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VROOM! POW! BANG! & 3 Futzes... The Art & Science of Custom-Made Cinema Sound Effects

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Most of the sounds that you hear in movies are not made by what you see on the silver screen. This paper explores the cinema sound creative process used in designing custom-made sound effects for award-winning short films. Presentation includes screening of selected scenes.

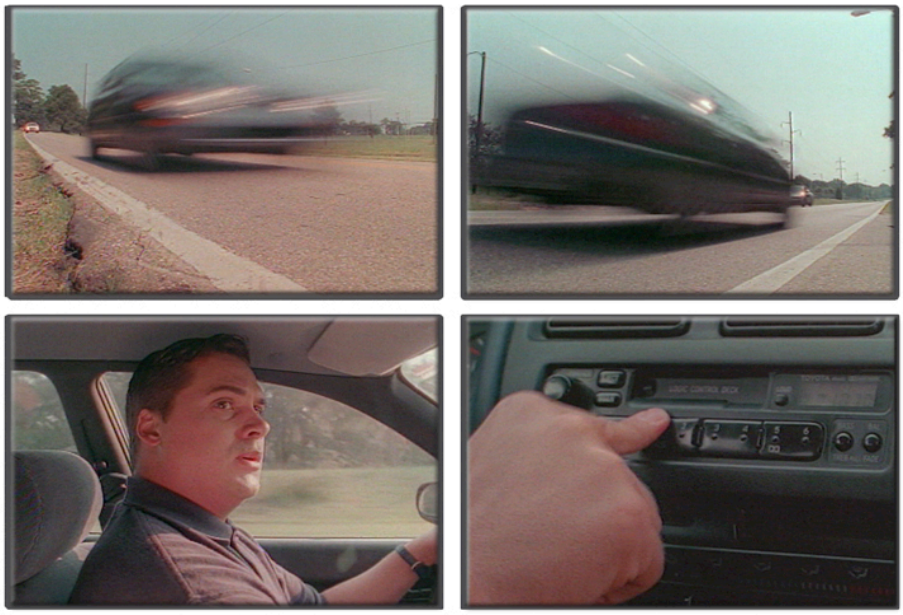
VROOM! **POW! BANG! & 3 Futzes...**

The Art & Science of Custom-Made Cinema Sound Effects - by LEE C. PAYTON © 2013

SYNOPSIS

Most of the sounds that you *hear* in movies are not made by what you *see* on the silver screen. This paper explores the cinema sound creative process used in designing custom-made sound effects for award-winning short films. Presentation includes screening of selected scenes.

VROOM! **& Futz #1** - Almighty Dollar - by Greg Marcks



01 Car Scene - EXT / INT / EXT - (Running Time: 01:03)

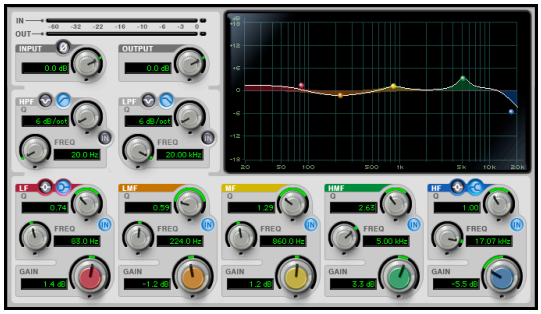
01 - Car pass-bys are a unique opportunity for multi-track sound design. Cinema audiences generally expect to hear some kind of sound whenever anything goes whizzing by. When a vehicle is idling, a mono recording should suffice (mono = single microphone recording & single speaker output). But when things travel across the screen like the car pass-by in the scene above, the sound must transfer in synch from one speaker to the other, in this case from Left to Right.

This kind of on-screen movement of sound can travel from the Left Speaker to the Right Speaker if in stereo, and thus requires two individual tracks to mix. For a 5.1 Surround mix, the sound may travel from Left to Right, through the Left Center, Center, and Right Center Speakers. This would require the ***VROOM!*** sound to occupy at least five individual tracks to mix. For innumerable reasons, it may be difficult to record usable production audio of car pass-bys on set. Quite often these shots are filmed MOS (without sound).

For the case of the Car Scene in Almighty Dollar, the exterior car pass-by was recorded with a Crown SASS PZM (pressure-zone microphone) stereo microphone (pictured below). This particular microphone offers *"...carefully controlled polar patterns and accurate human-ear spacing between its capsules, it produces a well-focused, natural stereo image without a 'hole in the middle.'"*[1] The stereo sounds recorded by this microphone were a true dream to work with, making the car pass-by in this scene sound very realistic. It helped that I had access to the stunt car after-hours. I was able to record a library of car sounds and pass-bys, giving me the opportunity to pick and choose which sounded best when synched to the picture.

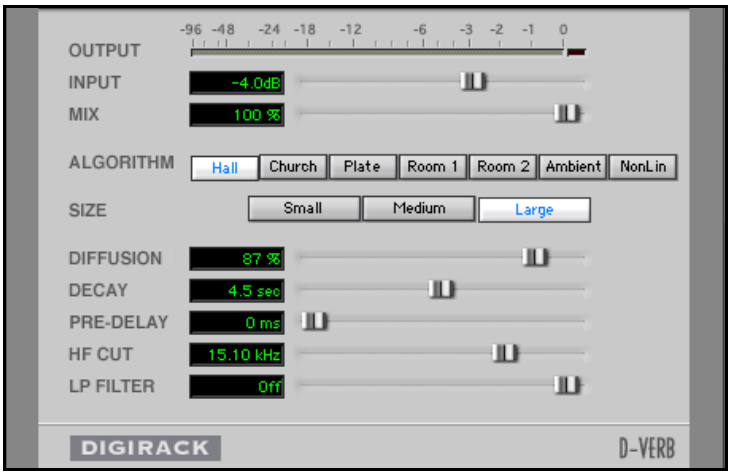
The picture cuts to the car interior on a hard cut, where the Rev. Harvey is searching frantically for Frank the Wino. The car radio is blaring out a succession of three different southern Christian commercials hawking various religious totems. These commercials are separated by the sounds of Harvey nervously switching the stations. When designing the sounds for radios and other broadcast technology, there are layers of sounds that make up the equipment itself, and other layers of sounds that comprise the programming being aired.

For this example, the layers that would make up the sound of the radio itself are combined with the sounds of the car's interior. The voices for the commercials were recorded in a studio environment and sound effects processing tools were used to make the clean recording sound like it is coming from the radio. The main three tools Sound Designers and Re-Recording Mixers use to achieve various sonic effects are the Equalizer (EQ), the Compressor and Reverb. The cinema industry term for the process of distorting a clean recording for affect is called *futzing*.



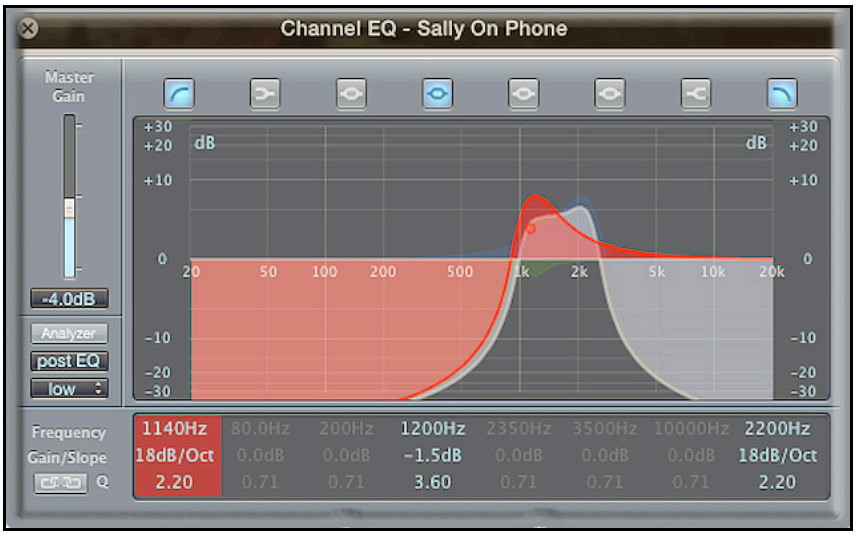
7-Band Graphic Equalizer in ProTools[2]

BombFactory Compressor in ProTools[2]



The D-Verb reverb unit in ProTools[2]

The sound of the car radio buttons had to be recorded on the Foley stage because most car radio buttons are not loud enough to be prominent in the final sound mix. Foley are sound effects made by human movement and the handling of props. When futzing a clean dialog recording to make it sound like a radio voice, the low and high frequencies are 'rolled-off' with the graphic equalizer. This emphasizes the mid-frequencies and gives dialog a radio-like or phone-like tonality. The image below shows an industry standard Equalizer (EQ) setting for voice futzing.



Industry Standard Phone-Futz EQ, showing a roll-off of Frequencies below 500Hz and above 5kHz [3]

When Harvey slams on the brakes and pulls over to the side of the road it is more than obvious in the wide shot (not to mention with the dust cloud the car kicks up...), that the car is skidding onto a dirt embankment. However, it is a cinema sound cliché[4] that all cars must squeal the tires when starting or stopping, no matter what surface the car is on. The tire squeals from my library of car sounds worked great, albeit unrealistically, in the final sound mix.

01a - The Mini-Van approaches... 01b - The Mini-Van vanishes...

01a - A very interesting sound concern in this scene is what I call the 'Mini-Van-ishing' shot. The shot above left 01a, was filmed in the morning before lunch, and shows a mini-van approaching on the left side of the frame. The shot above right 01b is the reverse shot on a hard cut. The problem for sound is that shot 01b was filmed in the afternoon, after lunch, and by then the mini-van was long gone.

So basically, what I had to deal with was the front half of a passing mini-van, the sound of which cuts off at the picture edit. There was usable production sound and dialog throughout the scene. If I used the sound of any other car to complete the pass-by, it would have to be the identical kind of mini-van with the exact same engine, and the same amount of load-bearing weight per axle. The friction of vehicles against the pavement changes their sound dramatically.

After many experimental recordings and edits, what eventually worked was the sound of the same mini-van from shot 01a, copied, reversed, and cross-faded with the original to complete the pass-by. Reverb and EQ were judiciously added to the copied portion of sound. This made it seem like it took longer for the van to go away than for it to arrive. Combined with exterior day ambience in the final mix, and the edit becomes unnoticeable.

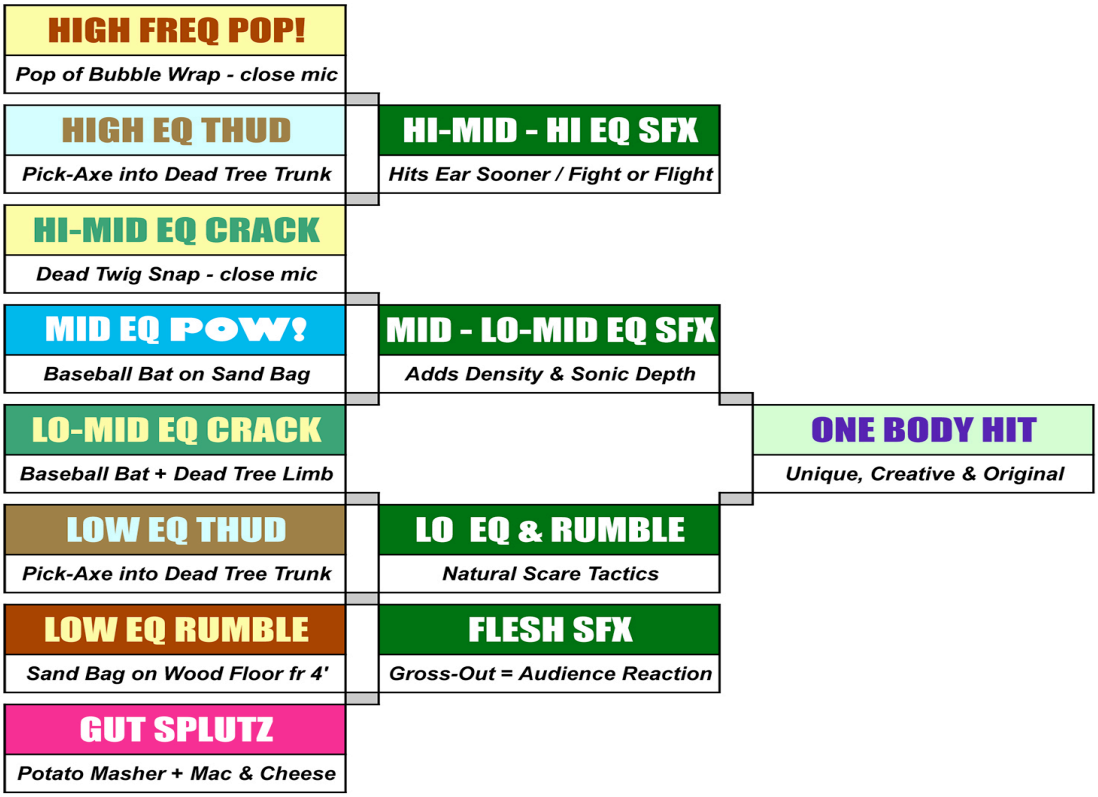
POW! & Futz #2 - Anderson - by Jason Doty

02 - Anderson opens with a brutal massacre of American POWs by the Nazis in World War 2. Many films glamorize violent scenes unrealistically, so I wanted to create unique sounds for gunshots, body hits, and warfare that would feel very real and scary to the Audience. This scene required a good deal of creativity, collaboration and ingenuity to make it sound horrific.

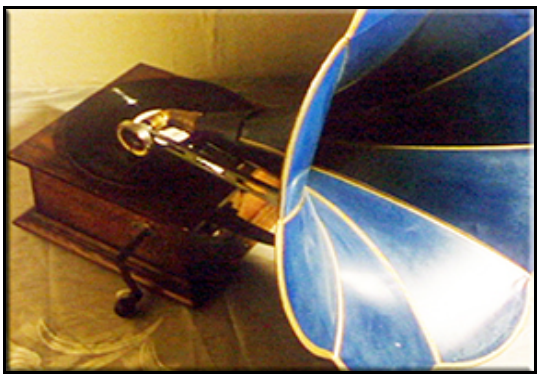
02 - Opening Massacre Scene - (TRT: 01:26)

There are a plethora of body hits, gunshots, ricochets etc, in Anderson, and each individual sound was custom created from original audio recordings. The gunshots were designed predominantly from recordings made on set with re-enactors and stunt weapons, and then 'sweetened' in post-production with additional sounds.

There were as many as 7-12 separate sounds that made up any one body hit. Each layer was recorded and mixed to capitalize on the dynamic frequency range represented by that one sonic event. The flow chart below offers a glimpse into the methodology and creative strategies used to create these sounds, as well as a brief description of the props used to make the sounds. Each sound was recorded with the highest quality microphone available, and suited for that application.



03 - Often a scene requires the degradation of sound. The antique phonograph sound started with a crisp, clean digital recording of symphonic music. The first phase of futzing involved re-recording from the original CD, through a similar setting as the phone-voice EQ, and onto a low-bias cassette tape (for maximum tape-hiss).



03 - Phonograph - (TRT: 00:24)

The sound horn for the phonograph is basically a metal & wood funnel. I arranged a series of metal music stands to form the shape of a funnel. At the large opening, I put an old boom box on a wooden bar stool to play back the futzed cassette. At the small opening, I re-recorded the sound again using an antique Webcor harmonica microphone[5], and onto a digital DAT recorder. This re-recording process gave the phonograph a severely degraded, period-authentic antique sound.

BANG! & Futz #3 - Lector - by Greg Marcks

LECTOR - 04a & 4b - Dialog & Foley - (TRT: 00:53)

04a - Lector is a rare film. It features 100% production dialog from the lead Actor - no ADR was required. The Foley sounds for the Workers were created from layers and layers of production sound effects, recorded on-set, after-hours with the props and some of the crew. In order to record as much usable production dialog as possible, I used 4 x 8 foot wheeled flats covered in soundproofing. Whenever the Lector was shot in a medium or close-up, I arranged these flats around the Actor, just outside of the frame, creating a mobile Voice Booth during production.

This worked extremely well to minimize reverberation and early reflections from Lector's loud dialog passages. We were shooting in a large concrete and brick warehouse, which is essentially a giant reverb chamber. The final mix required an elegant balance between the vocal range of the Lector, and the density of sounds from the many Workers in the building. As with the Body Hit in the previous example, the frequency range of each sound is exploited during the final mix.

04b - This scene concludes with the Workers 'applauding' the Lector with their cutting tools by banging them against their worktables. The picture edit cuts from wide to medium to close shots. A general clapping sound works in the wide, but for every closer shot, there had to be specific sounds in synch with the banging, while the background bangs continue uninterrupted. There are approximately 20 layers of sounds used to build the cutting tool bangs up to sound like applause. The scene then transitions to an exterior shot, and the cutting tool clapping sounds are cross-faded into the pass-by of a vintage automobile.

04b - Tool 'applause' & Transition to EXT. - *Location recording of vintage auto*

05 - Radio Show - (TRT: 01:02)

05 - Before working my Sound Design and Re-Recording magic on this scene, every time the picture would cut to the radio, the film was silent. There were about 9 layers of sound that made up the technology of the radio, switches, knobs and tuning.

For the programming on the radio, the Director contacted Dr. Demento and got a copy of a popular radio recording of the day. I re-created this from scratch in a digital recording studio, and degraded the sound similar to the Phonograph scene in Anderson.

SUMMATION

Lector and Anderson are period films (1924 and 1945 respectively). They required a fair amount of research into the technology of the era in order to create sounds that are believable and dramatic. Cinema sound gives the practitioner thereof the opportunity to exploit originality, creativity and ingenuity. Most sound in cinema is created or replaced in post-production. It is incumbent upon cinema artists to explore as many ideas as possible to create a dynamic cinema soundtrack.

TOTAL RUNNING TIME FOR ALL SCENES: Approximately 07:00 minutes

ESTIMATED PAPER PRESENTATION TIME: 15-20 minutes with time for Q&A

STILLS FROM FILM CLIPS: Rendered by Lee C. Payton - © *FSU Film School, 2013*

SFX FLOW CHART: Designed by Lee C. Payton - © 2013

CITATIONS & RESEARCH SITES

1. http://www.crownaudio.com/sass.htm - text & image
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2. Screen-grabs directly from a ProTools session

3. http://www.macprovideo.com/hub/final-cut/fcp-x-telephone--radio-voice-effects
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VROOM!
POW!
BANG!
Futz #1
Futz #2
Futz #3