

## The Art of Cinema Sound & Re-Recording Mixing

*A Workshop Presentation Focusing on the Sound Design & Sound Mix for*

CONTENTION - A 14-Minute Short Film - © LEE C. PAYTON, 2012

*With an Emphasis on Techniques Used to Salvage Production Dialog*



*Still from Opening Montage - Shot On Location - Oakland Cemetery - Atlanta, GA*

*Contention* is the story of two estranged brothers who attend their father's funeral service and get into a heated argument. One brother reveals the dark family secret that will either resolve their differences or drive them farther apart.



*Dexter Tillis (L) as Lawrence  
Shaun Mixon (R) as Malo*



*The set, hand-built by Students  
& Instructor with found supplies*

The genesis of *Contention* was a strong script, and a dynamic class of film students eager to explore and participate in all phases of pre-production and production, for a little-to-no budget short film. It was also a prime opportunity to work with very talented Actors on material that challenges thespian ingenuity and resolve. In an effort to maximize a transformative environment for the cast and crew, the decision was made to build a secure set for the shooting location.

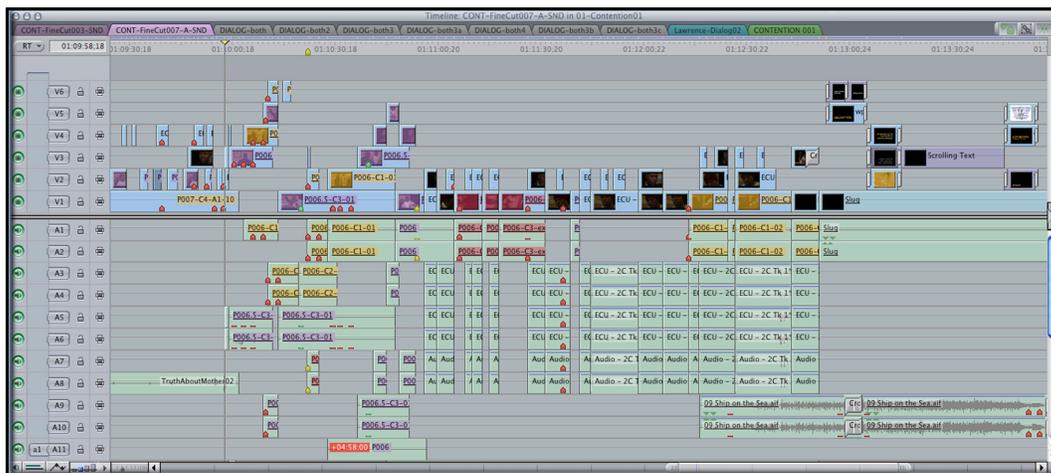


*ABOVE: Students from a Film Production class build a professionally finished set from materials donated by local construction companies. LEFT: The finished set, lit and ready for dressing, Actors and film crew.*

*Contention* was a multi-camera shoot with a cross-lighting design. When the Actors faced toward or away from each other, they would share their respective key and back lights, while the opposing corners provided the fill light. This made it virtually impossible to have a boom operator on set because of an overabundance of shadows. Additionally, the soundstage at this particular school was built under a giant dome, making recorded audio hideously reverberant.



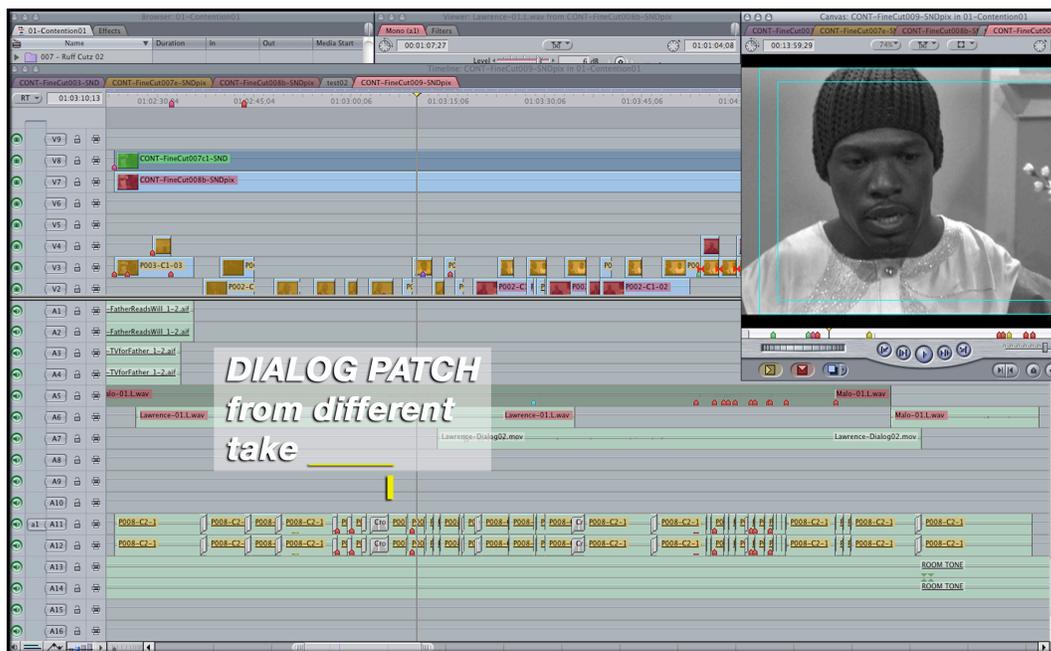
Various rigging techniques were employed to place the microphones out of the shots, and sound baffling was layered above the set to minimize the room reverb. The goal was to at least capture the best guide tracks possible during production dialog recording. There was an assortment of microphones connected to each camera, with additional audio recording devices placed strategically on set. This made the sound design and dialog editing phases of post-production a more arduous and time-consuming task because of the amount of dialog tracks.



*The picture edit in Final Cut Pro, showing the multi-camera picture cut, and as many as eight tracks of synchronized production dialog recordings*

As with most little-to-no budget short films, many production considerations are limited by the equipment available. For *Contention*, though the production dialog was recorded with many microphones, due to a myriad of reasons, most of the recordings were not usable in the final sound mix.

When production dialog tracks are not usable, it is professional industry practice to replace an Actor's lines through the process of ADR (Automated Dialog Replacement). Sometimes Actors are unavailable, or circumstances prevent an ADR session. Salvaging the production dialog then becomes vitally important. 'Salvaging' starts with production dialog that may be less than perfect for a final sound mix. But through a vast array of sound editing, sound effects processing, and re-recording techniques, many times a line of unusable production dialog can be patched, repaired, or outright replaced using on-set production dialog recordings. These techniques are not as reliable as ADR, but sound perfect enough in the final mix, once all the other sounds and music are added.



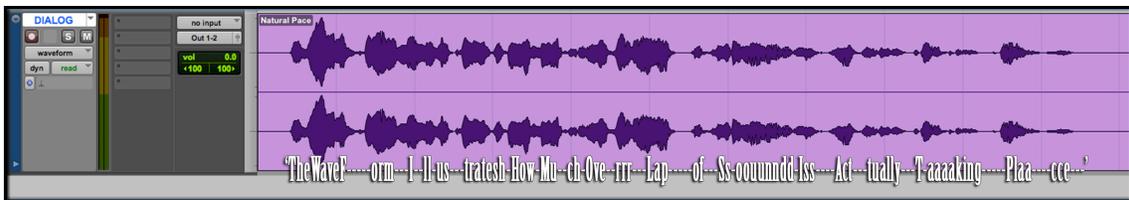
*The audio edit in Final Cut Pro, showing several lines of dialog and room tone pieced, or patched together from a different take than the picture edit*

Sound Designers have a few options in salvaging, or replacing lines of dialog. One is the rehearsal. If the Production Mixer has recorded the rehearsals as well as every take, many times rehearsal lines can be substituted depending on Actors' pace and emotional delivery. The hidden caveat to using rehearsal lines is that many Actors don't give their full intensity during rehearsal, instead saving energy for when the cameras are rolling. Variances in emotional intensity can sometimes synch up with and enhance nuances in acting performance. Emotional variations show less synchronization error than variance in acting pace or rhythm.

Another recourse is substituting a line of dialog from one take into the picture edit from a different take. This again works best when emotional intensity and line delivery pace are consistent from take to take. Important to both of these considerations is the role of the on-set Script Supervisor, who efficiently keeps track of the placement of key words. The classic example in this case is the

difference between saying the character's name first, then the line of dialog; or saying the line of dialog first, then the character's name. This example may not seem like a major concern to the Actor or Director while in the moment on set, especially if their goal is to build the character or story.

However, a variance this mild can mean hours of fine-tuned dialog editing because of how words in human speech naturally run together. Certain syllables, most vowel sounds and many thin, 'hiss-y' consonant sounds overlap from word to word. This makes the precise location of the beginnings and ends of words a critical skill in professional dialog editing. Each individual waveform represented in a non-linear Digital Audio Work Station (DAWS) may not represent individual words. Most often, the waveform illustrates how much overlap of sound is actually taking place.



This fluidity in the construct of human speech can be observed with even finer detail in yet another technique used to salvage production dialog. This technique involves cutting together entire sentences and passages of dialog from many different usable takes or rehearsals. If possible, it is best to pull individual words from takes or rehearsals exclusively, due to the inherent sonic differences on set once the cameras are rolling.

When employing this 'patch-together' technique it is common practice to use the best or most suitable words within sentences, no matter what take it is from. It is of utmost importance that the sound of the room tone behind the dialog is consistent across the entire edit, so that the patch sounds as though the dialog plays out in real time. It is also quite common to have to cut in pauses or breaths to match the on-screen performance.

On set, most experienced Production Mixers record at least 10-30 seconds of room tone per camera set-up. These bits of sound are crucial to the seamless reconstruction of a character's dialog. In post-production, most Dialog Editors know how vastly different various shooting locations and microphones can sound. Without this additional room tone, it is a much more labor-intensive process to salvage production dialog. The room tone around the dialog, which is unique per character and per camera set-up, must then be built up from only the audio tracks provided in the final picture lock. This constraint increases the chance of hearing an un-natural repetition in a piece of looped background fill. The goal is for the reconstructed dialog and the fill to sound seamless and natural.

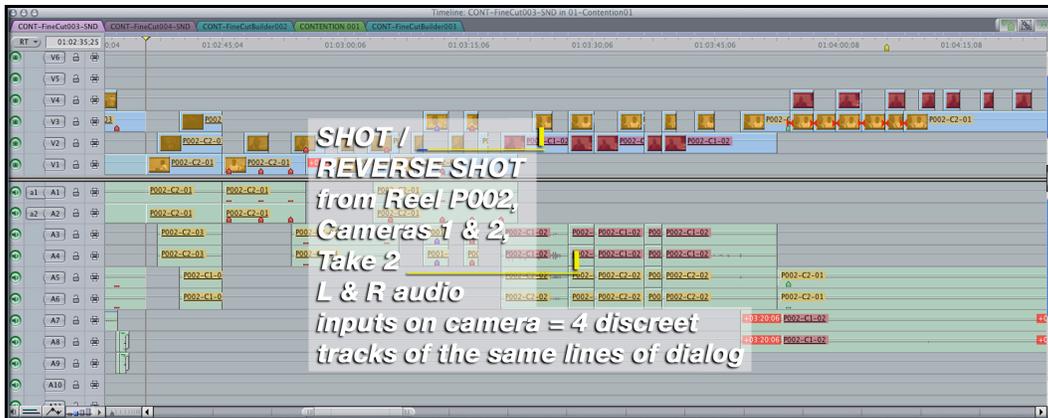
When there are usable words and lines of dialog somewhere in the dailies, and quiet sections of usable, or looped room tone, a talented and patient Dialog Editor can almost always create usable, mixable, salvaged production dialog. Current digital software can manipulate dialog to fit without changing pitch. However, learning to edit, patch, and reconstruct passages of dialog the 'old-school, analog' way is a highly specialized and completely transferable skill for film students.

The Art of Cinema Sound and Re-Recording Mixing Workshop guides the participant through the various challenges and outcomes throughout the post-production process as applied to the short film *Contention*. Cinema Sound decisions can often be made during the picture editing process. Close-ups can often be cut over medium shots without cuts in the dialog tracks so long as the Actor's pace is consistent. Salvaging production dialog also saves time, energy and money from the overall film budget by decreasing the expenses incurred when Actors come in to perform ADR sessions. For these and many more reasons, this workshop is suitable and challenging for all disciplines within the art of filmmaking. In addition, the art of cinema sound and re-recording mixing offers participants a plethora of valuable, transferable skills beyond filmmaking.

The workshop includes slides from various critical post-production concerns, accompanied by detail explaining editing challenges, workflow, methodology, outcomes and skill sets. Also included are comparative segments of the film showing differences that editing and sound design choices can make. Technology permitting, it would be of great interest to play back sections of *Contention* in Final Cut Pro and ProTools, and perform some of the editing concerns live for the workshop participants. Also discussed are ways to bring these various skill sets and methodologies into the classroom to assist variance in student learning styles. The capstone of the workshop will be the screening of the final 14-minute film with the finished sound mix. If Conference presentation technology permits playback from ProTools, the screening can be an actual real-time re-recording of the various audio tracks into the final mix.

The Art of Cinema Sound and Re-Recording can teach us more about the art of filmmaking. It is correlative across many artistic endeavors outside of filmmaking. Just as the comparison can be made between the microphone and the camera lens, so can sound design for cinema be analogous to landscape painting, and so forth. There are countless ways to assist sound students who are more visual learners, or who do not feel musically adept. Traditionally, filmmakers and film students who have little or no experience with the art of cinema sound and re-recording, come away from this type of workshop engaged and transformed with new knowledge. The presenter of this workshop is passionate about cinema sound, recorded sound, music, and sound in general. The more we learn about the art of sound, the more we learn about ourselves, and our world.

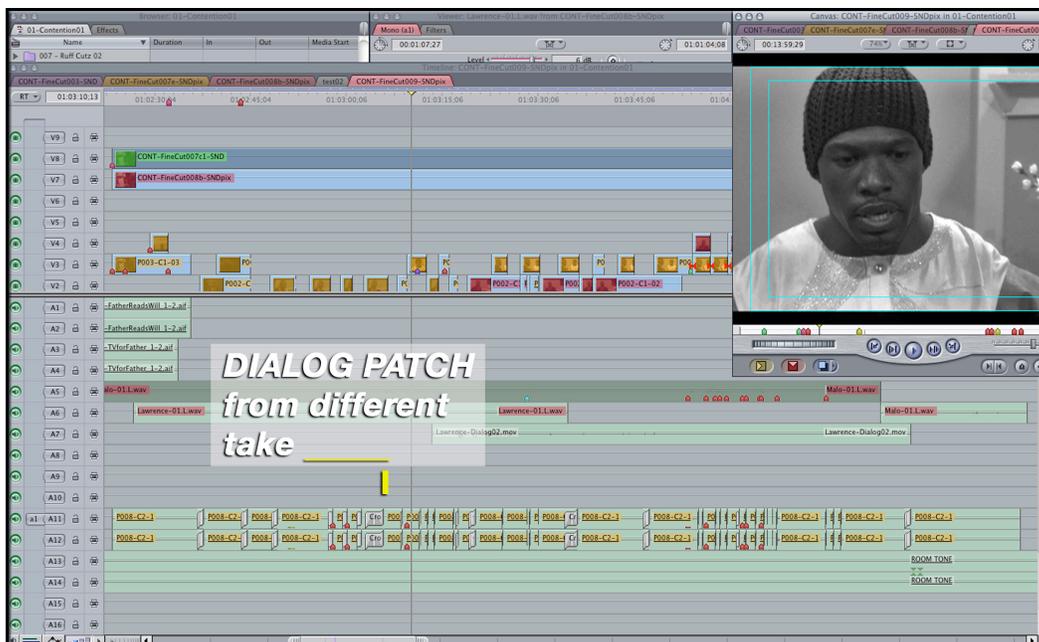




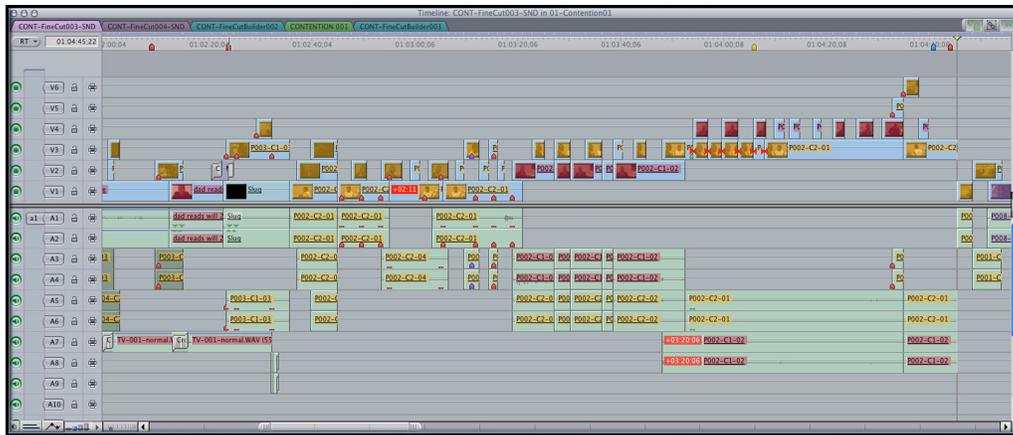
SLIDE 02 - Final Cut Pro

SLIDE 02: *Contention* was shot with multiple cameras so that certain scenes could be cut together from one good take when the Actors are completely embodying the characters. Each camera has two audio inputs, a Left and Right channel, and various microphones were used; boom mics, wireless radio mics, and planted mics. For any edited shot/reverse shot, using multi-camera, there can be up to four discreet tracks of the same lines of production dialog. This works great for the sound edit if only one set of dialog lines is usable. It becomes a tedious editing task when none of the many dialog tracks are usable.

SLIDE 03: Luckily in the case of *Contention*, there were usable lines of dialog for every scene somewhere in the dailies. Many of the production dialog tracks from the picture edit were unusable. But several rehearsals and alternate takes had lines of dialog that were usable. Dialog passages had to be pieced (patched) together or salvaged, using words, breaths, and pauses from different takes.



SLIDE 03 - Final Cut Pro

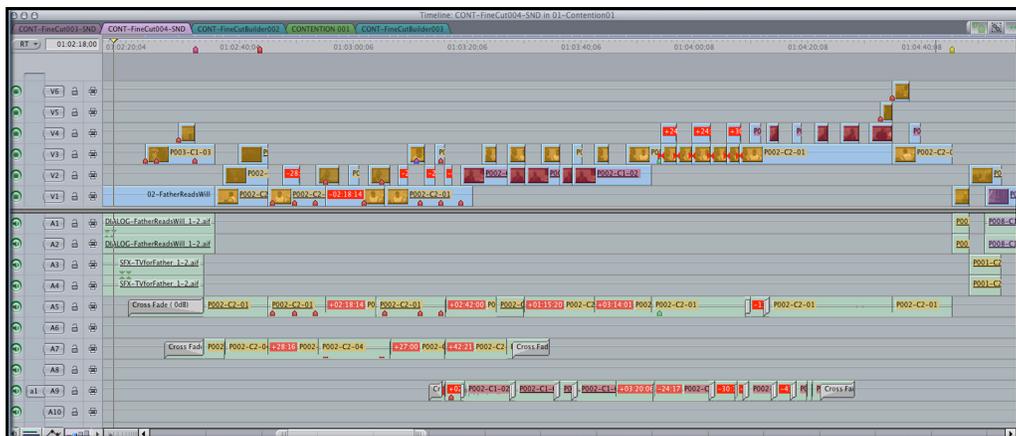


SLIDE 04 - *Final Cut Pro*

SLIDE 04: The picture edit for scene one, showing the multiple tracks of production audio. The initial goal would be to pick usable tracks and/or consolidate the dialog down to one mono track per character. Dialog is almost always in mono because people have only one mouth to produce vocalization. In *Contention*, the Father's voice during scene one is in stereo because he is reading his will from the VCR, and the TV in the scene would be in stereo.

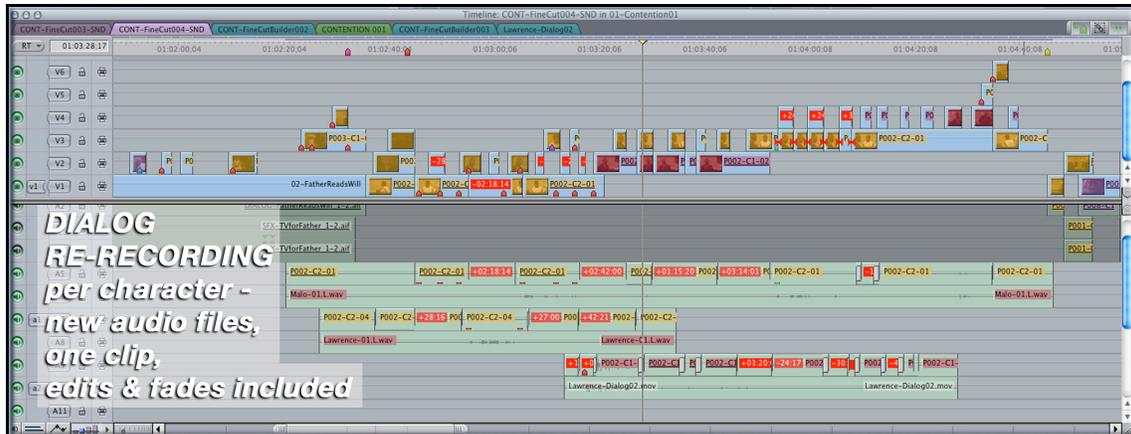
Dialog is always mixed into the center speaker because when audiences hear voices coming from side-screen or from the surround speakers, they tend to turn their heads away from the screen toward the direction of the voice. Our ears may have developed an automatic reaction to the frequency range of human dialog.

SLIDE 05: The same scene as above, only with the dialog separated by Character, placed onto its own mono track, and filled with appropriate room tone to give the scene sonic consistency. Notice that Character A's dialog is represented by one mono track, and that Character B's dialog requires two mono tracks. The second dialog track for Character B is from a different microphone source, and must be processed to match the timbre of the first dialog track.



SLIDE 05 - *Final Cut Pro*

SLIDE 06: The same scene again, with each Character's edited dialog re-recorded as single audio files. In Final Cut Pro, this is accomplished by soloing the desired mono track, exporting the audio as an AIFF file (uncompressed and transferable), re-importing the new audio file, and placing into synch on the timeline. So long as no changes are made to the metadata parameters of the original edit, the new single audio file should correspond precisely to the clip boundaries of the original edited dialog track. It is always wise to export these mono AIFF audio tracks with the industry countdown 2-pop in place for synchronization purposes.



SLIDE 06 - Final Cut Pro

Re-recording the dialog in this manner in Final Cut Pro includes the edits, fades and volume graphing into the new audio file. However, it is a multi-step process, and requires audio files to travel outside the editing platform, ergo they must be re-imported as new files. Audio can be re-recording within the ProTools software, and offers a more direct, streamlined process.

SLIDES 07 & 08: Another example of re-recording using Final Cut Pro. In the final scene of *Contention*, there were six discreet camera audio sources and two discreet audio only sources. Managing these eight tracks down to a single mono track per Character involves critical listening. Dialog tracks are chosen based on the best signal-to-noise ratio, the least amount of distortion when the Actors get loud, and the least noticeable room tone. Once these dialog passes are chosen and edited together onto one track, and filled with appropriate room tone between lines, they can then be re-recorded, exported and re-imported in synch.

With today's cinema post-production processes being done almost exclusively in the digital world, there is little reason why picture-editing students should not be able to do preliminary sound editing before the film gets to the Sound Designer. In order to fully utilize these re-recording techniques, the editing student must develop the ability to discern equivalencies in the frequency range of the room tone behind the dialog. As long as the re-recorded dialog track is seamless, with no noticeable changes in the quality of the dialog or room tone, the dialog can be considered salvageable and may be used in the final mix.



SLIDE 07 - Final Cut Pro

SLIDE 07: The picture edit in Final Cut Pro, showing the many audio tracks from the multi-camera set-up, and the audio-only recordings. The most usable lines of dialog from each audio track are selected, and consolidated onto one mono audio track. They are then re-recorded by exporting and re-importing into synch.

SLIDE 08: The same picture edit with the re-recorded dialog tracks per Character. Notice how we have gone from many tracks with myriad edits, down to fewer tracks with single audio files containing the entire lines of dialog and room tone.

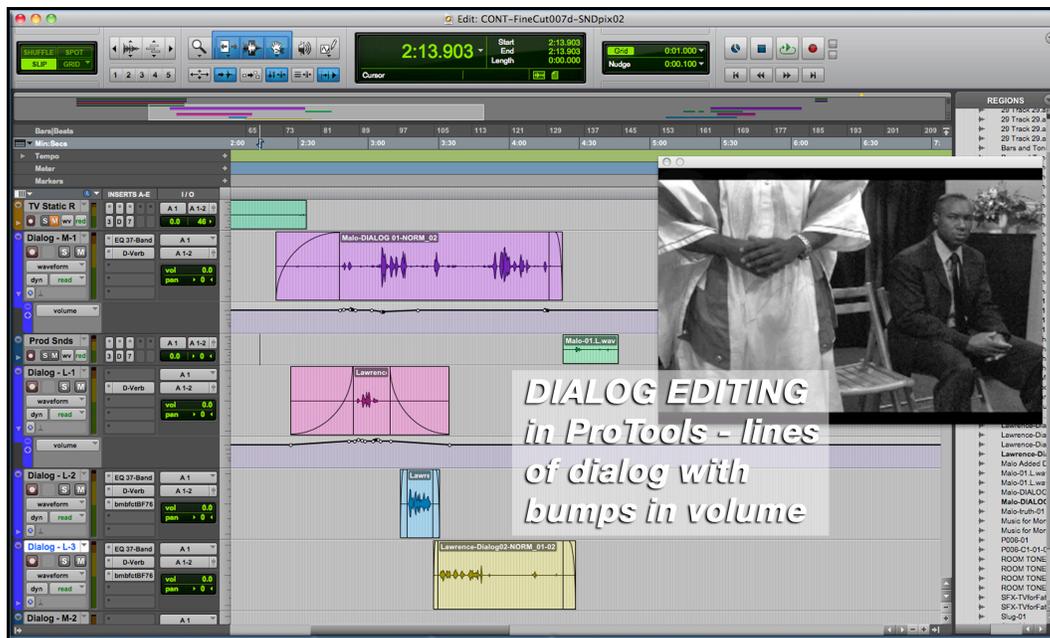


SLIDE 08 - Final Cut Pro

Once the edit has reached picture lock, and all the audio tracks are in place, the video is exported out of Final Cut Pro as a QuickTime movie. The audio is exported as an OMF, which stands for Open Media Eramework. The OMF ensures that all the individual audio tracks remain discreet across different computers and software platforms, so that when the film is imported into ProTools for Sound Design and Re-Recording Mixing, all the tracks are represented and not pre-mixed together into a default computer-standard stereo mix.

## PRO TOOLS - Dialog Editing, Sound Design and Re-Recording Mixing

ProTools is the industry standard software for sound editing, both for music applications and for cinema. It is an endlessly powerful audio manipulation program that is limited only by the imagination of the user. Preliminary sound design and re-recording can be accomplished using Final Cut Pro, but ProTools offers a great deal more flexibility and built-in tools which can be used to salvage production dialog, and to create dynamic cinema sound mixes.



SLIDE 09 - ProTools

SLIDE 09: The character Malo's dialog (purple clip) is contained within a much more noticeable room tone than Lawrence's dialog (magenta clip). Lawrence was recorded using a quiet radio mic in the lapel of his jacket, so the room tone is much less noticeable. For this reason, we are able to fade into the clip for his line of dialog, and fade out after the line.

As evidenced in the overlapping clips on tracks 'Dialog L-2' and 'Dialog L-3' (blue & yellow clips) one of the first goals in Dialog Editing is to have some kind of room tone running throughout the scene. It is most preferable from the usable dialog tracks, or within the clip handles. The black line underneath the dialog clips represents volume graphing, and the nodes signify slight manipulations (or 'bumps') to make certain words louder or softer.

When teaching students about the post-production sound phases of filmmaking, it is likened to a funnel, where many different tracks and layers of sound are continually mixed together, creating less and less tracks before we get to the final mix. The 'funnel' between dialog editing, sound design, and final mixing is called the 'pre-dub process.' It is also referred to as 'dubbing' or 're-recording.'

SLIDE 10: The same section of the film as above, showing each individual clip of dialog, and the first dialog pre-dub (green clip). These five clips of dialog and room tone have been re-recorded within the program using the auxiliary track bussing system that is integral to ProTools.



SLIDE 10 - ProTools

Sound effects processing is added to each track (INSERTS A-E column), using equalization, compression and room reverb to make the different microphone sources sound as similar as possible, and to make the dialog have as much clarity and punch as possible. These tracks are then routed through the auxiliary track labeled 'Vox-BUS' and re-recorded onto the track labeled 'VOX-MIX 01.'

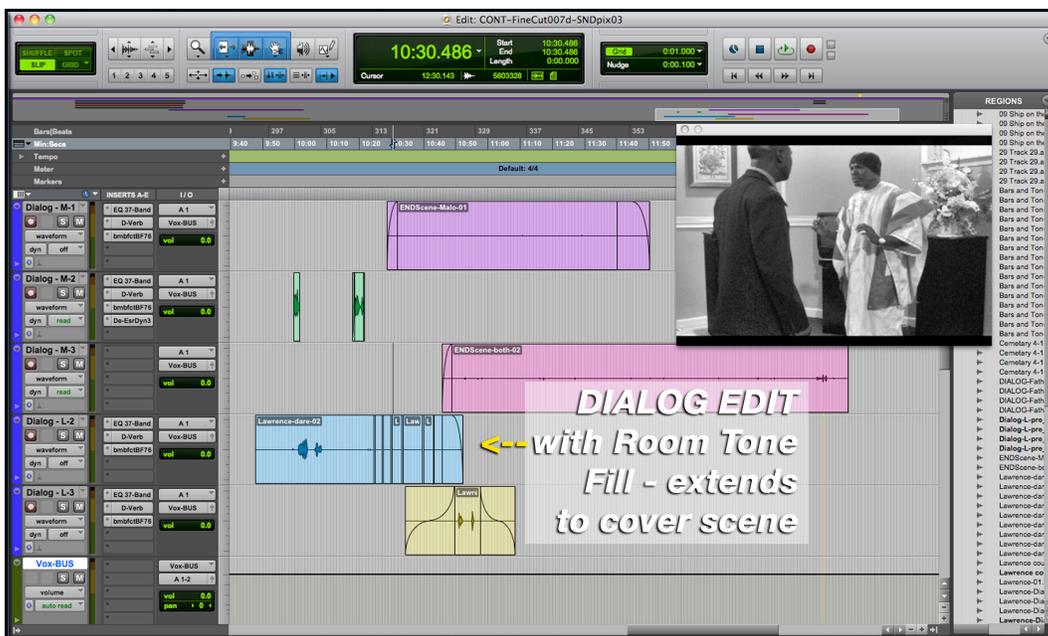
This re-recording process includes all the lines of dialog for each character, all of the room tone fill, and all the effects processing. After re-recording, this work is represented as one new, continuous audio file. Tracks in ProTools can be endlessly daisy-chained together, using the auxiliary bussing tracks. This variety of control over the quality, density and uniqueness of sound layers during the pre-dub process, greatly streamlines the final mixing process.

SLIDE 11: Often times Actors get passionate in their roles, and words that begin with hard consonants can spike the recording, getting dangerously close to 'going into the red.' One of the aspects of the pre-dub process is to manipulate these hard consonant spikes so that the flow of dialog has an even, natural-sounding, consistent decibel level. ProTools provides many tools to accomplish this - compressors, de-essers, equalization, etc.



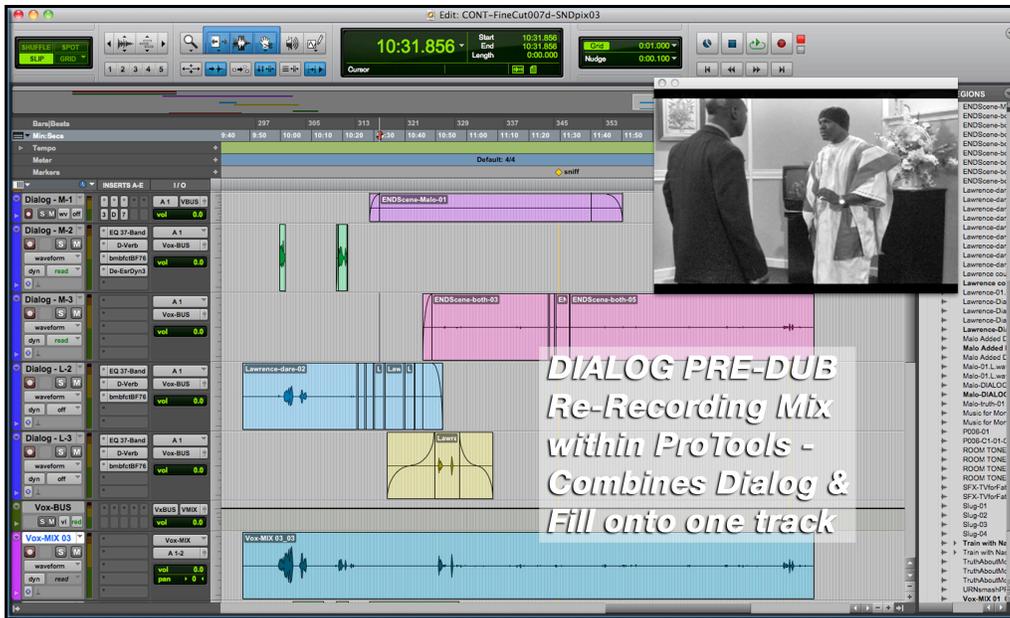
SLIDE 11 - ProTools

However, if dialog has already been re-recorded with effects processing applied, these tools applied a second time will cause unnatural sounding distortions. It is mainly for this reason that hard-consonant spikes must be manipulated using the volume graphing tools. In sound design lingo, lowering the volume by minute increments is called 'dipping,' whereas raising the volume by tiny decibel levels is referred to as 'bumping.'



SLIDE 12 - ProTools

SLIDE 12: In many instances, room tone must be duplicated and filled across empty spaces in the timeline so that there is some kind of room tone covering the entire scene. This goes a long way to 'selling' the idea that each picture cut plays out in real time and in one place. When there are noticeable variances in the sound of each room tone, an extra layer of the more noticeable room tone is added across the entire scene to smooth out the cuts (not shown in SLIDE 12).



SLIDE 13 - ProTools

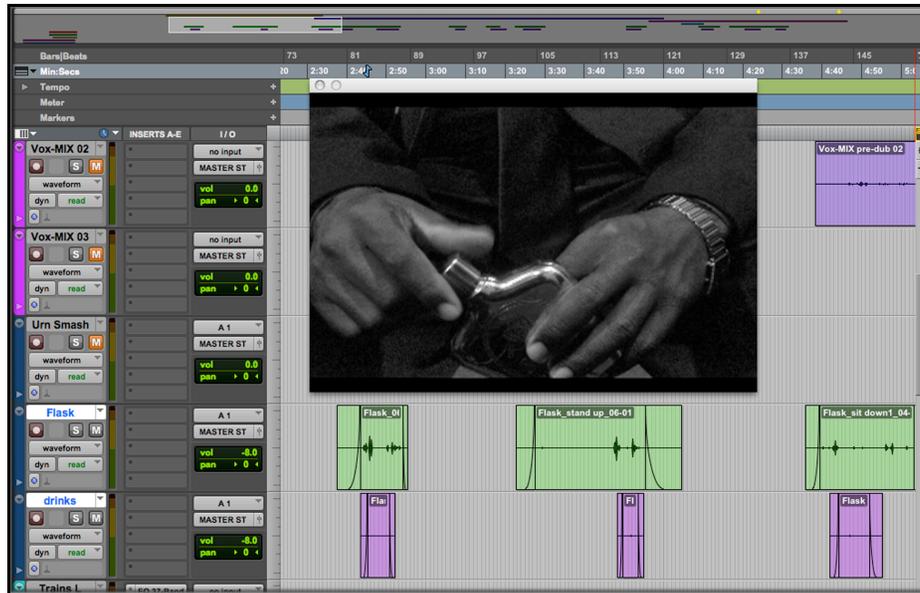
SLIDE 13: Another example of a pre-dub re-recorded within ProTools. This combines several lines of dialog from both characters, their respective room tone fills, and some slight production Foley. Foley are those sound effects that are specific to the character - their footsteps, clothing noise, body movements and the handling of props. Foley is mixed in at subtle volume levels to augment and enhance the sounds of characters.



SLIDE 14 - ProTools

SLIDES 14 & 15: The visual metaphor for the character of Lawrence is his flask, which he handles, pockets, and sips from throughout the film. It also symbolizes the ultimate connection between Lawrence and his brother Malo during the final

moments of the story. Being such a prominent prop, relying on just the on-set sounds of the flask did not give the prop enough of its own 'character.' Foley is recorded in 'passes' and SLIDE 14 shows the raw Foley recording of the flask in two passes - one for the handling and pocketing of the flask, and one for the sips.



SLIDE 15 - ProTools

SLIDE 15: An enlarged view of the individual clips of Foley. Even though these recordings were made on a quiet Foley stage in a controlled environment, it still makes for a smoother overall edit when fade-ins and fade-outs are added to each clip boundary. ProTools offers a variety of highly modifiable fades.

Foley for *Contention* includes clothing noise for both characters in one pass, chair squeaks for each character in one pass, flask handling sounds, and flask drinking sounds. These tracks are re-recorded based on the nature of the sonic event, and robustness of volume. The flask handling sounds are combined with the flask drinking sounds to represent one action from the Actor. Chair squeaks are more percussive with sharper attacks than clothing noise, which is somewhat mid-rangy and muffled. Thus these tracks are kept separate until the final sound mix.

In action films, blockbusters, animation, sci-fi, etc, with larger numbers of audio tracks, the re-recording / pre-dubbing process is an intrinsic and vital link in the chain of digital cinema sound. It would be virtually impossible to go into a final mix with every single component of every single sound represented on discreet tracks. When cinema sound was an analog, tape-based process, these discreet tracks corresponded to individual faders on the mixing console. Hence, the sound tracks were not as dense and full of sound as they are today. Many layers of extra sound tracks meant the duplication of tape hiss from the analog equipment, thus increasing the overall noise of the final mix.

SLIDE 16 & 17: After the re-recording process, the number of individual clips, clip boundaries, fade-ins and fade-outs, and sound effects processing has been greatly reduced into single audio files with effects included. These two slides represent an epitome of the re-recording / pre-dubbing funnel discussed earlier.

The final mix will be stereo, multi-channel, or surround sound. There must be consolidation (re-recording) of many different kinds of sounds on many tracks, before attempting the final mix. 'Like sounds go on like tracks' is a favorite industry saying among Sound Designers and Re-Recording Mixers.



SLIDE 16 - ProTools



SLIDE 17 - ProTools

It is proactive to help today's film students realize how important cinema history is in understanding their digital-age technology. If a student only knows how to accomplish filmmaking tasks *digitally*, they should also be aware of how they can accomplish filmmaking tasks *analog-ly*, while working and living in the digital realm. These prove to be highly transferable, transformative and sustainable skills.

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VIDEO CLIP COMPARISON: The slide on the left shows the actual shot with the final production dialog track. Because the Actor was consistent in his pace, rhythm and delivery, the close-up at right cut seamlessly over a very important line of dialog from the medium shot. The dramatic difference in performance is evident, and much more fitting for this moment in the story.

Other video clip comparisons are planned for this workshop. Given what technology may be available for presenting, it would be most interesting to see these comparisons within their native programs. Other brief QuickTime clips from *Contention* illustrating the concepts herein, can be shown as well.

The capstone of The Art of Cinema Sound and Re-Recording Mixing Workshop will be the screening of the finished film. The film can be screened in one of two ways:

- 1) Technology permitting, the film can be screened as a real-time re-recording mix of the pre-dubbed and bussed audio tracks within ProTools. (The workshop presenter may supply laptop with Final Cut Pro and ProTools.)
- 2) *Contention* can be screened from the finished DVD.

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