

Extracting the DTS audio part from a DVD.

This article describes the procedure how to rip the DTS content from a DVD and how to convert this into file(s) which can be played with any player. At the end, also a possibility of burning the files onto a CD-R to listen to your favorite music in your car. These steps are:

- Rip the content with DVD Decrypter;
- Demultiplex the DTS stream with VOBinator;
- Transcode the DTS stream with HyperCube Transcoder;
- Remix the 6 channels into a 2 channel file with eg. Audacity;
- Resample the file with SSRC to 44.1 kHz;
- Burn to cd with EAC.

It can be seen that it is not easy to do this but the result is worth it.

Rip the content with DVD Decrypter

(At the time of writing: version 3.1.9.0)

This is done in **IFO Mode**. The purpose of this step is to come up with one single VOB file. The settings are

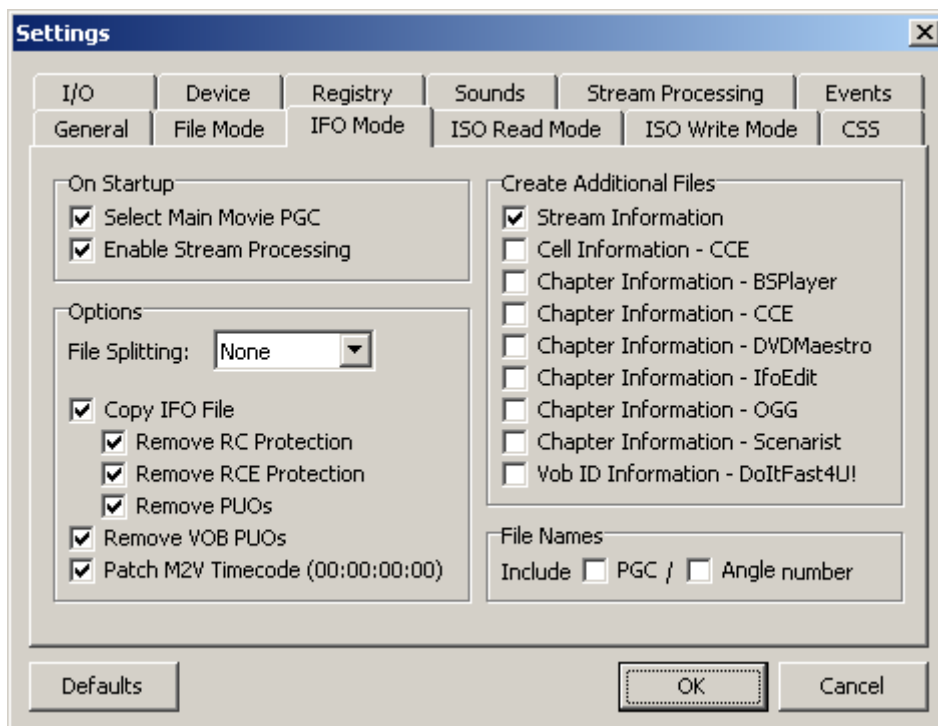


Figure 1. *The settings of DVDDecrypter in IFO Mode.*

After pushing “OK” and inserting a DVD, one can see something like Figure 2.

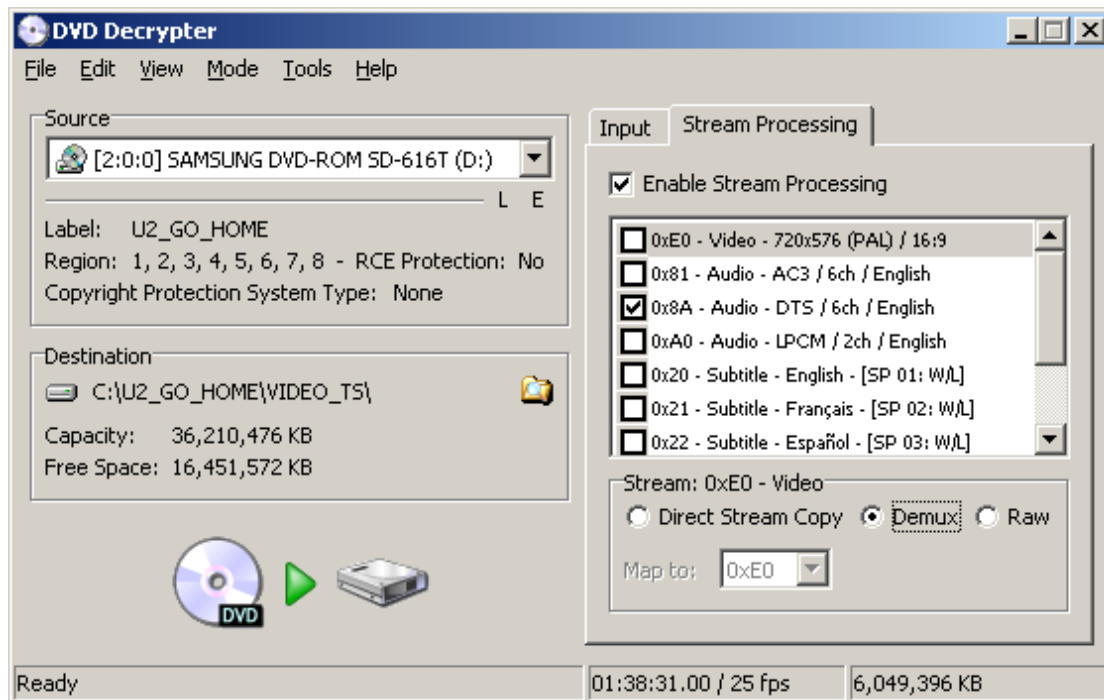


Figure 2. DVD Decrypter menu.

Here, we are only interested in the audio content, so **enable the “0x8A – Audio” box** for this particular case. Also “0x81” to “0x89” are possible. (**Disable all other boxes**). The last preparation is **enabling the “Demux”** selection box, although the default “Direct Stream Copy” is sufficient since there is only one item, i.e. “Audio”, selected. After selecting the wanted location on the hard disk (the “L” button), push the picture to start the process, ie.



Figure 3. Button to start DVDDecrypter.

The result of this action are three files:

- Stream Info
- IFO file
- VOB file

Where the last file can be played with software DVD players with DTS decoding software built in, e.g. InterVideo WinDVD. It is recommended to store these files somewhere as a back-up.

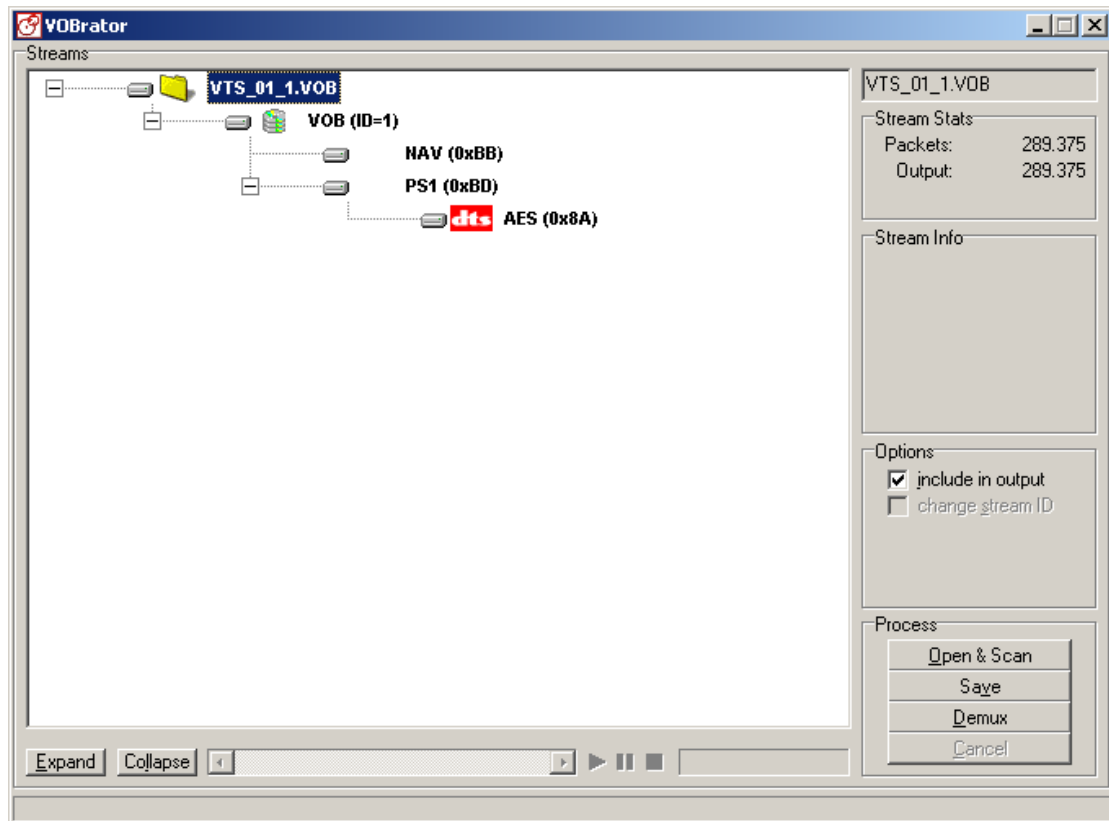
Demultiplex the DTS stream with VOBinator

(At the time of writing: version 0.2 Beta)

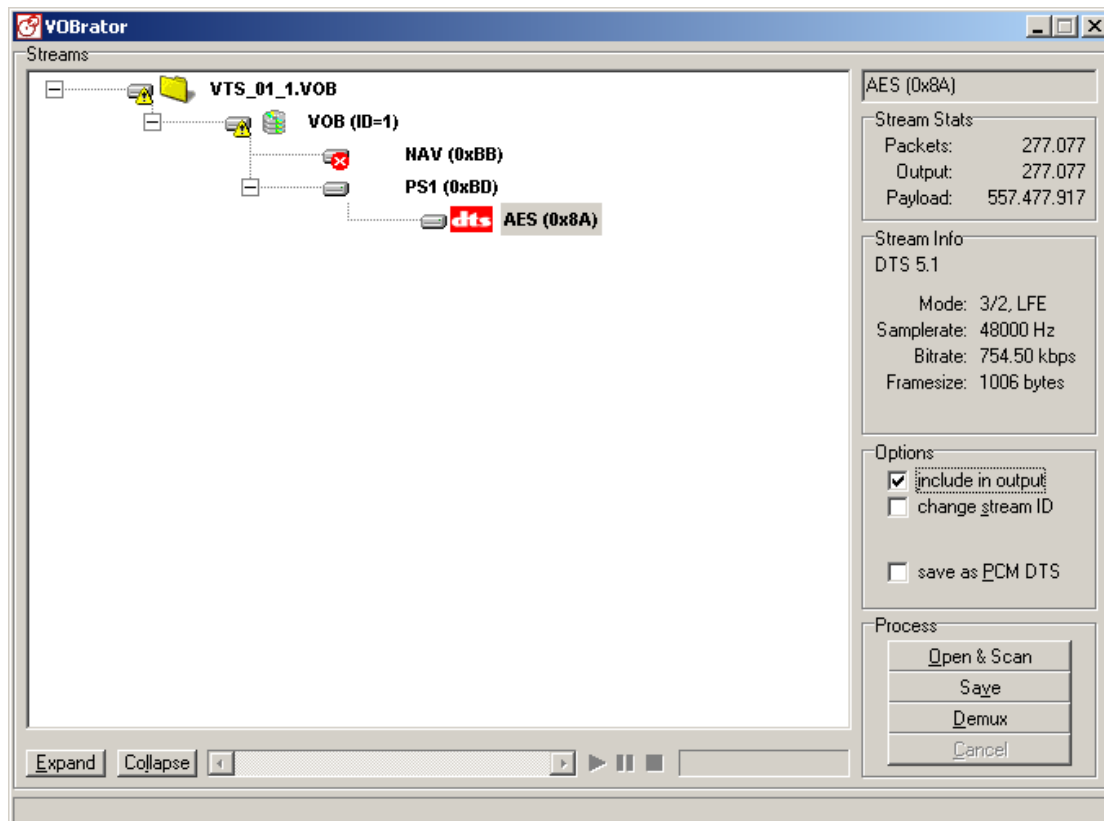
This tool is used to demultiplex the VOB file created by DVD Decrypter. This is a very old tool and probably there are better tools to do this, but why change a winning team?



Start up VOBrator, and load the first VOB file you ripped. This is done by **pressing “Open & Scan”**. It will scan the VOB file and display the structure of it, or



By **disabling “include in output”**, selecting the wanted audio stream and enabling **“include in output”** again, one is sure of the one and only file one was interested in! The resulting screen is as follows:



Please note that both **“change stream ID”** and **“save as PCM DTS”** are **unchecked**. **Press the “Demux” button** and select a place to save the resulting file. Here, there is an assumption that it would be saved as a VOB file, but one can ignore the extension. What the "Demux" option does is to simply separate the audio track for the VOB file you have opened, and save it as another file on your hard-drive. These files will have .ac3, .dts, .mp2/.mpa or .wav extensions, depending on what kind of audio your DVD movie is.

Transcode the DTS stream with HyperCube Transcoder

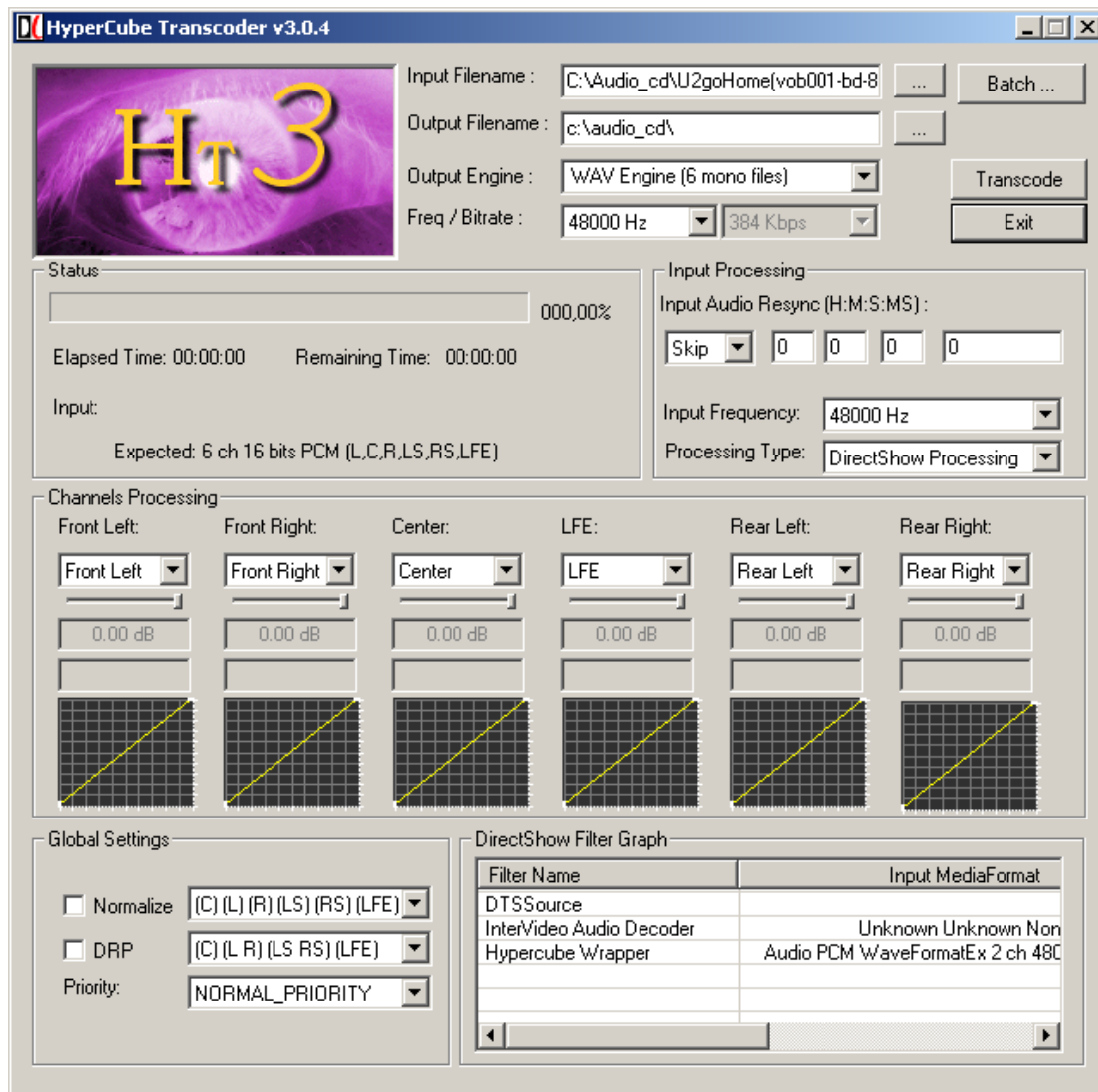
(At the time of writing: version 3.0.4)

This tool is the key component in this chain. It can handle DTS files (or WAVDTS files by using a different filter) as well as AC3 files and AVI files with AC3. It transcodes these stream into:

- 1 file with the MP2 Engine;
- 6 files with the PCM Engine;
- 1 file with the WAV Engine or
- 6 files with the WAV Engine.

The first is used to transcode for a (S)VCD (!) and the other are a matter of taste. Since I want total control, I choose for the latter. Here, one can load the 6 separate files into a mixing console and make your own stereo downmix.

The graphical user interface looks like this:



Where one can set the compression and attenuation channel by channel. From this point I wish to thank those guys who made this possible, it is an awesome piece of software! (<http://hypercube.is.dreaming.org/>)

The main important thing is the DirectShow Filter Graph. A possible solution is the above depicted sequence (automatically selected by the way), DTSSource – InterVideo Audio Decoder – Hypercube Wrapper. The DTSSource.ax file can be obtained from Doom9 or else on the internet. Put this file in your system32/ directory of Window\$ and type

```
regsvr32 dtssource.ax
```

Please refer to the Hypercube site for more info. The filter “InterVideo Audio Decoder” comes with InterVideo WinDVD and this is another key component in the DTS decoding procedure. Without this kind of filters it is impossible to transcode a DTS stream. Select this filter and with the right mouse button one can set the filter as follows.



Hit the **“Transcode”** button of HyperCube Transcoder and wait. The result of this action depends on what engine is selected and in this case there will be 6 mono WAV files waiting for further processing. By now the hard work is done, i.e. the DTS stream decoded into playable file(s). One final check is that the naming of the files can be wrong (it was for me), i.e.

- stream_r -> Center channel,
- stream_ls -> LFE channel,
- stream_c -> Right channel,
- stream_lfe -> Right Surround channel,
- stream_l -> Left channel and
- stream_rs -> Left Surround channel.

By the way, the InterVideo filter I used was from the trial version of WinDVD Recorder 4.5. So, all software used in this article is free!

Some thoughts and considerations

To do a quick and dirty conversion of a 6 channel into a stereo file one can use Foobar2000. Here, the HyperCube Transcoder is simply set to “1 file WAV Engine” and this file is opened with Foobar2000. However, this file can also be played with WinAmp etc. Within Foobar2000 there is a feature that allows you to convert 5.1 into stereo right away (in the DSP settings). Combined with the feature of Diskwriting, one can simply save this file as a stereo 44.1 kHz WAV file or something else. I am sure that there are more solutions like this out there.

To become a sound engineer/producer yourself, one has to downmix the separate files into a stereo file. Here, one can positioning the audio wherever they want in the left-right plane and one can process each track separately. This last option is in my humble opinion the best.

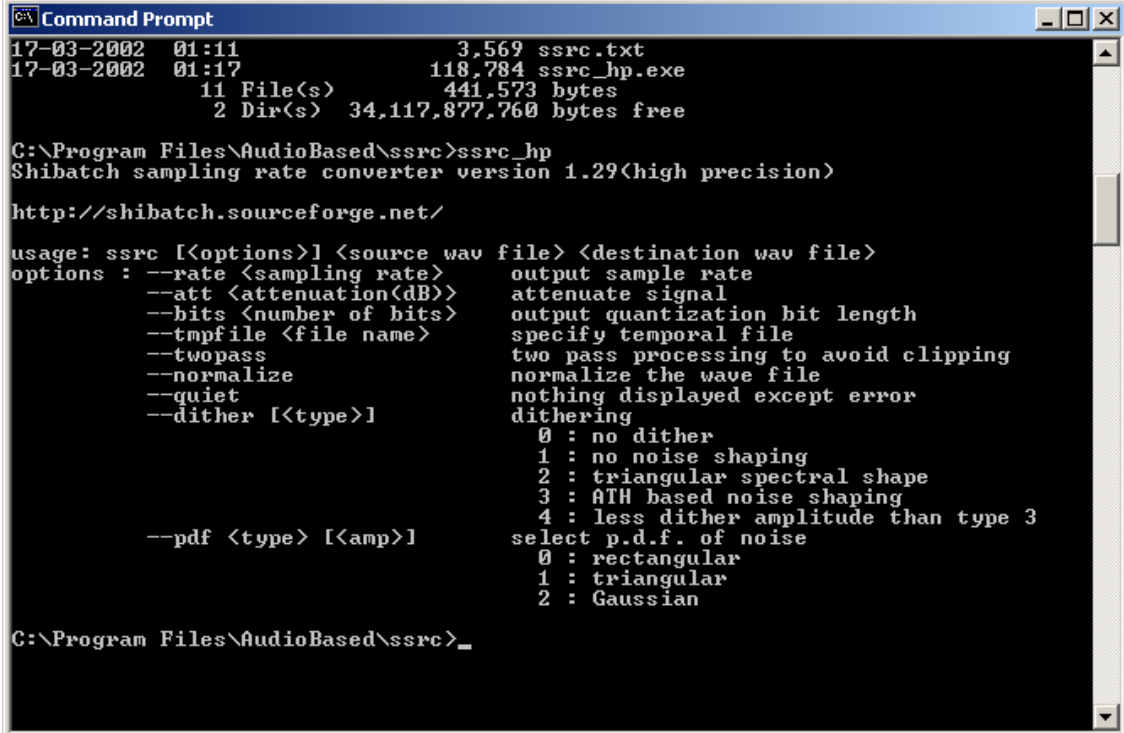
Remix the 6 channels into a 2 channel file

(At the time of writing: version 1.2.0 preBeta3)

One of the best free audio editors is Audacity and is one of my favorites, but one imagine that other editors are similar. **A small catch has to be resolved when Audacity is used: convert the mono files into stereo files.** A large number of tools can do that (e.g. Foobar2000) and it will not be discussed here.

Resample the file with SSRC to 44.1 kHz

Now we have a nice WAV file (unfortunately one large file, without separated tracks), but it is sampled with 48 kHz (most probably). Let me put it this way: there are almost no good resampling programs out there...Nero can do a proper job, but I recommend SSRC. This is a command line simple sample rate converter with the following features.



```
Command Prompt
17-03-2002 01:11          3,569 ssrc.txt
17-03-2002 01:17        118,784 ssrc_hp.exe
          11 File(s)          441,573 bytes
          2 Dir(s) 34,117,877,760 bytes free

C:\Program Files\AudioBased\ssrc>ssrc_hp
Shibatch sampling rate converter version 1.29<high precision>
http://shibatch.sourceforge.net/

usage: ssrc [<options>] <source wav file> <destination wav file>
options : --rate <sampling rate>      output sample rate
          --att <attenuation(dB)>      attenuate signal
          --bits <number of bits>     output quantization bit length
          --tmpfile <file name>       specify temporal file
          --twopass                    two pass processing to avoid clipping
          --normalize                  normalize the wave file
          --quiet                      nothing displayed except error
          --dither [<type>]            dithering
                                     0 : no dither
                                     1 : no noise shaping
                                     2 : triangular spectral shape
                                     3 : ATH based noise shaping
                                     4 : less dither amplitude than type 3
          --pdf <type> [<amp>]        select p.d.f. of noise
                                     0 : rectangular
                                     1 : triangular
                                     2 : Gaussian

C:\Program Files\AudioBased\ssrc>_
```

The command I use is as follows:

```
Command Prompt
C:\Program Files\AudioBased\ssrc>ssrc_hp --rate 44100 --twopass --normalize --dither 1 c:\Audio_cd\Audio.wav c:\Audio_cd\AEDM.wav
Shibatch sampling rate converter version 1.29(high precision)
frequency : 48000 -> 44100
attenuation : 0dB
bits per sample : 16 -> 16
nchannels : 2
length : 580804608 bytes, 3025.02 secs
dither type : no noise shaping, rectangular p.d.f, amp = 0.18

Pass 1
 100% processed, ETA = 0sec
peak : -0.108602dB

Pass 2
 100% processed, ETA = 0sec

C:\Program Files\AudioBased\ssrc>
```

or:

ssrc_hp --rate 44100 --twopass --normalize --dither 1 <source> <destination>

Now we have a 44.1 kHz WAV file which can be burnt on a CD-R.