

DVCPRO HD ASPECT RATIO BUG IN FINAL CUT PRO 6

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DVCPRO HD Bug in FCP

IMPORTANT: FINAL CUT PRO VERSION 6.0.2 FIXES THE ISSUE DESCRIBED IN THIS DOCUMENT

Background

Ever since an update of either Final Cut Pro, QuickTime or Pro Apps (no-one really knows) Final Cut Pro has a nasty bug when exporting a self contained quicktime movie from a DVCPRO HD (720p & perhaps 1080i) timeline. The aspect ratio and frame size of the resulting self contained movie is incorrect and therefore requires render when brought back in a native DVCPRO HD sequence - even the same sequence the movie was exported from.

For some of us, this is a big issue. Each re-render takes up to 2 hours per hour show. In our case, we are currently in post on a 13 part History Channel series, 1 two-hour documentary, 3 one-hour Biography Channel programs, 2 one-hour documentary specials and 1 two-hour History Channel documentary special. The network requires up to 14 deliverables per show (HD, SD, Texted, Textless, Short Forms, Cut Downs, Previews, etc.) - Add it up ; that's nearly 280 deliverables (20 shows X 14) each needing render - we're looking at 560 hours of unnecessary renders. Without mentioning the concern on what the re-renders are doing to the visual integrity of the programs.

Why use DVCPRO HD?

It's a fair question, especially since the release of the very promising Apple ProRes codec. Our reasons are simple:

- 1/ All our shows are shot with the Varicam and we'd like to stay native
- 2/ Prores has issues of its own (wrong timecode and other bugs)
- 3/ Editors started editing months back in DVCPRO HD (Media manager from DVCPRO HD to Prores isn't reliable)
- 4/ AJA and Black Magic ingesting to Prores has been unreliable (dropped frames on SATA RAIDS)

Why the need for exporting self contained and reimporting them?

This on the other hand isn't a valid question but I've heard it - so I'll address it. It isn't a valid question in my opinion because questioning why a user is utilizing a feature of the software is silly (The mechanic responds: why are you using the fifth gear on your car? stay in fourth...)

Our reasons are the following:

- 1/ Editors deliver a complete online self contained version of the shows which we use to master to HDCAM & Digibeta
- 2/ We sometime have to redo a master based on failing the network's tech review (audio hit, video hit, etc.)
- 3/ We archive self contained quicktimes on LTO tapes and would like to reimport them in the future, if needed, without requiring a render

Bug Description

A copy of a FCP 6 project with media (44 MB) which was used to write this document is available to download at:

http://LumiereMedia.com/dvcprohbug/DVCPROHD_BUG_TEST.zip

The bug is simple ([illustrations below](#)):

- 1/ Import a perfectly fine DVCPRO HD 720p60 clip into FCP
- 2/ Drop it on a timeline - it doesn't require a render (which is good)
- 3/ Place an IN and OUT point to cover the total clip
- 4/ Choose File/Export QuickTime Movie (use current settings/self contained/no recompress)
- 5/ Import the clip in FCP and it requires a render ([Figure 1](#) - [Figure 4](#)):
 - Aspect ratio is square / should be HD (960X720)
 - Resolution is 1280 X 720 / should be 960 X 720

Work Around

Although the following aren't legitimate workarounds they do shed some light on the nature of the bug.

Place a correct OUT point (The Out Point Inclusive rule):

A frequently used method to place IN and OUT points on a timeline is to use the up arrow (or Home button) to find your IN point to the left and press 'I' and use the down arrow (or End button) to find your OUT point to the right and press 'O'. Although it is an OK means to find your IN point, it is an inaccurate way to find your OUT point because it will include one extra frame to the right of the end of the clip in the timeline. Zoom in to the frame and you will clearly see the extra empty frame ([Figure 2](#)).

It is by using this method to place the IN and OUT points on a single clip that the bug manifests itself. Place a correct OUT point on the end of the clip (one frame back) and the resulting self contained movie will not have the issue described above ([Figure 3](#)).

So it looks like FCP gets confused on the settings of the exported clip if any included frames from the sequence does not include a clip (duplicating the working clip and exporting it as one self contained with correct IN and OUT points works fine). Including Slugs, FCP text, etc... doesn't.

Placing a correct OUT point and moving the IN point back a frame to include an empty frame does trigger the bug as well.

This workaround would work great for solid clips in a timeline but unfortunately, slugs, bars, text are often necessary in a sequence.

Recompress All Frames:

This workaround is even less desirable than the above but it works. Check the 'Recompress All Frames' checkbox in the export window and the resulting movie will have the correct settings. The problem is that this defeats the purpose of exporting a self contained movie since your material will go through an additional compression degrading the quality of your material.

Rendering Non DVCPRO HD Assets to DVCPRO HD Movie Doesn't work:

Rendering all your non DVCPRO HD assets (Text, Slugs, etc...) to DVCPRO HD and reimporting does not solve the issue.

Additional Findings (Some Clips Don't Have Problems)

It seems that the issue starts with the quicktime movie. In the exact same circumstances (same timeline) some generate the bug, others don't, even with 2 clips which seemingly have the exact same settings ([Figure 5](#)):

- [BUG CLIP](#)
- [NO BUG CLIP](#)

(click the clips above to download them)

They both don't need rendering in a DVCPRO HD 720p 59.94 timeline but one will generate a wrong aspect ratio self contained the other won't.

All reported settings in the FCP browser are identical ([Figure 6](#) & [7](#)).

Conclusion

The issue is definitely with the clips. What is different between these clips that makes FCP behave differently when exporting them? The answer to this question will lead to resolving this bug.

Illustrations

Name	Audio	Vid Rate	Pixel Aspect	Frame Si	Compressor	Data Rate	Aud Rate	Aud Format	Duration
Incorrect OUT Point	1 Stereo	59.94 fps	Square	1280 x 720	DVCPRO HD 720p60	13.9 MB/sec	48.0 KHz	16-bit Integer	00:00:05:02
Correct OUT Point	1 Stereo	59.94 fps	HD (960x720)	960 x 720	DVCPRO HD 720p60	13.9 MB/sec	48.0 KHz	16-bit Integer	00:00:05:01
Sequence 1	2 Outputs	59.94 fps	HD (960x720)	960 x 720	DVCPRO HD 720p60		48.0 KHz	32-bit Floating Point	00:00:05:02
Working DVCPROHD 720p60 CLIP	2 Stereo	59.94 fps	HD (960x720)	960 x 720	DVCPRO HD 720p60	14.3 MB/sec	48.0 KHz	24-bit Integer	00:00:05:01

Figure 1: Reimported Clips from an incorrect OUT points have the wrong Pixel Aspect Ratio and Frame Size



Figure 2: This OUT point includes on blank frame after the clip.

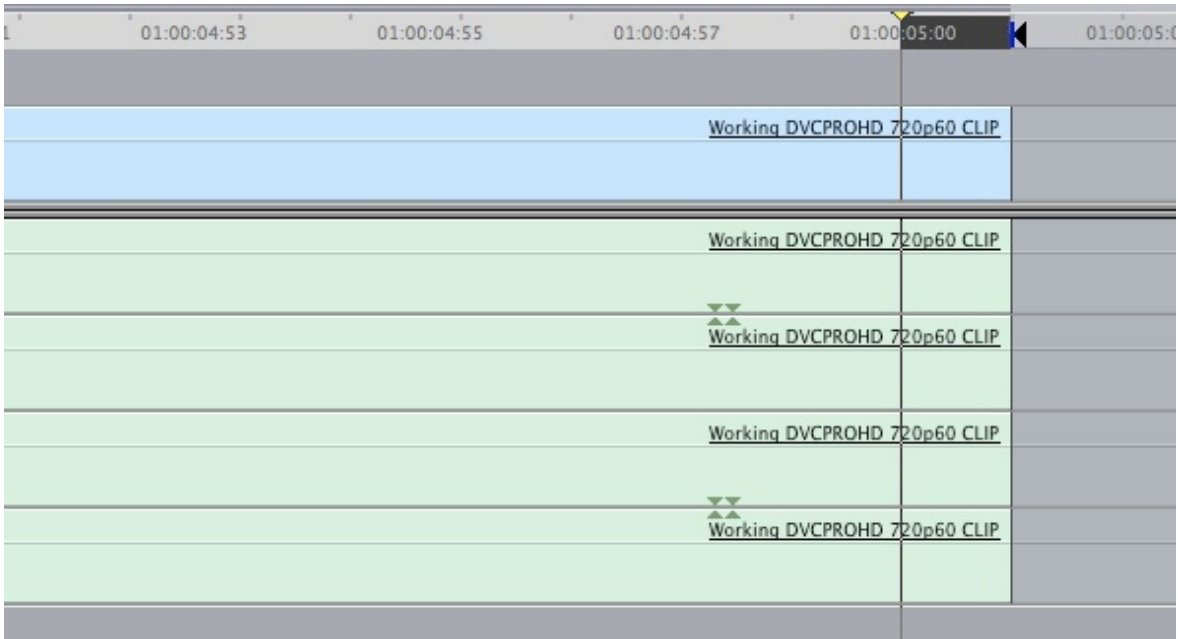


Figure 3: This OUT point includes the end of the clip without an empty frame.

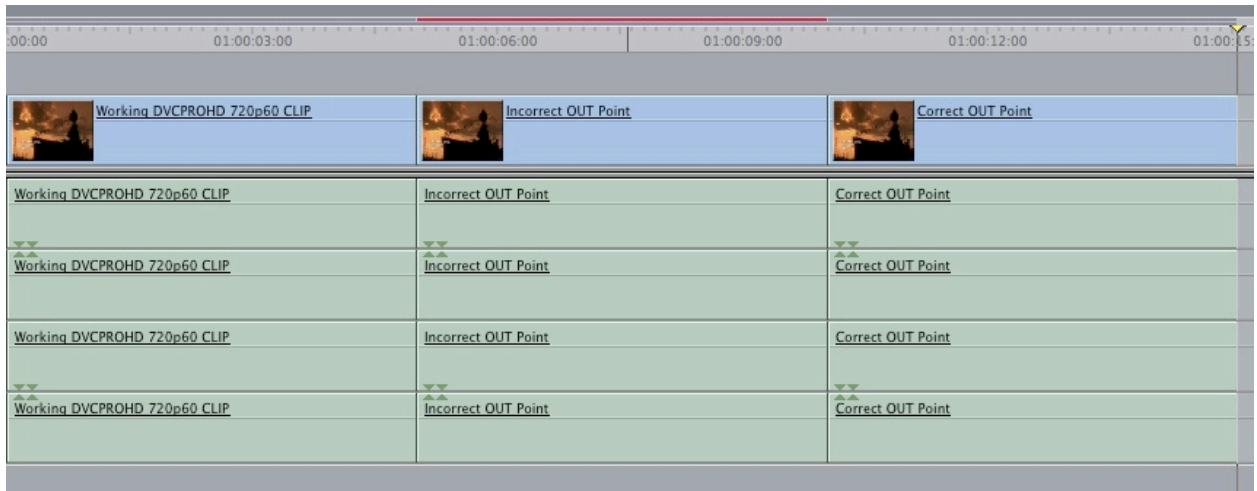


Figure 4: Clip with the wrong Aspect Ratio and Frame Size requires a render, the other doesn't.

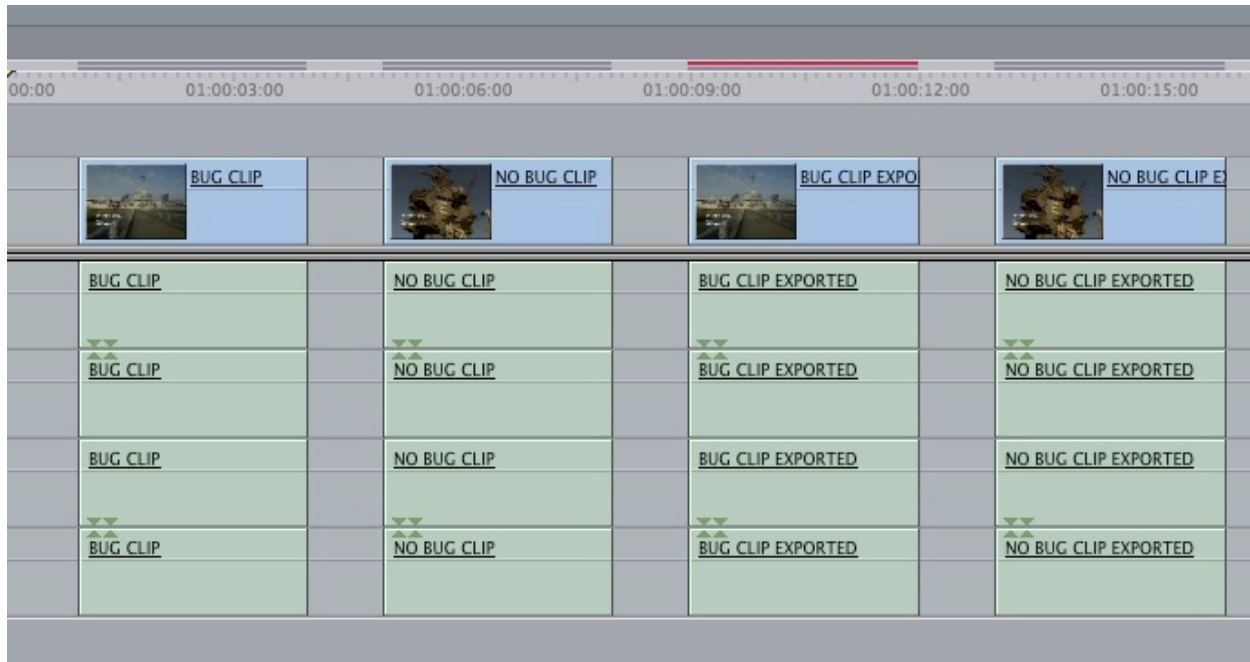


Figure 5: Although the BUG CLIP & NO BUG CLIPS both seem to have identical settings and play without render in the DVCPRO HD 59.94 Timeline, they generate different results when exported with an empty frame from the sequence.

Name	TC Rate	Audio	Vid Rate	Pixel Aspect	Frame Size	Compressor	Data Rate	Aud Rate	Aud Format	Duration	Out	In
BUG CLIP	60	2 Stereo	59.94 fps	HD (960x720)	960 x 720	DVCPRO HD 720p60	14.3 MB/sec	48.0 KHz	24-bit Integer	00:00:03:00	Not Set	Not Set
BUG CLIP EXPORTED	60	1 Stereo	59.94 fps	Square	1280 x 720	DVCPRO HD 720p60	13.9 MB/sec	48.0 KHz	16-bit Integer	00:00:03:01	Not Set	Not Set
NO BUG CLIP	60	2 Stereo	59.94 fps	HD (960x720)	960 x 720	DVCPRO HD 720p60	14.3 MB/sec	48.0 KHz	24-bit Integer	00:00:03:00	Not Set	Not Set
NO BUG CLIP EXPORTED	60	1 Stereo	59.94 fps	HD (960x720)	960 x 720	DVCPRO HD 720p60	13.9 MB/sec	48.0 KHz	16-bit Integer	00:00:03:01	Not Set	Not Set
Sequence 1	60	2 Outputs	59.94 fps	HD (960x720)	960 x 720	DVCPRO HD 720p60		48.0 KHz	32-bit Floating Point	00:00:16:01	Not Set	Not Set

Figure 6 (Part 1): All reported settings in the FCP Browser seem identical between BUG CLIP & NO BUG CLIP but they generate different results when exported.

Media Start	Media End	Tracks	Alpha	Composite	Field Dominance	Master Clip	Last Modified	Frame Blending	Capture	Size	Length
01:15:45:36	01:15:48:35	1V, 4A	None/Ignore	Normal	None	✓	Today, 8:49 AM	Off	Not Yet	42.9 MB	00:00:03
01:00:00:59	01:00:03:59	1V, 2A	None/Ignore	Normal	None	✓	Today, 9:21 AM	Off	Not Yet	42.0 MB	00:00:03
01:17:24:25	01:17:27:24	1V, 4A	None/Ignore	Normal	None	✓	Today, 8:48 AM	Off	Not Yet	42.9 MB	00:00:03
01:00:04:59	01:00:07:59	1V, 2A	None/Ignore	Normal	None	✓	Today, 9:21 AM	Off	Not Yet	42.0 MB	00:00:03
01:00:00:00	01:00:16:00	1V, 4A			None		Today, 9:25 AM				00:00:16

Figure 7 (Part 2): All reported settings in the FCP Browser seem identical between BUG CLIP & NO BUG CLIP but they generate different results when exported.