Post Production

This document is a written accompaniment to C31's training DVD titled 'Post Production'. The information below is a response to the main editing issues that C31 producers encounter. It is by no means a comprehensive editing guide, but will definitely help in what we feel are the most commonly misunderstood areas of editing.

The editor's overall job is to take all of the raw footage and use both technical and theoretical tools to create an interesting piece for the viewer that makes sense to watch. This guide concentrates on the technical aspects of editing, but theoretical aspects are equally important; aspects such as the skill of story-telling, flow, logical cuts and shot matching should all be factored in to achieve a story that makes sense to the viewer. There are many books available to help with understanding the basics of story-telling so now, we're onto the technical side of things!

Get it right first!

The most important thing to remember is that it's far easier to record you images and sound correctly in the first place, than to record your footage poorly and expect it to be fixed later in post production. If you're having to fix the same problems each episode, take the time to speak to who ever is filming the footage and discuss how you can solve these problems during recording. It will save you a lot of time and produce better results - a good quality shot will always look better than an average shot edited to look better.

Operating Systems

There are many different editing programs you can use, some of which may come with your computer or some that you may have to buy and install yourself. Regardless of which system you use, editing THEORY remains the same. The instructions throughout this document refer to Apple Mac's editing software *Final Cut Pro*. If you are using a different program and it has a different name for a filter, effect or attribute for something outlined in this document, most programs have great online help guides to get you through.

If you're still having trouble trying to figure out how to do something, there are many technical forums and websites dedicated to most editing programs. One particularly good site is www.creativecow.net, which not only has sections dedicated to most editing programs, it has online forums where you can post a question and receive an answer from professionals within a couple of hours!

Common Editing Processes

The guide below walks you through the most common editing processes, and has been written in accordance with C31's current technical requirements. The first half discusses visual aspects and the second half discusses audio aspects. If you are struggling to understand a particular area, more detailed guides are available from the C31 office. Don't forget to check your online help resources too!

It is also vital to have your editing suite connected up to a CRT monitor whilst editing. Watching your footage back on a CRT monitor gives you a 100% accurate representation of how your program is going to appear once ingested at C31. You will be amazed at how many aspect ratio and field dominance issues you will pick up whilst editing; elements that, if submitted incorrectly, can see your program rejected from broadcast!

VISION

Aspect Ratio: The shape of your video frame is referred to as 'aspect ratio'. C31 broadcasts in 4:3 aspect ratio, which refers to 4 units wide by 3 units high, so it looks squarish. The other aspect ratio is 16:9, also known as widescreen. This refers to 16 units wide by 9 units high and looks like a rectangle, and will have a black bar at the top and bottom of the screen if viewed on a non-widescreen television set.

The important thing to remember when starting any project is to ensure that you open a 4:3 PAL project, not a 16:9 project. This is generally found in the 'options' or 'setup' section when opening a new project. This will eliminate half the problems you could incur right from the word go!

The most common problem caused by aspect ratio is when 16:9 footage is imported into your 4:3 project that already contains 4:3 footage. Some editing programs don't understand that you're using 16:9 footage so the footage automatically gets stretched to fill the 4:3 frame, leaving people in your footage looking very tall and skinny. To fix this, click on each clip that has been stretched and in the settings tab, change the 'distortion' or 'aspect ratio' until it appears 4:3 again. Watch your CRT monitor to see at what point the footage is correct again.

If you do choose to edit entirely with 16:9 footage, you must 'letterbox' it. This is an exporting option. If you do not export it using this option, the footage will appear stretched and will be rejected by C31.

Reversed Fields: Australian TV runs on PAL format and PAL format contains 25 frames per second. Imagine your television image broken into 25 horizontal lines; each line a frame. Each of those frames contains an upper field and a lower field, so now imagine 50 horizontal lines on your screen to represent each field within the frame.

When your programs play out on tv on Australia, the lower field of each frame plays first before the upper field. Of course to the naked eye this just looks like one smooth continuous picture, but it is actually a calculated process.

If footage is broadcast that has not been set to 'lower field' first, the upper field of each frame will automatically play first. When this occurs, the result is jittery looking footage because it is actually playing the last half of each frame first, followed by the first half of the frame. While this jitter is slight, it is noticeable, annoying to watch and therefore unacceptable.

To ensure this doesn't happen, when starting a new project, check that your 'sequence settings' are set to 'lower field' (Also known as 'even' field). If you have selected a 'PAL' project from the start, your field dominance settings are probably already correct.

If you find that selected clips within your project have incorrect field dominance, you can apply a 'de-interlacing' filter to the problem clips and then render them. If this doesn't fix the problem, you may have to re-import the footage ensuring the correct 'field dominance' is initially set.

It's good to note that field dominance problems cannot be viewed on a LCD screen or computer monitor; the problems will only appear on a CRT monitor which is why you should have one hooked up!!

Colour Correction> White Balance: Different types of lighting sources create different colour tints which can affect the overall look of the footage being shot. For example, external, natural light creates a blue tint and internal light creates an orange tint. If the camera 'white balance' function isn't set when shooting, the colour of the footage can look too 'blue' or 'orange'. If you look at a white part of a frame, it's easy to see if it's incorrect; if it's not white, it's wrong! It's always better to set this on you camera and get it right at the time of shooting the scene, but luckily this can be amended in post production if need be, and here's how.

Most editing programs will have a 'colour correction' or 'colour balance' filter. Within this, there will be a 'white balance' or 'white point' icon. Double click on the incorrect clip, drag the white balance icon to a spot in the clip that should be white, and the whole clip should fix itself instantly!

Colour Correction> Colour Balance: Under-exposed and over-exposed footage can also be fixed by the magic of editing if exposure is not correctly recorded in the first place. Over-exposed means the footage is too bright and colours will look blown out or too light. Under-exposed means the footage is too dark.

Again, it's best to get this right at the time of shooting, but to fix/alter the colour balance in post, it really is a matter of playing around with the settings within any of these filters: 'levels', 'brightness', 'contrast'. You first need to click on a clip to select it, drag the filter onto it, and then play around with the 'brightness' and 'contrast' controls.

Colour Correction> Chroma: Excessive chroma saturation generally happens when you've either added graphic elements to your program, or have stylized or colour corrected some of your shots. So whilst the ability to colour correct is great, it can come with problems.

Basically, colours can become too 'heavy' and when this happens, television sets can become damaged and make a humming noise while broadcasting these 'colour-heavy' programs. Bad!! The reason for this is quite technical and stems back to the early days of television, but basically, every colour on the screen has a numerical value and the higher the number, the 'heavier' the colour. Any colour above the number 235 runs the risk of damaging television sets. To check the value of colours if you feel they are quite bright/heavy, use the 'RGB slider' and ensure there aren't any over 235.

AUDIO

The general technical standards for C31 audio are that programs:

- have consistent audio levels aiming for around -12db
- must be provided as a mono recording
- with dual track audio must have two dual mono tracks in phase
- must be in sync
- must be free from distortion, hisses and hums

Below you'll find out how to achieve all of this.

Constant Audio Levels: There is nothing more frustrating for a viewer than having to constantly change the volume when watching a tv program. This is why C31 asks all producers to submit programs at -12db. Ensuring every part within your program stays around -12db is a bit fiddly, but necessary.

First, ensure your audio meters are open and visible on your screen so you can actually view your levels. If the audio meter isn't open, it can be found in 'window'. Audio levels run from minus infinity, which is total silence, up to 0 which is full strength audio, or the loudest sound possible.

It would be almost impossible to have every single frame of audio reaching exactly -12db, but if you look at -12db as your average, you should be fine. Just ensure audio doesn't go above -6db, or it may get clipped and become distorted.

If your audio doesn't fall within the -12db range, you will need to alter each segment of audio so that it does. To do this, select the pen tool and click on the straight line that runs across the audio in your timeline. Each time you click, a small dot will appear. You can move this dot up or down, depending if you need the audio louder or softer. You will need to do this for your entire project, to achieve a constant audio level.

Also, bear in mind that multiple audio tracks playing at any one time will add up creating a louder volume than a segment with just 1 track. It's a good idea to double check segments with multiple tracks, and that within these multiple tracks one track isn't dominating over another (unless that's your desired outcome).

To enhance your sound even more once you've reached your optimal level of -12db, you can apply a 'compressor' filter. This helps lower the volume of the really loud spikes in your project and make the audio levels even smoother. A good starting point for compressor settings are a threshold of -25db, a ratio of 2, an attack time of 5 milliseconds and a release time of 500 milliseconds. As with colour correction, these settings are things that can be played around with until you are happy with your sound mix.

Once compressed, the overall waveform should look (and sound) a lot smoother, resulting in a higher quality broadcast!

Sync: When moving all of your video and audio clips around it can become easy for a bit of vision to become separated from the audio that belongs to it. This means viewers will see a mouth move for example, but the sound will be lagging a couple of seconds behind. Final Cut Pro users are blessed here because any sync errors appear in a hard-to-be-missed bright red colour on the timeline. Unfortunately not many other editing programs include that function. The only way to ensure your sync is correct is to watch your final edit back before you hand it in for broadcast.

The other sync issue that can occur is phasing. This has nothing to do with the vision, just audio. It is when your left audio track and right audio track become out of sync with one another. To understand this better, imagine each audio track to be a wave of energy moving through the air with high and low points. Since most audio clips contain matching left and right channels, if the two channels get out of alignment the two waves can combine to cancel each other out, resulting in the audio of your program cutting out at frequent intervals. This isn't very pleasant to listen to!! To avoid this happening, keep an eye on your individual audio tracks and ensure they don't get split apart.

Final Output: No matter how many different audio tracks you use while editing they will all eventually be mixed down to only 2 tracks, which gives you your final stereo mix that goes out to tape. Although this will be 2 tracks, C31 currently only broadcasts a single channel of audio – the left channel. This means you must ensure ALL of the audio from your program is on both the left and right channels.
Please note: If some of your audio is only on the right channel, it will not be broadcast at all!

To make sure you have this correct, there are various audio filters you can use: 'fill left', 'fill right', 'pan audio' (in which case you would pan it to zero); it varies from program to program. Just remember to apply the specific audio filter required to EVERY SINGLE different audio clip used. Once this is done, you will have equally balanced audio that will broadcast perfectly!

Timecode Breaks

When a gap in the stream of program information occurs, a timecode break occurs on your tape. When you print your program to tape, it is very important the tape does not contain a timecode break if you want your program to broadcast properly.

Timecode breaks usually occur when low quality tapes or old tapes are used, or when you are outputting the program to tape one segment at a time, and manually re-cuing the tape. It is therefore very important to a) use a brand new tape for each program and b) print your program to tape in its entirety. On point a, using a new tape each time also ensures any footage from a previous episode isn't accidentally broadcast as part of your new episode. Whilst our ingest team is great, it's better to avoid a potential problem happening rather than run the risk of the wrong footage going to air! Using good quality tapes also lessens the risk of digital glitches and drop-outs, which can result in an episode having to be re-submitted, so it's better to do it right the first time.

As well as this, higher quality tapes also last longer, so if you need to send your tape to another community station, you can do so feeling fairly confident there won't be any issues.

Summary

Editing is not an easy task, and there is always something new to learn to strengthen your skills. Spend some time playing with each of the filters mentioned here to learn what each of their parameters and controls do. You never know when something you discovered while mucking around will come in handy when fixing a problem in the future.

Remember that as an editor you have many tools at your disposal to correct problems with your raw footage, but you will always get better results if things are filmed correctly in the first place. Don't let your cameraman come to rely on you to fix their sloppy camera work; that just makes more work for you and you will eventually run into problems that just can't be fixed.

C31 has more comprehensive guides on specific sections, and also has experienced editors in the office, so please feel free to contact your programming team member if you need more help with a particular area. Good luck with your editing and remember, it's meant to be fun!