RealAudio® and RealVideo® Content Creation Guide

Version 5.0

RealNetworks, Inc.

Contents

Introduction

Real System 5.0™ is today's most powerful solution for streaming real-time live and on-demand audio and video over the Internet and corporate intranets. This guide explains how to create and manage RealAudio® and RealVideo® content using RealEncoder 5.0® or RealPublisher 5.0™ and, in some cases, information about creating and managing content using RealAudio Encoder 3.0 or 3.1.

Streaming and Real-Time Delivery

RealSystem 5.0™ enables streaming audio and video for reliable transmission under real-life conditions. Streaming is the latest technology for audio and video available and allows the audio or video clip to play as soon as it starts being received by your computer. Real-time delivery means that you do not have to wait while a file downloads; the clip plays as soon as your computer starts to receive it. You also have complete control over the clip; you can pause, move forward and back, and start or stop at any time.

Performance Range

With RealEncoder and RealPublisher you can choose to deliver a range of performance through ordinary modem connections all the way to corporate Intranet LANs. You can also maximize the available bandwidth to meet the demands of the content, for example, a music video requires different emphasis than a simple speech.

RealAudio and RealVideo formats are optimized for low-to-high speed connections including 14.4 and 28.8 Kbps modems, ISDN, T1 and LAN. You can also listen or view RealAudio and RealVideo files stored locally on your computer.

Content Sources

You can acquire content from a variety of sources:

- pre-existing audio and video files, for example, .wav for audio and .avi and .mov for video
- pre-recorded or live content from audio and video devices, such as cameras, microphones, audiotape, videotape, or satellite feeds.

RealEncoder and RealPublisher create on-demand content that users can access whenever they choose and can be created in all screen sizes. It can be played from standard Web servers or from RealNetworks RealServer for higher reliability. Live audio and video require a RealNetworks RealServer.

Web Page Creation and Publishing

In addition to the features found in RealEncoder, RealPublisher offers new Web publishing features:

- automatic HTML page creation
- easy uploading of HTML pages to your Web server and/or RealServer with the click of a few buttons

Web page creation and publishing can be accomplished using the step-by-step wizards included in Real Publisher. RealPublisher also provides options for display of your RealAudio or RealVideo clip on your Web page.

Basic Steps to Adding Streaming Media to Your Web Site

1. Select audio and video content from a variety of sources:

  - pre-existing audio and video files, including .wav, .avi, .au and .mov file formats
  - live sources such as video cameras, microphones, audiotape, videotape and satellite feeds

2. Compress, or encode, your source audio and video to create RealAudio and RealVideo files in several ways with:
   - pre-defined templates that automatically calculate audio and video bandwidth options for the modem connection delivering your content
   - multiple templates to deliver content over different modem connections from a single web page link
   - self-customized templates for advanced users
3. Create Web pages (with RealPublisher)
   - that are linked to your RealAudio and RealVideo files and launch the RealPlayer
   - that function as plug-ins and ActiveX controls
4. Publish Web pages and media files to a Web server and/or RealServer (RealPublisher only)

Using this Guide

ReaAudio and RealVideo Content Creation Guide is intended for people who are familiar with operating World Wide Web servers and with RealNetworks technology. You do not need previous experience using RealEncoder or RealPublisher, but you do need to know how to create directories or folders, copy files, and open text files.

Organization

This manual is organized in two sections:

Section 1: Overview

Shows the components and features of RealSystem 5.0. Diagrams illustrate the relationships between client and server for video and multimedia delivery.

Section 2: Content Creation

Explains how to create and manage video and multimedia content for delivery by RealServer and a Web server. The chapters are:

Installing RealEncoder and RealPublisher: Explains how to install RealEncoder and RealPublisher.

System Requirements: Discusses hardware requirements for Windows 95/NT and Macintosh.

Using RealEncoder and RealPublisher: Information about how to prepare files for encoding, which encoding settings to use and how to encode static and live files using RealEncoder, RealPublisher or Adobe Premiere.

Delivering Live Content: Explains how to deliver live video, including setting up RealNetworks RealServer and advertising your event on the Timecast Web site (http://www.timecast.com).

Bandwidth Negotiation: Explains how to create bandwidth negotiated files and bandwidth file organization.

RealEncoder Plug-In for Adobe Premiere: Explains how to encode files within Adobe Premiere.

Synchronized Multimedia: Discusses how to create a synchronized multimedia presentation with RealEncoder and RealPublisher and create events files.

Editing RealAudio and RealVideo Files: Explains how to use editing tools to change the static information in a file, alter the data with basic functions like cut and paste, and examine the contents of a file.

Publishing Your Files to the Web: Discusses how to generate Web (HTML) pages and publish those Web pages along with RealAudio and RealVideo files to a standard HTTP Web server or a RealServer.

Live Broadcasting: Explains how to advertise your live events.

Delivering Live Content: Explains how to deliver content for broadcasting live events.

Simulating a Live Broadcast: Information on how to play an existingmedia file as if it were a live event.

Configuring Your Web Site: Explains the many ways you can deliver RealAudio and RealVideo clips from your Web site, including HTTP streaming, Netscape plug-in, ActiveX object, and JavaScript.

Conventions

This manual uses the following conventions:

`Command`	Monospace font represents commands to be typed or information displayed on the screen.
`<file name>`	Angle brackets show where to insert information, such as the name and location of a file.
`[ ]`	Square brackets show optional command arguments.
Bold	Bold font is used for names of files, directories, commands, and options.

Overview

Before you create and manage RealAudio and RealVideo content you must understand how the system works. This chapter describes the basic features and primary components of RealSystem 5.0 and how they work together.

RealAudio and RealVideo Clips

A RealAudio or RealVideo clip is a file or live broadcast containing sound and video encoded in RealAudio or RealVideo format. These formats are highly compressed to deliver the best possible sound and video over a limited-bandwidth connection. Your audio and video can be stored for later use, broadcast live over a network, or simultaneously stored as a file for later use while it's being broadcast live.

Because there is no single best format for delivering audio and video, clips can be optimized differently for different kinds of content. You can choose to provide a clip in one or more formats based on the type of content and the available bandwidth. For example, you would use a different format to deliver speech over a 14.4 Kbps modem than you would to deliver a music video over an ISDN connection.

Components of RealSystem 5.0

RealAudio and RealVideo use a client-server system. The server provides the content to the client over a network. The basic components of RealSystem 5.0 are:

RealPlayer - The client program that enables users to see and listen to RealAudio and RealVideo clips. Special purpose player components enable ActiveX and Netscape plug-in capabilities.

RealEncoder/RealPublisher - The program that creates RealAudio and RealVideo clips. The input to this program can be a digitized audio clip, a live audio signal, a digitized video clip or a live video signal.

RealMedia Tools - The tools programs that can be used to modify RealAudio and RealVideo clips, including RMTools, RMMerge, RMCut, RMEdit, RMPaste and RM Dump.

RealServer - The server program that delivers RealAudio and RealVideo clips over a network. One RealNetworks RealServer can deliver clips to hundreds of Players at the same time.

Web Browser - The client program that enables users to find most RealAudio and RealVideo clips. The Web browser is also used to display the visual part of Synchronized Multimedia presentations. RealAudio and RealVideo work with all popular Web browsers.

Web Server - The server program that delivers Web pages. Typically, RealAudio and RealVideo clips are accessed by clicking a link on a Web page. The Web server also delivers the visual part of Synchronized Multimedia presentations. HTTP streaming of RealAudio or RealVideo files enables content providers to stream RealAudio and RealVideo clips from a World Wide Web server. While this method is not as robust, it provides a reasonable method for providing short RealAudio and RealVideo content to a limited number of users. RealAudio and RealVideo works with all popular Web servers.

RealAudio and RealVideo Files and Metafiles

RealAudio and RealVideo use several file types, each identified by a specific file extension. The files and their file extensions are:

RealAudio (.ra) clip - Audio encoded clip. This file is created with the older RealAudio Encoder.

RealMedia clip (.rm) - Audio or video clips encoded with RealVideo Encoder 4.0, RealEncoder 5.0 and RealPublisher 5.0. Files created with RealEncoder or RealPublisher and delivered by the RealServer can contain multiple streams, including audio, video, image maps, and events. Video files can contain audio and video or video only and can be played with RealPlayer. Audio only files can be played by RealPlayer.

RealMedia metafile (.ram) - The file that is used as an alias or pointer on a Web page to one or more RealAudio or RealVideo clips. The metafile contains the URL of one or more RealAudio (.ra) and RealVideo (.rm) files located on a Web server or a RealNetworks RealServer. The metafile is typically located on a Web server and is linked on a Web page.

RealPlayer plug-in metafile (.rpm) - The same as a metafile, but used with RealPlayer plug-in for Netscape Navigator and Internet Explorer 3.0 and later. RealAudio Event (.rae) The event file is used in synchronized multimedia. It is created with one of several event compiler utilities which comes bundled with the RealAudio and RealEncoders and RealPublishers.

Windows

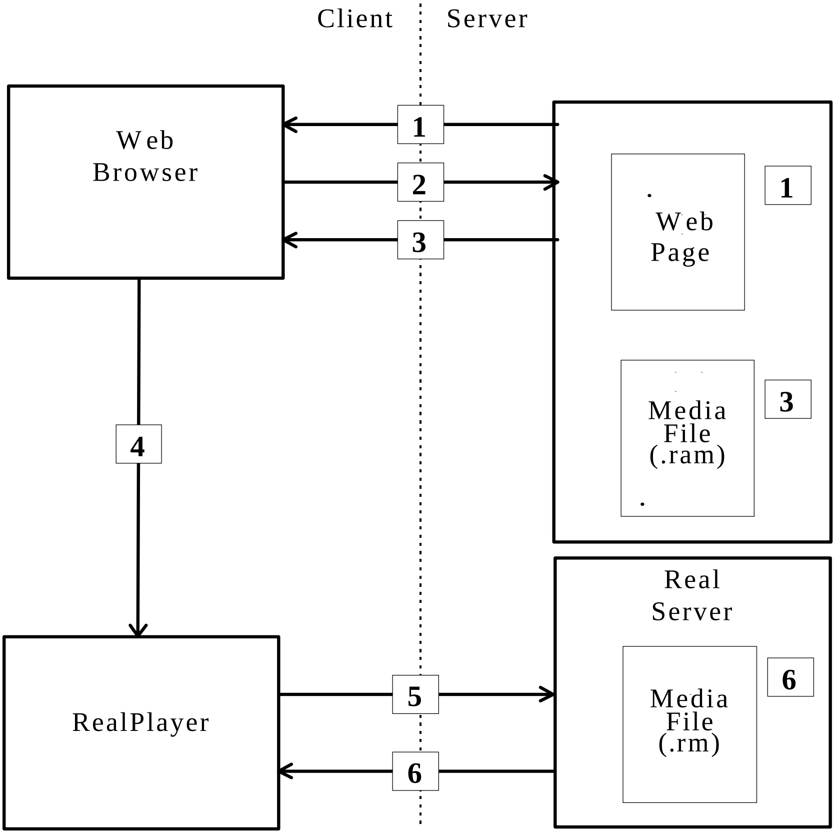
The RealAudio Encoder 3.0 events compiler is “Cevent32.exe.” The compiler for RealVideo Encoder 4.0, RealEncoder 5.0 and RealPublisher 5.0 is built into the RMMerge utility.

Macintosh

The 3.0 RealAudio Encoder events compiler is “RA Event Compiler.”
The compiler for RealVideo Encoder 4.0, RealEncoder 5.0 and RealPublisher 5.0 is not supported for Macintosh.

Delivering a RealAudio or RealVideo Clip

The following figure shows how typical RealAudio and RealAudio clips are delivered. The numbers in the figure match the numbered steps following the figure.



RealAudio and RealVideo Delivery System

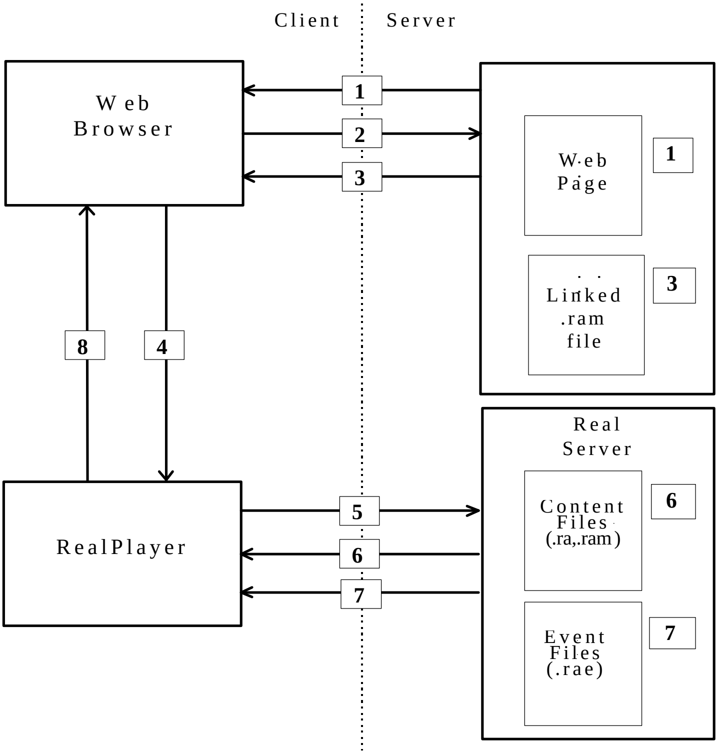
1. The Web browser displays a Web page that contains a link to a metafile.
2. The user clicks the link. The Web browser requests the metafile from the Web Server.
3. The Web server delivers a metafile to the Web browser.
4. The Web browser looks up the MIME type of metafile. Based on the MIME type, the Web browser starts RealPlayer as a helper application and passes it the metafile.
5. RealPlayer reads the first URL from the metafile and requests it from RealNetworksRealServer (although it could also be located on a Web server.
6. The server begins streaming the requested RealAudio or RealVideo clip to RealPlayer.

Note: No messages pass between the RealServer and the Web server. The Web browser provides the URL of RealAudio or RealVideo clip to RealPlayer. RealPlayer does not require a Web browser to function; users can enter the URL of a .ra, .rm or .ram file directly into RealPlayer, or use the Preset or Scan buttons on RealPlayer Plus.

Delivering Synchronized Multimedia

Synchronized Multimedia delivery works like regular RealAudio or RealVideo delivery, with one extra step between RealPlayer and the Web browser.

The following figure shows how a typical RealAudio or RealVideo Synchronized Multimedia presentation. The numbers in the figure match the numbered steps following the figure.



Media Delivery System

1. The Web browser displays a Web page that contains a link to a metafile.

2. The user clicks on the link. The Web browser requests the metafile from the Web Server.

3. The Web server delivers a metafile to the Web browser.
4. The Web browser looks up the MIME type of metafile. Based on the MIME type, the Web browser starts RealPlayer as a helper application and passes it the metafile.
5. RealPlayer reads the first URL from the metafile and requests it from RealServer.
6. RealServer begins streaming the requested RealAudio or RealVideo clip to RealPlayer.
7. RealServer concurrently notifies RealPlayer via an event file (.rae) when an event should occur. For more information see the “Using Synchronized Multimedia with Bandwidth Negotiation” section of the “Synchronized Multimedia” chapter.
8. RealPlayer sends the URL for the event to the default Web browser for viewing.

Static Encoding

RealAudio and RealVideo clips may be created from previously captured digital audio or video files. With static encoding, these files are compressed and are converted to RealAudio and RealVideo formats.

Modifying RealAudio and RealVideo Clips

When you encode a RealAudio or RealVideo clip, both RealEncoder and RealPublisher create a new file with a .rm file extension. The original file is not modified. Encoding a RealAudio or RealVideo clip is a one-way process; you cannot convert a RealAudio and RealVideo file back into the original source format. If you want to be able to encode other formats in the future, you need to archive the original source.

It is possible to modify some attributes of RealAudio and RealVideo clips without re-encoding them, such as Title, Author and Copyright and enabling or disabling Mobile Playbac and Selective Record.

Live Encoding

The source of a RealAudio or RealVideo clip can also be live input. The encoded RealAudio or RealVideo clip can be broadcast live over a network, stored as a file for later use, or it can be simultaneously stored as a file, or archived, and broadcast live.

RealEncoder and RealPublisher for Windows can encode a live input source. RealEncoder for the Macintosh cannot encode a live input source, and there is no Macintosh version of RealPublisher.

Live broadcasting requires a license and a RealNetworks RealServer.

Title, Author, and Copyright

RealAudio and RealVideo clips include text strings for the title, author, and copyright. This text is displayed by RealPlayer when the clip is played. Although the player usually labels the text as title, author, and copyright, the player displays whatever text you choose to supply.

You enter the title, author, and copyright text when encoding a clip. You can change this text after encoding by using the metafile. For information on metafiles, refer to the “Configuring Your Web Site” chapter. You can also change the text by using RMEdit and RMTools.

RealEncoder and RealPublisher Installation

Installing RealEncoder and RealPublisher is quick and easy. You can download the RealEncoder or RealPublisher from the RealNetworks Web site or install it from the RealServer CD-ROM.

Installing RealEncoder and RealPublisher on Windows Platform

To download the install program from the Intenet:

1. With a Web browser, go to the RealNetworks Web site:

   http://www.real.com

2. Go to the RealSystem 5.0 Products page, then to RealEncoder or RealPublisher 5.0 download pages to download the installer.

3. When prompted, click the **Save to Disk** button and specify a temporary directory for the installation program. Note where you saved it.

4. In File Manager or Explorer, double-click the installation icon in the temporary directory to activate the automated installation process.

To install RealPublisher setup program from CD-ROM:

1. Insert the CD-ROM into the drive
2. Follow the prompts.

To complete the installation of RealEncoder or RealPublisher:

1. Close any other applications that may be open and click **Next**.
2. To accept the terms and conditions for installing RealEncoder or RealPublisher, click **Next**.
3. Enter your name, company or organization name, and e-mail address. Then click **Next**.
4. If you are installing RealPublisher, you will be prompted to select the Internet Service Provider you will use to upload your RealAudio and RealVideo-enabled Web pages to a remote server. Select **Generic–No Defaults** if your Internet Service Provider is not listed.
5. To install RealEncoder or RealPublisher into the default directory, click **Next**. If you wish to install the encoder in a different location, click **Browse** and select the directory into which you want to it.
6. If you are installing over an existing RealVideo, RealAudio Encoder, RealEncoder or RealPublisher for which you have defined custom templates, select **Keep Existing Templates** if you want to preserve the custom templates.
7. To finish the installation, click **Finish**.
8. Click **OK**.

Installing RealEncoder on Macintosh Platform

To download the install program from the Intenet:

1. With a Web browser, download the installer from the RealNetworks Web site:

   http://www.real.com

2. Go to the RealSystem 5.0 Products page, then to the RealEncoder 5.0 download page.
3. Depending on the options set in your Web brower, you may be prompted to specify a directory for the installation program; otherwise it will download to a default directory.
4. The file will be downloaded as an HQX file and will need StuffIt Expander or similar utility to convert it to a Macintosh executable.
5. After conversion, double-click the installation icon to activate the automated installation process.

To complete the installation of RealEncoder:

1. To accept the terms and conditions for installing RealEncoder, click **Continue**.
2. To install the encoder into the default directory, select the folder you wish to install the encoder into and click **Install**.
3. If you are installing over an existing RealVideo, RealAudio Encoder, or RealEncoder for which you have defined custom templates, your previous templates will be merged with newly-installed templates.
4. To finish the installation, click **Finish**.
5. Click **Quit.**

Files Installed by RealEncoder and RealPublisher for Windows

The following files are installed in the RealEncoder/RealPublisher directory **(\Real\RVEncode** by default in Windows):

File	Description
enclic	An ASCII text file that contains the license agreement for the encoder.
EX-RM.prm	Adobe Premiere plug-in.
graphic.gif	Real logo.
pninet.dll	A dynamic link library used for Internet functions.
pntouch.dll	A dynamic link library used for registration.
pnWebpub.dll	A dynamic link library used for Web publishing.
Readme.htm	Information about Encoder installation and operation.
rmcut.exe	A utility that returns a copy of the stream from start to endtime without modifying the original source.
rmdump.exe	A utility used to examine the contents of a RealAudio or RealVideo file.
rmedit.exe	A utility used to modify the title, author, copyright, comment, mime type, or stream name of a RealAudio or RealVideo file.
rmevents.dll	A dynamic link library used by the rmmerge utility.
rmimap.dll	A dynamic link library used by the rmmerge utility.

File	Description
rmmerge.exe	A utility used to create a Synchronized Multimedia presentation.
rmpaste.exe	A utility used to re-sort from bandwidth to timestamp order.
rmtools.exe	GUI for showing stream number and name, mime type, start and endtime of source and destination files and for performing basic editing on these files
rvbatch.exe	Lets you run the encoder from a batch file as a command-line tool.
rvencode.exe	The RealEncoder/RealPublisher executable.
rvslta	RealVideo Simulated Live Transfer Agent.

Files Installed by RealEncoder for Macintosh

File	Description
graphic.gif	Real logo.
License agreement	Contains the license agreement for the encoder.
RVBatch	An Applescriptable Encoder
RealVideo Encoder	Adobe Premiere plug-in.
RVEncoder	The Encoder application
ReadMe.html	Information file
Sample Script	Applescript demonstrating use of the RVBatch utility.
RealAudio Exporter	RealAudio Exporter add-on for SoundEdit 16

System Requirements

This section outlines the basic hardware and software requirements to create RealAudio and RealVideo content. It contains information about the technical specifications for static encoding, used for creating on-demand content and instructions for live encoding which enables real-time live broadcasting.

Real Encoder and RealPublisher compresses high-bandwidth video signals to a low-bandwidth signal. This compression allows for the real-time transmission of clips via the Internet, even over a connection as slow as a 14.4 Kbps modem.

RealAudio content consists of audio only while RealVideo content can consist of audio and video or video only.

RealEncoder 5.0 is available for:

- Windows 95 (static and live content)
- Windows NT 3.5 and 4.0 (static and live content)
- Macintosh (static content)

RealPublisher 5.0 is available for:

- Windows 95 (static and live content)
- Windows NT 3.5 and 4.0 (static and live content)

Windows 95 and Windows NT System Requirements

Static and Live Encoding RealAudio for Windows 95/NT

Different hardware is required for encoding an audio file and encoding a live audio stream.

Requirement	Minimum	Recommended
CPU	486/66 DX	Pentium 586, 75MHz
RAM	8 MB	8 MB required, 16 MB recommended
Hard Disk space (software)	1 MB	1 MB
Sound Card	16-bit sound card or better	

Static Encoding RealVideo for Windows 95/NT

Requirement	**Minimum**	**Recommended**
CPU	486/66 DX	Pentium 120
RAM	16 MB	64 MB
Hard Disk space (software)	4 MB	4 MB
Hard Disk space (data)	500 MB	1 GB
Color Display	16-bit	24-bit (TrueColor)
Video Capture Card*	Any quality capture card which can produce .avi or .mov files	
Sound Card*	16-bit sound card or better	

*Video and sound cards are needed only for capture-to-file encoding and are not necessary for encoding of pre-existing AVI or QuickTime files. See the "Using RealEncoder and RealPublisher" chapter for more information on live capture-to-file encoding.

Live Encoding RealVideo for Windows 95/NT

Live capture and live encoding uses content from a variety of sources:

- VHS, S-VHS or Beta-SP tape
- live video camera and microphones
- any other analog video or audio source

High quality live encoding takes longer and requires greater computing resources than lower quality. Here are the requirements for encoding at low and high frame rates:

Requirement	**Low Frame Rate (less than 3 fps)**	**High Frame Rate (more than 3 fps)**	**Recommended for High Frame Rate or Large Screen Sizes**
OS	Windows 95	Windows NT	
Computer	Pentium 166 MHz	Pentium 200 MHz	Dual Pentium 2
RAM	32MB	64MB	
Hard Drive	1GB	1GB	
Color Display	16-bit	24-bit (TrueColor)	
Video Capture Card	Any native Video-for-Windows capable capture card	Osprey 100, Osprey 1000	
Sound Card	16-bit sound card or better	16-bit sound card or better	

Note: Slower machines also give reasonable results in Slide Show mode, at 1fps.

Capturing video puts a burden on your computer’s ability to write to your hard drive. Special hard drives exist for capturing video called AV drives. If you do not use one of these special drives, frames may be dropped during the capture process when the hard drive re-calibrates itself periodically. If you experience dropped frames with a standard drive, you can re-capture the video.

Macintosh Requirements

For Macintosh users, RealEncoder supports only static encoding for video and audio. It does not support live video or audio encoding. 68K Macintosh computers are also not supported. RealPublisher is not available for Macintosh users.

Static Encoding RealAudio and RealVideo for the Macintosh

Requirement	**Minimum**	**Recommended**
CPU	Any Power PC	604 Power PC
RAM	16 MB	32 MB
Hard Disk space (software)	4 MB	4 MB
Hard Disk space (data)	500 MB	1 GB
Operating System	7.5.5	8.0

Note: RAM requirements may be slightly less for RealAudio.

Using RealEncoder and RealPublisher

This chapter details RealEncoder and RealPublisher operations, including supported input formats, output options, and how to achieve the best possible audio and video quality.

RealEncoder allows two types of encoding:

- static encoding for pre-existing audio and video files (Windows and Macintosh)
- live encoding, for live broadcasting and archival purposes (Windows only)

RealPublisher allows two types of encoding:

- static encoding for pre-existing audio and video files (Windows only)
- live encoding, for live broadcasting and archival purposes (Windows only)

RealEncoder and RealPublisher enable you to compress video files or input from a video device into one or more RealAudio or RealVideo formats. Output can be sent to a file or directly to a RealNetworks RealServer for live broadcasting.

You can select input files by browsing from within RealEncoder or RealPublisher, or you can drag-and-drop files for automated processing. The Encoder window displays information about input and output file formats and has fields for entering descriptive information. You can specify options such as the compression type and copyright string to be included in the output file.

Some video editing programs can encode and write files in RealVideo format. For example, a RealEncoder plug-in is available for Adobe Premiere.

There is a difference between encoding from a live source and broadcasting a live event. Broadcasting from a live source requires a special license purchased with your RealNetworks RealServer. For information about serving a live stream refer to the “Delivering Live Content” chapter.

Source Files for Static Encoding

RealAudio and RealVideo clips may be created from previously captured digital audio or video files.

Video Formats Supported by RealEncoder

For **Windows**:

- Video for Windows (.avi). RealEncoder accepts compressed or uncompressed formats, although it is recommended you use uncompressed formats whenever possible.
- QuickTime for Windows (.mov). Only uncompressed files are supported.

For **Macintosh**:

- Quicktime for Macintosh (.mov). Uncompressed files and some compressed files are supported. Compressed files supported are Cinepak files and Apple’s Video Compressor. It is recommended, however, you use uncompressed formats whenever possible.

Audio Formats Supported by RealEncoder

It is recommended that you use uncompressed files whenever possible.

For **Windows**:

- Waveform (.wav). RealEncoder accept compressed or uncompressed formats, although it is recommended you use uncompressed files.

- QuickTime for Windows (.mov)
- Audio (.au)
- Sound (.snd)

For **Macintosh**:

- Audio Interchange File (.aif)
- Waveform (.wav)
- QuickTime for Macintosh (.mov)
- Audio (.au)
- Sound (.snd)

Video Formats Supported for RealPublisher

- Video for Windows (.avi). . RealPublisher accepts compressed or uncompressed formats, although it is recommended you use uncompressed formats whenever possible.
- QuickTime for Windows (.mov)

The following audio formats are supported by RealPublisher. It is recommended that you use uncompressed files whenever possible:

Audio Formats Supported for RealPublisher

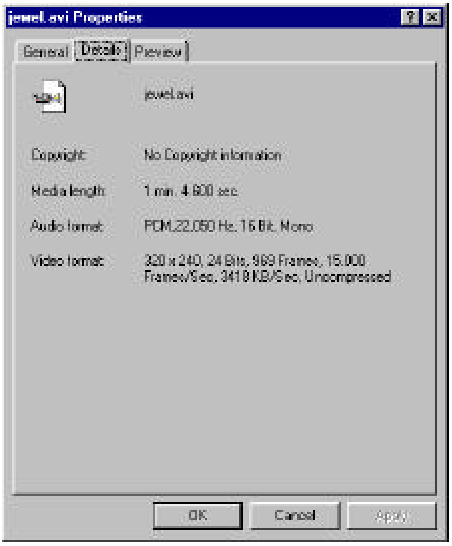
- Waveform (.wav). RealPublisher accepts compressed or uncompressed formats, although it is recommended you use uncompressed files.
- QuickTime for Windows (.mov)
- Audio (.au)
- Sound (.snd)

AVI Requirements

- AVI files should have a color depth of 24-bits.
- The standard video frame size for the Internet is 176 x 128, however height and width must both be divisible by 16. Height and width can also be 160 x 120, the only size not divisible by 16.
- File should be uncompressed for best results.
- Indeo drivers must be installed on your machine for the encoder to be able to open .avi files created with the YUV9 format. Indeo drivers are available from the Intel Web site at **www.indeo.com**. However, if you captured an .avi file on the same machine as RealEncoder or RealPublisher, the encoder typically has no problem opening it.

To determine if you have the AVI video codec for a particular AVI file:

1. Right-click the file name.
2. Click **Properties**.
3. Click **Details** tab. Look at the Video Format field.



jewel.avi

Copyright: No Copyright information

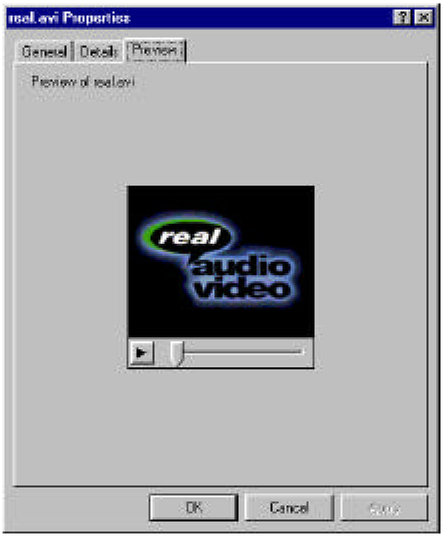
Media length: 1 min. 4.600 sec

Audio format: PCM,22,050 Hz, 16 Bit, Mono

Video format: 320 x 240, 24 Bits, 969 Frames, 15.000 Frames/Sec, 341.8 KB/Sec, Uncompressed

If the Video Format field says "Unknown format" most likely the corresponding AVI video codec is not installed.

4. If the Video Format field lists a format, click **Preview** tab. You should be able to view the video in the preview window.



Note: If you can preview the video, and still receive an error when encoding the AVI file, the file may not be in 24-bit color. You can convert the file to 24-bit file using a third-party video editing tool like Adobe Premiere.

QuickTime Requirements

- 24-bit RGB QuickTime video files
- 8- 16-bit mono and stereo audio
- On **Windows** platforms for RealEncoder and RealPublisher, files must be uncompressed.
- On **Macintosh** platforms for RealEncoder only, files can be uncompressed or compressed (Cinepak, Apple's Video Compressor, or

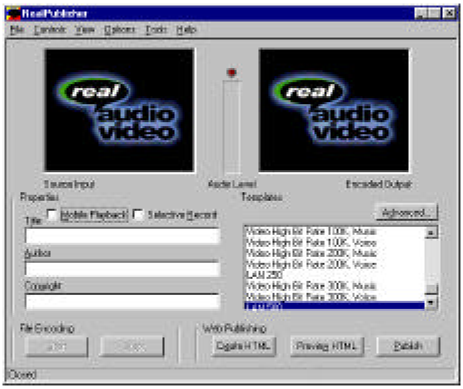
Raw), but it is recommended you use compressed files whenever possible.

Encoding RealAudio or RealVideo Files for Windows

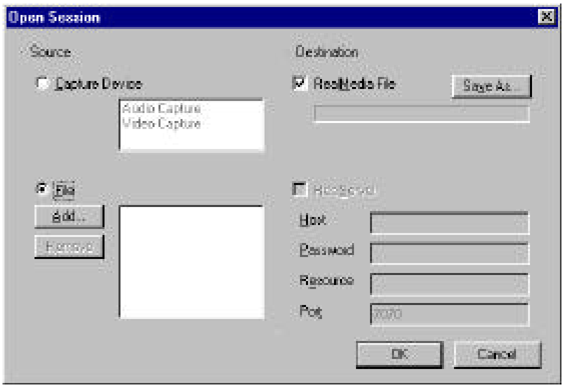
The following procedure shows RealPublisher screens. RealEncoder procedures are similar.

To create a RealAudio or RealVideo file from an existing audio or video file using RealEncoder or RealPublisher for Windows:

1. Start **RealPublisher**. The RealPublisher window opens:


RealPublisher
File Controls View Options Tools Help
Source Input
Audio Level
Encoded Output
Properties
Templates
Mobile Playback
Selective Record
Title
Author
Copyright
Advanced...
Video High Bit Rate 100K, Music
Video High Bit Rate 100K, Voice
Video High Bit Rate 200K, Music
Video High Bit Rate 200K, Voice
LAN 250
Video High Bit Rate 300K, Music
Video High Bit Rate 300K, Voice
File Encoding
Web Publishing
Create HTML
Preview HTML
Publish
Closed

2. Click **Open Session** from the File menu. The Open Session window appears:



3. In the source pane, verify that **File** is selected.
4. Click **Add**. The Add Source File dialog box appears.
5. Select the file you want to encode. Click **Open**.
6. In the destination pane, verify **RealMedia File** is checked.
7. Click **Save As**. The Select Destination File dialog box appears.
8. Choose a directory to store the file and enter the destination file name.
9. Click **Save**.
10. Click **OK**. The Open Session window closes.
11. In the properties pane, you can enter the Title, Author, and Copyright information for your output file. These fields are optional.
12. Click **Mobile Playback** if you wish to create content that can be downloaded by RealPlayers and transferred to Mobile Players such as the Audible Player for time-shifted playback.

    The Audible Player currently supports the 6.5 Kbps voice codec that is available as part of the RealEncoder 5.0 and RealPublisher 5.0 products. Contact your Mobile Playback vendor if you need more information.

13. If you wish RealPlayer and RealPlayer Plus users to be able to save your RealVideo or RealAudio signal to disk, click **Selective Record**.

14. In the encoding templates list box, select the template for the target audience you want your file to play for.

15. Click **Start** to begin the encoding process. When encoding is complete, an Encoding Complete message appears indicating the bit rate the file was encoded at.

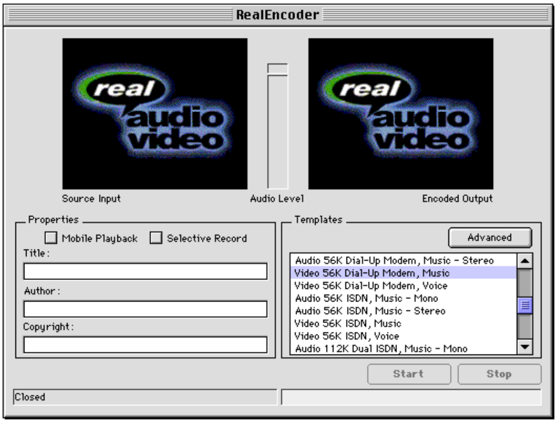
    If RealPublisher is unable to encode the file at the selected bit rate, you may need to re-encode the file with a different template. To edit your template settings, click **Advanced** and re-encode your file with the updated template.

16. View the encoded file with RealPlayer.

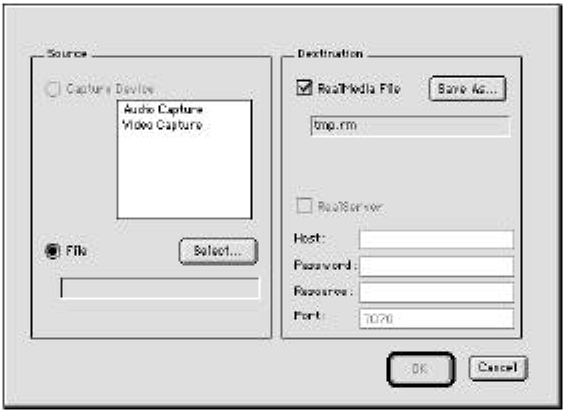
Encoding RealAudio or RealVideo Files for Macintosh

To create a RealAudio or RealVideo file from an existing audio or video file using RealEncoder on Macintosh:

1. Start **RealEncoder**. The RealEncoder window opens:



2. Click **Open Session** from the File menu. The Open Session window appears:



● File

☑ RealMedia File

tmp.rm

Port: 7070

3. In the source pane, verify that **File** is selected.

4. Click **Add**. The Add Source File dialog box appears.

5. Select the file you want to encode. Click **Open**. The Add Source File dialog box closes.

6. In the destination pane, verify **RealMedia File** is checked.

7. Click **Save As**. The Select Destination File dialog box appears.

8. Choose a directory to store the file and enter the destination file name.

9. Click **Save**.

10. Click **OK**. The Open Session window closes.

    Note: The Capture Device and RealServer options in the Open Session window are for live encoding and are not available for Macintosh users.

11. In the properties pane of the RealEncoder window, you can enter the Title, Author, and Copyright information for your output file. These fields are optional.

12. Click **Mobile Playback** if you wish to create content that can be downloaded by RealPlayers and transferred to Mobile Players such as the Audible Player for time-shifted playback.

The Audible Player currently supports the 6.5 Kbps voice codec that is available as part of the RealEncoder 5.0. Contact your Mobile Playback vendor if you need more information.

13. If you wish RealPlayer and RealPlayer Plus users to be able to save your RealVideo or RealAudio signal to disk, click **Selective Record**.
14. In the encoding templates list box, select the template for the target audience you want your file to play for.
15. Click **Start** to begin the encoding process. When encoding is complete, an Encoding Complete message appears indicating the bit rate the file was encoded at.

    If RealEncoder is unable to encode the file at the selected bit rate, you may need to re-encode the file with a different template. To edit your template settings, click **Advanced** and re-encode your file with the updated template.
16. View the encoded file with RealPlayer.

Command Line Encoding for Windows

In some situations you may find it convenient to batch encode live or on-demand content. Within the DOS command line, you can automatically encode several files sequentially. The following syntax is used:

```
RVBatch RVEncode.exe <options>
```

where `options` are any of RealEncoder or RealPublisher options described below. To see a full listing of the parameters and options, from the Rvencode directory type:

```
RVBatch RVEncode.exe /?
```

Command Line Batch Encoding Options

Option	Description (defaults in parenthesis)
/I	Use this option to specify an Input File
/O	Use this option to specify an outfile or dir - Output File Name or Directory (infile.rm or dir\YYYYMMDDHHMMSS.rm)
/L	Use this option to specify Use Live Input
/S	Use this option to specify "server[:port]/file" - Server Name, Port and File. (Port 7070)
/W	Use this option to specify password - Server Password
/D	Use this option to specify hhh:mm:ss - Maximum Encoding Duration (continuous)
/A	Use this option to specify an Audio Codec (0)
/V	Use this option to specify a Video Codec (0)
/F	Use this option to specify a framerate - Frame Rate. (Optimal)
/B	Use this option to specify Total Kbps for clip. (100)
/N	Encoding Speed range 1 to 5 where 1 = Normal, 5 = fastest(1)
/M	Optimal Framerate Bias 1 = Sharpest Image, 3 = Smoothest Motion (2)
/Q	Use this option to specify Quality 1-100. (100)
/T	Use this option to specify a Clip Title
/U	Use this option to specify a Clip Author
/C	Use this option to specify a Clip Copyright
/K	Use this option to Enable Mobile Playback. Valid options are: 0 Disabled 1 Enabled (1)
/R	Use this option to Enable Selective Record. Valid options are: 0 Disabled 1 Enabled (0)

Option	Description (defaults in parenthesis)
/X	Use this option to Enable Audio Encoding. Valid options are: 0 Disabled 1 Enabled (1)
/Y	Use this option to Enable Video Encoding. Valid options are: 0 Disabled 1 Enabled (1)
Z	Cropping Values : Left, Top, Width, Height (0,0,0,0)
/?	Use this option to Display the HELP information

Batch Encoding for Macintosh

In some situations you may find it convenient to batch encode files. With AppleScript you can automatically encode several files sequentially. The following table describes the encoding parameters for Macintosh. These can also be obtained by opening the RVBatch Dictionary which was installed with RealEncoder.

To open the dictionary using ScriptEditor:

1. Select **Open Dictionary** from the File menu. The Get File window appears.

2. Double click **RVBatch**.

Encoding Parameters

The audio and video codec names requested below are the same as those in the RealEncoder user interface.

Encoding Parameters

Parameter	Description
encode	Use this option to specify an Input File
output	Use this option to specify an FSSpec or full pathname of output file
audio	Enable audio encoding
using audio codec	Audio codec name
video	Enable video encoding
using video codec	Video codec name
at frame rate	Frame rate
optimal bias	Determines the behavior of optimized encoding and can be one of the following options: Sharpest Image, Normal or Smoothest Motion
at bitrate	Total bit rate
cropping	Sets the cropping rectangle and follows this form: top, left, bottom, right
at quality	Video quality setting (1-100)
encoding speed	speed of encoding–the faster the speed the less the quality of the encoding. Can be one of the following options: Normal, Medium, Fast, Faster, or Fastest
title	Title string
author	Author string
copyright	Copyright string
Mobile Playback	Enable Mobile Playback
Selective Record	Enable Selective Record

Setting the Timeout Value

Before encoding, look at the sample script which shows an example of how to use the RVBatch. This file is installed in the RealEncoder folder. Notice the Timeout command. When encoding using an actual script, be sure to change the default Timeout value of 60 seconds to a value which is much greater, for example, 99999. This ensures adequate time for encoding all batch files.

For more information refer to:
www.real.com

Using and Creating Templates

An encoding template allows you to specify bandwidth options for your content, whether for audio only, video only, or audio and video.

RealEncoder and RealPublisher come with pre-defined templates that enable you to encode your content specifically for your target audience. Each template is optimized for a particular type of audio and video content as well as for bandwidth. For a list of templates, refer to the “Pre-Defined Templates” section in this chapter.

You can adjust these templates or define a new one to optimize the type of audio and video you are encoding. For information about creating templates, refer to the “Creating New Templates” section in this chapter.

You can select one or more templates that best suit your needs, and the RealServer can deliver clips encoded using these multiple templates. In this way, you can reach the widest possible audience while still providing high-bandwidth users with the best listening experience. For more information about multiple templates, see the chapter “Using RealEncoder and RealPublisher.”

Taking it a step further, by using Bandwidth Negotiation you can configure your site to automatically serve the appropriately encoded file. For more information on this, refer to the “Bandwidth Negotiation” chapter.

Bandwidth

Understanding bandwidth is an important part of using templates. Bandwidth, also known as bit rate, is the amount of data that can be received by your modem during a set period of time. Bandwidth is measured in kilobits per second (Kbps). Standard modems are commonly referred to by the bit rate they are able to receive, for example, 14.4, 28.8, and 56. These designations may already be familiar to you.

In addition to standard bandwidths, you can encode clips for bit rates up to 500 Kbps. These higher bandwidths, however, are generally more typical of corporate intranets.

Pre-defined Templates

Each template is optimized for a particular type of audio and video content as well as for bandwidth. You can select one or more templates that best suit your needs.

RealEncoder and RealPublisher Pre-Defined Templates

Template Name	Audio Codec	Video Bit Rate (Kbps)	Total Bit Rate (Kbps)	Video Frame Rate
Audio 14.4, Voice	8.5 Kbps Voice	0.0	8.5	
Audio 28.8, Music - Mono	16 Kbps Music - High Response	0.0	16	
Audio 28.8, Voice	16 Kbps Voice - Wideband	0.0	16	
Audio 28.8, Music - Stereo	20 Kbps Music Stereo	0.0	20	
Video 28.8, High Action	6.5 Kbps Voice	13.5	20	Optimal Sharp
Video 28.8, Slide Show	12 Kbps Music	8.0	20	. 25
Video 28.8, Talking Heads	5Kbps Voice	13.5	20	Optimal Smooth
Audio 56K Dial-Up Modem, Music - Mono	32Kbps Music Mono	0.0	32	
Audio 56K Dial-Up Modem, Music - Stereo	32Kbps Music Stereo	0.0	32	
Video 56K Dial-Up Modem, Music	12 Kbps Music	22.0	34	Optimal Smooth
Video 56K Dial-Up Modem, Voice	6.5 Kbps Voice	27.5	34	Optimal Smooth

Template Name	**Audio Codec**	**Video Bit Rate (Kbps)**	**Total Bit Rate (Kbps)**	**Video Frame Rate**
Audio 56K ISDN, Music – Mono	40 Kbps Music Mono	0.0	40	
Audio 56K ISDN, Music – Stereo	40 Kbps Music - Stereo	0.0	40	
Video 56K ISDN, Music	16 Kbps Music - High Response	29.0	45	Optimal Smooth
Video 56K ISDN, Voice	8.5 Kbps Voice	36.5	45	Optimal Smooth
Audio 112K, Dual ISDN, Music - Mono	80Kbps Music Mono	0.0	80	
Audio 112K, Dual ISDN, Music - Stereo	80 Kbps Music - Stereo	0.0	80	
Video 112K Dual ISDN, Music	16 Kbps Music - High Response	64.0	80	Optimal Normal
Video 112K Dual ISDN, Voice	16 Kbps Voice - Wideband	64.0	80	Optimal Normal
Video High-Bite Rate 200K, Music	16 Kbps Music - High Response	184.0	200	Optimal Normal
Video High-Bite Rate 200K, Voice	16 Kbps Voice - Wideband	184.0	200	Optimal Normal

Template Name	Audio Codec	Video Bit Rate (Kbps)	Total Bit Rate (Kbps)	Video Frame Rate
Video High-Bite Rate 300K, Music	16 Kbps Music - High Response	284.0	300	Optimal Normal
Video High-Bite Rate 300K, Voice	16 Kbps Voice - Wideband	284.0	300	Optimal Normal

Notice that the total bit rate is a combination of the audio codec and the video bit rate. The total bit rate for each template is about 25% less than the total bit rate of the bandwidth of the connection to compensate for connection and packet overhead.

Multi-Template Encoding and Bandwidth Negotiation

The RealNetworks RealServer can deliver clips encoded using multiple templates. In this way, you can reach the widest possible audience while still providing high-bandwidth users with the best viewing and listening experience.

You can encode more than one RealAudio or RealVideo file at the same time using multi-template encoding. This allows you to encode your files with different compression rates based on the bandwidth capability of the user.

Multiple templates generate multiple output files. You can use multiple templates for testing or to allow the user to choose to stream the best file for the user’s bandwidth. Your Web site must have a separate hypertext link and Web page for each format or template.

However, using bandwidth negotiation with multi-template encoding requires only one link on your Web site to a particular clip, regardless of the number of files and enables the server to automatically stream the best file for the user’s stated bandwidth. Encoding files with the bandwidth negotiation option is discussed in the “Bandwidth Negotiation” chapter.

To encode a file with multiple templates:

1. Start RealEncoder or RealPublisher from your desktop and follow steps 1-13 for encoding audio and video files. See the “Encoding Audio or Video Files” section of this chapter.

2. In the encoding templates listbox, select one or more templates by holding down the Control key as you click each template name.

3. Click **Start** to begin multiple template encoding.

4. The Multiple Template Encoding dialog box appears.

   Each template should be a different data rate, for example a 28 Kbps template, a 56 Kbps template and a 200 Kbps template.

5. Follow steps 15-16 for encoding audio and video files. See the “Encoding an Audio or Video File” section in the “Using RealEncoder and RealPublisher” chapter.

6. Click **Begin**. The encoding process starts.

   The Multiple Template dialog box will remain visible during encoding, and you will be able to monitor audio levels.

7. Click **OK** when the “Encoding Complete message” appears.
8. You will not be able to preview the bandwidth negotiated files until the directory containing the files is posted on a RealNetworks RealServer. If you encoded them as individual files, you may now view them with the RealPlayer.

Creating New Templates

Each audio-only template is comprised of an audio codec. Each video template is comprised of an audio codec, video bit rate, total bit rate, frame rate, and encoding speed. The quality of encoded output is affected by these and by the actual media contents, such as fixed camera shots, more or less motion, and multiple camera shots.

If one of the templates does not achieve the effect you are looking for, try creating a new template by basing it on a pre-defined template and then modifying the settings. When you encode live content, you will probably need to create a new template also.

Setting Command Line Parameters to Achieve Total Bit Rates

RealVideo parameters that can be adjusted to obtain the preferred total bit rate are as follows:

- audio codec
- video bit rate

When deciding which parameters to set, the total bit rate must be considered. The total bit rate is the actual bit rate at which the video or audio file is encoded. If the target bit rate is 28.8 Kbps, then the total bit rate should be 20 Kbps, approximately 25% less that the target bit rate. The following are the recommended total bit rates for common bandwidths:

Recommended Total Bit Rates for Common Bandwidths

Target Bit Rate	Total Bit Rate
28.8 Kbps	19 or 20 Kbps
56.0 Kbps dial-up modems	34 Kbps
56.0 Kbps (ISDN)	45 Kbps
112 (Dual ISDN)	80 Kbps

For a video file, select the total bit rate according to the table above, and then from the table below, choose an audio codec if you are using video with audio.

Audio Codecs

Command Line Parameter	Bandwidth	Audio Codec
sipr 0	6.5 Kbps	6.5 Kbps voice
sipr 1	8.5 Kbps	8.5 Kbps voice
sipr 2	5 Kbps	5 Kbps voice
sipr 3	16 Kbps	16 Kbps - Wideband
dnet 0	16 Kbps	16 Kbps music Low Response
dnet 1	16 Kbps	16 Kbps music Medium Response
dnet 2	16 Kbps	16 Kbps music High Response
dnet 3	20 Kbps	20 Kbps music stereo
dnet 4	40 Kbps	40 Kbps music mono
dnet 5	40 Kbps	40 Kbps music stereo
dnet 6	80 Kbps	80 Kbps music mono
dnet 7	80 Kbps	80 Kbps stereo
dnet 8	8 Kbps	8 Kbps music
dnet 9	12 Kbps	12 Kbps music
dnet 10	32 Kbps	32 Kbps music mono
dnet 11	32 Kpbs	32 Kbps music stereo
28_8 0	15.2 Kbps	15.2 Kbps voice

Since RealAudio codecs have discreet bandwidths, the video bit rate is the difference between the total bit rate and the bit rate of the chosen audio codec:

Video Bit Rate = (Total Bit Rate) - (Bit Rate of Audio Codec)

In RealEncoder and RealPublisher , the video bit rate is calculated automatically. There are two video codecs:

Parameter	Video Codec
0	RealVideo (Standard)
1	RealVideo (Fractal)

Next choose a frame rate. Not all content types support high frame rates for a given bandwidth. The highest frame rate that can be achieved at 20 Kbps is 15 frames per second (fps) for Talking Head type content. Different content types require different frame rates. For example, while Talking Heads at 20 Kbps might support 10 fps, music videos may only support 3 fps or less.

If you are getting high levels of latency, you are exceeding the bounds of your content type.

To reduce latency levels:

- Choose **Optimize Frame Rate**. This lets the encoder adjust the frame rate.

  You can select Optimized Frame Rate when using the RealVideo (Standard) codec. Optimized Frame Rate provides constant image clarity, or sharpness, and variable frame rates. When this option is selected, the encoder automatically selects the frame rate.

  For example, if a person who is talking begins to gesture or move around quickly, the frame rate increases as the motion speeds up and decreases as the motion slows down. The image sharpness remains constant throughout.

- Reduce the screen size (176 x 128 is recommended). Use numbers divisible by 16 in setting frame size. Height and width can also be 160 x 120, the only size not divisible by 16.

- Lower the frame rate.

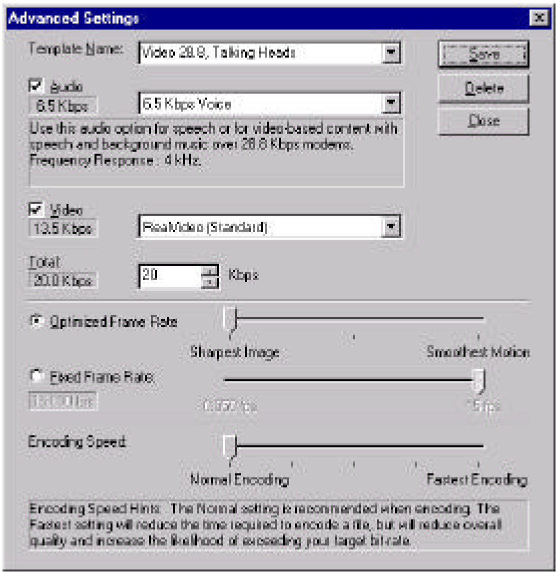
  Fixed Frame Rate is adjusted by moving the slider. Fixed Frame Rate gives you the option of choosing to emphasize image clarity or motion smoothness.

  For example, if your content contains a lot of motion, set the slider closer to the 15 fps setting. The resulting video image will be less clear but will exhibit smoother motion, i.e., more frames per second.

  However, if your content has less motion, set the slider closer to the .050 fps setting. The resulting video images will be more clear but will exhibit less smooth motion, i.e. fewer frames per second.

To create a new template for Windows:

1. In the templates pane, click **Advanced**. The Advanced Setting window appears:



Template Name: Video 28.8, Talking Heads

☑ Audio
6.5 Kbps
6.5 Kbps Voice

Use this audio option for speech or for video-based content with speech and background music over 28.8 Kbps modems.
Frequency Response : 4 kHz.

☑ Video
13.5 Kbps
RealVideo (Standard)

Total
20.0 Kbps
20 Kbps

● Optimized Frame Rate

○ Fixed Frame Rate

Encoding Speed

Encoding Speed Hints: The Normal setting is recommended when encoding. The Fastest setting will reduce the time required to encode a file, but will reduce overall quality and increase the likelihood of exceeding your target bit-rate.

2. Enter the name of the new template in the Template Name field and click **Save**.

   You should not directly modify the pre-defined templates. If you want to change some of the settings of a pre-defined template, save it as a new template by giving it a new name. This way you don't overwrite the pre-defined templates.

3. Select an audio codec. They are arranged by data rate and type of content.

4. Select a Video codec. RealPublisher has two video codecs available, RealVideo (Standard) and RealVideo (Fractal).

5. Select the total bit rate for the entire encoded file. The video bit rate will be total bit rate less the audio bit rate.

You should reduce the expected total bit rate by 25% to compensate for connection and packet overhead. For example, choose 20 Kbps for a 28.8 Kbps modem.

6. Choose **Optimize Frame Rate**. This lets the encoder adjust the frame rate.

   You can select Optimized Frame Rate when using the RealVideo (Standard) codec. Optimized Frame Rate provides constant image clarity, or sharpness, and variable frame rates. When this option is selected, the encoder automatically selects the frame rate.

   For example, if a person who is talking begins to gesture or move around quickly, the frame rate increases as the motion speeds up and decreases as the motion slows down. The image sharpness remains constant throughout.

   Fixed Frame Rate is adjusted by moving the slider. Fixed Frame Rate gives you the option of choosing to emphasize image clarity or motion smoothness.

   For example, if your content contains a lot of motion, set the slider closer to the 15 fps setting. The resulting video image will be less clear but will exhibit smoother motion, i.e., more frames per second.

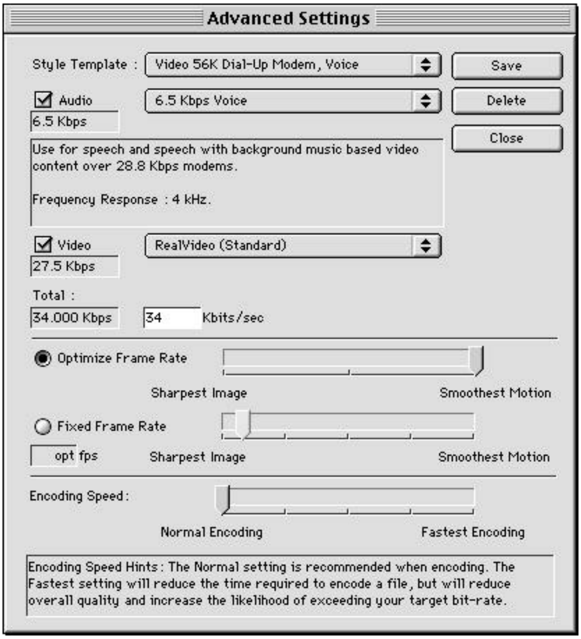
   However, if your content has less motion, set the slider closer to the .050 fps setting. The resulting video images will be more clear but will exhibit less smooth motion, i.e. fewer frames per second.

7. Click **Save** to save the template.

8. Click **Close** to close the Advanced Settings window.

To create a new template for Macintosh:

1. In the templates pane, click **Advanced**. The Advanced Setting window appears:



Advanced Settings

Style Template : Video 56K Dial-Up Modem, Voice

☑ Audio 6.5 Kbps Voice

6.5 Kbps

Use for speech and speech with background music based video content over 28.8 Kbps modems.

Frequency Response : 4 kHz.

☑ Video RealVideo (Standard)

27.5 Kbps

Total :

34.000 Kbps 34 Kbits/sec

● Optimize Frame Rate

○ Fixed Frame Rate

opt fps

Encoding Speed:

Encoding Speed Hints: The Normal setting is recommended when encoding. The Fastest setting will reduce the time required to encode a file, but will reduce overall quality and increase the likelihood of exceeding your target bit-rate.

2. From the Templates pop-up listbox, select **Custom**.

3. Select an audio codec. They are arranged by data rate and type of content.

4. Select a Video codec. RealPublisher has two video codecs available, RealVideo (Standard) and RealVideo (Fractal).

5. Select the total bit rate for the entire encoded file. The video bit rate will be total bit rate less the audio bit rate.

6. Once you have selected your settings, the Template Name window appears.

7. Enter the name of the new template in the Template Name field and click **OK**.

   You should not directly modify the pre-defined templates. If you want to change some of the settings of a pre-defined template, save it as a new template by giving it a new name. This way you don’t overwrite the predefined templates.

You should reduce the expected total bit rate by 25% to compensate for connection and packet overhead. For example, choose 20 Kbps for a 28.8 Kbps modem.

8. Choose **Optimize Frame Rate**. This lets the encoder adjust the frame rate.

   You can select Optimized Frame Rate when using the RealVideo (Standard) codec. Optimized Frame Rate provides constant image clarity, or sharpness, and variable frame rates. When this option is selected, the encoder automatically selects the frame rate.

   For example, if a person who is talking begins to gesture or move around quickly, the frame rate increases as the motion speeds up and decreases as the motion slows down. The image sharpness remains constant throughout.

   Fixed Frame Rate is adjusted by moving the slider. Fixed Frame Rate gives you the option of choosing to emphasize image clarity or motion smoothness.

   For example, if your content contains a lot of motion, set the slider closer to the 15 fps setting. The resulting video image will be less clear but will exhibit smoother motion, i.e., more frames per second.

   However, if your content has less motion, set the slider closer to the .050 fps setting. The resulting video images will be more clear but will exhibit less smooth motion, i.e. fewer frames per second.

9. Click **Save** to save the template.

10. Click **Close** to close the Advanced Settings window.

Performance Tips and Tricks

Drag-and-Drop Encoding for Windows

RealEncoder and RealPublisher for Windows support drag-and-drop encoding:

- Click an input-video-file icon and drag it onto an open RealPublisher or RealEncoder window. This enters path and file name information into the appropriate Encoder fields.
- Then you only need to enter the descriptive information and settings and click **Start** to begin the encoding process.

Image Size

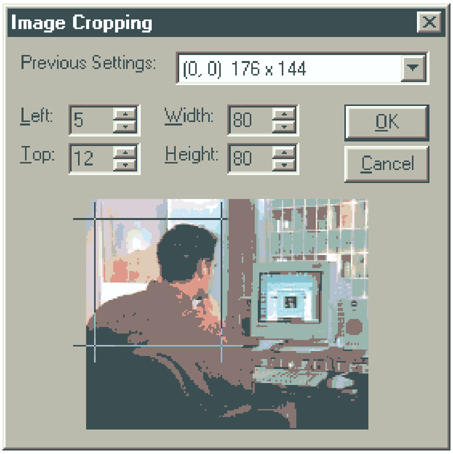
RealEncoder and RealPublisher support any size image that is divisible by 16. Height and width can also be 160 x 120, the only size supported that is not divisible by 16. Live capture image size is controlled through **Set Video Format** under the Options menu and is dependent upon the video capture hardware installed.

If you want to embed RealPlayer controls in your Web page, be sure you embed it using the same image size as when the clip was originally encoded. For example, if the image size of your encoded clip is 176 x 128, do not use 320 x 240 to embed it in your Web page. See the “Custom Controls for RealAudio and RealVideo” section in the “Congfiguring Your Web Site” chapter for more information on embedding RealPlayer controls.

Image Cropping

1. To encode only part of the screen, select **Crop Enabled** from the Options menu. To edit the image cropping settings, select **Crop Settings** from the Options menu. The Image Cropping window displays. Notice the crop lines around the image. These lines show the portion of the image that will

be encoded. Use **Left**, **Top**, **Width**, and **Height** to adjust the size and location of crop lines.



Previous Settings: (0, 0) 176 x 144

Left: 5

Top: 12

Width: 80

Height: 80

2. If you need to edit the crop settings, select **Crop Settings** from the Options menu.

3. Click the **Start** button to start the encoding process. When file encoding is complete, an Encoding Complete message appears indicating the bit rate the file was encoded at.

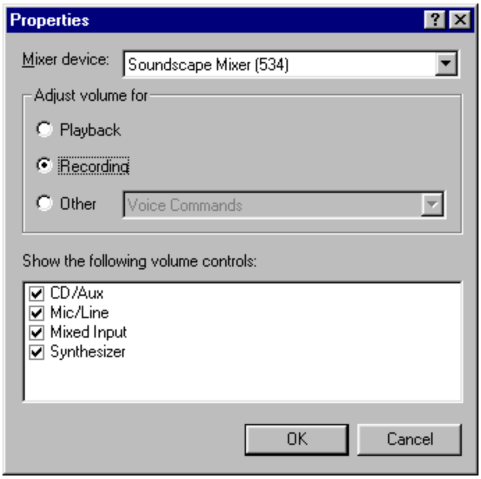
   If RealPublisher is unable to encode the file of the selected bit rate, you need to re-encode the file with a different template.

4. View the encoded file with RealPlayer.

Volume Control

1. Select **Volume Control** from the Options menu. The Volume Control window displays.

2. Select **Properties** from the Options menu. The Properties window displays.



Properties

Mixer device: Soundscape Mixer (534)

Adjust volume for

○ Playback

● Recording

○ Other Voice Commands

Show the following volume controls:

☑ CD/Aux

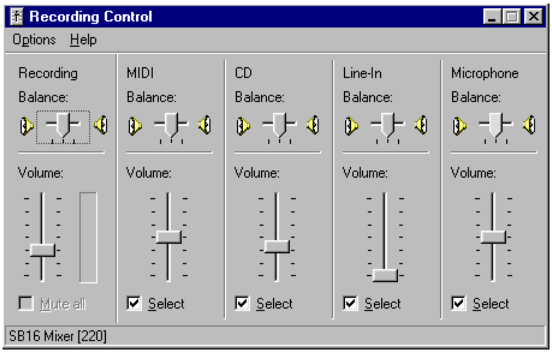
☑ Mic/Line

☑ Mixed Input

☑ Synthesizer

3. Click **Recording** to adjust the input recording volume. (Playback adjusts the level of the volume you hear while you are encoding, not the volume the end-user hears.)

4. Select from the list of volume controls the type of inputs you will be using and click **OK**. The Volume Control window will display the volume controls you select.



5. Select which recording inputs to use by clicking and checking the Select box for each input.

6. Adjust the sound level by moving the sliders up or down. Remember, if the volume is too high, the encoded sound may be clipped and appear distorted. If the volume is too low, it will be difficult to hear. Use the audio level meter in the RealEncoder window to monitor the level during encoding.

   Repeat previous steps 10-16 only if the audio meter in the RealEncoder or RealPublisher window indicates the input signal is too low.

7. Close the Recording Control window and return to the RealEncoder or RealPublisher window.

Using the Audio Level Meter

While you encode RealAudio or RealVideo you can monitor the audio input level to be sure you are encoding the optimal dynamic range. Green indicates a normal reading. Red warns that you are close to an over-modulated input. The best sound quality will occur when the top red bar is often lit but the clipping indicator never goes off.

Producing High Quality Video

To create the best possible streaming audio and video, you must start with the best possible source material. Different video formats yield different qualities when captured or “digitized.” Because RealAudio and RealVideo compression algorithms are lossy, some of the information contained in your original input is not included in the reconstructed signal sent to RealPlayer.

In particular, different video formats yield different qualities when digitized. Additionally, video playback devices commonly have two types of video outputs, S-video and composite. S-video produces better results.

The common video input devices in order of quality are:

1. Betacam-sp, also known simply as Beta. This format is common among video production professionals.
2. Laserdisc
3. S-VHS or Super-VHS
4. VHS

Satellite television services (e.g. Direct TV) have extremely high quality video. Their feed quality typically exceeds that of Laserdisc.

Content Elements that Affect Video Quality

Below are content elements that can affect the quality of a video encoding at 20 Kbps:

Content Type	**Expected Encoding Results**
Fixed camera shot, low motion	Clean frames, with high frame rates
Fixed camera shot, medium motion	Clean frames, somewhat lower frame rates
Multiple camera shots, low motion	Clean frames with 1 fps or less
Zoom with low motion	Clean frames with moderate frame rate
Fixed camera shot, high motion	Clean frames with moderate frame rate
Multiple camera shots, high motion	Clean frames with less than 1 fps

Note: RealEncoder and RealPublisher produce significantly better frames with higher frame rates when used with bandwidths higher than 28.8 Kbps.

Producing High Quality Audio

- Use high quality source files or recording input device.
- If you are not doing a live broadcast, capture or “digitize” the sound to a supported file format such as a .wav, mov, or .aif whenever possible.
- Digitizing the sound before encoding the file allows you to use a sound editor to adjust the amplitude of your signal to maximize the available dynamic range. If you do not adjust the signal, the resulting RealAudio and RealVideo files may sound flat.
- If your original audio file signal exceeds the acceptable amplitude range, the file may be “cliped.” Clipping can give rise to clicks or pops on playback. If your source file contains a clipped signal, your final RealAudio or RealVideo file will have high-frequency background noise or static. Lowering the input volume will help reduce clipping.
- Eliminate any DC offset either while recording or later with an audio editor. This removes low frequency noise.

- When encoding live-source audio, you have less opportunity to manipulate your input signal. Be sure that volume levels are prepared and tested before encoding.
- Cut any unnecessarily long silences from the beginning or end of the output file to conserve space.

Live Capture-to-File

If you have a real-time capture station, you can use it to capture and compress directly into RealAudio and RealVideo formats. To do this, use the output of a video player and set the encoder to capture-to-file instead of capture-to-a-live-server feed. This has the advantage of eliminating the need to create and store intermediate AVI files which are very large and take considerable disk space. It is also the fastest way to capture content like breaking news clips when time-to-post is important.

Live Content Settings

Live Content should be set the same way as you would creat static files. If you are experiencing a lower quality or frame rate than you do with static content, you may need a more powerful machine.

Encoding with Multiple Audio Codecs

Use a CD quality sampling rate (44.1 kHz), sampling width (16-bit) and two channels when creating an input file that you intend to encode using multiple audio codecs. Stereo audio codecs will not encode mono audio input.

Synchronizing Audio with Video and Preventing Pitch Shifting

To ensure that the audio stays synchronized with video or other time critical media and to prevent pitch shifting in audio resampling, the following sampling rates need to be used with the following audio codecs.

Audio Codecs and Sampling Rates

Audio Codec	Sampling Rate
14.4	8, 16 or 32 kHz
5 Kbps voice	8, 16, 32 kHz
6.5 Kbps voice	8, 16 or 32 kHz
8.5 Kbps voice	8, 16 or 32 kHz
15.2 Kbps voice	8, 16 or 32 kHz
16 Kbps voice	16 or 32 kHz
8 Kbps music	8, 16 or 32 kHz
12 Kbps music	8, 16 or 32 kHz
16 Kbps music High response	11.025, 22.05 or 44.1 kHz
16 Kbps music Med response	11.025, 22.05 or 44.1 kHz
16 Kbps music Low response	8, 16 or 32 kHz
20 Kbps music stereo	8, 16 or 32 kHz
40 Kbps music mono	11.025*, 22.05 or 44.1 kHz
40 Kbps music stereo	8*, 16 or 32 kHz
80 Kbps music mono	11.025*, 22.05* or 44.1 kHz
80 Kbps music stereo	8*, 16* or 32 kHz

* The sampling rates are lower than the default input rates of the encoder. For fuller sound, it is recommended you use the higher sampling rates.

Audio Codec Reference Chart

Audio Codecs	Minimum Bandwidth Required	Bandwidth Negotiation Name	Command Line Parameter	Input Sample Rate	Frequency Response
Voice					
5Kbps Voice*	14.4k Modem	sipr.6	sipr 2	8, 16 or 32 kHz	4 kHz
6.5Kbps Voice	14.4k Modem	sipr.8	sipr 0	8, 16 or 32 kHz	4 kHz
8.5Kbps Voice	14.4k Modem	sipr.10	sipr 1	8, 16 or 32 kHz	4 kHz
16Kbps Voice - Wideband*	28.8k Modem	sipr.20	sipr 3	16 or 32 kHz	8 kHz
15.2Kbps Voice - RealAudio 2.0	28.8k Modem	28_8.36	28_8 0	8, 16 or 32 kHz	4 kHz
Music					
8Kbps Music	14.4k Modem	dnet.10	dnet 8	8, 16 or 32 kHz	4 kHz
12Kbps Music	14.4k Modem	dnet.15	dnet 9	8, 16 or 32 kHz	4 kHz
16Kbps Music - High Response	28.8k Modem	dnet.20	dnet 2	11.025, 22.05 or 44.1 kHz	5.5 kHz
16Kbps Music - Medium Response	28.8k Modem	dnet.20	dnet 1	11.025, 22.05 or 44.1 kHz	4.7 kHz
16Kbps Music - Low Response	28.8k Modem	dnet.20	dnet 0	8, 16 or 32 kHz	4 kHz
20Kbps Music Stereo	28.8k Modem	dnet.25	dnet 3	8, 16 or 32 kHz	4 kHz
32Kbps Music Mono*	56k Modem (X2)	dnet.40	dnet 10	11.025, 22.05 or 44.1 kHz	8 kHz
32Kbps Music Stereo*	56k Modem (X2)	dnet.40	dnet 11	8, 16 or 32 kHz	5.5 kHz
40Kbps Music Mono	ISDN (Single)	dnet.50	dnet 4	11.025*, 22.05 or 44.1 kHz	11 kHz
40Kbps Music Stereo	ISDN (Single)	dnet.50	dnet 5	8*, 16 or 32 kHz	8 kHz
80Kbps Music Mono	Dual ISDN/T1	dnet.100	dnet 6	11.025*, 22.05* or 44.1 kHz	20 kHz
80Kbps Music Stereo	Dual ISDN/T1	dnet.100	dnet 7	8*, 16* or 32 kHz	16 kHz

* Denotes New 5.0 Audio Codecs; All others are 4.0 compatible. 2.0/1.0 (14_4.18) compatibility is no longer supported by Encoder 5.0 or later.
Sampling rates are lower than the default input rates of the Encoder. For fuller sound, it is recommended that you use a higher input sampling rate.

Bandwidth Negotiation

You can encode your files with different compression rates based on the bandwidth capability of the user. You can choose to provide as many different data rates for each file as you want.

The Player gets the best quality the connection can handle without having to explicitly choose among multiple links and Web pages. You can choose to provide as many different data rates for each file as you want. The bandwidth negotiation process is transparent to users.

Bandwidth negotiation requires only one link on your Web site to a particular clip. To provide content in multiple formats without bandwidth negotiation, your Web site must have a separate hypertext link and metafile for each format.

Creating Files with the Bandwidth Negotiation Option

To create a Web page that uses the Bandwidth Negotiation option:

1. Start **RealPublisher** from your desktop and follow steps 1-13 for encoding audio and video files. See the "Encoding Audio and Video Files" section of the "Using RealEncoder and RealPublisher" chapter.
2. In the encoding templates listbox, select one or more templates by holding down the Control key as you click each template name.
3. Click **Start** to begin multi-template template encoding.
4. Typically, each template should be a different data rate. For example you might choose a 28 Kbps template, a 56 Kbps template and a 200 Kbps template.

5. The Multiple Template Encoding dialog box appears. Verify that **Enable Bandwidth Negotiation** is selected. The files will automatically be named for the server.

6. Follow steps 15-16 for encoding audio and video files. See “Encoding an Audio or Video File” in the “Using RealEncoder and RealPublisher” chapter.

7. Click **Begin**. The encoding process starts.

   The Multi-Template dialog box will remain visible during encoding, and you will be able to monitor audio levels.

8. Click **OK** when the “Encoding Complete” message appears.

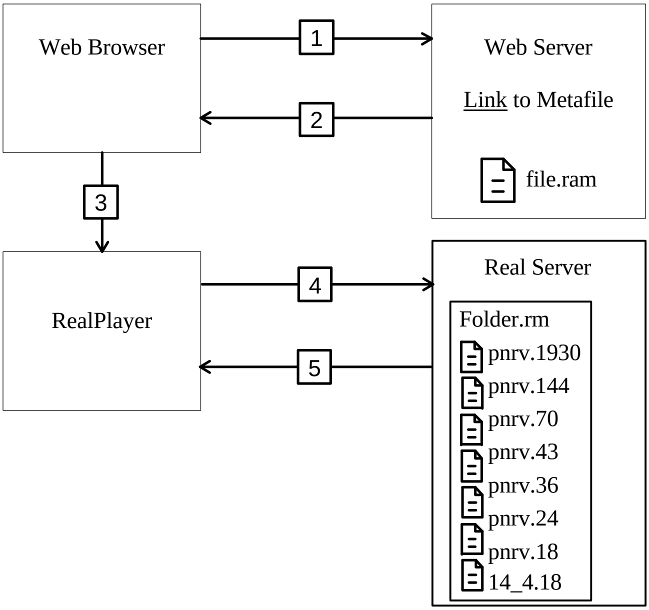
9. You will not be able to preview the files until the directory containing the files is posted on a RealNetworks RealServer.

Bandwidth File Organization

File organization is the key to bandwidth negotiation. The next figure shows a single link on a Web page, and seven available RealVideo files encoded using different algorithms.

The following steps correspond to the numbers in the figure:

1. The user clicks a link to a metafile on a Web page.



2. The Web server returns the metafile to the Web browser and based on the **.ram** file extension, sets the MIME type of the metafile to **audio/x-pn-RealAudio**.

3. The Web browser looks up the MIME type of the metafile, starts RealPlayer as a helper application, and passes it the metafile.

4. RealPlayer reads the first URL from the metafile and requests it from RealServer. Based on its preference settings, RealPlayer also sends a list of RealVideo compression types it supports.

5. RealServer checks the directory specified by the URL and begins streaming the highest bandwidth file supported by RealPlayer.

The following table shows the file name for each bandwidth and connection type.

Connection	**Bandwidth (Kbps)**	**File Name**
T1	154.4	pnrv.1930
Dual ISDN	112	pnrv.144
Single ISDN	56.7	pnrv.70
56.6	56.7	pnrv.43
28.8	28.8	pnrv.36
19.2	19.2	pnrv.24
14.4	14.4	pnrv.18

The following table shows the file formats that RealAudio Player version 1.0 through 3.0 requests and order in which they are requested:

Player Version	Bandwidth Setting	Files Requested
1.0	All	lpcJ.18
2.0	14.4	lpcJ.18
2.0	28.8, ISDN, T1	28_8.36 lpcJ.18
2.1	14.4	lpcJ.18
2.1	28.8, ISDN, T1	28_8.36 lpcJ.18
3.0	14.4	lpcJ.18
3.0	28.8	dnet.25 dnet.20 28_8.36 lpcJ.18
3.0	ISDN	dnet.50 dnet.25 dnet.20 28_8.36 lpcJ.18
3.0	T1	dnet.100 dnet.50 28_8.36 dnet.25 dnet.20 lpcJ.18

Note: RealAudio Player 3.0 with a 28.8 Kbps connection always plays RealAudio 2.0 **-** 28.8 (28_8.36) format if it is available. If you want to provide another 28.8 format such as 28.8 Stereo (dnet.25), do not also provide the 28_8.36 format. If you do not provide any format supported by a Player, that Player receives a message to upgrade to the current Player release.

The following table shows the file formats that RealPlayer 4.0 and 5.0 requests and in what order they are requested:

Player Version	Bandwidth Setting	Files Requested
4.0	28.8	pnrv.36 dnet.25 pnrv.24 dnet.20 28_8.36 pnrv.18 dnet.15 sipr.10 lpcJ.18
4.0	ISDN	pnrv.1930 pnrv.144 dnet.100 pnrv.70 dnet.50 pnrv.36 dnet.25 pnrv.24 dnet.20 28_8.36 pnrv.18 dnet.15 sipr.10 dnet.10 sipr.8 lpcJ.18

Player Version	Bandwidth Setting	Files Requested
4.0	Dual ISDN	pnrv.1930 pnrv.144 dnet.100 pnrv.70 dnet.50 pnrv.36 dnet.25 pnrv.24 dnet.20 28_8.36 pnrv.18 dnet.15 sipr.10 dnet.10 sipr.8 lpcJ.18
4.0	T1	pnrv.1930 pnr.144 dnet.100 pnrv.70 dnet.50 pnrv.36 dnet.25 pnrv.24 dnet.20 28_8.36 pnrv.18 dnet.15 sipr.10 dnet.10 sipr.8 lpcJ.18

Player Version	Bandwidth Setting	Files Requested
5.0	28.8	pnrv.36 dnet.25 pnrv.24 dnet.20 28_8.36 pnrv.18 dnet.15 sipr.10 lpcJ.18
5.0	56.6	pnrv.1930 pnrv.144 dnet.100 pnrv.70 dnet.50 pnrv.43 pnrv.36 dnet.25 pnrv.24 dnet.20 sipr.20 28_8.36 pnrv.18 dnet.15 sipr.20 sipr.10 sipr.6 lpcJ.18

Player Version	Bandwidth Setting	Files Requested
5.0	ISDN	pnr.1930 pnrv.144 dnet.100 pnrv.70 dnet.50 pnrv.43 pnrv.36 dnet.25 pnrv.24 dnet.20 sipr.20 28_8.36 pnrv.18 dnet.15 sipr.10 dnet.10 sipr.8 sipr.6 lpcJ.18
5.0	Dual ISDN	pnrv.1930 pnrv.144 dnet.100 pnrv.70 dnet.50 pnrv.43 pnrv.36 dnet.25 pnrv.24 dnet.20 sipr.20 28_8.36 pnrv.18 dnet.15 sipr.10 dnet.10 sipr.8 sipr.6 lpcJ.18

Player Version	Bandwidth Setting	Files Requested
5.0	T1	pnrv.1930 pnrv.144 dnet.100 pnrv.70 dnet.50 pnrv.43 pnrv.36 dnet.25 pnrv.24 dnet.20 sipr.20 28_8.36 pnrv.18 dnet.15 sipr.10 dnet.10 sipr.8 sipr.6 lpcJ.18

The following table shows the file formats that RealPlayers 4.0 and 5.0 request from RealAudio servers 1.0 through 3.0 and RealServer 5.0. They are listed in the order they are requested for each bandwidth setting.

The unshaded file formats can be played in real time. The file formats shaded in gray can be played, but the player will use a buffered playback mechanism to play the file.

File Formats Requested by RealPlayers and RealServers

T1/LAN	Dual ISDN	ISDN	56.6	28.8	19.2	14.4
pnrv.1930	pnrv.144	pnrv.70	pnrv.43	pnrv.36	pnrv.24	pnrv.18
pnrv.144	dnet.100	dnet.50	pnrv.36	dnet.25	dnet.20	dnet.15
dnet.100	pnrv.70	pnrv.43	dnet.25	pnrv.24	sipr.20	sipr.10
pnrv.70	dnet.50	pnrv.36	pnrv.24	dnet.20	28_8.36	dnet10
dnet.50	pnrv.43	dnet.25	dnet.20	sipr.20	pnrv.18	sipr.8
pnrv.43	pnrv.36	pnrv.24	sipr.20	28_8.36	dnet.15	sipr.6
pnrv.36	dnet.25	dnet.20	28.8.36	pnrv.18	sipr.10	lpcJ.18
dnet.25	pnrv.24	sipr.20	pnrv.18	dnet.15	dnet10	28_8.36
pnrv.24	dnet.20	28_8.36	dnet.15	sipr.10	sipr.8	sipr.20
dnet.20	sipr.20	pnrv.18	sipr.10	dnet10	sipr.6	dnet.20
sipr.20	28_8.36	dnet.15	dnet.10	sipr.8	lpcJ.18	pnrv.24
28_8.36	pnrv.18	sipr.10	sipr.8	sipr.6	dnet.25	dnet.25
pnrv.18	dnet.15	dnet10	sipr.6	lpcJ.18	pnrv.36	pnrv.36
dnet.15	sipr.10	sipr.8	lpcJ.18	dnet.43	pnrv.43	dnet.43
sipr.10	dnet10	sipr.6	dnet.50	dnet.50	dnet.50	dnet.50
dnet10	sipr.8	lpcJ.18	pnrv.70	pnrv.70	pnrv.70	pnrv.70
sipr.8	sipr.6	dnet.100	dnet.100	dnet.100	dnet.100	dnet.100
sipr.6	lpcJ.18	pnrv.144	pnrv.144	pnrv.144	pnrv.144	pnrv.144
lpcJ.18	pnrv.1930	pnrv.1930	pnrv.1930	pnrv.1930	pnrv.1930	pnrv.1930

Bandwidth Negotiation Example

In this example, you deliver one of three RealVideo formats depending on the connection speed and RealPlayer version.

To setup this example:

1. Encode the source file in the following formats:
    - 20 Kbps Video **-** 6.5 Kbps Audio
    - 34 Kbps Video **-** 16 Kbps Audio
    - 100 Kbps Video **-** 16 Kbps Stereo
2. Create a metafile named **myvideo.ram** containing a URL such as:

```
pnm://www.real.com/music/myvideo.rm
```

3. Create a link to the metafile in a Web page. The following HTML code is a typical link:

```
<A HREF="http://www.real.com/myvideo.ram">
Watch myvideo</A>
```

4. On RealServer computer, create a directory named **myvideo.rm** in the **/music** directory.
5. In this directory, store the three files, automatically renamed **pnrv.36**, etc. as shown in the previous table.
    - The file that is played depends on the Player connection and version.

RealEncoder Plug-in for Adobe Premiere

The RealEncoder plug-in for Adobe Premiere 4.2 exists for both Windows and Macintosh platforms. Currently, the Windows version is installed by RealEncoder and RealPublisher. The Windows Adobe Premiere plug-in is installed in the /Premiere/plugins directory. The Macintosh Adobe Premiere plug-in must be copied to the plug-in directory in the Premiere folder.

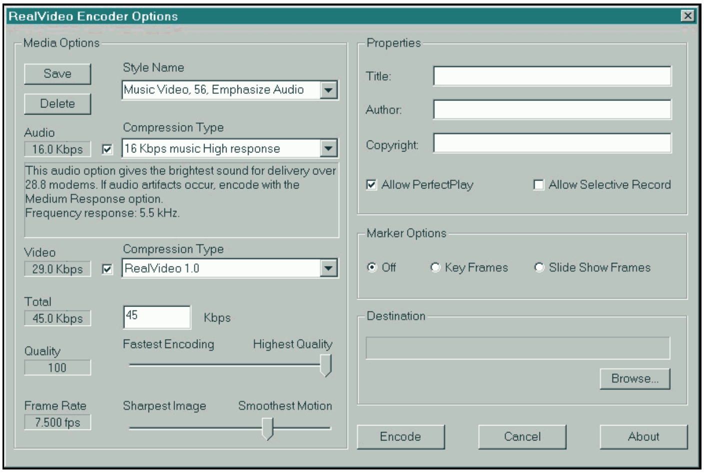
The RealEncoder Adobe Premiere plug-in does not work with Adobe Premiere LE because Premiere LE does not support third party plug-ins.

Encoding with Adobe Premiere 4.2

Adobe Premiere is an advanced editing program that is supported by RealEncoder and RealPublisher. RealEncoder and RealPublisher install an Adobe Premiere plug-in, allowing you to encode directly from Premiere.

To encode RealAudio and RealVideo clips in Adobe Premiere 4.2:

1. Start Adobe Premiere 4.2.
2. Click **Open** from the File menu.
3. Select one of the supported file types. The file appears in the Clip window.
4. Select the Clip window.
5. Click **Export** from the File menu and select **RealEncoder**. The RealEncoder Options window appears (Windows version):



Style Name: Music Video, 56, Emphasize Audio

Audio: 16.0 Kbps ☑ Compression Type: 16 Kbps music High response

This audio option gives the brightest sound for delivery over 28.8 modems. If audio artifacts occur, encode with the Medium Response option.
Frequency response: 5.5 kHz.

Video: 29.0 Kbps ☑ Compression Type: RealVideo 1.0

Total: 45.0 Kbps 45 Kbps

Quality: 100 Fastest Encoding — Highest Quality

Frame Rate: 7.500 fps Sharpest Image — Smoothest Motion

Title:
Author:
Copyright:

☑ Allow PerfectPlay ☐ Allow Selective Record

● Off ○ Key Frames ○ Slide Show Frames

6. In the media options pane, select one of the pre-installed templates.

   These templates are guidelines for creating content containing both audio and video. You can save your own templates, or delete templates that you do not use. If you delete a template you created yourself, it will be permanently deleted. If you delete a template which was installed by RealEncoder, you can get it back by reinstalling RealEncoder.

   Once you have selected a template, you can change any of the audio codecs, any of the video codec settings, or the total bit rate.

7. Click **Optimized Frame Rate** or **Fixed Frame Rate**.

   For all pre-defined templates, the default setting is **Optimized Frame Rate**.

- You can select Optimized Frame Rate when using the RealVideo Standard video codec. Optimized Frame Rate provides constant image clarity, or sharpness, and variable frame rates. When this option is selected, the encoder automatically selects the frame rate.

  For example, if a person who is talking begins to gesture or move around quickly, the frame rate increases as the motion speeds up and decreases as the motion slows down. The image sharpness remains constant throughout.

- You can select Fixed Frame Rate when using the RealVideo Standard video codec or the RealVideo Fractal video codec. Fixed Frame Rate is adjusted by moving the slider. Fixed Frame Rate gives you the option of choosing to emphasize image clarity or motion smoothness.

  For example, if your content contains a lot of motion, set the slider closer to the 15fps setting. The resulting video image will be less clear but will exhibit smoother motion, i.e., more frames per second.

  However, if your content has less motion, set the slider closer to the .050fps setting. The resulting video images will be more clear but will exhibit less smooth motion, i.e. fewer frames per second.

8. Click **Save** to save the template.
9. Click **Close** to close the Advanced Settings window.
10. In the properties pane, enter the Title, Author, and Copyright information for your output file. These fields are optional.
11. Click **Mobile Playback** if you wish to create content that can be downloaded by RealPlayers and transferred to Mobile Players such as the Audible Player for time-shifted playback.

    The Audible Player currently supports the 6.5 Kbps voice codec that is available as part of the RealEncoder 5.0 and RealPublisher 5.0 products. Contact your Mobile Playback vendor if you need more information.
12. If you want to allow RealPlayer Plus users to save your clip to disk, click **Allow Selective Record**.
13. In the Marker Options frame, click the appropriate option. Refer to Marker Options for more information.
14. In the destination pane, click **Select** and enter the name of the output file.
15. Click **Encode**. Adobe Premiere begins encoding the file.
16. When the file is encoded, a Status dialog box appears, providing details about the encoded file. Click **OK**.

Marker Options

Marker options allow you to take advantage of the Marker feature in Adobe Premiere.

- Click **Off** to encode the entire clip regardless of markers. Choosing this option means that you don’t have control over which frames get encoded.
- Click **Key Frames** to encode a marked file. Choosing this option will ensure that all frames that are marked are encoded.
- Click **Slide Show Frames** to encode only the marked frames. Choosing this option allows you to create slide shows out of video files and gives you control over exactly which frames you want to use.
- To set and clear numbered and unnumbered markers, first activate the “clip”
- You can add unnumbered markers by pressing "+" or "=" while in the clip window.
- You can remove any marker by pressing "c" or "v".

Note: The plug-in recognizes both Premiere’s numbered (up to 10 available) and unnumbered markers (up to 1000 available).

Supported File Formats

The RealEncoder plug-in for Adobe Premiere supports all of the file types supported by Adobe Premiere.

Supported Movie File formats are:

- Video for Windows (.avi)
- QuickTime for Windowsand Macintosh (.mov)
- FilmStrip (.flm)

Note: It is strongly recommended you use uncompressed files only

Supported audio formats are:

- Audio Interchange (.aif)
- Windows Waveform (.wav)

Note: Audio source files must be sampled at 11.025, 22.05, or 44.1 kHz. 8-bit and 16-bit mono and stereo audio files are supported.

Synchronized Multimedia

In addition to basic audio and video content, you can create real-time on-demand multimedia presentations using the RMMerge utility included with RealEncoder 5.0 and RealPublisher 5.0 (Windows only). These presentations can be as simple as a narrated slide show of your home page or as intricate as a multi-frame training program that the viewer controls.

RealNetworks RealAudio and RealVideo have the ability to synchronize World Wide Web pages with audio and video. Thus, your audio or video clips can be used as a “time line” to display new pages or frames in the Web browser or to update its content. This enables the creation of Internet slide shows, presentations, guided tours and site walk-throughs. A user can have full random access (fast forward and rewind), and the Web browser content is synchronized with the audio.

Information about these sycnhronized events is embedded within RealAudio and RealVideo streams and delivered to a RealPlayer along with the audio and video data. When this event information is streamed to a RealPlayer, the RealPlayer in turn sends the location of a desired Web page to a Web browser telling it to update the page’s content.

Another way to create a synchronized multi-media presentation is using the RealPlayer plug-in. However, since sending the Web browser to a new URL unloads the RealPlayer plug-in when the HTML page is unloaded, it is best to create separate frames for RealPlayer Controls and for the changing images.

Creating a Synchronized Presentation for RealSystem 5.0

RealEncoder 5.0 and RealPublisher 5.0 allow you to create real time on-demand multimedia presentations. Creating a synchronized presentation is a two-step process.

1. Using a text editor, create an input events file specifying the display time for each URL, title, author or copyright event. For more details, see the "Creating an Input Events File" section in this chapter.

2. After creating a text version of the input events file, you must generate an output presentation file. This is done with the `rmmerge.exe` tool that comes with RealEncoder 5.0 and RealPublisher 5.0. To do this, use the following syntax:

   ```
   rmmerge -f rmevents <event file> <input media file>
   <output media file>
   ```

   where:

   `event file` is the input events file created in the previous step
   `input media file` is your input .rm file
   `output file` is the resulting synchronized presentation file

   For example:

   ```
   rmmerge -f rmevents events.txt audio_video.rm
   output.rm
   ```

Creating a Synchronized Presentation for RealAudio 3.0 Systems

If you are still using RealAudio Encoder 3.0 to create real time on-demand multimedia presentations, creating a synchronized presentation is a three-step process:

1. Using a text editor, create an input events file specifying the display time for each URL, title, author or copyright event. For more details, see the "Creating an Input Events File" section above.

2. After creating a text version of the input events file, you must convert the file to a binary event file. This is done with the `cevents32.exe` command line utility that comes with your RealAudio Encoder. To do this, use the following syntax:

   ```
   cevents32 <input event file> <output event file>
   ```

where:

`<input event file>` is the input events text file you just created
`<output event file>` is the output binary events the file that will be associated with your encoded audio file.

For example, to a create synchronized multimedia presentation to accompany paradise.ra, you would generate paradise.rae using the following command:

```
cevents32 paradise.txt paradise.rae
```

3. Place the resulting .rae file in the same directory as the .ra audio file. The .ra and .rae files must have the same name except for the file extension. The RealServer automatically detects the file and send the event information to a RealPlayer, which then sends it a Web browser.

Creating an Input Events File

Begin by creating a list of the URLs, titles, authors, or copyrights that you want to be shown during your presentation and the times within RealAudio or RealVideo clip when they should be displayed. The syntax for each entry should follow the format (with a space between each part of the command):

```
u starttime endtime EventURL
i starttime endtime Title
a starttime endtime Author
c starttime endtime Copyright
```

where:

`u` stands for URL event; each line starts with the letter u
`i` stands for title; each line starts with the letter i
`a` stands for author; each line starts with the letter a
`c` stands for copyright; each line starts with the letter c
`starttime` is the time into the clip when the new event is shown
`endtime` is the time into the clip when that event ends
`EventURL` (generally beginning with “http:” or “file:”) is the Internet address for that event (usually an HTML document)

The time for `starttime` and `endtime` is:

```
[[[days:]hours:]minutes:]seconds[.tenths]
```

The lines of the input file must be in ascending order of start time. The end time should be at least one tenth of a second before the start time of the next event. The following example shows how an input file might look:

```
u 00:00:10.0 00:00:59.9 http://www.real.com/
u 00:01:00.0 00:02:00.0 http://www.mysite.com/ page2/
```

This input file tells RealPlayer to send the Web browser to the RealNetworks home page ten seconds into the audio clip. One minute into the audio clip, the Web browser displays a page from "www.mysite.com".

The input file may also contain comment lines beginning with the # symbol. These comment lines are ignored by the event creation tool and are a good way to document the date that the file was created and the type of information found on each page.

Using Synchronized Multimedia from Local Files

RealPlayer can also read local synchronized presentation files just as the RealServer does. In order for the local presentation to work with multiple platforms and with both Internet Explorer and Netscape Navigator, without hardcoding the directory structure, you need to follow these steps.

To play a synchronized presentation file locally:

1. Place all .rpm/.ram, .rm, .ra, .rae, HTML and image files in one directory. The starting document should be named Index.html.
2. Do not use /'s in your file names. Use the following syntax:

   ```
   u 00:00:10.0 00:00:45.0 &&media&&test2.html
   ```

   Note: You cannot use relative path commands like ../ if you want the presentation work on a Macintosh.

Using Synchronized Multimedia with Bandwidth Negotiation

When you deliver a Synchronized Multimedia presentation using Bandwidth Negotiation, you can choose to deliver the same event for all encoding formats, or you can choose to deliver different events for each encoding format.

You can create a single synchronized multimedia presentation for multiple formats, or you can create a different multimedia presentation for each encoding format. If you are working with previously created content, you can continue to use the previous method to create presentations. For new content, refer to the “Synchronized Multimedia”chapter.

Frames: The Basics

Some Web browsers support a feature which allows the browser window to be divided into multiple regions. Each region is called a frame and can display a separate URL such as a graphic or document. For an introduction to frames visit Netscape’s Web site at:

www.netscape.com

If you are unfamiliar with frames the following two sites provide a good introduction:

Understanding Frames

www.netscape.com/navigate/understanding_frames.html

Frames: An Introduction

www.netscape.com/assist/net_sites/frames.html

Editing Audio and Video Files

If you want to edit your audio and video files, you have two options—you can edit your .rm files, or you can edit your original source files.

Editing the original source files is the editing method of choice. However if you choose to edit your .rm files, you can use the Windows editing utility, RMTools, and DOS: RMEdit, RMPaste and RMDump which enable simple editing of RealVideo files. Encoded video files are stored in indivisible clips of varying duration depending on the encoding algorithm and the video bit rate. This limits how precisely encoded video can be cut and pasted.

Editing RealAudio and RealVideo Files

RMTools, the Windows 95 and Windows NT editing utility, is installed with RealEncoder and RealPublisher. This utility enables you to perform three basic editing tasks:

- Edit the file properties
- Examine the contents of a file
- Edit the data of a file.

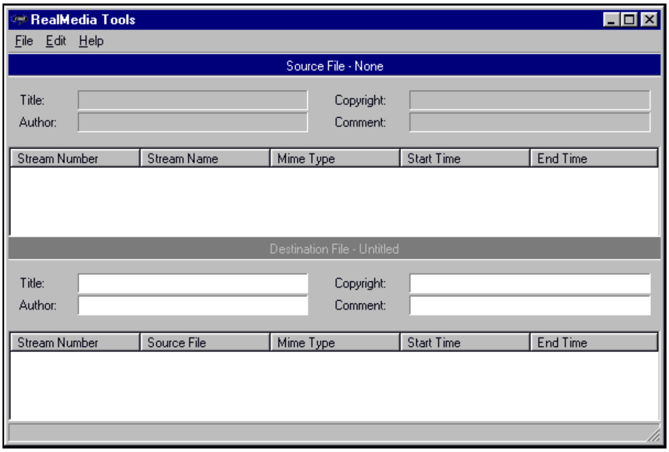
Editing File Properties

RMTools allows you to edit the static information about the file: title, author, copyright, and comment as well as the stream name and mime type for each individual stream. You can also enable or disable Mobile Playback or Selective Record. Editing the file properties does not affect the data.

To edit file properties of RealAudio and RealVideo files using RMTools:

1. Click **Start**. From **Programs,** select **Real**.

2. Select **RealMedia Tools.** The RealMedia Tools window appears. Notice the window is divided into two panes, the source file pane on top and the destination file pane on the bottom.

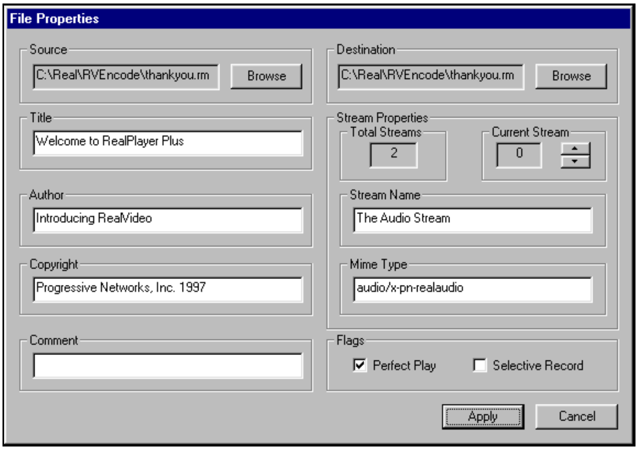


3. Select **Open Source** from the File menu. The Open File dialog box displays. Select the file you want to edit. The file properties information is displayed in the source file window.

4. To sort by the stream attribute, click the column. You can also resize the columns by placing the cursor over the column border and then clicking-and-dragging.

5. Select **File Properties** from the Edit menu. The File Properties dialog box appears. The file name is displayed in the source box and in the destination

box. New file names can be selected by clicking **Browse** and selecting a new file from the dialog box.



Source: C:\Real\RVEncode\thankyou.rm

Destination: C:\Real\RVEncode\thankyou.rm

Title: Welcome to RealPlayer Plus

Author: Introducing RealVideo

Copyright: Progressive Networks, Inc. 1997

Comment:

Total Streams: 2

Current Stream: 0

Stream Name: The Audio Stream

Mime Type: audio/x-pn-realaudio

Flags: ☑ Perfect Play ☐ Selective Record

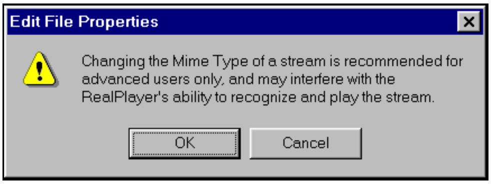
6. To save changes to the existing file, do not change the destination file name. To save the changes to a new file, click **Browse** to select or enter a different name in the destination box.

7. Type the new title name, author, copyright information, and any comment in the appropriate boxes. (You can also type a new title, author, copyright, or comment directly in the fields on the source and destination panes.)

8. The total number of streams is listed in the Stream Properties box. If you want to change the name or the mime type of one stream, select the stream to be changed by clicking the up or down arrow.

9. If you want to change the stream name, type the new name in the Stream Name box.

10. Changing the mime type is recommended for advanced users only. If you are certain you wish to change the mime type, type the new mime type in the Mime Type box. If you change the mime type, the following warning will appear after you have applied the changes.



Changing the Mime Type of a stream is recommended for advanced users only, and may interfere with the RealPlayer's ability to recognize and play the stream.

11. Click **Mobile Playback** if you wish to create content that can be downloaded by RealPlayers and transferred to Mobile Players such as the Audible Player for time-shifted playback.

    The Audible Player currently supports the 6.5 Kbps voice codec that is available as part of the RealEncoder 5.0 and RealPublisher 5.0 products. Contact your Mobile Playback vendor if you need more information.

12. If you want to allow RealPlayer Plus users to save your clip to disk, click **Selective Record**.

13. Click **Apply**. The changes are applied to the file and displayed in the source file pane of the RealMedia Tools window.

Examining the Contents of a RealAudio or RealVideo File

RMTools enables you to view the contents of an .rm file by dumping the contents to a text file. You can then edit or print the file as you would any other text file.

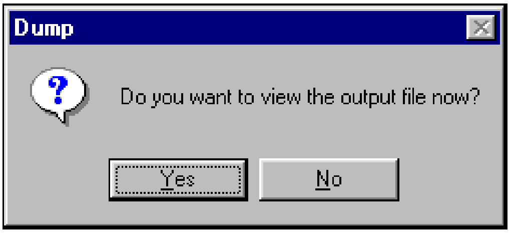
To examine the contents of a RealAudo or RealVideo file:

1. Select **New Session** from the **File** menu.

2. Open the Source file from the File menu. The file information is displayed in the source pane.

3. Select **Dump** from the File menu. The Dump As dialog box appears. The default name is the same as the source file name, with the extension changed to .txt. You may also select or enter another dump file name.

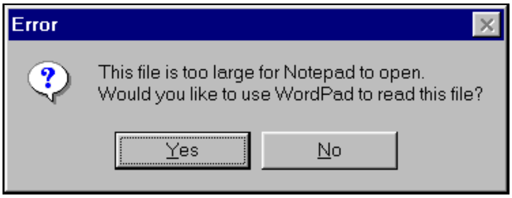
4. Click **Save**. When prompted to view the file now, click **Yes**.



Dump

Do you want to view the output file now?

5. The following error message may appear. If so, click **Yes**. The Notepad or WordPad window displays the contents of the file. For an example of an .rm text file, refer to the “Command Line Editing of RealAudio and RealVideo Files” section.



Error

This file is too large for Notepad to open.
Would you like to use WordPad to read this file?

6. You can view, edit, and print the file just as you would any other text file.

Editing RealAudio and RealVideo Data

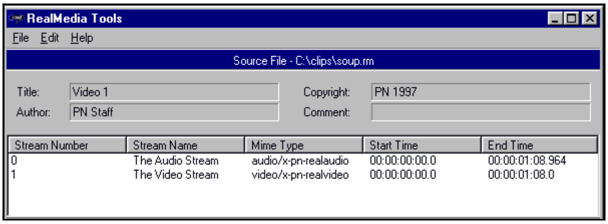
RMTools allows simple editing of .rm files. You can put multiple clips in one file; you can shorten the length of a clip; and you can take a video stream from one file and add the audio stream from another file. When working with more than one file, streams of the same mime type must have the same encoding parameters if they are going to be pasted together.

To place two RealVideo clips in one file:

1. Select **New Session** from the File menu.

2. Select **Open Source** from the File menu. The Open File dialog box appears.

3. Select the file you want to edit. Click **Open**. The source file pane displays the stream number, the stream name, mime type, and the start and end times.

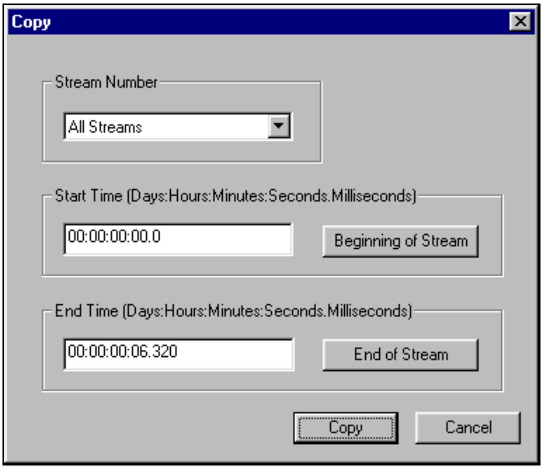


Source File - C:\clips\soup.rm

Title: Video 1
Author: PN Staff
Copyright: PN 1997
Comment:

Stream Number	Stream Name	Mime Type	Start Time	End Time
0	The Audio Stream	audio/x-pn-realaudio	00:00:00:00.0	00:00:01:08.964
1	The Video Stream	video/x-pn-realvideo	00:00:00:00.0	00:00:01:08.0

4. Select **Copy** from the Edit menu. The Copy dialog box appears.



Stream Number: All Streams

Start Time (Days:Hours:Minutes:Seconds.Milliseconds): 00:00:00:00.0

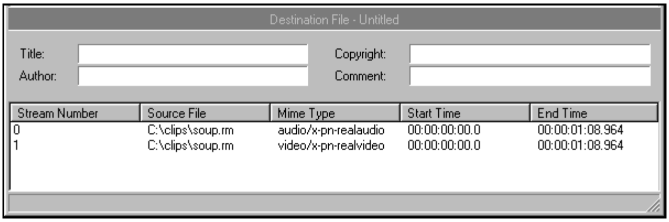
End Time (Days:Hours:Minutes:Seconds.Milliseconds): 00:00:00:06.320

5. In the Stream Number box, accept the default, **All Streams**.

6. Do not change the start and end times. Click **Copy**.

7. Select **Paste** from the Edit menu. The Paste dialog box appears.

8. Click **Paste**. The destination pane displays the stream number, source file, mime type, start time and end time.



Stream Number	Source File	Mime Type	Start Time	End Time
0	C:\clips\soup.rm	audio/x-pn-realaudio	00:00:00:00.0	00:00:01:08.964
1	C:\clips\soup.rm	video/x-pn-realvideo	00:00:00:00.0	00:00:01:08.964

9. Right-click the source pane. A shortcut menu appears. Click **Open Source**. Choose a second clip to be added at the end of the first clip. (Both clips must have the same encoding parameters.)

10. Click **Open**. The source pane displays the information from the new file while the destination pane displays the information from the streams that were previously pasted.

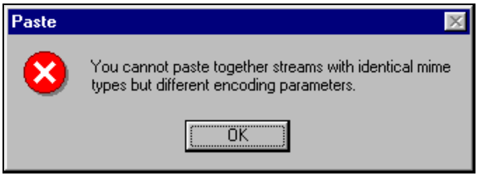
11. Select **Copy** from the Edit menu.

12. Accept the default, **All Streams**, and the start and end times. Click **Apply**.

13. Right-click the destination pane. A shortcut menu appears. Click **Paste**. The Paste dialog box appears. The previous end time displays as the new start time.

14. Click **Paste**. The second clip is listed below the first clip.

15. If the following warning displays, you must select a different clip or re-encode the clip so that the encoding parameters are the same.



You cannot paste together streams with identical mime types but different encoding parameters.

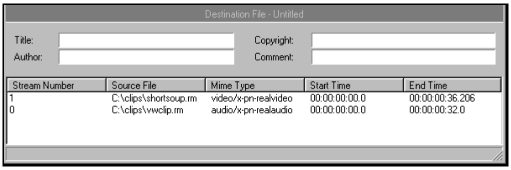
16. Select **Save As** from the File menu. The Save As dialog box appears.

17. Type the new file name. Click **Save**.

18. Use RealPlayer to view the new file.

To put the video stream of one file with the audio stream of another:

1. Select **New Session** from the **File** menu.
2. Select **Open Source** from the **File** menu. The Open File dialog box appears.
3. Select the first file you want to edit. Click **Open**. The source file pane displays the information from the file.
4. Select **Copy** from the Edit menu. The Copy dialog box appears.
5. In the Stream Number box, select the stream that contains the video. Click **Copy**.
6. Select **Paste** from the Edit menu. The Paste dialog box appears.
7. Click **Paste**. The destination pane displays the information from the new file. Notice only the video stream has been pasted into the destination pane.
8. Right-click the source file pane. A shortcut menu appears. Click **Open Source**.
9. Choose a second file with the same encoding parameters as the first clip, and of approximately the same duration. Click **Open**. The source pane displays the information from the file.
10. Right-click the source pane. A shortcut menu appears. Click **Copy**. The Copy dialog box appears.
11. In the Stream Number box, select the stream that contains the audio. Do not change the start and end times.
12. Click **Copy**.
13. Right-click the destination pane. A shortcut menu appears. Click **Paste**. The Paste dialog box appears.
14. Click **Paste**. The audio stream is listed below the video stream. Notice both streams have the same start time, and should have similar end times.



Stream Number	Source File	Mime Type	Start Time	End Time
1	C:\clips\shortsoup.rm	video/x-pn-realvideo	00:00:00:00.0	00:00:00:36.206
0	C:\clips\vwclip.rm	audio/x-pn-realaudio	00:00:00:00.0	00:00:00:32.0

15. Select **Save As** from the File menu. The Save As dialog box appears.

16. Type the new file name. Click **Save**.

17. Use RealPlayer to view the new file.

Command Line Editing of RealAudio or Real Video Files

The RealVideo file editing tools, RMCut, RMPaste, RMEdit, and RMDump are run from a DOS command line. The RMCut tool is used to cut a specific portion of a RealVideo file without changing the original source. The RMPaste tool is used to combine two or more RealVideo files. The RMEdit tool is used to modify the title, author, copyright, comment, mime type, or stream name. It can also be used to print the current values for the file or stream. The RMDump tool is used to examine the contents of a RealVideo file.

Editing RealVideo Files

RMEdit has five separate forms. The first form modifies any or all of the title, author, copyright, and comment for the file.

```
rmedit -i input -o output [-t title]
[-a author] [-c copyright] [-C comment]
```

The second form modifies any or all of mime type and stream name for the selected stream.

```
rmedit -i input -o output (-S stream number [-m
mimetype] [-s stream name])
```

The third form prints out the current values for the file and for each stream that RMEdit is capable of modifying.

```
rmedit -i input
```

The fourth form sets or clears Mobile Playback mode and Selective Record.

```
rmedit -i input -o output [-r [ON|OFF]] [-p
[ON|OFF]]
```

The fifth form prints the RMDump version and copyright notice.

```
rmedit -v
```

where:

`<input>` is the path and file name to the input file.
`<output>` is the path to the output file that contains the edited file.
`<title>` is the title text.
`<author>` is the author text.
`<copyright>` is the copyright text.
`<comment>` is the comment text.
`<stream number>` is the stream number for the following two parameters. (May be repeated for any number of streams.)
`<mimetype>` is the mimetype for a specified stream.
`<stream name>` is the stream name for a specified stream.
`-v` prints the RMDump version and copyright notice.
`-k` is the mobile playback mode.
`-r` is the set/clears selective record.

Note: Only valid mime types (those accepted by the player) should be entered in the mime type field.

Note Input and output file names must not be the same.

The following examples demonstrate the use of the RMEdit tool:

1. To create a new file modifying the title, enter:

```
rmedit -i original.rm -o newfile.rm -t ″My New Title″
```

2. To change the stream name of stream 1, enter:

```
rmedit -i original.rm -o newfile.rm -S1 -s ″New Stream Name″
```

3. To display the current contents of the file, enter:

```
rmedit -i original.rm
```

Note: Long file names are acceptable, but file names containing spaces must be contained in quotes.

Cutting RealAudio or RealVideo Files

Use the RMCut tool to cut a specific portion of a RealAudio or RealVideo file without modifying the original source. A cut is made by setting the start and end times for individual streams. Not entering a start time defaults to the beginning of the file and likewise, not entering an end time defaults to the end of the file. RMCut can be used without RMPaste to remove the front or end of a file.

To create a copy of a piece of a RealAudio or RealVideo file:

1. View your original RealAudio or RealVideo file to determine the start and end times of the segment you want to copy (you can read the times on the status bar of RealPlayer).

2. Create a copy by typing:

```
rmcut -i input ([-S stream] [-s start] [-e end]) -o output -v
```

where:

`<input>` is the path to the input file
`<stream>` is the stream number. If not specified, all streams are used. It can be repeated to grab one or more streams.
`<start>` is the start time in Days:Hours:Minutes:Seconds.Milliseconds format. If missing, this parameter defaults to the beginning of the file.
`<end>` is the end time in Days:Hours:Minutes:Seconds.Milliseconds format. If missing, this parameter defaults to the end of the start+input length. (Multiple start end sequences can be used to cut discontinuous portions of the stream.)
`<output>` is the path to the output file that contains the edited file.
`-v` is the print version and copyright notice

Note: An image map stream's start and end times must go from the beginning to the end of the file. Use RMCut to strip out the image map before working with the RealAudio or RealVideo file. Then, to alter and re-merge the image map file with the video image, refer to the “Image Maps” section in the chapter “Editing Video Files.”

The following examples demonstrate the use of the RMCut tool.

1. To create a new file with only stream zero, enter:

   ```
   rmcut -i source.rm -o cutfile.rm -S0
   ```

2. To create a new file with the first 30 seconds of stream 0:

   ```
   rmcut -i source.rm -o cutfile.rm -s0.0 -e30.0
   ```

3. To create a new file with the first 30 second of stream 0 and with the first 45 seconds of stream 1, enter:

   ```
   rmcut -i source.rm -o cutfile.rm -S0 -s0.0 -S1 -s0.0 -e45.0
   ```

Examining the Contents of RealAudio or RealVideo Files

RMDump is used to examine the contents of a RealAudio or RealVideo file. RMDump accepts two input parameters: the input file and the output file.

To use RMDump, type:

```
rmdump -i infile -o outfile
rmdump -v
```

Where:

`<infile>` is the input .rm extension file
`<outfile>` is the output text file (use a text editor to view)
`<-v>` prints the RMDump version and copyright notice.

An example of how to run RMDump is shown below:

Example

```
>rmdump -i input.rm -o out.txt
dumping input.rm to out.txt . . .
dumping realmedia headers . . .
dumping stream packets
dumping stream 0 . . .
dumping stream 1 . . .
done
! Elapsed time = 556 milliseconds
```

The next step is to use an editor like Notepad on Windows NT/95 to examine the contents of the RMDump.

```
RealMedia File: input.rm
================
RM_HEADER_OBJECT
... deleted to save space ...
====================
RM_PROPERTIES_OBJECT
... deleted to save space ...
====================
RM_CONTENT_OBJECT
... deleted to save space ...
==========================
RM_MEDIA_PROPERTIES_OBJECT
object_id: 0x4D445052 (RPDM)
size: 155 bytes
object version: 0
stream_number: 0
max_bit_rate: 12062 bps
avg_bit_rate: 12062 bps
max_packet_size: 288 bytes
avg_packet_size: 288 bytes
start time: 0 milliseconds
preroll: 191 milliseconds
duration: 224898 milliseconds
stream_name: The Audio Stream
mime_type: audio/x-pn-realaudio
type_specific_length: 73
==========================
RM_MEDIA_PROPERTIES_OBJECT
object_id: 0x4D445052 (RPDM)
size: 116 bytes
object version: 0
stream_number: 1
max_bit_rate: 7000 bps
avg_bit_rate: 7000 bps
max_packet_size: 668 bytes
avg_packet_size: 564 bytes
start time: 0 milliseconds
preroll: 3474 milliseconds
duration: 228000 milliseconds
stream_name: The Video Stream
mime_type: video/x-pn-realvideo
type_specific_length: 34
====================
RM_DATA_OBJECT
... deleted to save space ...
==========================
Seek Time: 1 with reqtime = 0 and actualtime = 0
packet  0:  stream 0  timestamp    0  size: 288 keyframe
packet  1:  stream 1  timestamp    0  size: 639 keyframe
packet  2:  stream 1  timestamp    0  size: 619 keyframe
packet  3:  stream 1  timestamp    0  size: 599 keyframe
packet  4:  stream 1  timestamp    0  size: 544 keyframe
packet  5:  stream 1  timestamp    0  size: 639 keyframe
packet  6:  stream 0  timestamp  192  size: 288 keyframe
packet  7:  stream 0  timestamp  384  size: 288 keyframe
packet  8:  stream 0  timestamp  575  size: 288 keyframe
packet  9:  stream 0  timestamp  767  size: 288 keyframe
packet 10:  stream 0  timestamp  958  size: 288 keyframe
packet 11:  stream 0  timestamp 1150  size: 288 keyframe
packet 12:  stream 0  timestamp 1341  size: 288 keyframe
packet 13:  stream 0  timestamp 1533  size: 288 keyframe
packet 14:  stream 0  timestamp 1724  size: 288 keyframe
packet 15:  stream 0  timestamp 1916  size: 288 keyframe
packet 16:  stream 0  timestamp 2108  size: 288 keyframe
packet 17:  stream 0  timestamp 2299  size: 288 keyframe
packet 18:  stream 0  timestamp 2491  size: 288 keyframe
```

The RM_MEDIA_PROPERTIES_OBJECT sections describe the stream type and stream number for each stream.

- The keyframe field is used to identify the start of a series of related packets.
- Keyframes are sometimes too large to form a single packet. In this case multiple keyframes will be seen with the same timestamps.
- Some codecs produce packets with the keyframe flag always set. And others produce a mixture of keyframe and non keyframe packets.
- Packet sizes can be identical in size or vary in size within a single stream.
- The RM_MEDIA_PROPERTIES_OBJECT sections contain attributes of each stream which include:
    1. The stream number.
    2. The stream type.
    3. The total stream type (audio or video).
    4. The total duration of the stream in milliseconds.

5. The preroll which describes how long to load buffers into the player before playing the stream.

Combining RealAudio or RealVideo Files

RMPaste assumes that streams on the input side are joined to streams on the output side based upon their mime types. Start and End times are specified to map the input file, which may contain one or more streams, to a new time range in the output file. Only one file can use default start and end times. Start and end times must not overlap. If streams overlap, packets from both streams are intermingled based upon timestamp.

```
rmpaste (-i <input> [-s <start>] [-e <end>]
[-f <from stream> -t <to stream>]) -o <output> -v
```

where:

`<input>` is the path to the input file. There can be one or more -i -s -e parameters sequences.
`<start>` is the start time in Days:Hours:Minutes:Seconds.Milliseconds format. If missing this parameter defaults to the beginning of the file.
`<end>` is the end time in Days:Hours:Minutes:Seconds.Milliseconds format. If missing this parameter defaults to start+input length.
`<output>` is the path to the output file that contains the edited file.
`<from stream>` is the input stream number to be sent to the to stream.
`<to stream>` is the output stream number.
`-v` is the print version and copyright notice.

Note RMPaste can paste in additional streams and add to existing streams. When streams are pasted together, the timestamps must not overlap.

Note If multiple streams are in the input file and the timestamps of the streams do not start at the same time, the start time applies to the earliest stream in the file. The start time plus the difference between the streams first packet is used for the remaining streams. See first example.

The following examples demonstrate the use of the RMPaste tool:

1. If you cut three streams from a source file using:

```
rmcut -i source.rm -o cutfile1.rm -S0 -s10.0 -S1 -s20.0 -S2 -s30.0
```

resulting in an output file like:

Times

Stream0:	0.3	1.1	….
Stream1:	10.4	12.4	….
Stream2:	22.0	32.0	....

and mapped it using:

```
rmpaste -i cutfile1.rm -s5.0 -i cutfile2.rm -e5.0 -o paste.rm
```

the new stream times for cutfile1.rm would be:

Times

Stream0:	5.3	6.1	….
Stream1:	15.4	17.4	….
Stream2:	27.0	37.0	....

with cutfile2.rm placed from the beginning of the file to 5 seconds into the file. (packets not shown)

2. To create a new file using the first 60 seconds of the source.rm file swapping the first 45 seconds with the next 15 seconds in the file enter:

```
rmcut -i source.rm -o cutfile1.rm -s0.0 -e45.0
rmcut -i source.rm -o cutfile2.rm -s45.0 -e60.0
rmpaste -o newfile.rm -I cutfile2.rm -s0.0 -e15.0 -I cutfile1.rm -s15.0 -
e60.0
```

3. To add a new stream to an existing file:

```
rmpaste -I original.rm -I newstream.rm -o newfile.rm
```

Image Maps

"Click-able" image maps allow users to interact with the video content by adding image-specific video seeking and URL commands. Image maps are fully customizable; actions can be connected to rectangular, circular or polygonal content regions and can be varied over specific user-defined time intervals.

To create Image Maps:

1. Create an Image Map File (text file).
2. Merge the Image Map file (with a .rm file).

Creating an Image Map File

Image Map Files are text files that have HTML-like tags which specify the location and action of each image map. Image map files should be created in a text editor and saved as text only.

All tags shown below are required unless otherwise stated. Negative values for numbers are not allowed.

DURATION Tag

This tag must be at the beginning of the file. The DURATION tag specifies the amount of time from the start time of the first map to the end time of the last map in the file. The format is as follows:

DURATION=x:x:x:x:x

Tag Name	Description
DURATION	Times are specified in the following format: Days:Hours:Minutes:Seconds:MilliSeconds. All of the these fields must be present. That means if you don't want to specify a particular setting, fill 0's in that space.

MAP Tag

This line describes the overall properties of the image map. You may have as many MAP tags in a file as you wish. The format is as follows:

<MAP START=x:x:x:x:x END=x:x:x:x:x COORDS=x,y,x1,y1>

Tag Name	Description
START	Times are specified in the following format: Days:Hours:Minutes:Seconds:MilliSeconds. All of the these fields must be present. That means if you don't want to specify a particular setting, fill 0's in that space. If START contains all 0's then the start of the clip is assumed.
END	Times are specified in the following format: Days:Hours:Minutes:Seconds:MilliSeconds. All of the these fields must be present. That means if you don't want to specify a particular setting, fill 0's in that space. If END contains all 0's then the end of clip is assumed.
COORDS	Specifies the rectangle that this entire map is going to occupy. If you enter an area bigger than the entire display area, the entire area is active. Any area not located within this rectangle will be clipped.

Note: Using the /MAP tag means you are done with the current image map.

AREA Tag

There can be 0 to 40 area lines in an image map. These lines describe the different regions that are active within an image map.

<AREA START=x:x:x:x:x END=x:x:x:x:x SHAPE=XXXX
COORDS=x0,y0,x1,y1,x2,y2,…xn,yn action_tag ALT="" >

Tag Name	Description
START	Specifies the start time of this area during the map. This field is optional; if you do not include a START time, the area begins at the beginning of the map time. Times are specified in the following format: Days:Hours:Minutes:Seconds:MilliSeconds. All of the these fields must be present. That means if you don't want to specify a particular setting, fill 0's in that space. If START contains all 0's then the start of the current map is assumed.
END	Specifies the end time of this area during the map. This field is optional; if you do not include an END time, the area ends at the end of the map time. Times are specified in the following format: Days:Hours:Minutes:Seconds:MilliSeconds. All of the these fields must be present. That means if you don't want to specify a particular setting, fill 0's in that space. If END contains all 0's then the end of map is assumed. **Note** If the start and end times of an area are outside the start and end times of the map, then the start and end times of the map are used.
SHAPE	The XXXX for the SHAPE tag can be one of the following values: (CIRCLE, RECTANGLE, POLYGON). CIRCLE - COORDS tag should specify three values: centerX,centerY,radius RECTANGLE - COORDs tag should specify four values: left,top,right,bottom POLYGON - COORDs tag should specify at least 6 values (x and y coordinates for at least 3 points). These are the vertices for the polygon.

action_tag	The action_tag is one of the following: PLAYER, URL, SEEK.
	PLAYER - Used to specify a new stream to play with RealPlayer. For example:
	`PLAYER="pnm://video.real.com/welcome.rm"`
	URL - Used to specify a new URL to display in a browser. For example:
	`URL="http://www.real.com"`
	SEEK - Used to specify a time within the current clip to seek to. For example:
	`SEEK=0:0:0:5:0.`
	Note the format is just like the START and END tags.

ALT	The ALT tag contains text that appears in the status bar of the player when the mouse is over this AREA and it is active. If you want no text then use "" as shown above.

Image Map Example

```
DURATION=0:0:0:40:0

<MAP START=0:0:0:0:0 END=0:0:0:5:20 COORDS=0,0,100,100>

<AREA SHAPE=CIRCLE COORDS=50,50,10
     URL="http://www.real.com" ALT="Home Page">

</MAP>

<MAP START=0:0:0:5:20 END=0:0:0:20:3 COORDS=0,0,100,100>

<AREA SHAPE=RECTANGLE COORDS=0,0,50,50 SEEK=0:0:0:3:98
     ALT="Seek to a point in the clip">

</MAP>

<MAP START=0:0:0:20:3 END=0:0:0:40:0 COORDS=0,0,100,100>

<AREA END=0:0:0:30:0 SHAPE=POLYGON COORDS=0,50,50,0,100,50
     PLAYER="pnm://video.real.com/welcome.rm" ALT="">

<AREA START=0:0:0:31:0 SHAPE=POLYGON
     COORDS=0,25,25,0,100,50 SEEK=0:0:0:0:0 ALT=”Rewind to
     Beginning”>

</MAP>
```

Merging an Image Map File with a Video Image

When you have finished creating the Image Map file, you convert the Image Map text file into a .rm file using the RMMerge tool that is installed with RealEncoder and RealPublisher . Then, you merge that .rm file with an encoded video (.rm) file.

To convert the Image Map file into a .rm file:

1. From a DOS command line, change directories to the directory that RealEncoder or RealPublisher was installed, which by default is C:\REAL\RVENCODE
2. Enter the following command:

```
rmmerge -f rmimap.dll image_map_text image_map_rm
```

Done..... appears when the image map text file has been converted to a .rm file.

Note: If you receive the message Error Parsing file, verify that the Image Map file is saved as text only and the tags are used correctly.

3. Merge the Image Map .rm file with a video (.rm) file by typing the following command:

   ```
   rmmerge image_map_rm video_rm final_rm
   ```

   The final_rm file contains your Image Map as well as the audio/video clip.

4. Verify the Image Map by playing the final_rm file with RealPlayer.

Modifying RealAudio and RealVideo File Descriptions

You can change the Title, Author, or Copyright text, and modify the Selective Record and Mobile Playback settings in a .rm file using several different methods:

Method	Description
RMTools	The is the editing tool available for Windows 95 and Windows NT. Refer to the“Editing File Properties” section.
RMEdit Tool	This is a command line tool available for Windows. Refer to the “Command Line Editing of RealVideo Files” section.
.ram File	Set the Title, Author, and Copyright text strings in the .ram file. Refer to the “Metafiles”section of the “Configuring Your Web Site” chapter.

Advanced Editing

For advanced editing of RealAudio and RealVideo, the following programs are recommended:

- Adobe Premiere
- In sync Kohesion

Publishing to the Web

RealPublisher is an enhanced version of RealEncoder and offers Web publishing features including:

- automatic HTML page creation
- easy uploading of HTML pages to either a standard HTTP Web server or a RealNetworks RealServer

Creating Web Pages (HTML)

A primary feature of RealPublisher is the HTML Generation Wizard. With it you can automatically create an HTML page that contains your encoded media file and play back the media file through your Web browser.

The wizard leads you a series of prompts to help you create the HTML file and choose how your Web page will look displayed either with a Pop-up Real Player Embedded RealPlayer. The wizard then allows you to preview the finished page.

The **Pop-up RealPlayer** application is launched and run from the browser and uses a standard display window and controls. The **Embedded RealPlayer** is a Netscape or Active X plug-in that allows you to integrate components of RealPlayer within your Web page. With it you can also customize the controls and design of your Web page.

To create a Web page displaying a pop-up RealPlayer (single audio or video data rate file):

1. Start **RealPublisher**. The RealPublisher window opens.
2. Click **Create HTML**. The HTML Generation Wizard window appears.
3. Click **Next** to select a media file. The Media File page appears.

4. Click **Encoded File**.
5. If you are creating a Web page for bandwidth negotiated files click **Bandwidth Negotiation**.
6. The name of the last file encoded appears by default: If you wish to use the default file, click **Next.**
7. To select the name of a different file, click **Browse**. The Select File dialog box appears. Select the file and click **Open**.
8. The Playback Method page appears. Click **Next**.
9. Click **Pop-Up Player** and click **Next**.
10. The RealMedia caption name page appears. This name is what viewers will will use to select this content.
11. Enter caption name and click **Next.**
12. The Filename page appears. Enter name of HTML file you want to create and click **Next.**
13. If you wish to preview your HTML page with a Web browser, click **Preview HTML** on the Results page.
14. When preview is completed, click **Finish.**

To create a Web page displaying an embedded RealPlayer (single audio or video data rate file): (single audio or video data rate file):

1. Follow steps 1-6 for displaying pop-up RealPlayer.
2. Click **Embedded RealPlayer** and click **Next**.
3. The Player Control page appears. Select player control layout from the available templates. Click **Next**.
4. Select player control layout from the available templates and click **Next**.
5. Click **Auto Start** if you wish the RealAudio or RealVideo file to automatically launch when Web page is displayed.

6. The RealMedia caption appears. This name is that viewers will use to select this content.

7. Enter caption name and select caption placement by clicking **Place Caption Above Embedded Player** button or **Place Caption Below Embedded Player** button. Click **Next**.

8. The Filename page appears. Enter name of HTML file you want to create and click **Next.**

9. If you wish to preview your HTML page with a Web browser, click **Preview HTML** on the Results page.

10. When preview is completed, click **Finish.**

Note: Keep in mind that the web pages you create with the HTML wizard will initially point to media files located on your local hard drive. When you upload your pages to a remote web server, these local file references will automatically be updated. You should avoid making manual changes to any HTML files created by the HTML wizard. Alterations to these files or any file references contained in the associated .ram/.rpm metafile may cause errors when publishing Web pages to a remote server.

Automatic Creation of Metafiles

A metafile connects a Web page to one or more RealAudio or RealVideo clips located on a remote server. The function of a metafile is to “point” to the location where your media file actually resides and is required for your file to “stream”, not just download and play. Typically, a metafile is located on the Web server and contains the URL where your RealAudio or RealVideo clips can be found. Metafiles are automatically created and updated by RealPublisher during the Web page creation and publishing steps.

Metafiles created by the RealPublisher during the “Create HTML” process reside on your local hard drive and point to files on your local file system. When you publish with the RealPublisher, they are automatically updated to the servers where your media files are sent.

Publishing Your Files

Another primary feature of RealPublisher is the Publish-to-Server Wizard. It allows users to publish their RealAudio and RealVideo-enabled Web page to a remote server. The server can be either a RealNetworks RealServer or a standard HTTP Web server using a standard FTP protocol.

The wizard leads you through a series of prompts to help you specify the type of server and the directory where you will upload your page. You can also specify the name of the Web server and the URL path where your Web page will be located. The wizard then allows you to preview the finished page.

Remember that when you upload your Web pages to a remote server, RealPublisher automatically updates your HTML and .ram/.rpm metafile to point to the appropriate server addresses, directories and files.

To avoid confusion during the publishing process, two worksheets have been provided for you below: one for simple HTTP streaming and the other for streaming your media files from a RealServer. It is recommended you complete the appropriate worksheet before you begin.

Worksheet 1:
Publishing a File to Stream from an HTTP Web Server

If you are using a standard HTTP Web server to stream RealAudio or RealVideo, you should obtain the following information from your system administrator or ISP. For simple HTTP streaming, your Web page and media file will be copied to the same location.

1. **File Server**: Name or IP address of the file server that your Web page will be uploaded to. For example: **ftp.server.com**.
____

2. **Directory**: Name of the directory on the file server where your Web page will be uploaded to. For example, if the personal directory assigned to you by your system administrator is 'htmlpages', enter **htmlpages** as the directory name. ***Note:*** *The directory field is optional and may be left blank. This is because on certain servers you may be automatically placed in your personal directory when you log in.* ____

3. **Web Server**: Name or IP address of the Web server users will use to locate your Web page. For example, if the full URL users will use is **http://www.server.com/htmlpages/file.htm**, enter **www.server.com** as the Web server name. ____

4. **URL Path**: The URL path on the Web server that users will use to locate your Web page. For example, if the full URL is **http://www.server.com/htmlpages/file.htm**, enter **htmlpages** as the URL path.
____

Worksheet 2:
Publishing a File to Stream Directly from a Real Server

If you are using a RealServer to stream RealAudio or RealVideo, you will need to obtain the following information from your system administration or ISP. Please note that for streaming from a RealServer your Web page will be copied to a standard HTTP Web server, while your encoded media file may be copied to a separate RealServer.

1. **File Server**: Name or IP address of the file server that your Web page will be uploaded to. For example: **ftp.server.com**.
____

2. **Directory**: Name of the directory on the file server where your Web page will be uploaded to. For example, if the personal directory assigned to you by your system administrator is 'htmlpages', you would enter **htmlpages** as the directory name**.** ***Note:*** *The directory field is optional and may be left blank. This is because on certain servers, you may already be put in your personal directory when you log in.*
____

3. **RealServer:** Name or IP address of the RealServer that your encoded media file will be uploaded to. For example: **ftp.server.com**. ______________

4. **Media Directory:** Name of the media directory on the RealServer where your encoded media file will be uploaded to. For example, if the media directory assigned to you by your system administrator is 'myvideo', you would enter **myvideo** as the directory name. ___________________________________

5. **RealServer Location:** Name or IP address of the RealServer that users will use to locate your media file. For example, if the full URL users will use to locate your media file on the Internet is **pnm://pnm.server.com/myvideo/file.rm** you would enter **pnm.server.com** as the RealServer name. ____

4. **URL Path:** The URL path on the RealServer that users will use to locate your media file. For example if the full URL that users will use to locate your media file is **pnm://pnm.server.com/myvideo/file.rm** you would enter **myvideo** as the URL path. ____

The following Web page publishing instructions (both standard HTTP Web server and RealServer) are for users who selected the **Generic - No Defaults** setting when installing RealPublisher. Otherwise, if you selected a specific Internet Service Provider from the listbox during installation, you should follow the simple steps provided by the online wizard. The wizard will automatically appear after completing step one below.

To publish a file to stream directly from a standard HTTP Web server:

1. Click **Publish**. The Publish to Server Wizard window appears.
2. Click **Next** to create a wizard. File Name page appears with the name of the last Web page created using the wizard:
3. Click **Next** if you wish to publish this page.
4. Click **Browse** to select another file. Select File page appears. Enter name of file you wish to publish and click **Open.**
5. The Service Provider page appears. Choose an Internet Service Provider from the list or select **Generic - No Defaults** if your Service Provider is not listed. Click **Next**.
6. The Streaming Method page appears. Click **Stream Media File from a Standard HTTP Web Server** and click **Next**.
7. The Web Server Information Upload Location page appears. Type in the name or IP address of the remote server where you are uploading your files and the directory on the upload server where your page will be sent.Then type in your user name and password.
8. The Web Server Information Internet Location page appears. Type in the name or IP address of the Web server and URL path that users will use to locate your Web page on the Internet.
9. Please note that the Upload Location may be different than the one used to view your Web page on the Internet. Contact your Internet service provider for this information.
10. The Upload Progress page appears. Click **Finish**. Your files automatically upload to your Web server.

To publish a file to stream directly from a RealServer streaming media server:

1. Click **Publish**. The Publish-to-Server Wizard window appears.
2. Click **Next** to create a wizard. File Name page appears with the name of the last Web page created using the wizard:
3. Click **Next** if you wish to publish this page.
4. Click **Browse** to select another file. The Select File page appears. Enter name of file you wish to publish and click **Open.**
5. The Service Provider page appears. Choose an Internet Service Provider from the list or select **Generic - No Defaults** if your Service Provider is not listed. Click **Next**.
6. The Streaming Method page appears. Click **Stream Media File from a RealServer**, then click **Next**.
7. The Web Server Information Upload Location page appears. Type in the name or IP address of the Web server where you are uploading your files and the directory in the upload server where your page will be sent. Then type in your user name and password.
8. The RealServer Information Upload Location page appears. Enter the name or IP address of the RealServer where your media file will be sent. Enter the directory where your media file will be sent and click **Next**.
9. The RealServer Information Internet Location page appears. Type in the name or IP address of the RealServer and URL path that users will use to locate your media file on the Internet.

   Please note that the Upload Location may be different than the one used to view your media file on the Internet. Contact your Internet service provider for this information.The Upload Progress page appears.
10. Click **Finish**. Your files automatically upload to your Web server.

Broadcasting Live Content

RealEncoder or RealPublisher included with a RealNetworks RealServer can deliver live content for broadcasting live events.

To deliver live content, you need:

- A live source
- A computer running RealAudio Encoder 3.0, RealEncoder 5.0 or RealPublisher 5.0
- A machine running a RealNetworks RealServer with a minimum of 60-streams
- RealPlayer

The computer running the encoder and the computer running RealServer can be on different platforms. Also, RealEncoder 5.0 and RealPublisher 5.0 require RealServer 5.0.

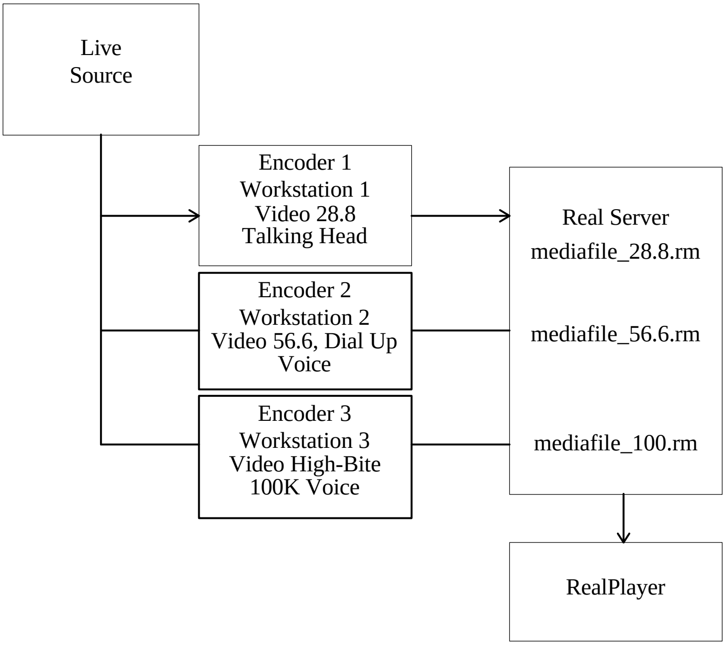
If you choose, you can save the event to disk while you are broadcasting. For more information about this, see the “Archiving Live Broadcasts” later in this chapter.

To provide content in multiple compression algorithms, you need to run a RealEncoder or RealPubliserh and a separate computer for each codec, all with the same input signal. All concurrently running RealEncoders or RealPublishers should use identical settings except for compression type and stream name. Each computer sends its output to a RealServer.

For example, here are three different templates you might use simultaneously for live content (use the diagram above for reference):

- Video 28.8 Talking Heads
- Video 56.6 Dial-Up Modem, Voice
- Video High-Bite Rate 100K, Voice

Be sure each file on each computer has a different name, such as mediafile_28.8.rm, mediafile_56.6, and mediafile_100.rm. The file name should be easy to identify, because RealPlayer users will have to choose the appropriate file based on their particular modem connection. We recommend including the modem bandwidth connection in the name to help the user choose correctly.


Live Source
Encoder 1 Workstation 1 Video 28.8 Talking Head
Encoder 2 Workstation 2 Video 56.6, Dial Up Voice
Encoder 3 Workstation 3 Video High-Bite 100K Voice
Real Server
mediafile_28.8.rm
mediafile_56.6.rm
mediafile_100.rm
RealPlayer

Note: Bandwidth negotiation during live events is not supported by RealEncoder 5.0, RealPublisher 5.0 or RealServer 5.0.

Designing Live Encoding Templates

Live encoding usually requires creating your own template. How you design your template depends largely on the power of your system. When encoding video frames that are 176 x 128 pixels, a 200 MHz Pentium computer gives a good result with a frame rate of 4 to 15 fps. A Dual Pentium 2 gives the best results for high frame rates and large screen sizes. See the “System Requirements” chapter for more information.

Delivering Live Content with RealServer

To deliver live content:

1. Attach your audio or video source to the audio or video capture card.
2. Configure the **server.cfg** file. For more information on how to configure this file, see the RealServer Administration Guide.

   Be sure the following configuration settings are included in the RealServer configuration file:

- **PnaPort -** the port number to which the Encoder connects.
- **EncoderPassword -** the password the Encoder uses to connect.
- **Encoder Timeout -** configuration parameter specifies how long RealServer stays connected to a RealEncoder/RealPublisher that is not sending data.
- **LiveFileTarget** and **LiveFilePassword -** (Optional) Specify that the server saves the live content as a file.

3. Configure RealEncoder or RealPublisher for live broadcasting and click **Start** to begin encoding.

Connecting RealEncoder or RealPublisher to RealServer

RealEncoder and RealPublisher translates the broadcast into one or more formats that RealServer can distribute over the Internet. As administrator of the RealServer , you must provide a way for the RealEncoder or RealPublisher to connect to RealServer. You do this using the **PnaPort** and **EncoderPassword** configuration settings on the RealServer.

The **EncoderPassword** setting specifies the password the Encoder must use to connect to RealServer. Passwords are necessary to keep unauthorized users from connecting to the stream of your live broadcast. For example, if you have the setting:

```
EncoderPassword FrogNet
```

the person starting the Encoder must use the password `FrogNet` to start the Encoder.

EncoderPassword

Password used by RealAudio Encoder, RealEncoder or RealPublisher and the rvslta utility program to connect to RealServer.

Used by	**pnserver**
Default value	(none)
Range of values	Alpha-numeric string without spaces
Restart Server after change	No

```
EncoderPassword <password>
```

Note that the default setting of no password allows any RealAudio Encoder, RealEncoder, or RealPublisher to connect to the server.

Example

```
EncoderPassword rmRecord1
```

EncoderTimeout

The time in seconds that the Server will wait before disconnecting RealEncoder/RealPublisher that is not sending data. If the connection to RealEncoder/RealPublisher is lost, the Server must disconnect before RealEncoder/RealPublisher can reconnect.

Used by	**pnserver**
Default value	30
Range of values	1 - 32767 seconds
Restart Server after change	No

```
EncoderTimeout <seconds>
```

Setting EncoderTimeout to less than 10 seconds is not recommended.

Example

```
EncoderTimeout 20
```

EncoderControlList

Allows multiple people to encode live content and use the same file name for different files. The file is published to a virtual directory beginning with the user's name.

Default value	(none)
Range of values	Alpha-numeric string without spaces

Syntax

```
EncoderControlList [ {user1, user1password},
{user2, user2password}, ...]
```

Example

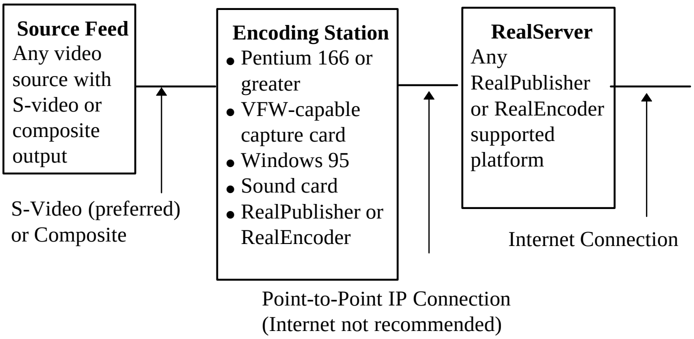
```
EncoderControlList [ {smith, encd} ]
```

In this example, any files encoded by the user "smith" will appear in a virtual directory named "smith." So if the user encodes a file and calls it "live.rm," the path to file will be "pnm://my.server.com/content/smith/live.rm".

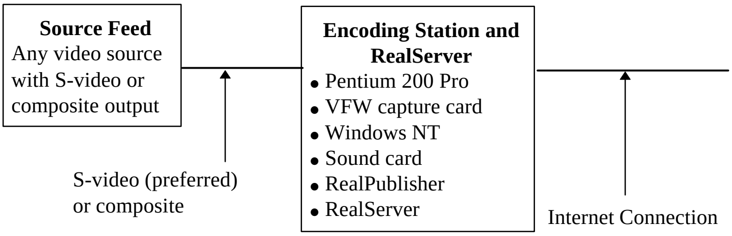
Live Broadcast System Requirements

Delivering live video content at a higher frame rate requires a different system configuration that delivering live content at a low frame rate. Three recommended configurations are detailed below.

Configuration 1: Low Frame Rate (<2 frames per second)

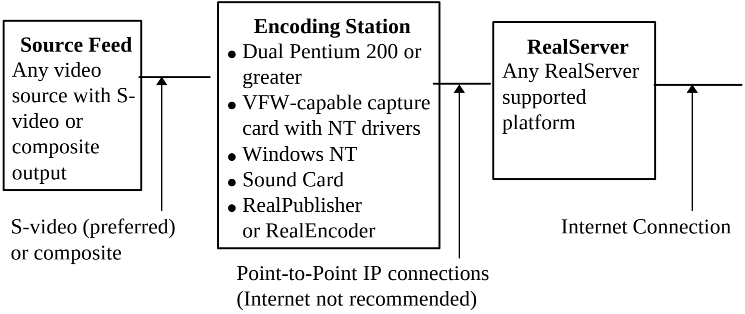

Source Feed
Any video source with S-video or composite output
S-Video (preferred) or Composite
Encoding Station
• Pentium 166 or greater
• VFW-capable capture card
• Windows 95
• Sound card
• RealPublisher or RealEncoder
Point-to-Point IP Connection (Internet not recommended)
RealServer
Any RealPublisher or RealEncoder supported platform
Internet Connection

Configuration 2: High frame rate (up to 10 frames per second* <200 streams)



*Actual maximum frame rate is dependent on bit rate and content.

Configuration 3: High frame rate (up to 15 frames per second)


Source Feed
Any video source with S-video or composite output
S-video (preferred) or composite
Encoding Station
• Dual Pentium 200 or greater
• VFW-capable capture card with NT drivers
• Windows NT
• Sound Card
• RealPublisher or RealEncoder
Point-to-Point IP connections (Internet not recommended)
RealServer
Any RealServer supported platform
Internet Connection

Encoding Live Content for Windows

There are a variety of techniques you can use to improve the quality of your live content. These include changing variables such as frame rates, frame size, audio codecs and total bit rate. It also includes monitoring your output to ensure you are delivering content with the highest possible quality.

Producing High Quality Live Content

- The average bit rate should be equal to the requested bit rate (the bit rate specified in the template). If the average bit rate exceeds the requested bit rate, you can:
    1. Switch to Optimized Frame Rate.
    2. Use a lower bit rate audio codec.
    3. Use a higher requested bit rate.
- Audio quality is important when delivering live content. Setting the volume too low can result in a weak signal. Setting the volume too high can cause a distortion of the audio.
- Latency, the amount of time required for buffering the video, should not exceed 5-10 seconds when delivering live content.
- View the live content using a RealPlayer. This allows you to see how the live content looks when it is delivered.
- If you are not maintaining the required frame rate, reduce the system load by disabling the encoder preview window. If you are having encoding problems you have four variables to adjust:
    1. Frame size
    2. Frame rate selection
    3. Total bit rate
    4. Audio codec (portion of total bits)

You may need to experiment with these variables to achieve the overall effect you are after.

Live Encoding RealAudio or RealVideo

To encode and broadcast live audio or video using RealEncoder or **RealPublisher:**

1. Start **RealEncoder** or **RealPublisher.** The RealEncoder or RealPublisher window opens.

2. Click **Open Session** from the File menu**.** The Open Session window appears.

3. In the source pane, verify that **Capture Device** is selected.

4. Click **Audio Capture** for audio only or select **Audio Capture** and **Video Capture** for video with audio.

5. In the destination pane, click **RealServer**.

6. While performing a live broadcast you can archive the event by also selecting **Destination RealMedia File** from the Open Session window.

7. Enter host name, which is the domain name or the IP address of the RealNetworks RealServer computer.

8. Enter your password. This field is optional depending on how your RealServers set up.

   Due to security enhancements to RealServer 5.0, RealEncoder and RealPublisher 5.0 can only encode live streams to RealServer 5.0. Encoding live streams to RealServer 4.0 will return the following message: “Server Alert: Invalid Password.”

9. Enter the resource name, which is the name you give to the audio or video stream being encoded and which users will refer to.

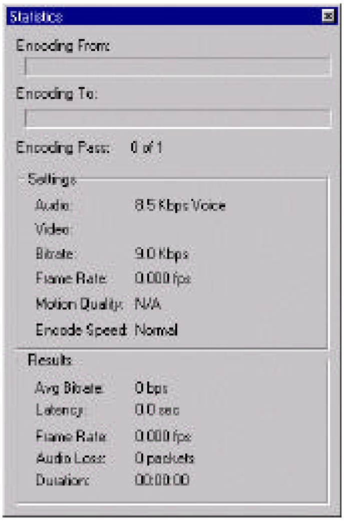
10. Click **OK**. The Open Session window closes.

11. In the properties pane, enter the Title, Author, and Copyright information for your output stream. These fields are optional. If you choose to provide this information, it will be displayed on the viewer’s Real Player.

12. To allow RealPlayer Plus users to save your Real Audio or RealVideo signal to disk, click **Selective Record**.

13. In the templates pane, select the template to encode the file.

14. Select **Statistics** from the View menu. The Statistics window appears. The information displayed in this window during broadcast will help you evaluate and adjust your template settings.



Encoding From:

Encoding To:

Encoding Pass: 0 of 1

Settings
Audio: 8.5 Kbps Voice
Video:
Bitrate: 9.0 Kbps
Frame Rate: 0.000 fps
Motion Quality: N/A
Encode Speed: Normal

Results
Avg Bitrate: 0 bps
Latency: 0.0 sec
Frame Rate: 0.000 fps
Audio Loss: 0 packets
Duration: 00:00:00

15. The audio level meter, view input video window and view output window can be turned off to marginally increase performance. From the Options menu, click **Show Source Input, Show Encoded Output,** and **Show Audio Meter** to clear the selection.

16. For video encoding only, notice **Frame Rate** in the results pane of the Statistics window. Wait while enough data is collected for an average frame rate to be determined. If the average frame rate is below the frame rate set in your template, adjust the encoding by varying one of the five variables.

17. For video encoding only, notice **Latency** in the results pane of the Statistics window. If latency is greater than 5 or 10 seconds, adjust the template.

For video encoding only, select **Set Video Format** from the Options menu. You can use this option to adjust video format settings while delivering live content. Click **OK** to accept the current settings.

18. Click **Start** and monitor the progress of the encoding.

    Note: Listening and viewing the live content through your Web browser is strongly recommended.

Live CommandLine Encoding for Windows

Command line options allow automation of live feeds. Refer to the “Command Line Encoding for Windows” section of the “Using RealEncoder and RealPublisher” chapter for a list of static encoding options. Additional RealEncoder/RealPublisher options for live encoding are listed below:

Command Line Options for Live Feed Automation

Option	Description
/L	Turns on Live Input instead of static input file. The destination can then be selected between server or file output.
/S server[:port]/filename	Specifies delivery to a server on the supplied port. If the port is not supplied then the default of 7070 is used. The server can be either a hostname or IP address. The filename is used as the target on the server.
/W password	Specifies the password, if required to connect to the Live Server. The default is no password and is only used if the target is a server.
/O	Used for the file name at the encoder if simultaneous file output is required.
/I	Specifies an Input File.
/D hhh:mm:ss	Allows encoder to run for the supplied time. The maximum time is 999:59:59. When the time elapses then the encoder should gracefully shutdown and exit. If a static file is being encoded and the file ends before the maximum duration, there is no need for an error message. If this option is not supplied, then the encoder continues to run.
Ctrl-C	Terminates encoding.

Enhancing Live Broadcasts with Video Image Maps and Synchronized Web Pages

You can deliver a Synchronized Multimedia presentation or apply an image map to a video stream with a live broadcast. The events are delivered relative to the time a client begins playing the live broadcast, instead of relative to an absolute position in the broadcast.

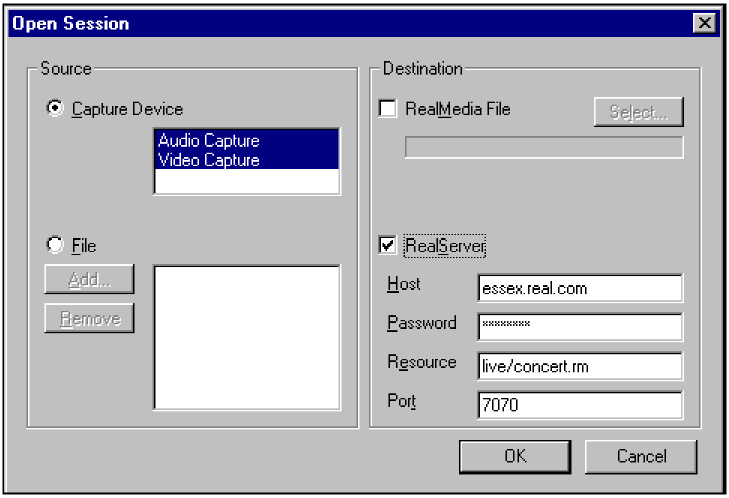
The URL events must be defined before the broadcast, but you can change the content of the Web page the URL references during the broadcast.

An image map can change over time, but this is not synchronized with the video stream. You can add any static content type to a live stream that is not already present in the stream. An example of this could be a link for the whole image to a site with a link to the broadcaster tied to a superimposed logo added to the stream before encoding.

To create a Synchronized Multimedia presentation for a live broadcast:

1. Create the input file that defines each event and the time that the event is sent. Remember that the times you specify are relative to when the client begins playing the live broadcast.
2. Run the **rmmerge** tool to create a .rm file.
3. Repeat steps 1 and 2 for any image maps.
4. Name the .rm file with the same filename you specify in the **Resource** box in RealPublisher or RealEncoder for the broadcast.
5. Move the .rm file to the path specified in the **Resource** box in RealPublisher or RealEncoder .

The following example shows RealPublisher screens. RealEncoder procedures are similar:



● Capture Device

Audio Capture
Video Capture

○ File

☐ RealMedia File

☑ RealServer

Host: essex.real.com

Password: ********

Resource: live/concert.rm

Port: 7070

For example, if you set up RealPublisher as follows, the file must be named **concert.rm** and it must be located in the **/live** directory relative to the server's base path.

Archiving Live Broadcasts

You can choose to save (or "archive") a live broadcast for playback later. RealServer can be configured to automatically archive live broadcasts or you can use the **rafile** or **rmfile** utility program to archive broadcasts from any RealServer over a network. You can choose to create just one file, a new file based on elapsed time such as every 30 minutes, or a new file based on size such as every 5 MB. **Rafile** archives audio-only broadcasts; **rmfile** archives video-only or audio-and-video broadcasts.

If RealServer or **rafile** or **rmfile** archives a live broadcast with the same destination path and file name used for a previous broadcast, the .rm file from the previous broadcast is overwritten. Reusing the same output file name can simplify Web page maintenance, because the links for a recurring event remain the same. If you want to maintain an archive of live broadcasts, either copy the

.rm file elsewhere before it is overwritten or use unique file names for each live broadcast.

Rmfile can be driven either by command line options or by a configuration file. The command line options will always overrule the configuration file.

To configure RealServer to archive automatically:

If you specify the **LiveFileTarget** and **LiveFilePassword** settings in the server's configuration file, RealServer automatically archives any live media stream that arrives at the Server. These media streams are created as RealMedia (.rm) files. Be sure you have enough available disk space to store the files generated from a live broadcast. The archive files are stored in the directory specified by the **LiveFileTarget** setting, or in the working directory that was used to start RealServer if a target directory is not specified.

To configure RealServer to save manually:

The **rafile** and **rmfile** programs can run on a different computer than RealServer or RealEncoder/RealPublisher because they accept a network address for the media source. Archive files written by **rafile** or **rmfile** are stored in the directory specified, or in the working directory used to start the **rafile** or **rmfile** program if no directory is specified.

For a list of options for the **rmfile** program, at a command line, type:

```
rmfile /?
```

Example 1:

A television station broadcasts over the Internet and wants to archive the entire broadcast day in multiple files each 60 minutes long to the **/usr/Archive** directory. The broadcast is named Live.rm and is available in RealVidep 28.8 format only. The relevant configuration settings are:

```
LiveFilePassword   rmBroadcast1
LiveFileTarget     /usr/Archive
LiveFileTime       1h
```

RealServer automatically archives the live broadcast to a series of files named Live0.rm, Live1.rm, Live2.rm, and so on, in the /usr/Archive directory. Each file contains one hour of audio data encoded in the RealVideo 28.8 format.

Example 2:

A concert promoter broadcasts a live concert over the Internet and wants to archive the entire concert on a separate computer. The archive computer runs the **rmfile** utility program from a command line.

The configuration file setting on the RealServer computer is:

```
LiveFilePassword rmBroadcastZ
```

The command on the archive computer is:

```
rmfile -b -p rmBroadcastZ
pnm://my.server.com:7070/live.rm
c:\real\server\content\archive
```

The **rmfile** utility program connects to the server using the URL pnm://my.server.com/live.ra. The resulting files can be copied to a RealServer for later rebroadcast of the concert.

Simulating a Live Broadcast

At times, you might want to play a recorded media file as if it were being broadcast live. Perhaps you want to test your system before a live event or delay broadcast of a concert. The **rvslta** (RealVideo Simulated Live Transfer Agent) utility lets you play a recorded media file as if it were live.

To use **rvslta**, you need to specify the password from the Server's **EncoderPassword** configuration setting (in the RealServer configuration file) and the names of the input and output files.

The rvslta (RealVideo Simulated Live Transfer Agent) utility delivers pre-recorded content as if it were a live event. Users connecting to the link will get the event "in progress". It can be used as a test, to delay broadcast of a live event or to multicast pre-recorded content. The syntax is as follows:

Syntax

rvslta -i <inputfile.rm> -o <outputfile.rm> -s <server> [-p <port>] [-w <password>]
[-l <iterations>]

where:

`<inputfile>` is the path and file name to the input file.
`<outputfile>` is the path and file name to the output file.
`<server>` is the server name.
`<port>` is the server port (port defaults to 7070).
`<password>` specifies the password **rvslta** uses to connect to the server. It matches the password specified by the **EncoderPassword** in the configuration settings file.
`<iterations>` is an integer.

Example

```
rvslta -i c:\archive.rm -o livenow.rm -s
www.my.server.com -p 7070 -w rmRecord1
```

Advertising Live Events

With a RealNetworks RealServer, you can send live events directly to user's computers, letting people enjoy music, speeches, and public events from their computers. Whether you are promoting a concert, holding a company meeting, or covering a campaign speech, you can use RealAudio and RealVideo to attract whole new audiences.

If you want help advertising your site or live event, you can advertise in "Timecast: Your RealMedia Guide" **(http://www.timecast.com**), the RealNetworks online resource for RealAudio and RealVideo sites and live events.

Inform the Timecast staff of your site or event by completing an online form. After you submit the online form, the data is verified by a staff member of Timecast and posted on the Timecast site. Timecast strives to be a quality listing service and therefore maintains editorial control over all information submitted. If you have any questions or need to make changes to any submissions please email **Timecast@Timecast.com**.

To advertise your site on Timecast:

Use the Web form located at **http://cgi2.timecast.com/cgi-bin/addsite.cgi** to submit your newly completed site for inclusion in either Timecast's Audio, Video, or Live Stations Guide**.** On the Web form, you enter basic information about the site such as the site name, URL, and description.

To advertise your event on Timecast:

Use the Web form located at **http://cgi2.timecast.com/cgi-bin/addlive.cgi** to submit all your live events. On the Web form, you enter basic information about the event, such as name, complete URL, date and time of the event, and a short description. You can also indicate whether the event is recurring (occurs weekly) or non-recurring (one-time only).

Place Special Tags in your HTML Code

If you have several different events, you can save time by inserting special “live tags” in your HTML code. The live tags are placed within comment lines in the source html, so that they are invisible to your users. A software robot reads the information in the live tags and automatically enters the event(s) in Timecast.

To advertise your live event using special tags:

1. On the Web page with the link to your live event, insert the live tags using the following format:

   ```
   <!--@Rastart event="Brief Event Description"
   start="Thu, 11 Apr 1996 20:30:00 EST" -->
   (some HTML that describes the event)
   <!--@RAend-->
   ```

   Note: For more information about the live tag, refer to:
   http://www.real.com/help/content/livetags.html

2. Send e-mail to: *live_event@real.com*. Do not enter a subject. In the body of the e-mail, enter the complete URL for the page containing the live tags (for example: **http://www.real.com/example/tags.html**). A software Robot gathers the information in your live tags. The data is verified by a staff member of Timecast and posted.

   Note: It is very important that you include the full address, including the “http://” part. If you use frames, be sure to send the address for the event page that appears within a frame, not the HTML page that creates the frames.

Configuring Your Web Site

After encoding your RealMedia files, you are ready to attach the files to Web pages. The following sections explain the construction and use of RealMedia content on your Web site. When you have your RealServer set up, use this information to showcase audio and video content from your site.

Making the Most of Your Content

To get the most out of your RealMedia content, educate your Web site's visitors about RealAudio and RealVideo. Let people know that they can listen and view your clips instantly, without download delays. Identify each clip with a Real bubble icon to distinguish it as real-time audio and video.

real™ audio

real™ video

The graphics are available from the RealNetworks Web site at

www.real.com

on the "Logos and Trademarks" page. Make it easy for your visitors to get RealPlayer by linking the graphics to the RealNetworks home page at:

www.real.com/

Metafiles

RealMedia material is reached via links, just as HTML documents use hyperlinks to connect Web pages. However, the RealAudio and RealVideo links you put into your HTML pages are not direct references to the RealAudio or RealVideo files. Instead they are references to text files which contain information needed to establish a connection between your RealServer and your listener's RealPlayer and to initiate playback. These files are called metafiles.

Metafiles contain the addresses of RealAudio (.ra) and RealVideo (.rm) files. These addresses are in the form of URLs. They begin with a locator type, followed by a specific address. The locator type identifies the protocol used to exchange information between client and server. Common locator types include http and ftp.

The locator type used by RealNetworks software is pnm (Progressive Networks Metafile). Addresses you put into a metafile begin with `pnm://`

To create a link between two of your Web pages, you might add the following text to an HTML document:

```
<A HREF="sect2.htm">Continue to Section 2</A>
```

A visitor to your site could click the text, and your Web server would then deliver the appropriate section of your document.

If you employed the same syntax to create a link to a RealAudio and RealVideo file, your visitor's click would prompt your Web server to deliver your clip. But, your Web server cannot stream RealAudio and RealVideo for real-time playback. Only your RealServer can do that.

Your Web server can, however, convey information to a user's RealPlayer that enables that Player to establish a direct connection to your RealServer . Once in place, this direct connection is used to stream to the Player and to carry commands (such as seek or pause) back to your RealServer .

Instead of pointing to a file, your Web page is set up to point to a metafile. This metafile, in turn, contains the URL (Uniform Resource Locator) of the file (or files) you want associated with the hyperlink. The user's browser passes the URLs to RealPlayer, which retrieves .ra or `.rm` files from your RealServer .

Creating Metafiles

Your Web pages will link to metafiles, which in turn point to the DNS name or IP address of the computer on which your RealServer and RealMedia files are located.

If you are using RealFlash Animation, you'll include that information in the metafiles.

To create a metafile:

1. Use a text editor (such as Notepad) to create a file containing the RealAudio or RealVideo URL. The contents of your file should be in the following form:

   ```
   pnm://hostname/path/filename
   ```

   where **`hostname`** is the name of your Web server, **path** is the path to the file (relative to the BasePath of the RealServer), and **filename** is the name of the file ending with .rm, .ra, or +.swf.

   For example, to provide access to a RealVideo file called `hello.rm`, the text of your metafile would be:

   ```
   pnm://www.server1.com/hello.rm
   ```

   where `www.server1.com` is the DNS name of the machine running your RealServer , on which you store your RealAudio or RealVideo files.

   If you want more than one file to play in sequence when the user clicks your link, create a metafile containing several URLs (on separate lines with no intervening blank lines). For example, if your metafile contains:

   ```
   pnm://www.server1.com/hello.rm
   pnm://www.server1.com/welcome.rm
   pnm://www.server1.com/coolstuff.rm
   ```

   the Player automatically plays your three files in sequence. A listener can use the Clip menu on the Player to move forward and backward between clips (.rm files).

   If you are using RealFlash Animation, combine the audio file name with the RealFlash file name using the plus (+) sign:

   ```
   pnm://www.server1.com/hello.rm+hello.swf
   pnm://www.server1.com/welcome.rm
   pnm://www.server1.com/coolstuff.rm
   ```

2. Save your metafile in the “All files (*.*)” format, using a .ram file name extension.

   For example, you could save the three lines shown above in a file named welcome.ram on your Web server.

3. In your HTML document, reference the metafile in a hyperlink, followed by a reference to the Real icon (so that the Real icon is displayed to the left of the file) as follows:

   ```
   <A HREF="http://www.real.com/welcome.ram"> <IMG
   SRC="http://www.real.com/pics/rvfile.gif"
   align=left border=0> Welcome!</A>
   ```

   where welcome.ram is the metafile.

File Name Extensions

Each metafile that you create must be saved with (or renamed to have) a file name extension. This extension tells your Web server what the metafile is, to ensure that the enclosed URL is handled properly.

There are two metafile types: .ram and .rpm. These different file name extensions are passed on by your Web server and, ultimately, tell the user’s Web browser which application to launch to play the referenced file:

.ram file – Browser launches RealPlayer
.rpm file – Browser launches RealPlayer plug-in (see below)

Note: You must configure your Web server to understand that the extension .ram refers to the MIME type **x-pn-realaudio** and that the extension .rpm refers to the MIME type **x-pn-realaudio-plugin**.

Customizing Calls to Video and Audio Content

Optional arguments may be added to metafiles to finesse what is seen and heard by users when they click your RealAudio or RealVideo link. You may alter the point in a clip at which play starts or ends, or the Title, Author, and Copyright information is displayed by RealPlayer.

Add the options to your metafile following the URL to which they apply. Options must be preceded by a ? (question mark) and separated from each other by an & (ampersand). The syntax is as follows:

```
pnm://www.real.com/test.rm?[opt1]&[opt2]
```

where opt is a name/value pair separated by an equal sign (=). For example,

```
title="mymovie"
```

Changing Start and Stop Times

To create a link that starts playing a clip from a point other than the beginning of the file, use the **start** command. Specify the time into the clip at which play should begin. For example:

```
pnm://www.real.com/test.rm?start=”30”
```

would result in playback starting thirty seconds into the file.

The format for the start time is as follows:

```
start=”dd:hh:mm:ss.ss”
```

Tenths of seconds are separated from seconds by a decimal point; the other units of time are separated by colons. The time is interpreted from right to left, and it is not necessary to specify days, hours, or minutes if these are not relevant.

Similar to the **start** option is the **end** option. For example, the metafile text:

```
pnm://www.real.com/test.rm?end=”5:30”
```

is used to provide for playback of test.rm that terminates five minutes and thirty seconds from the start of the clip.

Note: The end time is always measured from the actual start of the data in the file, even in the case where playback begins elsewhere. For example, the line:

```
pnm://www.real.com/test.rm?start=”30”&end=”5:30”
```

is used to start play of test.rm from the thirty-second mark and to stop play five minutes later.

Changing Title, Author, or Copyright Information

The following options exist to change the descriptive information from within the metafile:

```
title=”new title”
author=”new author”
copyright=”new copyright”
```

Strings can be changed independently or in combination.

Changing information in this manner does not change what is stored in your file—only what is displayed when it is accessed through this particular metafile. This functionality is especially useful if, for example, you have one large file that contains your band's entire CD, and you want to credit the author of each song as it plays. You could create a multi-clip .ram file as follows:

```
pnm://www.server/band.rm?end=”5:30”&title=”Song1”
pnm://www.server/band.rm?start=”5:31”&end=”7:45”&title=
”song2”&author=”Joe Smith”
pnm://www.server/band.rm?start=”7:46”&end=”15:01”&title
=”song3”&author=”Jane Smith”&copyright=”My Music, 1996”
```

HTTP Streaming

HTTP streaming enables content providers to stream RealAudio and RealVideo clips from a World Wide Web server. While this method is not as robust, it provides a reasonable method for providing short RealAudio and RealVideo content to a limited number of users.

Before you can stream RealAudio and RealVideo clips through HTTP, you must define the following MIME types for your World Wide Web server:

audio/x-pn-RealAudio (files with a .ra, .rm or .ram file extension)
audio/x-pn-RealAudio-plugin (files with a .rpm file extension)

video/x-pn-RealVideo (files with a .ra, .rm or .ram file extension)
video/x-pn-RealVideo-plugin (files with a .rpm file extension)

Some World Wide Web servers are pre-configured with these MIME types.

Note: If you are running a Web page off an ISP server, send mail to the ISP administrator asking them to configure server for the RealPlayer MIME types.

To stream RealAudio and RealVideo content using HTTP:

1. Copy your encoded RealAudio and RealVideo files (files with the .ra or .rm extension) to your World Wide Web server.

2. Use a text editor (such as Notepad) to create a metafile containing the RealAudio or RealVideo URL. For example, the contents of your file should be in the following form:

   ```
   http://hostname/path/filename
   ```

   where hostname is the name of your World Wide Web server. For example: www.real.com

   Note: Refer to “Creating Metafiles”. This file works similarly, except it uses http as the protocol instead of pnm.

3. Save your metafile as “All Files (*.*) using a .ram file name extension.

4. In your HTML document, reference the metafile in a hyperlink. For example:

   ```
   <A HREF="file.ram">
   <A HREF="http://hostname/file.ram">
   ```

   You can use relative or complete paths. If you use complete paths, you must include both the hostname and the complete path. For example:

   ```
   <A HREF="http://www.real.com/home/welcome.ram">
   ```

5. When a user clicks on the link, the audio or video file(s) begin to download. RealPlayer begins playing after a few seconds; it does not need to wait for the entire file to be downloaded.

Custom Controls for RealAudio and RealVideo

RealAudio and RealVideo enables seamless integration of RealPlayer Controls into your Web page layout. You can place individual interactive components, such as a play button or image window, anywhere on your page, just as you would place an image using the <IMG> tag in HTML.

There are two products which, in conjunction with the most popular Web browsers, enable “in page” audio controls.

- RealPlayer plug-in provides Player-like features to browsers that support the Netscape Navigator Plug-in architecture. This plug-in also works in Internet Explorer 3.0.
- RealPlayer Control for ActiveX works with Internet Explorer 3.0 and Visual Basic applications to provide RealAudio and RealVideo playback capabilities.

Using RealPlayer Plug-in for Netscape

The Plug-in runs as an adjunct to Web browsers that support Netscape's Plug-in architecture. This RealPlayer Plug-in is included in the Player installation.

The <EMBED> tag specifies Plug-in attributes in HTML pages in much the same way that the <IMG> tag specifies image attributes. The basic <EMBED> tag for RealPlayer contains only the attributes SRC, WIDTH, and HEIGHT, as shown below:

```
<EMBED SRC=metafile.rpm WIDTH=width_value
HEIGHT=height_value>
```

For example:

```
<EMBED SRC="sample1.rpm" WIDTH=300 HEIGHT=134>
```

creates an in-page Player that is 300-pixels wide and 134-pixels high.

For the plug-in, metafiles are stored with a .rpm file name extension. .

The name tag is supported as an option with JavaScript to refer to a specific plug-in.

Feature	Description
SRC Attribute	The SRC attribute specifies a metafile to be accessed. RealPlayer Plug-in is associated with a .rpm file name extension. This extension tells the user’s Web browser to load RealPlayer Plug-in rather than the stand-alone RealPlayer. For the user’s Web browser to correctly identify .rpm files, you or your system administrator must first configure the .rpm MIME type in your Web server. Users do not need to configure their Web browsers to recognize the .rpm MIME type. The plug-in architecture automatically sends .rpm files to RealPlayer plug-in. Files with a .rpm extension are identical to .ram files, except for the extension.
WIDTH and HEIGHT Attributes	The WIDTH and HEIGHT attributes specify the size of the embedded RealAudio or RealVideo component. Unlike images, Plug-ins do not size automatically. The WIDTH and HEIGHT can be specified in pixels (the default) or as a percentage of the Web browser window (for example: WIDTH=100%). **Note** If the WIDTH and HEIGHT attributes are not included, the Plug-in may appear as a tiny (and useless) icon with some browsers. If you want your Plug-in component to maintain an absolute size, specify HEIGHT and WIDTH in pixels. If you want the Plug-in graphic to scale with the Web browser window, specify size as a percentage. For example, if you want to fit the entire width of the Web browser window, use WIDTH=100%.

Feature	Description
CONTROLS Attribute	The CONTROLS attribute of the <EMBED> tag allows you to place individual control elements within your page. You can use multiple <EMBED> statements to construct a custom interface, made up of individual controls. You can also place multiple controls within a single <EMBED> statement. CONTROLS supports the following values: All, ControlPanel, InfoVolumePanel, InfoPanel, StatusPanel, StatusBar, PlayButton, StopButton, VolumeSlider, PositionSlider, PositionField, StatusField, ImageWindow.
CONSOLE Attribute	Sets a console name used to link multiple control instances. All controls with the same console name work together. For example, if you have multiple Play and Stop buttons on the same page, the console name would enable them to control the same RealAudio or RealVideo clip. Call this function once for each instance of the Play or Stop button you want to link. The console name. "_master" links to all instances. "_unique" links to no other instances.
AUTOSTART Attribute	Sets whether or not the control automatically starts playing once the source data is available. Valid values are TRUE or FALSE.
NOLABELS Attribute	Suppresses the Title, Author, and Copyright label text in the controls window. The text strings in the fields are still displayed.
RESET Attribute	Resets RealPlayer Control for ActiveX playlist. Valid values are TRUE or FALSE.
AUTOGOTOURL Attribute	Specifies how a URL is handled. Valid values are TRUE or FALSE. TRUE indicates that RealPlayer Control for ActiveX automatically forwards the URL event to the browser. FALSE indicates that the OnGotoURL VBScript event is used instead.

Preparing HTML Pages for Browsers that Cannot Use the Plug-in

Some Web browsers do not support plug-ins. You can create HTML pages that are enhanced for plug-ins but which also work for other browsers. Simply use the <NOEMBED> tag to include HTML statements for use by Web browsers that do not support plug-ins.

The <NOEMBED> command should appear after an <EMBED> command and take the following syntax:

```
<NOEMBED> HTML to be ignored </NOEMBED>
```

For example, the command:

```
<EMBED SRC="sample1.rpm" WIDTH=300 HEIGHT=134>
<NOEMBED> <A HREF="sample1.ram"> Play the clip
using the stand-alone Player! </A></NOEMBED>
```

would show a page with the plug-in if your page were accessed by a browser supporting plug-ins, and would otherwise display the message “Play the clip using the stand-alone Player!” (and allow playback with the standard Player).

Using RealPlayer Control for ActiveX

You can embed RealPlayer Control for ActiveX in HTML pages using the Object tag.

The following is an example of RealPlayer Control <OBJECT> in an HTML page.

```
<OBJECT
  ID=RAOCX
  CLASSID="clsid:CFCDAA03-8BE4-11cf-B84B-0020AFBBCCFA"
  HEIGHT=140
  WIDTH=312>
  <PARAM NAME="SRC" VALUE="pnm://audio.real.com/file.rm">
  <PARAM NAME="CONTROLS" VALUE="all">
</OBJECT>
```

Note: Directory names cannot have spaces.

Embedded Object Parameters

Feature	**Description**
OBJECT	Tag is used to embed RealPlayer Control for ActiveX. There should be one <Object> tag per RealPlayer Control on the page.
CLASSID	Specifies the control's CLSID. This value is always “clsid:CFCDAA03-8BE4-11cf-B84B-0020AFBBCCFA” for RealPlayer Control for ActiveX.
HEIGHT	Specifies the control's height on the HTML page. A value of 0 makes the control invisible.
WIDTH	Specifies the control's width on the HTML page. A value of 0 makes the control invisible.
PARAM	Specially embedded tag for supplying parameters to the ActiveX object.

The following properties are available with the PARAM Parameter:

Parameter	Description
SRC	Sets the source of RealAudio or RealVideo clip. The SRC location can be pnm, file or http protocol. This parameter is required.
CONTROLS	Sets the visible components of the control. Valid CONTROLS include All, ControlPanel, InfoVolumePanel, InfoPanel, StatusPanel, StatusBar, PlayButton, StopButton, VolumeSlider, PositionSlider, PositionField, StatusField, and ImageWindow.
CONSOLE	Sets a console name used to link multiple control instances. All controls with the same console name work together. For example, if you have multiple Play and Stop buttons on the same page, the console name would enable them to control the same RealAudio or RealVideo clip. Call this function once for each instance of the Play or Stop button you want to link. The console name. "_master" links to all instances. "_unique" links to no other instances.
AUTOSTART	Sets whether or not the control automatically starts playing once the source data is available. Valid values are TRUE or FALSE.
NOLABELS	Suppresses the Title, Author, and Copyright label text in the controls window. The text strings in the fields are still displayed.
RESET	Resets RealPlayer Control for ActiveX playlist. Valid values are TRUE or FALSE.

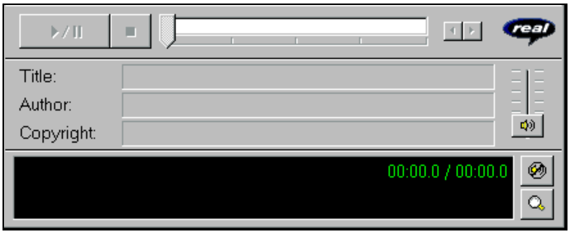
Parameter	Description
AUTOGOTOURL	Specifies how a URL is handled. Valid values are TRUE or FALSE. TRUE indicates that RealPlayer Control for ActiveX automatically forwards the URL event to the browser. FALSE indicates that the OnGotoURL VBScript event is used instead.

Specifying How the Control Should Look

The CONTROLS attribute allows you to place individual control elements within your page. The CONTROLS attributes for the Netscape Navigator plug-in and RealPlayer ActiveX Control are the same. The following explains the output of each attribute:

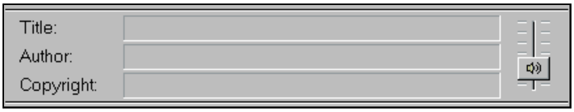
All - Displays a full Player view including the Control Panel, Information-and-Volume Panel and Status Bar.

Minimum Width: 21%	**Maximum Width**: 100%
Minimum Height: 23%	**Maximum Height**: 80%



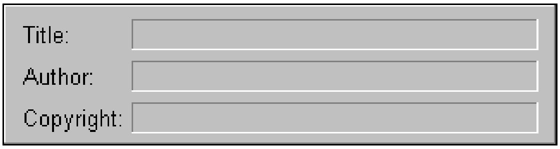
InfoVolumePanel - Displays the Title, Author, and Copyright information panel and the volume slider.

Minimum Width: 21%	**Maximum Width**: 100%
Minimum Height: 12%	**Maximum Height**: 50%



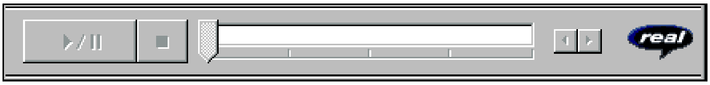
InfoPanel - Displays the Title, Author, and Copyright information.

Minimum Width: 20%	**Maximum Width**: 100%
Minimum Height: 10%	**Maximum Height**: 50%

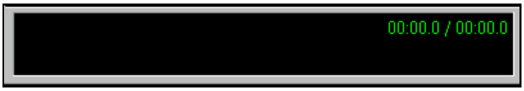


ControlPanel - Displays the play/pause button, the stop button and the position slider.

Minimum Width: 21%	**Maximum Width**: 100%
Minimum Height: 8%	**Maximum Height**: 25%



StatusPanel - Displays the Status Panel showing informational messages, current time position, and clip length. If you do not embed a Status Panel in your page, error messages are displayed in the Web browser's status bar.

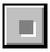


PlayButton - Displays the play/pause button.

Minimum Width: 5%	**Maximum Width**: 100%
Minimum Height: 2%	**Maximum Height**: 25%

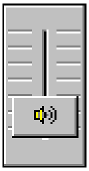
StopButton - Displays the stop button.

Minimum Width: 5% **Maximum Width**: 100%
Minimum Height: 2% **Maximum Height**: 25%



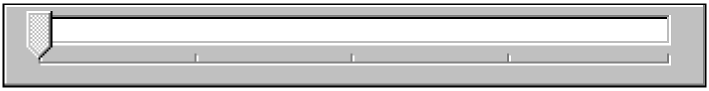
VolumeSlider - Displays the volume slider.

Minimum Width4% **Maximum Width**100%
Minimum Height10% **Maximum Height**100%



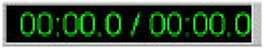
PositionSlider - Displays the position slider.

Minimum Width 8% **Maximum Width** 100%
Minimum Height 5% **Maximum Height** 25%



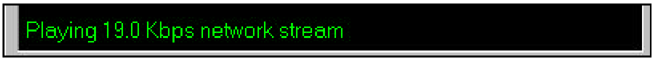
PositionField - Displays the field of the Status Bar showing position and clip length.

Minimum Width: 10% **Maximum Width**: 100%
Minimum Height: 4% **Maximum Height**: 25%



StatusField - Displays the message text area of the Status Bar.

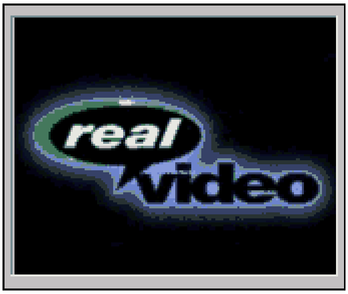
Minimum Width: 13%
Maximum Width: 100%
Minimum Height: 4%
Maximum Height: 15%



Playing 19.0 Kbps network stream

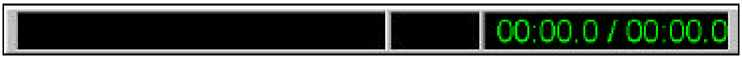
ImageWindow - Displays the video image. (Only available for .rm files)

Minimum Width: 100%
Maximum Width: 100%
Minimum Height: 100%
Maximum Height: 100%



StatusBar - Displays the status field, position field, channels (stereo/mono).

Minimum Width: 21%
Maximum Width: 100%
Minimum Height: 5%
Maximum Height: 14%



00:00.0 / 00:00.0

ActiveX Methods and Properties

Methods

Methods are functions that control the performance of the Control. Unless otherwise noted, these methods have no return values and no parameters.

Method	Description
DoPlayPause	Plays or pauses the current clip. Equivalent to clicking the Play/Pause button.
DoStop	Stops the clip. Equivalent to clicking the Stop button.
DoNextItem	Skips to the next clip in a .ram file that contains multiple clips. A .ram file is a metafile that points to one or more RealAudio or RealVideo files.
DoPrevItem	Skips to the previous clip in a .ram file that contains multiple clips. A .ram file is a metafile that points to one or more RealAudio or RealVideo files.
CanPlayPause	Tests if Play/Pause function is available. Returns TRUE or FALSE
CanStop	Tests if Stop function is available. Returns TRUE or FALSE.
HasNextItem	Tests if the next clip function is available. The next clip function is available when the connected source is a .ram file that contains multiple clips, and the current clip is not the last clip in the .ram file. Returns true or false.
HasPrevItem	Tests if the previous clip function is available. The previous clip function is available when the connected source is a .ram file that contains multiple clips, and the current clip is not the first clip in the .ram file. Returns true or false.
AboutBox	Opens the Copyright information for the control.
EditPreferences	Opens the Preferences dialog box. Enables the end user to set his/her preferences. These preferences are global to all RealAudio or RealVideo clients on the machine.
HideShowStatistics	Shows or hides the Connection Statistics dialog box.
IsStatisticsVisible	Tests if the Connection Statistics dialog box is displayed. Returns true or false.
DoGotoURL(url, target)	Causes the control to attempt a navigation to the specified URL in the specified frame target. The container must support URL browsing. Parameters: string URL, string target.

Object Properties

The object properties are set within Visual Basic and specify properties about the control.

Property	Description
Source	Specifies the URL of the clip to play. The Source location can be pnm:, file: or http: protocol.
Controls	Returns/Sets the visible components of the control. Valid CONTROLS include ALL, ControlPanel, InfoVolumePanel, InfoPanel, StatusBar, StatusPanel, PlayButton, StopButton, VolumeSlider, PositionSlider, PositionField, ImageWindow and StatusField.
Console	Sets a console name used to link multiple control instances. All controls with the same console name work together. For example, if you have multiple Play and Stop buttons on the same page, the console name would enable them to control the same clip. Call this function once for each instance of the Play or Stop button you want to link. The console name master links to all instances while _unique links to no other instances.
Autostart	Sets whether or not the control automatically starts playing once the source data is available. Valid values are TRUE or FALSE.
NoLabels	Suppresses the Title, Author, and Copyright label text in the controls window. The text strings in the fields are still displayed.
AutoGotoURL	Specifies how a URL will be handled. Valid values are TRUE or FALSE. TRUE indicates that the RealPlayer ActiveX Control will automatically forward the URL event to the browser. FALSE indicates that the OnGotoURL VBScript event will be sent instead.

Java and JavaScript Methods

Methods are functions that control the performance of the Java enabled RealPlayer Plug-in.

Method	**Description**
SetSource(String *Source*)	Specifies the URL of the RealAudio clip to play. The Source location can be pnm:, file: or http: protocol.
SetControlsString(String *ControlsString*)	Returns/Sets the visible components of the control. Valid CONTROLS include ALL, ControlPanel, InfoVolumePanel, InfoPanel, StatusBar, PlayButton, StopButton, VolumeSlider, PositionSlider, PositionField, and StatusField.
SetConsoleName(String *ConsoleName*)	Sets a console name used to link multiple RealVideo plug-in instances. All Plug-ins with the same console name work together. For example, if you have multiple Play and Stop buttons on the same page, the console name would enable them to control the same clip. Call this function once for each instance of the Play or Stop button you want to link. The console name master links to all instances while _unique links to no other instances.
SetAutoStart(Boolean *bAutoStart*)	Sets whether or not the plug-in automatically starts playing once the source data is available. Valid values are TRUE or FALSE.
SetNoLabels(Boolean *bNoLabels*)	Suppresses the Title, Author, and Copyright label text in the Plug-in window. The text strings in the fields are still displayed.
DoPlayPause()	Plays or pauses the current clip. Equivalent to clicking the Play/Pause button.
DoStop()	Stops the RealAudio clip. Equivalent to clicking the Stop button.
DoNextItem()	Skips to the next clip in a .ram file that contains multiple clips. A .ram file is a metafile that points to one or more RealAudio files.
DoPrevItem()	Skips to the previous clip in a .ram file that contains multiple clips. A .ram file is a metafile that points to one or more RealVideo files.
CanPlayPause()	Tests if Play/Pause function is available. Returns TRUE or FALSE
CanStop()	Tests if Stop function is available. Returns TRUE or FALSE.
HasNextItem()	Tests if the next clip function is available. The next clip function is available when the connected source is a .ram file that contains multiple clips, and the current clip is not the last clip in the .ram file. Returns true or false.
HasPrevItem()	Tests if the previous clip function is available. The previous clip function is available when the connected source is a .ram file that contains multiple clips, and the current clip is not the first clip in the .ram file. Returns true or false.
AboutBox()	Opens the Copyright information for the control.
EditPreferences()	Opens the Preferences dialog box. Enables the end user to set his/her preferences. These preferences are global to all clients on the machine.
HideShowStatistics()	Shows or hides the Connection Statistics dialog box.

IsStatisticsVisible()	Tests if the Connection Statistics dialog box is displayed. Returns true or false.

CallBack Methods

CallBack methods are functions that provide notification from the RealAudio or RealVideo engine. CallBack methods can only be used with Java applets by implementing the RAObserver interface.

Method	**Description**
onClipOpened(String *shortClipname*, String URL)	Sent when a clip has been opened.
onClipClosed()	Sent to indicate that no clip is currently open.
onShowStatus(String *status*)	Sent to indicate that the status text is changing.
setAutoGoToURL(boolean *bAutoGoToURL*)	Specifies how a URL will be handled. Valid values are true or false. True indicates that the RealPlayer plug-in will automatically forward the URL event to the browser. False indicates that the OnGoToURL event will be handled by the Java applet instead.
onGoToURL(String *url*, String *target*)	Sent when a URL event has been encountered for the currently playing clip. This event will only occur if the AutoGotoURL property is false.

Advanced Control Attributes

The more exciting features of RealPlayer plug-in and RealPlayer Control for ActiveX may be utilized by specifying custom attributes within your HTML documents.

Removing Text Labels from Controls

If your Web page is in a language other than English, or if you want to use the Description fields to display information other than Title, Author, and Copyright, you may remove the Title, Author, and Copyright Labels from the information area. Controls that display Title, Author, and Copyright information for a clip, support a NOLABELS=TRUE attribute.

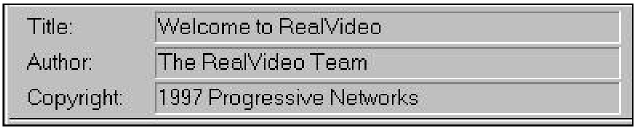
For example, allowing the default behavior

```
<EMBED SRC="use_lbl.rpm" WIDTH=350 HEIGHT=80
CONTROLS=InfoPanel>
```

or specifying NOLABELS=FALSE

```
<EMBED SRC="use_lbl.rpm" WIDTH=350 HEIGHT=80
CONTROLS=InfoPanel NOLABELS=FALSE>
```

results in the following display.

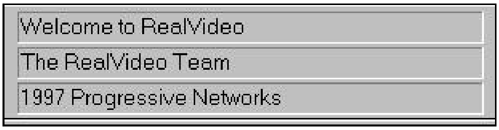


Title: Welcome to RealVideo
Author: The RealVideo Team
Copyright: 1997 Progressive Networks

On the other hand, using NOLABELS=TRUE, for example:

```
<EMBED SRC="no_lbl.rpm" WIDTH=350 HEIGHT=80
CONTROLS=InfoPanel NOLABELS=TRUE>
```

produces the following InfoPanel:



Welcome to RealVideo
The RealVideo Team
1997 Progressive Networks

Starting Clips Automatically

Adding an AUTOSTART=TRUE attribute tells the user's browser to automatically begin playing your clip when the page is visited. You can use this feature to begin narration, to play a welcome message or start a video.

Since only one clip can play at a time, if you specify AUTOSTART for more than one control instance, only the last control to load will play. The order in which your files are delivered is dependent on the Web server and on the browser's cache size. This is not necessarily the order in which you put them within your HTML. Therefore, you should specify AUTOSTART for only one control instance per page.

Playing Clips with a Hidden Control or Plug-in

If you want to play RealAudio or RealVideo clips without having a visible Plug-in control, you hide the control. By embedding a Plug-in in your page that has its size set to width=2 height=0, no image appears on your Web page. You can control the Plug-in with JavaScript.

For example:

```
<script Language=JavaScript>
function playSource()
{if (navigator.appName == "Netscape")
   {document.javaPlug1.DoPlayPause();}
else
   {RAOCX.DoPlayPause();}
}
</script>
<A HREF="#" onClick="playSource()"><IMG
   SRC="button.gif"></A>
<OBJECT ID=RAOCX CLASSID="clsid:CFCDAA03-8BE4-11cf-B84B-
   0020AFBBCCFA" WIDTH=2 HEIGHT=0>
<PARAM NAME="SRC" VALUE="pnm://audio.real.com/welcome.rm">
<PARAM NAME="CONTROLS" VALUE="PlayButton">
<embed src="start.rpm" Width=2 Height=0
   Controls=PlayButton name=javaPlug1>
</OBJECT>
```

The above example works in both Netscape and Internet Explorer. Only one control will appear on the Web page.

Making Controls Work Together

You can embed any number of RealPlayer controls within a Web page. Normally, each tag instance refers to different content. Sometimes, however, you may want to link two or more controls together. For example, you can create a play button and an image window that work as a pair.

To include multiple components that work together, specify a CONSOLE attribute for each control and assign this the same value in each instance. For example:

```
<EMBED SRC="sample1.rpm" WIDTH=30 HEIGHT=33
   CONTROLS="PlayButton" CONSOLE="Clip1">
<EMBED SRC="empty1.rpm" WIDTH=176 HEIGHT=144
   CONTROLS="ImageWindow" CONSOLE="Clip1">
```

Note Each <EMBED> tag must have a unique SRC attribute (if the same source is specified for two tags, one is ignored). Create a dummy .rpm file (named, for example: empty1.rpm) for a second control accessing a clip. Put a hard carriage return (ASCII code 13) into the dummy file.

Specifying a `CONSOLE` value of “_master” links a particular control to all other RealPlayer Controls on the page. Use this value, for example, to add a Status Bar to display information for all clips, for example:

```
<EMBED SRC="sample1.rpm" WIDTH=300 HEIGHT=33
CONTROLS="StatusBar" CONSOLE="_master">
```

Because many platforms, including Windows, only support one volume setting, all volume sliders act on the same underlying value and affect all clips regardless of CONSOLE name. For this reason, you may want to include only one volume slider per page, with no reference to a .rm file in its associated .rpm file.

If you only include an ImageWindow control on the Web page, the video stream may still be controlled by using the context sensitive pop-up menu. For Windows users, right-click the ImageWindow; Macintosh users, click and hold the mouse button until the pop-up menu appears.

Frame Document

A frame document describes the sub-HTML documents or frames that make up a window. The basic structure of a frame document is similar to that of a normal HTML document except that the FRAMESET tag replaces the BODY tag. Each frame is defined by the FRAME tag. In order to effectively use RealVideo, each FRAME tag needs the SRC and NAME attributes. The SRC points to the URL to be displayed in the frame. The NAME attribute assigns a name to the frame so that it can be targeted by links in other documents. The example below shows a simple frame document that would create two frames:

```
<HTML>
<FRAMESET ROWS="105,*">
   <FRAME SRC="banner.html" NAME="banner">
   <FRAME SRC="lyrics.html" NAME="Lyric">
</FRAMESET>
</HTML>
```

Synchronizing Frames and Video and Audio

Frames and RealVideo and RealAudio content are synchronized in the same way that a regular Web page and RealVideo and RealAudio content are synchronized: a .rae file. The difference lies in the addition of the targeted frame name to the text file that is used to create the .rae file. The syntax for each entry should follow the format:

```
u starttime endtime &&framename&&EventURL
```

where:

`u` stands for URL event (each line starts with the letter `u)`
`starttime` is the time into the clip when the new event is shown
`endtime` is the time into the clip when that event ends, && is a delimiter
`framename` is the frame name as specified in your frame document
`EventURL` (generally beginning with "http:" or "file:") is the URL for that event (usually an HTML document).

The time format is:

```
[[[days:]hours:]minutes:]seconds[.tenths]
```

The lines of the input file must be in ascending order of start time. The end time should be at least one tenth of a second before the start time for the next event.

The example below shows an .rae input file for a Web site that displays lyrics as a song plays. Each verse is displayed within a frame called Lyric.

```
u 00:00:10.0 00:00:35.0
&&Lyric&&http://www.songs.com/ver1.html
u 00:00:35.0 00:00:50.0
&&Lyric&&http://www.songs.com/ver2.html
```

Note: You cannot use frames within a presentation using RealPlayer as a helper application. You can only use frames within a multimedia presentation using the Plug-in or ActiveX Control.

More Information on Frames

A complete discussion of frames is beyond the scope of this manual. For more information on frame attributes and syntax and on targeting windows consult the following Web pages:

Frames -- Syntax

http://www.netscape.com/assist/net_sites/frame_syntax.html

Targeting Windows

http://www.netscape.com/eng/mozilla/2.0/relnotes/demo/target.html

Content Creation for Internet Appliances and Set-top Boxes

Recently, there has been a significant increase in the number of appliances such as televisions, Internet phones etc. that are able to view content resident on servers on the World Wide Web. Increasingly, these appliances will also have the capability to view and play RealAudio and RealVideo content. While these devices may be able to play RealAudio or RealVideo, they are often constrained in various ways. Some examples of these constraints include:

- Their Internet connections are at relatively low bit rates.
- They may not have the capability to playback RealVideo.
- They may be able to playback content that uses only the RealVideo (Standard) codec.

To make your content accessible by this increasingly large user population, we strongly recommend creating content in a variety of formats that are playable both on RealAudio and RealVideo players running on PCs and workstations as well as appliances. To do so, you can take advantage of RealAudio and RealVideo's many codec offerings and do one or more of the following:

- If you choose to use the RealVideo (Fractal) codec to create high-quality, high bandwidth content, you may also wish to use the RealVideo (Standard) codec to create a lower bit-rate version of the same content. The same strategy could be used if you are creating high bandwidth content using RealVideo(Standard).
- Create links on your Web-pages to audio-only versions of video presentations. These audio-only versions can be created at multiples bandwidths (using bandwidth negotiation). You may also wish to create content using codecs that are part of RealAudio Encoder 3.0 to accommodate users that may have audio players.

- Another alternative would be to use bandwidth negotiation and create high bandwidth RealVideo content and low bandwidth RealAudio versions of the same content, ie. pnrv.20 and 14_4.18 would play video to RealPlayers 4.0 and 5.0 and 14.4 audio to any other.

Index