

Convert an SQ Quadraphonic LP to 5.1 Dolby Digital or DTS

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First, play the LP and record the stereo file to your hard drive. I like to record at 96 ksps and 24-bits but you will then have to down sample to 44.1 ksps and 16-bits to be compatible with the SQD12sfx decoder program.

Launch the SQ decoder, SQD12sfx.exe, and enter the file name. Check the “separate single channels WAV file” box and “normal SQ matrix decode.” You can keep the default reduce volume by 0.5 dB. Click START.

A bar graph shows the conversion progress. When it’s finished you will have four new mono wav files in your source folder with the source name plus being identified as left-front, right-front, left-back and right-back. (Probably a good idea to back them up to a usb drive before continuing.)

In my aX article I suggested adding center and LFE (sub-woofer) channels using a DAW (such as REAPER) but this is very easy to do in Audacity, a free audio editor (www.audacity.com).

Launch Audacity and click on File | Import Audio and select the Left-Front channel. Click File | Import Audio again and select Right-Front. This next step may not be necessary but it will insure the mix will not be clipped.

Select the LF channel (click anywhere in the left-side of the channel pane). Click Effect | Amplify and choose an attenuation value (negative dB) to make the peak amplitude at -6dB. For example, if the peak reading is 3.2dB (shown on the screen), enter -2.8dB and click OK. Repeat for the RF channel.

Now, reselect the LF channel with a click and Shift-click the RF channel to also select it. (Both channel panes should have the same darker color background showing they are selected.) Click Tracks | Mix and Render. Both the LF and RL channel panes should disappear and be replaced by a single pane with the title Mix. Select the channel, then click File | Export Selection and save it with Center in the file name. Close the file.

Repeat the above File | Import Audio steps for the LB and RB files, including the File | Export Selection with LFE (Low Frequency Effects) in the file name. (This is the sub-woofer channel.) Before closing it, select Effect | Lowpass Filter and chose 12 dB/octave rolloff and 120 Hz cutoff frequency. Run the filter and then adjust the amplitude for a -6dB peak as described above. (Most amplified sub-woofers have a built-in lowpass filter but it does no harm to do the pre-filtering.)

If you intend to make a DVD playable on a dvd player, you need to resample the six mono files from 96 ksps to 48 ksps because this is required by the AC3 encoder (keeping 16-bits per sample is OK). The re-sampling is easily done in most any audio editor but re-open at least one of the files to make sure it’s 48 ksps. Some dvd creation programs will warn you about the sample rate – and some

won't.)

Now you have six mono wav files that can be encoded to a 5.1 format. For Dolby Digital (AC3) encoding launch WAVtoAC3.exe (code.google.com/p/wavtoac3encoder/). Enter the mono file names in this order: LF, RF, Center, LFE, LB and RB. Click MUX Wizard and you should see the names you entered matched with the programs channel names. Click Cancel.

Click Encode. A single file with the extension .ac3 should be created in the same folder as your mono input files. You can check that the encoding is correct by using the AC3-Decoder in the AC3Filter pack (www.ac3filter.com).

The DVD-Audio format does not support .ac3 files so you will need to make a DVD-Video, with or without any video content, to have a disc playable on a dvd player. For a disc playable on a computer with media playing software, you can make a data disc using Windows Media Creator, Roxio Media Creator or others.

I evaluated several Windows programs for creating DVD-Videos, ranging from free to a bit expensive.

1. FREE, DVDStyler (www.dvdstyler.org). It will accept an .ac3 audio file but it requires a video file to be loaded first. An easy work-around is to convert a still photo to an mpg2 video file. I used AVS Video Converter to convert a jpg image. (This converter isn't free but you get to use all of their many utility programs for a one-time low price.) Then the short (about 5 seconds) video file must be lengthened to be at least as long as the ac3 audio file. I used AVS Video Editor which you can also use with an AVS license, www.avs4you.com.

Just drag the short video file to the timeline until the length is OK, it is displayed on the right side of the screen. Then click Produce to create the new, longer file. Click on File Browser in DVDStyler and add the new video file, then add the ac3 audio file and click Burn. The Burn menu lets you Preview and Create an iso image which is useful because you can review the log file to make sure the build was error free before using a DVD. If the build was successful, burn the iso image file to a DVD with Roxio or Nero or your choice. It creates a very nice 5.1 surround sound DVD.

I used a simple, one-song example to find out if it would work. You can optionally add menus and perform other editing tasks. There is extensive documentation, especially for a free program, and I have included the **dvdstylermanual.pdf** and **dvd_styler_guide.pdf** in the convert-sq.zip file. DVDStyler is produced by Aimersoft so it's curious that it supports ac3 audio files when their "paid for" programs do not.

2. FREE, DVD Creator 1203 (www.wondershare.net). Does not support ac3 audio files.

3. FREE, DVD Flick (www.dvdflick.net). Does not support ac3 audio files.

4. \$39.95, Aimer DVD Creator 3.0.0 (www.aimersoft.com). Does not support ac3 audio files.
5. \$39.99, Video Editor 3.6.2 (www.wondershare.com). Accepts the extended length video file and the ac3 audio file and creates an iso image file but the audio is converted to just stereo. On the Output screen, I went to Format | Advanced settings | Channels and changed the setting to 5.1 but the output file was still just stereo.
6. \$49.00, DVD Lab 131 (www.mediachance.com). Does not support ac3 audio files.
7. \$49.95, Video Converter Ultimate (www.aimersoft.com). Loads the extended length video file and the ac3 audio file and can create a .vob file (or you can chose other output formats). Media players such as VLC Player will play vob files.
8. \$160.00, DVD Lab Pro 2 (www.mediachance.com). Somewhat expensive but it works fine without having to expand the length of the video file. Apparently it does it internally to match the audio file length. "There is a good tutorial: "How to Author AC3 5.1 Channel Audio Only DVD Using DVDLab Pro2 (included on the Addendum CD) and at: <http://forum.videohelp.com/threads/277150-How-to-Author-AC3-5-1-Channel-Audio-Only-DVD-Using-DVDLab-Pro-2>.

If you prefer, you can also encode the six mono files to DTS format and “burn” it to a CD by using SurCode CD-DTS from www.minnetonka.com. (This one is not free!) The SurCode user manuals (pdf files) are included in this convert-sq.zip file.

ADOBE AUDITION 3

There are several free scripts available online to use Adobe Audition 3 to decode SQ Quad which has an advantage over SQD – it’s not limited to 44.1 ksps, 16-bit files so 96/24 files can be used. The script that is both easy to use and best documented (I think) was written by Andreas Kempf and is included in the Audition3.zip file. This script file, which can be edited with a program editor such as JEdit, currently looks for three files: front.wav, rear.wav and temp.wav in the SQ_Temp folder on drive I. You will probably need to change at least some of this (lines 10, 58 and 131). Also, change the Title (line 2) to match your drive and folder name for the three wav files. Lines 13 and 17 read “SR 96000” meaning sample rate. If your input files have a different sample rate, change these numbers.

Print and read the two text files in Audition3.zip and follow the instructions. It works fine but it is rather slow as documented in the “Important Notes” section. The needed plug-in, GraphicPhase.dll, is also in the zip file. It handles the 90° phase shifts in the conversion.

Use an audio editor to create the Center and LFE files, encode the six wav files and create a data DVD or DVD-Video as needed. The higher resolution audio does sound a bit better. Unfortunately,

using Mix and Render in Audacity to make the Center and LFE files results in their being converted to 16-bits even though the input files are 24-bits or higher. You may want to consider using REAPER or another DAW for mixing to preserve the input file sample length. Otherwise Audacity is a great “mini-DAW” so I would like to see an improvement to this short coming.

More info on quad conversion can be found at:

<http://www.quadrasonicquad.com/forums/showthread.php?9353-SQ-QS-Matrix-Decoding-Software> and also at thread 7939 at the above website.

CIRLINCA DVD-Audio Solo Ultra

This fairly inexpensive Windows program, www.cirlinca.com, version 4.4 or higher, will create a 5.1 DVD-Audio from a multi-channel file or six mono wav files. It does not appear to work correctly in the Standard version using six mono wav files, the center channel is not included. However, you can combine the six mono files into a single file which works fine in the Standard version. This is easily done in Audacity with the limitation of having a 96 kbps, 16-bit output with 96 kbps, 24-bit inputs. Use a DAW to preserve a 24-bit output.

Take a look at the enclosed one-page Cirlinca tutorial: “Surround and 5.1.” Then using Audacity File | Import Audio import the six mono files in order: FL, FR, C , LFE, SL and SR. Go back to the FL file and select it by left-clicking in the left side of its panel. Then Shift-left click the other channels to select all of them.

Click File | Export Selection. Select a folder and give the new file a name, then click Save. You will get a screen showing six rectangles on the left with lines to six rectangles on the left. This is correct so click OK. The new file will be created. Click File | Close and click No unless you want to save a project file. If so, click Yes and give it a name.

Now back to the Surround and 5.1 tutorial... follow the “multi” steps. You will have the choice of making a DVD-Audio or DVD-Video. Choose DVD-Audio if your player supports it or DVD-Video to play on any DVD player. There won’t be any video information so just the audio will play, sort of a DVD-Universal.

You also have the choice of directly writing to a DVD or creating an iso image file on your hard drive. Choosing the iso option is convenient if you think you will be making more than one copy of your creation – you can burn the iso file to DVD with Cirlinca Solo, Roxio Media Creator, Nero or another program of your choice.