):** The **In** or start point for the selected clip. The default is to start at the beginning of the clip (00:00:00;00), but this field allows you to change the In point.
- ❑ **Out (HH:MM:SS:FF):** The **Out** or stop point for the selected clip. The default is to stop at the end of the clip, but this field allows you to change the Out point.
- **Clear button:** Select a clip and click the **Clear** button to delete the highlighted clip.



NOTE: If you close DelayTool while it is attached to a player, a dialog box appears which allows you to either stop the recorder or allow the recorder to continue after you exit DelayTool. If you allow the recorder to continue, be aware that when you re-open DelayTool it will not automatically re-attach to the player. To do this, you must first click **Stop** to enable the **Run** button, and then click **Run**.

3. Playout Controls

The **Playout Controls** area allows users to configure and control playout of up to six different delayed outputs. Each channel's controls are identical, as described in the following section.

4. Channel Playout Controls

- **MediaDirector:** In the **MediaDirector** field, a drop-down list is used to specify the MediaDirector on which the Player for this delayed channel is connected. The selected MediaDirector must also be connected to the same file system as the selected "record" MediaDirector (where the ingest feed to be delayed is recorded). All MediaDirectors (configured using the "**Add MediaDirector**" function) automatically appear in the popup list. If the selected MediaDirector cannot be found, an error message appears.
- **Player:** In the **Player** field, a drop-down list is used to specify the "playback" Player. All available play-capable Players that have been configured on the selected MediaDirector automatically appear in the popup list.

- **Delay:** The **Delay** field is used to specify the delay interval (between ingest and playout) on this particular Player. Remember that this value cannot be larger than the “**Maximum Allowable Delay**” value specified in the Record channel area.
- **Status:** The **Status** field displays the current status of the delayed playout channel: **Play**, **Cued for Play**, or **Stopped**. Note the background color of the status field and some status text changes depending on whether or not DelayTool is attached to the player.

If DelayTool is attached to the player, the status field will display blue when the player is playing back.



If DelayTool is not attached to the player, the status field will display black, and any status text will appear in parentheses.



Please note:

- Configured and attached playout channels display a status of **Cued for Play** until the specified delay has elapsed — and then automatically commence playing.
- Playout channels that have an assigned Player but which are not yet attached display a **Stopped** status.



DANGER: Having multiple instances of DelayTool simultaneously connected to the same player can result in problems with the timeline and is neither recommended nor supported.

- **Shuttle:** Click the **Shuttle** button to bring up the Shuttle dialog. See [Shuttle Dialog](#) for details.
- **Attach:** Click the **Attach** button to attach the configured Player for this channel. Once attached, the channel’s Player is under control of this application. The button is mutually exclusive with the **Detach** button, and grayed out once pressed.



NOTE: If you attach to a player that is already in use by another application, a warning message will appear as this operation can have unexpected results.

- **Detach:** Click the **Detach** button to detach the configured Player for this channel, and display a confirmation dialog box to halt playout. The button is mutually exclusive with the **Attach** button, and grayed out once pressed.
- **Comment:** The **Comment** field (text based) allows the operator to enter information about the selected playout channel.

5. Status Log

The scrolling **Status Log** area contains both error and informational data about the application’s status and the attached Players.

Please note:

- Status lines include the date, time, and action for each Record and Playout channel controlled.
- Lines with a leading “*” are serious errors that may effect one or more of the playback streams.
- All the information in this window is saved to a file in a subdirectory called “**logs**” which is located in the same directory as the installed executable. The file name is the record Player’s named with a “**.log**” extension.

- The application retains the last 1MB of log data.

Status: Click to access the **Status** window which displays Player status, date, and timecode information.

Status Window

The DelayTool **Status** window provides Player status, date, and timecode information as illustrated in [Figure 3-4](#).

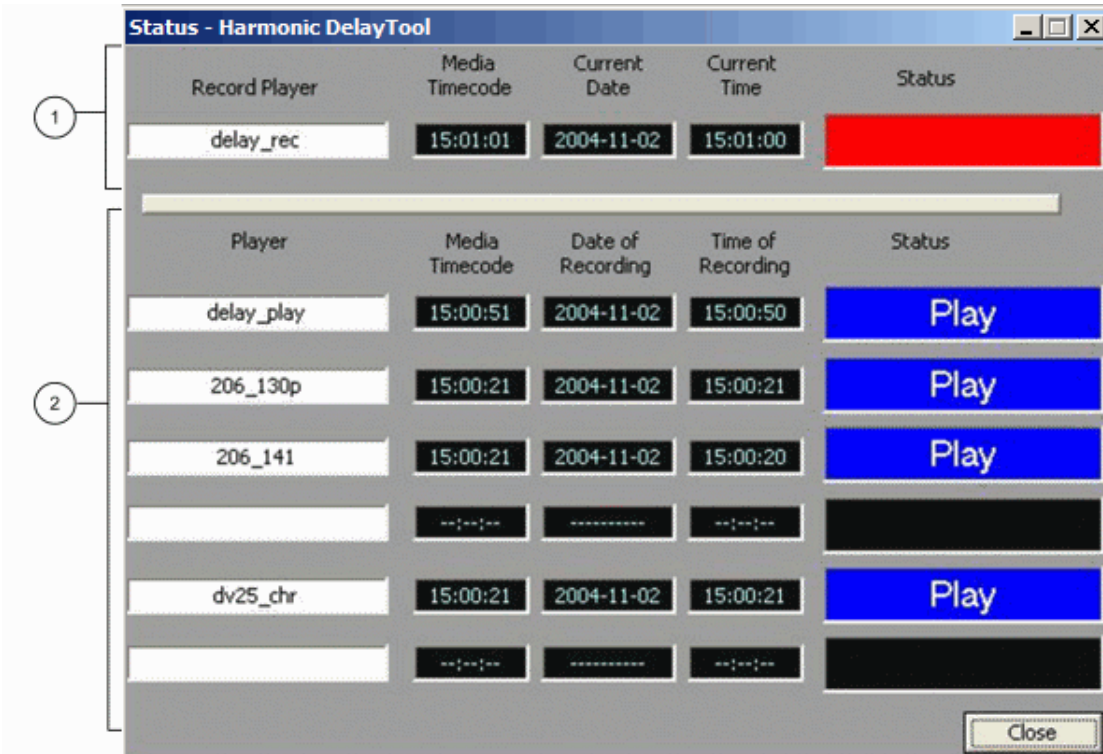


Figure 3-4: DelayTool Status Window

Following are descriptions of each item as itemized in [Figure 3-4](#):

1. Record Player

The **Record Player** area provides the following information:

- **Record Player:** Shows the Player to which the ingest feed is recorded.
- **Media Timecode:** Displays the current VITC time code value of the ingested video as selected and specified in the Player's actual parameters.

Refer to the **System Configuration** section in the *Harmonic Spectrum System User's Guide* for full details on specifying Player time code parameters.

- **Current Date:** Shows the current date.
- **Current Time:** Shows the current time.
- **Status:** Displays the current status of the record channel: Recording or Stopped.

2. Playout Player

The **Playout Player** area provides the following information:

- **Player:** Shows the playout Player.
- **Media Timecode:** Displays the current VITC time code value of the playout video as selected and specified in the Player's actual parameters.
Refer to the **System Configuration** section in the *Harmonic Spectrum System User's Guide* for full details on specifying Player time code parameters.
- **Date of Recording :** Shows the date when the recording took place.
- **Time of Recording:** Shows the time at which the recording took place.
- **Status:** Displays the current status of the delayed playout channel: **Play**, **Cued for Play**, or **Stopped**. Please note:
 - Configured and attached playout channels display a status of **Cued for Play** until the specified delay has elapsed – and then automatically commence playing.
 - Playout channels that have an assigned Player but which are not yet attached display a **Stopped** status.
- **Close:** Click to close the **Status** window.

File Menu

Descriptions of all **File Menu** items are provided in this section.

[Figure 3–5](#) illustrates the **File Menu**.

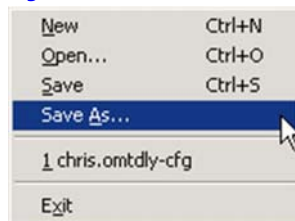


Figure 3–5: File Menu Options

- Click **New** to clear all devices (MediaDirectors, record Players, and delay Players) in preparation for creating a new delay configuration.
- Click **Open** to open a previously saved configuration file that contains MediaDirectors, record Player, delay Player, Comment and delay time settings.
- Click **Save** to save the last named “settings” file that contains MediaDirectors, record player, delay Player, Comment and delay time settings.
- Click **Save As** to display the **Save As Dialog** that allows you to save a new settings containing MediaDirectors, record Player, delay Player, Comment and delay time settings.
- Click a listed file (**1, 2, 3...**) to open a saved or previous configuration file for quick access.
- Click **Exit** to exit the DelayTool application. If changes have been made to the current configuration, a dialog box appears that allows you to save the changed file. A dialog also appears requesting confirmation that the controlled channels are to be stopped as shown in [Figure 3–6](#).



Figure 3-6: Confirmation Dialog

Commands Menu

Descriptions of all **Commands Menu** items are provided in this section.

Figure 3-7 illustrates the **Commands Menu**.



Figure 3-7: Commands Menu Options

- Click **Add MediaDirector** to display the **Add MediaDirector** dialog (*Figure 3-8*), which allows you to enter the IP address (or registered name) of the MediaDirector that you wish to utilize for this delay application. Once added, the MediaDirector is available in the drop-down “MediaDirector” lists for both recording and delayed payout.

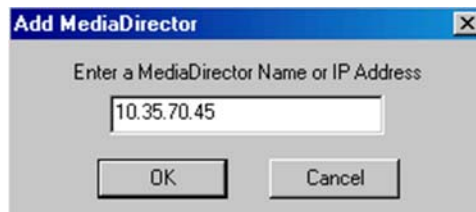


Figure 3-8: Add MediaDirector Dialog

- Click **Remove MediaDirector** to display the **Remove MediaDirector** dialog, which allows you to remove a selected MediaDirector from the drop-down “MediaDirector” lists.



Figure 3-9: Remove MediaDirector Dialog

- Click **Refresh Players** to query all configured MediaDirectors, and refresh the list of all connected Players. This function is useful if new Players have been recently added.
- Click **Show Critical Error Window** to display the **Possible Service Interruption** dialog, which provides a scrolling list of all critical errors since the application’s launch.

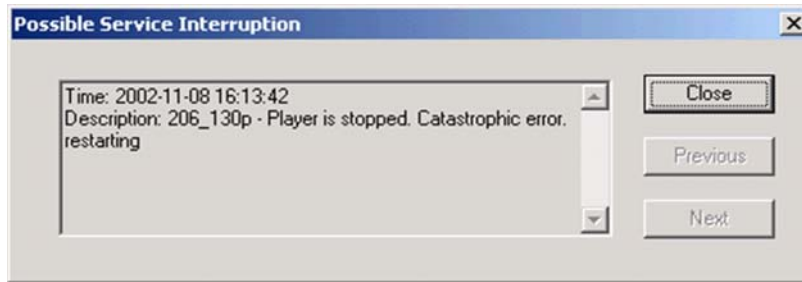


Figure 3–10: Possible Service Interruption Dialog

- Click **Change Save Clip Size...** to set the size of the clips that are created when using the **Save Selection** feature. This must be set before clicking the **Run** button on the **Main** window. Note that this setting also affects the segment size used by DelayTool.

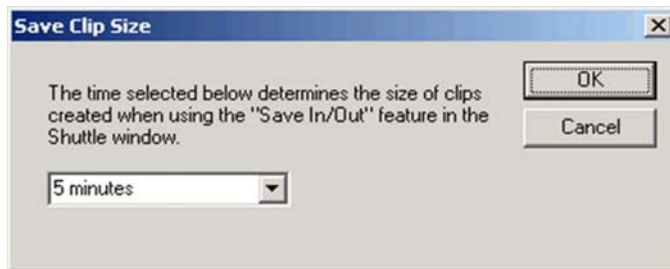


Figure 3–11: Save Clip Size Dialog

Options Menu

The options in this menu define how your playback players will respond when the record player is stopped or when the player is detached.

The following options define how playback players respond when stopping the recorder. See [Figure 3–12](#).

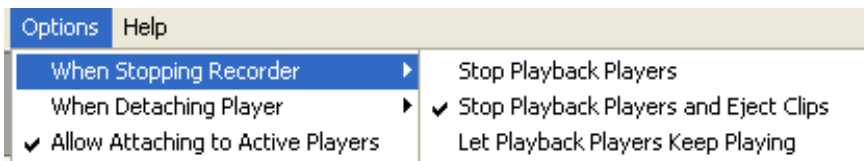


Figure 3–12: Options When Stopping Recorder

- Stop Playback Players:** Select this option if you want playback players to stop once recording is stopped.
- Stop Playback Players and Eject Clips:** Select this option if you want playback players to stop and clips to be ejected once recording is stopped.
- Let Playback Players Keep Playing:** Select this option if you want to allow the playback player to continue playing the rest of the timeline once the recording is stopped.

The following options define how a playback player responds when detaching the player. See [Figure 3–13](#).

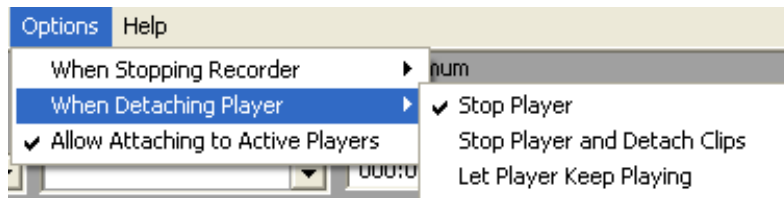


Figure 3–13: Options When Detaching Players

- **Stop Player:** Select this option if you want the playback player to stop once the player is detached.
- **Stop Player and Detach Clips:** Select this option if you want the playback player to stop and clips to be detached once the the player is detached.
- **Let Player Keep Playing:** Select this option if you want to allow the playback player to continue playing the rest of the timeline once the player is detached.

The option for **Allow Attaching to Active Players** must be checked if you wish to attach DelayTool to a player that is already in use.



NOTE: If you attach DelayTool to a player that is already in use by another application, a warning message will appear as this operation can have unexpected results.

Help Menu

Descriptions of all **Help Menu** items are provided in this section.

Figure 3–14 illustrates the **Help Menu**.

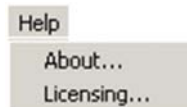


Figure 3–14: Help Menu

- Click **About DelayTool...** to show the **About DelayTool** dialog with the version, date, and copyright information for DelayTool.
- Click **Licensing ...** to display the **License Information** dialog (which lists the IP address or host name) of the licensing server to which your PC is connected.

The **License Server** field is automatically filled in, based on your license server entry information at the time of application startup. If you wish to reset the license server IP address (for example, if the licenser server changes), click **Reset Server Setting** and enter the new IP address or host name.

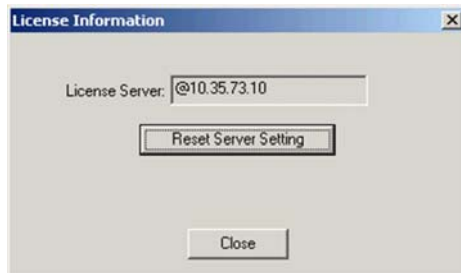


Figure 3–15: License Information Dialog

Shuttle Dialog

The **Shuttle** dialog will display when you click one of the **Shuttle** buttons on the DelayTool main window. Use the **Shuttle** dialog to:

- Browse through all material recorded in the cache.
- Pick an In (playback) point, which will be automatically reflected on the DelayTool main window.
- Select the in/out point for material recorded in the cache and save that selected material.

Descriptions for the **Shuttle** dialog are provided in this section.

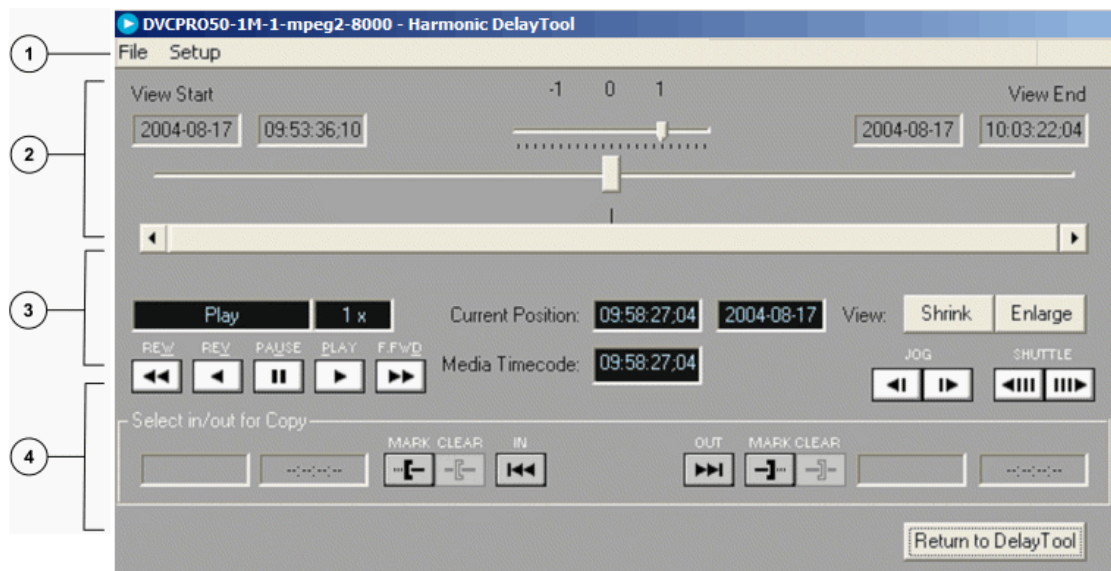


Figure 3–16: Shuttle Dialog

1. Menu Bar	3. Transport Controls
2. Cache Viewing Area	4. Select In/Out for Copy

Following are descriptions of each section as itemized in [Figure 3–16](#):

1. Menu Bar

The **Menu Bar** provides menus for **File** and **Setup** that are used to access and operate the Shuttle dialog.

Refer to the [File Menu](#) and [Setup Menu](#) for complete details.

2. Cache Viewing Area

The **Cache Viewing Area** provides you with the ability to browse through all recorded media in the cache as shown in [Figure 3–17](#).

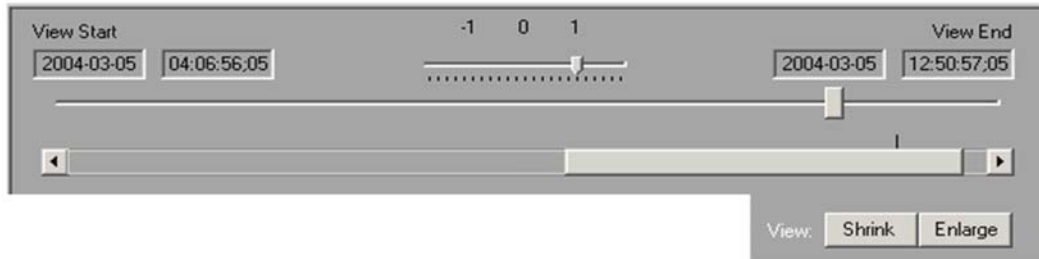


Figure 3–17: Cache Viewing Area

- **View Start:** The **View Start** field displays the start date and time for the portion of the recorded material within the entire cache that you are viewing.
- **View End:** The **View End** field displays the end date and time for the portion of the recorded material within the entire cache that you are viewing.
- **Slide Bars:** There are two slide bars in the Cache Viewing Area used for navigating and viewing material recorded in the cache.

The lower slide bar represents the entire cache, with the position bar indicating the viewing area within the cache. The marker over the position bar indicates your current position.

The upper slide bar can be used to fine-tune your location within the viewing area.

- **View: Shrink/Enlarge buttons:** Click on the **Shrink** or **Enlarge** buttons to incrementally shrink or enlarge the viewing area of the cache. The minimum size for the viewing area is ten seconds. The maximum size for the viewing area is the entire cache.

3. Transport Controls

The transport controls provide navigational buttons to view all recorded media in the cache. The **Shuttle** window transport controls comprise the VTR-style buttons and readouts.

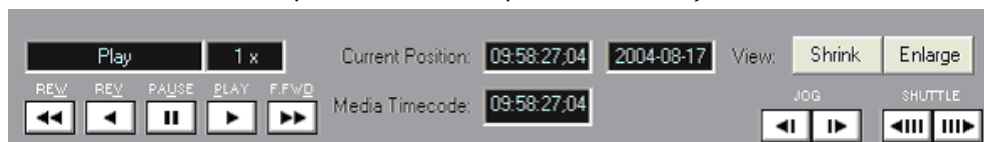


Figure 3–18: Shuttle Window Transport Controls

- **Transport Status** – This readout displays DelayTool’s current transport status. Depending upon the current DelayTool mode, the following “status” labels are shown:
 - **Rewind** (-32x to -2x)
 - **Reverse Play** (-1x)
 - **Slow Reverse Play** (-1/2x to -1/32x)
 - **Paused** (0x, still frame shown)
 - **Stopped** (0x, E-E mode)
 - **Slow Forward Play** (1/32x to 1/2x)

- **Play** (1x)
- **Fast Forward** (2x to 32x)
- **RECORDING** – Shown when recording is in progress.
- **Transport Speed** – This readout (to the right of **Transport Status**) shows the current playback speed, from “–32 x” to “32 x.”
- **Current Position** – These two readouts show the current position in the cache, displaying both the date and time the current frame was recorded. This readout is affected by the **Timecode** and **Frame Count** selections in the **Setup** Menu.



NOTE: The three readouts - **Transport Status**, **Transport Speed**, and **Clip Position** - display white text on a red background while recording is in progress. The **Transport Status** field flashes.

- **Media Timecode** – Displays the current VITC time code value of the playout video as selected and specified in the Player’s actual parameters.
 - **Shuttle** buttons – DelayTool **Shuttle** window supports the following transport speeds, as multiples of normal forward play:
 - 32, -16, -8, -4, -2, -1, -1/2, -1/4, -1/16, -1/32, 0, 1/32, 1/16, 1/8, 1/4, 1/2, 1, 2, 4, 8, 16, 32
 - Clicking the left **Shuttle** button changes the clip’s current speed to the next faster reverse speed.
 - Clicking the right **Shuttle** button changes the clip’s current speed to the next faster forward speed.
 - Clicking a **Shuttle** control while the Player is stopped plays the clip at –1/32x or 1/32x, respectively.
 - **REW** (Rewind) – Plays the clip at –32x.
 - **REV** (Reverse) – Plays the clip at –1x.
 - **PAUSE** – Plays the clip at 0x, presenting a still frame (pause). If no clip is loaded, black is played.
 - **PLAY** – Plays the clip at 1x (normal play mode).
 - **FFWD** (Fast Forward) – Plays the clip at 32x.
 - **JOG** buttons – Pauses any playback in progress, and backs up (left **JOG** button) or advances (right **JOG** button) the clip by one frame.
4. **Select in/out for Copy:**

Select in/out for Copy provides you with the ability to save specified recorded media in the cache.



Figure 3–19: Select in/out for Copy

- **Mark [In], Mark [Out]:** These two buttons mark the in (start) and out (end) points for copying. Click one of the Mark buttons to set that point on the views’ current Frame. Both the in-point and out-point are inclusive; in other words, the marked frames are the first and last frames to be copied from the cache.



NOTE: In some editing applications, the out-point is exclusive; that is, the first frame that is not shown. Older linear editors worked this way, but many newer non-linear editors use inclusive out-points.

- **Clear [In], Clear [Out]:** Click one of the **Clear** buttons to clear the corresponding marked in- or out-point. Note: the following
 - When no in-point is set, the corresponding **Clear** button is grayed out and disabled.
 - When no out-point is set, the corresponding **Clear** button is grayed out and disabled.
 - The Time Fields immediately adjacent the **Mark** and **Clear** buttons show the selections' current in-point and out-point. These fields are affected by the Timecode and Frame Count selections in the **Setup** menu.
- **[Goto] In, Out:** Click the **In** or the **Out** button to jump to the currently marked in-point or out-point.

File Menu

Figure 3–20 below illustrates the **File** menu for the **Shuttle** dialog.

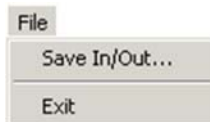


Figure 3–20: File Menu Shuttle Dialog

- Click **Save In/Out...** to save selected material recorded in the cache.
- Click **Exit** to close the **Shuttle** dialog and return to the DelayTool **Main** window.

Setup Menu

Figure 3–21 illustrates the **Setup** Menu for the **Shuttle** dialog.

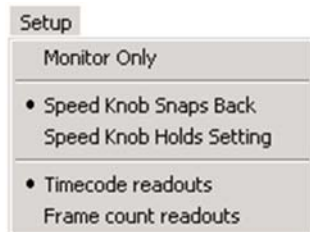


Figure 3–21: Setup Menu Shuttle Dialog

- Click **Monitor Only** to place the **Shuttle** window in a special mode in which all controls are grayed out. This view-only mode is designed for situations in which you (or others) want to monitor clip activity (such as with an automation system), but also want to prevent accidental clip control. To return to full control, simply uncheck the option.
- Click **Speed Knob Snaps Back** to cause the **Speed Knob** to always snap back to 0 (zero) when it is released.
- Click **Speed Knob Holds Setting** to cause the **Speed Knob** to remain at its current position (and speed) when it is released.
- Click **Timecode readouts** to cause all time-related fields and readouts to display timecode.
- Click **Frame count readouts** to cause all time-related fields and readouts in the Shuttle window to display frame counts.

DelayTool Operating Procedure

Use the following steps to operate DelayTool:

1. Select MediaDirector for Recording.

Using the drop-down “**MediaDirector**” field in the **Record Control** area, select the MediaDirector that you wish to use for recording. If the computer (on which DelayTool is installed) is on the same network as the MediaDirector, the MediaDirector name or IP address should be appear in the drop-down list.

If the MediaDirector is not visible in the list, click **Commands > Add MediaDirector** to display the **Add MediaDirector** dialog, and enter the desired MediaDirector name or IP address.



NOTE: DelayTool accepts MediaDirector names (as given by the Network Manager) or IP addresses. If an error is reported or the MediaDirector is still not visible in the list, check the MediaDirector and its network connection to the computer running the DelayTool.

2. Select the Record Player.

Using the drop-down “**Record Player**” field in the **Record Control** area, select the Player that you wish to use for recording. If the intended Player is not in the list, check that the Player is properly configured for record and activated in the Network **MANAGER**. It may also be necessary to select **Refresh Players** from the **Commands** menu.

Refer to the **System Configuration** section in the *Harmonic Spectrum System User’s Guide* for complete details on configuring and activating Players.

3. Specify the Maximum Allowable Delay.

Using the “**Maximum Allowable Delay**” field, enter a value (in HH:MM:SS format) for the longest delay period that will be required for the ingest feed. It is not necessary to type leading zeros or colons. This value must be greater than or equal to the desired program delay for any of the playback channels.



NOTE: Once recording is started, the “**Maximum Allowable Delay**” value cannot be changed unless recording is first stopped.

4. Check Disk Space.

Verify that there is enough disk space on the MediaDirector to store the amount of media specified by the “**Maximum Allowable Delay**” field – plus an additional 15 minutes used for buffering. This amount of space is required regardless of how many playout channels are being delayed. Allowing an extra 10% is recommended.

To check free space, on the **MANAGER** navigate to the **MediaDirector Properties** screen for the selected MediaDirector. Scroll down to the “**General Properties**” section and note the value in the **Filesystem Free Space** field. The value is listed in bytes, followed by the same value as a percentage of the total.

5. Select MediaDirectors for Playback.

Using the drop-down “**MediaDirector**” fields in the **Playout Control** area, select MediaDirector(s) for each playback channel desired. The only MediaDirector that will work for playback are those sharing the same file system as the record Player.

If the intended MediaDirector does not appear in the popup list, check the shared file system setup on both the record and playback MediaDirector and/or select “Add MediaDirector” under the “Commands” menu. If an invalid MediaDirector has been configured and selected, a message appears as in [Figure 3–22](#).



Figure 3–22: MediaDirector Error Message



NOTE: When more than one MediaDirector is in use by DelayTool, common VITC must be present in the video reference supplied to all MediaDirector in use.

Refer to the *Harmonic Spectrum System User's Guide*, specifically the “**Changing MediaDirector Clock Reference VITC Lines**” section in **System Operations** for VITC setup information.

6. Select Players for Playback.

Using the drop-down “**Player**” fields in the **Playout Control** area, select a Player for each playback channel you wish to delay. If the intended playback Player is not found in the list, ensure that the Player has not already been selected on another row. Using the **MANAGER**, check that the Player is activated and properly configured for playout.

When using DelayTool, playback and record Players must have identical configurations. It is recommended that you set each Player’s mode to “**Play and Record**.” If a mismatch occurs, playback errors can result. If DelayTool discovers a mismatch, you will be alerted with a dialog, as shown in [Figure 3–23](#).



Figure 3–23: Framerate Error Message

Refer to the *Harmonic Spectrum System User's Guide* —specifically the **System Operations** section for Player configuration details.

7. Specify Delay.

Using the “**Delay**” fields in the **Playout Control** area, enter the desired amount of delay (in HH:MM:SS format) for each playout channel.



NOTE: For playback Players connected to the same MediaDirector Host processor as the record Player, the minimum delay is 10 seconds. If the playback Player is on a different MediaDirector Host than the record Player, the minimum delay is 40 seconds.

8. Start Recording.

Click “**Run**” on the top row to begin recording. Once recording begins, the button will gray out and the “**Stop**” button will activate.

9. Attach Players.

For each delay channel that you wish to activate, click “**Attach**” on the associated playback row. Once activated, the button grays out and the “**Detach**” button activates. Note:

- Playback Players can be detached and attached at any time (before or after recording is started).
- If the playback delay for a channel is less than the accumulated record time, playback starts immediately at the appropriate point. If not, the playback Player pauses on the first frame of the media until the specified delay is reached – and then commences playout.

10. Stop Recording.

To stop recording, click the “**Stop**” button to display a confirmation dialog.



NOTE: The playback Players will respond according to the selection in the [Options Menu](#).

If the recording Player is already stopped, the **Stop** button will be grayed out.

Once the recording is stopped, all recorded material is saved in the cache. The recorded material is only deleted when the **Clear Cache** button is pressed.

11. Fill Interruptions.

Click on the **Fill Interruptions** button to display a list of all known interruptions in the cache. To specify a clip for an interruption:

- a. Highlight an interruption.
- b. Click the **Modify** button to display the **Select Clip** dialog.
- c. Use the **Select Clip** dialog to browse for a prerecorded clip for playout during that interruption.

12. Save In/Out Clips.

DelayTool allows you to save media in the cache. You can save specific material by using the Shuttle window to mark the in/out points in the cache, and then using the **Save In/Out** pull down menu to save the marked material as new media.

- a. Click on the **Shuttle** button for a currently playing Player. This will display the **Shuttle** dialog.
- b. Use the slide bars to navigate through and view media in the cache.
- c. Use **Select In/Out for Copy** to mark an In point and an Out Point for the media you wish to save.
- d. After marking the media, click **File > Save In/Out...** This will display the **Save Copy To...** dialog. Specify a clip name and click **OK** to continue or **Cancel** to return to the **Shuttle** dialog.

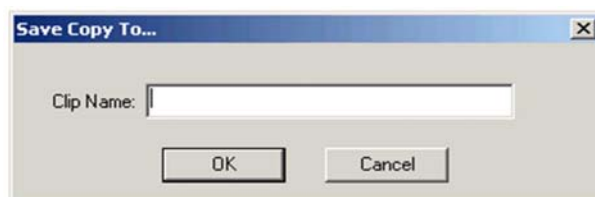


Figure 3–24: Save Copy To Dialog

- e. The **Copy Clips** dialog displays the Source, Destination, and Progress for the media being saved.



Figure 3–25: Copy Clips Dialog

DelayTool Notes

Please note the following important points regarding DelayTool:

- **Save In/Out Clips** – If the marked section spans clip boundaries, multiple clips will be saved. A number is appended to the clip name selected providing a unique ID for each of the copied clips.
- **Critical Error Window** – If a critical error occurs, an entry is posted in a “Critical Error” window. This window may be viewed at any time via the Commands menu.
- **Logs** – Log files are stored in a subdirectory called “logs.” This subdirectory is located in the same directory as the executable. The logs contain both information and error messages, and DelayTool saves the most recent megabyte of information.
- **Frame Synchronization between Playback and Recording** – If the playback and recording frame rates are different (for example, from a bad reference setup), timeline drift will occur. If timeline drift accumulates to more than one second’s worth of frames, DelayTool attempts to compensate by either dropping frames or repeating frames.
- **System Failures** – If DelayTool runs into any serious errors with the record Player, the program attempts to compensate. This may include stopping some or all playback channels, deleting cache clip files, and restarting recording or playback. In general, once any faults are repaired, DelayTool should return to normal operation. There may be empty sections within the clip cache that will require filling via the Fill Interruptions dialog.
- It is strongly recommended that you connect reference black with VITC to the MediaDirector.

Appendix A

Contacting the Technical Assistance Center

Harmonic Global Service and Support has many Technical Assistance Centers (TAC) located globally, but virtually co-located where our customers can obtain technical assistance or request on-site visits from the Regional Field Service Management team. The TAC operates a Follow-The-Sun support model to provide Global Technical Support anytime, anywhere, through a single case management and virtual telephone system. Depending on time of day, anywhere in the world, we will receive and address your calls or emails in one of our global support centers. The Follow-the-Sun model greatly benefits our customers by providing continuous problem resolution and escalation of issues around the clock.

Table A-1: For Distribution and Delivery (Legacy Harmonic) Products

Region	Telephone Technical Support	E-mail
Americas	888.673.4896 or 408.490.6477	support@harmonicinc.com
EME	+44.1252.555.450	support.emea@harmonicinc.com
Asia Pacific – Other Territories	+852.3713.9300	hongkongtechsupport@harmonicinc.com
India	+44.1252.555.450	support.emea@harmonicinc.com
Russia	+7.495.926.4608	rusupport@harmonicinc.com
Africa	+44.1252.555.450	support.emea@harmonicinc.com
Mainland China	+86.10.8391.3313	chinatechsupport@harmonicinc.com

Table A-2: For Production and Payout (Legacy Omneon and Rhonet) Products

Region	Telephone Technical Support	E-mail
Americas	888.673.4896 or 408.490.6477	omneon.support@harmonicinc.com
EMEA	+44.1252.555.450	omneonemeasupport@harmonicinc.com
Asia Pacific – Other Territories	+65.6542.0050	apacsupport@harmonicinc.com
Japan	+81.3.5565.6737	japansupport@harmonicinc.com
China - Mainland	+86.10.8391.3313	chinasupport@harmonicinc.com
Russia and CIS	+7.495.926.4608	rusupport@harmonicinc.com

The Harmonic Inc. support website is:

<http://www.harmonicinc.com/content/technical-support>

The Harmonic Inc. Distribution and Delivery product software downloads site is:

<ftp://ftp.harmonicinc.com>

The Harmonic Inc. Playout and Production software downloads site is:

<ftp://ftp.Omneon.com/Updates/Omneon/Current/>

The Harmonic Inc. corporate address is:

Harmonic Inc.
4300 North First St.
San Jose, CA 95134, U.S.A.
Attn: Customer Support

The corporate telephone numbers for Harmonic Inc. are:

Tel. 1.800.788.1330 (from the U.S. and Canada)
Tel. +1.408.542.2500 (outside the U.S. and Canada)
Fax.+1.408.542.2511

Appendix B

Compliance, Safety, and Agency Approvals

NOTE: The information in this appendix may apply to purchased products.

This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if it is not installed and used in accordance with the instructions in this manual. Operation of this equipment in a residential area is likely to cause harmful interference. If this occurs, the user will be required to correct the interference at his or her own expense.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15, Subpart B of the Federal Communications Commission (FCC) rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Connections between the Harmonic equipment and other equipment must be made in a manner that is consistent with maintaining compliance with FCC radio frequency emission limits. Modifications to this equipment not expressly approved by Harmonic may void the authority granted to the user by the FCC to operate this equipment.

WEEE/RoHS Compliance Policy

Harmonic Inc. intends to comply fully with the European Union's Directive 2002/96/EC as amended, on Waste Electrical and Electronic Equipment, also known as "WEEE," and Directive 2002/95/EC, as amended, on the Restriction of use of Hazardous Substances, also known as "RoHS."

Harmonic will ensure that product which cannot be reused will be recycled in compliance with the WEEE Directive. To that end, users are advised that (1) Harmonic equipment is not to be discarded in household or office garbage, (2) Harmonic Inc. will pay the freight for shipment of equipment to be disposed of if it is returned to Harmonic, (3) customers should call the normal RMA telephone numbers to arrange for such shipment, and (4) for additional and updated information on this process customers may consult the Harmonic website: http://harmonicinc.com/pa_weee_recycle.cfm.

Harmonic will ensure that its products will be either reused or recycled in compliance with the WEEE Directive. For the latest information concerning Harmonic's WEEE/RoHS Compliance Policy and its Recycling and Take-Back process, please visit our web site.



Restricted Substance Statement

Harmonic products contain less than the permitted limits for the six restricted substances except where exemptions published in the RoHS Directive are applicable. This statement is based on vendor-supplied analysis or material certifications, and/or lab test results of the component raw materials used in the manufacture of Harmonic products.

Restricted Substance	Permitted limit*
Cadmium (Cd)	≤ 0.01% (Cd)
Lead (Pb)	≤ 0.1% (Pb)
Chromium (VI) (Cr (VI))	≤ 0.1% (Cr VI)
Mercury (Hg)	≤ 0.1% (Hg)
Polybrominated Biphenyls (PBBs)	≤ 0.1% (PBBs)
*Homogeneous material definition as per the EU Directive.	

产品中的有毒有害物质或元素的名称及含量表

Names and Contents of Toxic and Hazardous Substances

This section lists the names of contents of toxic or hazardous substances, or elements in the products if the part is present.

该表显示哈雷公司产品中可能含有的有毒有害物质元配件的信息，除了来源于元配件供应商的物料成分资料，亦来自其它相关的机构与资料。哈雷产品不一定使用这些元配件。

This table shows those components where hazardous substances may be found in Harmonic products based on, among other things, material content information provided by third party suppliers. These components may or may not be part of the product.

除非特殊注明，哈雷公司产品的环保使用期限 均为 20 年。该环保使用期限的有效条件为：必须遵循该产品使用手册的规定，对该产品进行使用或存储。

The Environmental Protective Use Period for Harmonic products is 20 years unless displayed otherwise on the product. The EPUP period is valid only when the products are operated or stored as per the conditions specified in the product manual.

部件名称 (Part name)	有毒有害物质或元素 (Hazardous Substance)					
	铅 (PB)	汞 (Hg)	镉 (Cd)	六价铬 (CrVI)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷线路板 (Printed Circuit Assemblies)	X	O	O	O	O	O
机械组件 (Mechanical Subassemblies)	X	O	O	O	O	O
光学组件 (Optical Subassemblies)	X	O	O	O	O	O

部件名称 (Part name)	有毒有害物质或元素 (Hazardous Substance)					
	铅 (PB)	汞 (Hg)	镉 (Cd)	六价铬 (CrVI)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
电源 (Power Supplies)	X	O	O	O	O	O
缆线 / 线束 (Cables, harnesses)	X	O	O	O	O	O
屏幕 / 显示器 (Screens, Monitors)	X	O	O	O	O	O
金属零件 (Metal Parts)	O	O	O	O	O	O
塑料 / 发泡材料 (Plastics, foams)	O	O	O	O	O	O
电池 (Batteries)	O	O	O	O	O	O

O: 表示在该部件的所有均质材料中，此类有毒有害物质的含量均小于 SJ/T11363-2006 标准所规定的限量。

O: Indicates the content of the toxic and hazardous substances at the homogeneous material level of the parts is below the limit defined in SJ/T11363 2006 standard.

X: 表示至少在该部件的某一均质材料中，此类有毒有害物质的含量超出 SJ/T11363-2006 标准规定的限量。

X: Indicates that the content of the toxic and hazardous substances in at least one of the homogeneous materials of the parts is above the limit defined in SJ/T11363 2006 standard.

기종별	사용자 안내문
A급 기기 (업무용 정보통신기기)	이기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못 판매 구입 하였을 때에는 가정용으로 교환하시기 바랍니다.

Standards and Agency Approval

The following tables list regulatory standards and agency approvals:

North America

Standards	Agency Approval
EMI: FCC Part 15, Subpart B, ICES-003, Issue 2, Class A	FCC
Safety: UL60950-1, CAN/CSA C22.2 No. 60950-1	cTUV-us Mark

Europe

Standards	Agency Approval
EMI/EMC: EN55022 Class A, EN55024, EN61000-3-2 and EN61000-3-3	CE
Safety: EN 60950-1, EN60825-1	TUV-GS or T-Mark, CE
RoHS2: Directive 2011/65/EU	CE

Japan

Standards	Agency Approval
EMI: VCCI V-3, VCCI V-3 / 2000.04, VCCI V-3 2009	VCCI

Australia and New Zealand

Standards	Agency Approval
EMI: AS/NZS CISPR22	AS/NZS CISPR22

Canadian EMC Notice of Compliance

English: This digital apparatus does not exceed the Class A limits for the radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Commerce.

French: Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

EU Manufacturer's Declaration of Conformity

We: Harmonic, Inc.

Declare under our sole responsibility that the products identified below comply with the following EU Directives and Harmonized Standards stated.

Applicable EU Directives for ContentBridge:

Regulatory Compliance	Directive(s)	Notes
ContentBridge 1000		
EMC	FCC Part 15, ICES-003 CISPR 22 2004/108/EC Electromagnetic Compatibility including amendments	Class A for Digital Equipment, USA, Canada EN55022, EN61000-3-2, EN61000-3-3, and EN55024
Safety	TUV 2006/95/EC Low Voltage Directive including amendments	UL60950-1, CAN/CSA-C22.2 No. 60950-1 Safety of Information Technology Equipment
ContentBridge 2010A		
EMC	FCC ICES CE Mark VCCI BSMI C-Tick SABS CCC MIC	Class A Class B EN 55022 Class B, EN55024, EN61000-3-2, EN61000-3-3 Class B Class A Class B Class B Class B Class A
Safety	UL CAN/CSA EN IEC	UL 60950-1 CAN/CSA-C22.2 No. 60950-1 EN 60950-1, EN60825-1, EN60825-2 IEC60950-1

Regulatory Compliance	Directive(s)	Notes
ContentBridge 2010B/2010C		
EMC	ACMA or C-Tick BELLIS KVALITET ICES CNCA or CCC KONCAR CE SII VCCI OTAN – CKT INSM NEMKO GOST SABS KCC BSMI UKRTEST or UKRSERTCOMPUTER FCC STZ ICT	Class A
Safety	IRAM BELLIS SCC CNCA or CCC KONCAR CE TUV IECEE IECEE CB SII OTAN – CKT KEBS KUCAS NYCE or NOM INSM SONCAP NEMKO GOST KSA ICCP NRCS BSMI UKRTEST or UKRSERTCOMPUTER NRTL STZ	

Applicable EU Directives for ContentDirector:

Regulatory Compliance	Directive(s)	Notes
ContentDirector 1000C, 10000D, and 2000		
EMC	ACMA or C-Tick BELLIS KVALITET ICES CNCA or CCC KONCAR CE SII VCCI OTAN – CKT INSM NEMKO GOST SABS KCC BSMI UKRTEST or UKRSERTCOMPUTER FCC STZ ICT	Class A
Safety	IRAM BELLIS SCC CNCA or CCC KONCAR CE TUV IECEE IECEE CB SII OTAN – CKT KEBS KUCAS NYCE or NOM INSM SONCAP NEMKO GOST KSA ICCP NRCS BSMI UKRTEST or UKRSERTCOMPUTER NRTL STZ	

Applicable EU Directives for ContentServer and ContentStore:

Regulatory Compliance	Directive(s)	Notes
ContentServer 1042B/1042C-DP		
EMC	FCC Part 15, ICES-003 CISPR 22 89/336/EEC Electromagnetic Compatibility including amendments	Class A for Digital Equipment, USA, Canada EN55022A:1998+A1:2000 +A2:2003 EN61000-3-2:2000, EN61000-3-3:1995+A1:2001 EN55024:1998 +A1:2001+A2:2003 Immunity
Safety	TUV 73/23/EEC Low Voltage Directive including amendments	UL60950-1: 2003 CAN/CSA-C22.2 60950-1-3 Safety of Information Technology Equipment
ContentServer 2122/2124		
EMC	FCC Part 15, ICES-003 CISPR 22 89/336/EEC Electromagnetic Compatibility including amendments	Class A for Digital Equipment, USA, Canada EN55022 EMISSIONS EN61000-3-2, EN61000-3-3 EN55024 Immunity
Safety	UL60950 73/23/EEC Low Voltage Directive including amendments	IEC 60950 CAN/CSA-C22.2 60950 Safety of Information Technology Equipment
ContentServer 3000		
EMC	FCC (CFR 47, Part 15) Class A IECS-003, Issue 3, Class A	EN 55022, EN1000-2-3, EN1000-3-3 EN55024, AS/NZS 3548 (CISPR-22 Class A) VCCI V-3
Safety	IEC/EN 60950-1: CB report and CB certificate UL/CSA 60950-1: cTUVus-mark	
ContentStore 3160		

Regulatory Compliance	Directive(s)	Notes
EMC	FCC (CFR 47, Part 15) Class A IECS-003, Issue 3, Class A	EN 55022, EN1000-2-3, EN1000-3-3 EN55024, AS/NZS 3548 (CISPR-22 Class A) VCCI V-3
Safety	IEC/EN 60950-1: CB report and CB certificate UL/CSA 60950-1: cTUVus-mark	

Applicable EU Directives for Network Switch 2924, 2948 and 5406:

Regulatory Compliance	Directive(s)	Notes
CE	Low Voltage Directive is: 2006/95/EC, EMC directive is: 2004/108/EC	EN60950-1 Safety of Information Technology Equipment
EMC	FCC VCCI EN CISPR-22	Class A Class A 55022 Class A
Safety	CSA 22.2 UL IEC EN	No. 60950-1 60950-1 60950-1 60950-1

Applicable EU Directives for the MediaDeck 7000:

Regulatory Compliance	Directive(s)	Notes
CE	Low Voltage Directive (73/23/EEC) including amendments	EN60950-1: 1992, A1 + A2 + A3 + A4 Safety of Information Technology Equipment
EMC	FCC Part 15, ICES-003 ICES-003 Directive of Electromagnetic Compatibility EN55022: 1998 EN55024: 1998 CISPR 22	Class A for Digital Equipment, USA Class A for Digital Equipment, Canada (89/336/EEC) including amendments Emissions from Information Technology Equipment Immunity for Information Technology Equipment Class A Others

Applicable EU Directives for the MediaDirector 2201, 2202, 2251, 2252, and the MediaCenter:

Regulatory Compliance	Directive(s)	Notes
CE	Low Voltage Directive is 2006/95/EC, EMC directive is: 2004/108/EC	EN 60950-1 Safety of Information Technology Equipment
EMC	FCC Part 15 Class A ICES-003 VCCI Class A CISPR 22 Class A CNS 13438 EN 55022 Class A KN22 Class A	USA Canada Japan Australia, New Zealand, EU Taiwan EU Korea
Safety	UL 60950-1 First, Second Edition CSA C22.2	

Applicable EU Directives for MediaPort Series 5000, MediaPort 7000 Series, and ChannelPort:

Regulatory Compliance	Directive(s)	Notes
MediaPort 5000 Series, MediaPort 7000 Series, and ChannelPort		
CE	Low Voltage Directive is: 2006/95/EC, EMC directive is: 2004/108/EC	EN60950-1 Safety of Information Technology Equipment
EMC	FCC Part 15, ICES-003 ICES-003 Directive of Electromagnetic Compatibility EN55022 EN55024 CISPR22	Class A for Digital Equipment, USA Class A for Digital Equipment, Canada (89/336/EEC) including amendments Emissions from Information Technology Equipment Immunity for Information Technology Equipment Class A Others
Safety	UL/CUL, CAN/CSA C22.2 No. 950-95 Third Edition and UL1950 Third Edition UL/CUL, CAN/CSA C22.2 No. 60950-1-03 First Edition and UL60950-1 First Edition	
ChannelPort		
Safety	UL 670950-1, 2nd Edition CSA C22.2 No. 60950-1-03, 2nd Edition IEC 60950-1:2005 (Second Edition) EN 670950-1,2006 + A11:2009	

Applicable EU Directives for the Ellipse1000 and 2000:

Regulatory Compliance	Directive(s)	Notes
CE	Low Voltage Directive is: 2006/95/EC, EMC directive is: 2004/108/EC	
EMC	EN55022, EN61000-3-2, EN61000-3-3 and EN55024. VCCI V-3, AS/NZS CISPR22, KN22 and KN24	
Safety	EN60950-1, EN60525-1, EN60825-2, UL60950-1, CSA C22.2 No. 60950-1	

Applicable EU Directives for the Electra 1000, 5000, 5400, and 9200 encoders:

Regulatory Compliance	Directive(s)	Notes
CE	Low Voltage Directive is: 2006/95/EC, EMC directive is: 2004/108/EC	
EMC	EN55022, EN61000-3-2, EN61000-3-3 and EN55024. VCCI V-3, AS/NZS CISPR22	
Safety	EN60950-1, EN60525-1, EN60825-2, UL60950-1, CSA C22.2 No. 60950-1	

Applicable EU Directives for the Electra 8000 encoders:

Regulatory Compliance	Directive(s)	Notes
CE	Low Voltage Directive is: 2006/95/EC, EMC directive is: 2004/108/EC	
EMC	EN55022, EN61000-3-2, EN61000-3-3 and EN55024. VCCI V-3, AS/NZS CISPR22, KN22 and KN24	
Safety	EN60950-1, EN60525-1, EN60825-2, UL60950-1, CSA C22.2 No. 60950-1	

Applicable EU Directives for the ION AVC HD, ION AVC SD, ION MPEG-2, ION MPEG-4 AVC, and ION Multichannel encoders:

Regulatory Compliance	Directive(s)	Notes
CE	Low Voltage Directive is: 2006/95/EC, EMC directive is: 2004/108/EC	
EMC	EN55022, EN61000-3-2, EN61000-3-3 and EN55024. VCCI V-3, AS/NZS CISPR22	
Safety	EN60950-1, EN60525-1, EN60825-2, UL60950-1, CSA C22.2 No. 60950-1	

Applicable EU Directives for ProStream 1000, 2000, 4000, 4500, 5000, and 8000:

Regulatory Compliance	Directive(s)	Notes
CE	Low Voltage Directive is: 2006/95/EC, EMC directive is: 2004/108/EC	
EMC	EN55022, EN61000-3-2, EN61000-3-3 and EN55024. VCCI V-3, AS/NZS CISPR22	
Safety	EN60950-1, EN60525-1, EN60825-2, UL60950-1, CSA C22.2 No. 60950-1	

Applicable EU Directives for the MV400, MV450, and MV500 MPEG-2:

Regulatory Compliance	Directive(s)	Notes
EMC	EN55022, EN61000-3-2, EN61000-3-3 and EN55024. VCCI V-3, AS/NZS CISPR22	
Safety	EN60950-1, EN60525-1, EN60825-2, UL60950-1, CSA C22.2 No. 60950-1	

Important Safeguards and Notices

This section provides important safety guidelines for both the Operator and Service Personnel. Specific warnings and cautions are found throughout the guide where they apply, but may not appear here. Please read and follow the important safety information, noting especially those instructions related to risk of fire, electric shock or injury to persons.

Safety and Regulatory Information for the ContentServer 3000 and ContentStore 3160

Danger: Class 1 laser product.



Attention: Produit laser de classe 1


Warnung: Laserprodukt der Klasse 1

This equipment contains optical transceivers, which comply with the limits of Class 1 laser radiation. Visible and invisible laser radiation may be emitted from the aperture of the optical transceiver ports when no cable is connected. Avoid exposure to laser radiation and do not stare into open apertures.

Lithium Battery Notice for Service Personnel

This product contains a lithium battery. Although the battery is not field-serviceable, observe the following warning:



Mark	Notes
	<p>CAUTION: Danger of explosion if battery is replaced with incorrect type. Replace only with the same type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.</p> <p>WARNING: CALIFORNIA PERCHLORATE ADVISORY Some lithium batteries, may contain perchlorate material. The following advisory is provided: "Perchlorate Material – special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate/" for information.</p> <p>ATTENTION: Il y a danger d'explosion s'il a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un type equivalent recommande par le constructeur. Mettre au rebut les batteries usees conformement aux instructions du fabricant</p> <p>WARNUNG: Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.</p>
	<p>WARNING: This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).</p> <p>ATTENTION: Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifier qu'un fusible ou qu'un disjoncteur de 120 V alt., 15 A U.S. maximum (240 V alt., 10 A international) est utilisé sur les conducteurs de phase (conducteurs de charge).</p> <p>WARNUNG: Dieses Produkt ist darauf angewiesen, daß im Gebäude ein Kurzschluß- bzw. Überstromschutz installiert ist. Stellen Sie sicher, daß eine Sicherung oder ein Unterbrecher von nicht mehr als 240 V Wechselstrom, 10 A (bzw. in den USA 120 V Wechselstrom, 15 A) an den Phasenleitern (allen stromführenden Leitern) verwendet wird.</p>


Mark	Notes
	<p>WARNING: To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. These guidelines are provided to ensure your safety:</p> <ul style="list-style-type: none"> ■ This unit should be mounted at the bottom of the rack if it is the only unit in the rack. ■ When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack. ■ If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
	<p>ATTENTION: Pour éviter toute blessure corporelle pendant les opérations de montage ou de réparation de cette unité en casier, il convient de prendre des précautions spéciales afin de maintenir la stabilité du système. Les directives ci-dessous sont destinées à assurer la protection du personnel.</p> <ul style="list-style-type: none"> ■ Si cette unité constitue la seule unité montée en casier, elle doit être placée dans le bas. ■ Si cette unité est montée dans un casier partiellement rempli, charger le casier de bas en haut en plaçant l'élément le plus lourd dans le bas. ■ Si le casier est équipé de dispositifs stabilisateurs, installer les stabilisateurs avant de monter ou de réparer l'unité en casier.
	<p>WARNUNG: Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt. Die folgenden Richtlinien sollen zur Gewährleistung Ihrer Sicherheit dienen:</p> <ul style="list-style-type: none"> ■ Wenn diese Einheit die einzige im Gestell ist, sollte sie unten im Gestell angebracht werden. ■ Bei Anbringung dieser Einheit in einem zum Teil gefüllten Gestell ist das Gestell von unten nach oben zu laden, wobei das schwerste Bauteil unten im Gestell anzubringen ist. ■ Wird das Gestell mit Stabilisierungszubehör geliefert, sind zuerst die Stabilisatoren zu installieren, bevor Sie die Einheit im Gestell anbringen oder sie warten.

The Technical File is available to proper authorities and the product is marked.

Safety Symbols

The product is marked with these symbols when it is necessary to refer to the manuals to prevent damage to the product.

Symbol	Name	Description
	<p>Caution</p>	<p>Please observe the following important cautions:</p> <ul style="list-style-type: none"> ■ When installing this equipment, always comply with the National Electrical Standard and local electrical standard for attachment of the power cords. ■ Risk of explosion if battery is replaced incorrectly or with an incorrect type. There are no user-serviceable batteries inside Omneon products. Refer to Omneon qualified personnel only to service the replaceable batteries. Dispose of batteries according to the instructions. ■ Use only specified replacement parts. ■ Follow static precautions at all times when handling this equipment. ■ Slots and openings in the chassis are provided for ventilation. Do not block them. Leave the back of the frame clear for air exhaust cooling and to allow room for cabling – a minimum of 6 inches (15.25 cm) of clearance is recommended. ■ Disconnect <i>all</i> AC power supplies when servicing any unit.
	<p>Warning</p>	<p>Please observe the following important warnings:</p> <ul style="list-style-type: none"> ■ Any instructions in this guide that require opening the chassis or removing a board should be performed by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing unless you are qualified to do so. ■ Heed all warnings on the unit and in the operating instructions. ■ Do not use this product in or near water. Disconnect all AC power before installing any options or servicing the unit unless instructed to do so by this manual. ■ This product is grounded through the power cord grounding conductor. To avoid electric shock, plug the power cord into a properly wired receptacle before connecting the product inputs or outputs.

Symbol	Name	Description
		<ul style="list-style-type: none"> ■ Route power cords and other cables so that they are not likely to be damaged. Disconnect power before cleaning. Do not use liquid or aerosol cleaners; use only a damp cloth. ■ Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on. Do not insert anything into either of the system's two power supply cavities with power connected. ■ Do not wear hand jewelry or watches when troubleshooting high current circuits, such as the power supplies. ■ To avoid fire hazard, use only the specified correct type, voltage and current rating as referenced in the appropriate parts list for this product. Always refer fuse replacement to qualified service personnel. ■ Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading."
	Laser Warning	<p>Please observe the following laser warnings:</p> <ul style="list-style-type: none"> ■ Invisible Laser Radiation, when open or when operating with the fiber disconnected. AVOID DIRECT EXPOSURE TO THE BEAM. Never operate a unit with a broken fiber or with a separated fiber connector.

Safety Precautions

To avoid injury and prevent equipment damage, observe the following safety precautions:

- Do not move or ship equipment unless it is correctly packed in its original wrapping and shipping containers.
- Only Harmonic trained personnel can undertake equipment service and maintenance.
- To prevent damage by lightning, ground the unit according to local regulations.
- Do not permit unqualified personnel to operate the unit.

AC Power Supply to the Unit

To ensure correctly and safely operation of the unit, the following are required:

- Adding to the system a UPS (Uninterrupted Power Supply) and an AVR (Automated Voltage Regulator) is highly recommended.

- Installing the main power supply by a qualified electrician, according to power authority regulations. Make sure all powerings are wired with an earth leakage, according to local regulations.
- It is recommended to install the encoder within 1.5m (approximately 5 feet) from an easily accessible grounded AC outlet.
- When the encoder is rack-mounted, ensure that the rack is correctly grounded.



DANGER: To ensure that the rack is correctly grounded by a qualified electrician. Incorrectly grounded equipment may result in electrical shock.

DC Power Supply to the Unit

In the case the unit is fitted with DC power inputs, the following are required:

- Never work on DC powered equipment while power is applied. Disconnect power before making connections to the device.
- Ensure a suitable overcurrent device is inline between the equipment and the power source.

Rack Mount Instructions

- Elevated Operating Ambient: If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
- Reduced Air Flow: Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical Loading: Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing: Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Handling Fibre Channel Cables

- Always read and comply with the handling instructions on the shipping container.
- Follow all ESD precautions and approved fiber cleaning procedures.
- The fiber is made of a very pure, expensive glass and should be treated with great care. Handle fibers only in areas that are very clean and do not contain sharp objects.
- Wear finger cots or gloves as dirt and oils can damage the fiber and contaminate connectors.
- Do not allow kinks or knots to develop in the fiber. If tangles occur, carefully work out the tangles avoiding pulling or bending the fibre beyond its bend radius.
- Always use the correct tools for stripping and cleaving the fiber. It will save time and reduce breakage caused by scratches.

- If you must secure a bundle of fiber cables together, avoid plastic and metal tie wraps; secure with velcro instead.

Product End-of-Life Disassembly Instructions

This section provides instruction for the disassembly of the indicated Harmonic Spectrum MediaDeck 7000 product family in order to remove components requiring selective treatment, as defined by the EU WEEE Directive (2002/96/EC).

Description	Notes	Qty in the product	Location
Printed Circuit Board Assemblies (PCBA) (PCBA)	With a surface greater than 10 sq. cm (Additional PCBA-s may be present depending on the configuration)	2	Inside the chassis
Batteries	All types including standard alkaline and lithium coin or button style batteries	1	LITHIUM COIN, P/N 57-1006 3V,20MM,2PIN on the main Base board. California USE Only: Perchlorate Material - For handling see: www.dtsc.ca.gov/hazardouswaste/perchlorate
Mercury-containing components	For example, mercury in display backlights, switches, batteries	None	
Liquid Crystal Displays (LCD) with a surface greater than 100 sq cm	Includes background illuminated displays	None	
Video display device	With a screen size of more than 10 cm measured diagonally	None	
Cathode Ray Tubes (CRT) None		None	
Capacitors / condensers (Containing PCB/PCT)		None	
Electrolytic Capacitors / Condensers measuring greater than 2.5 cm in diameter or height		None	
External electrical cables and cords		2	
Gas Discharge Lamps		None	

Description	Notes	Qty in the product	Location
Plastics containing Brominated Flame Retardants		None	
Components and parts containing toner and ink, including liquids, semi-liquids (gel/paste) and toner		None	
Components and waste containing asbestos		None	
Fiber-optic cables		None	
Laser parts		None	
Radioactive components, parts or materials		None	

The following table lists the required tools.

Description	Size
Philips screw drivers	# 1 and #2
Flat-head screw driver	small
Flat-head screw driver	large
Diagonal-cutting pliers, long-nose pliers	~ 5"
Sockets	11/32", 1/2", 5/8", and 9/16" (deep)
Special tools to remove specific components	Not needed

Product Disassembly Process

1. Disassemble equipment at a dedicated area only, gather the needed tools for disassembly.
2. Remove covers, housing, etc.
3. Remove and separate subassemblies (i.e. lasers, cables, metals, displays, fans, etc.).
4. Separate hazardous materials from the remainder of the material.
 - a. Sort hazardous materials into their different types (i.e., batteries, hazardous liquids, hazardous solids, fiberglass, etc.).
 - b. Proceed with hazardous waste management processes only.
5. Identify re-usable materials/subassemblies and separate these from the rest of the material.
6. Identify and separate recyclable materials as per below examples:
 - a. Scrap material to be sent to smelter(s).
 - b. E-waste such as displays, CPU's, cables and wires, hard drives, keyboards, etc.
 - c. Metals such as steel, brass, and aluminum.
 - d. Plastics such as fan casings, housings, covers, etc.

- e. Fiber optics and plastic tubing not containing electrical or data wiring.

Safety Rules

Recycler personnel are to wear personal protective equipment including proper eye protection, proper hand protection, and proper breathing protection if needed.

Recycler personnel shall be experienced with using the proper tools required for disassembling equipment. Untrained personnel shall not disassemble Harmonic products. Unfamiliarity with tools can cause damage and injury.

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