Compressor 3.5

Encoding and Delivery

Compressor

Working with Frame Controls

NOTE ▶ This tutorial is excerpted from *Apple Pro Training Series: Compressor 3.5 Quick Reference Guide*, by Brian Gary, 0-321-64743-2. For more information or to buy the book, go to www.peachpit.com/apts.

Frame controls let you augment the encoding process by implementing advanced technology when converting from one video format to another. Frame controls function as separate tasks during encoding, apart from the target's codec.

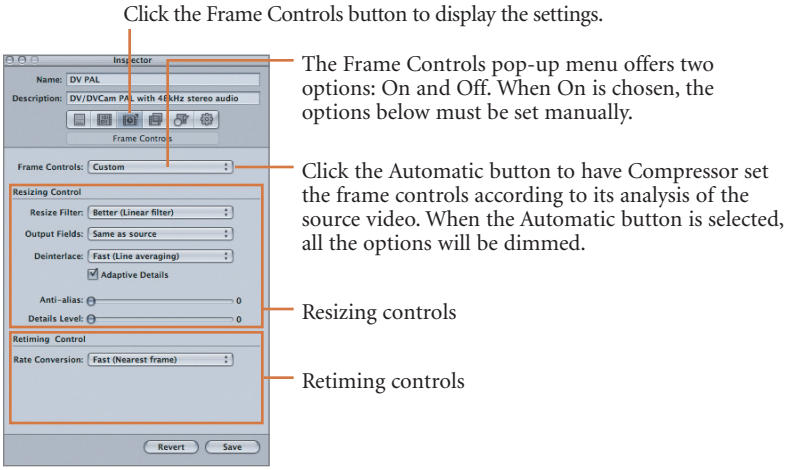
Using Frame Controls

Frame controls employ optical flow technology (also used in Apple's Shake and Motion), which calculates motion tracking for every pixel vector as it goes from one movie frame to the next. When that calculation is completed for a given frame rate and frame size, Compressor can more intelligently place those pixels in different frame rates and sizes during a conversion. Compared to inferior conversion techniques like blending and scaling, optical flow produces amazing results, but the massive increases in quality come at the expense of longer encoding times.

Frame controls are most useful when converting from one video format (standard) to another requires a conversion of frame size and/or rate, such as converting NTSC footage (720 x 480 at 29.97fps) to PAL (720 x 546 at 25fps). Additionally, frame controls can greatly improve conversions between interlaced and progressive video and also remove film to video pulldown, known as "reverse telecine." You can achieve broadcast-level transcoding in Compressor but as a general rule when working with frame controls, or downconverting High Definition video to Standard Definition, you have to choose between higher quality and faster encoding.

You access frame controls in the Inspector window by selecting a custom setting from the Settings window or a target from the Batch window.

NOTE ► Frame Controls are *not* viewable in the Preview window.

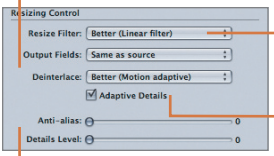


NOTE ▶ The Automatic option works in only three instances: HD to SD MPEG-2 downconversions, H.264 encoding for Apple devices, and H.264 encoding for DVD Studio Pro. For all other instances you will need to create custom settings. From the Frame Controls pop-up menu, choose On and deselect the Automatic button.

Resizing Controls

When source media is transformed from one frame size to another—in converting HD footage to SD, for example—the resizing controls can significantly increase the conversion quality.

The Output Fields and Deinterlace pop-up menus work together to control conversions between interlaced and progressive footage. If you choose "Same as source" in the Output Fields pop-up menu, for example, no conversion will occur, and Compressor will ignore the Deinterlace option. If you choose Progressive in the Output Fields pop-up menu and the source media is interlaced, the selection in the Deinterlace pop-up menu is applied. When converting progressive sources, make sure to choose the correct field dominance (Top or Bottom) for the output format. Generally, the best choice in the Deinterlace pop-up menu is Better (Motion adaptive).



The Resize Filter pop-up menu dictates the method that Compressor will use to resize the source media (see the table on next page).

Select the Adaptive Details box to have the encoder delineate carefully between noise and edge detail.

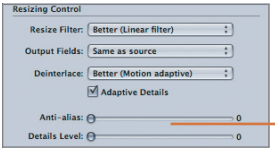
The Anti-alias and Details Level sliders increase smoothness and sharpness within the frame size conversion. When source media is scaled up or down, jagged artifacting or detail blurring can occur in the transcoded media. Use the Anti-alias slider to smooth jagged edges, and use the Details Level slider to adjust image sharpness. Use only one adjustment or the other. Increasing both sliders can result in canceling out the effects of each one.

TIP Deselect the Adaptive Details box when encoding for iPods, iPhones, the web, or any media that will be viewed on progressive-scan displays. Deselecting this box allows Compressor to utilize the same deinterlacing algorithms used by Apple's DVD Player, resulting in significantly shorter encoding times.

Quality versus Encoding Time	Resize Filter Choice
Fastest encoding	Fast (Nearest pixel). Encoding calculations are based on a blending of relative pixel positions from frame to frame.
Balance between speed and quality	Better (Linear filter). This option adds a weighted-average calculation to the Fast method that produces much smoother results at the cost of increased encoding time. Use this option if motion artifacting is present when Fast is used.
Best quality	Best (Statistical Prediction). This option kicks optical flow into high gear, as it analyzes each frame pixel by pixel and reconstitutes frames mathematically by repositioning each pixel relative to the new frame size.

Reverse Telecine

When 24-frame film is transferred to video, it undergoes a process called *telecine*. During that process, extra frames are added to conform the 24 fps progressive footage into 29.97 fps interlaced video for playback in the NTSC format. This process is commonly referred to as a 3:2 pulldown. Compressor automatically detects the pulldown pattern of sources that have either constant or broken cadences and adjusts the processing as required. You can use frame controls to reverse that process (reverse telecine) and output 23.98-frame media from NTSC sources for editorial in Final Cut Pro.



Choose Reverse Telecine in the Deinterlace pop-up menu.

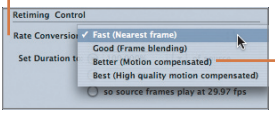
NOTE ▶ When Reverse Telecine is selected, the other frame controls options are disabled.

TIP Do not segment a Reverse Telecine job because the cadence detection may not process accurately.

Retiming Controls

When changes in frame rate are introduced into a conversion—such as in converting 29.97 fps NTSC to 25 fps PAL—the retiming controls can be used to increase the output quality significantly.

Rate Conversion pop-up menu



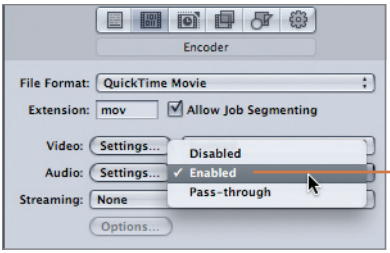
Generally, the Better (Motion compensated) option is the optimal balance between encoding speed and quality.

Quality versus Encoding Time	Rate Conversion Choice
Fastest encoding	Fast (Nearest frame). Depending on the format conversion, Compressor removes or adds frames by copying the neighboring frames on either side. This setting will introduce stuttering playback (frame judder) except when used with mostly static content, such as interview footage. Use it only when encoding speed is paramount and the source media can bear the compromise.
Good quality with faster conversion time	Good (Frame blending). Compressor blends the average picture data of neighboring frames to smooth the removal of frames or to cover the addition of frames to the frame-rate conversion.
Better quality with slower conversion time	Better (Motion compensated). Compressor uses optical flow to determine the vector path of each pixel from frame to frame and completely reinterprets the source media in the new frame rate.
Best quality	Best (High quality motion compensated). This setting increases the detail value of the optical flow motion calculations, placing each pixel more precisely in the reconstructed frame rate. Consider this option only when you are increasing the frame rate (adding frames). The significant increase in encoding time is not offset by greater quality when you use this option for frame-rate reductions.

Retiming Audio

In all instances, when audio accompanies video in source media, it will be retimed to match the new frame rate (or speed) of the output video. Compressor will pitch-correct the audio so that it sounds the same as the original soundtrack. This ensures that the output audio and video stay in sync.

QuickTime container-based targets allow you to “pass-through” the audio in the Encoder settings.



Make sure to select Enabled for all audio that you want to maintain sync with video during a retiming conversion.

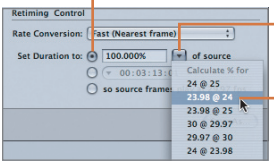
Speed Changes

By default, the "Set Duration to" field in the Retiming Controls is set to 100.000% of source. With that setting, no changes in speed will occur even if the frame rate changes from one rate to another—for example, 29.97 fps NTSC to 25 fps PAL.

> **NOTE ►** When applying speed changes to media that contains audio, or audio-only media, the pitch will not shift because Compressor will automatically use Mac OS X's Core Audio technology during the conversion.

You can use frame controls in one of three ways to make constant speed changes to the output media:

By default, "Set Duration to" is selected.



Use the "Set Duration to" pop-up menu to choose a common conversion rate.

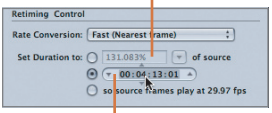
For example, choose this option to retime 23.98 fps source media into true 24 fps video. The percentage field to the left will automatically update to the correct duration offset.

You can input a custom percentage directly in the "Set Duration To" field. Values greater than 100.000% will cause the output movie to slow down, and values less than 100.000% will speed up the output.

NOTE ▶ This is the opposite of how Final Cut Pro's Speed Tools work, where smaller percentages slow down clips and larger percentages speed up clips.

Using timecode to determine the speed change is very similar to a fit to fill edit in Final Cut Pro, whereby you set an edit duration and the source clip either speeds up or slows down to fill into the edit.

The percentage field automatically updates to the correct duration offset.

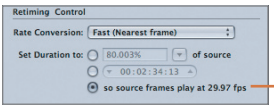


Select the radio button next to the timecode field and enter a new duration into the field. When you hold the pointer over the individual hours, minutes, seconds, and frames values, up and down triangles appear above and below the field. You can click the up and down arrows to move the values forward or backward.

Selecting the last "Set Duration to" option is similar to the way Cinema Tools retimes media by conforming the source frame rate into the target frame rate. With this option selected, Compressor will not employ optical flow in the conversion.

TIP It's common to have a video or audio clip that is a few seconds (or frames) too long or too short. You can use the retiming controls to fit the output clip exactly into your time constraints.

TIP You can use Apple's Motion or the Speed Tools in Final Cut Pro to create *variable* speed changes.



Select this option to force the output movie to conform to the frame rate established in the Encoder pane.

Frame Controls in the Real World

The results of settings made in the Frame Controls pane do not appear in the Preview window, so a real-time preview of their impact is not available. However, because of the potentially lengthy encoding times when frame controls are applied, you will want to use a test-clip workflow on small sections of the source media to audition the settings. This carries a two-fold benefit: You will not waste time encoding the entire media with an unsatisfactory setting, and you can estimate encoding times for the entire media based on the test times. For example, if one minute of footage is encoded in five minutes, it will take roughly five hours to encode one hour of footage with the same settings.

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