Auditory Neuroscience

Mentorship Part 3
Adaptive Audio in Gameplay
Being a Guest in a Mix
CAS Career Achievement Award Recipient John Pritchett

SUMMER 2016
CSS-50
Selectable Stereo/Mono Short Shotgun

Summer $150 Rebate
Contact an Authorized Sanken Microphone Dealer Now!

Mics of the highest quality uniquely designed for what you need to do every day.

From Short to Long, Extreme Rejection to Wide Stereo, M-S to Point-and-Shoot Surround, Sanken has the right shotgun for you.

www.facebook.com/pages/plus24net/
FEATURES

CAS Career Achievement Award .......................... 10
John Pritchett to be honored

Adaptive Audio in Gameplay ............................. 12
How do they do it?

The Value of Mentorship ................................. 20
A journey with CAS members Peter Devlin and Phil Palmer

The Changing Landscape of Media Production ......... 26
What’s next?

A Guest in the Mix ........................................ 32

Crazy Ex-Girlfriend ....................................... 36
A dub stage case study

DEPARTMENTS

The President’s Letter .................................... 4

From the Editors .......................................... 6

Technically Speaking ..................................... 8
Auditory Neuroscience: Making Sense of Sound

You Just Can’t Make This Stuff Up .................... 41
Tales from the trenches

Been There Done That .................................. 42
CAS members check in

The Lighter Side ......................................... 46

Cover: Auditory Neuroscience
Dear Friends,

This is an excellent moment for our members, as we ramp-up some great events during the transition from summer to fall.

On Saturday, August 13, at Warner Bros., CAS members attended a screening of the beloved film and Best Sound Oscar nominee *The Fugitive*. The screening was followed by a detailed Q&A with director Andrew Davis, as well as some of the principals involved in creating the classic soundtrack, including production mixer Scott D. Smith CAS, Foley mixer Mary Jo Lang CAS, and re-recording mixers Frank Montaño & Michael Herbick. Invitations were sent out via email. If you did not receive an invitation, please let the office know so that you will be sure to hear about future happenings.

Next up, on September 17, we’re co-sponsoring the third annual “Mix Presents Sound for Film” event with Mix magazine and the MPSE—to be held at Sony Studios. This all-day exhibition and conference spotlights the technologies and techniques behind sound for picture, from production to playback. The CAS panel, “Workflow for Musicals in Film and Television Production,” will feature your fellow CAS colleagues, re-recording mixer Gary Bourgeois (*Captain America: The First Avenger, Criminal, Ghostbusters II*) and production mixer Phil Palmer (*Glee, Better Call Saul*), as well as others. The panel will be moderated by production mixer and CAS BOD member Glen Trew.

Also at the Mix event, our annual Parade of Sound Carts will take place on the Streisand Stage. This year, it will include two workshops during the day. Be sure to mark your calendars. For more info, visit MixSoundForFilm.com

The next afternoon, September 18, we’ll be co-hosting the MPSE and CAS Annual Golf and Poker Tournament. Whether it’s more probable that you’ll be dealt an ace than shoot one, you’re bound to have a good time at this philanthropic fun-filled event.

As always, stay tuned for updates.

We’re excited about raising the activity options for our members and look forward to seeing many of you there.

Best,

Mark Ulano CAS
President
Get more work done, faster, and deliver ahead of schedule with our comprehensive suite of post production solutions. Includes RX 5 Advanced Audio Editor, RX Final Mix, RX Loudness Control, Insight, and special partner products and videos.

Now available at www.izotope.com/rxsuite
President Kennedy stated that “Change is the law of life. And those who look only to the past or present are certain to miss the future.” With new ways to access media and experience entertainment, we have to keep ourselves informed to successfully navigate this change. With this in mind, April Tucker CAS provides a well-researched article on “The Changing Landscape of Media Production.” Given the growth in interactive media such as games, AR, and VR, Matt Foglia CAS sits down with some game audio pros to gain insight into this nonlinear world in his article “Adaptive Audio in Gameplay: How Do They Do It?” Since mentors can offer approaches and mindsets to adjust to situations—such as a changing landscape—David Bondelevitch CAS MPSE adds the third installment of our “The Value of Mentorship” series with interviews from Peter Devlin CAS and Phil Palmer CAS.

Also in this issue, Devendra Cleary CAS discusses his experiences as a production sound mixer visiting the dub stage—and calls for re-recording mixers to visit the set. G. John Garrett CAS gets deep in his “Technically Speaking” column by exploring the book Auditory Neuroscience: Making Sense of Sound, while Karol Urban CAS MPSE interviews the mixers behind the “romantic dramedy musical” Crazy Ex-Girlfriend. For a little levity, be sure to read the “You Just Can’t Make This Stuff Up” stories that your colleagues have submitted. As always, you can read what your fellow members have been up to in the “Been There Done That” section and check out some pictures in their “The Lighter Side” submissions.

A special request for our International and East Coast members: We’d love for you to share your experiences and/or expertise with us through this publication. As you know, much of our coverage is centered around North America, specifically, the West Coast—but we have members all over the world! If you have an idea for an article or column, please reach out to us! (We’re pretty easygoing.)

The CAS Quarterly is produced as a service to our members on a voluntary basis. If you are a member and would like to contribute an article—whether on the production or post-production side, please let us know. Additionally, we greatly appreciate, and want your feedback and suggestions—so send them in! Email us at CASQuarterly@CinemaAudioSociety.org. Finally, don’t forget that our sponsors are professionals like you who understand the business and needs of this crazy industry. We encourage your commitment to them.

Correction
The phonograph pictured in our 2016 Spring CAS Quarterly (page 14) depicts a 1878 Bergmann edition of an Edison tinfoil phonograph, not a Kinetophone. The 1894 Edison Kinetophone was an early motion picture viewing device. It had an oak cabinet and a Type M electric phonograph inside.
Our Studio Tapes will fit your requirements

Contact your local distributor: www.rmg-i-usa.com / 847-812-5727

www.recordingthemasters.com

Mixing
Archiving
Mastering
Studio tracking
Location recording

TRXLA3 100 MHz WIDE-BAND
DIGITAL RECORDING WIRELESS TRANSMITTER

ZHD MODULATION
a 50 KHz wide signal spaced as close as 100 KHz apart with outstanding transmission distance

INTERNAL BACKUP RECORDING
capture quality back-up audio in the most hostile RF environment

QRX200 200 MHz WIDE-BAND RECEIVER WITH ENHANCED RANGE AND AUTOMATIC TRACKING FRONT END FILTER

ENCRYPTED AUDIO
keeps transmitted audio private

DIGITAL MODULATION
100% digital modulation for superior quality

Zaxcom.com | 973-835-5000
Did you hear that?

Exploring the book: Auditory Neuroscience: Making Sense of Sound

by G. John Garrett CAS

I’ve bitten off something relatively big to report on, and it will take a few installments to get through it, but *Auditory Neuroscience* (Jan Schnupp, Israel Nelken, and Andrew King, MIT Press paperback edition, 2012) is, beyond its pure density, an interesting and informative text that I can recommend. There is math, if you want it, but the authors encourage the reader to fake it through the formulae, as the subsequent explanations work without most of the algebra.

The book begins with a couple of fascinating examples about how we hear, and they have kept me piling through the dense stuff to get to a better understanding of the process. I’m sure it will inform our work as sound professionals, and there are hints that this book will turn our understanding of how we perceive and process sound upside down.

For instance: “You have probably never thought about it this way, but every time you talk to someone, you are effectively engaging in something that can only be described as a telepathic activity, as you are effectively ‘beaming your thoughts into the other person’s head,’ using as your medium, a form of invisible vibrations.”

Unschooled in neuroscience, I have long maintained that understanding speech is a form of decryption. I have also written about how I believe that, when you hear bad sound in a film, it excites a part of your brain to tell you that your primal threat-detection system is not working correctly, and you can’t go back to experiencing the movie until you fix the (perceived) problem in the personal alarm system.

The ability of our ears and brain to figure out what something is just from the sound of it is truly astonishing. An early example is to imagine a drawer full of cutlery crashing onto the kitchen floor. It’s a tremendously complex sound made up of nearly endless sine wave combinations that radiate from the source and reflect off surfaces until they get to our ear. However, we can make a good approximation of the size, mass, and materials making the noise almost instantly.
Long before your mind has had a chance to ponder any of this, your auditory system will already have analyzed the sound-pressure wave pattern to extract the following useful pieces of information: “that the fallen objects are indeed made of metal, not wood or plastic; that there is quite a large number of them, certainly more than one or two; that the fallen metal objects do not weigh more than a hundred grams or so each … as well as that their impact occurred in our kitchen, not more than 10 meters away, slightly to the left, and not in the kitchen of our next-door neighbors or in a flat overhead.”

We are introduced to sinusoidal motion of the mass-spring system which translates to everything which vibrates and, depending on the frequency and amplitude, everything we hear. Then, on to Fourier’s description of any function consisting of a mixture of sine waves, and the following Fourier analysis. It’s interesting to note that “the workings of the ear only vaguely resemble the calculation of a Fourier spectrum,” but it’s still a critical part of understanding and working with sound.

There is some impulse analysis and the introduction of using windows of time to estimate the frequency of a sound and calculating the spectrum within the window. One factor is that frequency analysis, in the ear or machines, depends on the length of the sample you get, and how suddenly you open and close the window, if you will. If you want frequency resolution to be high, you need a longer window to do the evaluation, but it will be harder to determine when the sound begins, sort of like Heisenberg’s uncertainty principle for subatomic particles! Your brain has an advantage over windowed spectrograms in that we can do multi-resolution analysis. In a given time window, the higher the frequency, the greater your pitch resolution. The authors go into a discussion of linear proportionality in resonant systems and filters, which basically is about how, when a filter is tuned to the resonant frequency of the input, it creates an output. If you think of your cochlea as a series of linear mechanical filters, you can start to see where this is going.

Next time, we’ll get into anatomy, and how all this math and resonance and linearity wind up exciting a pair of stunningly elegant and complex electro-mechanical transducers that bring so much of the world to us—telepathically.
Cinema Audio Society President Mark Ulano announced that the organization will honor multiple CAS Award- and Oscar®-nominated sound mixer John Pritchett CAS with the Cinema Audio Society’s highest accolade, the CAS Career Achievement Award, to be presented at the 53rd CAS Awards on Saturday, February 18, 2017, Omni Los Angeles Hotel at California Plaza—Bunker Hill Ballroom, Los Angeles, California.

“It’s truly an honor to announce the selection of John Pritchett by the CAS for our Career Achievement Award at this year’s 53rd Annual CAS Awards. John is the consummate ‘Mixer’s Mixer’ with a widely diverse career in film and television. His collaboration with directors such as Robert Altman, Paul Thomas Anderson, and Richard Linklater and many others on over one hundred projects is a portfolio of excellence and innovation. He’s a winner of the prestigious CAS Award for his mixing work and is also multi-nominated by his peers at the Academy of Motion Pictures and the British Academy as well, signifying his well-earned reputation for creative excellence. John Pritchett is a beloved figure and has generously given back to the sound community for many years as a noted mentor and supporter of many of our best practitioners in the field. I take great pleasure in announcing the CAS’s recognition of John and his terrific body of work.”

Pritchett, who was born in Santa Monica, California, was discovered by director Robert Altman while working as a recording engineer in Dallas, Texas. Pritchett made seven pictures with Altman, including The Player, Short Cuts, and Kansas City. He was the second soundman in Hollywood to go digital, with Altman’s Short Cuts in 1993.

Known for his successful working relationships with some of Hollywood’s most creative directors, Pritchett has made four movies with director Lawrence Kasdan, including Wyatt Earp and French Kiss; four with writer-director David Mamet, including The Spanish Prisoner and State and Main; three with writer/director Paul Thomas Anderson, Magnolia, There Will Be Blood, and Inherent Vice; and two films with Oliver Stone, World Trade Center and W. He was also the sound mixer on such hits as 2006’s The Break-Up, 2000’s Miss Congeniality, and 1987’s Dirty Dancing.

Twice nominated for an Academy Award, in 2006 for Memoirs of a Geisha and in 2003 for Road to Perdition, Pritchett was also nominated for a CAS Award for both films and won in 2003. He was nominated for a BAFTA Film Award in 2007 for There Will Be Blood.

His 102nd film, Everybody Wants Some!! for director Richard Linklater, continues his reputation for expertise in handling complex technical requirements during production. “People hire me because my team and I are able to get the sound needed with the least disruption,” said Pritchett.

The Player (1992)
Short Cuts (1993)
French Kiss (1995)
Wyatt Earp (1994)
There Will Be Blood (2007)
W (2008)
Road to Perdition (2003)
In our typical linear world, we know what the scene at hand contains and we know when various sound elements will be present—and when they won’t. As new genres of entertainment develop, shifting toward more user-interactive content, that preexisting script can begin to fade. Interactive media along with augmented and virtual reality often require a different type of thought process for those of us accustomed to working in a linear fashion. With these platforms, processors (or game engines) are constantly adjusting and updating the sounds that will play—along with their position and levels—as the “script” changes with each choice made by the user. Add to this, surround and immersive options, and there can be numerous possible sound mixes for the same “scene.” While AR and VR are evolving, adaptive audio for video games is more established and may provide a solid jumping-off point for audio implementation in these newer platforms.
In an attempt to gain more insight into the approaches and thought processes involved when working with adaptive audio, I reached out to a few professionals who create audio assets (sound designers and composers) and assemble audio for games (the mixers and supervising sound editors of the genre): an audio director/composer (Brad Derrick), a composer (Erik Desiderio), and an audio implementer (Brian DiDomenico).

Brad Derrick: Audio Director & Composer
Brad is a composer, audio director, and sound designer whose credits include *Elder Scrolls Online, Dark Age of Camelot*, and *Air Warrior II*.

For those who come from a more traditional film or TV sound background, describe your role as an audio director for games.

The audio director’s chief responsibility is determining the audio “vision” for the game, overseeing numerous sound designers, voice-over artists, and other teams—both in-house and outsourced—to make sure they’re all coming together to consistently execute on that vision. Additionally, the audio director is partially or wholly responsible for designing the systems that drive sound, music, and voice-over implementation. This means working closely with programmers and members of the sound team to create the means of taking thousands of individual sounds and creating an immersive and robust soundscape at gameplay runtime [when players are playing the game]. And, of course, the audio director gets to go to lots of meetings, spending time with other teams, acting as a liaison between the audio world and the other branches of game development.

Adding 3D and immersive audio options to a project in the interactive environment has got to require some different approaches than doing so for a linear project. How do you go about approaching the sound field to take advantage of the additional sound source options?

We put a lot of effort into how we utilize the multichannel sound environment, both for aesthetic and feedback reasons. The location of sounds in the 3D space,
their attenuation radii, their high & low roll-offs with respect to distance, the “width” of the sound as you approach the sound source... these are all factors we agonize over for every sound in the game. Fortunately, middleware, such as Wwise, allows us to exert as much (or as little) control over these factors as we choose.

**Can you give me an example?**

We probably spent the most amount of time designing and iterating on how combat sounds use the 3D space in order to not only sound visceral and immersive, but to convey critical information to the player. In a game like ours [*Elder Scrolls Online*], scores of players and NPCs [non-player characters] can be on-screen and engaged in combat simultaneously. When that kind of aural chaos is unfolding, it’s important to the player to be able to distinguish sounds that affect them from what is essentially the background din. The sound of a successful attack against an opponent—no matter how far away that opponent is—needs to cut through the mix. The directionality of one’s opponents or allies needs to be as clear as possible, especially when they’re not in the player’s field of vision (i.e., off-screen). So we set some initial values for all those position-related factors based on our experience as gamers and developers, then we play test and adjust. Then we play test and adjust some more. Eventually, we get to a point where the audio is telling the player what they need to know—and it sounds fantastic.

**Are you receiving components—such as music cues—mixed so that certain elements of a cue are already positioned in a particular place in the immersive field?**

No. We do all of our positional mixing at runtime, using the Wwise middleware. It allows us to not only set the multi-channel positionining and “width” for every sound element, but to update it dynamically based on various game data. So as the location of the sound source changes relative to the player, location and width (and, of course, volume and filter- and other parameters) are updated.

**Given that they may be shifting, how do you keep sounds out of each other’s way to avoid conflict?**

In addition to the combat-specific discussion above, we carve out positional niches for all the various elements of the mix—voice-over, UI, music, ambience, etc., and take great pains to ensure they all play nice together. While the sounds associated with on-screen elements have their position largely determined by their placement in the game world, things like voice-over, UI, and music can be freely placed wherever feels good and doesn’t interfere with those on-screen elements.

For example, even when VO comes from on-screen char-
acters, a good amount is fed to the center channel for intelligibility. UI tends to be LCR. Music is essentially 4.1, with just a little bit sent to the rear channels. And those ambient sounds not tied to on-screen elements (wind, insects, disembodied voices, etc.) are scripted to be randomly placed in the multichannel field. The aim is to provide a mix that maintains clarity, even at its most dense.

As an audio director designing an interactive music system, I know exactly what the composer can or cannot provide as assets for that system. I understand, not just on a technical level (e.g., stem options), but on a musical level—whether it’s even possible to create music that will work within the parameters and confines of the system and still come out sounding like good music. For example, I’ll know how to compose for a particular combat sequence because I’ve played through it many times myself. On the other side of the fence, as a composer who is already intimately familiar with not only the music system I’m composing for, but also familiar with every aspect of the game as a whole, I’m pretty well positioned to create what is needed with very little iteration. I’m primed to compose music that is stylistically well suited for the game. [And] since I’ve been working on the game day in and day out since Day One as the game’s audio director, it’s a pretty sweet symbiosis.

**As someone who also composes, has working as an audio director affected your creative approach?**

Being both audio director and composer has tremendously changed the way I do both jobs. So much so, that I can’t imagine doing only one or the other job at this point. The most obvious benefit is the elimination of any guesswork or communication errors when it comes to one of those positions understanding the needs, constraints, abilities, etc., of the other.

As an audio director designing an interactive music system, I know exactly what the composer can or cannot provide as assets for that system. I understand, not just on a technical level (e.g., stem options), but on a musical level—whether it’s even possible to create music that will work within the parameters and confines of the system and still come out sounding like good music. For example, I’ll know how to compose for a particular combat sequence because I’ve played through it many times myself. On the other side of the fence, as a composer who is already intimately familiar with not only the music system I’m composing for, but also familiar with every aspect of the game as a whole, I’m pretty well positioned to create what is needed with very little iteration. I’m primed to compose music that is stylistically well suited for the game. [And] since I’ve been working on the game day in and day out since Day One as the game’s audio director, it’s a pretty sweet symbiosis.

**In linear media, we don’t have something that we consider “middleware.” Can you give an example of what it does with the music, for instance?**

Sure. In the game I’m currently working on, for instance, loads of game data are gathered at runtime and fed into the combat music system, which then tells our middleware (Wwise) what to do musically—and the combat score evolves with the ongoing encounter. As easy or hard enemies are added to the fight or die off, as the player’s health goes up or down, as friendly players join in to help or abandon the player, and when the fight is finally ended, all that data is fed to Wwise. Wwise will then add or remove stems from a multitrack mix, adjust the volumes of those parts, or branch into whole new musical areas altogether. The result is a musical flow that sounds engaging and appropriate to the fight, no matter what kind of turns it may take.
As an audio director, how does the final “sign off” happen? Essentially, how do you evaluate the numerous possible user scenarios so you feel confident that things are good to go?

In a game this size that’s this unpredictable, checking everything is nearly impossible. Spot-checking each “type” of scenario is doable, however. The hope is that a successful mix in each type of scenario will translate to a successful mix in all scenarios of that type. That said, the mix feedback goes through many stages after leaving the audio department. The QA [Quality Assurance] team puts ears on it, internal play tests provide feedback and, even though it should be “done” by that point, the live environment can sometimes provide useful feedback as well. [All of this] tends to provide 99 percent confidence that everything is solid enough for shipping, meeting the high bar we’ve set for ourselves. Of course, in a game with half-a-million sound files (and growing), and hundreds of hours of content, something is bound to slip through the cracks. And if that something is bad enough, it will turn up in a YouTube video—and then we’ll find it and fix it.

Erik Desiderio: Composer

Erik is an award-winning composer, writing for both linear and nonlinear media. Some noted linear credits include The Borgias, Entourage, Duck Dynasty, and the Academy Award-winning film The Moon and the Son. His most recent video game work includes Adventure Time and Reborn.

How do you approach composing for interactive media since the composition won't develop the same way each time?

Composing nonlinear music is especially fun and challenging because of the interactive aspect of it. There are many techniques to have the music react to the player’s actions, and they affect the way that you compose the music. One technique is to have branching music that works like a flowchart. So, in the starting area, it plays one cue that loops, then depending on what area the player goes to next, the game will trigger a transitional piece of music that sets up the music for the new area. This transitional cue can change keys or tempo—whatever is needed to smoothly set up the next cue to play.
With linear media such as a film, you may augment a score with additional instruments/orchestration/harmonies, etc., as a scene evolves or storyline evolves. With games, you don’t know at what point in a level the score will need to develop. How do you approach this when trying to compose something that, when all is put together, sounds like a complete song?

In addition to the “horizontal” branching method of adaptive music [that I just mentioned], there are also ways to add more layers to a base layer of music to heighten the intensity of the scene and create excitement for the player. This is referred to as a “vertical” approach to interactive music. Games with great interactivity use both vertical and horizontal approaches to make an exciting soundtrack.

For example, in a lot of games, you have an exploratory part of the game where combat can occur at any time. There will be a base layer of music that is more ambient, possibly with some light percussion for an exploratory feeling. The programmer adds parameters that dictate the level of intensity that the designer wants the player to feel. The audio middleware interprets the values from the game engine, and will play more or less layers of music to affect the emotion of the player. So, if the player is walking around exploring an area, the game engine plays the simplest version of the music. When enemies come and attack, the game will add additional layers of music to add to the intensity and excitement of the original music bed. If the player escapes from the enemies, the additional layers will be removed, and only the base layer of music will play.

What type of files are you passing along to the audio director and implementer?

Generally, I provide them with stems similar to a feature or TV for archival purposes, so they can remix the music in a different way in the future. This is generally between 8-10 stems that are broken down according to the different groups of instruments. But I’m also giving them mixes of the different interactive layers, so that the interactive aspect of the game can be properly implemented as we planned it out. These layers are not necessarily created according to instrument groups, but are based upon the different intensity levels that you want to create in the game. This can vary between 2-6 layers, depending on the situation, and will determine how much control the implementer has over the music.

Are you usually given the opportunity to listen to one of your gaming scores in context before a release? It seems like that would be the true point where—as a player is interacting with the game—you’d be able to hear how well the score adapts to the interactive world.

Yes, this is super important. On some games that I’ve worked on, I’ve implemented the music myself using the Wwise middleware. This works as a plug-in in the game engine, which has been Unreal or Unity. By playing the game, I’m able to immediately know whether or not the music works and tweak it accordingly. Sometimes it’s hard to tell how the particular level or scene will work in the context of a large game, so you always have to look at the big picture.

Often, I’m just sending the assets to the developer and they are implementing the music. They let me know if there are any questions or concerns. The game engine builds are updated with Perforce or GitHub [these control the versions], which keep everyone working on the game in sync by updating the project with the new version of the game.

You gave a talk about composing for VR games at the Game Developers Conference this past March, and you’re currently working with a VR company on a project. Are you finding that the immersive environment of VR and 3D audio affects how you approach the orchestration and mix—given the “openness” of the soundscape—compared to a more traditional surround project?

Definitely. I like to mix for VR using binaural plug-ins that allow me to elevate certain elements of the music above the horizontal plane. Generally, lighter elements like airy synths or shakers can sound fantastic if they are coming at you from slightly above, and I often put core rhythmic instruments

As an audio director designing an interactive music system, I know exactly what the composer can or cannot provide as assets for that system. I understand, not just on a technical level (e.g., stem options), but on a musical level—whether it’s even possible to create music that will work within the parameters and confines of the system and still come out sounding like good music.

—Brad Derrick
below the horizontal. The instruments sound best coming from in front of the listener, using reverb to fill out the music from behind.

With traditional surround sound, the dialogue and Foley mostly come out of the center speaker and the music sits in the left, right, and surround speakers. So, the dialogue and Foley feel closer to the listener than the music in the mix. In VR, it's reversed. The music is mixed as if you were listening to it on headphones or close to your head, and the dialogue and other sounds are mixed realistically, so they would sound like they are coming from further away, e.g., from the person talking across the room from you in the virtual environment. For some VR projects, simple or sparse music works really well and feels immersive because it is mixed to sound closer to the player.

I assume there's a different mindset for you when you're implementing for an interactive environment vs. a linear environment. Can you discuss those differing approaches?

Well, when I'm creating sounds for a linear environment, I know exactly what will happen and when to place the sound and how it should sound at that given time. In-game rendered cinematics certainly fall under this category and, in some cases, so do in-game events where the camera takes control from the player.

In games, audio must adapt to what the player or AI does at any given time and it must be controlled in real-time. "In real-time" is the key phrase. Sound is mixed, occluded, attenuated, spatialized, triggered, stopped, and positioned all in real-time. This is the main principle difference between game audio and linear film/TV audio.

Can you provide an example of how a sound effect may be implemented?

A basic example would be how footsteps are implemented. You place what's called an “anim notify” on the character animation at each step. That notify calls (looks for) the physical material the character is stepping on (concrete, dirt, gravel, snow, wood). Then, the code determines if the player is running, walking, scuffing, landing, etc., and looks for the appropriate footstep sounds for the material. It also attaches the sound to the foot of the player so the sound emits from each foot. The amount of variations for footsteps is critical to avoid repetition—and the game engine handles all of this very well. The game engine also occludes, spatializes, and attenuates the sound to provide the most realistic interpretation of that sound as possible. In VR, this attention to detail is even more paramount.

Music, voice-over, and any nonstatic sounds all require adaptive implementation. They use scripting—which is sometimes known as "visual scripting," like in the game engine Unreal 4—or code in order for a sound to be manipulated or controlled (adjust volume in real-time, turned on/off, moving sounds in the environment, attaching sounds to objects/characters, switching music based on events, etc.).

With a traditional linear mix, we have our standard DME stems—with multiple sub-stems of each. What type of stems are you given to implement?

In terms of preparing assets for implementation, the only stems that we really utilize are music stems. These might include percussion, brass, strings, synths, metals, etc. These stems are all triggered simultaneously in-game, but some are
muted depending on the intensity of the music needed at a given moment in-game. Or music can be pre-rendered as three or four intensity levels and cross-faded in-game.

For example, the tension cue might include percussion and pad, combat low [cue] to include percussion, pad, strings, and combat high [cue] to include the full mix. Tension, combat low, and combat high are all bounced from the same composition, same length, and tempo changes so that they can be switched in real-time seamlessly at any point in the cue.

Sound effects are more modular in how they are implemented. Let’s say a weapon-firing sound is made up of five elements. In a film, a sound designer might print that sound and hand it to an editor. For a game, I would take all five of those elements that make up that sound, create 20 variations of each element and render them all out as separate files. Then, import those files into the game engine and essentially “rebuild” what I created in Pro Tools, in the game engine.

The variations are placed in random “containers” that play a different variation each time that weapon is fired. Typically, the more frequently a sound is played, the more variations that are needed. This fundamental technique is used for weapons, footsteps, explosions, character efforts/vocalizations, impacts, etc. Not all sounds need variation—and there are times when you want to just render-out what you created in your DAW. But the principle of modular sound design implementation is utilized in many aspects of game audio.

**How do you approach 3D and immersive audio as opposed to straight surround in the interactive environment?**

Audio for VR is certainly a different beast than non-VR game audio, but you’re not treating the sound environment that much differently. The main difference with VR is that you can now hear sounds in a 360-degree space versus just a 2D plane. So now, if you have a jet flying overhead or someone talking one level below you, you’ll be able to hear that those sounds [originate] above and below you. There’s really no change in how those sounds are implemented, but the playback system has now changed.

One advantage of VR is utilizing ambisonics. Third-party audio middleware tools like Audiokinetic’s Wwise as well as Playstation’s 3D Audio API, both process Tetrahic recordings beautifully [those created using Core Sound’s Tetrahic for Ambisonic recordings]. These types of recordings are great for ambience, room tone, diegetic music, and other object-based sounds placed in the game environment.

The other aspect that is different in implementing for VR audio is that you need more emitters than non-VR (a location where the sound is emitting from). For example, think of a creaky door opening. Traditionally, you’d just render a one-shot sound of the player opening a door. But in VR, you have to go a step further and break that sound apart into individual elements. The squeak of the hinges would be attached (or sound emitted from) the top and bottom hinge. The door-handle rattle sound would emit from the handle and the sound would also move with the door as it opens. This attention to detail really sells the immersive environment of VR.

I think the main difference between mixing in surround sound and mixing for 3D VR audio is that, in linear surround sound, you have to imagine (to some extent) where the sound is coming from and what sounds are happening off-screen. In VR, you don’t have to imagine it or really even mix for it because it’s all happening in real-time.

**How do you approach mixing since you don’t exactly know when sounds will be playing together—given that a player is making real-time choices that determine the sounds heard?**

Well, there is less of a need to pre-mix a sound or music cue because you can’t predict if there will be dialogue spoken over the music or gunfire or any number of other sound effects. If you have predetermined triggers for music in an area of a game (for example, you know a cue will play over combat), then you can mix that cue to leave headroom for explosions and weapons. Or, if a piece is being played over conversation, you could notch out some mid-high frequencies to leave space for the dialogue.

It’s also important to note that music in games is repurposed in other areas of the game. So creating a composition that is dynamic in how it’s orchestrated and arranged is just as important as how the music is mixed. Music that can work in various areas of the game helps with budget and is an efficient way to fill out a soundtrack—especially for games that require hundreds of hours of music.

**As someone who also composes and creates sound design, has working as an audio implementer affected your creative approach?**

Ha, yes! As a composer who knows how music is implemented and all the various adaptive techniques to play back music in-game, having that knowledge can sometimes be a creative blocker. But at the same time, since I know how it’s going to be implemented, I know that I need a composition that can work with just a few stems or the full mix. In terms of sound design, having the knowledge of implementation hasn’t affected the creative process, but it has made it easier to prepare assets for in-game use. An elevator sound, for example, isn’t just a one-shot sound. There’s a short start sound followed by a looping elevator and then a separate stop sound. Knowing how sounds will be hooked up to events and played back has really helped me in designing sounds for games. I’m always checking with level designers and asking how a certain object is working in-game.
As a technical sound designer, how do you go about QC-ing your work?

You want to play test every square inch of the game if possible. Mixing a game takes a lot of iteration. The more variation in gameplay (if the game is open-world), the harder it is to test all of the possible scenarios the player might experience. For example, if you’re a run-and-gun type of player, you might plow through an area and the music is intense the whole way. Or you might take it slow and the music switches from tension to full combat along the way. To ensure a consistent mix, I usually get the full music track to a good spot when most of the sound effects are playing. Then, all the other music states (intensity stems) will usually fall into place.

As for sound effects, I first make sure that every type of sound and all of their variations have balanced levels. It saves me a huge amount of time mixing the game if all of my footsteps, gunfire, ambience, props, dialogue, etc., are all balanced. So if there are any files that spike too loud or are super quiet, I want to fix those on the asset level and not in-game (usually). Toward the end of the project, I’m in a hurry and won’t have time to reprint assets, so I’ll make those adjustments in-engine. Once I have consistent and balanced assets, then it’s just relying on the game engine’s tools to mix those sounds in real-time.

A big “thank-you” to Brad, Eric, and Brian for taking the time to share your insight and experiences.

---

“[Music cues are] from the same composition, same length, and tempo changes so that they can be switched in real-time seamlessly at any point in the cue.”

–Brian DiDomenico
I was very happy to read the first two parts of this series, written by Devendra Cleary CAS, as mentorship has always been very important to me. When I was a grad student at USC, I was lucky that Tom Holman (CAS Career Achievement Award recipient and current Board member) began his teaching career there, and I was even luckier to be his teaching assistant the last year I was a student. After graduating, Bill Varney (former president of the CAS) hired me as a trainee at Universal. After that, I worked in transfer at Danetrax, learning from Dane Davis MPSE, and then onto a feature supervised by Chuck Campbell MPSE. All of these people had strong influences on me in the early part of my career, and I am forever indebted to them. As a professor at CU Denver and previously at USC, I try to give back to my students the same knowledge and guidance that had previously been passed on to me.

For this issue, I chose to look at two other members of the current CAS Board of Directors. Peter Devlin CAS is one of the most experienced production sound mixers working today. He has been nominated for the Oscar four times, including Transformers, Transformers: Dark Side of the Moon, Star Trek (2009) and Pearl Harbor, and for the CAS Award four times as well. I started the discussion with a question about how he got into audio and who his own mentors had been.

Devlin left St Mary’s Christian Brother’s School in 1980 in Belfast and applied for an audio trainee assistant position at BBC Northern Ireland. Initially thinking he might move into the camera department, he quickly realized his true interest was in sound. To prepare for the interview, he spent his days in the local library reading as much about microphone principles, recording techniques, and filmmaking that he...
could find. Within a few weeks he felt prepped, and after a second interview, he was successful in being accepted to the trainee program.

He was sent to the BBC engineering facility at Evesham, just outside Birmingham. For almost 60 years, the BBC trained employees in all areas of production at this center. Today, it still offers courses but in a much more limited manner. Here, he was taught in such basics as the physics of sound and electronics. He also learned the BBC’s approach to all areas of broadcast sound, including manually synching sound effects in radio dramas on vinyl, mic’ing techniques, editing 1/4” tape, operating Fisher booms, and mixing radio drama. Upon completing this course (and a subsequent radio operator course in London), he was assigned to the audio department in Belfast.

It was there that he met his mentor, “Dixie” Deane. At that time in the early ’80s, television dramas were shot on video when working on soundstages, and were shot on film while doing location work. Deane was the lead drama sound mixer and was responsible for the production mix on many dramas to come out of Northern Ireland. Devlin expressed his interest in drama and Deane took the time to explain his methodology of working, and offered the possibility that Devlin could be included in future projects. A typical sound crew for a BBC television drama would have four people: one mixing, two operating Fisher booms, and a fourth similar to utility. Deane gave Peter the opportunity to start as the utility, and eventually moved up to second boom, alongside his regular drama crew of first boom Tony Dobbyn.

One production Devlin was particularly proud of was his boom work on Danny Boyle’s first directing television project, **Scout**, with actors Stephen Rea and Ray McAnally. Since it was shot on film, sound was handled by a different department within the BBC. The recordist was Peter Lindsay, who was then on staff at the BBC. Lindsay would himself go onto a freelance career with a fine body of work and several BAFTA nominations. Devlin would also credit Lindsay with being a mentor to him in those early years.

Devlin explained, “I can’t speak highly enough about those people that I worked with and touched my life. There was sound supervisor John Lunn, who was responsible for many of the music shows that were produced at BBC Belfast. As one of his assistants, I was able to watch techniques used in mixing the orchestra one week and Tammy Wynette in a country concert the next. John was kind enough to share his knowledge. His calmness and amazing sense of humor in the most difficult production situations had a profound and lifelong effect on me.

“One of the great opportunities of belonging to an audio unit in a region like Northern Ireland was that you had the opportunity to work in so many areas of sound. From music to news and current affairs, from boxing to soccer and rugby, it was indeed a tremendous training ground.” Devlin continued, “It was a great thing to be able to work in all those different areas of sound before deciding to focus on film work.”
In the '80s, there was considerable unrest in Northern Ireland and Devlin was assigned as a sound recordist for television news. Patsy Hill was one of the best news cameramen and was assigned with Devlin. Hill’s teenage son, Ronan, would sometimes tag along on shoots. Ronan is now a multiple CAS and Emmy Award winner as production mixer on *Game of Thrones*. “Sometimes I feel like it’s six degrees of separation in this business in how we belong to a small group who all seem to know each other,” Devlin added.

Devlin had been a big fan of the innovative TV series *Miami Vice*, and wrote a letter to producer/director Michael Mann asking if he could visit the show in Miami and spend time with his sound department. Amazingly, Mann replied with an invitation to the set. The BBC gave him time off to travel to the US, and Devlin was able to shadow production mixer (and former Board member) Joe Foglia CAS for a few days. Devlin then traveled to Los Angeles for a day to watch post production on the show at Universal. After returning to Belfast with what was now a burning desire to work in the film industry in the US, he received a call from Joe Foglia offering him a position at his company to cover calls that he could not handle, including documentaries, commercials, and low-budget features. Because of the opportunity offered by Mann and Foglia, in 1987, Devlin made the decision to move to the US, which meant parting from the BBC.

“The significant thing is how someone can touch your life through a simple kind gesture. Dixie Deane set me on the path to working in drama, and Michael Mann was good enough to invite me to the set where I got to meet Joe, who later hired me. Dixie was definitely the strongest mentor I had, he instilled in me my passion for drama. It’s so important in the field to share your experience and pass that on and encourage people who are coming into the industry. Dealing with students, the one thing I noticed is that I thought I was ready for anything after just a few months of training at the BBC, but everything is learned by experience, by making mistakes and finding your own way and your own technique,” Devlin added.

The second Board member involved in this discussion of mentorship is our current Vice President, Phil Palmer CAS, who has been nominated for the Emmy three times,
including a win for his work on *Glee* and once for his current gig, *Better Call Saul*. He has also been nominated for the CAS Award four times. Palmer graduated from Southern Methodist University in Dallas as a radio, film, and TV major. There was an emphasis on audio, but only about four students chose that path. The final class was a year-long class. Ted Gardner was his audio professor, an early adopter of a mobile recording truck in Dallas. Robert Wald CAS (who was nominated for the Oscar for 1987’s *RoboCop*), had studied there as well, as did John Pritchett CAS years earlier, who won the CAS Award for *Road to Perdition*.

Palmer was also a musician, playing guitar who, after graduating, toured for a few years in cover bands, playing 5-6 nights a week all over the country. After a couple of years, he got an offer to be a live audio engineer for the band Buster Brown in Dallas, and took it as his entry into audio. “Being the guy in the band who owned the audio system was a great way to ensure a job,” Palmer explained.

Bob Wald had come into his class at SMU for a guest lecture, and Palmer had kept in touch with him after that. Wald called Palmer at work and asked if he was willing to keep his head down and work as utility on a TV movie being shot in Phoenix. “It paid double what I had ever made before, so I covered the phone and leaned over to my boss and said, ‘I quit.’”

Don Broughton was the boom operator. “I had no idea what I was doing. I kept my head down and, after that, Bob got called to do a feature in LA, and the feature unionized during production. I got into the union on my second show ever! I got a break on the initiation fee as well, since it organized during shooting. I had no real experience and it was one of the hardest jobs in my life,” Palmer continued.

“Bob Wald was my first early mentor, followed by Geoff Patterson CAS (who won the CAS Award three times for the series *Deadwood*).” When Geoff moved from booming to mixing, he asked Palmer to move up to boom with him. “It was a bit of the blind leading the blind. It was a month-long shoot on a horror film in 1992. Geoff ushered me into being a boom operator and I stayed a boom op until 1999, which is when I moved up to mixing.”

Being from Dallas, Palmer was invited to work on *Walker, Texas Ranger*, which was a huge production, usually with two sound crews working. Wisely, he had spent the previous years investing in gear so that he would not have to buy an entire package all at once for his first mixing gig. Don Broughton needed someone to cover him as boom op on the show and asked Palmer. While on set, mixer Darrell Henke asked for a recommendation of second mixer, and Palmer quickly responded, “I’ll do it!!!”

Palmer finished his booming career on the first film he did with Peter Devlin mixing, the Oliver Stone feature film *Any Given Sunday*. Stone is famous for thinking outside the box as a director, and the film is a good example. There would frequently be three scenes shooting at the same time, in different areas of the same football stadium. They might be shooting action on the field with both sets of sideline coaches mic’d, while at the same time, the announcers were being shot in the booth, and a third scene in the locker room may be taking place. “Oliver Stone used to refer to it as ‘the three-ring circus,’” so that he could have all of us working at once,” Devlin explained.

For that reason, there were three full crews working at any given time, with second unit occasionally sending a sub-mix to the first unit recorder. The stadium was also set up with speakers to simulate the sound of a live crowd to help motivate the actors. Devlin was using Nagra D as recorders, so they had more tracks than previously available.
Being from Dallas, Palmer was invited to work on *Walker, Texas Ranger*, which was a huge production, usually with two sound crews working. Wisely, he had spent the previous years investing in gear so that he would not have to buy an entire package all at once for his first mixing gig. Don Broughton needed someone to cover him as boom op on the show and asked Palmer. While on set, mixer Darrell Henke asked for a recommendation of second mixer, and Palmer quickly responded, ‘I’ll do it!!!’

They shot at the Orange Bowl in Miami as well as other south Florida locations for approximately nine weeks. Devlin’s crew was Kevin Cerchiai on boom and Mike Schmidt as utility, with second unit mixer Mark Weber. They then moved to Dallas, and Palmer was hired to do second unit material as boom operator. Devlin explains, “It was the biggest sound crew of any show I have ever done. Phil was terrific, he had a great personality and worked well with second unit mixer Peter Verrando. They were able to pull off everything we needed. Our friendship started to develop at that point.”

“It was an interesting dance between the two crews. This was also the first multitracking that I had done,” Palmer added.

Devlin eventually recommended Palmer as second unit mixer on several features, including *Star Trek* and *Angels & Demons*. Asked about how he felt he might have influenced Palmer as a mentor, Devlin explained, “I think I would use the word ‘reserved’ to describe Peter on the set. He wants to fix things on the set, but he is reserved in the way he approaches discussions with other crew members and cast. He is always careful and tactful. He is a ‘big picture’ person in that he is good at negotiating what is needed. Most of what I have impressed on me is how important it is to develop relationships on the set, and how to conduct yourself with the director, the DP, and the actors. That’s a big part of being a production sound mixer,” Palmer explained.

“I think I would use the word ‘reserved’ to describe Peter on the set. He wants to fix things on the set, but he is reserved in the way he approaches discussions with other crew members and cast. He is always careful and tactful. He is a ‘big picture’ person in that he is good at negotiating what is needed. Most of what I have impressed on me is how important it is to develop relationships on the set, and how to conduct yourself with the director, the DP, and the actors. That’s a big part of being a production sound mixer,” Palmer explained.

”Peter has been so gracious to me and selfless on many occasions to offer up opportunities because he thought I could handle them. There is a lot expected of you,” Palmer added.

Palmer’s style and level of achievement that he required from his crew was something that was inspiring to me. I saw different approaches to sound recording that were really intriguing to me. Peter brought that forth in the way he worked,” Palmer explained. “There were so many elements going on in that film that there was no way to cover it with only one sound crew. A lot of the moves from boom to mixer was inspired by Peter, who continued to mentor me during the transition. He was incredibly supportive.”

Palmer moved to Los Angeles in 2001, and not long afterward, Devlin was looking to move from Florida to Los Angeles. Palmer noticed a sign two houses down from where he lived, called the number and discovered it was owned by his landlord. Devlin wound up renting it, continuing a friendship that would grow for years.

“We talked shop a lot, and still do. In fact, we have to remind ourselves to talk about other things. We have grown to have styles that are similar, and we cover for each other with no learning curve. Most of what he has impressed on me is how important it is to develop relationships on the set, and how to conduct yourself with the director, the DP, and the actors. That’s a big part of being a production sound mixer,” Palmer explained.

“So much of it is always having a backup plan, so that if you cannot make it absolutely perfect for sound, you have a way of making things work as best as possible under the given conditions. For example, I was working on a film in a very cramped location, and you would not imagine them being able to fit three cameras into this tiny space, but they did anyway, and at the last moment, shooting wide and two close-ups at the same time. You have to have a Plan B so that if you do not hold up production even when there is a last-minute change,” Palmer explained.

“Peter has been so gracious to me and selfless on many occasions to offer up opportunities because he thought I could handle them. There is a lot expected of you,” Palmer added.
Hostage is another example. Devlin left the production early and Palmer did five weeks of shooting. “It was a challenge and it was early on in my mixing career, but Peter felt good enough that I could complete the show.”

Palmer continued, “There were some amazing things done on Star Trek that we still laugh about. The clips most used in the trailers were almost entirely second unit material that I did. We would see the trailers and laugh. It was a great relationship as both friends and colleagues. Peter is very humble; when asked about participating in this article, he was shocked to find out that he was such a mentor to me.”

Palmer also feels it is important to pass on to the next generation. “Devendra Cleary has worked with a lot of mixers, but I feel we are all products of the people we have worked with before. I was probably the last mixer he worked with as utility, then, he started mixing. It is very gratifying that he has moved on. In many ways, Devendra has taken things to another level.” (Devendra appropriately started this series of articles on mentorship, writing the first two parts.)

Palmer explained, “I also have a high level of expectation from the crews that work with me, which I learned by working from other mixers who have that high level, and sometimes ‘tough love’ is a necessity in training people. My current boom op, Mitchell Gebhard, was previously my sound utility, and seeing his development moving up is incredibly gratifying, and also comforting, knowing that I can rely on him.”

Devlin concluded, “I think that the CAS supports students at school and aspiring young sound mixers. The online community has made it much easier to contact people. I remember the first time I called CAS Career Achievement Award winner Jeff Wexler. I knew of Jeff from his reputation and as a mixer on one of my favorite films, Being There. I was looking at getting into hard disk recording with the Deva, and Jeff, although never having met me, was kind enough to spend considerable time with me on the phone. As a community, we have become much more social. It’s important to have the discussion and encourage younger mixers. All sound mixers are mentoring every day, whether it is on set or in post.”
The past decade has had an explosion of content. For example, there were twice as many original scripted series canceled in 2015 than aired in 2000. [1] At first glance, there’s the potential for more work than ever before. Finding it may not be as easy as it sounds, though.

To understand the changing landscape (and how it’s affecting our side of the industry), we have to ask a few questions:

> What changed?
> Who is creating content?
> Who is distributing content?
> Where’s the money going?

https://redef.com/original/age-of-abundance-how-the-content-explosion-will-invert-the-media-industry
More distribution channels

Historically, making content has been expensive (from production costs to distribution, marketing, and promotion). Distribution was controlled by those who owned (or could afford) the infrastructure—like a TV studio, film studio, or publisher. In the past decade, media equipment and software have become easily accessible, affordable, and easy to use. The internet (and mobile devices) have opened up distribution opportunities that cost little or nothing to content creators. Crowdfunding has allowed anyone to create high-quality content with no strings attached. “This meant that content could not only be created by those outside the business, but that commercializing this content became significantly less expensive and risky. This led to a massive increase in available, indexed, and distributed content.” [1]

Everyone can be a distributor

All content providers have a gatekeeper (a “curator” of sorts). Music labels have A&R. TV networks have programming executives. On the internet, anyone can be a curator to an audience he/she creates. Actor George Takei has nearly 10 million followers on a Facebook page where he writes about himself, shares humorous articles, and the occasional cat photo. A person (or entity) who has a significant social media following is called an influencer. A study by Forrester Research showed that “6.2 percent of web users are responsible for 80 percent of influence in social media.” [2]
This is significant because power has shifted. Anyone who acts as a curator can earn money for having an audience. That essentially makes them a distributor—whether they are curating content as a business or for fun. It doesn’t matter if it’s a billion-dollar corporation or a kid with a webcam making YouTube videos. If you’ve got an audience paying attention, it’s potential business.

The power of tracking users

A recent study showed that most consumers (60 percent) will provide personal information to get recommendations more tailored to them. Platforms are now designed to collect and interpret user data for that purpose. “In doing so, [platforms] are building the relationship with the consumer … they are building trust. People reward relevancy, and big data helps deliver the entertainment people want.” [3]

Netflix, for example, tracks “events” when you watch, such as:

- When you pause, rewind, or fast-forward
- What day you watch content (Netflix has found people watch TV shows during the week and movies during the weekend.)
- The date you watch
- What time you watch content
- Where you watch (ZIP code)
- What device you use to watch (Do you like to use your tablet for TV shows and your Roku for movies? Do people access the Just for Kids feature more on their iPads, etc.?)
- When you pause and leave content (and if you ever come back)
- The ratings given (about 4 million per day)
- Searches (about 3 million per day)
- Browsing and scrolling behavior
- Netflix also looks at data within movies [such as credits]. Some have figured these characteristics may be the volume, colors, and scenery that help Netflix find out what users like. [4 - This section is all quoted from this article.]

Viewers are getting more content that they like. Curators and platforms are building trust with their followers/viewers; advertisers can more easily and efficiently reach a tightly targeted audience.

Anyone can be a media company

Companies that formerly turned to traditional advertising are moving into media creation to find customers. “The battle for the consumer’s attention has become brutal, and requires new strategies and capabilities. Companies have recognized these developments and are reaching the same conclusion: We all have to be in the media business.” [5]

For example, Marriott and Red Bull now have production companies creating original content (Marriott through its “Content Studio”; “Red Bull Media House” is in Santa Monica, CA). David Beebe, Marriott’s VP of Global Creative, said last year, “We are a media company now.” He continued, “First and foremost, [the goal] is to engage consumers. Get them to associate with our brands, build lifetime value with them. Content’s a great way to do that.” [6] It’s working; Red Bull has more than 4.7 million subscribers on YouTube.

Why does it matter where media is going?

For those of us who have been in the professional media market for some time, we established ourselves working under the old distribution model. Our work is sourced from established production companies, film studios, television networks, or through people/companies who have relationships with them. We’re probably viewers of online content, but not paying attention to the shift that’s happening behind the scenes—one that’s affecting where our work is sourced from.

Today, a “media” brand isn’t known for one medium anymore; any platform from Reddit to Yahoo! to The Huffington Post could be writing original articles, reporting news (written or video), creating videos or podcasts, or even producing or recording music. Television studios are building apps and streaming content through their own platforms (Fox Now, CNN Go). In 2017, CBS All Access is planning to distribute their new Star Trek series online only. All of this cross-media content has created a need and demand for audio technology and skilled workers.

At the same time, since distribution channels are evolving, the flow of advertising money—and their budgets—is...
evolving, too. Advertisers are looking to influencers to reach their target audiences but influencers are evolving, too. This creates one of the biggest difficulties in finding (and sustaining) work in the new media world: Finding the money. If the money is continually shifting and the amount of content continues to rise, how do we know where the paid work is? Consumer data is giving us some clues to bigger trends.

How are consumers of media changing, and how does it affect us?

Consumers are seeking experiences, not physical items. “79 percent of adults in the US and UK say they value experiences more than they do material items and 64 percent would rather spend their money on an experience than a material item.” [7] We’ve already seen a steep decline in DVD and CD sales; this just reinforces that physical media is on the way out.

Consumers are multitasking. “93 percent of consumers simultaneously use another device when watching entertainment content.” [3] There’s a huge potential for supplemental material here—extra content, behind-the-scenes videos, interviews, apps, etc. More work to go around.

Source doesn’t matter. “Consumers don’t care where content is coming from, as long as it is entertaining.” [3] A freelance mixer today is likely working for a diverse group of clients and content. Again, following the money.

Consumers are watching content on their own time—and without ads. “Viewers watch half of all hit prime-time entertainment after using some form of time-shifting technology. Approximately, 50 percent of online viewing occurs in ad-free or ad-light formats.” [8] For mixers in advertising or promo, we’re already seeing the impact of this. In promo, we only need to do one version of a spot for online content (“Watch now on FX Now” vs. “Starts Friday at 8,” “Tomorrow at 8,” “Tonight at 8,” etc.). The industry is still figuring out the ideal model for ads and that’ll affect advertising money (and in turn, paid work). Do consumers prefer pay-per-episode/movie like iTunes? A la carte for distributors like Netflix or HBO Go? Or, there’s the Hulu model—will users pay a fee to watch ad-free?

Consumers are going mobile. “Mobile has grown so fast that it’s now the leading digital platform, with total activity on smartphones and tablets accounting for 62 percent of digital media time spent, and apps alone now representing the majority of digital media time at 54 percent.” [9] We may be underestimating the importance of mixing for mobile devices and apps.

Consumers are watching less on television. The latest Nielsen data (2016 Q1) shows a continuing trend that the majority of age groups are spending less time watching television year by year. The exception is viewers over 65, which have seen a 5 percent increase over the past five years.

“Taken together, the data illustrates a critical shift. Thanks to technology, the entertainment landscape has become so flat that virtually anyone now has a license to create great entertainment content. This will only create more competition for Hollywood studios, which until recently, had a lock on the market.” [3]

Box-office sales

The film industry is also adapting to this shift to online content. Movies that are released theatrically are seeking global audiences. Online content and influencers have become marketing tools. “Going to the movies has become all about the social media conversation. Creative remains key, but it’s less about television commercials and more about shaping the social conversation,” says IMAX Entertainment CEO Greg Foster. [10]

> “Revenue at the 2015 global box office crossed $38 billion for the first time in history.” [12]
By the end of 2017, China is expected to surpass North America—which reached a record $11 billion in box-office revenue in 2015—as the largest movie market in the world.” [12]

Independent films are finding opportunities in streaming and VOD platforms

Meanwhile, independent film production has also gone through a renaissance of growth. While online distributors are spending more money than ever, profits (from ticket sales and online distribution) are only supporting a fraction of the films created.

> “Since 1985, the indie film industry has seen a nearly twentyfold increase in the number of theatrical releases even though ticket sales have remained flat (in 2014, the Head of SXSW’s film festival decried that ‘the impulse to make a film had far outrun the impulse to go out and watch one’).” [1]

> Competition is increasing for slots in major film festivals—out of 12,166 submissions to Sundance in 2015 (across all categories), only 184 were selected. [13]

> Streaming platforms for independent films (such as Netflix and Amazon) are spending record money for content. In 2015, four out of five Sundance films received distribution deals at a total investment estimated at $4.5 billion. [13]

> Recently, a startup called The Screening Room proposed a service that would stream first-run/recently released movies to home viewers—but for a hefty price. If successful, it has the potential to be a disruptor in film distribution.

> Home quality viewing is increasing. “Super high-definition 4D theaters are expected to be in nearly half of all US homes by 2020.” [11]

What’s next?

More consumers will be streaming. “In North America, 85 percent of households are today ready for streaming, and projections say that 96 percent will be ready by 2017. Europe is following quickly with 74 percent projected by 2017. By 2017, the number of tablets and internet-connected or smart TV sets, will be nearly 1 billion worldwide.” [8]

More low-cost content online. “Top-tier network entertainment programs can draw 10 million to 15 million viewers and cost up to $5 million per episode, and top-tier cable shows—at up to $3 million per episode—routinely draw millions of viewers. By comparison, the top YouTube channels have proved they can drive millions of views for $30,000 to $50,000 per episode. In some cases (for example, *Recipe Rehab* on CBS or *AwesomenessTV* on Nickelodeon), online productions have migrated to linear television. With low costs and a growing ecosystem of digital aggregators, online and mobile content creators are challenging the long-held belief that producing hit entertainment content must be a very expensive proposition available only to those with deep pockets.” [8]

Television networks will continue to spend for quality programming. “Live sporting events, hit content, and original, niche programming continue to generate strong viewership and rates. In 2014, networks spent $45 billion on content development, resulting in the production of approximately 350 original titles.” [8]

Traditional distributors will continue to adapt and create content. Television and film studios are finding ways to retain audiences and find new audiences online. Even if the means of distribution is changing, they are still doing what they’ve always been doing (making shows and movies)—and doing it better than ever.

Advertising will become more personalized. “More data will mean more accountability from advertisers. They understand that media and entertainment companies know a great deal about their viewers and customers, and they’ll demand even more personalization in advertising than what exists today. As Kip CEO Brian Wong wrote in *The Wall Street Journal*, “Personalization is no longer a luxury, but an expectation.” [14]

It’s possible this will change how we do advertising work.
For example, in 2013, Netflix created multiple trailers for *House of Cards*, each which played to a different audience depending on their tastes. We’re already seeing some shift in workload from broadcast to web. A scheduled TV show needs multiple versions of a promo to air (“Tomorrow at 8,” “Tonight at 8,” “Next,” etc.), whereas online content only need a single identifier (“Watch anytime on FX Now”). In the long run, however, online advertising will likely become so individualized that technical processes—like mixing—will needs to be automated (similar to adaptive audio for mobile or games).

For professionals, finding work (and contacts) can take more effort. Whether it’s an indie filmmaker who’s self-funding or a corporation-turned-media-company, it can be hard to connect with the people or companies who could use your services. If you want to work for a company like The Huffington Post or Reddit mixing their audio content, how do you reach them? Who are the content producers or operations managers? When a content creator only has one client (themselves), they’re not offering a service. There’s no need to publicize the people behind the content, which makes them harder to find.

Technological advancements could affect how we work on content. There’s always going to be a need for “artisanal” audio (workers who truly understand the craft and work at a high quality). The goal of a lot of new media content, though, is not quality. If content is purely informational—for example, one voice and a music bed—those content creators may be better served by audio automation software (sound corrective tools and auto-mixing) than hiring a skilled human mixer.

While this may sound controversial, the goal of a lot of new media content is to be first to share a story or to share basic knowledge. We go to YouTube to learn how a plumber fixes a toilet, for example. In today’s age (where anyone can shoot and edit a video on a mobile device or buy a microphone for the cost of lunch), we have to be realistic about what consumers want out of different types of media. Sound software specifically geared for quick-consumption content is a niche of the market that hasn’t been filled yet. This could be the next big leap in audio technology, and could develop tools that are beneficial to everyone.

### Bibliography


6. https://contently.com/strategist/2015/11/05/were-a-media-company-now-inside-marriotts-incredible-money-making-content-studio/


8. https://www.bcgperspectives.com/content/articles/media-entertainment-technology-digital-future-television-where-us-industry-is-heading/


It is understood and encouraged that, as production sound professionals, we can benefit tremendously from attending the final mix sessions of projects we are involved in. True, our work schedules sometime cause conflict in our ability to attend. Even if this is not the case, sometimes family, friends, vacations, and living life can get in the way of making this a possibility. Putting all of that aside—and at risk of sounding preachy or otherwise obvious—I feel that it is not only a good idea but is imperative that we attend these mix sessions as often as possible. On that same token, I feel the inverse doesn’t happen enough and that post-production re-recording mixers and supervising sound editors should make the pilgrimage to the set every so often as well. As much as I know the work is appreciated, I feel that a physical visit will solidify what goes into laying these tracks down at the compromised pace and in the environment that we work in. With each of us visiting the other side of our craft, we can further build relationships—while building a better understanding of this evolving world of sound.

Every time I attend a mix session, it is a unique experience. As a fair warning, when I talk about post-production sound here, my lack of expertise will become very apparent. Yes, I have attended plenty of final mix sessions, but I have no formal training or hands-on practice in this craft. I have strictly been engulfed in the study, practice, and application of production sound for the last 18 years and have not explored post sound other than as an admirer and a spectator.

Typically, on a one-hour episodic TV series, there are two days to mix an episode with those days occurring back-to-back. The day that you, as the production mixer, choose to attend may result in very different experiences. The “day one” can be very educational for the production mixer because you may hear some rougher, work-in-progress scenes where you get to see and hear how the re-recording mixers finesse the material. You may also have to be more of a “fly-on-the-wall” because the mixers are busy and under a tough deadline—so they may not be able to explain exactly everything they are doing. For instance, I’ll see the iZotope...
by Devendra Cleary CAS

RX plug-in on their screen and I’ll hear them make a few passes until they are happy with the shaping and cleaning. I just watch, listen, and learn. Sometimes you are hanging around long enough to join the mixers, sound editors, and post supervisors for lunch. This can be a much more relaxed atmosphere to ask questions, I guarantee they will ask you questions as well, for example, “Is that apartment set near the stage door?” “Is that air conditioning chiller for you guys or for another stage?” This can result in some informative feedback such as what they can notch out, what scenes sounded really great, and when and why they may need isos in a scene even if they always try to use the mix and boom tracks.

PLAY-BY-PLAY

A few years back, I was on hiatus from a one-hour series. I had time to visit the mix sessions every single week for the remainder of the episodes. These sessions were taking place at Todd-AO/Soundelux in Santa Monica at the Lantana facility (RIP). I have to say as a side note, even with my limited post-sound knowledge, I could tell this facility was something special. A vast amount of magical filmmaking had taken place right there and I could certainly feel that vibe in the air. It is heartbreaking that it has since closed its doors.

I invited my boom operator, Chris Walmer, to sit in on this particular mix session. The dialogue mixer was working on a specific scene that starts out with quiet dialogue between our two main actors sitting at a bar. In production, I had mixed with the lavaliere mics—even though we had a boom over their heads. This was because of their very low-level speech. Even without the challenge of shooting wide-and-tight frames, this speech was so low that this was the preferred way to pull the dialogue out. The scene then transitioned to a karaoke host announcing the next singer—and his dialogue was captured with a practical, dynamic, handheld mic, as well as a lavaliere. No boom was over the host, due to a hard spotlight preventing a pole and mic from being there without an egregious shadow in the camera’s frame. Same for our other cast member who took the stage to sing. This actor was earwigged and singing live to the track in his ear. This was also captured primarily with the practical handheld mic, though this actor was also wearing a lavaliere. Next, one of our main cast members from the earlier part of the scene is called to the stage and sings a song as well. Same thing, he was earwigged and sang to the track in his ear. This vocal performance seemed intentionally unusable because the actor (by choice) wanted to re-record the song in post as ADR or ASR (automated singing replacement—Ha!).

This was a fairly challenging dialogue scene for the re-recording mixer. As my boom operator and I were watching and listening to this on the dub stage, we were remembering the challenges of the day, yet we also knew that we had captured the scene to the best of our abilities. We listened as the dialogue mixer went through every line from the beginning of the scene with the quiet dialogue over and over again, making similar choices as I did on the day of production. Now, they had the opportunity to make it even cleaner, crisper, and better balanced. We watched with great mystery as the dialogue mixer was cleaning up some dialogue. Chris asked what he was doing exactly and I did not have a precise answer for him. We wished he could have given us a play-by-play of the steps he was taking—but it was day one of the mix and I knew that we couldn’t slow the process.

In the end, the scene sounded great and with no ADR (other than the preplanned redo of the second vocal performance)—even though there was concern after hearing it rough and unfinished only 15 minutes earlier. So, this is when I realized that, sometimes, it’s important to accept the fact that we have to watch and learn and be a fly-on-the-wall. But if you keep attending week after week, you may encounter more relaxed moments where the re-recording mixers can share with you their play-by-play.

EXECUTIVE COMPANY

Attending the mix on a “day two” and during the afternoon playback can often involve executive producer attendance. This gets interesting. I have experienced a variety of scenarios while attending the mix alongside this power presence. On one hand, it can be very simple when they are very low maintenance with almost zero notes for the entire episode. It can also be very craft-oriented and they want your feedback to be included along with anyone else’s. This always surprises me because I feel that, on the dub stage, I am outside my expertise zone and I ask myself, “What can I contribute?” But then I realize I am another set of ears who deeply cares about this project and that makes me thank my lucky stars that this situation is in front of me. I pay close attention and I take notes alongside the associate producer and executive producers. Sometimes my notes are actually implemented! Though my goal is to not derail anything.

Now, on the other hand, it can be very business-oriented and a schmooze fest. This may sound disingenuous but, to be honest, sometimes, we production sound mixers need to hustle and get the next job! I have been to very serendipitous mix sessions where I’m not sure I would have been invited to this executive producer’s next pilot if not for bonding with them on a personal level after the mix, when we all (and I mean ALL: associate producer, sound supervisor,
When clicking on and opening a poly WAV file of a scene, it can sometimes be easy to forget the labor that went into creating it. So here’s a call-to-action for any re-recording mixer reading who hasn’t visited the set someday (when you have time). Heck, you may even be having an email exchange with your production sound mixer right now—so ask to stop by!

JOIN US ON SET
I have nothing but enormous respect for my post-production sound friends and understand how amazingly good you make the entire soundtrack become. Sometimes, however, during certain chats with sound supervisors or re-recording mixers, I get the impression that they may not fully understand how the severely complex poly WAV files that they work with come to be. There’s the frequent tooth-and-nail fight in the chain beforehand, the tireless sweat from the boom operators who have to formulate plans with complicated camera setups, and there’s the unique skill involved in the strategic attachment of lavaliere mics by the utility sound technician, just to name a few of our everyday challenges.

NOW, THEY HAD THE OPPORTUNITY TO MAKE IT EVEN CLEANER, CRISPER, AND BETTER BALANCED. WE WATCHED WITH GREAT MYSTERY AS THE DIALOGUE MIXER WAS CLEANING UP SOME DIALOGUE USING iZOTOPE RX. CHRIS ASKED WHAT HE WAS DOING EXACTLY AND I DID NOT HAVE A PRECISE ANSWER FOR HIM. WE WISHED HE COULD HAVE GIVEN US A PLAY-BY-PLAY OF THE STEPS HE WAS TAKING— BUT IT WAS DAY ONE OF THE MIX AND I KNEW THAT WE COULDN’T SLOW THE PROCESS.

Every record has to go through a complex chain or custom-figured complexities. As a production mixer, there is increasingly challenging RF engineering required in ever-changing environments in order to allow compromise-free (i.e., hit free), high-quality audio to magically leap through the air and land on our deliberately positioned antenna systems, then onto our wireless receivers, which then get patched into a miniaturized battery-powered mixing panel before finally landing on the digital multitrack recording system. It is a sincerely complex and challenging process.

In the end, we are one sound team. Whenever I hear my work edited, polished, and noise reduced, it warms my heart to be lucky enough to be involved in productions with such talent in post. I’m sure post feels the same way when they are working with quality production audio tracks. We need to stick together and keep the dialogue amongst each other fresh and open.

I look forward to seeing you at the next dub session and I appreciate your hospitality. I have a pair of headphones, HD monitors, a comfy chair and, hopefully, quality craft service waiting for you on set! •
Shift from inspiration to action. Immerse yourself in the just-launched tech and trends that you need to see to believe. Learn from the creatives leading New York City’s TV, film, commercial, live events and digital content. Get the gear you need to redefine modern media — and change the way you think about your next project. Whether your content is ON screen, ON air, ON stage, ON demand — get in ON it.

#NABShowNY REGISTER TODAY. NABShowNY.com
Pay Only $25 Using Code MP02
A Dub Stage Case Study: CRAZY EX GIRL-FRIEND

by Karol Urban CAS MPSE

No one saw Crazy Ex-Girlfriend coming, or at least I didn’t. It is an historical mashup of genres. A romantic dramedy musical delivering a weekly hour of dynamic, surprising shenanigans on The CW. It plays more Unbreakable Kimmy Schmidt or Ally McBeal than its closer genre relative, Glee. Additionally, the music was highly stylized, favoring many popular songs from the ’80s and ’90s.

The plot depicts a high-powered, anxiety-powered lawyer (Rachel Bloom) who, after a chance encounter with her summer camp ex (Vincent Rodriguez III), decides to move to a small California town to garner his affections anew. The show, created by Bloom herself and master scriptwriter Aline Brosh McKenna (Devil Wears Prada, 27 Dresses), plays like a clever quirky comedy featuring complex inner dialogue from the main character that often breaks out into song and full music video and musical theater sequences.

An unusual format like this carries all kinds of unique workflow implications and sonic considerations. So, I contacted King Soundworks, a sound for picture company with locations in Van Nuys, Burbank, and Santa Monica, and the re-recording mixers of Crazy Ex-Girlfriend, Jonathan Greasley and Eric Offin, to tell us just how things went down on the dub stage:

Crazy Ex-Girlfriend publicity shots are courtesy of The CW. Rachel Bloom.
How long was the mix and how did you decide to tackle it as a team?
Jon: We had a lot to do in a two-day mix, just like any crew on a one-hour show. I’d do a pass on the dialogue first, then go back and put in the score and songs. Eric would be roughing in effects, Foley, and BGs on headphones in the meantime, and he’d then mix his tracks into the dialogue and music. I’d go back and put in loop group once the BGs and crowd beds were in there.

Did the complexity of this genre make it a race to the finish line? How did you manage your time? Was a third music mixer ever considered?
I personally think the standard two-day mix for an hour-long TV show is an unfortunate short sell on a vitally important finishing stage of the process. There are so many small things that have to be left by the wayside because of time restrictions, both technical and creative: from dialogue mismatches between angles or takes to a really masterful sculpting of music and backgrounds around the core dialogue of a scene. The story can really be shaped and accentuated by a mix that has been allowed time to develop. We, too often, have to prioritize damage control for a noisy location or getting through a complex and busy scene enough to make it play well, where a little more time would allow it to play excellently.

Adding a third mixer dedicated to music was never discussed. I think if it had come up, I’d have advocated for a third mix day over a third mixer.

How soon did you get the music?
If everything came through the approval process and made it to mastering in time, we’d get the score and the musical numbers at the start of the first day. We always had the score in time, but the mastered songs would often come in sometime during the morning—not late enough to really cause any major ripples.

Did you receive stereo or 5.1 tracks?
One of the early discussions was stereo vs. 5.1 and how that affects the prep of the tracks and how they should be split into stems. The composers were initially wary of giving me stems—I think partly to do with wanting to protect their mixes and partly just wanting the songs to play like a music video.

The music numbers were mostly parodies of pop music. So, one week we’d have a Billy Joel-style piano ballad, then an R&B bump ‘n’ grind-style track, then a ’90s-style rap battle, then a Huey Lewis & the News-styled piece. Making these specific references play was as much about tonality of instrumentation as it was about the lyrics and style of songwriting.

Adam [Schlesinger] and his guys did a great job with these nods to so many different styles. I think they were initially concerned about maintaining the integrity of their intent, but you really just have to have the separation on the mix stage for placement in the field, before even getting to level concerns and re-balancing the elements for broadcast.

With ATSC, most TV is broadcast in Dolby Digital now, which is great. So, we wanted to, at least, have separation of vocals and backing vocals from the backing tracks so we could have the lead vocal more in the center channel, move the backing vocals around depending on where they are coming from and what sort of character they had, and then have the band wider in the stereo field to carry all the weight.

If we only had stereo mixes on the stage, then you’d either have to have them be panned hard left and right—[where] the center would just drop out of the mix when the song starts—or pan them inward a little to fill out the LCR—which can get muddy with the balance and cause possible phase issues as mono, phantom stereo, and true stereo content would all be occupying the same panning position. I could have used an unmixing plug-in to get some separation, but it was much better to have the actual flexibility.

At times, there were SFX embellishments that enhanced the storytelling and broke the music video rule. How was that determined?
How much to play the songs like a music video was a constant discussion during the mixing process. We sometimes added sound effects to highlight certain jokes or moments in the lyrics or background, but other times, it was best to play them dry, music only. We started off with a Golden Rule: “Don’t Add Any Sound Effects.” But that only lasted until it felt like we needed a sound effect to underline a joke.
Were there any difficulties with clarity of the lyrics given the heavily stylized processing used on many of the music numbers in order to achieve a particular genre or period style?

Jon: It was critically important for the comedy to have the lyrics of the songs be intelligible. Once or twice, we had a vocal stem that had a vocal effect rendered into it like a short plate reverb with pre-delay or a tight slap delay that felt very much like the style of music production that was being referenced, but it ended up negatively affecting the intelligibility of the vocals to a point where we reverted back to the unmastered, dry vocal stem, and then re-created the pop music-style limiting and compression [i.e., lots of both] and vocal effect, but with special attention paid to the clarity of the lyrics.

Were the mastering styles of any of the music genres a problem?

Mastering is very important in pop music, especially with the “loudness wars.” We've had dynamics all but mastered out of pop music now. The stereo mixes of the songs were mastered for iTunes every week, so the stems went through the same mastering process to maintain the same sound. The first thing I'd do on every track would be to clip gain down the stems by 8 dB or so, because music mastered to -0.1 dBFS played at unity is just far too loud for a TV mix. In addition, pop music is mixed and mastered for a specific format and specific listening environments, and that’s not always what will play best on broadcast TV. It was pretty common to tweak the EQ of a track to get a little extra definition in the low mids or take the edge off a particularly bright vocal to make the transitions between musical numbers and production dialogue not too dramatic of a shift.

The transitions in and out of musical numbers were often used to make a shift in the focus of the audience jumping in and out of Rebecca Bunch’s head. How did you work those sections to ensure that convention was met and balance of apparent volume between music and dialogue was tempered?

Usually, the songs represented little breaks with reality for the characters, moments that no one else in the story was [a part of]. The transitions in and out needed to be smooth, of course, but the thing that was easiest to lose track of was the difference in level going back into a dialogue scene from a loud and proud crescendo. Some of the songs build to a pretty bombastic out, so transitioning back into conversational dialogue could sometimes be a big drop. We always did a pass on small stereo speakers at 70 dB SPL or so, because you really get a better sense of the dynamics of the show at a lower level on speakers with less fidelity. Everything sounds or highlight a moment. Then, we just accepted that it was a case-by-case thing.

Comedy writers can be very sensitive to anything that obscures or even comes close to their dialogue, so we had to be sensitive of that as well. For the most part, all the humor they want in the show is contained in the written word, so embellishing with sound cues doesn’t always go over too well. But, there are times that a well-timed sound effect bumps up the joke a notch, so we did get some choice moments to play here and there.

Eric: On the SFX side, we always try to ride the line between warm and natural, with a touch of funny thrown in. We love to do cool design verbs and delays when needed. As an example, there would be flashbacks and slow-motion shots. With the musical numbers, we went through a few different mindsets.

The first was to fill out the musical numbers with sound design and backgrounds—making them full and fun. As the season went on, we started pulling back more into music video land, adding only a few SFX per musical piece [while] trying not to have too much “air” in the musical numbers, as that can sound like unwanted noise at times. Eventually, we ended up giving each musical number just the right amount of sound for what the piece was trying to achieve—whether it was a Disney feel or a ’90s rap battle.
It’s no secret. Location Sound has the largest inventory of pro audio gear.

So no matter where you are, shop Location Sound’s pro audio equipment selection and fulfill your critical sound equipment needs now!

Was this a difficult show to meet LKFS requirements on, as music-centered sections often sit higher on the meters?

Fortunately, for this show, The CW measured LKFS using 1770-1 (Infinite Dialogue), as opposed to the 1770-3 (Infinite All Measurement). Infinite All is a very restrictive and poorly thought out way to measure loudness of program material. With the songs being oftentimes so dense and powerful in the mix, a 1770-3 measurement could have meant that the already tight dynamic range of broadcast TV would have to be even further squashed. The Infinite Dialogue measurement allowed us to hit the crescendos a little harder and make the intimate moments play a little softer, while still having a tight mix that plays on both 5.1 home theaters and smaller built-in TV speakers, or even earbuds and laptops, as is increasingly the chosen viewing conditions for content these days.

How does one deliver stems for a show that has the depicted actors breaking into song? Where does the dialogue stem end and the music stem begin?

The vocals for the musical numbers were mixed into the music stem, and any spoken-word stuff that went into, out of, or was contained within the songs was generally mixed into the dialogue stem. We did have to do an instrumental music stem for international deliverables, and we also provided an option stem with the English-spoken word content that could be used along with the domestic music stem, if the market so chose.

What an incredible audio journey Crazy Ex-Girlfriend must have been to mix! My gratitude goes out to Jonathan Greasley and Eric Offin and King Soundworks for offering us at the CAS insight and knowledge on mixing a one-hour romantic dramedy musical TV show. Fabulous work!
Boom op Ron Ayres and I were working on Season 1 of the Detroiters for Comedy Central. Jason Sudeikis and Olivia Wilde bring their little son Otis (around 2 years old) to the set. During the martini shot, little Otis starts being rather vocal and it’s ruining sound takes, so they decide to leave. While walking by my sound cart during a take, little Otis is yelling, trying to form the words “bye-bye”—just as Jason & Olivia are looking at me, miming the words “Sorry.” Cutest thing ever. Little Otis is totally welcome on set anytime he wants to hang out, even if it means a little ADR.

—Jamie Scarpuzza CAS
Production Sound Mixer

When covering the Indy 500 race several years back, I was specifically reminded by our ABC Sports producer to be sure to record the famous “Gentlemen, Start Your Engines.” I was on the track at the starting line talking with drivers, carrying a Nagra, when suddenly, the announcement came on without warning. I frantically turned on the recorder—but missed “Gentlemen.” How do I explain this to the producer? Well, you just can’t make this up.

For some reason, I don’t recall now, the race start was stopped on Lap One and all cars returned to the starting line, engines off, and an official “Gentlemen, Restart Your Engines” happened. I made sure I got that! Later, in the motel room, I edited the tape, took “Re” off the “Restart” and got both versions correct. No one ever knew, but me. So ABC was happy. I was saved.

—Don Matthews CAS, Retired
Production Sound Mixer, who is loving living in Colorado Springs, CO

For many years, the Kennedy Center has honored at least five people, who have made significant lifetime contributions to the arts. The Kennedy Center Honors is recorded as a TV show during the first week of December for later broadcast during Christmas week. With rare exception, the president attends these ceremonies. It is not unusual at the end of a president’s last term in office, that there is some special presentation in recognition of his last time attending the ceremonies as president.

So it was at the end of President Reagan’s second term. While I don’t remember the nature of the presentation, President Reagan was so moved by it, he stood up in his balcony box and, in a clear stage voice, made a comment to the stage and audience. The stage and audience responded with appreciation and the program continued. The producers of that year’s show were Nick Vanoff and George Stevens, Jr. and I was immediately asked if I had somehow recorded the president’s remark so it could be used in the broadcast.

Now, any mixer who’s done a show where the president is in attendance, knows that the Secret Service is extremely sensitive about any microphones in close proximity to the president. The closest audience mikes were actually two PZMs under the balcony—they were of no help. The only mikes even pointed in that direction were two 416s off the corners of the stage, also of no help. So, as is often the case, discounting the sensitivity of the Secret Service, the producers viewed this as an audio problem.

Just so happens, the following weekend, George Stevens, Jr. produced a second show, Christmas in Washington, also with the president in attendance. So I called George and suggested that, of all people, President Reagan knows what “looping” means and suggested he may just be up for looping his line at the second event. Being a real sport, the president gave us two takes, the second of which closely fit the picture. With appropriate EFX to match the Kennedy Center Opera House, I dropped in the president’s loop line in post and the audio problem was solved.

By the way, the president’s line was: “It beats getting an Oscar!”

—Edward J. Greene CAS
Production Sound Mixer

My name is Marlowe Taylor and I am a production sound mixer out of Cleveland, Ohio. I really couldn’t believe it at first. Can you actually see the same actor two times in one year on back-to-back features?!!? Well, let me tell you . . . I had just finished mixing a feature, starring Arnold Schwarzenegger called 478 and the co-star, Glenn Morshower, was such a down-to-earth person and a funny, funny guy. At the movie wrap, we all bug. Then a few months later, some guy pulls up on set, out front of a restaurant, gets out, and BAM!!!!, it’s Glenn again! This time, on the set of a sci-fi feature called Curvature. He gave me a big hug and said, “Marlowe, you’re busy, brother.” I never felt so good knowing that doing my job—of which I love every second—reflects on others with them remembering who you are by name! These are just some of the moments/ reasons I love what I do and being a member among all my brothers and sisters of the CAS. It is what motivates me every day to keep striving to be the best—and that’s why I smile while rolling sound! I’m now in prep for the feature Gotti. Maybe it will be three times the charm and I will see Glenn Morshower again! LOL!

—Marlowe Taylor CAS
Production Sound Mixer
NBC Universal Post is buzzing: “Boldly going where no mix has gone before” over on the Hitchcock Stage, mix team Jon Taylor CAS and Frank Montaño finished the final mix for Star Trek Beyond for director Justin Lin, producer JJ Abrams, and Bad Robot/Paramount Pictures. It’s Almost Christmas for Mix Stage 6 which just wrapped the final mix for feature director David E. Talbert with mixers Andy Koyama and Wayne Lemmer, and supervising sound editor Derek Vanderhorst. Over on Mix Stage 5, Peter Nusbaum CAS and Whitney Purple have the usual suspects in mixing Blackish, The Mindy Project, Just Add Magic, and Best Friends Whenever. This fall, the team will also mix a new comedy for NBC called Great News. In Studio A, mixers John Cook CAS and Bill Freesh CAS have their hands full with the hit show Veep. The team is also about to start its second season of the hit series Mr. Robot for the USA network. In Studio B, mix team Nello Torri CAS and Alan Decker CAS are currently working on Season 3 of Tyrant for FX networks and Season 1 of Emerald City for NBC. Starting in July, the team mixes Shots Fired for Fox and Taken for NBC, and in the fall, the team will mix Season 6 of Homeland and Grimm for NBC and Showtime, Outlander for Starz, and Patriot Season 1 for Amazon.

In Colorado, production mixer Dave Schaaf CAS and boom op Jesse Yadon recently worked on Gnow, starring Penelope Mitchell and Kyle Gass. They are also slated to start on Amateur.

Todd Grace CAS and Ed Carr CAS continue to keep Dub 2 at Warner Bros. humming. Having completed the first season of Limitless for CBS, year three of Sleepy Hollow for FOX, Season 6 of Shameless for Showtime, and the first season of Damien for A&E, they began the second season of Casual for Hulu, the fourth season of Devious Maids for Lifetime, and the first season of Graves for Epix … Soon they will begin Dirty Dancing for Lionsgate, and hopefully, spend a little quality time outside the studio on a beach with a beverage!

At Smart Post Sound, Stage 5, Sherry Klein CAS and Lisle Engle CAS are mixing Falling Water for USA ... and getting ready to begin mixing Bull for CBS for this fall! Sherry also just completed with Mark Server, Queen of the South for USA at Larson Studios.

George A. Flores CAS began 2016 with the back nine episodes of Supergirl with boom operator Colin Campbell and split utility duties from Alexis Schafer and Iris von Hase. Thanks to Ed Moskowitz CAS, Stephan von Hase CAS, Jon Ailetcher CAS, and Michael Piotrowski for mixing the double-up episodes. Shout-outs should also go to Steve Evans, Eli Moskowitz, Nicole Zwiren, Kraig Kishi, Kelly Hallmark, Ethan Biggers, Owen Taylor, Nick Carbone, and Daniel Greenwald for their help as well. Right on the heels of Supergirl was a pilot for ABC/Fox with boom operator Alexander Burstein and sound utility Alexis Schafer. In April, boom operator Shawn Morse, boom/utility/playback Daniel Quintana, and utilities Iris von Hase & Alexis Schafer joined George for Season 12 of It’s Always Sunny in Philadelphia. With multiple cameras, waterslide work, and earwig playback plus live vocals, they did a great job once again. Special thanks to mixer Chris Kellet for always rocking on the Philly portion of the season.

Ken S. Polk CAS has recently finished work on two theatrical releases due out next month: Dying to Know: Ram dass & Timothy Leary, a Gay Dillingham/Robert Redford feature documentary, and The Land, a Steven Caple/Nas project for IFC. The sound design and mix of Dying to Know was done exclusively at Ken’s studio, Th’ Meat Locker, while The Land was a project through Smart Post Sound/Joe Melody and Jan Bezoskua/White Light Audio, with pre-dubs done at Th’ Meat Locker, and the final being the first film mixed at Smart Post West in West LA. Ken has recently completed software/hardware update to “Th’ Meat Locker Studio,” now an HDX2 studio, with 40 fader Icon, updated HD video satellite. The 5.1–7.1 ”plug and play” translation to larger rooms and “Lot” stages is excellent!!

Brendan Beebe CAS, Dennis Fuller, and Sean Byrnes have just finished Big Little Lies for HBO and loaded right into American Horror Story 6 for FX. Very thankful for the hard work of the crew!

Karol Urban CAS MPSE, after finishing up Season 12 of Grey’s Anatomy and Season 2 of Kingdom, mixed a Mar Vista suspense thriller called Open End. She is now mid-season on Season 2 of Edge of Alaska, as well as supervising dialogue and mixing the Lionsgate feature Cookoff.

During August, Fred Ginsburg CAS presented two workshops on sound at the annual conference of the University Film & Video Association that was held this year in Las Vegas, Nevada. One workshop focused on production sound, and another one introduced professors from film schools across the USA to iZotope RX5. Co-presenting was CAS Board member David Bondelevitch MPSE.

Post sound mixer Jamie Scarpuzza CAS and boom op Ron Ayres are working on Season 1’s Detroiters show for Comedy Central.


Jay Patterson CAS, along with Ken Strain booming, and Kris Manning as utility/2nd boom, started Showtime’s I’m Dying Up Here in mid-July.

James Ridgley CAS got busy with two features. Both with dubious genre titles and actors he has been told not to mention. He also worked on quite a few commercial/industrial side projects, including some Kardashian/Jenner (Oops!!)
things and some projects on Honda and Hyundai (but I hate to give them plugs). From transgender model shows to Hershey’s Kisses commercials, business is great! In the downtime, James has four producers interested in a few screenplays he has written.

Brett Grant-Grierson CAS started in 2016 with a wrap on The Last Man on Earth and a busy pilot season, including Marvel’s 19 with Josh Bower and Tanya Peel. Then, onto a very windy and dusty Season 5 on Longmire in Santa Fe, New Mexico. A huge thanks goes to Chris Diamond on boom and local utility Daniel Carlton. It is a fun show with a great cast and crew, crazy location moves, and extreme weather changes all in one day! Then, Brett came back to Los Angeles for the second half of the year to start Season 2 of Scream Queens, joined by Josh Bower and Chris Silverman.

Robert Sharman CAS moved to England two years ago. He’s loving it but starting over in a new market has been a challenge. He mixed The Infiltrator, which shot in England for Tampa, with great boom op Tom Harrison and 2nd boom Jo Vale. He also mixed a nice series for Sky1, Agatha Raisin, and the UK portion of The Conjuring 2 for New Line, with Jo moving up to 1st boom on both, and Dave Thacker on 2nd boom. Now, he’s back in the United States for a couple of months for another quick New Line horror movie, Annabelle 2, with my good friend and boom op, Richard Bullock, and another longtime friend, Tanya Peel on 2nd boom. He is quite enjoying the LA visit, and thinking he’ll likely be making the back-and-forth trips a regular thing.

Philip Perkins CAS is grateful for a very busy 2016 so far. He completed mixes for PBS docs Paying the Price for Peace, Company Town, A Bitter Legacy, Arc of Justice, Uplift America, and Good Girl, as well as production sound for docs The Long View, West Coast Jazz, and Norman Mineta, and location music recording with Charles Lloyd and Jason Moran, the Barbed Wire Trio, and the computer network band The Hub.

Gavin Fernandes CAS is gearing up for a busy year. First up is Versailles for Ovation/Canal+. Time where he will try out his new Fab notch and some new verbs. Then, he’s onto HBO’s Big Little Lies. Somewhere in there, Gavin will make time for the documentary Ti-Anna - Inside These Walls.

Steve Weiss CAS is on his fourth season mixing Major Crimes for TNT, with Vince Schelley on boom and Dennis Carlin handling utility chores.

Marlowe Taylor CAS was the production mixer for features 478 and Curvature. He is now in prep for the feature Gotti.

Andy Hay CAS is currently closing out a fantastic broadcast season on Stage 5 at Technicolor alongside FX mixer Ken Burton CAS. It’s been a busy year mixing for The Originals, Criminal Minds, Angie Tribeca, Togetherness, Blood & Oil, and Looking. Up next is Berlin Station for Paramount/Epix, followed by When We Rise for Gus Van Sant. This September marks a return to Andy’s first love: movies! He’s transitioning over to the feature department at Technicolor as supervisor and re-recording mixer. Up first is Adam Wingard’s Death Note for Netflix—a US adaptation of the beloved Japanese anime. Wingard’s thriller The Woods will be released September 16 in which Andy also supervised and mixed for Lionsgate at Technicolor earlier this year. He’d like to personally thank Jackie Jones for bringing him to Technicolor last year, and a huge thanks to Doug Kent and Jeff Eisner and all of the amazing supervisors and mixers and clients he’s had the pleasure of working with at his new home.
The Cinema Audio Society is once again launching its Student Recognition Award. The CAS Student Recognition Award is intended to encourage students’ interest in production or post-production sound mixing, and to recognize individuals with exceptional and demonstrated passion for the field.

The CAS Student Recognition Award is a $2,500 cash award. The selection criteria will focus on the student’s short essays in response to application questions and a professor’s recommendation letter. Five finalists will be selected and will be invited to attend the 2017 CAS awards dinner as guests where the Student Recognition Award winner will be announced (travel and expenses not included.) Application period begins August 1, 2016 and ends October 15, 2016.

Eligibility for the CAS Student Recognition Award is open to any student enrolled in a Bachelor’s or Master’s degree program at an accredited college or university. Students may be pursuing any major, but should have a demonstrated interest and some experience in production and/or post-production, sound mixing for film and television. Please encourage students who fit the criteria to apply.

Sincerely,

Mark Ulano, CAS President
CAS STUDENT RECOGNITION AWARD

CAS will begin accepting applications Monday August 1, 2016. All applications must be completed and submitted online no later than Saturday, October 15, 2016. The CAS Student Recognition award will be announced at the 53rd CAS Awards on February 18, 2017.

ELIGIBILITY

Students (graduate or undergraduate) in good standing at an accredited 4 year, degree granting college or university during any school term between January 1, 2016 and December 31, 2016 are eligible to apply. Students at US or international colleges and universities are eligible, provided the institution is accredited. All application materials must be submitted in English. Student applications must be accompanied by a recommendation from a professor or instructor.

SELECTION CRITERIA

The CAS Student Recognition Award is given to an individual student based on the recommendation of an instructor or professor at the student’s college or university; and on the student’s accomplishments, enthusiasm, and demonstrated potential in the field of sound mixing and/or sound recording for film and television. It is not an award of excellence based on a specific student project.

APPLICATION REQUIREMENTS

1. Students must submit the following materials online:
   A. Unofficial transcript. (Please highlight and explain relevant coursework.)
   B. List of projects in which you were the primary person responsible for production and/or post-production sound mixing.
   C. Once you have completed your portion of the application, a link will then be provided for you to give to your professor.
   D. Shortly after submitting your application and documents, we will send you an email confirmation that it has been received.

Finalists will be asked to submit a 2 minute example of their work and an informal introductory video, 3 minutes or under.

Applications must be submitted online no later than Saturday, October 15, 2016, 11:59 pm PST. Incomplete or late applications will not be considered.

ADDITIONAL INFORMATION

• The CAS Student Recognition Award will be announced and presented at the 2017 CAS Awards Dinner. Five finalists will be invited to attend the Awards Dinner as the guests of CAS. Any related travel expenses are the responsibility of the student nominees.
• $2,500 will be awarded to the selected student. Any related tax liability is the responsibility of the student.

Please visit our webpage for the online application:

cinemaaudiosociety.org
Taking a break from *The Big Sick* from left: boom op Jerry “Niru” Cox, actress Holly Hunter, mixer Charles R. Hunt CAS, and utility/2nd boom Paul Reed.

Dan Dugan CAS recording surround for bioblitz at McLaren Park in San Francisco.

Brendan Beebe CAS shows an old ’55 hardwired with a DPA 4071 for *Big Little Lies*.

Karol Urban CAS MPSE presenting Vickie Sampson, sound supervisor/dialogue editor/director, to the industry attendees of June’s LA Sound Group. It was such a great success. Thank you all for joining us and thanks to Westwind Media for hosting us.

On the job with sound utility Alexis Schafer, boom operator Alexander Burstein, and sound mixer George A. Flores CAS.
Looks like we need another family reunion to squeeze two of the new guys into the picture.

The next generation

It's hard to believe that it was 41 years ago when the first Lectro wireless was introduced. Boy, have things changed.

688: The only field mixer to offer Dugan automixing.

Learn more at www.sounddevices.com

Made in the USA by a Bunch of Fanatics®