LIGHTS! CAMERA! MUSIC! ACTION!

A Brief Look at Media Conversion Software

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The information offered in this presentation is not, and is not intended to be, a comprehensive list of media conversion and editing software applications.

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Why Convert?

The short answer:

Because the audio or video file you want to listen to/view is not compatible with your media player.

A little background:

There are many different audio and video file formats (see the links in the panel at right)

Most media players will play most file formats.

There are 2 notable exceptions:

- Windows Media Player (aka WMP, or "wimp"
- iPod, although this is changing with additional software (plug ins) now available.

A list and comparison of audio formats:
http://en.wikipedia.org/wiki/Comparison_of_audio_codecs

In the famous words of Phil Rizutto:

"Holy Cow"

That's a lot of formats.

Why Convert? (2)

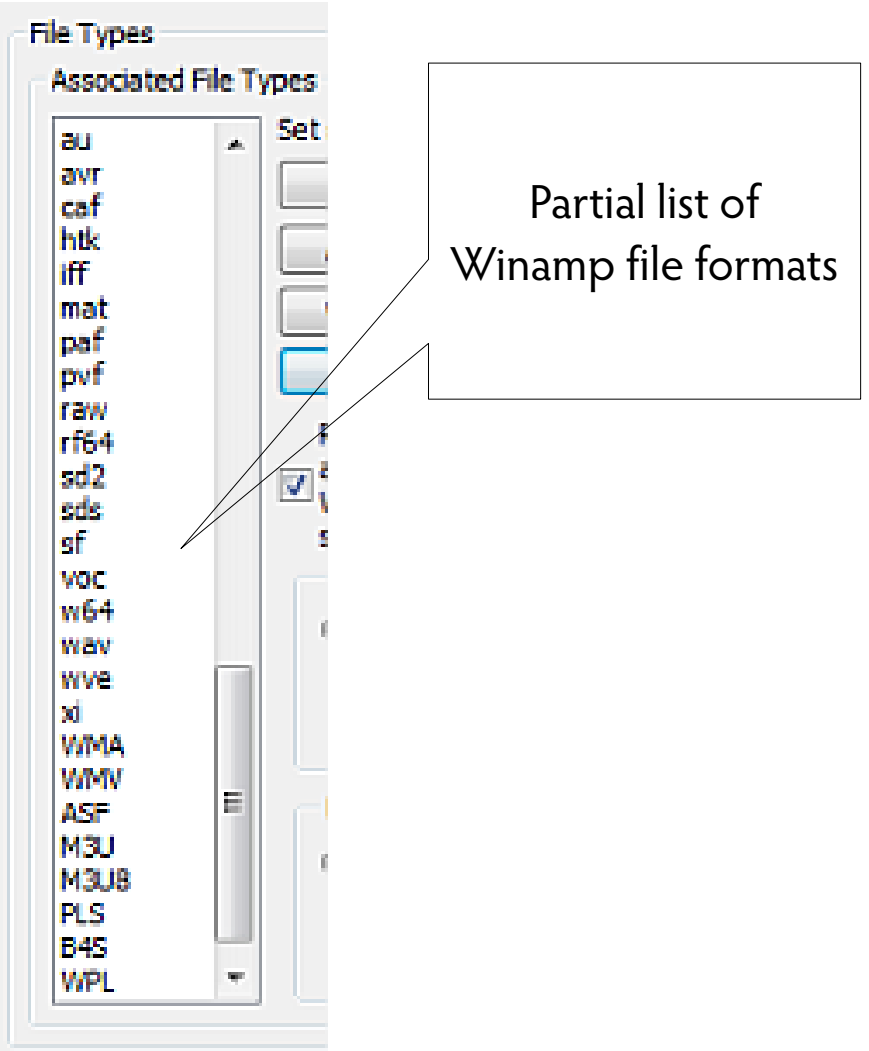
Two examples of media players that accept many file formats:

Winamp, http://www.winamp.com/

Free, proprietary
Versions for several OSs
62 audio formats, 12 video formats

VLC, http://www.videolan.org/vlc/

Free, open source
Versions for many OSs
29 audio formats, 18 video formats (Windows)



Most Common Audio Formats

CDA – Audio CDs

MP3 – the most popular audio format

AAC – associated primarily with Apple products, a number of smart phones, and internet audio streams.

WAV – a Microsoft format

And maybe a few you might have heard of:

wma, aiff, m4a, m4p, ogg, flac, ra/ram

CDA:
http://en.wikipedia.org/wiki/Compact_Disc_Audio_track

MP3:
http://en.wikipedia.org/wiki/Mp3

AAC:
http://en.wikipedia.org/wiki/Advanced_Audio_Coding

WAV:
http://en.wikipedia.org/wiki/Wav

Links to Audio Format Descriptions (1)

http://www.wisegeek.com/what-are-different-types-of-digital-audio-files.htm (Brief descriptions of selected audio file formats)

http://forums.ilounge.com/digital-audio-formats/38962-digital-audio-formats-guide.html (Brief descriptions of selected audio formats - not identical to above link)

Links to Audio Format Descriptions (2)

http://www.buzzle.com/articles/mp3-technology-advantages-and-disadvantages.html ("This article has been written to enlist the MP3 advantages and MP3 disadvantages, so as to help you decide if you want to convert your existing music files which are in some other format to MP3 or not.")

http://www.helium.com/items/819811-advantages-and-disadvantages-of-mp3-technology ("Advantages and disadvantages of mp3 technology")

http://www.wisegeek.com/what-is-flac.htm ("FLAC is an open-source, royalty-free format that has been adopted widely for its many advantages in digital audio reproduction.")

http://ipod.about.com/od/glossary/g/what_is_aac.htm ("What is an AAC File?")

Some Comments on Audio Formats (1)

Two general format categories:

- Uncompressesed (CDA, WAV, others)
- Compressed (MP3, AAC, others)

The key tradeoff:

Audio quality vs. file size

CD (CDA) quality: stereo, 16 bit resolution, 44.1 kHz sample rate = 1411 kbps

10 MB of space for every minute of sound

Audio formats (uncompressed, lossy compressed, lossless compressed):
http://en.wikipedia.org/wiki/Digital_audio_format

Audio compression formats:
http://en.wikipedia.org/wiki/Comparison_of_audio_codecs

Why compression works: (Psychoacoustics):
http://en.wikipedia.org/wiki/Psychoacoustics

Some Comments on Audio Formats (2)

Sources of information on Digital Audio:

Digital Audio Essentials. Bruce Fries and Marty Fries. ISBN 0-596-00856-2. See Chapter 8, esp. pp. 142 – 153.

This book is in the FRPCUG Library and can be checked out by members at no charge.

http://teamcom.biz/MP3Handbook/11.htm (Digital Audio Primer) ("...a few key principles to achieve good (sound) results.")

Which Audio Format Is Best?

How are you going to listen to the music:

High quality stereo/surround sound system? - uncompressed

Portable media player (iPod, etc.)? - compressed

Car stereo? - possibly either or both

All of the above? - this is where conversion software really helps.

One CD:
http://en.wikipedia.org/wiki/Audio_compression_%28data%29

Approx. one hour of uncompressed high fidelity music

less than 2 hours of music compressed losslessly

7 hours of music compressed in the MP3 format at medium bit rates.

"...know why choosing the correct sound file format is important...."
Best Format?

Links to iPod/iTunes Information (1)

http://support.apple.com/kb/TA38530 ("iPod 101: Which Files Work With iPod and iTunes")

http://support.apple.com/kb/HT1334?viewlocale=en_US ("iPod: About compatible song formats")

http://www.usb4ever.com/v-a-standards/itunesform.html ("iTunes File Formats – Which Is The Best?")

Links to iPod/iTunes Information (2)

http://ipod.about.com/od/fileformatguide/a/file_formats.htm ("A guide to what audio, video, and image file types are prevalent online and which ones work with iPod and iTunes.")

http://bindapple.com/difference-between-ipod-and-mp3-player/ ("What are the differences between an iPod and a MP3 Player? Practically, both of them do the same thing, meaning they play songs. . . . So, where is the catch?")

http://www.kenrockwell.com/apple/itunes.htm ("A Recording Engineer's Guide to the Secrets of iTunes and iPod")

Format Conversion Applications

There are a number of choices:

Conversion only (see link at right)

Editing/conversion (more on this later)

Conversion only example:

Pazera Video Converters Suite:

8 audio formats

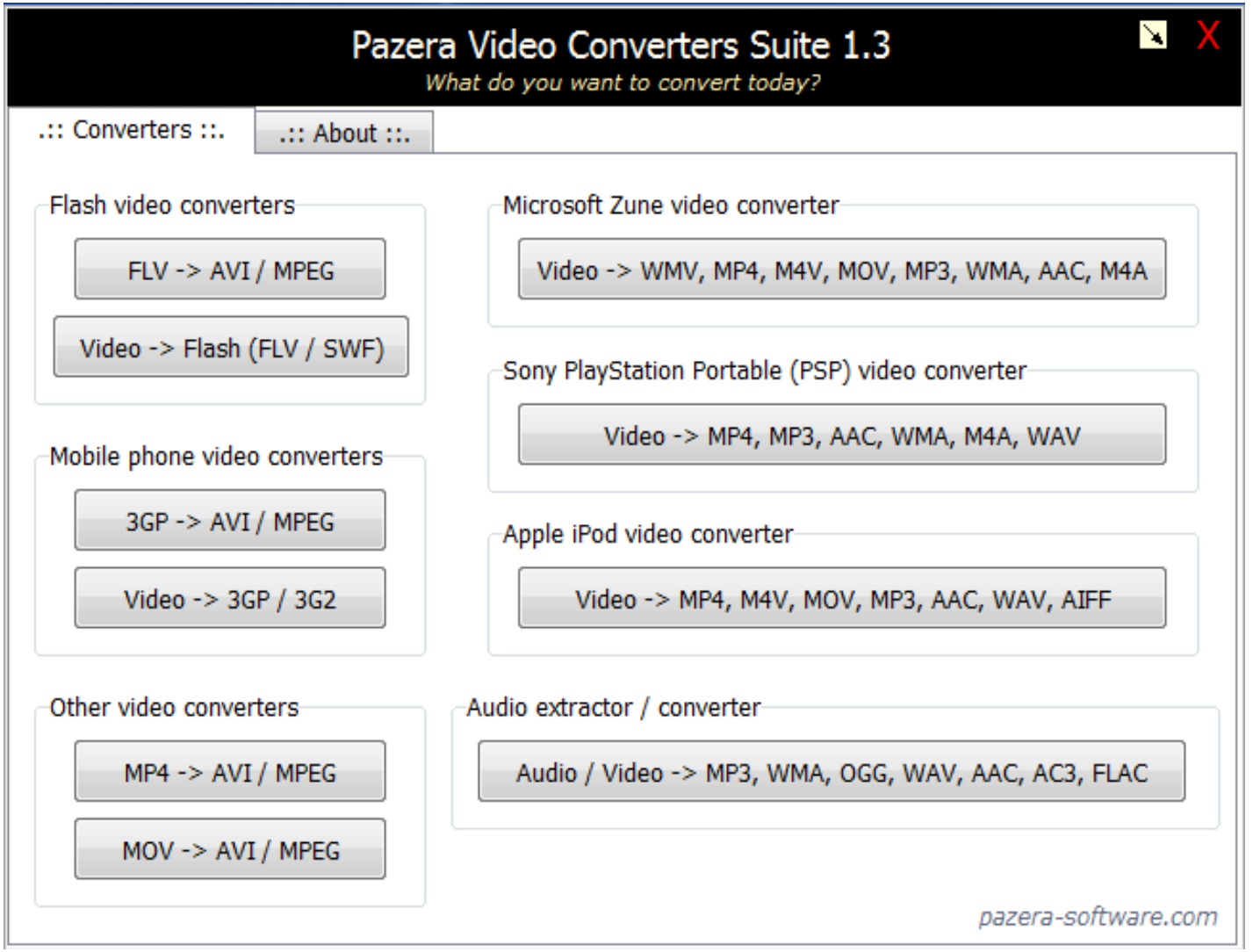
Multiple video formats

Audio/Video conversion applications:

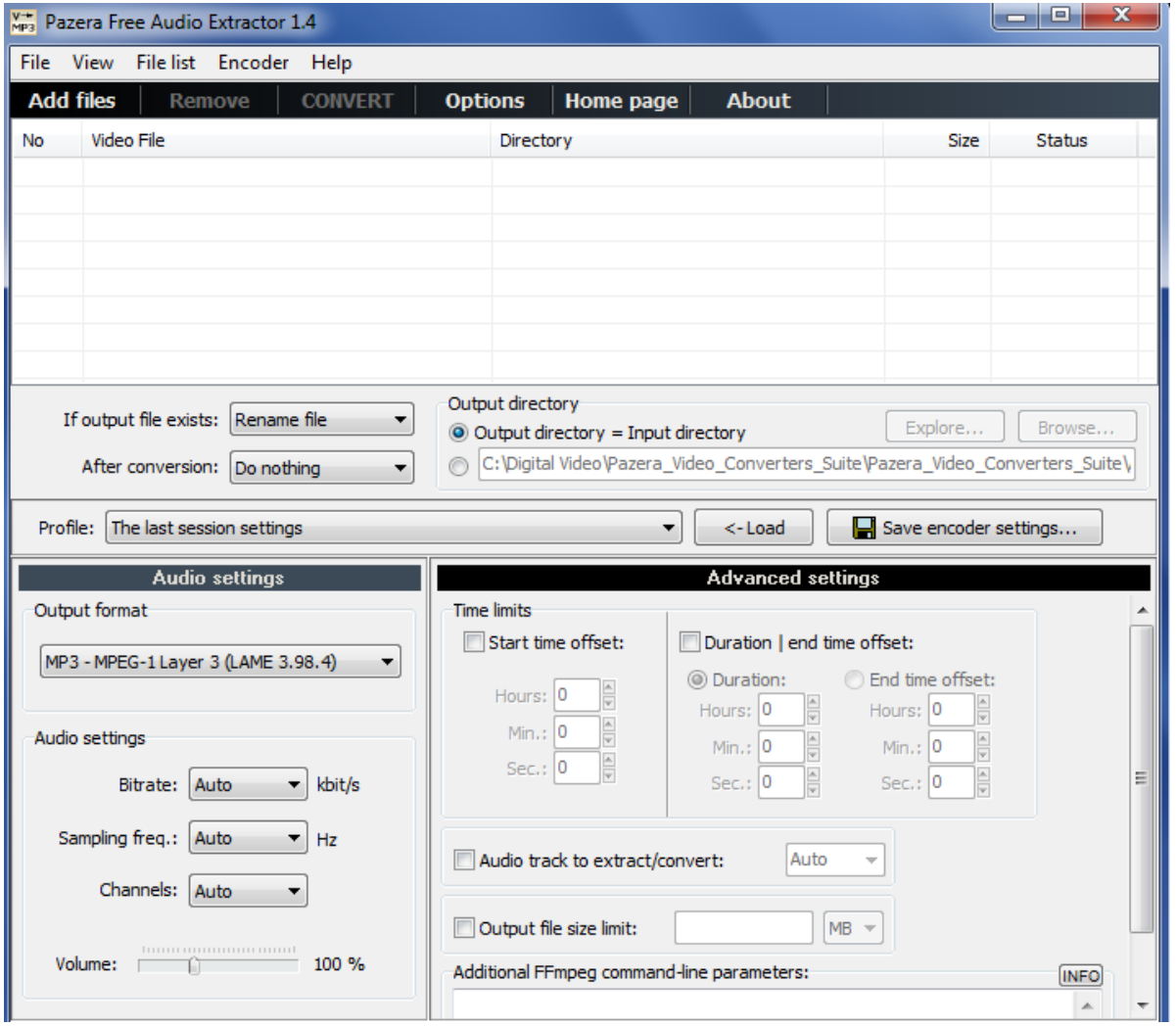
Best Free Audio / Video Format Conversion Program

DO NOT convert a compressed file format to a uncompressed file format

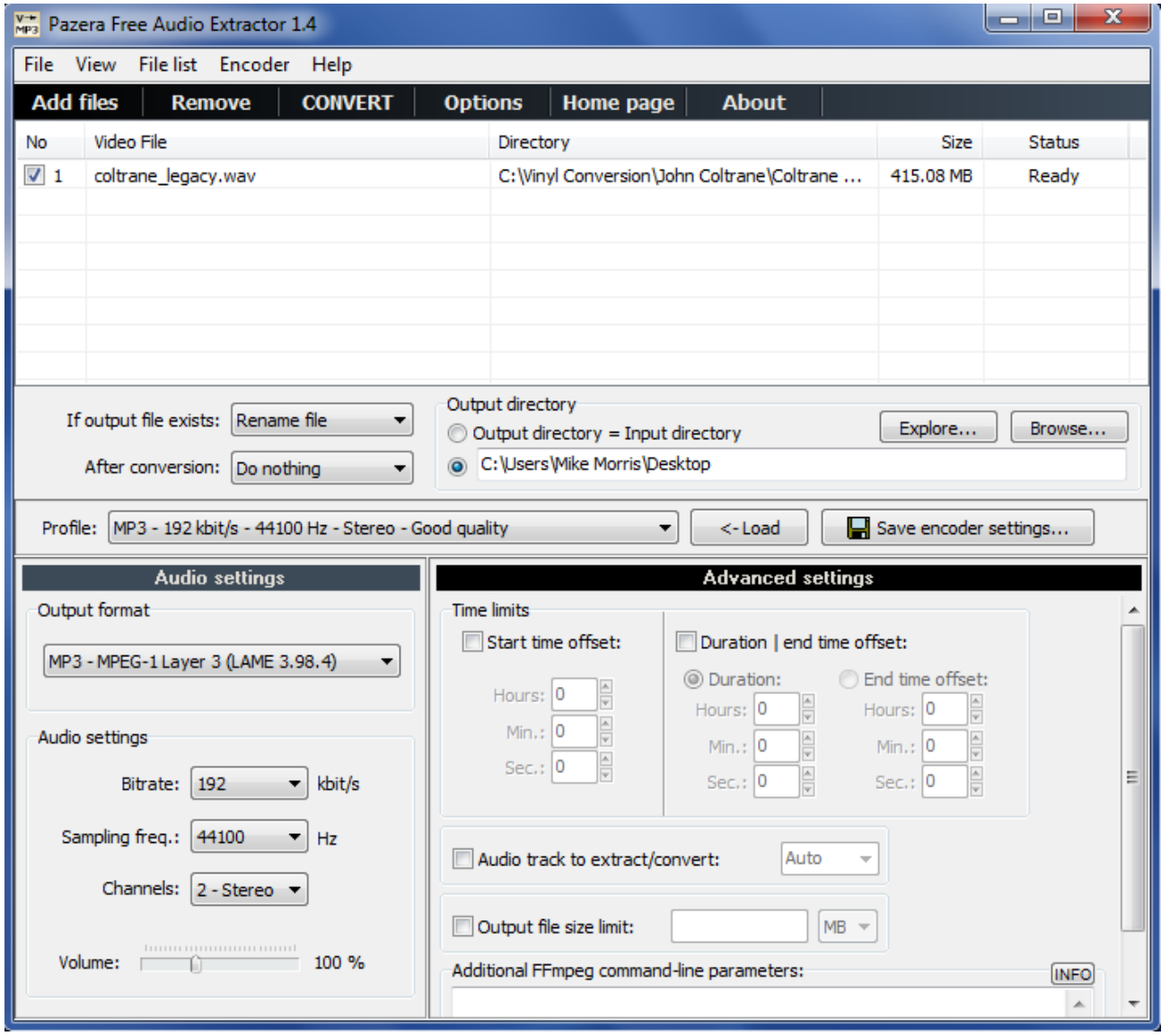
An Audio Format Conversion Demonstration (1)



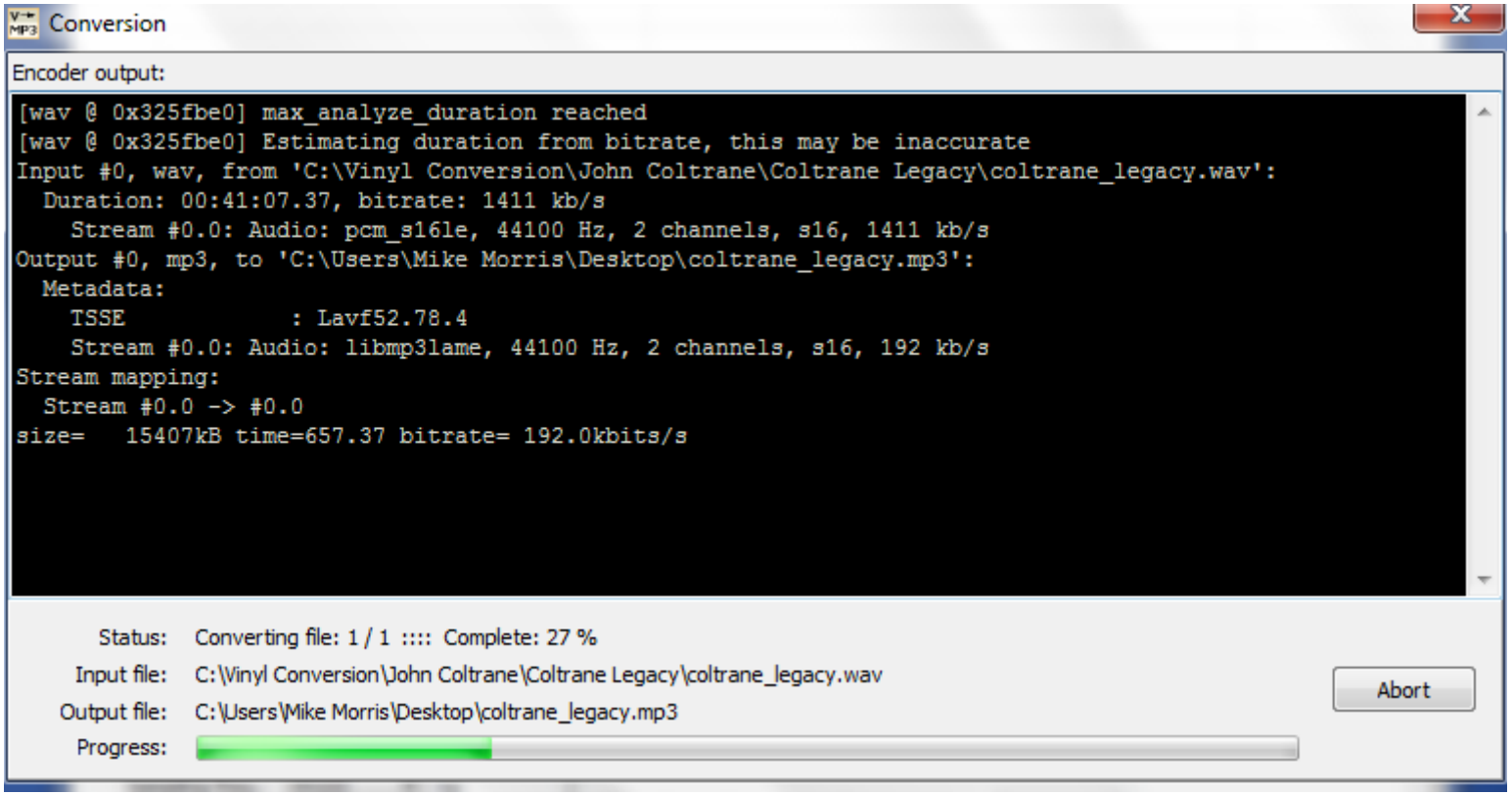
An Audio Format Conversion Demonstration (2)



An Audio Format Conversion Demonstration (3)



An Audio Format Conversion Demonstration (4)



Video File "Formats"

More complicated than audio formats:

"Containers"

e.g., VOB, what you see on a DVD movie

Video format, audio format, captions (subtitles), more

Is a container a format, or a format a container?

Ask Betty . . . .

Description of a digital container format:

Media Container

A few of the many containers:

avi, flv, mpeg, mov, qt

Container Format Comparison

References for VOB:

http://en.wikipedia.org/wiki/VOB ("A VOB file (Video Object) is a container format in DVD-Video media")

VOB Definition ("(VOB) is basically one of the core files found on DVD-Video discs and contains the actual movie data")

Most Common (?) Video File Containers (1)

AVI - A Microsoft format

"AVI files can contain both audio and video data in a file container that allows synchronous audio-with-video playback"

MPG/MPEG

Standards for audio and video compression and transmission established by the Moving Picture Experts Group(MPEG)

AVI
http://en.wikipedia.org/wiki/Audio_Video_Interleave

MPG/MPEG
http://en.wikipedia.org/wiki/MPEG

FLV
http://en.wikipedia.org/wiki/Flash_Video

MOV/QT
http://en.wikipedia.org/wiki/QuickTime
http://en.wikipedia.org/wiki/QuickTime_File_Format

Most Common (?) Video File Containers (2)

FLV - An Adobe Systems format

"Flash Video is a container file format used to deliver video over the Internet using Adobe Flash Player versions 6–10. Flash Video content may also be embedded within SWF files. Flash Video has been accepted as the default online video format by many sites. Notable users of it include YouTube, Hulu, VEVO, Yahoo! Video, metacafe, Reuters.com, and many other news providers."

MOV/QT - Quick Time

"… an extensible proprietary multimedia framework developed by Apple Inc., capable of handling various formats of digital video, picture, sound, panoramic images, and interactivity. It is available for Mac OS classic (System 7 onwards), Mac OS X and Microsoft Windows operating systems."

What is the Best Video Format (Container)?

There isn't one

Key Factors to consider (not a comprehensive list):

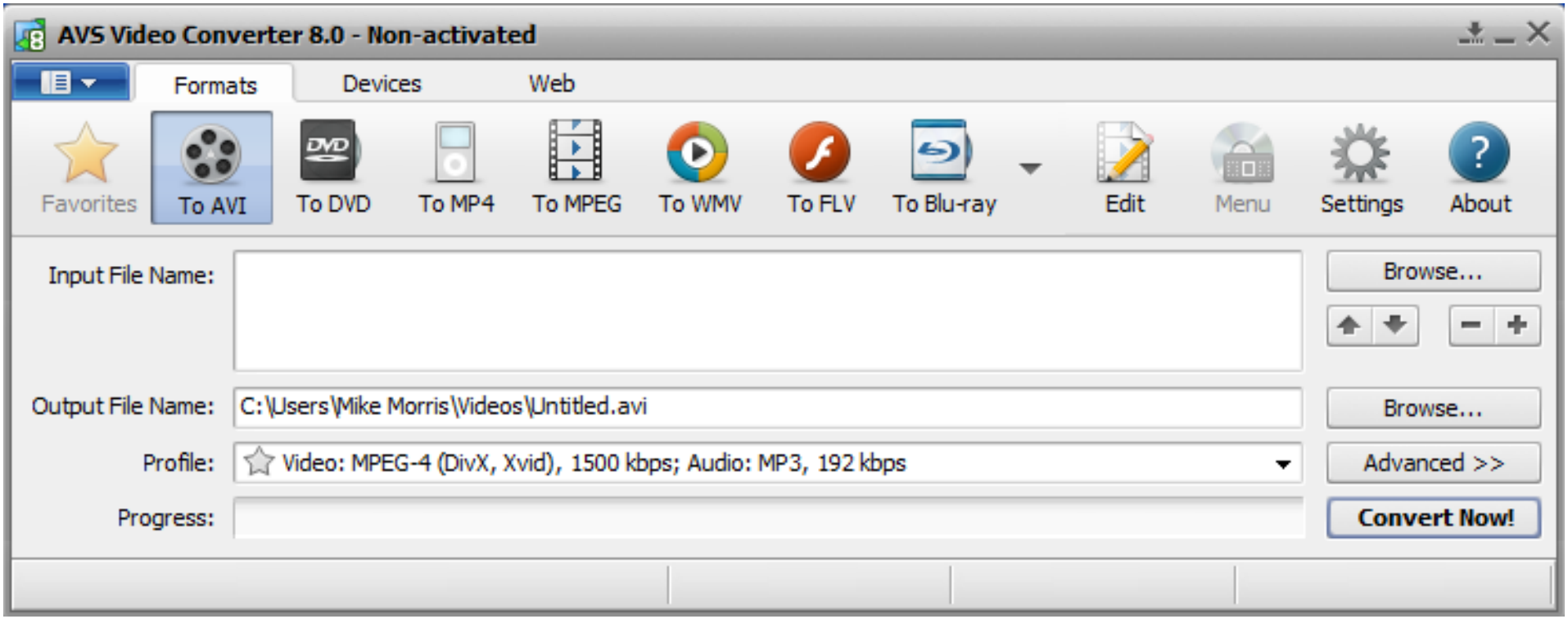
- End use - family (DVD, Home Theater), business, movie theater, archive
- File size / compression rate
- Video resolution
- Compatibility with video players (which ones and how many)

As with audio formats, there is a tradeoff between file size and quality (compression, resolution)

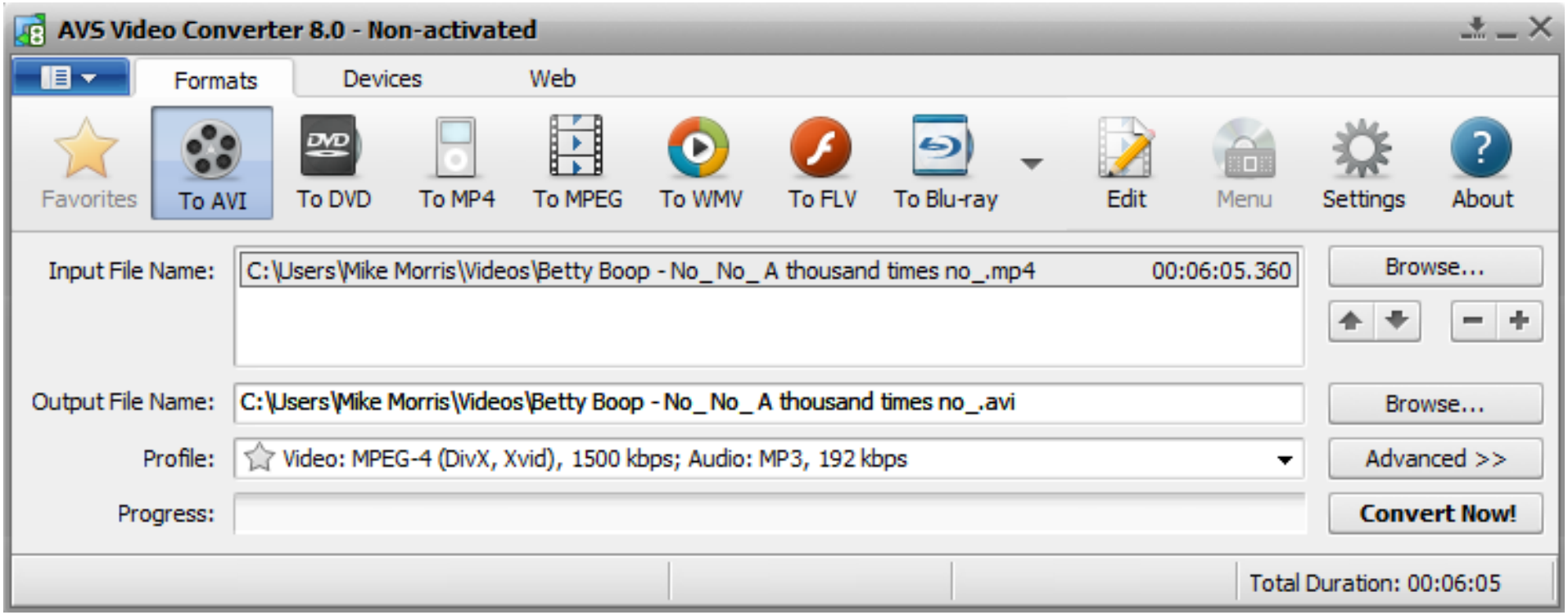
A Video Format Conversion Demonstration (1)

Video conversion using AVS:

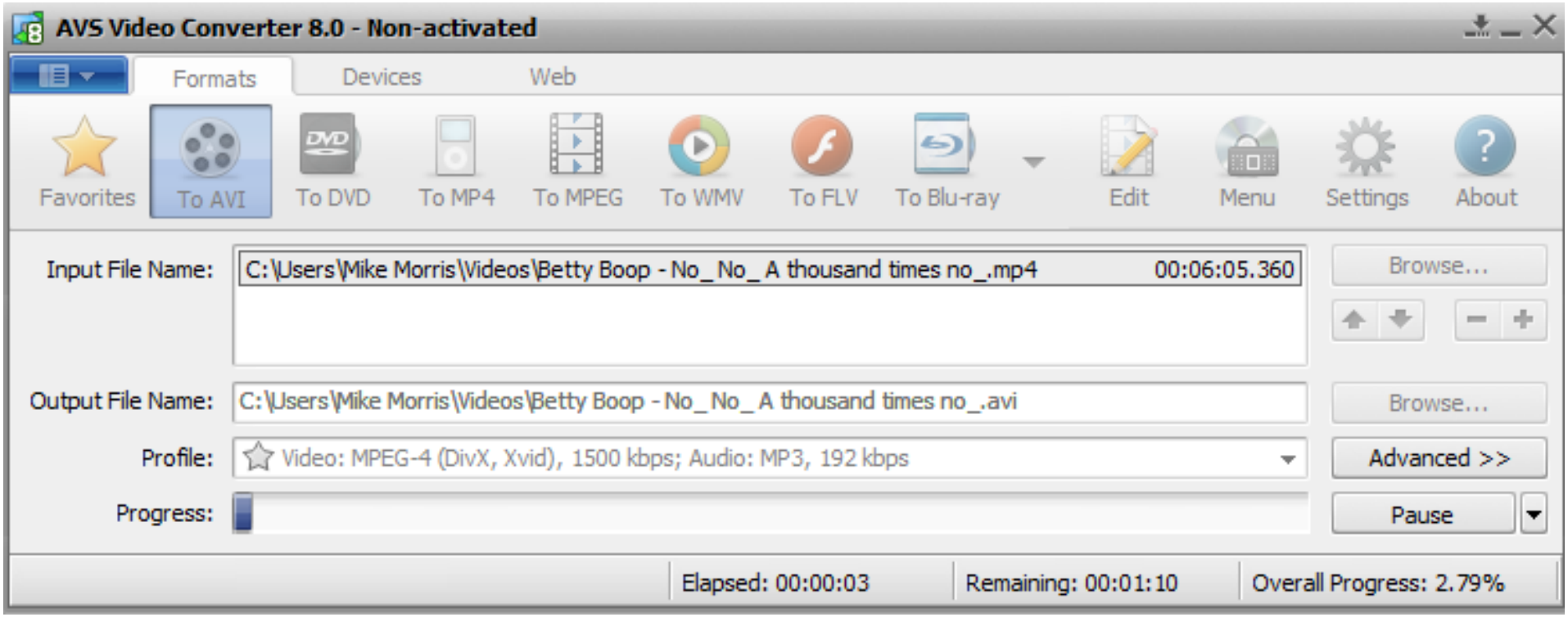
A Video Format Conversion Demonstration (2)



A Video Format Conversion Demonstration (3)



A Video Format Conversion Demonstration (4)



Convert vs. Edit (1)

Editors designed for use with music typically allow the user to do the following:

Record audio from one or more inputs and store recordings in the computer's memory as digital audio

Edit the start time, stop time, and duration of any sound on the audio timeline

Fade into or out of a clip (e.g. an S-fade out during applause after a performance), or between clips (e.g. crossfading between takes)

Digital audio editor definition:
http://en.wikipedia.org/wiki/Audio_editing_software

Convert vs. Edit (2)

Mix multiple sound sources/tracks, combine them at various volume levels and pan from channel to channel to one or more output tracks

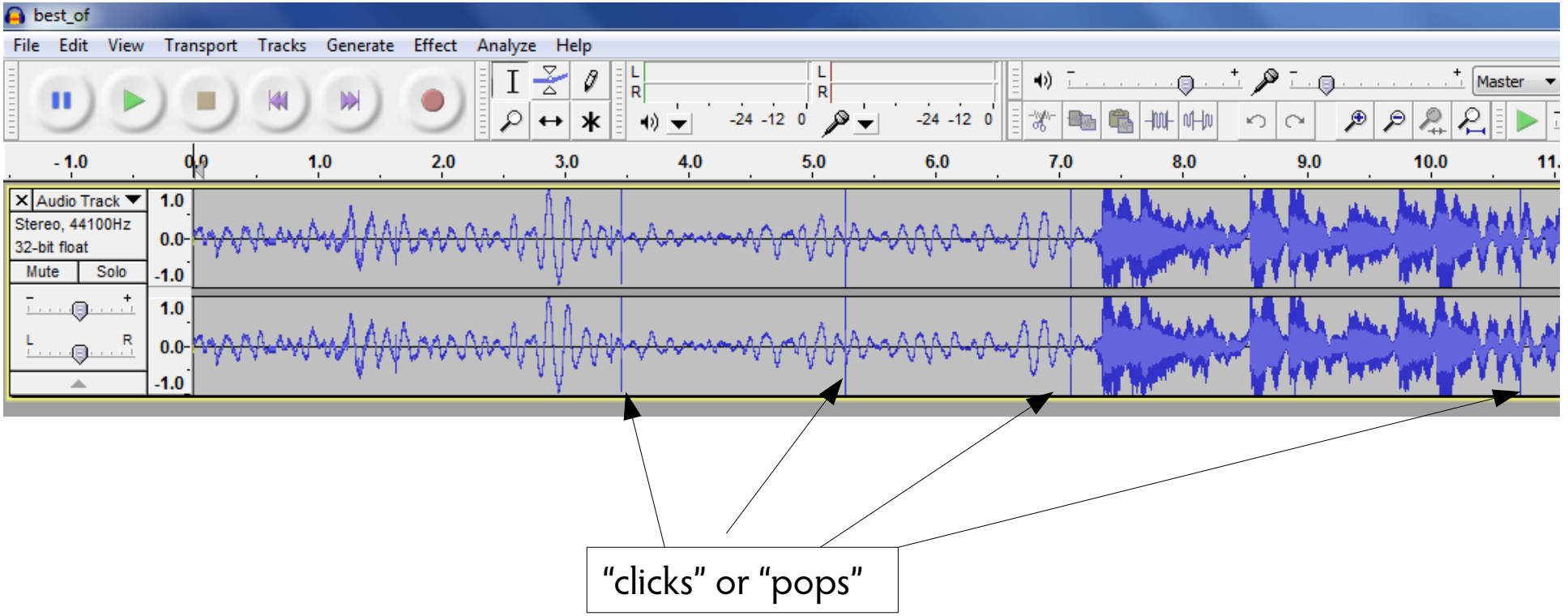
Apply simple or advanced effects or filters, including compression, expansion, flanging, reverb, audio noise reduction and equalization to change the audio

Playback sound (often after being mixed) that can be sent to one or more outputs, such as speakers, additional processors, or a recording medium

Conversion between different audio file formats, or between different sound quality levels

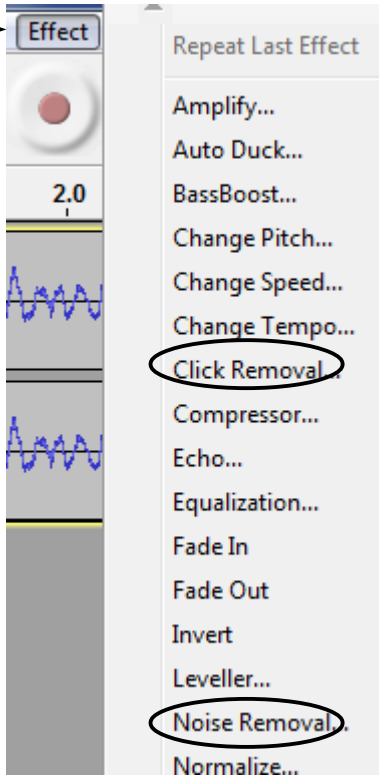
An Audio Editing Demonstration (1)

Editing an audio file using Audacity:



An Audio Editing Demonstration (2)

Use the “Effect” item on the The Audacity menu:



From the Audacity Manual:

"Click Removal is designed to remove individual clicks on audio tracks and is especially suited to declicking recordings made from vinyl records, without damaging the rest of the audio."

However,

"Very soft and rapid light ticks that sound like static electricity and which are typical of vinyl (sometimes referred to as "crackle") won't be effectively removed with Click Removal. For this type of noise you should use the Noise Removal effect."

An Audio Editing Demonstration (3)

Expand the view around the click

Select an area around the click

Select Effect/Noise Removal

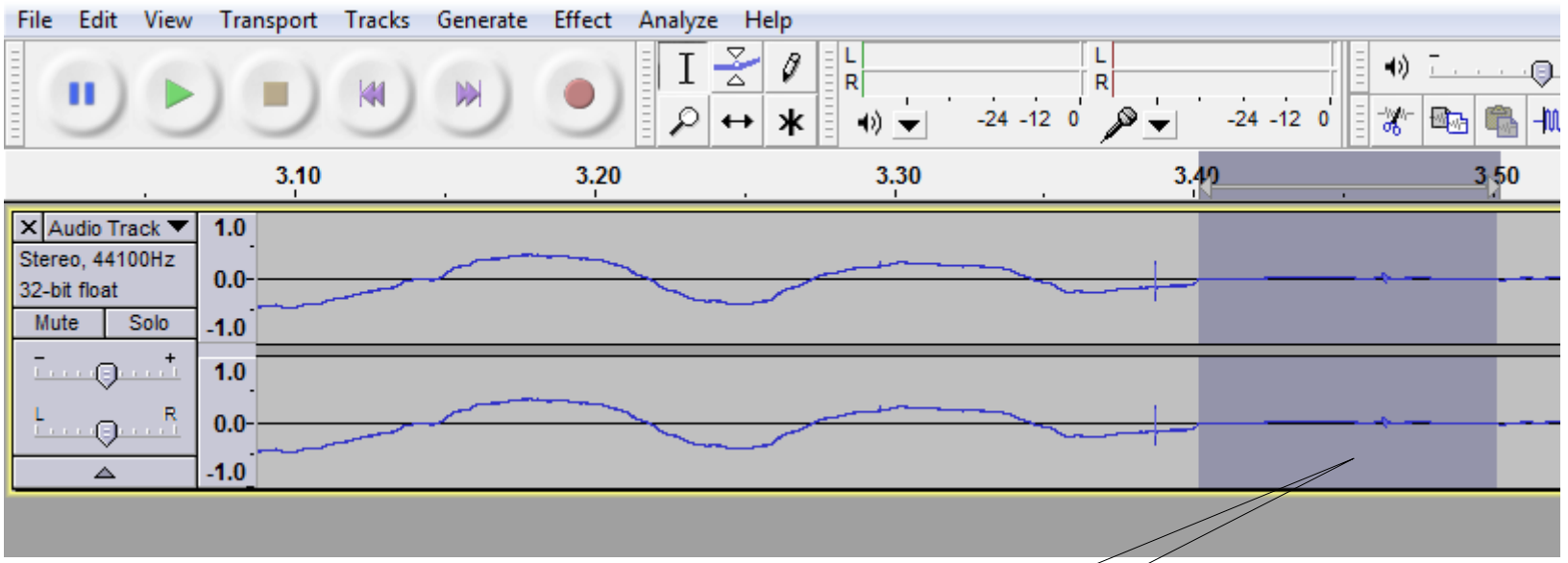
Click on the "Get Noise Profile" button

Select Effect/Noise Removal

Click on OK (start with default settings)

An Audio Editing Demonstration (4)

The result:



Summary

There exists an enormous variety of digital audio and video formats, and the list grows almost on a daily basis

Most media players (software and hardware), with a few important exceptions, will play most formats.

With so many formats available, a format conversion application can expand your enjoyment of music and video.

There is no best format, for either audio or video. You must decide on how you are going to use the music or video, educate yourself on the alternatives, and select one or more formats that meet your needs

Finally . . .

That's All Folks!