HELIX MOBILE PRODUCER AND HELIX MOBILE PRODUCER LIVE USER'S GUIDE

Helix™ Mobile Producer 10 powered by Envivio™

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CHAPTER

1

INTRODUCTION

Welcome to the *Helix Mobile Producer and Helix Mobile Producer Live User's Guide* from RealNetworks®. This manual shows you everything you need to know about these two products, which enable you to convert audio and video into streaming media for wireless devices such as mobile telephones and personal digital assistants (PDAs).

Using Helix™ Mobile Producer or Helix Mobile Producer Live powered by Envivio™, anyone can create streaming media easily from a variety of sources. You can convert from existing audio or video files, record directly from audio/video (A/V) devices, or use these applications together with Helix Server to broadcast and stream live content.

What is Helix?

Helix from RealNetworks is a universal digital media delivery platform. With industry-leading performance, integrated content distribution, advertising, user authentication, Web services support, and native delivery of many types of media files (RealMedia™, Windows Media, QuickTime, MPEG-4, and 3GPP), Helix from RealNetworks is a robust digital media foundation that meets the needs of businesses and networking service providers.

Helix Mobile Producer and Helix Mobile Producer Live

With Helix Mobile Producer or Helix Mobile Producer Live, you can format your video and audio content to reach the world of wireless devices. This innovative encoding software enables mobile operators and content providers to convert streaming media to a full spectrum of standards for mobile products. Helix Mobile Producer and Helix Mobile Producer Live are key components of RealNetworks' end-to-end solution (encoding, serving, and

playback) for mobile multimedia, supporting both on-demand and live encoding and making it possible to generate content with the bit rates, frame sizes, and other settings most suitable for mobile devices.

Standard and Professional Versions

Helix Mobile Producer gives you the ability to encode streaming audio or video presentations as files. Helix Mobile Producer Live encodes live capture input for live broadcasts and file output. Helix Mobile Producer and Helix Mobile Producer Live are delivered in two versions, Standard and Professional. The Professional edition includes the following additional features:

- Command-line encoding
- SNMP reporting
- For RealVideo encoding, the maximum bit rate is 2 Mbps, and the maximum video resolution is 640x480
- Batch encoding through the graphical interface

Why Use Helix Mobile Producer or Helix Mobile Producer Live?

When it comes to 3GPP mobile encoding, Helix Mobile Producer and Helix Mobile Producer Live do it all. These products are ideal for either live or on-demand content and will convert most common types of video and audio to standards-compliant 3GPP formats. This section discusses the features and capabilities of this software in terms of two key areas: quality and productivity.

Quality

Helix Mobile Producer and Helix Mobile Producer Live provide support for a range of encoding technologies that enable high-quality media delivery, using the features described in the following paragraphs.

MPEG-4 SVP video

Stream or download high-quality video to users' cell phones or PDAs, at bit rates from 10 to 384 kilobits per second (Kbps). Helix Mobile Producer supports the following MPEG-4 SVP levels:

level 0 and 1	up to 64 Kbps
level 2	up to 128 Kbps
level 3	up to 384 Kbps

H.263 Profile 0 video

This is another standards-based codec that you can use to deliver good-quality video at bit rates from 10 to 384 Kbps, but without the licensing requirement of MPEG-4. Helix Mobile Producer supports the following H.263 Profile 0 levels:

level 10	up to 64 Kbps
level 20	up to 128 Kbps
level 30	up to 384 Kbps

Variable-bit-rate encoding

This feature enables the video codec to vary the bit rate throughout a clip, depending on the type of content being encoded. With variable-bit-rate encoding, the more action there is in a scene, the more bits are used for that scene. This makes for a more consistent quality of video encoding for downloadable content, while keeping download times as short as possible.

Double-pass video compression

Double-pass encoding increases output quality by analyzing video data before encoding the input video.

AMR audio

Using this feature, you can deliver high-caliber voice clips at bit rates ranging from 4,750 to 12,200 bps.

AAC-LC audio

This feature enables you to deliver music and mixed-audio content at bit rates from 8 to 128 Kbps. AAC provides better-quality audio than does MP3 at the same bit rate.

Video scaling

You can use imported video files to scale standard screen resolutions ranging from QQCIF (88 x 72) to CIF (352 x 288).

Prefiltering

By cropping or making adjustments in frame-rate conversion, inverse-telecine, deinterlacing, noise filtering, brightness, contrast, and gamma settings, you can improve video quality.

Productivity

Helix Mobile Producer and Helix Mobile Producer Live increase your productivity by providing support for a number of media formats and tools that make automated media encoding possible.

Input file support

With DirectShow and QuickTime 6 installed, Helix Mobile Producer and Helix Mobile Producer Live can read a variety of file types, including AVI, MOV, DV, MPEG-1, MPEG-2 (with an additional DirectShow or QuickTime plug-in), MP3, MPEG-4, and WAV files.

XML preset files

By using preset XML files, you can define all of the settings for a given file-to-file encoding job, making it easy both to edit the files and to reuse the same settings for batch processing.

Command-line interface

A simple command-line interface enables you to create batch-processing scripts or to wrap your 3GPP encoding into your own customized, automated system.

Additional Documentation Resources

In addition to this manual, you might want to consult the following RealNetworks books, the first three of which are available for downloading at the following Web address:

http://service.real.com/help/library/encoders.html

- *Introduction to Streaming Media*

Start with this guide if you are new to streaming media or RealNetworks products. Written for the beginning user, this book explains how to put together a basic presentation using different production techniques.

- *RealNetworks Production Guide*

  This guide is the main reference manual for streaming media production. Refer to the production guide for instructions and tips on producing audio and video clips, as well as for complete information about using the Synchronized Multimedia Integration Language (SMIL).

- *RealPlayer Scripting Guide*

  If you are a Web programmer, refer to this guide for instructions about using JavaScript or VBScript with RealPlayer™ from RealNetworks. Using these scripting languages, you can customize RealPlayer to turn it into your own Internet jukebox, for example.

- *Helix Server Administration Guide*

  The basic reference for the Helix Server administrator, this guide explains how to set up, configure, and run Helix Server to stream multimedia. You need this guide only if you are running Helix Server yourself. You can download this manual from the following Web address:

  http://service.real.com/help/library/servers.html

Technical Support

For general information about RealNetworks Technical Support, visit the following Web page:

http://service.real.com

CHAPTER

2

STREAMING MEDIA BASICS

This chapter introduces you to streaming media and how you can use Helix Mobile Producer or Helix Mobile Producer Live to create streaming media. It gives you a brief look at how streaming works, the different types of media that you can create with Helix Mobile Producer or Helix Mobile Producer Live, and the various RealNetworks products that you use when streaming.

What is Streaming Media?

Before the advent of streaming media, users had to wait for media files, or clips, to be downloaded from the Internet or from a network server before they could play the clips. With streaming media, users can see and hear these clips almost instantaneously.

A streaming clip consists of small packets of information that are sent over a network connection. The user receives these information packets in a "stream" and, using a player (such as RealPlayer from RealNetworks), experiences the media piece by piece.

The mechanics of the streaming process are virtually invisible to the user. In fact, the process is similar to viewing a film, with each data packet being analogous to a single frame in a filmstrip. When a film is run through a projector and displayed on a screen, the audience is not aware of each individual frame they are seeing; rather, they experience the film as one continuous flow. Similarly, when users receive and play streaming media clips on their computers, what they experience is a continuous stream rather than a succession of discrete data packets.

How is Streaming Media Created?

Helix Mobile Producer and Helix Mobile Producer Live create streaming media data packets by a process called "encoding." During encoding, the

source media is transformed into streaming media through the use of "codecs" (compression/decompression algorithms). The entire process is summed up in the following four steps:

1. Helix Mobile Producer receives the source media as a file; Helix Mobile Producer Live receives the source media as live audio or video.
2. Helix Mobile Producer and Helix Mobile Producer Live use a codec to compress the media source's data into packets.
3. The data packets are streamed to the user over the Internet or an intranet.
4. At the user's end, the same codecs are used to piece the media back together so that the user can play the clip.

Working with Audio and Video Clips

Although for you the steps involved in encoding streaming audio are similar to those involved in encoding video, there are some basic differences in the way Helix Mobile Producer and Helix Mobile Producer Live process audio and video streams.

Encoding audio is simpler than encoding video. A basic streaming audio clip is created by using an audio file or live audio source as the input. Helix Mobile Producer and Helix Mobile Producer Live use various audio codecs to convert your standard audio input into a format that can be streamed.

A more complex task for Helix Mobile Producer and Helix Mobile Producer Live is converting standard video input into streaming media. A video clip is created either by converting an existing video file or by capturing a live video source, such as from a video camera or a VCR, and sending it to your computer by way of a video capture card. Helix Mobile Producer and Helix Mobile Producer Live convert different attributes of the video—such as frame rate, type of motion, and size of the image—into a video clip by using a video codec. If the video also includes audio data, that must also be converted by the audio codecs.

Targeting Audiences

Before Helix Mobile Producer or Helix Mobile Producer Live can compress the source data, it needs to know something about the intended audience for the resulting media clip. An audience is defined by the bit rate at which their computers can connect to the Internet or a given network. For example, a person using a 56-Kbps dial-up modem to connect to your media stream is a member of the 56K Modem audience.

Single-Bit-Rate Streaming

Because some data is lost during the compression process, picking the correct audience is key in preserving as much of your source data as possible.

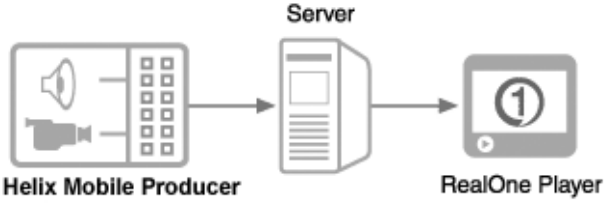
Other RealNetworks Products

Helix Mobile Producer and Helix Mobile Producer Live are members of the RealNetworks family of software products. These components work in tandem with one another to create, stream, and play your media clips:

- Helix Mobile Producer and Helix Mobile Producer Live create streaming clips for mobile devices.
- Helix Server streams the media clips to users.
- RealPlayer enables users to play the streamed media clips.

The following diagram illustrates how these RealNetworks products work together.

RealNetworks Software Products



Helix Server

Just as a Web server delivers pages to Web browsers over the Internet, Helix Server serves streaming media clips to your audience. It enables users to stream the media clips rather than download them. By streaming the content, a user can begin to watch the clip almost immediately and doesn't have to wait for the entire file to be downloaded.

There are two different ways to deliver your content: as an on-demand file or as a live broadcast. On-demand delivery entails encoding your media content before your audience needs it. With live broadcasting, on the other hand, the media is being encoded at the same time that your audience is playing it. For both types of delivery, you can use Helix Server in conjunction with Helix Mobile Producer or Helix Mobile Producer Live.

Client Software

A client, such as RealPlayer installed on a mobile device, plays the streamed media. Note that with Helix Server, you can also deliver streaming content to computers running Windows Media Player or QuickTime as their client (player) software.

CHAPTER

3

SYSTEM REQUIREMENTS AND INSTALLATION

This chapter discusses the hardware and software requirements for Helix Mobile Producer and Helix Mobile Producer Live, and it explains how to install the products on a computer running Microsoft Windows.

> **Note:** Windows 2000 and Windows XP are the only operating systems supported for use with Helix Mobile Producer.

System Requirements

The following table lists the hardware and software requirements and specifications for installing and running Helix Mobile Producer or Helix Mobile Producer Live on your computer.

Helix Mobile Producer and Helix Mobile Producer Live System Requirements and Specifications

Category	Item	Requirements or specifications
Minimum system requirements and support	Microsoft Windows operating system	Windows 2000 or Windows XP Pentium III equivalent or greater 128 MB of RAM (256 MB recommended) NTFS is required for large files that cannot be handled by a FAT32 file system DirectX 8.1 or later Optional Requirements: DirectShow MPEG-2 Decoder to import MPEG-2 and QuickTime 6.0 or later to import MOV and MP4 files (QuickTime 6.3 recommended)
	Graphics card	Color graphics card capable of 1024 x 768 resolution
	Networking	Ethernet card

(Table Page 1 of 2)

Helix Mobile Producer and Helix Mobile Producer Live System Requirements and Specifications (continued)

Category	Item	Requirements or specifications
Supported import formats	Video	AVI, MOV, MPEG-1, MPEG-2, MPEG-4, DV
	Audio	AIF, MP3, WAV
Supported capture devices (only the Video for Windows driver versions are supported)	Osprey 100	Video: S-Video and Composite Audio: None
	Osprey 200/210/220	Video: S-Video and Composite Audio: Analog RCA and XLR
	Osprey 500 DV/500 DV Pro	Video: S-Video and Composite, IEEE 1394/DV, and SDI Audio: AES/EBU
	Osprey 540	Video: S-Video and Composite, IEEE 1394/DV, and SDI Audio: Analog RCA and XLR, AES/EBU, and Embedded SDI Audio
	Techsmith Camtasia	Video: Screen capture only
	Pinnacle PCTV Rave	Video: S-Video and Composite Audio: RCA
	Philips ToUcam Pro	Video: Webcam Audio: mono, 16-bit, 8 / 11.025 / 22.05 / 44.1 kHz
Export	File format	3GPP, 3GPP2 MPEG-4 files, optionally prepared for RTP streaming AMR MP3 QCP (QCELP file format) RealMedia

(Table Page 2 of 2)

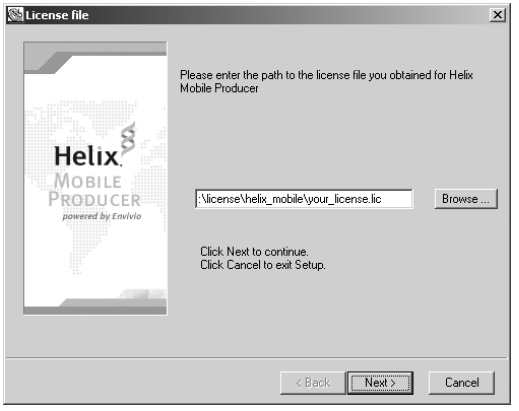
Installing Helix Mobile Producer or Helix Mobile Producer Live

This section explains how to install Helix Mobile Producer or Helix Mobile Producer Live on your computer and how to register your copy of the product with RealNetworks.

> **Note:** To install Helix Mobile Producer or Helix Mobile Producer Live, you must have at least a "Power User" access level.

➤ To install and register Helix Mobile Producer or Helix Mobile Producer Live:

1. Double-click the icon for the installer file (`helix-XXX.exe`, where *XXX* is the version number). Then read and follow the online instructions displayed during the installation process.
2. Specify the path to the licensing file where indicated, and then click **Next**, as shown in the following illustration.



3. Follow the rest of the installation instructions.

CHAPTER

4

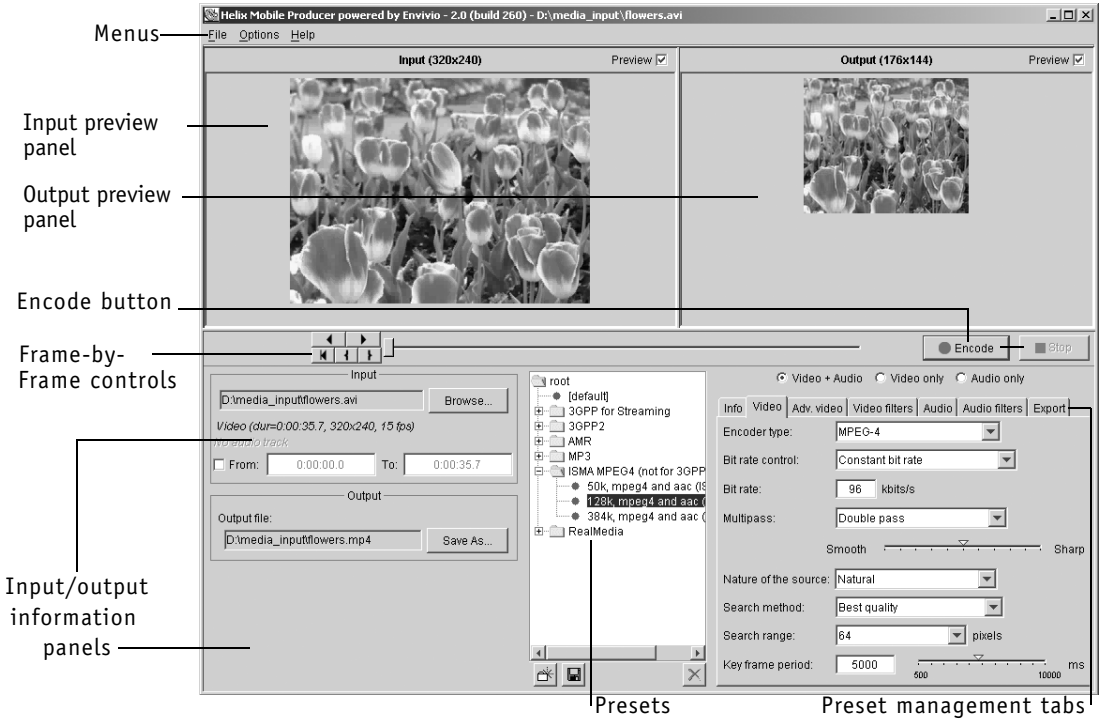
QUICK START

This chapter explains how to start Helix Mobile Producer and Helix Mobile Producer Live. It introduces key concepts that will help you encode audio and video from prerecorded files or live media sources.

Starting Helix Mobile Producer or Helix Mobile Producer Live

To start Helix Mobile Producer or Helix Mobile Producer Live, double-click the **Helix Mobile Producer** icon or use the Windows Start menu. Programs are listed directly under **Start>Programs**.

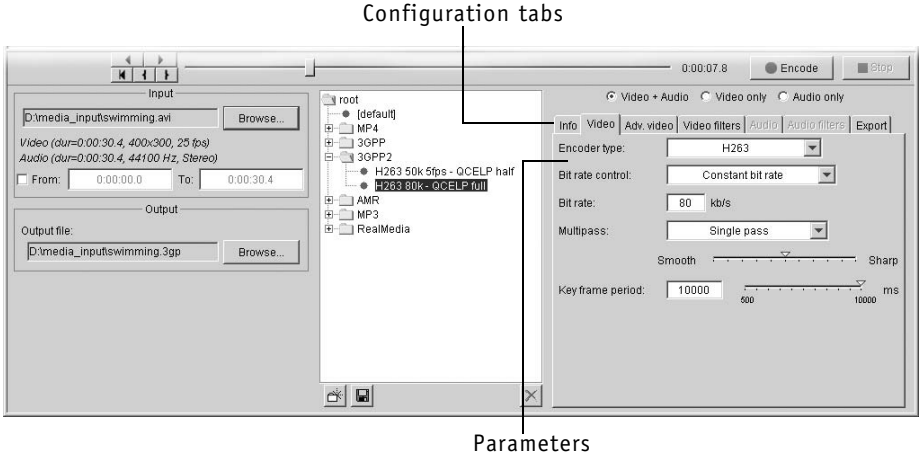
Helix Mobile Producer Workspace



The Helix Mobile Producer workspace is composed of several panels, which are described in the following paragraphs.

- The upper window is divided into two preview panels:
  - The Input panel (on the left) displays a preview of the original video input.
  - The Output panel (on the right) displays a preview of the encoded output.
- The horizontal bar in the middle of the workspace displays either the frame-by-frame controls or the encoding progression bar. It contains the **Encode**, **Stop**, and **Play** buttons.
- The lower window is organized into three panels:
  - The left panel summarizes the input and output directories.
  - The middle panel displays the available presets.
  - The right panel has tabs for configuring video and audio encoding parameters and filters, and for defining export settings.

Lower Window of Helix Mobile Producer Workspace



Quick Concepts

This section describes key concepts that will help you to understand how to use Helix Mobile Producer effectively.

Media Sources

A Helix Mobile Producer presentation can include one digital video source, one digital audio source, or both. Note that input media sources can be either existing files or media that's "captured" live.

Preset Encoding Parameters

Before encoding your media, you can select a set of encoding parameters that have been saved collectively as a *preset*. Presets are available for any encoding session on your computer.

Encoding

Encoding compresses digital media so that it takes up less space and can be transmitted faster. The compression process identifies the essential components of the input media and discards the superfluous parts.

Be aware that the addition of data such as hint tracks and headers to audio or video streams during the encoding process results in the encoded files being somewhat larger than the sum of the encoded media bit rates multiplied by the duration of the file (`(audio bit rate + video bit rate) x duration`). This does not affect the bit rate or quality of the media, because this additional data remains on the server and is not streamed to the client.

> **Tip:** The hint track is required by the streaming server to optimize the streaming experience. A 3GPP media file must have a hint track to be properly streamed from most streaming servers. The hint track is not required if the media file is to be downloaded and played locally, however. To avoid having Helix Mobile Producer add a hint track to such a file, clear the **Prepare for streaming** check box on the **Export** tab before encoding the audio or video clip.

Getting Started

This section outlines the main steps involved in preparing to encode audio or video input: setting up sources for offline or live encoding, selecting encoding parameter presets, and setting output options.

Basic Workflow

Perform the sequence of actions outlined in this section to encode media for file output or broadcast output by using Helix Mobile Producer.

➤ To encode media with Helix Mobile Producer:

1. Set input parameters:
   - Select an input media source: file (offline encoding) for Helix Mobile Producer or capture (live encoding) for Helix Mobile Producer Live.
   - For file input with Helix Mobile Producer, select the file's path. (If your input is an AVI file, you would then choose how you want to open AVI files.)
   - For captured input with Helix Mobile Producer Live (for example, camera or VTR), select audio and video input sources, and then set the duration.
2. Select a preset and set parameters:
   - Select a preset, and then adjust the values if necessary.
   - Set the export parameters.
3. Set output options:
   - Specify the destination for file output.
   - Specify the parameters for broadcast output.
4. Encode the input media (file or live).
5. View the output file or the live broadcast.

Setting Up Source Files for Offline Encoding with Helix Mobile Producer

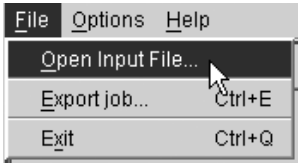
You need to specify a source file before you can start encoding offline input media with Helix Mobile Producer.

Selecting a Source File

Use the following procedure to specify an input source file that you want to encode.

➤ To select a source file:

1. Click **File>Open Input File**.



2. Select an input source file.

   Note: When you select a video source, the preview of the input video is displayed in the **Input** preview panel. If you select an audio source, a headphones icon is displayed.

Choosing How to Import AVI Files

If you select an AVI source file, it is opened with a DirectShow filter by default. You can select a different AVI import library by using the following procedure.

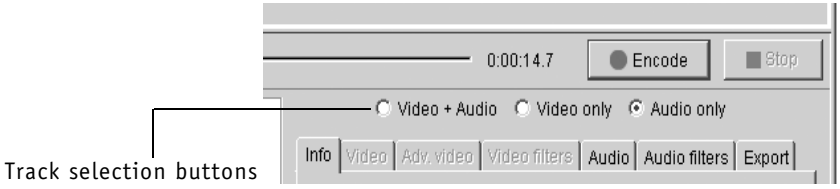
➤ To select an alternate import library:

1. Click **Options>Preferences**.
2. In the **Open AVI with** box, select an AVI import library, and then click **Close**.

Selecting Tracks

If the input source contains both audio and video tracks, you can indicate the track you want to encode by selecting the corresponding option button, as shown in the following illustration.

Controls for Selecting Tracks



Setting Up Capture Sources for Live Encoding

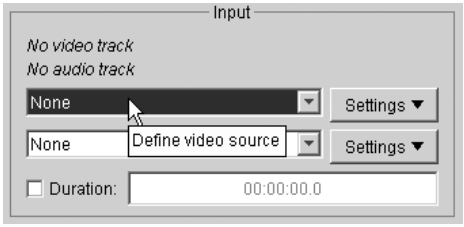
You need to specify live input sources before you can begin using Helix Mobile Producer Live to encode live media.

Selecting a Media Source

The first thing you must do if you want to encode a live media stream is to decide what source you will use for your input media, and then select that source in the Input panel in the Helix Mobile Producer Live workspace.

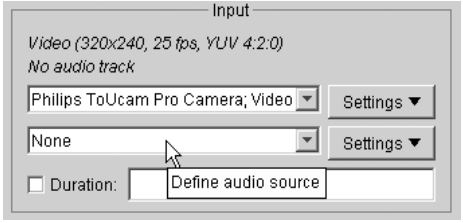
➤ To set up capture sources:

1. Select a video source from the list of available video capture devices.



Note: When you select a video source, a preview of the input video is displayed in the Preview panel. Note that no output preview is displayed for RealMedia encoding.

2. Select an audio source from the list of available audio capture devices.

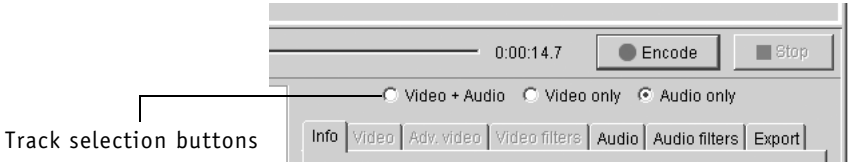


Note: For any given instance of live media that you want to encode and broadcast, you might need to select only a video capture source or only an audio capture source, and not both.

Selecting Tracks

If the input source contains both audio and video tracks, you can indicate the track you want to encode by selecting the corresponding option button, as shown in the following illustration.

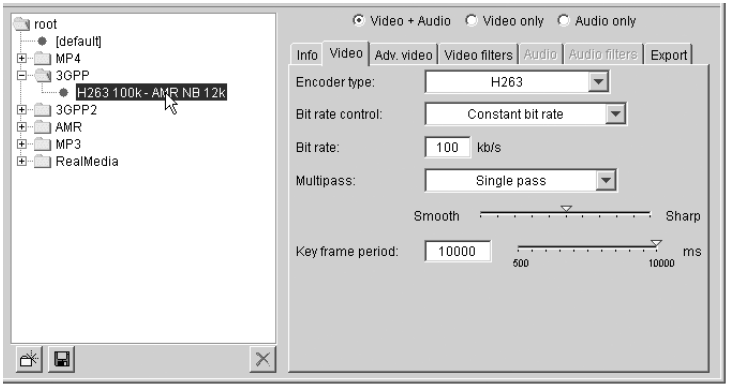
Controls for Selecting Tracks



Selecting an Encoding Parameter Preset

Whenever you select a preset, Helix Mobile Producer and Helix Mobile Producer Live use parameters that have been preselected for optimized output from the input media.

Preset Folders and Encoding Parameter Tabs



Setting Output Options

Using Helix Mobile Producer or Helix Mobile Producer Live, you can encode input audio and video as output files. Helix Mobile Producer Live provides you with the option of encoding this media as live broadcasts.

File Output

You can specify the path where you want to generate the output file by clicking the **Browse** button in the Output panel and then selecting the path to the output directory.

Live Broadcast Output (Helix Mobile Producer Live only)

You can use a streaming media server as a destination for encoded output. When you use this method, the encoding and transmission of live media

directly to the streaming server and then straight to your audience occur simultaneously. This is called live broadcasting.

You can use either of two modes for live broadcasts:

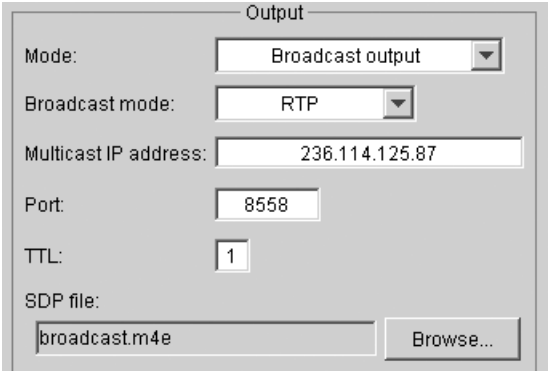
- RTP broadcast mode (for 3GPP, 3GPP2, and MP4 only)
- Helix broadcast mode (for RealMedia only)

RTP (Real-time Transport Protocol) Broadcast Mode

RTP is a standards-based packet format designed as the companion to the RTSP protocol. MPEG Players, for example, use RTP as its packet format. Helix Server fully supports RTP, and shifts to RTP automatically when streaming to an RTP-based client.

The following illustration shows the broadcast options that are available in RTP mode. These options are described in the table following the illustration.

The Output Panel



The following table lists and describes the broadcast options you can select when using RTP broadcast mode.

RTP Broadcast Options

Option	Description
Multicast IP address	A randomized IP address that is automatically created. Modify this address by entering the IP address for the streaming server.
Unicast IP address	A unicast is the simplest way to broadcast a live event to viewers. You can use live unicasting for audio and video feeds delivered on the Internet or private intranets. Enter your Unicast address in the Multicast IP address field.

(Table Page 1 of 2)

RTP Broadcast Options (continued)

Option	Description
Port	The SDP file will pass this port to your server. The destination will include the port you specified and three ports above. For example, if you specify port `8558`, the ports `8559`, `8560`, and `8561` will also be included. You must select an available port range that is not in use. For an audio-only broadcast, the actual port used is two ports higher than the selected port. For example, if you select port `8558`, port `8560` is used. Note: Do **not** set your server to use these ports in the server administration interface.
TTL	TTL stands for Time to Live. This is a value from 0 through 255 that defines the scope within which multicast data packets should be sent over a network using IP as its protocol. Each router decrements the TTL by 1. When the value for a given data packet reaches a predefined lower limit, the router throws the packet away. By default, TTL is set to 1.
SDP file	SDP stands for Session Description Protocol. The SDP file, also known as the announce file, enables viewers to connect to a live encoding session. This file contains information about the audio and video streams in the live broadcast (for example, the type and format of the media) and information that players need to receive the media (for example, address and port data). By default, an announce file is generated automatically each time a live encoding session starts.

(Table Page 2 of 2)

For more information about RTP, please read the following documentation:

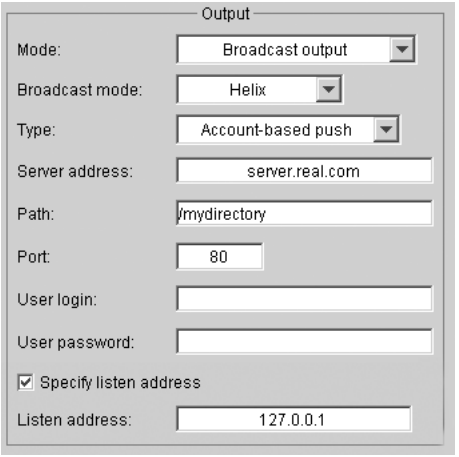
- **RTP—** "RTP: A Transport Protocol for Real-Time Applications," RFC 1889, available at **http://www.ietf.org/rfc/rfc1889.txt.**
- **RTP—**"RTP Profile for Audio and Video Conferences with Minimal Control," RFC 1890, available at **http://www.ietf.org/rfc/rfc1890.txt**.

Helix Broadcast Mode

You can use a computer running Helix Server as the destination server for your encoded output. On receiving your output media, Helix Server will immediately broadcast the stream to your audience.

The following illustration shows the broadcast options that are available in Helix broadcast mode. These options are described in the table following the illustration.

The Output Panel



The following table lists and describes the broadcast options you can select when using Helix broadcast mode.

Helix Broadcast Options

Option	Description
Type	Account-based push broadcast
Server address	The IP address or name of the Helix Server to be used for a broadcast (for example, `server.real.com`).
Path	The path allows you to selectively archive your media. When you broadcast a live stream, you can define a path name such as `news/`, along with the stream name `live.rm`. The `news/` source path does not correspond to an actual directory path on either the encoder or Helix Server computer. It's just a name sent with the stream name that enables the server to use various features, such as selective archiving rules. This setting is optional.
Port	The Helix Server port that Helix Mobile Producer Live contacts when the broadcast begins. The default setting is port 80. Following this initial contact, Helix Server and Helix Mobile Producer Live negotiate which server port to use for the actual encoded output.

(Table Page 1 of 2)

Helix Broadcast Options (continued)

Option	Description
User logon and password	The name used to authenticate the connection to the server, and the password needed to connect to the server. These values are defined in the Helix Server authentication database.
Listen address	The listen address sets the IP address that Helix Mobile Producer Live uses to listen for packet resend requests from Helix Server. If your Helix Mobile Producer Live machine has multiple IP addresses, enter the IP address that Helix Mobile Producer Live should use for communications from Helix Server. If you are broadcasting through a firewall performing network address translation (NAT), set the listen address to the IP address of the firewall or the value `0.0.0.0`. The `0.0.0.0` value tells Helix Server to allow a Helix Mobile Producer Live connection from any IP address. The connection still requires the valid password, however.

(Table Page 2 of 2)

Encoding Input Media

As soon as you have specified the source media and set up encoding preferences by selecting a preset and adjusting encoding parameters (as explained earlier in this chapter), you are ready to start encoding your media.

Starting to Encode

To begin encoding, click the **Encode** button below the Output panel on the Helix Mobile Producer workspace. When encoding begins, the progress bar indicates the encoding status and the elapsed time, as shown in the following illustration. Any time you want to stop the encoding process, simply click the **Stop** button to the right of the **Encode** button.

Control Buttons and Progress Indicators for Encoding

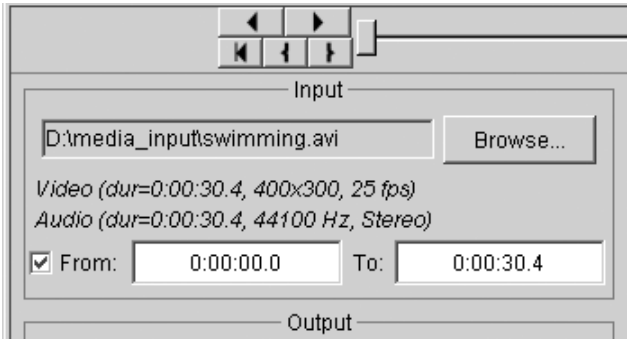
Partial Encoding

By default, Helix Mobile Producer and Helix Mobile Producer Live encode the entirety of whatever input media they receive. There are, however, options you can use to encode only part of an input file or to encode live input (Helix Mobile Producer Live only) for only a specified amount of time.

Partially Encoding an Offline Media File

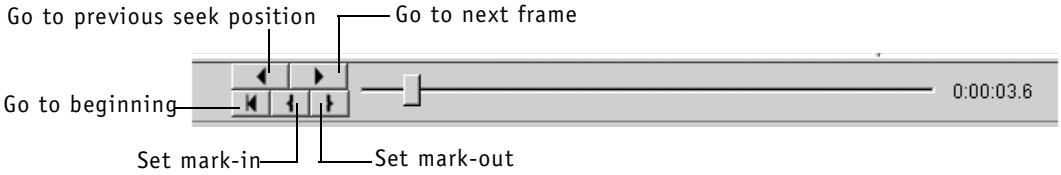
To encode only a part of an input file, select the **From** check box and then type the start and end points you want for the encoding, as shown in the following illustration. Note that these points are measured from the beginning of the input file, in tenths of a second.

Controls and Settings in the Input Information Panel



Another option is to use the **Set mark-in** and **Set mark-out** buttons to specify graphically the start point and end point for the encoding, respectively. See these and other buttons in the following illustration.

Frame-by-Frame Controls

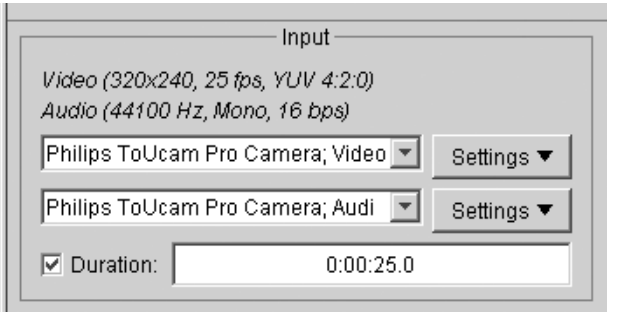


Partially Encoding a Live Broadcast (Helix Mobile Producer Live only)

After you have set the encoding process in motion for live media, Helix Mobile Producer Live will, by default, continue encoding the live stream until either the **Stop** button is clicked or the specified duration period comes to an end. To

set this latter option, select the **Duration** check box and then type whatever duration period you want, as shown in the following illustration.

Setting a Capture Source in the Input Information Panel



CHAPTER

5

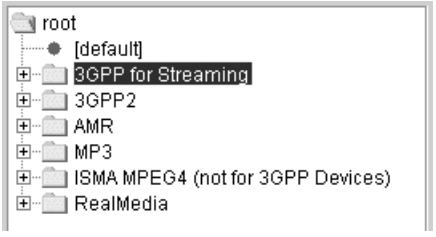
SETTING ENCODING PARAMETERS

This chapter explains how to use groups of settings called *presets* to specify encoding parameters, filter options, and export options for video and audio input in Helix Mobile Producer and Helix Mobile Producer Live. It also provides detailed descriptions of all of these parameters and options.

Working with Presets

You can use the many presets that come with Helix Mobile Producer and Helix Mobile Producer Live as encoding parameter templates. These presets are grouped in folders that make them easy to find and manage. The following illustration shows what the list of preset folders looks like on-screen.

Preset Folders in Helix Mobile Producer



Preset Folders and Presets

It's easy to create, change, save, and delete preset folders, as described in the following procedures.

➤ To create a preset folder:

1. Click the **New Folder** button. 
2. Type the name of the new folder, and then click **OK**.

➤ To create a new preset:

1. Modify an existing preset.
2. Click the **Save** button. 
3. In the dialog box that opens, select the **Create a new preset** option button.
4. Type a name for the new preset, and then click the **Save** button.

   – or –

   Select the new preset, and then drag it into the new preset folder.

➤ To delete a preset:

1. Select the preset you want to delete.
2. Click the **Delete** button. 
3. In the **Confirmation** dialog box, click the **Yes** button.

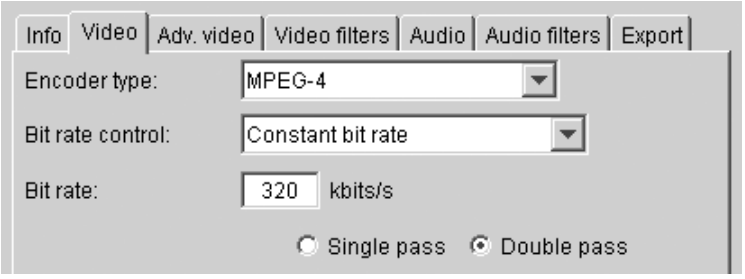
➤ To delete a preset folder:

1. Select the folder you want to delete.
2. Click the **Delete** button. 
3. In the **Confirmation** dialog box, click the **Yes** button.

The Preset Panel

In Helix Mobile Producer and Helix Mobile Producer Live, you can create new presets, edit existing ones, and delete presets that you no longer need. The preset panel, located in the lower-right quarter of the workspace, contains tabs for configuring video and audio encoding parameters and filters, and for defining export settings and preset properties. When you select a tab, the options for that category are displayed, as shown in the following illustration.

The Preset Panel in Helix Mobile Producer



Bit Rates in Presets

Bit rates are stated in kilobits per second (Kbps). There are several parameters that you must consider when creating a bit rate preset:

- You need to know the channel capacity supported by the connection.
- The maximum streaming bit rate is the highest bit rate that the *bit-rate smoother* allows for audio or video transmission by a streaming server. The maximum streaming bit rate must be less than the channel capacity.
- The combined media bit rate is the sum of the audio bit rate and the video bit rate.
- . The video bit rate is the specified bit rate for a video stream.
- The audio bit rate is the specified bit rate for an audio stream.

Preset Considerations

You can adjust the preset parameters and create specific presets that take your content and broadcast requirements into account.

Consider the following criteria when developing a preset:

- The type of content
- The size and length of the presentation
- The level of video quality you want
- The level of audio quality you want
- The available bit rate
- The amount of time required for encoding

Type of Content

When developing an encoding preset, you must take into account the type of content to be encoded. Specifically, you need to know whether the content will be video (and if so, which type) or audio only.

Video

- Low-action video with sound (a lecture, for example)

  For any delivery method using the MPEG-4 encoder, you might want to change the motion-estimation search setting from **Best quality** to **Fastest**.

Note that this will likely diminish the quality of the video output but will also reduce the amount of encoding time.

For any delivery method, you might want to decrease the frame rate by using the frame-rate divide ratio to increase the quality of the video output (see see "Change frame rate" on page 42). When frames are removed from the video stream, the remaining frames become clearer, even at the same bit rate.

- High-action video with sound (a sports event, for example)

  For any delivery method using the MPEG-4 encoder, you might want to change the motion-estimation search setting from **Fastest** to **Best quality**. This will increase the amount of encoding time but will also improve the quality of the video output.

  For any delivery method using the MPEG-4 encoder, you might also want to increase the search range. This will increase the amount of encoding time but will also improve the quality of the video output.

- Streaming video

  For streaming video using either the H.263 or MPEG-4 encoder, RealNetworks recommends selecting **Constant bit rate** in the **Bit rate control** box (on the **Video** tab) as an encoding parameter. For more information, see "Bit Rates in Presets" on page 31.

Audio Only

For streaming audio, RealNetworks recommends keeping the default parameters and setting only the bit rate.

Level of Video Quality

- Very high, with no artifacts

  For any delivery method, select the denoising filter (see "Denoising" on page 44). This filter will remove *artifacts*, which are image distortions that some compression methods can introduce into video streams. Note that filtering too much can cause spatial blurring or temporal persistence.

  For a presentation that will be streamed over a fast local network using the MPEG-4 encoder, you might want to use the **Quality control** option and increase the quality setting, as described in "Quality control (MPEG-4 encoder only)" on page 36. Be aware, however, that doing this will increase the file size.

For a high-action video that will be transmitted by any delivery method using the MPEG-4 encoder, you might want to change the motion-estimation search setting from **Fastest** to **Best quality**. You can also increase the search range by entering a higher number in the **Search range** box. Both of these changes will increase the amount of encoding time but will also improve the quality of the video output.

For a low-action video that will be transmitted by any delivery method, you might want to increase the frame-rate divide ratio, especially for a very low target bit rate (see "Change frame rate" on page 42).

At the same bit rate, the quality of the video output is higher if you don't use error resilience.

- Moderate, with minor artifacts

  The installed presets should result in better than moderate-quality output without any adjustment.

- Low, with visible artifacts

  Change the frame rate, use the denoising filter, or reduce the video size (see "Scale" on page 43). You can then save these settings as a new preset.

Level of Audio Quality

- Better quality at the same bit rate (AAC audio encoder only)

  If you reduce redundancies between the left and right channels by using the joint stereo option (see "Use joint stereo (AAC audio encoder only)" on page 46), you can keep the same bit rate and get better audio quality.

- The same quality at a lower bit rate (AAC audio encoder only)

  If you apply redundancies efficiently between the left and right channels, you can lower the audio bit rate (variable bit rate, average bit rate, and maximum bit rate) and get the same quality of output. If you are streaming the audio content from a server, you can also lower the maximum streaming bit rate.

Available Bit Rate

- Higher video quality, but using more of the available bit rate (MPEG-4 and H.263 encoders only)

  Using the **Bit rate control** option (see "Bit rate control (MPEG-4 and H.263 encoders only)" on page 35), you can increase the target bit rate.

- Optimum video quality without constraints on the bit rate (MPEG-4 encoder only)

  Using the **Quality control** setting (see "Bit rate control (MPEG-4 and H.263 encoders only)" on page 35), you can set the level of video quality without adversely affecting the bit rate.

- Faster recovery time for streaming video

  You can set the **Key frame period** option to refresh the image more often. However, note that the more often the image is refreshed, the less of that bit rate will be available.

- Bit-rate reduction

  Consider setting a lower bit rate or audience if you do any of the following:

  - Increase the frame-rate divide ratio (see page 42).
  - Increase the key-frame period (see page 39).
  - Reduce the video size (see "Scale" on page 43).
  - Use the inverse telecine filter (see page 43), the deinterlace filter (see page 43), and the denoising filter (see page 44) correctly.
  - Use joint stereo for audio encoding (see page 46).

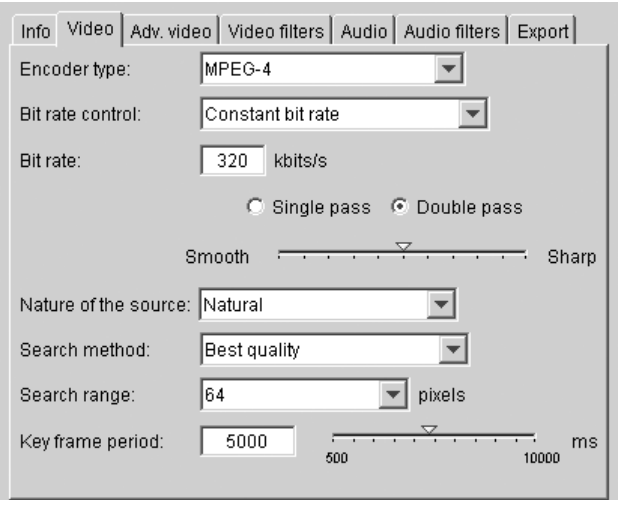
Time Required for Encoding

Factors that affect encoding time include the length of the presentation and the encoding parameters. For example, when you use the MPEG-4 encoder, the motion-estimation method used (the best quality takes the most time) and the search range setting (the higher the value, the more time that's required) also affect encoding time.

Setting Video Parameters and Filters

Among the seven tabs on the preset panel in the Helix Mobile Producer and Helix Mobile Producer Live workspace are three that you can use to set standard and advanced video encoding parameters and to select video filters. The following illustration shows the Video tab on the preset panel.

The Video Tab



Standard Video Encoding Parameters

This section explains how to use the various encoding options on the Video tab to set the basic parameters for encoding video input. For information about additional settings you can specify before you encode your video content, see "Advanced Video Encoding Parameters" on page 40.

Encoder type

The following table lists and describes the three video encoding formats that Helix Mobile Producer and Helix Mobile Producer Live support.

Video Encoding Formats

Format	Description
MPEG-4	ISO/IEC video codec
H.263	International Telecommunications Union video codec
RealVideo	RealNetworks video codec

Bit rate control (MPEG-4 and H.263 encoders only)

Constant bit rate

Use this option if your content is going to be streamed over a limited-bit-rate channel such as a network. If you select this parameter, the output stream is delivered at the single, constant bit rate (CBR) that you've specified. Note that

selecting this setting might lower the quality of the video output. For MPEG-4 encoding, some video frames might be omitted to ensure that the output video stream conforms to the CBR that you selected.

> **Tip:** Higher bit rate values reduce coding artifacts, but they use more of the available bit rate.

Variable bit rate

Use this option to set the variable bit rate (VBR), or average bit rate, for encoding the video. This bit rate is expressed in kilobits per second (Kbps). By default, the maximum bit rate is twice the average bit rate.

> **Tip:** If you clear the **Limit maximum bit rate** check box, the bit rate will not be limited and no frames will be dropped from the video stream.

Quality control (MPEG-4 encoder only)

Use this option if you are more concerned about preserving the quality of the video image than you are about the bit rate. You select a percentage to specify the degree of output quality that you want.

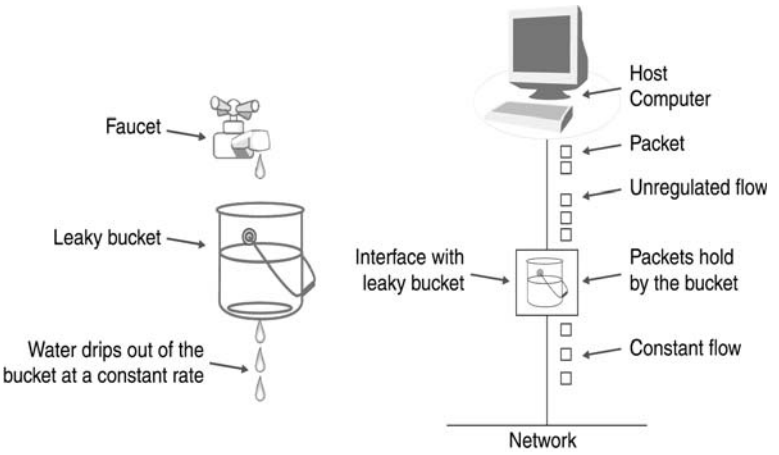
Select a percentage between 0 and 100, with 0 being the lowest degree of quality and 100 being the highest. The default value is 50, which produces medium-quality video output. Keep in mind that the higher the percentage you select, the bigger the output file. At 100 percent, there is almost no data compression.

The leaky bucket algorithm

Both CBR and VBR are consistent with the "leaky bucket" concept. Leaky bucket is a flow-control mechanism designed to reduce the effect of the inevitable variability in input data streams as they are "injected" into communication networks. The leaky bucket algorithm performs the following functions:

- It controls what the encoder can inject into the network.
- It prevents the data "bucket" from overflowing by automatically regulating the bit rates in the event that the encoder generates too much data or very complex data.
- It prevents "burstiness" in the input stream, ensuring a smooth, even data flow.

The Leaky Bucket Algorithm



The video buffer is the normative MPEG-4 video buffering verifier (VBV). The VBV is the instantaneous bit-rate smoother, or transmission buffer, that ensures that the instantaneous bit rate never exceeds the target bit rate behind the video buffer. You can also use it as a reception buffer.

Bit rate (MPEG-4 and H.263 encoders only)

Use this option to set the standard bit rate for encoding the video stream, in kilobits per second (Kbps). Note that to set a constant bit rate or a variable (average) bit rate for the clip, you use the **Bit rate control** option, as described earlier in this section.

Number of Encoding Passes (Helix Mobile Producer only)

For offline encoding only, you can select either the **Single pass** or **Double pass** option button. Double-pass encoding is for offline encoding with Helix Mobile Producer. It uses information from the first pass to reallocate the bits during the second pass. This enables you to encode video input at a very high level of quality. Keep in mind, though, that double-pass encoding takes twice as long as single-pass encoding.

Note: This setting is ignored for live encoding.

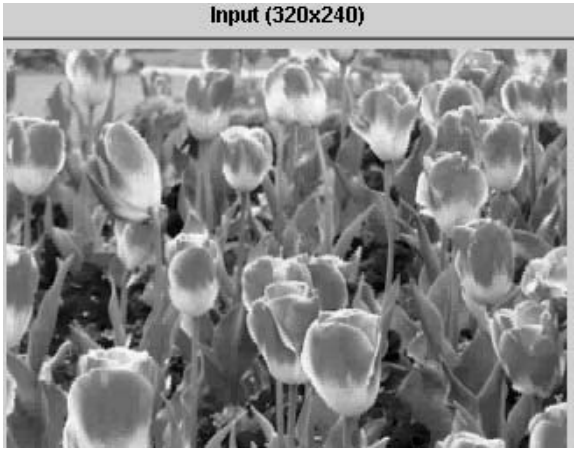
Smooth and Sharp (MPEG-4 and H.263 encoders only)

You can adjust the image quality of video output by using the **Smooth/Sharp** adjustment slider. If you use the **Sharp** setting, there will be fewer video frames but higher-quality output.

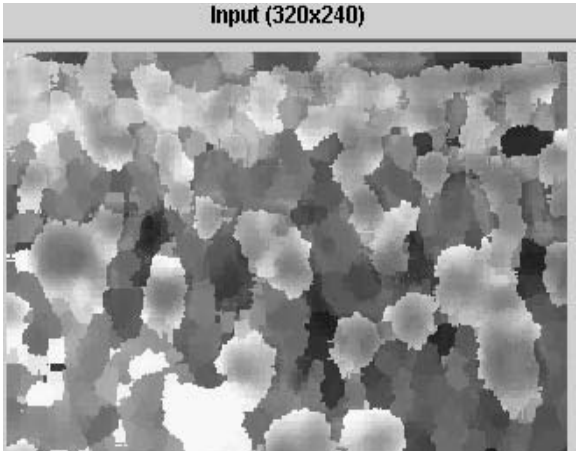
Nature of the source (MPEG-4 encoder only)

For this parameter, select **Natural** for filmed images, or select **Synthetic** for animated images.

Example of a Natural Source



Example of a Synthetic Source



Search method (for MPEG-4 motion estimation only)

Motion estimation is the process that Helix Mobile Producer uses to encode a block of video data as a translation of a previously decoded image. The better the motion-vector estimation, the lower the bit rate. This operation is time-consuming and is essentially a trade-off between the amount of time you're

willing to wait for the search and the degree of improvement you want in the motion vector. You can select either of two settings to estimate the motion, as described in the following paragraphs.

Using the **Best quality** setting substantially increases the amount of encoding time but produces the highest-quality output. Use this setting for video sources that have a lot of motion if you have the time to encode the input at a high level of quality.

Conversely, using the **Fastest** setting reduces the amount of encoding time but produces more motion artifacts.

Search range (for MPEG-4 motion estimation only)

The search range affects all motion estimation calculations. If an object, such as a baseball, is moving too quickly, the motion estimator loses track of it. You use the search range to set a limit (in pixels per frame) on the maximum speed of moving objects.

The default value is 32 pixels per frame; other values you can select are 16, 64, and 128. As the value increases, the quality of the output video improves but the encoding process takes longer.

Key frame period

Use this parameter to specify how often you want key frames to be inserted into a given video stream.

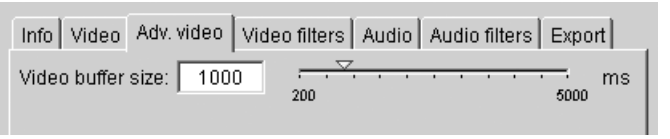
Key frames, which are often called *I-frames* in MPEG-4 literature, are entire frames of video that are inserted into the stream periodically to synchronize the decoder and enable it to recover from errors. The **Key frame period** parameter specifies the amount of time (in milliseconds) between key frames in a video stream. For instance, setting the period as 50 milliseconds refreshes the image at least every 50 milliseconds.

Refreshing the image more often (by setting a shorter key-frame period) reduces the amount of recovery time for streaming video; however, this requires a much higher bit rate because more frames of video are included in the stream. Note that setting shorter intervals between key frames will result in more robust steaming performance in the event of network congestion. Using a shorter key-frame period also provides many more random access points (RAPs) to speed up the random access in a video stream.

Advanced Video Encoding Parameters

In addition to the standard set of video encoding parameters provided in Helix Mobile Producer and Helix Mobile Producer Live, there are three options you can use to set parameters for more advanced encoding tasks. You will find these additional parameters displayed on the **Adv. video** tab, which is shown in the following illustration.

The Adv. Video Tab



Video buffer size (MPEG-4 and H.263 encoders only)

For the video buffer size, you can select a value from 200 through 5000 milliseconds. Increasing this value increases the amount of time required for decoding. For background information, see the explanation of the leaky bucket algorithm (on page 36) and the accompanying illustration.

Use video packets (error resilience)

Error resilience works by adding redundant information to encoded MPEG-4 video packets. If the video output is to be streamed over a network that might be unreliable, it's a good idea to select this parameter, thus enabling the decoder to better recover from errors. Note, however, that error resilience increases the number of bits in the video stream. Also, using this option without adjusting the bit rate accordingly can degrade the video quality.

If you have selected **Use video packets (error resilience)** and specified the associated packet size (from 100 through 2,048 bytes), the video stream will be divided into discrete packets of *n* bytes each, with *n* being the number of bytes that you have specified.

The **Use HEC** (Header Extension Code) option repeats the decoding parameters that you have selected.

For each video frame, important information that describes the video frame is repeated in the video packet. By checking this header information in the video packets against the information received at the beginning of the video frame, the decoder detects whether the video frame header has been received correctly. If the frame has become corrupted, the decoder can still decode the rest of the data in that frame by using the repeated header information.

The **Use data partitioning** option reorders the date in a video packet, placing sensitive data at the beginning of the packet. If you have selected this parameter, shape and motion data is separated from texture data by a marker, making it possible for at least one of these types of data to be recovered even if the other one is lost.

Maximum startup latency (RealVideo encoder only)

You use this option to specify the maximum amount of time that a video clip will "prebuffer" before playback begins. The prebuffering time is used by the video codec to store data bits that will be needed during high-action scenes in the clip. The larger the value for maximum startup latency, the longer the user must wait before the clip starts playing, but the better the quality of the video.

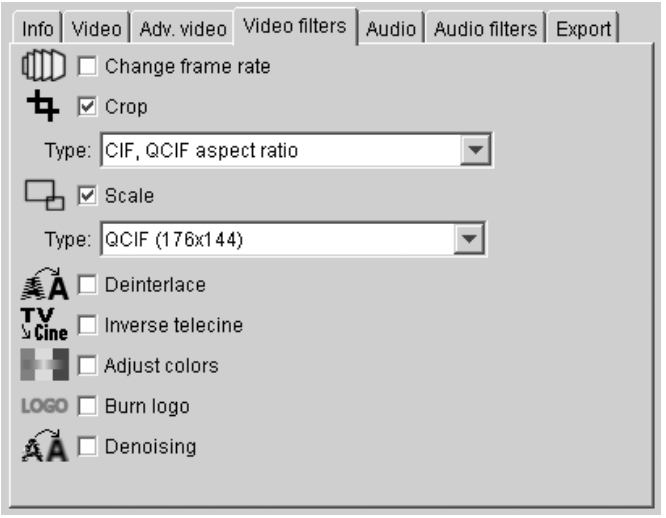
Use loss protection

If you select this option for an encoded video clip, error-correction information is added to the files encoded with the RealVideo encoder. This information protects the clip against data packet loss while it is being streamed (that is, the player can reconstruct any packets that would otherwise have been lost).

Video Filters

This section describes the various video filters included in Helix Mobile Producer and Helix Mobile Producer Live. You can use these filters (shown in the following illustration) to adjust and customize your streaming video content in a number of different ways before you begin encoding it.

The Video Filters Tab



Change frame rate

Select this option to change the frame rate (the number of frames per second, or fps) in the original video source and specify the ratio for dividing frames. Note that reducing the frame rate decreases the bandwidth used by the encoder and might affect the minimum bit rate.

When changing the frame rate, you can specify a frame-rate divide ratio (either 2:1, 3:1, 4:1, or 5:1) or a target frame rate (from 1 through 30 fps). If you do change the rate, we recommend using 2:1, which is the default divide ratio. For example, if your original video source has a frame rate of 30 fps and you use the 2:1 divide ratio, the frame rate in the output will be15 fps.

Be aware that reducing the frame rate diminishes the quality of the motion in the video stream and that it's not necessary to do this for most video sources.

Crop

You can crop out an unwanted portion of a video stream by selecting a predefined size (for example, CIF or16/9) or by specifying the top and left offsets and the height and width of the video output. With Helix Mobile Producer, cropping occurs before scaling.

Scale

You can resize your video input either by selecting a predefined size (for example, 50% or CIF) or by specifying the height and width of the video output (in pixels).

Deinterlace

The deinterlace filter smooths temporal changes, removes video-interlacing artifacts, and makes interlaced images progressive. Use this filter for video input that is interlaced. Keep in mind, however, that if the original video source was *not* interlaced and you use the deinterlace filter anyway, the quality of the output will be very poor.

> **Note:** A video is interlaced if you can see a "combing" effect in the preview panel. Essentially, an interlaced frame consists of two images captured at different times and combined in one frame in such a way that the two instants merge into a single image.

Inverse telecine

Telecined sequences have extra frames so that filmed content can be shown on television screens. The inverse telecine filter restores the stream to its original state, or frame rate, by performing the exact inverse operation. That is, the filter converts telecined content from 29.97 fps (NTSC, the standard television protocol) back to 24 fps (the standard frame rate for film).

If you select **Upper** in the **Field order** box, the first frame in the first line will be read first.

> **Note:** Only film that has been telecined from 24 fps to 30 fps can be converted back to 24 fps. If the original content was not telecined, the quality of the output will be poor.

Adjust colors

Brightness, contrast. You can adjust the brightness and contrast of a video stream by dragging the sliders back and forth or by entering numeric values in the corresponding text boxes.

Gamma correction. You can adjust the midtones and color balance of a video stream by moving the sliders for the red, green, and blue curves individually (the default method). Alternatively, you can select the **Link** check box to link

the three sliders so that they move together, and then make whatever gamma adjustments you want.

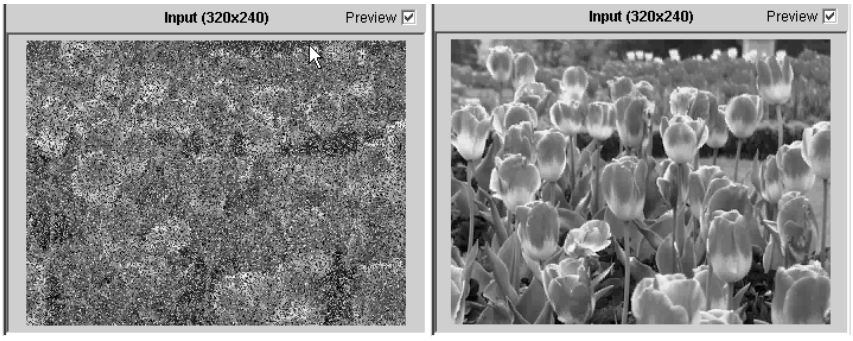
Burn logo

Use this option to burn a logo from a BMP, GIF, PNG, or JPEG source file directly onto an encoded video frame. To do this, click **Browse** to select a source file, and then specify the position of the logo by moving the **Left** and **Top** sliders. If the file includes transparent attributes (PNG or GIF files only), select the **Use transparency** check box.

Denoising

The term *noise* is used to describe extraneous or unwanted visual information in a video frame. An example of noise is the visual broadcast interference you sometimes see in analog television images. The following illustration provides an exaggerated example of a noisy video frame and the same video frame without any noise.

Examples of Video Images with Noise and Without Noise



The denoising filter uses a complex algorithm to extract unwanted noise from video frames so that only the original images are encoded. Use this filter only for noisy source content or for low-bit-rate video input.

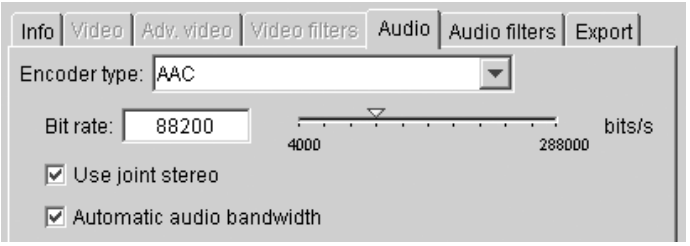
Setting Audio Parameters and Filters

The default audio encoding parameters and filters in Helix Mobile Producer and Helix Mobile Producer Live have been set carefully to provide the best overall quality of audio output for the most common streaming audio scenarios. We recommend changing these presets *only* if you have advanced knowledge of audio encoding.

Audio Encoding Parameters

This section explains how to use the various encoding options on the **Audio** tab to set the basic parameters for encoding audio input.

The Audio Tab



Encoder type

The following table lists and describes the six audio encoding formats supported by Helix Mobile Producer and Helix Mobile Producer Live.

Audio Encoding Formats

Format	Description
AAC	Advanced Audio Coding
AMR narrowband	Adaptive multirate speech codec
AMR wideband	Adaptive multirate speech codec
QCELP	QualComm Code Excited Linear Predictive Coding speech codec
RealAudio	RealNetworks audio file format
MP3	MPEG-3 audio file format

Bit rate

Use this option to specify the bit-rate value for an audio stream in bits per second (bps). Different bit-rate ranges are available for different audio encoders. Note that this option is not available for the RealAudio encoder.

Mode

Use this option to select either **Voice** or **Music** if you have selected the RealAudio encoder.

Use joint stereo (AAC audio encoder only)

Joint stereo coding removes redundancies between the left and right audio channels of stereo sources. Select this option to encode channel redundancies and differences separately. Using this setting can reduce the bit rate by as much as half, but it also might introduce some artifacts. Clear the **Use joint stereo** check box if you want the redundant portions to be encoded twice.

Automatic audio bandwidth (AAC audio encoder only)

Select this option if you want Helix Mobile Producer to set an automatic bit rate for the spectral bandwidth of your audio content. The spectral bandwidth is the maximum audio frequency to be encoded. Reducing this bandwidth removes some of the higher (treble) frequencies but improves the encoding of the lower frequencies, often resulting in better overall audio quality.

Audio bandwidth value (AAC audio encoder only)

If you are not using the **Automatic audio bandwidth** option, specify in the **Audio bandwidth value** box the maximum audio frequency for your audio steam. After you set this limit, all frequencies higher than the specified maximum will be filtered out.

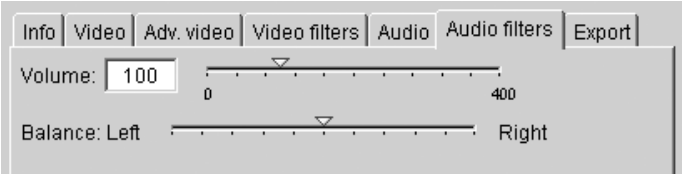
DTX (AMR audio encoders only)

If you select this option, the AMR codecs can use discontinuous transmission so that periods of silence in an audio track will not be encoded. This results in a reduced bit rate for the audio output.

Audio Filters

The preset panel also contains a tab on which you can set the volume level and the balance (left/right) for your audio streams, as shown in the following illustration.

The Audio Filters Tab



Volume

Use the slider to set the volume level for an audio stream. The value is a percentage from 0 through 400, where 100 represents the current volume level.

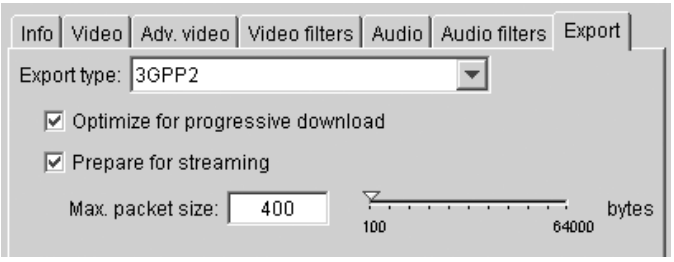
Balance

Use the slider to control the balance between the left and right audio channels.

Setting Export Parameters

This section explains how to use the **Export** tab on the preset panel to specify settings for exporting encoded video and audio files. These export options are shown in the following illustration.

The Export Tab



Export Parameters

The following subsections describe the available export options and provide detailed instructions on how to use them, as well as providing ancillary information that will help you prepare your video and audio clips for exporting.

Export type

You can export encoded files in any format listed in the following table.

File Formats Supported for Exporting

Format	Description
MPEG-4	MPEG-4 media file format
3GPP	European third-generation partnership project file format

(Table Page 1 of 2)

File Formats Supported for Exporting (continued)

Format	Description
3GPP2	North American and Asian third-generation partnership project file format
AMR	Adaptive multirate speech codec
QCP	Speech codec
MP3	MPEG-1 audio layer 3 file format
RealMedia	RealNetworks media file format

(Table Page 2 of 2)

For More Information: For more information about file format compatibility, see Appendix E**.**

SureStream Audiences for RealMedia Clips

Before you encode a RealMedia clip, you can choose the audience or audiences for which you want to encode the clip. For each audience, a separate stream is encoded based on the type or speed of Internet or intranet connection that the members of that audience have.

When you choose to encode a RealMedia clip for a particular audience, you are telling Helix Mobile Producer or Helix Mobile Producer Live to create a stream for that audience. Note that although you can choose more than one audience for an encoding job, the amount of encoding time required and the size of the encoded output will increase with every audience stream that is added. For that reason, generally it is recommended that you select no more than two or three audiences that you know you need for a given clip.

Use the following procedures to add and remove SureStream audiences for encoded RealMedia clips, respectively.

➤ To add audiences to your encoding job:

1. Click the **Export** tab.
2. Select the check boxes for the audiences that you want to include.

➤ To remove audiences from your encoding job:

1. Click the **Export** tab.
2. Clear the check boxes for the audiences that you want to remove.

Optimize for progressive download (MPEG-4 and H.263 encoders only)

By default, MPEG-4 files are generated with the metadata following the raw media data, which results in efficient writing of the MPEG-4 files. However, this means that a player must completely download an MPEG-4 file before playing it, as the player cannot begin playback until it has received the metadata.

If you have selected the option, the MPEG-4 file is reordered at the end of the encoding process so that the metadata appears at the *beginning* of the file. This enables a player to download and play the content at the same time, rather than having to wait for the entire file to be downloaded before playing it.

Prepare for streaming (MPEG-4 and H.263 encoders only)

If you plan to stream video or audio content from a streaming server, you can use the **Prepare for streaming** option to include "hint tracks" that tell the server how to send the streams and what to set as the maximum bit rate for the presentation.

Be aware that the addition of data such as hint tracks and headers to audio or video streams during the encoding process results in the encoded files being somewhat larger than the sum of the encoded media bit rates multiplied by the duration of the file ((audio bit rate + video bit rate) x duration). This does not affect the bit rate or quality of the media, because this additional data remains on the server and does not get streamed to the client.

> **Note:** The hint track is required by the streaming server to optimize the streaming experience. A 3GPP media file must have a hint track in order to be properly streamed from most streaming servers. The hint track is not required if the media file is to be downloaded and played locally and not streamed from a server. To avoid having Helix Mobile Producer add a hint track to such a file, clear the **Prepare for streaming** check box on the **Export** tab before encoding the audio or video clip.

Max. packet size (MPEG-4 and H.263 encoders only)

The maximum packet size should be less than the maximum transmission unit (MTU) of the network over which the content will be streamed. Packet header "overhead" should also be taken into account in this calculation. By default, the maximum packet size is configured to be appropriate for general Internet usage, for which the MTU of 1,500 bytes takes into account UDP and

IP packet headers. For other types of target networks, such as ATM or wireless networks, the maximum packet size should be adjusted to reflect the corresponding larger or smaller MTU.

A maximum packet size that is too small will add unnecessarily high overhead, as the packet headers will take a larger proportion of the bit rate relative to the packet payloads.

A maximum packet size that is too large will reduce the error resiliency of the stream because the packets will be fragmented on the network, meaning that the loss of one packet fragment will cause the entire packet to be discarded.

Calculating Maximum Packet Size

Use the following procedure to determine the maximum packet size that you can use for a presentation that will be streamed over a network.

➤ To define the output packet size:

1. Identify the MTU for your network.
2. Identify the packet structure used on your network.
3. Subtract the header size from the MTU to get the number of bytes available for the RTP packet, as shown in the following text and tables.

   RTP streaming over UDP over Ethernet

   The MTU is 1,500, and the packet structure is as follows:

20-byte IP header	8-byte UDP header	12-byte RTP header	N-byte RTP payload

   Use the following equation to determine the value to set for maximum packet size over UDP packet size:

   1,500 - 20 - 8 = **1,472**

   RTP streaming over RTSP interleave over Ethernet

   The MTU is 1,500, and the packet structure is as follows:

20-byte IP header	28-byte TCP header	4-byte RTSP	12-byte RTP header	N-byte RTP payload

   Use the following equation to determine the value to set for maximum packet size over RTSP interleave:

   1,500 - 20 - 28 - 4 = **1,448**

The following table lists the types of packet headers and the typical size for each one.

Typical Packet Header Sizes

Header	Size (in bytes)
IP	20
PPPoE	8
RTP	12
RTSP interleave	4
TCP	28
UDP	8

The following table lists the applicable RFCs and gives a description and the typical MTU for each one.

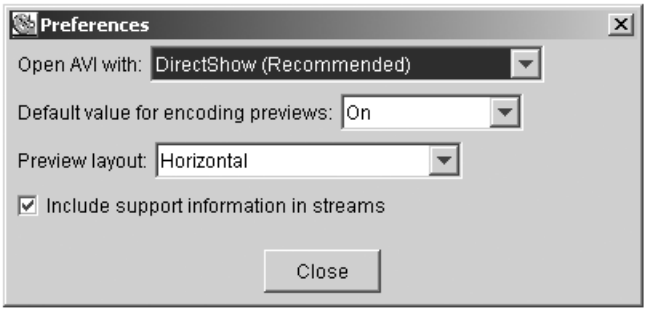
Typical MTUs

RFC	Description	MTU
894	Minimally required	68
1051	ARCNet	508
1356	X.25, ISDN	576
1055	Serial line IP (SLIP)	1,066
1042, 2516	IEEE 802.3 / 802.2, PPPoE	1,492
894, 895	Ethernet	1,500
1390	FDDI	4,352
1042	4-Mb token ring	4,464
1042	802.4 token bus	8,166
None	16-Mb token ring	17,914
1374	HIPPI	65,535

Setting Preferences

This section explains how to use the options in the **Preferences** dialog box (shown in the following illustration) to set parameters for opening AVI input files and previewing encoded media. To access this dialog box, click **Options>Preferences** in the menu bar at the top of the Helix Mobile Producer or Helix Mobile Producer Live workspace.

The Preferences Dialog Box



Preference Options

The following paragraphs discuss the options that enable you to select an import library for AVI files, set the default value for previewing your media (input or output, or both), and select the layout for previews.

Open AVI with (Helix Mobile Producer only)

You can use this option to select the import library for AVI files. Note that AVI files are opened in DirectShow by default. However, if you experience difficulty reading an AVI file, try to open it either in QuickTime or in Video for Windows by clicking **Options>Preferences>Open AVI with** and then selecting the library you want to use.

For other file formats, Helix Mobile Producer automatically uses the corresponding import library (for example, QuickTime for MOV files).

Default value for encoding previews

This option applies to both input and output previews by default, but you can modify it by selecting or clearing the **Preview** check box for either input preview or output preview.

Using previews, you can see whether the filters you have selected have been correctly applied. Previews also show you the video and audio quality that you will experience when you play the encoded content.

If you are not satisfied with the current parameter settings, you can stop the encoding at any time, reset the parameters however you want, and then restart the encoding process.

Preview layout

You use this option to select the layout, or orientation (horizontal or vertical), for input and output media displayed in the preview panels.

Include support information in streams

Select this option to include support information in MPEG-4 and 3GPP clips.

CHAPTER

6

USING THE COMMAND-LINE ENCODER

This chapter shows you how to run Helix Mobile Producer Professional or Helix Mobile Producer Professional Live from the command line in Windows. Helix Mobile Producer Professional gives you the ability to encode streaming audio or video presentations as files. Helix Mobile Producer Professional Live encodes live capture input for live broadcasts and file output.

Basic Encoding

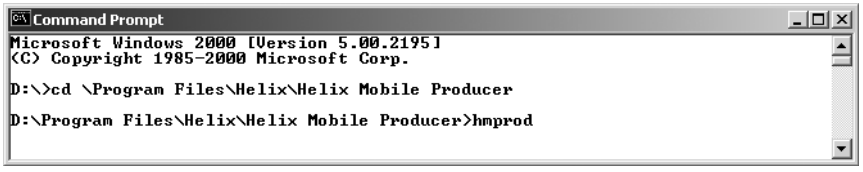
Helix Mobile Producer Professional and Helix Mobile Producer Professional Live provide a simple command-line interface you can use to encode your audio or video input.

Getting Started

You access the command line from the Windows command prompt.

➤ To use the command-line interface:

1. Open the Command Prompt window.



2. Set the current directory to match the location of the `hmprod.exe` program by typing `cd` followed by the path to the program.
3. Type `hmprod` followed by command-line arguments to start the command-line encoder.

> **Note:** Starting the command-line encoder without including any arguments will display the syntax and command-line flags

for the application you have specified (hmprod.exe, in this case).

➤ To set the path to Helix Mobile Producer Professional:

To avoid navigating to the directory that contains Helix Mobile Producer or Helix Mobile Producer Live, include the path to the executable (.exe) file in your Path variable. For example, enter the following command at the command prompt:

```
set PATH=%PATH%;D:\Program Files\Helix\Helix Mobile Producer;
```

Basic Encoding Commands

You can use the command-line interface to encode streaming media in one of two ways: offline with Helix Mobile Producer Professional (file input to file output) or live with Helix Mobile Producer Professional Live (live capture input to file output or broadcast output). For offline encoding with Helix Mobile Producer Professional you specify either a job file or a file that specifies input source, output destination, and preset encoding parameters. For live encoding with Helix Mobile Producer Professional Live, you specify a job file.

Offline Encoding

The minimum encoding arguments for offline encoding are as follows:

hmprod -i *input_file* -o *output_file* -p *preset_name*

Helix Mobile Producer Professional includes a library of preset encoding parameters. These preset files are installed with the software in the following directory:

helix_mobile_producer_directory\preset

You have the option of specifying additional arguments and flags on the command line. These are described in the section "Command-Line Reference" on page 57.

For More Information: The preset file parameters are listed and described in Appendix A.

Live Encoding

The minimum encoding arguments for live encoding are as follows:

hmprod -job *job_file*

A job file is an XML file that specifies all encoding parameters.

You can specify additional arguments and flags on the command line. These are described in the section "Command-Line Reference" on page 57.

> **For More Information:** The preset file parameters are listed and described in Appendix A.

Command-Line Reference

The command-line interface has several flags and arguments that you should be familiar with before doing any encoding from the command line. To simplify command-line use and to make it easier to reuse encoding settings, you can use job files to define all of the encoding settings.

Helix Mobile Producer Professional Command-Line Flags

The command-line flags, or tags, that you can use for offline encoding with Helix Mobile Producer Professional are listed and described in the following table.

Command-Line Flags for Offline Encoding

Flag	Description
`-job` *jobname*	Denotes the XML job file that specifies all of the encoding parameters.
`-i` *input_file*	Specifies the input file to be encoded. Be sure to provide the absolute path to the input file.
`-o` *output_file*	Specifies the output file for the encoded media, including the appropriate file extension. Be sure to provide the absolute path to the output file.
`-p` *preset_file*	Denotes the XML preset file that specifies all of the encoding parameters.
`-v`	Displays the encoding status, including the percentage of encoding completed.
`-lib ds|vfw|qt`	Specifies the preferred media library to be used for file reading: `ds`: Directshow `vfw`: Video for Windows `qt`: QuickTime

(Table Page 1 of 2)

Command-Line Flags for Offline Encoding (continued)

Flag	Description
-t av|v|a|auto	Specifies whether audio and video tracks in the input media are to be encoded: av: encode audio and video v: encode video only a: encode audio only auto: encode audio and video, if possible
-from *milliseconds*	Specifies the point in the source file where you want encoding to begin. You cannot use this flag with a job file.
-to *milliseconds*	Specifies the point in the source file where you want encoding to stop. You cannot use this flag with a job file.

(Table Page 2 of 2)

Helix Mobile Producer Professional Live Command-Line Flags

The command-line flags used for live encoding with Helix Mobile Producer Live are listed and described in the following table.

Command-Line Flags for Live Encoding

Flag	Description
-job *jobname*	Denotes the XML job file that specifies all of the encoding parameters.
-v	Selects the verbose encoding mode.
-listCaptureDevices (-lcd)	Displays a list of available capture devices.
-showVideoSourceDriver (-svs) *driverIndex*	Opens a video source driver dialog box
-showVideoFormatDriver (-svf) *driverIndex*	Opens a video format driver dialog box.
-showAudioSourceDriver (-sas) *driverIndex*	Opens an audio source driver dialog box.
-showAudioControlDriver (-sac) *driverIndex*	Opens an audio control driver dialog box.
-from	Specifies the point in the clip where live encoding will begin, in milliseconds.
-to	Specifies the point in the clip where live encoding will end, in milliseconds.
-h	Displays the command-line usage guidlines

Using Job Files

To simplify encoding tasks with the command-line interface, you can use a job file that specifies all of the encoding parameters. The job file also specifies the input source and the output destination. For example:

```
hmprod -job job_file_name
```

Job File Parameters

For definitions of all of the job file parameters, see Appendix B.

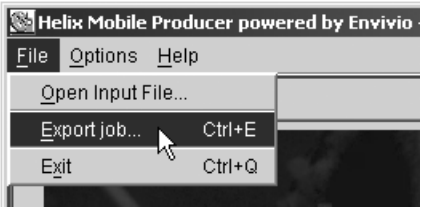
Exporting and Creating Job Files

You can export existing job files from Helix Mobile Producer Professional or Helix Mobile Producer Professional Live, create the files in other applications capable of generating XML, or edit them manually.

Exporting a Job File

You can export a job file, as shown in the following illustration. When you do this, all the parameters of the current encoding task are included with the job file. You can then use the file as a template for other encoding tasks that have the same characteristics.

The Export Job Command on the File Menu



Creating a Job File

Because job files use the XML format, you can use any application capable of generating XML files to create a job file. The following is an example of an XML job file:

```
<job>
   <input>
      <file name="D:\media\movie_m480.mov"/>
   </input>
   <output>
```

```
      <file name="D:\media\my_movie.3gp"/>
   </output>
   <parameters>
      <export>
         <parameter id="hinted" value="true"/>
         <parameter id="progressiveDownload" value="true"/>
         <parameter id="exportType" value="3gpp"/>
         <parameter id="MTUSize" value="1448"/>
      </export>
      <videoEncoder>
         <parameter id="smoothVsSharp" value="50"/>
         <parameter id="keyFramePeriodInMs" value="10000"/>
         <parameter id="motionEstimationMethod" value="normal"/>
         <parameter id="numberOfPass" value="1"/>
         <parameter id="bitRate" value="100000"/>
         <parameter id="videoEncoderType" value="mpeg4"/>
         <parameter id="sourceNature" value="natural"/>
         <parameter id="searchRange" value="64"/>
         <parameter id="rateControlMode" value="cbr"/>
      </videoEncoder>
      <audioEncoder>
         <parameter id="bitRate" value="23850"/>
         <parameter id="audioEncoderType" value="amrwb"/>
         <parameter id="dtx" value="true"/>
      </audioEncoder>
      <videoFilters>
         <parameter id="scaleType" value="QCIF"/>
         <parameter id="useSpatialFilter" value="false"/>
         <parameter id="useScaleFilter" value="true"/>
         <parameter id="useDeinterlaceFilter" value="false"/>
         <parameter id="scaleFilterHeight" value="144"/>
         <parameter id="changeframerate" value="false"/>
         <parameter id="burnLogo" value="false"/>
         <parameter id="useColorAdjustment" value="false"/>
         <parameter id="useCropFilter" value="false"/>
         <parameter id="useInverseTeleCine" value="false"/>
         <parameter id="scaleFilterWidth" value="176"/>
      </videoFilters>
      <advancedVideoEncoder>
         <parameter id="useVideoPacket" value="false"/>
         <parameter id="allowBitRateUnderflow" value="false"/>
         <parameter id="vbvSizeInMs" value="1000"/>
      </advancedVideoEncoder>
      <presetProperties>
```

```
        <parameter id="summary" value="..."/>
        <parameter id="comments" value=""/>
      </presetProperties>
      <audioFilters>
        <parameter id="balanceLeftRight" value="0"/>
        <parameter id="volume" value="100"/>
      </audioFilters>
    </parameters>
</job>
```

Preset Files

You can use preset files for offline encoding. To do this, enter the following command at the command prompt:

`hmprod -i` *`input_file`* `-o` *`output_file`* `-p` *`preset_name`*

Helix Mobile Producer Professional includes a library of encoding parameter presets. These preset files are installed with Helix Mobile Producer Professional in the following directory:

`helix_mobile_producer_install_directory``\preset`

You can also create new, customized preset files with whatever encoding parameters you choose.

Preset File Parameters

For definitions of all of the preset file parameters, see Appendix A.

Creating Preset Files

You can export existing preset files from Helix Mobile Producer Professional or Helix Mobile Producer Professional Live, create the files in other applications capable of generating XML, or edit them manually. The easiest method of creating a new preset file is to edit an existing preset file in Helix Mobile Producer Professional and then save the preset with a new name.

➤ To create a preset file:

1. Start Helix Mobile Producer Professional or Helix Mobile Producer Professional Live, and then select a preset.
2. Edit the preset parameters however you want.

3. Save the edited preset file with a new file name. By default, the new preset will be saved in the *helix_mobile_producer_install_directory*\preset directory.

Live Encoding with Helix Mobile Producer Professional Live

When you are using the command-line interface for live encoding, you need to include a job file name, as in the following example:

`hmprod -job job_file_name`

The job file shows Helix Mobile Producer Professional Live how to run a live encoding session. The file includes instructions for capturing live input media and instructions for either saving the encoded media to a file or sending it to a streaming server for live broadcast.

Note: Live encoding of file input is not supported.

Creating Job Files for Live Encoding

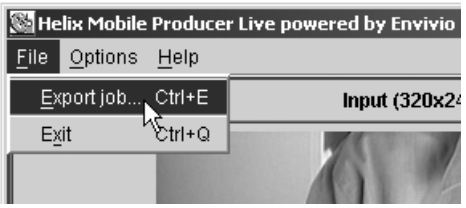
There are two ways to create a job file for live encoding. The first way is to set up a live encoding session with Helix Mobile Producer Professional Live and then export the job file. The second way is to create a job file in an XML editing program, using the reference information for preset files and job files provided in this user's guide (see Appendix A and Appendix B, respectively).

Exporting a Job File

Set up a live encoding session in Helix Mobile Producer Professional Live, and then export a job file for command-line encoding, as described in the following procedure.

➤ To export a job file:

1. Start Helix Mobile Producer Professional Live, and then set up a live encoding session, as described in "Setting Up Capture Sources for Live Encoding" on page 19.
2. Set the live broadcast options for the encoding session, as described in "Live Broadcast Output (Helix Mobile Producer Live only)" on page 21.
3. Click **File>Export job**, as shown in the following illustration.



4. Select a directory for the exported job file, and then save the file in that directory.

Creating a Job File in an XML Editing Program

You can use XML editing software to create a job file manually. Or, if you prefer, you can edit an exported job file to meet your specific requirements. For a thorough understanding of the structure of job files and preset files, see Appendix A and Appendix B at the end of this user's guide.

If you are creating a job file manually, you can use the following command at the command prompt to find information about the available capture devices for live media:

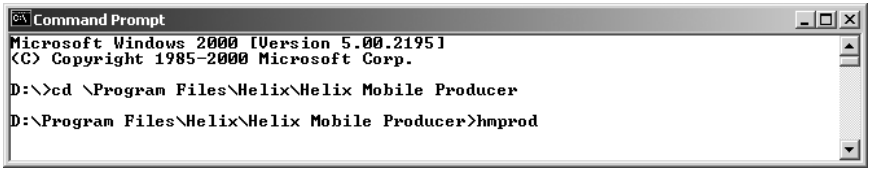
```
hmprod -lcd
```

Encoding Live Input

After you have created a job file, you can use the command-line interface to begin live encoding either for file output or for live broadcast, as described in the following procedure.

➤ To encode live input by using the command line:

1. Open the Command Prompt window.



2. Set the current directory to match the location of the `hmprod.exe` program by typing `cd` followed by the path to the program.
3. Type `hmprod` followed by command-line arguments to start the command-line encoder, as in the following example:

   ```
   hmprod -job "myjob.xml"
   ```

As soon as the encoding process is completed, the encoded media will be sent to the streaming server specified in the job file.

CHAPTER

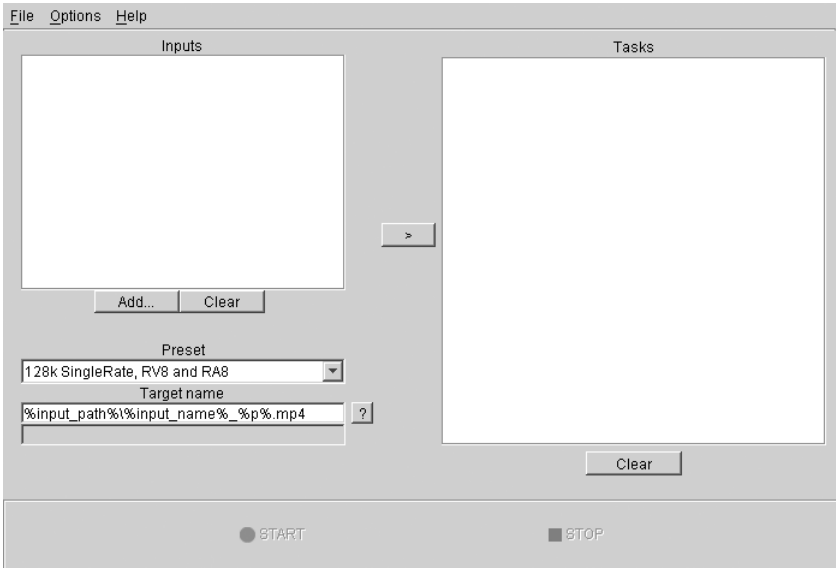
7

USING THE BATCH PROCESSOR

Helix Mobile Producer Professional gives you the ability to queue up encoding jobs and process them in batches.

Getting Started

To switch to batch processing mode, click **File>Go to Batch Processor**. The following window is displayed:



Note: You can also toggle between the batch processor and the Helix Mobile Producer by pressing **Ctrl+B**.

Adding Media

To add media to the input list, you can either click **Add...** and select the file you want to encode, or drag and drop them in the **Inputs** window. You can

select which track (audio and/or video) you want to encode by selecting the related radio button.

Note: The **Clear** button removes all media from the input list.

Selecting a Preset

Select the appropriate preset from the pull-down list of presets. You can encode files using the same preset, as described in "Encoding with the Same Preset" on page 67, or using different presets, as noted in "Encoding with Different Presets" on page 68.

Note: You must have saved your own presets if you want to use them in batch processing mode. See "Working with Presets" on page 29.

Specifying Output File Name

You can specify the MPEG-4 output file name using variables based on input settings. By default, the name is the following:

%input_path%\%input_name%_%p%.extension

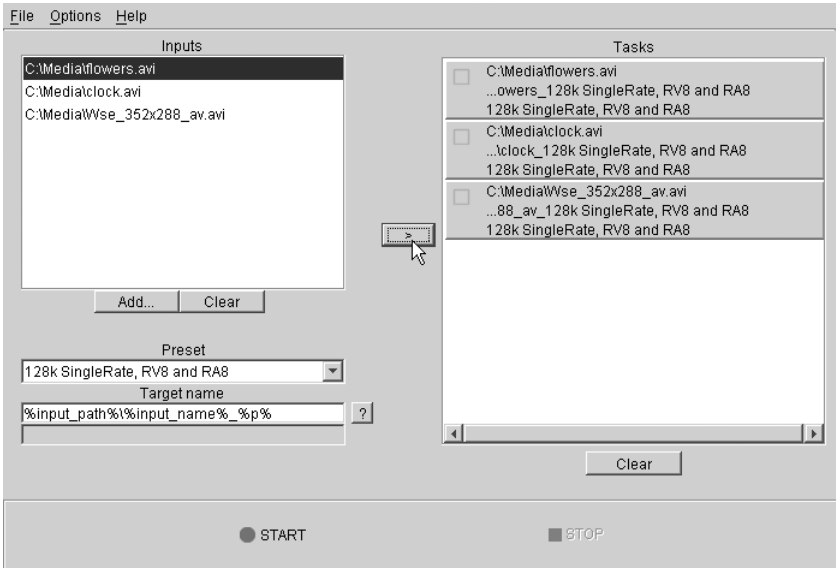
But you can define your own output file name:

- *%input_path%* or *%ip%* is replaced by the input file path
- *%flat_input_path%* or *%fip%* is replaced by the input file path without '\\' or ':'
- *%input_name%* or *%in%* is replaced by the input file name (without the extension)
- *%input_extension%* or *%ie%* is replaced by the input file name extension
- *%preset%* or *%p%* is replaced by the preset name
- *extension* is replaced by the appropriate file extension (linked to the selected preset.

Encoding with the Same Preset

➤ To encode several files using the same preset:

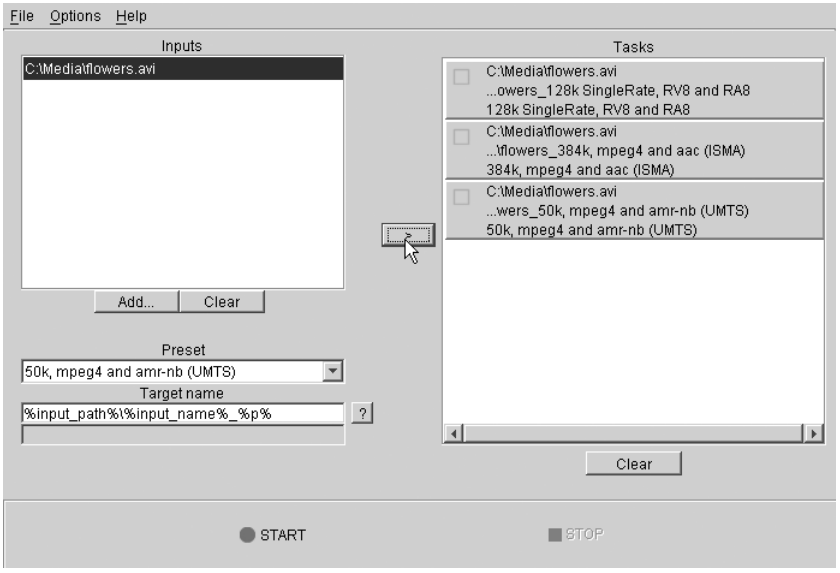
1. Add the files you want to encode, as described in "Adding Media" on page 66.
2. Select the appropriate preset. See "Selecting a Preset" on page 66.
3. Move the input files you want to encode to the **Tasks** list by clicking the > button.
4. Click the ● button to start the batch encoding task.



Encoding with Different Presets

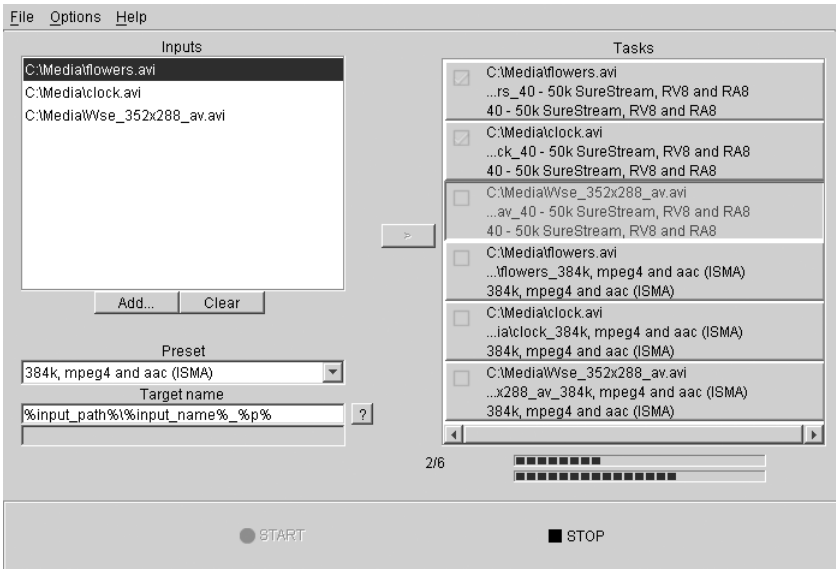
➤ To encode a file using different presets:

1. Add the file you want to encode. See "Adding Media" on page 66.
2. Select the first preset, as described in "Selecting a Preset" on page 66, then click the > button. Repeat this step to change the preset.
3. Click the ● button to start encoding the batch.



Understanding the Batch Encoding Process

As each job is run, Helix Mobile Producer applies the selected preset, and starts encoding.



The upper bar indicates the global progression of the jobs. The lower bar indicates the progression of the current job. If an error occurs, Helix Mobile Producer stops the operation, records the error, and starts the next job. To return to the encoding panel, press **Ctrl+B**.

APPENDIX

A

PRESET FILE REFERENCE

This appendix provides a reference for preset files supported by Helix Mobile Producer and Helix Mobile Producer Live, describing the format and syntax of preset file encoding parameters for audio and video input. It shows the basic structure of a preset file and gives you details about the various sections of a preset file.

Creating Preset Files

Using Helix Mobile Producer or Helix Mobile Producer Live, you can define audio and video encoding properties, or parameters, in preset files. (Many preset file parameters are described in greater detail in Chapter 5 of this book.) A preset file is an XML file that uses the following format:

```
<?xml version="1.0" encoding="UTF-8"?>
<preset>
  <version stage="3gppR2" build="251" />
  <parameters>
    <audioEncoder>
      <parameter id="audioEncoderType" value="amrnb" />
      <parameter id="bitRate" value="5900" />
      <parameter id="dtx" value="true" />
    </audioEncoder>
    <audioFilters>
      <parameter id="balanceLeftRight" value="0" />
      <parameter id="volume" value="100" />
    </audioFilters>
    <videoEncoder>
      <parameter id="bitRate" value="14100" />
      <parameter id="keyFramePeriodInMs" value="5000" />
      <parameter id="numberOfPass" value="2" />
      <parameter id="rateControlMode" value="cbr" />
      <parameter id="smoothVsSharp" value="50" />
      <parameter id="videoEncoderType" value="h263" />
    </videoEncoder>
```

```
<videoFilters>
    <parameter id="burnLogo" value="false" />
    <parameter id="changeframerate" value="true" />
    <parameter id="newFps" value="7" />
    <parameter id="reduceFrameRateType" value="converter" />
    <parameter id="scaleFilterHeight" value="144" />
    <parameter id="scaleFilterWidth" value="176" />
    <parameter id="scaleType" value="QCIF" />
    <parameter id="useColorAdjustment" value="false" />
    <parameter id="useCropFilter" value="false" />
    <parameter id="useDeinterlaceFilter" value="false" />
    <parameter id="useInverseTeleCine" value="false" />
    <parameter id="useScaleFilter" value="true" />
    <parameter id="useSpatialFilter" value="false" />
  </videoFilters>
  <advancedVideoEncoder>
    <parameter id="advVideoEncoderType" value="h263" />
    <parameter id="useVideoPacket" value="false" />
    <parameter id="vbvSizeInMs" value="1000" />
  </advancedVideoEncoder>
  <export>
    <parameter id="MTUSize" value="400" />
    <parameter id="exportType" value="3gpp" />
    <parameter id="hinted" value="true" />
    <parameter id="progressiveDownload" value="true" />
  </export>
  <presetProperties>
    <parameter id="comments" value="Compatible with most 3gpp
      streaming capable devices. " />
    <parameter id="summary" value="20 kbps total bit rate with H.263 video
      and AMR-NB audio" />
  </presetProperties>
 </parameters>
</preset>
```

Note: The minimum parameters for a preset file are export parameters and video encoder or audio encoder parameters. All other parameters are optional.

Version Parameter

You can define the encoder version that is compatible with a particular preset file, as in the following example:

```
<version stage="3gppR2" build="251" />
```

Export Parameters

File export parameters that you can define in presets are listed and defined in the following table. An example of how to set these parameters is provided as well. Note that some of these properties are optional.

File Export Parameters

Parameter ID	Definition	Value	Optional
`exportType`	Export file type.	MP4, 3GPP, 3GPP2, AMR, QCP, MP3, or RM	No
`audienceList`	RealMedia SureStream audiences.	The audience file names, separated by a semicolon (without the `.rpad` file extension). For example: `100k;50k;150k`	Required for RealMedia export only
`hinted`	Prepare for streaming. See "Prepare for streaming (MPEG-4 and H.263 encoders only)" on page 49.	True|False	Yes (True by default)
`MTUSize`	Maximum packet size, in bytes. See "Max. packet size (MPEG-4 and H.263 encoders only)" on page 49.	Any integer from 100 through 64000	Yes (1448 by default)
`progressiveDownload`	Optimize file for progressive download. See "Optimize for progressive download (MPEG-4 and H.263 encoders only)" on page 49.	True|False	Yes (False by default)

Example

```
<export>
   <parameter id="MTUSize" value="1448"/>
   <parameter id="exportType" value="3gpp2"/>
   <parameter id="hinted" value="true"/>
   <parameter id="progressiveDownload" value="true"/>
</export>
```

Audio Encoder Parameters

Audio encoder parameters that you can define in presets are listed and defined in the following table. An example of how to set these parameters is provided as well. Note that some of these properties are optional.

Audio Encoder Parameters

Parameter ID	Definition	Value	Optional
audioEncoderType	Type of audio codec used.	AAC, AMR-NB, AMR-WB, QCELP, RNAudio, or MP3	No
rnAudioMode	Type of RealAudio codec used.	Voice|Music (the audio bit rate is determined by the selected audience)	Required for RealAudio
bitRate	Bit rate in bits per second (bps).	See the values listed in the table immediately following this one	Not required for RealAudio
useAutomaticBandwidth	Automatic bit rate for the spectral bandwidth, in bits per second (bps). See "Automatic audio bandwidth (AAC audio encoder only)" on page 46.	True|False	AAC only
manualBandwidth	Manually specified bit rate for the AAC encoder, in bits per second (bps).	Any integer from 4000 through 288000	AAC only

(Table Page 1 of 2)

Audio Encoder Parameters (continued)

Parameter ID	Definition	Value	Optional
dtx	Discontinuous transmission. See "DTX (AMR audio encoders only)" on page 46.	True|False	AMR only
useMS	Joint stereo. See "Use joint stereo (AAC audio encoder only)" on page 46.	True|False	AAC only

(Table Page 2 of 2)

The following table lists all of the values you can choose among for the bitRate parameter, depending on the file format being used.

Values for the bitRate Parameter

File format	Value
AAC-LC	Any integer from 4000 through 288000
AMR-NB	4750, 5150, 5900, 6700, 7400, 7950, 10200, or 12200
AMR-WB	6600, 8850, 12650, 14250, 15850, 18250, 19850, 23050, or 23850
QCELP	14000 for full-rate; 6800 for half-rate
MP3	16000, 24000, 32000, 40000, 48000, 56000, 64000, 80000, 96000, 112000, 128000, 160000, 192000, 224000, 256000, or 320000

Example

```
<audioEncoder>
   <parameter id="audioEncoderType" value="aac" />
   <parameter id="bitRate" value="88200" />
</audioEncoder>
```

Audio Filter Parameters

The two audio filter parameters that you can define in presets are defined in the following table. An example of how to set these parameters is provided as well.

Audio Filter Parameters

Parameter ID	Definition	Value	Optional
balanceLeftRight	Audio balance.	Any integer from -100 through 100 (the default value is 0)	No
volume	Audio volume.	Any integer from 0 through 400	No

Example

```
<audioFilters>
   <parameter id="balanceLeftRight" value="0"/>
   <parameter id="volume" value="100"/>
</audioFilters>
```

Video Encoder Parameters

Video encoder parameters that you can define in presets are listed and defined in the following table. An example of how to set these parameters is provided as well. Note that some of these properties are optional.

Video Encoder Parameters

Parameter ID	Definition	Value	Optional
videoEncoderType	Type of video codec used.	MPEG4, H263, or rnVideo	No
rateControlMode	Rate control (for single pass only). See "Bit rate control (MPEG-4 and H.263 encoders only)" on page 35.	CBR, VBR, or QC	Yes
bitRate	Bit rate in bits per second (bps).	Any integer from 10000 through 384000	CBR only

(Table Page 1 of 3)

Video Encoder Parameters (continued)

Parameter ID	Definition	Value	Optional
averageBitRate	Average bit rate.	Any integer from 10000 through 384000	VBR only
limitMaxBitRate	Maximum bit rate limit. See "Variable bit rate" on page 36.	True|False	VBR only
maxBitRate	Maximum bit rate.	Usually double the average bit rate	VBR only
numberOfPass	Number of encoding passes. See "Number of Encoding Passes (Helix Mobile Producer only)" on page 37.	1 = single pass (default) 2 = double pass	Yes
keyFramePeriodinMs	Key-frame period, in milliseconds (the maximum distance between two I-frames).	Any integer from 500 through 10000 (the default value is 10000)	Yes
smoothVsSharp	Image adjustment (between smoothness and sharpness).	Any integer from 0 through 100 (the default value is 50, which equates to no effect)	Yes
searchRange	See "Search range (for MPEG-4 motion estimation only)" on page 39.	16, 32, 64, or 128	—
motionEstimationMethod	See "Search method (for MPEG-4 motion estimation only)" on page 38.	Fast|Normal	—
rnKeyFramePeriodInMs	Number of seconds between encoded video key frames.	Any integer from 0 through 60	RealVideo only
rnMode	Mode selection appropriate for the amount of motion in the video.	Normal, smooth, sharp, or slideshow	RealVideo only

(Table Page 2 of 3)

Video Encoder Parameters (continued)

Parameter ID	Definition	Value	Optional
rnNumberOfPass	Number of encoding passes.	1 = single pass (default) 2 = double pass	RealVideo only
rnRateControlMode	Specified bit rate control.	CBR, VBR, or quality	RealVideo only
rnVideoCodec	RealVideo codec.	rv8, rv9, or rvG2SVT	RealVideo only
rnQualityFactor	Specified video quality.	Any integer from 0 through 100	RealVideo only

(Table Page 3 of 3)

Example

```
<videoEncoder>
   <parameter id="videoEncoderType" value="0" />
   <parameter id="bitRate" value="200000" />
   <parameter id="numberOfPass" value="1" />
   <parameter id="rateControlMode" value="0" />
   <parameter id="keyFramePeriod" value="10000" />
   <parameter id="vbvSize" value="1000" />
   <parameter id="smoothnessVsQuality" value="0" />
</videoEncoder>
```

Advanced Video Encoder Parameters

Advanced video encoder parameters that you can define in presets are listed and defined in the following table. An example of how to set these parameters is provided as well. Note that some of these properties are optional.

Advanced Video Encoder Parameters

Parameter ID	Definition	Value	Optional
rnEnableLossProtection	Parameter that specifies whether error correction information is added to the encoded file.	True|False	RealVideo only
rnMaxStartupLatency	Maximum time that a clip will be buffered before playback begins.	Any integer from 4 through 25	RealVideo only

(Table Page 1 of 2)

Advanced Video Encoder Parameters (continued)

Parameter ID	Definition	Value	Optional
vbvSizeInMs	Video buffer size in milliseconds. See "Video buffer size (MPEG-4 and H.263 encoders only)" on page 40.	Any integer from 200 through 5000	CBR only
useVideoPacket	Activation of video packets for error resilience. See "Use video packets (error resilience)" on page 40.	True|False	MPEG-4 only
videoPacketLength	Maximum length of the video packet.	Any integer from 100 through 2048	MPEG-4 only
useDataPartioning	Available only if useVideoPacket = True.	True|False (the default value is False)	MPEG-4 only
useRVLC	Available only if useDataPartioning = True.	True|False (the default value is False)	MPEG-4 only
useHEC	Available only if useVideoPacket = True.	True|False (the default value is False)	MPEG-4 only

(Table Page 2 of 2)

Example

```
<advancedVideoEncoder>
   <parameter id="allowBitRateUnderflow" value="false"/>
   <parameter id="useVideoPacket" value="false"/>
   <parameter id="vbvSizeInMs" value="1000"/>
</advancedVideoEncoder>
```

Video Filter Parameters

Video filters that you can define in presets are listed and defined in the following table. An example of how to set these parameters is provided as well. Note that some of these properties are optional.

Video Filter Parameters

Parameter ID	Definition	Value	Optional
useInverseTeleCine	Inverse telecine (29.97 fps to 24 fps). See "Scale" on page 43.	True|False (the default value is False)	Yes
inverseTeleCineParity	Even|Odd parity. Even defines the order in the Lower field. Odd defines the order in the Upper field.	Even|Odd	Yes (unless useInverseTeleCine = True)
useDeinterlaceFilter	Activation of the deinterlacing filter. See "Denoising" on page 44.	True|False (the default value is False)	Yes
changeFrameRate	Frame rate adjustment. See "Change frame rate" on page 42.	True|False (the default value is False)	Yes
reduceFrameRateType	Method of reducing the frame rate.	Converter|Divider	Yes
frameRateConverter	Output frame rate in frames per second (fps).	Any integer from 1 through the input frame rate (the default value is the input frame rate)	Yes (unless changeFrameRate=True)
framerateDividerRatio	Ratio used to divide the frame rate.	2, 3, 4, or 5	Yes

(Table Page 1 of 4)

Video Filter Parameters (continued)

Parameter ID	Definition	Value	Optional
useCropFilter	Activation of the cropping filter. See "Crop" on page 42.	True|False (the default value is False)	Yes
cropFilterX	Position from the left to crop.	Depends on the input size	Yes (unless useCropFilter = True)
cropFilterY	Position from the top to crop.	Depends on the input size	Yes (unless useCropFilter = True)
cropFilterWidth	Width to crop.	Depends on the input size	Yes (unless useCropFilter = True)
cropFilterHeight	Height to crop.	Depends on the input size	Yes (unless useCropFilter = True)
useScaleFilter	Activation of the image scaling filter. See "Scale" on page 43.	True|False (the default value is False)	Yes
scaleFilterWidth	Width to scale.	Depends on the input size	Yes (unless useScaleFilter = True)
scaleFilterHeight	Height to scale.	Depends on the input size	Yes (unless useScaleFilter = True)
useColorAdjustment	Enable color adjustments.	True|False	Yes
brightness	Brightness value.	Any integer from -100 through 100 (the default value is 0, which equates to no effect)	Yes
contrast	Contrast value.	Any integer from -100 through 100 (the default value is 0, which equates to no effect)	Yes

(Table Page 2 of 4)

Video Filter Parameters (continued)

Parameter ID	Definition	Value	Optional
useGammaCorrection	Activation of gamma correction. See "Adjust colors" on page 43.	True|False (the default value is False)	Yes
gammaCorrectionFactorR	Red gamma correction factor.	Any integer from -100 through 100 (the default value is 0, which equates to no effect)	Yes (unless useGamma Correction = True)
gammaCorrectionFactorG	Green gamma correction factor.	Any integer from -100 through 100 (the default value is 0, which equates to no effect)	Yes (unless useGamma Correction = True)
gammaCorrectionFactorB	Blue gamma correction factor.	Any integer from -100 through 100 (the default value is 0, which equates to no effect)	Yes (unless useGamma Correction = True)
burnLogo	Parameter that sets the logo file to be burned onto the encoded output. See "Setting Audio Parameters and Filters" on page 44.	True|False (the default value is False)	Yes
fileNameLogo	Name of the logo file if burnLogo is used.	Absolute path to the logo file	Yes
transparencyLogo	Use if the logo file includes transparent attributes.	True|False (the default value is False)	Yes
xOriginLogo	Logo x position.	Depends on the output video size	Yes
yOriginLogo	Logo y position.	Depends on the output video size	Yes

(Table Page 3 of 4)

Video Filter Parameters (continued)

Parameter ID	Definition	Value	Optional
useSpatialFilter	Activation of the denoising filter. See "Denoising" on page 44.	True|False (the default value is False)	Yes
spatialFilterThreshold	Value for the denoising filter.	Any integer from 1 through 5	Yes (unless useSpatialFilter =Yes)

(Table Page 4 of 4)

Example

```
<videoFilters>
    <parameter id="burnLogo" value="false"/>
    <parameter id="changeframerate" value="false"/>
    <parameter id="useColorAdjustment" value="false"/>
    <parameter id="useCropFilter" value="false"/>
    <parameter id="useDeinterlaceFilter" value="false"/>
    <parameter id="useInverseTeleCine" value="false"/>
    <parameter id="useScaleFilter" value="false"/>
    <parameter id="useSpatialFilter" value="false"/>
</videoFilters>
```

Preset Metadata Parameters

The two metadata parameters that you can use in presets are defined in the following table. Note that both of these parameters are optional.

Preset Metadata Parameters

Parameter ID	Definition	Value	Optional
comments	Metadata	*comments*	Yes
summary	Metadata	*summary*	Yes

Example

```
<presetProperties>
   <parameter id="comments" value="comments"/>
   <parameter id="summary" value="summary"/>
</presetProperties>
```

APPENDIX

B

JOB FILE REFERENCE

This appendix provides a reference for job files created in Helix Mobile Producer or Helix Mobile Producer Live, describing the format and syntax of job file encoding parameters for audio and video input. It shows the basic structure of a job file and gives you details about the different sections of a job file.

> **Note:** Although you can create a job file using the standard version of Helix Mobile Producer or Helix Mobile Producer Live, running a job file requires the use of the command-line application described in Chapter 6. This application is available only with Helix Mobile Producer Professional and Helix Mobile Producer Professional Live.

Creating Job Files

You can include in a job file the same audio and video encoding properties that you can define in a preset file. Additionally, a job file contains parameters related to the input media source and the output media destination. A job file is an XML file that uses the following format:

```
<?xml version="1.0" encoding="UTF-8"?>
<job>
   <version build="272" stage="3gppR2"/>
   <input>
      <capture>
         <parameter id="videoPixelFormat" value="CAP_I420"/>
         <parameter id="videoFrameRate" value="30.00021"/>
         <parameter id="audioDriver" value="Philips ToUcam Pro Camera; Audi"/>
         <parameter id="audioBitsPerSample" value="16"/>
         <parameter id="videoHeight" value="240"/>
         <parameter id="videoDriver" value="Philips ToUcam Pro Camera; Video"/>
         <parameter id="videoWidth" value="320"/>
         <parameter id="audioSamplingRate" value="44100"/>
```

```
      <parameter id="audioNbChannels" value="2"/>
   </capture>
</input>
<output>
   <file name="D:\Program Files\Helix\Helix Mobile Producer Live
   2.0\output.3gp"/>
</output>
<parameters>
   <export>
      <parameter id="hinted" value="true"/>
      <parameter id="progressiveDownload" value="true"/>
      <parameter id="exportType" value="3gpp"/>
      <parameter id="MTUSize" value="400"/>
   </export>
   <presetProperties>
      <parameter id="summary" value="20 kbps total bit rate with H.263 video
      and AMR-NB audio"/>
      <parameter id="comments" value="Compatible with most 3gpp streaming
      capable devices. "/>
   </presetProperties>
   <videoEncoder>
      <parameter id="smoothVsSharp" value="50"/>
      <parameter id="keyFramePeriodInMs" value="5000"/>
      <parameter id="numberOfPass" value="2"/>
      <parameter id="bitRate" value="14100"/>
      <parameter id="videoEncoderType" value="h263"/>
      <parameter id="rateControlMode" value="cbr"/>
   </videoEncoder>
   <videoFilters>
      <parameter id="useColorAdjustment" value="false"/>
      <parameter id="reduceFrameRateType" value="converter"/>
      <parameter id="useDeinterlaceFilter" value="false"/>
      <parameter id="useInverseTeleCine" value="false"/>
      <parameter id="changeframerate" value="true"/>
      <parameter id="newFps" value="7"/>
      <parameter id="useCropFilter" value="false"/>
      <parameter id="burnLogo" value="false"/>
      <parameter id="useScaleFilter" value="true"/>
      <parameter id="scaleFilterWidth" value="176"/>
      <parameter id="useSpatialFilter" value="false"/>
      <parameter id="scaleFilterHeight" value="144"/>
      <parameter id="scaleType" value="QCIF"/>
   </videoFilters>
   <advancedVideoEncoder>
```

```
            <parameter id="advVideoEncoderType" value="h263"/>
            <parameter id="useVideoPacket" value="false"/>
            <parameter id="vbvSizeInMs" value="1000"/>
         </advancedVideoEncoder>
         <audioEncoder>
            <parameter id="bitRate" value="5900"/>
            <parameter id="audioEncoderType" value="amrnb"/>
            <parameter id="dtx" value="true"/>
         </audioEncoder>
         <audioFilters>
            <parameter id="balanceLeftRight" value="0"/>
            <parameter id="volume" value="100"/>
         </audioFilters>
      </parameters>
   </job>
```

Input Parameters

This section defines the properties, or parameters, that you can set for import file formats and live capture sources for audio and video input. Note that some of these properties are optional.

File Input

You can set the file name parameter for file input, as shown in the following table and example.

File Name Parameter

Parameter ID	Definition	Value
file name	Input file for offline encoding	Absolute path to the input file name

Example

```
<input>
   <file name="D:\movies\my_movie.avi"/>
</input>
```

Note: Helix Mobile Producer Live does not support live encoding of file input for broadcast output.

Live Capture Input (Helix Mobile Producer Live only)

The live capture input parameters you can set for Helix Mobile Producer Live are listed and defined in the following table. You can set these parameters as shown in the example after the table.

Live Capture Input Parameters

Parameter ID	Definition	Value	Optional
duration	Duration of the live capture	Milliseconds	Yes
videoPixelFormat	Color space used for the capture device	CAP_I420 CAP_RGB24 CAP_RGB32	Yes
videoFrameRate	Input video frame rate	—	Yes
audioDriver	Input audio capture source	—	No
audioBitsPerSample	Bits per sample	8 or 16	Yes
videoHeight	Height of the input video image in pixels	—	Yes
videoDriver	Input video capture source	—	No
videoWidth	Width of the input video image in pixels	—	Yes
audioSamplingRate	Audio sampling frequency rate in hertz	—	Yes
audioNbChannels	Number of audio channels	1 or 2	Yes

Example

```
<input>
   <capture>
      <parameter id="pixelFormat" value="CAP_I420"/>
      <parameter id="videoPixelFormat" value="CAP_I420"/>
      <parameter id="videoFrameRate" value="30.00021"/>
      <parameter id="audioDriver" value="Philips ToUcam Pro Camera; Audi"/>
      <parameter id="bitsPerSample" value="16"/>
      <parameter id="audioBitsPerSample" value="16"/>
      <parameter id="videoHeight" value="240"/>
      <parameter id="videoDriver" value="Philips ToUcam Pro Camera;Video"/>
      <parameter id="videoWidth" value="320"/>
      <parameter id="audioSamplingRate" value="44100"/>
      <parameter id="audioNbChannels" value="2"/>
   </capture>
</input>
```

Output Parameters

This section defines the parameters that you can set for audio or video output files or broadcasts. Note that some of these properties are optional.

File Output

You can set the file name parameter for file output, as shown in the following table and example.

File Name Parameter

Parameter ID	Definition	Value
file name	Output file for offline encoding	Absolute path to the output file name

Example

```
<output>
   <file name="output.mp4"/>
</output>
```

Helix Broadcast Output (Helix Mobile Producer Live only)

There are a number of Helix broadcast output parameters that you can set, as shown in the following table and example.

Helix Broadcast Output Parameters

Parameter ID	Definition	Value
broadcastMode	Broadcast mode selection	Helix
serverPort	Port number on the Helix server to which the data packets are to be sent	Port number
broadcastType	Broadcast type selection (Helix only)	accountBasedPushBroadcast
serverAddress	Helix server address	server.real.com, for example
userName	User name for authenticating the connection to the Helix server	—

(Table Page 1 of 2)

Helix Broadcast Output Parameters (continued)

Parameter ID	Definition	Value
userPassword	Password for authenticating the connection to the Helix server	—
specifyListenAddress	Indicates whether to specify the listen address.	true|false
listenAddress	Address where Helix Mobile Producer Live listens for resend requests from the server.	IP address

(Table Page 2 of 2)

Example

```
<output>
   <broadcast>
      <parameter id="serverPort" value="80"/>
      <parameter id="broadcastMode" value="helix"/>
      <parameter id="broadcastType" value="accountBasedPushBroadcast"/>
      <parameter id="serverAddress" value="server.real.com"/>
      <parameter id="userName" value=""/>
      <parameter id="userPassword" value=""/>
      <parameter id="path" value="/mydirectory"/>
   </broadcast>
</output>
```

RTP Broadcast Output (Helix Mobile Producer Live only)

There are five RTP broadcast output parameters that you can set, as shown in the following table and example.

RTP Broadcast Output Parameters

Parameter ID	Definition	Value
broadcastMode	Broadcast mode selection.	RTP
ttl	Amount of time left until a live multicast begins.	1 through 15
multicastIPAddress	IP address for a multicast.	IP address

(Table Page 1 of 2)

RTP Broadcast Output Parameters (continued)

Parameter ID	Definition	Value
port	Destination port for RTP broadcast mode. For an audio-only broadcast, the actual port used is two ports higher than the selected port. For example, if you select port 8558, port 8560 is used.	Port number
sdpFile	Session description protocol file (or *announce file*), which provides information about a streamed Web broadcast.	Absolute path to the announce file

(Table Page 2 of 2)

Example

```
<output>
   <broadcast>
      <parameter id="ttl" value="1"/>
      <parameter id="multicastIPAddress" value="236.130.125.87"/>
      <parameter id="port" value="8558"/>
      <parameter id="broadcastMode" value="rtp"/>
      <parameter id="sdpFile" value="broadcast.sdp"/>
   </broadcast>
</output>
```

APPENDIX

C

AUDIENCE FILE REFERENCE

This appendix describes the audience syntax. Each audience file records settings about how clips are encoded. The information in this appendix allows you to edit audience information to modify encoding settings.

Understanding Audiences

Each audience file defines a single audience for which a clip is encoded. Helix Mobile Producer predefines a number of audiences that appear within the graphical user interface when you click the **Audiences** button. For example, one audience may be for 20K. Each audience specifies the streaming rates at which audio and video clips are encoded, along with other settings.

Audience Files

The audience files are stored in the `audiences` subdirectory under the RealNetwork directory in the main Helix Mobile Producer installation directory. Audience files use the file extension `.rpad`, and their file names correspond directly to the audience name in the graphical interface. For example, the **20k Dial-up** audience in the graphical user interface stores its information in the file named `20k Dial-up.rpad`.

Some settings in the audience files, such as the video codec, the frame rate, keyframe interval, and buffer size, can be overridden using the GUI interface. You can also edit audience files manually. This allows you to change audience information used by the graphical interface or command line application using a text editor or any automated process that can modify text files.

> **Tip:** When creating a new audience file, RealNetworks recommends that you start with an existing audience file that you have renamed.

Audience Section

The <audience> and </audience> tags encapsulate an audience section within an audience file. The audience section then uses separate <streams> sections to define the video stream, the audio stream, and so on. The <audience> tag follows directly after the XML declaration tag.

```
<?xml version="1.0" encoding="UTF-8"?>
<audience xmln="http://ns.real.com/tools/audience.1.0"
   ...all audience parameters...
</audience>
```

Audience Properties

The following table describes the properties that each <audience> list can contain.

Audience Properties

Property	Value	Function
avgBitrate	positive integer from 1 to 999999	Defines the average bit rate for this audience in bits per second (bps). This is ignored if the encoding type is set to vbrQuality, or you are encoding audio without video. For more on encoding types, refer to "Stream Encoding Types" on page 101.
maxBitrate	positive integer from 1 to 999999	Limits the total bit rate for this audience to a maximum number in bits per second (bps). The value, which must be more than the value for avgBitrate, applies only if the encoding type is vbrBitrate or vbrQuality, as described in "Stream Encoding Types" on page 101.
streams	list	Defines each stream in the audience, as described in "Streams Section" on page 95.

Audience Properties Example

The following example shows a template for an audience using 256 Kbps DSL or cable modem connections. The average bit rate is set to 225 Kbps, which allows approximately 10 percent of the total bandwidth for network overhead. If variable bit rate encoding is used, bandwidth spikes can reach 450 Kbps:

```
<audience>
   <avgBitrate type="uint">225000</avgBitrate>
   <maxBitrate type="uint">450000</maxBitrate>
   <name type="string">256k DSL or cable</name>
   <streams>
      ...streams defined here...
    </streams>
</audience>
```

Streams Section

Each audience template has a streams section that defines the encoded streams. This section starts and ends with <streams> and </streams> tags (note the plural "streams"). Within this list, one or more sublists defined between <audioStream> and </audioStream> tags, and a single <videoStream> and </videoStream> tag pair.

For audio, these streams are defined:

- music in an audio-only clip
- voice in an audio-only clip
- music in a video clip
- voice in a video clip

The following example shows the five possible streams defined within an audience section:

```
<audience>
   ...
   <streams>
      <audioStream>
         ...audio stream for music in an audio-only clip...
      </audioStream>
      <audioStream>
         ...audio stream for voice in an audio-only clip...
      </audioStream>
      <audioStream>
         ...audio stream for music in a video clip...
      </audioStream>
      <audiostrea">
         ...audio stream for voice in a video clip...
      </audioStream>
      <videostream xsi:type="videoStream">
```

```
            ...video stream...
        </videostream>
            </streams>
</audience>
```

Audio Stream Properties

The following table describes the properties that the various audio streams can contain. The codecName and codecFlavor properties are required.

Audio Stream Properties

Property	Value	Function
codecFlavor	number	Sets the encoding speed used with the chosen codec. For a list of the flavor numbers, refer to the tables in Appendix D.
codecName	sipr|cook|ralf|raac	Defines the type of codec used to encode the stream. For a list of the codec names, refer to the tables in Appendix D.
pluginName	rn-audiocodec-realaudio	Defines the plug-in that encodes the stream.
streamContext	list	Determines the audio context for which the codec is used. Refer to "Audio Stream Context" on page 96.

Audio Stream Context

Each audience can have up to four audio streams that define which audio codec is used based on the presentation type (audio-only or audio-video) and audio mode (voice or music). This creates four possible audio stream contexts:

- voice in an audio-only clip
- music in an audio-only clip
- voice in a video clip
- music in a video clip

These contexts exist because you should use different codecs when encoding music or voice. As well, the audio typically receives more bandwidth in an

audio-only clip than in a video clip. When Helix Mobile Producer encodes a clip using the audience information, it selects just one of the audio contexts, based on other audio settings you have defined in the job file, and graphical interface.

Each audio stream uses the streamContext sublist to define one of the four possible audio contexts. For example, the following markup instructs Helix Mobile Producer to use this audio stream when encoding voice audio for a video clip or broadcast:

```
<audioStream">
   ...audio codec information...
   <streamContext type="bag">
      <audioMode type="string">voice</audioMode>
      <presentationType type="string">audio-video</presentationType>
   </audioStreamContext>
</audioStream>
```

The following table describes the stream context properties.

Stream Context Properties

Property	Value	Function
audioMode	music|voice	Indicates that the audio is music or voice, causing Helix Mobile Producer to encode with a music or voice codec. The default is music.
presentationType	audio-video| audio-only	Specifies if the stream is audio and video, or audio-only. If audio-only is selected, Helix Mobile Producer generally uses a higher bit-rate codec for the audio. The default is audio-video.

Audio Context Examples

The following sections explain the codec choices and show the markup used for defining audio streams for a 56 Kbps dial-up modem audience. Because this type of modem connection rarely achieves a sustained throughput of 56 Kbps, the avgBitrate value for the audience is set at 34 Kbps. The audio (or audio and video together) cannot use more than this amount of bandwidth.

> **For More Information:** Appendix D lists the audio codecs along with the values you use for codecName and codecFlavor.

Voice for Audio-Only Clips

For audio-only with voice, choose a voice codec that uses as much of the available bandwidth as possible. For a 34 Kbps target speed, for example, the best choice is 32 Kbps voice, which has a codec name of cook and a flavor of 7:

```
<audioStream">
   <pluginName type="string">rn-audiocodec-realaudio</pluginName>
   <codecName type="string">cook</codecName>
   <codecFlavor type="uint">7</codecFlavor>
   <encodingComplexity type="string">high</encodingComplexity>
   <streamContext type="bag">
      <presentationType type="string">audio-only</presentationType>
      <audioMode type="string">voice</audioMode>
   </streamContext>
</audioStream>
```

Music for Audio-Only Clips

For audio-only music, choose a music codec that has a bit rate as close to the available bit rate without going over. For a 34 Kbps target speed, for example, a good choice is 32 Kbps Stereo Music High Response - RealAudio. This codec has a name of cook and a flavor of 21:

```
<audioStream>
   <pluginName type="string">rn-audiocodec-realaudio</pluginName>
   <codecName type="string">cook</codecName>
   <codecFlavor type="uint">21</codecFlavor>
   <encodingComplexity type="string">high</encodingComplexity>
   <streamContext type="bag">
      <presentationType type="string">audio-only</presentationType>
      <audioMode type="string">music</audioMode>
   </streamContext>
</audioStream>
```

Voice Audio for Video Clips

For audio with video, it's generally advisable to allocate only 20 percent of a video's bandwidth for audio. A good choice when streaming at 34 Kbps is 6.5 Kbps voice. This codec has a name of sipr and a flavor of 0:

```
<audioStream>
   <pluginName type="string">rn-audiocodec-realaudio</pluginName>
   <codecName type="string">sipr</codecName>
   <codecFlavor type="uint">0</codecFlavor>
   <encodingComplexity type="string">high</encodingComplexity>
   <streamContext type="bag">
```

```
      <presentationType type="string">audio-video</presentationType>
      <audioMode type="string">voice</audioMode>
   </streamContext>
</audioStream>
```

Music Audio for Video Clips

As with voice, a music codec for a video stream should consume only about 20 percent of the total bit rate. A good choice is either 6 Kbps Music - RealAudio, or 8 Kbps Music - RealAudio if you want better sound quality. The following illustrates the 8 Kbps codec, which has a name of `cook` and a flavor of `0`:

```
<audioStream>
   <pluginName type="string">rn-audiocodec-realaudio</pluginName>
   <codecName type="string">cook</codecName>
   <codecFlavor type="uint">0</codecFlavor>
    <streamContext type="bag">
      <presentationType type="string">audio-video</presentationType>
      <audioMode type="string">music</audioMode>
   </streamContext>
</audioStream>
```

Video Stream Properties

The following table describes the properties that a video stream can contain. Each video stream section begins with a `<stream xsi:type="videoStream">` tag and ends with a `</stream>` tag.

Video Stream Properties

Property	Value	Function
codecName	rv8|rv9|rvg2svt	Defines the specific video codec used. The default is rv10 for RealVideo 10.
enableLossProtection	true|false	Determines if error correction packets are added. The default is false.
encodingType	cbr| vbrBitrate| vbrQuality|	Sets constant bit rate encoding or a type of variable bit rate encoding. The default is cbr. Refer to “Stream Encoding Types” on page 101.

(Table Page 1 of 2)

Video Stream Properties (continued)

Property	Value	Function
maxFrameRate	positive number from 0-60.000	Sets the maximum target frame rate. The default is 30.
maxKeyFrameInterval	positive number from 0 to 60.000	Sets the maximum number of seconds between video key frames. The default is 10.
maxStartupLatency	number of seconds between 4.0 and 25.0	Determines how long the clip buffers. The default is 4.0.
pluginName	rn-videocodec-realvideo	Defines the plug-in that encodes the stream. You use the same value for RealVideo 8, 9, or 10.
quality	positive integer from 1 to 100	Sets a quality target for VBR downloads. See also "Stream Encoding Types" on page 101.

(Table Page 2 of 2)

Video Stream Bit Rate

When you define a video stream, you do not set its bit rate directly. To determine the rate, take the audience's avgBitrate value and subtract the rates for the selected audio stream, event stream, and image map stream.

For a 256 Kbps audience, for example, the average bit rate may be 225 Kbps. If a 44 Kbps music audio codec is used for the sound track, and no event stream or image map stream is used, the video's visual track has an average bit rate of 181 Kbps (225 minus 44). If the video uses a voice sound track that consumes 32 Kbps, the visual track has an average bit rate of 193 Kbps (225 minus 32).

For a variable bit rate clip, the same calculation using the audience's maxBitrate value reveals the video's maximum rate. If the maximum rate is 450 Kbps, for instance, the video's visual track can use a maximum bandwidth of 406 Kbps (450 minus 44) when a music codec is used, or a maximum bandwidth of 418 Kbps (450 minus 32) if a voice codec is used.

Stream Encoding Types

The encodingType property selects one of the following encoding modes for the audio or video stream. The value you select determines whether Producer ignores or adheres to other audience settings:

cbr	Constant bit rate stream based on the audience's avgBitrate. The audience maxBitrate and the video stream quality values are ignored. Use this setting for all audio codecs other than the RealAudio lossless codec, which uses vbrUnconstrainedQuality. This is the only setting you can use for a video stream when packaging multiple streams into a single clip using SureStream technology.
vbrBitrate	Variable bit rate stream based on the audience's avgBitrate and maxBitrate settings. The video stream quality value is ignored. This is the standard setting for more variable bit rate clips.
vbrQuality	Variable bit rate stream based on the audience's maxBitrate setting and the video stream's quality setting. The audience's avgBitrate setting is ignored. Use this value if you want to try to maintain the encoding quality at a certain level and it is not necessary to maintain a consistent, average bit rate. The quality level may be constrained by the maximum bit rate, however.

Video Stream Example

The following example shows a video stream defined for a 56 Kbps dial-up audience:

```
<videostream>
   <codecName type="string">rv8</codecName>
   <enableLossProtection type="bool">false</enableLossProtection>
   <encodingComplexity type="string">high</encodingComplexity>
   <encodingType type="string">cbr</encodingType>
   <maxFrameRate type="double">15.000000</maxFrameRate>
   <maxKeyFrameInterval type="double">10.000000</maxKeyFrameInterval>
   <maxStartupLatency type="double">4.000000</maxStartupLatency>
   <pluginName type="string">rn-videocodec-realvideo</pluginName>
   <quality type="uint">30</quality>
</videostream>
```

APPENDIX

D

REALAUDIO CODEC REFERENCE

This appendix provides a reference for all RealAudio codecs used by Helix Mobile Producer, broken down into separate tables for voice, mono music, stereo and surround sound music codecs.

Using the RealAudio Codec Reference Tables

The codecs below are grouped into tables according to the type of application such as voice or music and provide detailed information about each codec.

RealAudio Codec Name

This column describes the name of the codec as it appears in the Audience Templates dialog. (To access the Audience Templates dialog, click **Audiences** and double click the **Template** name you want to use.)

The name gives you vital information about the codec: the bit rate for the codec, the type of audio the codec is suited for, and if the codec is a "high response" codec.

High response codecs cover high frequency sounds, such as a flute, than normal codecs at the same bit rate. But they don't cover low frequencies, such as a bass drum, as well as normal codecs.

Codec Flavor

The codec flavor column identifies the codec number you can call from the command line.

Sampling Rate

The Sampling Rate column lists the codec's optimum sample rate. Using a codec's optimum sampling rate in your audio source file ensures that the audio stays synchronized with other media and prevents pitch shifting during audio resampling. Audio quality degrades if you use lower than the optimum sampling rate.

Audio input should be set at the same sample rate as required by the desired output codec. In the case of SureStream encoding, the input sample rate should be equal or greater than the largest sample rate of all codecs in included in the output.

If you use a higher sampling rate when creating the source audio, it is best to use a multiple of the optimum rate. If the optimum rate is 8 kHz, for example, use a higher rate of 16 kHz or 32 kHz. When in doubt, use a CD-quality sampling rate of 44.1 kHz for your source audio.

Frequency Response

The Frequency Response column lists the codec's frequency response in kiloHertz. A codec with a higher frequency response reproduces a wider range of sound than a codec with a lower response.

Frequency response measures how much of the original audio's frequency range will be used in creating the RealAudio clip. Thus, the codec does not enhance produced audio's quality; it always results in a clip of equal or lower quality than the original audio. For example, if the original audio has an 8 kHz frequency response, encoding it with a codec that has a frequency response of 10 kHz produces a clip that still has a response of 8 kHz.

Compatibility

Some codecs are available for use with early versions of the Real Player. Compatibility is indicated below each codec type.

Voice Codecs

Helix Mobile Producer uses a voice codec when you encode a voice-only or voice-with-music clip. The lowest-speed voice codec normally used with RealAudio is 16 kbps. The lower-speed codecs can be used as "duress" streams in SureStream clips. They are also used to encode soundtracks for low-bandwidth RealVideo clips.

Available Voice Codecs

Helix Mobile Producer offers several codecs designed specifically for encoding voice.

RealAudio Voice Codecs

Codec Bit Rate	Codec Name	Codec Flavor	Sampling Rate
5 Kbps voice	sipr	2	8 kHz
6.5 Kbps Voice	sipr	0	8 kHz
8.5 Kbps Voice	sipr	1	8 kHz
16 Kbps Voice	sipr	3	16 kHz
32 Kbps Voice	cook	7	22.05 kHz
64 Kbps Voice	cook	14	44.1 kHz

Player Compatibility

- The sipr 6.5Kbps and 8.5Kbps codecs are compatible with RealPlayer 4 and later.
- The sipr 5Kbps and 15 Kbps codecs are compatible with RealPlayer 5 and later.
- The cook 32Kbps and 64Kbps codecs are compatible with RealPlayer G2 and later.

Music Audio Codecs

Music codecs create a higher quality of sound for audio recordings than voice codecs. Music Audio codecs are designed to encode audio with a larger pitch variance than voice. You will capture a broader, fuller sound with codecs designed for higher bit rates, but your files will be larger.

The lower-speed codecs can be used as “duress” streams in SureStream clips, and to encode soundtracks for low-bandwidth RealVideo clips. When there are two versions of a codec, Helix Mobile Producer uses the high response version by default.

About High-Response Codecs

The 20 kbps, 32 kbps, and 44 kbps music codecs come in two flavors. Helix Mobile Producer by default uses the “high response” versions, which are the

better codecs for most situations. But you can also use the "normal response" versions.

The high response codecs cover a larger frequency spectrum than the normal response versions. Sometimes, the high response version has twice the range as the normal codec. This means it provides crisper sound and is better at capturing high frequencies. With symphonic music, for example, the high response codec gets more of the flute and piccolo. It can produce more distortion than the normal response codec with voices and loud sounds such as drums, though.

If you are encoding music with a diverse range of frequencies, stick with the high response codecs. If you notice distortion, compare your results with a clip that uses the normal response codecs. The best tool for determining which codec to use is your ear. Listen carefully for minute differences in how the clip sounds. It also helps to have other people listen. Our own ears have different frequency responses, too.

The slowest stereo codec is 12 kbps. Stereo codecs don't go lower than that because they would not have enough frequency response for adequate sound. In the following table, the RealAudio 8 codecs are marked with RA8.

Available Audio Codecs

The wide of available codec bit rates allow you encode your files for your exact audience needs.

Music Audio Codecs

Codec Bit Rate	Codec Name	Codec Flavor	Sampling Rate
6 Kbps Music - RealAudio	cook	8	8kHz
8 Kbps Music - RealAudio	cook	0	
11 Kbps Music - RealAudio	cook	1	8 kHz
16 Kbps Music - RealAudio	cook	2	8 kHz
20 Kbps Music - RealAudio	cook	3	11.025 kHz
20 Kbps Music High Response - RealAudio	cook	15	22.05 kHz
32 Kbps Music - RealAudio	cook	4	22.05 kHz
32 Kbps Music High Response - RealAudio	cook	16	44.1 kHz

(Table Page 1 of 2)

Music Audio Codecs

Codec Bit Rate	Codec Name	Codec Flavor	Sampling Rate
44 Kbps Music - RealAudio	cook	5	44.1 kHz
64 Kbps Music - RealAudio	cook	6	44.1 kHz

(Table Page 2 of 2)

Player Compatibility

- All Music Audio Codecs are compatible with RealPlayer G2 and later.

Stereo Music Audio Codecs

Helix Mobile Producer contains an array of RealAudio codecs that are optimized for stereo music. These RealAudio codecs enable you to stream high-quality stereo music at a wide range of bandwidths.

Because the output is designed for dual speaker systems, your music will reach a large audience with varying systems.

Available Music Audio Codec

A variety music audio codecs are now available in Helix Mobile Producer.

Stereo Music Audio Codecs

Codec Bit Rate	Codec Name	Codec Flavor	Sampling Rate
12 Kbps Stereo Music - RealAudio 8	cook	26	11.025 kHz
16 Kbps Stereo Music - RealAudio 8	cook	17	22.05 kHz
20 Kbps Stereo Music	cook	9	11.025 kHz
20 Kbps Stereo Music - RealAudio 8	cook	18	22.05 kHz
20 Kbps Stereo Music High Response - RealAudio 8	cook	19	22.05 kHz
32 Kbps Stereo Music	cook	10	22.05 kHz
32 Kbps Stereo Music - RealAudio 8	cook	20	22.05 kHz
32 Kbps Stereo Music High Response - RealAudio 8	cook	21	44.1 kHz
44 Kbps Stereo Music	cook	11	22.05 kHz
44 Kbps Stereo Music - RealAudio 8	cook	22	44.1 kHz
44 Kbps Stereo Music High Response - RealAudio 8	cook	23	44.1 kHz
64 Kbps Stereo Music	cook	12	44.1 kHz

(Table Page 1 of 2)

Stereo Music Audio Codecs (continued)

Codec Bit Rate	Codec Name	Codec Flavor	Sampling Rate
64 Kbps Stereo Music - RealAudio 8	cook	24	44.1 kHz
64 Kbps Stereo Music - RealAudio 10	raac	0	44.1 kHz
96 Kbps Stereo Music	cook	13	44.1 kHz
96 Kbps Stereo Music - RealAudio 8	cook	25	44.1 kHz
105 kbps Stereo Music, RA8	atrc	2	44.1 kHz
132 kbps Stereo Music, RA8	atrc	3	44.1 kHz
132 kbps Surround Audio	atrc	8	44.1 kHz
146 kbps Stereo Music, RA8	atrc	4	44.1 kHz
146 kbps Surround Audio	atrc	9	44.1 kHz
176 kbps Stereo Music, RA8	atrc	5	44.1 kHz
176 kbps Surround Audio	atrc	10	44.1 kHz
264 kbps Stereo Music, RA8	atrc	6	44.1 kHz
264 kbps Surround Audio	atrc	11	44.1 kHz
352 kbps Stereo Music, RA8	atrc	7	44.1 kHz
352 kbps Surround Audio	atrc	12	44.1 kHz

(Table Page 2 of 2)

Player Compatibility

- All RA8 codecs are compatible with RealPlayer 8 and later
- All other stereo music codecs are compatible with RealPlayer G2 and later.

APPENDIX

E

FILE AND DEVICE COMPATIBILITY

This appendix provides a reference for compatibility among the various file formats and numerous codecs supported by Helix Mobile Producer and Helix Mobile Producer Live. It also briefly addresses the compatibility of these formats and codecs with the wireless mobile devices currently available.

File Format and Codec Compatibility

Helix Mobile Producer supports six audio codecs (not including the RealAudio codecs), three video codecs, and seven file formats, not all of which are compatible with one another. Refer to the following tables to determine whether a given audio or video codec is supported within a particular file format. An X in a codec's column means that the codec is compatible with the file type listed on the left in that row.

Audio Codec Compatibility

The following table provides a reference for audio codec compatibility.

Audio Codec Compatibility with Supported File Formats

	Audio codecs					
File formats	AAC	AMR-NB	AMR-WB	QCELP	RealAudio	MP3
MPEG-4	X					
3GPP	X	X	X			
3GPP2	X	X	X	X		
AMR		X	X			
QCELP				X		
MP3						X
RealMedia					X	

Video Codec Compatibility

The following table provides a reference for video codec compatibility.

Video Codec Compatibility with Supported File Formats

	Video codecs		
File formats	RealVideo	MPEG-4 SVP	H.263 Profile 0
MPEG-4		X	
3GPP		X	X
3GPP2		X	X
AMR			
QCELP			
MP3			
RealMedia	X		

Device Compatibility

Not all wireless mobile devices are compatible with all of the file formats and codecs listed in the preceding tables. To determine which formats and codecs a particular mobile device supports, see the manufacturer's documentation for that device.

GLOSSARY

AAC
Advanced Audio Coding, for MPEG-2 or MPEG-4 files.

ADSL
Asymmetric digital subscriber line. A high-speed Internet connection carried over telephone lines.

AIFF, AIFC
Audio Interchange File Format. A format for storing digital audio samples in a file. AIFC, a newer version of this format, can be used for compressing audio files.

artifacts
Blemishes, noise, spots, or other flaws in video, audio, or image production in MPEG files.

AVI
Audio/Video Interleaved. A multimedia file format.

bandwidth
Bandwidth has many meanings, depending on the context. It started as a radio term and has been expanded to include other kinds of communications. It is the numeric difference between the highest and lowest frequencies of a radio band or channel.

Bandwidth means the same thing in relation to audio data, although in most applications, the lowest frequency is sufficiently low enough to be considered equal to zero. Hence, audio bandwidth usually means the highest frequency of an audio signal or the highest frequency that can be carried by an audio system.

Typical examples of bandwidth are 300–3,400Hz for telephone lines, 20–20,000 Hz for hi-fi systems, and 50–15,000 Hz for FM radio signals.

BIFS
Binary format for scenes. A set of nodes, based on VRML (Virtual Reality Modeling Language), that make it possible to combine 2D and 3D graphics, natural and synthetic sound, audio and video information, and stored and streamed material in one environment.

bit rate
The rate of data transmission over a computer network. Helix Mobile Producer uses several bit rates. The target bit rate is the channel capacity of the network. The maximum bit rate is a limit, less than the target bit rate, that Helix Mobile Producer uses to fit data into the actual bandwidth for a streaming server. The audio encoder uses an average target bit rate and a maximum target bit rate for variable-bit-rate encoding.

broadband
A general term for high-speed Internet connections provided by DSL lines, cable modems, and T1 lines.

CBR
Constant bit rate.

CELP
Code Excited Linear Prediction. An audio-encoding scheme used for very low-bit-rate encoding, mainly for speech.

CIF (pronounced "sif")
Common Intermediate Format. A video display size (288 x 352 pixels) well suited to higher bit rates.

codec
The software that encodes and decodes an audio or video file. The word is a shortened form of coder-decoder or compression-decompression.

entropy
A measure of the degree of disorder or chaos in a system. In the context of streaming media, as the entropy value increases, data compression becomes more difficult.

hinted movies
Movies that can be streamed for broadcast over the Internet. A "hint track" contains information about the media file that enables the server to stream it properly.

I-frames
An MPEG-4 term for video key frames.

Internet
An interconnected system of networks that connects computers around the world, using the TCP/IP protocol.

ISO
International Organization for Standards. ISO is a network of the national standards institutes of 146 countries. ISO standards are technical agreements that provide the framework for compatible technology worldwide.

Kbps
Kilobits per second. A standard measure of the rate of data transmission over electronic devices.

key frame
A video frame that fully refreshes its contents and can be used as a reference point for other frames in the video sequence. In MPEG terminology, this is known as an I-frame.

motion estimation
For video, a method that estimates changes between frames.

.mov
The Apple QuickTime file name extension for movie files.

MPEG (pronounced "m-peg")
As defined on the MPEG Web site, MPEG stands for Moving Pictures Experts Group and is the name given to a family of international standards for coding audiovisual information in a compressed digital format. The MPEG family of standards includes MPEG-1, MPEG-2, MPEG-4, MPEG-7, and MPEG-21, which are formally known as ISO/IEC-11172, ISO/IEC-13818, ISO/IEC-14496, ISO/IEC-15938, and ISO/IEC 21000, respectively.

multimedia
A media presentation that contains some combination of text, graphics, sound, video, and animation. Most personal computers can now display multimedia content, and the source is typically a CD because the files are large and require considerable storage capacity. The MPEG-4 format enables broadcasters to deliver multimedia presentations over the Internet.

noise
Random flaws that occur in audio or video content.

pixel
A picture element, which is one point—or the smallest unit—in a graphic image.

profile
A subset of the MPEG-4 standard that enables an MPEG-4 file to be as complex as is necessary for a given software application. Vendors can use profiles to implement only the part of the MPEG-4 standard that they need, knowing that their files will be compatible with products from other vendors.

QCIF (pronounced "q sif")
Quarter Common Intermediate Format. A video display size (1/4 CIF = 144 x 176 pixels) well suited to lower bit rates.

RVLC
Reversible Variable Length Coding.

scene description
A description of the media in a streamed presentation and how the content is to be reconstructed. The technical term for this is BIFS (binary format for scenes).

set-top box
A device that connects a TV to the Internet so that Internet information can be displayed on the TV screen. This term also is used to refer to a cable or satellite television receiver.

SIF
Standard Image Format. For video, the SIF NTSC is 352 x 240 pixels, and the SIF PAL is 352 x 288 pixels.

smoother
An algorithm that Helix Mobile Producer uses to regulate bit rates in streaming media and prevent unexpected peaks or bursts in the data streams. The smoother prevents media encoders from generating too much data or overly complex data.

stream
The encoded media or scene description data in an MPEG-4 file. A media stream consists of audio, video, or other multimedia content that is transmitted across a computer network in a streaming or continuous manner.

streaming
The delivery of a media stream from a steaming server to a media player (such as RealPlayer) as a steady, continuous flow of audio, video, or other data. The player reconstructs each media scene by using information stored in the scene description.

URL
Uniform Resource Locator. A standard, worldwide protocol for naming documents or sites (such as Web pages) on the Internet.

VBR
Variable bit rate.

VTR
Videotape recorder.

APPENDIX

F

SNMP MONITORING

This appendix explains how to set up Simple Network Management Protocol (SNMP) support for Helix Mobile Producer Professional and Helix Mobile Producer Professional Live on Windows operating systems. It also includes a reference table for supported SNMP objects that provide management information about Helix Mobile Producer Professional and Helix Mobile Producer Professional Live.

The SNMP Service

Helix Mobile Producer Professional and Helix Mobile Producer Professional Live support the Windows SNMP service. You can use an SNMP browser to monitor (remotely) computers running Helix Mobile Producer Professional or Helix Mobile Producer Professional Live. Note that the management information base (MIB) gets installed on your computer only if the Windows SNMP service is already installed there.

If you decide to install the Windows SNMP service after installing Helix Mobile Producer Professional or Helix Mobile Producer Professional Live, you must uninstall Helix Mobile Producer, install the SNMP service, and then reinstall Helix Mobile Producer.

> **Note:** When you install Helix Mobile Producer Professional or Helix Mobile Producer Professional Live, select the **Install SNMP agent** check box on the final page of the Setup wizard.

Installing the Windows SNMP Service

The following procedure shows you how to do an SNMP installation on a computer running Windows 2000.

➤ To install the SNMP service:

1. Insert the Windows 2000 CD into your disk drive.

2. Click **Install Additional Components**.
3. Click **Management and Monitoring Tools**.
4. Click **Next.**

   This starts the installation process for the SNMP service.

Accessing the Helix Mobile Producer MIB

The MIB file is located in the Helix Mobile Producer Professional or Helix Mobile Producer Professional Live installation directory, ESS-MIB.mib.

SNMP Object Description

The following table provides the names and descriptions of all of the monitored objects in the Helix Mobile Producer Professional MIB file.

Monitored SNMP Objects

SNMP object	Description
Instance	ID of a computer running Helix Mobile Producer Professional
Clip Size	Current encoding clip size, in kilobytes
Clip Duration	Current encoding clip duration, in seconds
Input Source	Input file path (if any)
CPU Usage	CPU usage displayed as a percentage
Target Bandwidth	Global bandwidth, in bits per second
Player Version	—
Player Compatibility	—
Audio Codec Name	Current audio encoder type
Audio Codec Id	Current audio encoder version
Audio Bitrate	Current audio bit rate, in bits per second
Audio Frequency	Cutoff frequency (for AAC LC files only)
Audio CPU	Audio CPU usage (not defined)
Video Codec Name	Current video encoder type
Video Codec Id	Current video encoder version
Video Target Bitrate	Video target bit rate, in bits per second
Video Average Bitrate	Average video bit rate (VBR), in bits per second

(Table Page 1 of 2)

Monitored SNMP Objects (continued)

SNMP object	Description
Video Latency	Video latency (for CBR), in milliseconds
Video CPU	Video CPU usage (not defined)
Video Max Fps	Maximum number of frames per second (fps) during the current encoding session (fps × 1000)
Video Min Fps	Minimum number of frames per second (fps) during the current encoding session (fps × 1000)
Video Average Fps	Average number of frames per second (fps) during this encoding session (fps × 1000)
Video Quality	PSNR × 1000
Audio Capture Source	Audio capture device string
Video Capture Source	Video capture device string
Broadcast Info	Destination address, port, and TTL information
Current Time Stamp	Current media time stamp, in h:m:s format (hours:minutes:seconds)

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