

The Graphical Guide to Recording Half-Life 2 Demos and Converting Them to AVIs

by Tyler Knott

Half-Life 2 has advanced built-in demo and movie making capabilities. This guide will step you through everything you need to do to show the world what you can do. This guide is composed of three parts: Demo Recording, Video Rendering, and Video Conversion.

PART I: Demo Recording

To record your demo you first need to activate the console. To do this go to Options ⇒ Keyboard ⇒ Advanced... and activate **Enable developer console** (Fig. 1). The console (Fig. 2) should now be accessible via the key below the escape key (~ on US keyboards).

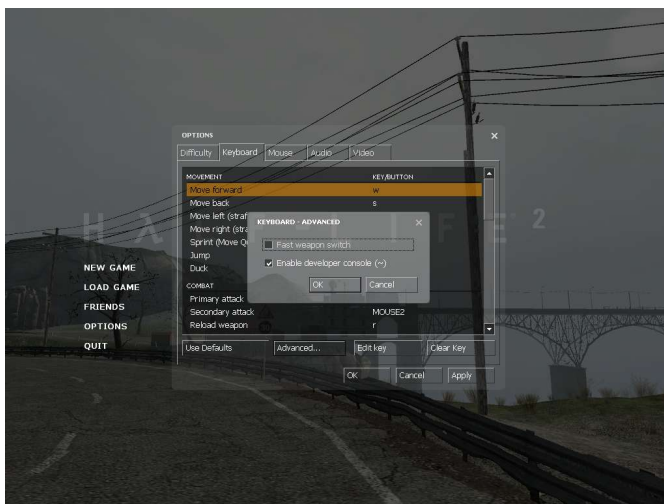


Fig. 1: Activating the console.

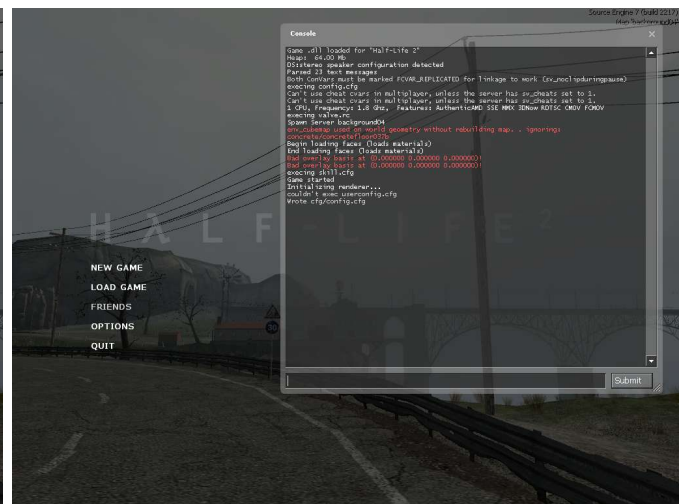


Fig. 2: The console.

Load the map you want to record and get to where you want your demo to start, then bring up the console (this should pause your game). To record type `record demoname`, replacing *demoname* with what you want to name your demo. To stop, bring up the console and type `stop`, or if you would like to press a key and have that happen type in `bind "key" "stop"`. Replace *key* with whatever key you like. [You could also do this with the `record` command, but unless you edited the bind every time with a new demo name, you'd overwrite your previous demo.] You should now have a demo file in your **Program Files\Steam\SteamApps\[your steam login]\half-life2\hl2** folder. If you want to upload it be sure to compress it (with a program like WinZip or WinRar) first to minimize the file size.

PART II: Video Rendering

Before you can make an AVI file you need to render the frames. You could use FRAPS for this, but I find that unless you have a *really* beefy computer, its results are quiet poor (and even with a really good system, you're still better off using the method described below).

NOTE: This will require a lot of hard drive space (a one minute clip (at 640x480@30fps) takes up about 1.6 Gigs)

To render the frames you need to use three commands: `host_framerate` - a variable that determines the framerate that your movie is rendered, `startmovie` - which starts the frames rendering, and `endmovie` - which stops the rendering. Because we want to start the rendering as quickly as possible

you should use the following bind command to make startmovie accessible without the console (instead via the F11 key): `bind "F11" "host_framerate 30; startmovie moviename"` Each time you record a new movie you'll want to change the *moviename* so you don't overwrite your old movie. You should also bind endmovie to a key, like F12.

In my experience there are three “sweet spots” in terms of video size to video quality: high resolution at 640x480, medium resolution at 532x400, or low resolution at 320x240. In order to render at custom resolutions you need to use the `mat_setvideomode width height 0` command (with a space between the width, height, and the 0). Whatever resolution you render at you should render with high levels of AA and AF and all the advanced options (except "Wait for Vertical Sync") turned to high. Don't worry if your computer isn't fast enough, Half-Life 2 will slow down so all the frames are rendered properly. [NOTE: If you notice any pinkness where it should not be, try reducing the level of AA and AF.]

When you're done with that, start playing your demo using the `playdemo demoname` command (replacing *demoname* with the name of the demo you want to render). As soon as the demo starts playing, press the key you bound startmovie to. During rendering it is normal for the game to appear to be drawing very slowly and for the audio will skip. Before the demo ends, press the key you bound to endmovie or you'll end up with a bunch of frames that are just the game menu. When it's done rendering you should have a bunch of TGA files and a WAV file in your **Program Files\Steam\SteamApps\[your steam login]\half-life2\hl2** folder. To convert them into an AVI see the next part.

PART III: Video Conversion

So, now that you have your TGAs you need to convert them to AVI. There are many ways to do that, but I'm going to cover using the completely free VirtualDub (www.virtualdub.org) with XviD (Google for 'XviD Binary'), so everyone can use this guide make these videos for free.

First, open VirtualDub and go to **File ⇒ Open Video File** (Fig. 3). Browse to your **Program Files\Steam\SteamApps\[your steam login]\Half-Life 2\hl2** folder. Select the first frame you want to be in your AVI. It should be named *moviename#####.tga*, with *moviename* being the name of the demo and ##### being the frame number, with 0000 being the first frame rendered. When you've selected the starting frame, press **Open** and let VirtualDub find all the other frames (Fig. 4).

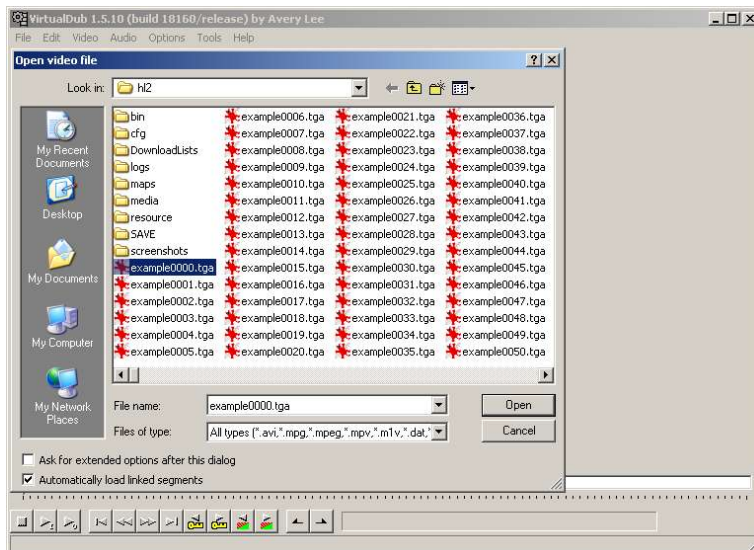


Fig. 3: VirtualDub & the Open dialog.



Fig. 4: VirtualDub searching for frames.

When VirtualDub is finished finding frames go to the Audio menu and select WAV Audio. An open dialog will appear. The audio for your movie will be called *movienamewav*. Select that and click open. Then, go to the Audio menu again and select Full Processing Mode.

After that, go to Audio ⇒ Conversion (Fig. 5), select **Custom**, enter 32000 in the box, and select **High Quality**. Or, for a low-rez encode, select **22050** from the **Sampling rate** list and select **High Quality**.

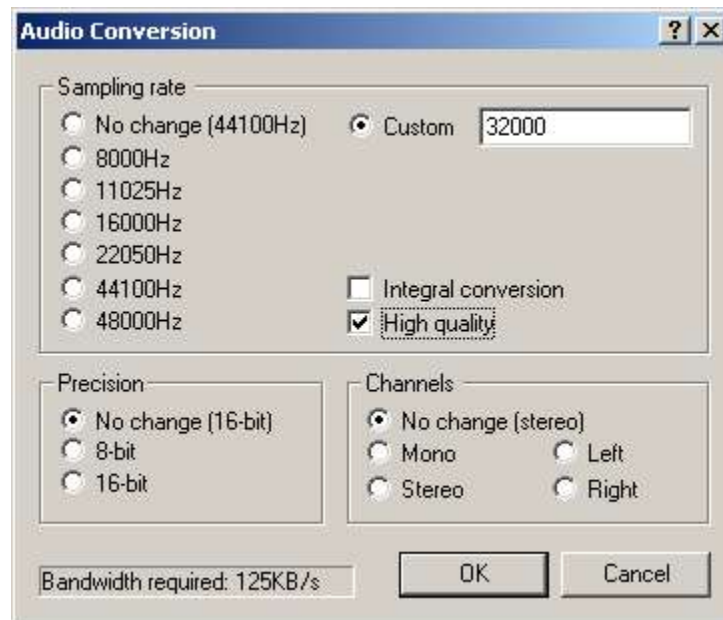


Fig. 5: The Audio Conversion options.

Then go to Audio ⇒ Compression (Fig. 6). To compress the audio to MP3 you need an MP3 codec. The one that comes with Windows is limited to 56 kbps which is too low to get good quality from. If you install Windows Media Player 10 you get the Professional version of the codec which allows full audio rates, or you could download the LAME ACM codec at <http://www.rarewares.org/mp3.html>.

If you have the Windows Media Player 10 MP3 codec it'll appear as **MPEG Layer-3**, or if you have the LAME one it'll appear as **Lame MP3**. Whichever you have, select it, then select your bitrate and sampling rate. Select **160 kbps, 32000 Hz Stereo** for a hi-rez encode, **96 kbps, 32000 Hz Stereo** for a medium rez encode, or select **64 kbps, 22050 Hz, Stereo** for a low-rez one. Click OK.

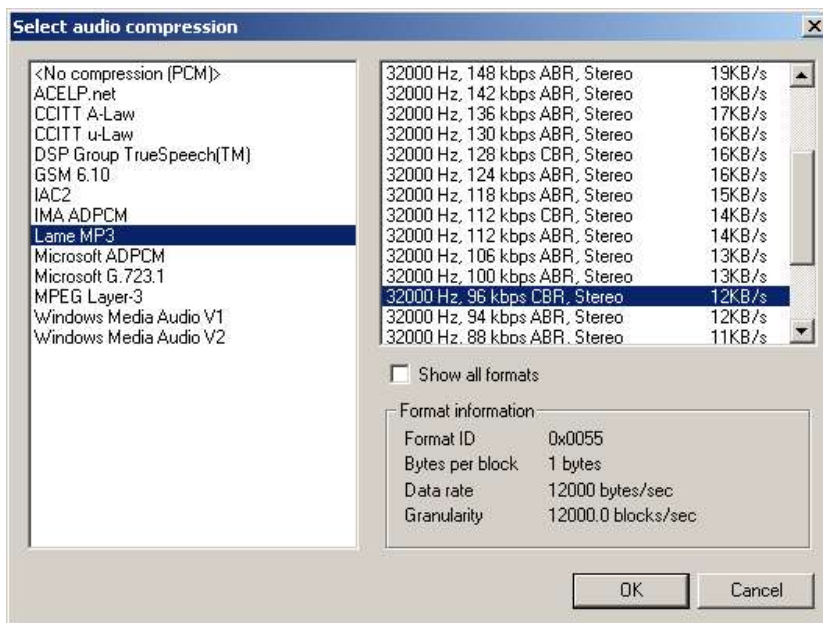


Fig. 6: The Audio Compression dialog

Then, go to Video \Rightarrow Frame Rate and select **change so video and audio durations match** under **Source rate adjustment**. This will ensure the best synchronization between the audio and video.

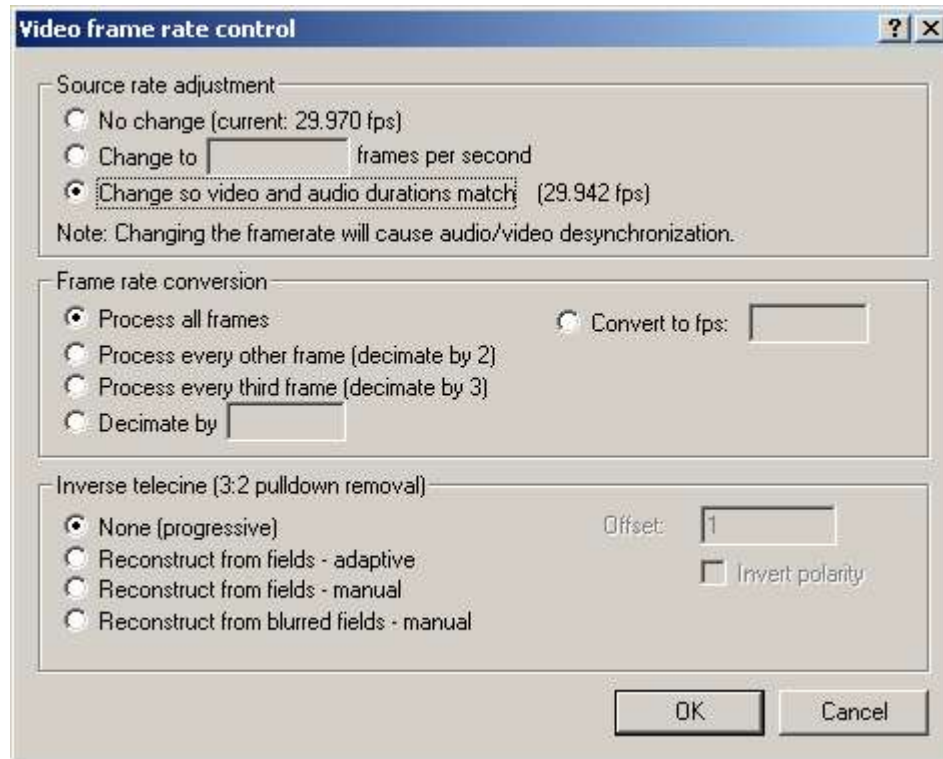


Fig. 7: The Frame Rate Control dialog

If you need to do any resizing or other filtering then go to Video \Rightarrow Filters and click **Add**.

If you rendered your file above 640x480 then you should probably resize it down, as files bigger than that are unnecessarily large for Internet distribution. To resize to 640x480, choose the **resize** filter and enter 640 as the new width and 480 as the new height. Also, you could resize it down to 320x240 for a low-res version. The default resizing algorithm isn't the best in terms of quality (but it's fast), so you should select a different one (Bicubic, Precise Bicubic, and Lanczos3 are pretty good).

Next, go to Video \Rightarrow Compression (Fig. 8). You can use any video compressor you want, but I'm going to use XviD in this guide. To download XviD Google for "xvid binary". I've chosen XviD for a number of reasons: 1) it's free, 2) it's open source, 3) it's fast, and finally, 4) it's very high quality.

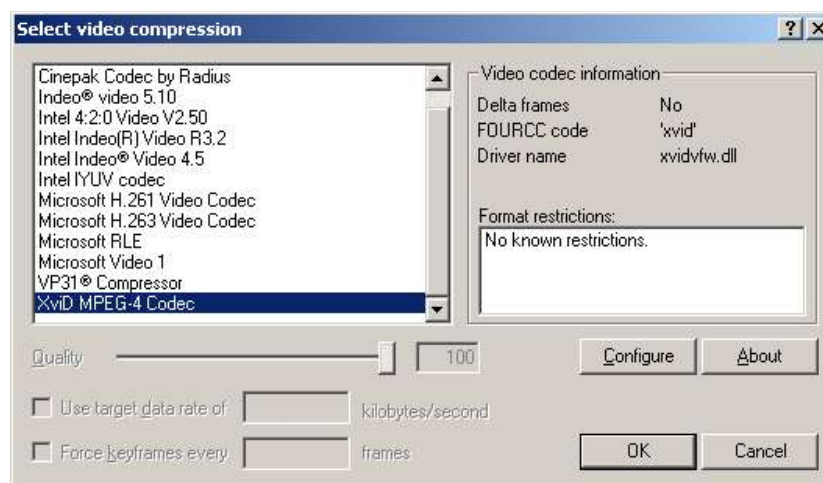


Fig. 8: The Video Compression dialog.

Select **XviD MPEG-4 CODEC** and press **Configure**. Select **Twopass - 1st pass** as the **Encoding type**. Then, click on **more...** next to **Profile @ Level** and match your settings with the ones in Fig. 10.

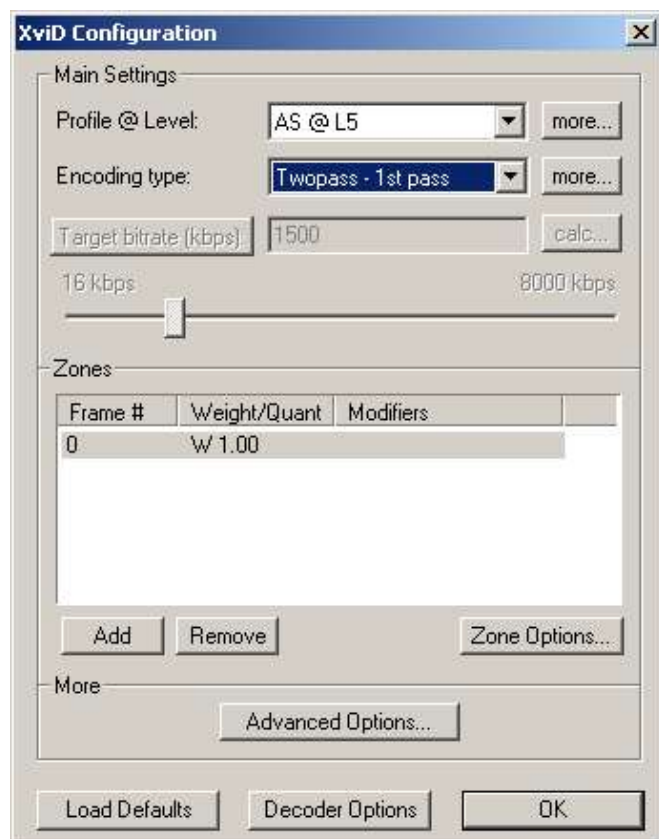


Fig. 9: XviD's Configuration dialog

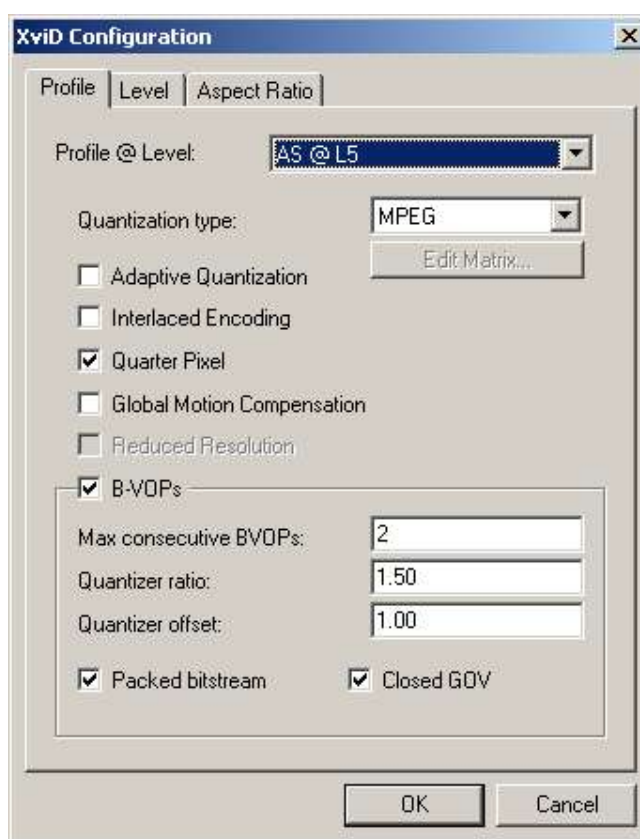


Fig. 10: Profile settings.

Click **OK** then click **Advanced Options** and set it like the one you see in Fig. 11. Then click **OK**.

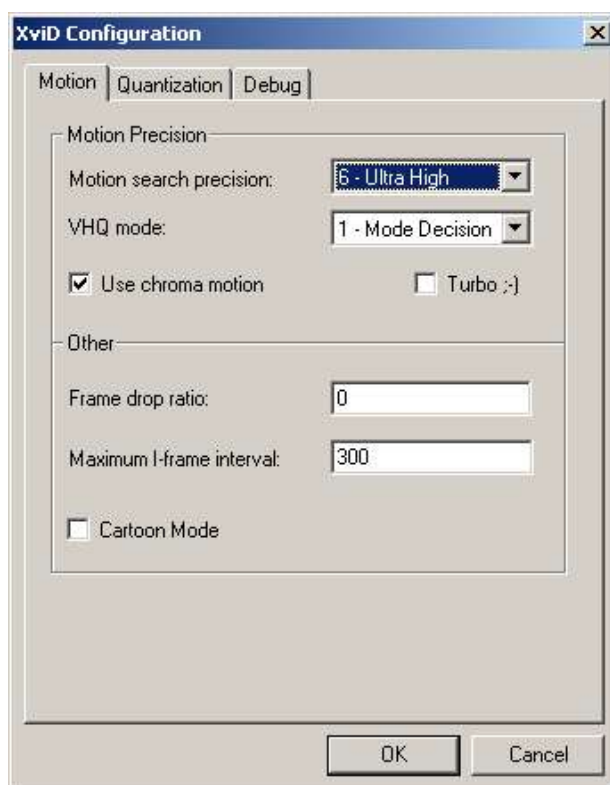


Fig. 11: Advanced options.

Click **OK** on the XviD settings, and again on the **Compression** dialog.

When you've completed that go to File ⇒ Save as AVI... and save your file.

VirtualDub will then process the file. When it finishes, go back to the XviD settings and select **Twopass - 2nd pass** as the **Encode type**. Select a **Target bitrate** of about 1750 kbps for 640x480 files (which comes out to approximately 14 megabytes/minute), 1250 for 532x400 (about 9 megs/minute), and 400 for 320x240 (about 3.5 megs/minute). Then, go back to the save dialog and save a new file under a different name. This will be the file you can play and distribute.

History

December 10, 2004 – Initial Release

December 23, 2004 – Revised the 5th paragraph of Part II to include information on custom resolutions and the different resolutions to render at.

Changed audio bitrate options to match up better with the new resolutions.

Changed the high resolution bitrate to 1750 from 1500 (looks much better) and added the medium resolution bitrate.

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