

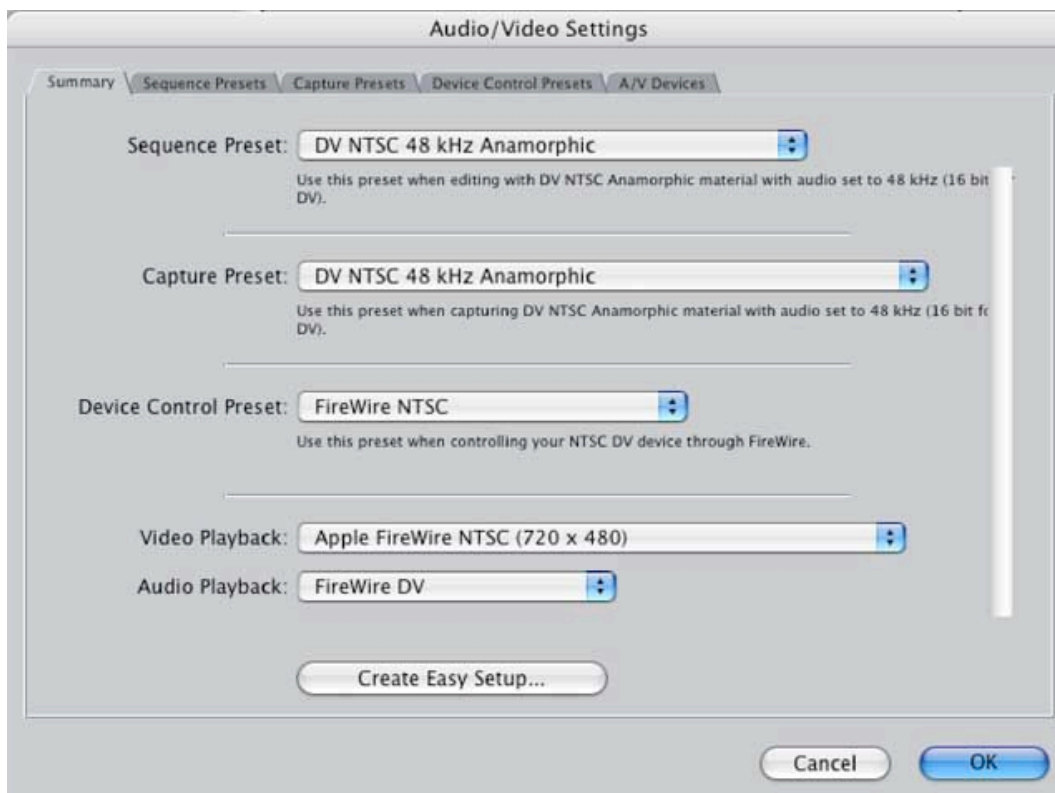
# Slow Motion For The Everyman!

By Alex Mitchell

One cinematic device that can be employed by the ambitious cinematographer is the use of over or undercranking the motor in a motion-picture camera. This produces the effect of slowed down motion and sped up motion, respectively. This has been something that, until the advent of high quality deinterlacing and retiming software, film could do that video could not. However, with the aforementioned software tools you can turn regular 60i footage into gorgeous overcranked 24p footage. Here's how.

## 1. Make sure the video that you're shooting is 60i and your audio/video settings are correctly configured.

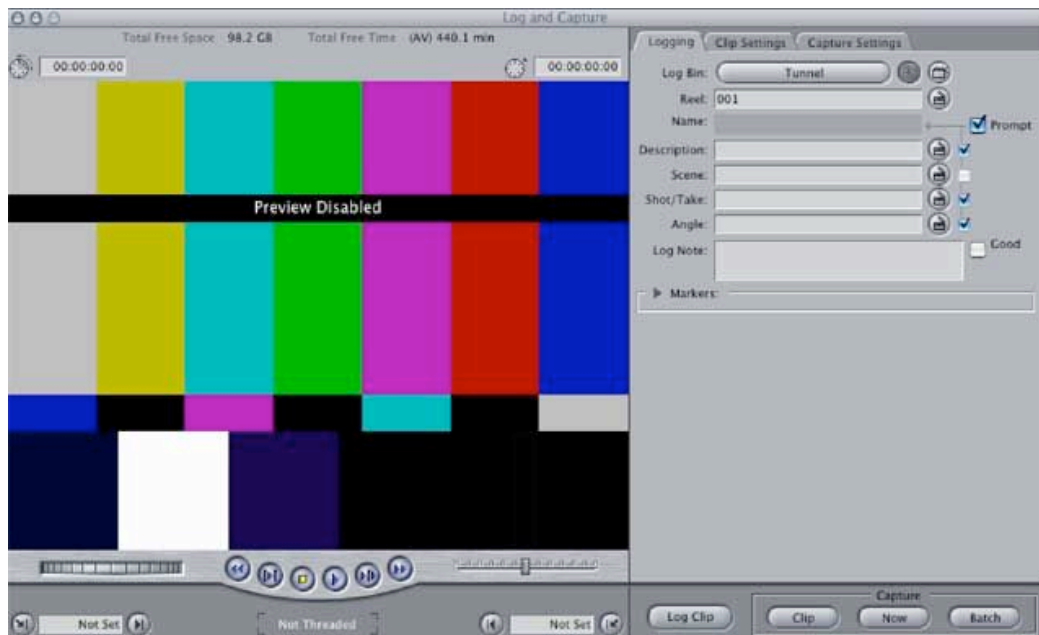
Before shooting turn off any 30p or 24p modes so you're capturing 60i footage. You need the highest temporal resolution, although you could use 30p footage for a very slight overcrank. For this project I'll be using standard anamorphic NTSC DV footage but this could also be done with HDV 60i as well. The only difference is that you'll need to select those presets in the "Audio/Video Settings" menu.



(Figure 1.1) The Audio/Video Settings menu found under "File".  
Has to be set to accept 60i footage.

## 2. Import your clips into the scratch folder.

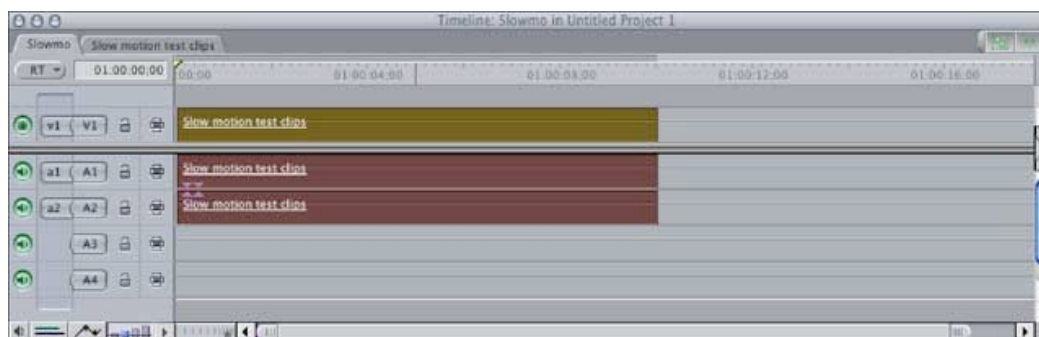
Using Final Cut Pro's log and capture window, select the in and out points of the footage you want to be slow motion. Remember that you have to convert any clips you want to be slowed down *before* you edit them into your final project because there's no way to slow them down effectively afterwards.



(Figure 2.1) Final Cut Pro's Log and Capture window. Hit Command-8 to access.

## 3. Put these clips into a timeline and then export that timeline using compressor.

This step is pretty simple. Make sure you get the clips to the exact length you're going to need them to be and then go to the export menu and select compressor. Here comes the tricky part.



(Figure 3.1) The Timeline.

**4. Make sure you select the right format and the right options to create a 60 progressive frame per second format.**

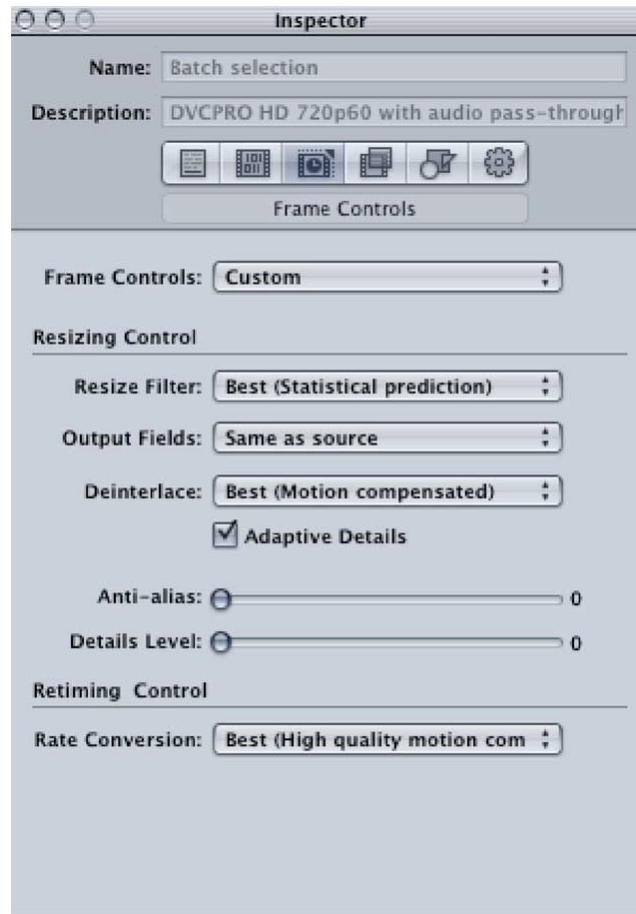
Blasphemy you say! NTSC DV is 29.97 FPS so how can you make 59.94 frames out of that without just making each frame last twice as long? You see, the thing about NTSC DV is that it makes each of those frames out of two separate interlaced fields which can easily be separated and made into their own frames at a negligible quality drop. Basically, you're splitting one frame into two frames and adding filler, albeit very well calculated and good looking filler. There are a lot of important points here though.



*(Figure 4.1) Interlaced fields in NTSC footage. Notice that they are captured at different times and then combined into a single frame to create the illusion of sixty frame video.*

First you'll need the right compression codec. DVCPro HD at 720 60p works really well for this. After you've selected that codec you'll need to set your frame controls like this:

Resize Filter: Statistical Prediction  
Deinterlace Filter: Motion Compensated  
Retiming: High quality Motion Compensated



(Figure 4.2) The Frame Control tab in the inspector.

## 5. Grab a beer because this is going to take a long time.

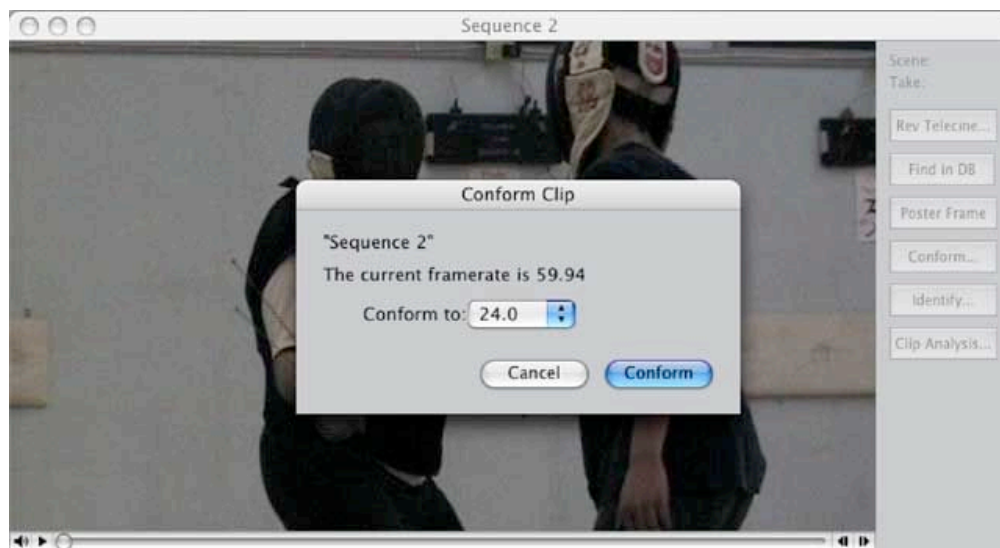
I'm just converted a two second clip and it took two hours. For the fastest turnaround time I recommend purchasing high RPM hard drives and a lot of RAM. A faster processor is also a bonus if you have that kind of money lying around.



(Figure 5.1) A selection of bottled beers.

## 6. Open up your recently converted clip in Cinema Tools.

In addition to being able to export EDLs and reverse telecine 24p footage, Cinema Tools has the added bonus of being able to force clips to conform to a variety of framerates. For this clip you want it to conform to 24 because that's the framerate of film and also the slowest you can make this go without making it look stuttery. After conforming it, watch it to make sure you got everything right.



(Figure 6.1) Conforming a clip to 24 FPS using Cinema Tool's "Conform" function.

## 7. Get it back into your SD workflow.

From this point it gets very easy. Under the "File" menu hit "Import" and then use the new window to select your recently conformed clips. It will require some rendering in the project if your timeline is configured for a different format than the one you're importing, but after that point you will be able to edit the overcranked footage however you like.

### Things to note:

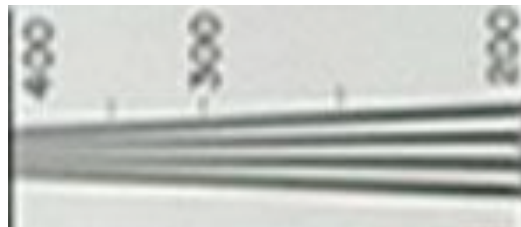
For best results while using a DVX100A or B make sure that you **do not** shoot in squeeze mode as it introduces a lot of artifacting. Shoot in 4:3 mode and import all your footage into a 4:3 timeline in Final Cut. When importing the footage after Compressor is done exporting, alter the aspect ratio of the clip under the motion tab in the viewer to +18. Scale the video to 68.25 for 4:3 projects and 90.5 for 16:9 projects. Both of these variables must be altered after the clip has been dropped into the timeline.

"Four Eyed Monsters" on the DVXUser forums has published another method for producing slowmotion video from a 60i source:

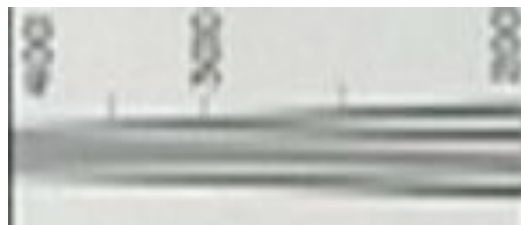
*From the DVXUser forums:*

- 1.) *Shoot in 60i with the highest shutter which i think is 1/2000*
- 2.) *Capture into Final Cut Pro as you would any 60i video*
- 3.) *Open Cinema Tools and hit New>Batch Conform*
- 4.) *Select your 60i clip, and hit conform*
- 5.) *There will be a window that pops up and select the frame rate 23.98*
- 6.) *Re-enter FCP 5 and place your NOW 23.98 clip in the timeline*
- 7.) *When its on the timeline clone your clip and put the clip on top of itself(so the 23.98 conformed clip is on two Video tracks on top of one another*
- 8.) *Slow both clips down to 50% and turn frame blending off*
- 9.) *de-interlace the top video track to UPPER and the bottom LOWER*
- 10.) *On the top track, add a blink filter and make sure the first 2 boxes have a 1 in them and the third one at 0.*
- 11.) *Render and ENJOY!*

A couple of notes about this method; for starters, the most common shutter angle in film – even in slow motion – is one-hundred-eighty degrees. If we're shooting sixty frame video that equates to an exposure time of 1/120<sup>th</sup> of a second, so setting your shutter to that will yield the most natural results and have fewer complications under fluorescent lighting. Any higher than that and you risk making your video feel faster than it really is. Also, this method loses somewhere in the ballpark of one hundred fifty lines of resolution. Considering the DV's paltry resolution this is a big drawback. However, this process takes far less time than my method. This is important as it could be used as a way to preview a slowmo shot before you take the time to rendering it using my method.



*(Figure E.1) Resolution chart footage obtained from DVCPro HD conversion.*



*(Figure E.2) Resolution chart footage obtained from Four Eyed Monsters' technique.*