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Feature

Film & FCP

By Neil Sadwelkar

In the previous issue of 'The Creative i', I gave an overview of FCP systems and just skimmed over what it is capable of doing. If you haven't read it, then maybe you should take a look at it [here](#). I'm writing this with the assumption that you've read this 'FCP - First to Final!' expose, I wrote last week.

This time I'm going to visit '*editing film with FCP*' - the kind of film that gets shown in theatres.

Those of you, who came into editing just a year or two ago, a quick history lesson is due. But wait! Surely there are many more who already know or really don't care how they did it in 1940! So for them, I'll dig into the FCP and film business straight away, so they can start editing their films this evening itself.

'F' for Film...

First, the film is shot at 24 fps [*frames per second*] as usual. The negative is processed, and then run through a telecine machine. The telecine machine plays the film at 25 fps [*or 29.97 if the video is NTSC*] and converts the picture into video to be transferred to a DigiBeta or Betacam or DV tape. While transferring, the telecine machine also reads the edge numbers [*or key numbers*] off the negative and builds a table of 'edge numbers vs. timecode' of the video tape. This is called a 'log file' or 'flex file' or 'ALE file'. It's usually transferred to a floppy.

This log file is then imported into *CinemaTools*, an application that ships with FCP 4. *CinemaTools* stores the log into a database and outputs a 'batch list'. This batch list is then imported into FCP. FCP shows you the film rushes as clips in your project - usually one clip per film roll. You then automatically capture these clips from your source [*telecine dump*] tapes into FCP. After capture, you have 25 fps clips of your 24 fps original. Now, you quit FCP, open *CinemaTools* and 'conform' these clips to 24 fps. This is instantaneous. You then connect database entries in *CinemaTools* to actual clips that you have captured with FCP.

In *CinemaTools*, you can also open your rush clips and check that the timecode and key number relationship is consistent. If it isn't, or there are slippages, you can correct them without affecting your clips or your edit.

Done! What's next?

How about sound?

The original pilot [*recorded on the location*] sound can then be transferred directly into FCP from the original Nagra tapes or DATs. You can then line up picture and sound into a 24 fps timeline and sync them together into 'merged clips'. You can even store these 'merged clips' and edit with them. Sort of like 'Autosync' in an Avid.

When the next batch of film cans become available, you again do the 'telecine - import logs - output batch lists - capture - conform - connect' procedure. And keep on repeating this till the producer has finished all shooting or money.

So, now you have your picture and your sound. And even the merged clips - 'talkie' film rushes. You then edit them into a film - telling a story the way the director visualized it, and the writer wrote it and the actors acted it and... ok, you get the idea!

Once editing is completed, FCP can output a 'cut list' including a 'pull list'. It does this through *CinemaTools* which, if you remember, has a database connecting video timecode to key numbers.

Taking these cut-lists, the negative cutter can cut the negative. Of course, what is normally done is, the negative cutter first 'pulls' the negatives - meaning pulls out OK shots. You then have these printed into a positive. And the negative cutter cuts this positive rush as per the cut list.

On the sound front, you can output an audio EDL that *ProTools* can open and recapture the audio from the time-coded DATs. Or if you've used a Nagra, you can export your final audio tracks one by one as AIFF or *.wav files to open in *ProTools* or *Nuendo* or whatever. FCP can

also export OMF files with media and handles. And these files open in ProTools with DigiTranslator.

If you wish, you can also capture the original sound from DAT into FCP as a digital signal. You could use an S/PDIF audio interface like the USB Audiophile or FireWire Audiophile from M-Audio. Both supports 24-bit 98 kHz, so recapture in ProTools may even be unnecessary as the OMF will convey the actual sound files.

So whichever way - you do your audio and output it for mixing and effects. Once it's all done and complete, the sound is mixed and printed to optical. This is a black and white film with no picture but only sound as a visual waveform along one edge of the film. The negative cutter can now match his cut of positive with this optical sound for that final check before finally cutting the negative. Once everything is all well and lines up, the original negative is cut and edited into the final 'edited negative' mechanically, by the numbers.

This edited negative and the corresponding final optical sound is used to make prints and sent to theatres. Then posters are made, tickets sold, audiences come, buy popcorn... etc etc.

So that's it. That's how easy it is to edit films - with FCP. Of course, like all such things, it looks simple and straightforward till you have to actually do it the first time. But seriously, this is a procedure, which even if a bit complicated, works accurately. Things can and do go wrong with FCP if the usual precautions are not taken. Just like they can go wrong while editing with Avid Film Composer. But film editing with FCP does actually work.

FCP Film editing setup

Now for practical realities. What kind of a setup is needed for FCP film editing?

If you have the facility of having your rushes 'telecined' to DV with time-code and logs, then you can get just a G5, 2 monitors, external FireWire hard disks, a DV camcorder or deck, and a Canopus ADVC-100. It also helps to have a large screen TV set or a video projector. For sound you may need to hire a Nagra or DAT. To capture from Nagra, you can pass sound through the Canopus. To transfer sound from DAT too, the Canopus can be used. For DAT timecode and control, you need to get a 'USB to serial' adapter. And to make all this work, you need me! Just kidding :) For DAT digital capture via S/PDIF you need an M-Audio USB Audiophile or FireWire Audiophile.

Seriously though, FCP directly supports all these devices. But it takes some care and perseverance to make them work smoothly.

This basic DV setup should be about Rs 3.5 to 5 Lakhs. That's because of the sheer amount of hard disk space film requires. At DV resolution, a 180 GB hard disk can hold about 200 rolls worth of film. Also, you have to work with a dual-monitor set-up when editing film. The number of clips and bins, usually open while editing films, makes a single-monitor too crowded.

If you want to capture telecine-footage from Betacam, you can still use the above setup. Because the Canopus will convert Betacam to DV for capture into FCP. But if you want to be able to work at higher resolutions, or work in 24 fps natively, you can get an Aurora IgniterX Pro card. This card gives you true 24 fps working and M-JPEG compression so you can store more rushes to disk than DV. Like 10:1 or even 20:1 compared to 5:1 for DV. And you can also work at up to 1:1 and do your TV promos yourself.

The Aurora IgniterX Pro is about US \$ 3000 which should work out to about Rs 2 Lakhs. Add this to the above basic setup price.

Further you can also add HD to the above system and very fast SCSI disk arrays and make your promos or VFX portions as HD from this same setup itself. And the price of HD hardware for FCP has come to the point that the basic FCP setup can do HD with an up-gradation cost of even as less as 5 Lakhs. So an FCP film setup is about as 'future-proof' as you can get.

History lesson

For those who got into ad film-making as a first exposure to film, and are led to believe that reverse-telecine is the only way show films in theatres, here's how they've been doing it since the time even before you were born. And this is how Spielberg still prefers to cut his films - the manual way. In the beginning there was film. Meaning before TV and before video - about 5 decades before they really came in. Film was shot in film cameras on 35 mm film at 24 fps [100 years later, still is]. This was then processed into a negative. Since it was too risky to cut the original camera negative, this was printed to a positive called 'rush print'. Sound didn't need processing but was transferred to 35 mm magnetic film.

The editor then took the film [picture] and sound film, cut it into shots and joined them into a meaningful story. Once this was finalised, the cut rushes were compared to the negative and the negative was cut. The final cut sound was transferred to 'optical sound' - meaning film with sound waveforms visible on it. The edited negative picture and edited sound were fused into a 'married print'. This could be then run in theatres. This whole method of editing film predates today's Avids etc by many decades. You could call it manual film editing. A couple of small details. The original negative has tiny 'edge numbers' or 'key numbers' printed on the edge. These are visible in the rush print too. So the negative is cut as per the positive using these numbers. This could be called 'conforming'.

To help view the negative, a 'viewer' is used. This can be a machine like 'Movieola', 'Picsync', 'Steenbeck', CTM, KEM or some such. To keep things organised, the editor uses a contraption that has a cloth bag and an overhead rail to hang film bits. This was and still is called a 'bin' - for maybe five decades before Avid used that term. Film editing allows you to insert, delete or rearrange material easily and without needing to re-edit the remaining portions. So it was the first form of 'non-linear editing'. The original shooting media - the negative - is not edited at first, so film editing could be the first 'non-destructive editing' system. And again, since a copy of the original media - the negative - is used for editing, film editing is essentially 'offline editing'.

How good is the 'F' of FCP?

To conclude, how good is film editing with FCP? Especially for one used to editing on Avid?

Let me be honest about this. Avid was definitely a superior film editing system. FCP 4.1 has gotten FCP closer to Avid. But for rock-solid reliability, Avid has the edge. And especially so with PAL film editing, an area where FCP has the maximum 'issues'. Avid still has a larger pool of trained editors, an area where FCP in India just doesn't seem to be catching up.

With FCP, creating and maintaining a database manually in a separate application [CinemaTools] makes things cumbersome and error-prone. Avid handles key numbers internally. So this is one area that some gets defeated and tends to give up on FCP. Also, FCP doesn't do a 'true 24 fps' pull-down edit method. So when viewed on an external monitor or TV [running at 25 fps], 24 fps clips appear to have an odd 'judder' once every sec. One gets used to it, and it doesn't affect sync, or cut lists. But it's there. The Aurora card minimizes it to some extent.

Another issue is that this process of converting a clip from 25 fps to 24 fps [*internal reverse-telecine*] destroys the original timecode. So halfway through your project, if your disk crashes and you need to recapture your rushes, things can get a bit stressful. It's not impossible, just difficult.

So there are issues with FCP. But I must also admit that there is no one single crippling issue that can prevent someone from successfully editing completely with FCP. And you have to remember that buying an FCP film editing setup costs less than half of a comparable Avid setup. So, many professionals who would otherwise rent an Avid can actually buy an FCP setup.

And even for those who can afford an Avid, for the same price as one Avid, getting two FCP setups will definitely be more productive. One can be used for capture and sync and the other for editing. After all capture and sync is over, the first setup can be used for audio work - track-laying, effects, dubbing, mixing or even cutting promos for TV. An FCP system also has other extras like the ability to burn DVDs, so edits can be sent to directors on location via DVD for quick and efficient evaluation.

So there! That's how some of the upcoming films will be edited on FCP. At the present only about a dozen features have been edited on FCP so far. But it could catch up and grow. It definitely brings editing film within the reach of many who were otherwise resigned to renting an Avid.

About Neil Sadwelkar



Neil Sadwelkar has little formal training, so he just about makes a living in the film & TV industry in India. His profession is a higher form of meditation through which one can deny hunger and sleep - it's called editing. In his spare time thinks hard and writes stuff like this piece above. And in whatever time is left over, he does his own accounts and chases clients for money. As you must have noticed by now, he is also shamelessly besotted with Macintosh machines and considers them as God-sent gifts to man kind!

He builds and tinkers with computers, so some people get conned into believing that he knows a lot about computers and editing software, so they even pay him as a consultant. Really! If you love what he's written you can drop him a line at neil@misenscene.net and tell him he's the greatest. He even has a web site dedicated to Final Cut Pro where you can take in more of his writings.

If you're a budding editor you can make him feel good by asking for advice. But if you're looking for work, don't bother because he doesn't have contacts. And if you really hate his writings, write to him and give him some work, so he has no time to write stuff like this. But don't make him chase you for money; else he'll go back to writing.