

695 QUARTERLY

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SUMMER 2014
VOLUME 6 ISSUE 3



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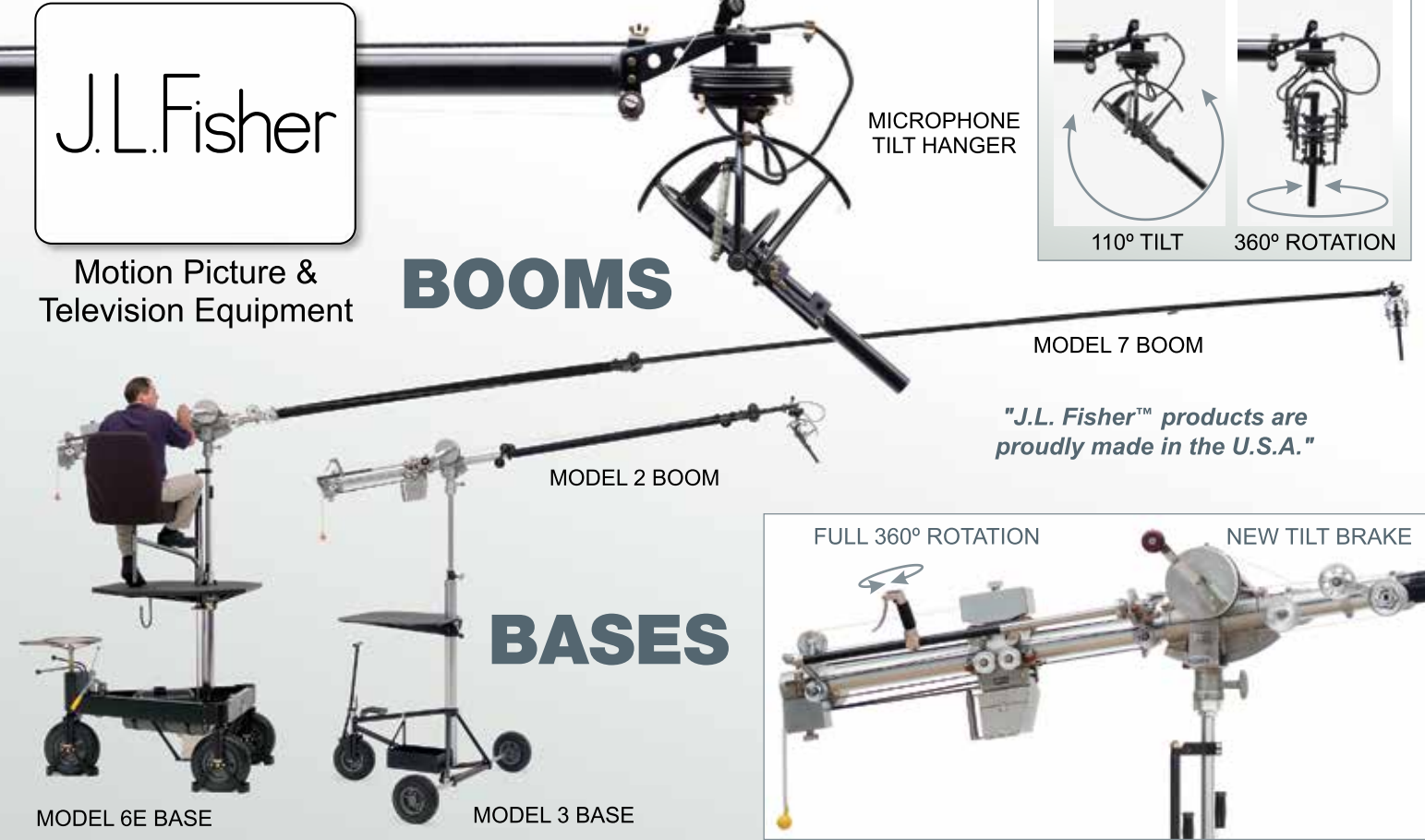
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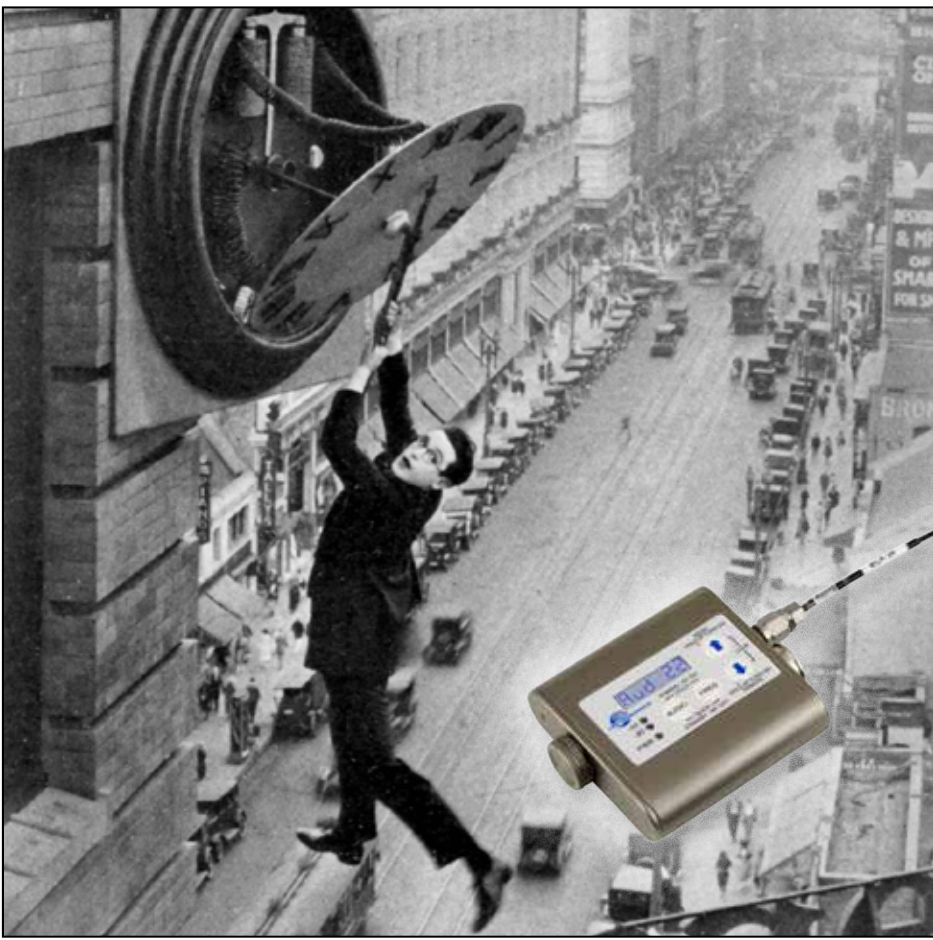


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Cover: *Anchorman 2: The Legend Continues*,
photo by Gemma LaMana and courtesy of
Paramount Pictures Corporation. From
left, standing: Dylan Baker, Josh Lawson,
David Koechner, Will Ferrell, Steve Carell
and Paul Rudd. Middle: Todd Marks and
kneeling in front, left to right: Perry Freeze,
Ben Betts and Jeb Jenhennig.

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From the Editors



Video engineering occupies a prominent position in this issue. In the profile of Hal Hanie, we follow his 56-year career in television broadcasting. And the account of making a functional news studio for *Anchorman 2* demonstrates how complex the field can be, especially when practiced at the highest levels.

Stuart Wilson's account of recording *Edge of Tomorrow* restates a common theme in this publication—careful preparation is often at the root of outstanding results.

We also offer a chance to become acquainted with the Nagra Seven, a two-track recorder with a touchscreen interface made in Switzerland with exacting standards.

Finally, we note with sadness the passing of Walt Martin on July 24, 2014. He was a friend to all the editors on the *Quarterly* and many in the film community and will be missed. A memorial service is planned for 12:30 p.m. on September 6 at Forest Lawn in the Hollywood Hills. An article in *The Hollywood Reporter* has additional information. <http://www.hollywoodreporter.com/news/walt-martin-dead-clint-eastwood-722908>

Fraternally yours,
David Waelder, Eric Pierce and Richard Lightstone

From the Trustees

As the Trusteeship of Local 695 continues, the Trustees would like to report on the changes that have been made at the Local.

If you have been by the Local lately, you likely have noticed some new faces in accounting. Nicole Riordan has taken over as bookkeeper. Nikki comes to us with an AA in Business Administration and a strong background in IT. She is proving to be a valuable asset in our efforts to update and modernize the Local 695 computer network. In addition to her duties here, she is continuing her education and expects to earn her BS in Business Management from CSUN in 2015.

It is with great reluctance that we report that Leslie Otsuki has decided to move on from the Local. She has worked for Local 695 for thirty years and she will be greatly missed. However, we are pleased to report that her post will be filled by Linda Skinner, a 695 alumna. Leslie is working with Linda to bring her up to speed.

Donna Gamble-Ramirez continues to hold the office together and is spearheading the effort to bring about a more organized and efficient local union. Hundreds of boxes of un-filed documents have been cataloged, barcoded and moved to a secure off-site document storage facility, all under Donna's watchful eye. A lot has been done and there is much more to do.

The Local's accounting software has been updated to QuickBooks for a more efficient accounting of the Local's finances. The next step is to update the network and hardware. Scott Bernard and Laurence Abrams have contacted no fewer than five vendors to compete for the project.

The Local's training classes continue uninterrupted. In fact, a class on RF microphone usage has been added and has had its first two sessions.

Those of you that have called the office for assistance and have spoken to Joe Aredas Jr., will recognize that he brings a calm, steady and knowledgeable voice when dealing with member issues. A word of caution to any employer that would mistake Joe's calm demeanor for

a lack of resolve on the part of the union; he is passionate and tenacious when it comes to defending the members of this Alliance.

Scott has taken well to his new position. When he is not on the phone with members or employers, he has been evaluating all of the longstanding arrangements with vendors that do business with the Local. Whether it is the phones or the copy machines and many things in between, he has been able to cut costs while improving service. It seems that negotiating is not just for the bargaining table.

With the office operating more smoothly, we can turn our attention to revitalizing the building. The new sign out front is just the beginning.

We are looking forward to seeing all of you. As always, you are welcome to stop by and talk with the Trustees, to see some old friends or to make new ones.

In Solidarity,
Mike, Steve and Peter

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Our Contributors



Brendan Beebe

For the past twenty years, Brendan Beebe has worked in motion pictures, television, commercials and reality TV. Starting out as a Utility Sound Tech and then Microphone Boom Operator. Most recently, Brendan has been working as a Production Sound Mixer on such shows as *The Mentalist*, *Ray Donovan* and *Stalker*. Brendan has been part of several sound teams winning Academy Awards and Emmys. Brendan lives in Los Angeles with an amazing wife and three kids.



Ben Betts

For the past twenty-plus years, Ben has been Supervising Engineer on shows including *seaQuest*, multiple *Star Trek* TV/features, *Studio 60*, *Chuck*, *G.I. Joe* and *CSI*. He is currently Consulting Producer on *Let's Ask America*, Executive Producer for *WebCamRiot/Flune.tv* and *DIAVfx.com* and continues to consult on various productions around Los Angeles.



Todd Marks

Starting with a fourth-grade photography class, transitioning to Super 8 film in high school, and then to film studies in college, Todd has had a lifelong love of visual media. His professional career as a Computer and Video Playback Supervisor spans more than two decades. Todd's influence can be seen in many of the projects he's been involved with, including *The NET*, *Deep Impact*, *Star Trek Nemesis*, *Solaris*, *Team America*, *The Internship*, *FLIGHT* and, of course, *Anchorman 2*.



Stuart Wilson

Stuart was nominated for Best Technical Achievement for a road movie with a crew of seven which started in an Afghan refugee camp in Pakistan shortly after 9/11. He graduated from Hogwarts School of Witchcraft and Wizardry after four of the Harry Potter films. A love of documentary and capturing dramatic moments that happen only once has kept him moving from one production extreme to the other ever since. Oscar noms for *War Horse* and *Skyfall*.



David Waelder

David has recorded sound for films for several decades and has been an editor of the *695 Quarterly* since its inception five years ago.

Photos courtesy of the respective contributors

695 QUARTERLY

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Production Sound Technicians,
Television Engineers,
Video Assist Technicians and
Studio Projectionists

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From the Interim Business Agent



I'm excited to report that AB 1839 is gaining steam in Sacramento. Due to the hard work of the Entertainment Union Coalition (EUC), we have breezed through several committees; not one committee member has voted against this bill. We are in the middle of a big push to encourage Gov. Brown to appreciate

how important it is that California match the incentive programs in New York and the other states that have drawn much of our work out of California. As I write this today, Local 695 members have stepped up. We have received more than a 50% response to our mailings asking you to sign and return letters to Gov. Brown. I'm proud to say that we see a renewed enthusiasm by Local 695 members.

As we gear up for the fourth quarter of the year, I would like to thank the members who came to the office or called in to show their support for the staff. We are always here to serve the membership.

I had the privilege to present Local 695 member Frank Sciuto with his fifty-year Gold Card. Frank had a long career as a Videotape Representative with Local 695 up to his retirement in 1994. Before Frank came to work as a Representative with Local 695, he worked as a Representative for the IA West Coast Office and was instrumental in securing a contract with CFI.



Frank Sciuto

It was a joy to spend time with Frank, sharing stories and letting him know that his hard work carries on with the representatives working for you today. I brought Frank's file with me and shared with his family and friends some of the letters Frank drafted as a Local 695 Representative. We all had some good laughs. Some of these letters reminded us all why Frank had the nickname "The Italian Stallion." When it came to representing the members of Local 695, Frank was a tough cookie. Local 695 member Laurence Abrams and 695 staff member Leslie Otsuki along with Frank's four children, enjoyed honoring Frank and his service to the IA and Local 695.

Scott Bernard
Interim Business Agent

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NEWS & ANNOUNCEMENTS

Cinegear Expo 2014

This was the year of the drone at Cinegear. Wherever you turned, someone was showing a remote-controlled flying platform. The offerings were thinner for audio work.



Matt Mayer from Sound Devices

Matt Mayer was at the **Sound Devices** booth to introduce the new Pix 970. This is an audio recorder that shares the same form factor as the Pix 260i but without the video circuits. It has MADI inputs and dual-power inputs for operational

security. Dante and PixNet are built in as well as dual-drive capability on the front panel with two eSATA inputs on the back. There are eight analog tracks, eight AES tracks and the possibility of recording up to sixty-four tracks using MADI and Dante.

SanDisk, one of the inventors of flash memory, was showing the new C-Fast model with read and write speeds of 450 MBits/second and 350 MBits/second, respectively.

Mark Anderson at G-Tech was showing the Studio line and the new G-RAID drives with multiple drive enclosures that can be configured for automatic mirroring for security. The Thunderbolt-enabled drives can play video files at 500 MBits/second.



Photos by David Waelder



Mark Anderson from G-Technology



One of the many drones on display

In Memoriam

BRUCE A. BURNS

Mixer

May 28, 1943 – May 1, 2014

TONY MAX

Boom Operator

June 1, 1950 – May 24, 2014

BRUCE B. GLIMPSE

Mixer

June 1, 1957 – June 12, 2014

WALTER B. MARTIN

Mixer

April 18, 1945 – July 24, 2014

GARY C. THOMAS

Boom Operator

August 16, 1951 – July 30, 2014

Talks with Local 600

Local 600 and Local 695 have been meeting to work out areas of common concern, including playback from camera and other issues. These on-going discussions have already been productive and more information is forthcoming. Go to www.695.com



Above: Patrushkha Ulano and Renée Barbieri.
Right: Mark Ulano and Gary Raymond.
(Photos by Mark and Patrushkha Ulano)



Kriky and Seth (& Beau) BBQ

The penultimate Kriky and Seth BBQ drew more than 100 people from the sound community on Saturday, July 12. This year's event, the eighth in the series, was held at Beau Baker's home in Toluca Lake. This year was a potluck affair but the hosts generously provided a professionally-staffed taco bar. There was ample food for all. Everyone had a good opportunity to socialize, renew friendships and meet new people in the craft.

They have announced that next year will be the last so, if you haven't attended, you'll want to be sure to be on the mailing list. Send an email to soundbbq@kriky.com or visit the **Kriky & Seth's Sound Department BBQ on Facebook**.

Set Safety

We regret to report that Teamster driver Gary Joe Tuck died in a rollover crash while returning home from the New Mexico set of the TV show *Longmire*. The accident took place around 4:30 AM Saturday, June 28, after a particularly long workday. He had clocked in to work at 9 AM Friday and out at 3 AM Saturday. New Mexico Teamsters Local 492 believes that long hours on the show are to blame and is conducting an independent investigation.

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COMEDY OR DRAMA SERIES (ONE-HOUR)



Breaking Bad "Felina"

AMC • Sony Pictures Television
Nominees: Darryl L. Frank, Jeffrey Perkins, Eric Justen
Production Sound Team: Bil Clement, Allen Crawford



Downton Abbey Episode 8

PBS • A Carnival Films/Masterpiece co-production in association with NBC Universal
Nominees: Alistair Crocker, Nigel Heath, Alex Fielding



Game of Thrones "The Watchers on the Wall"

HBO • HBO Entertainment in association with Bighead, Littlehead, Television 360, Startling Television and Generator Productions
Nominees: Ronan Hill CAS, Onnalee Blank CAS, Mathew Waters
Production Sound Team: Simon Kerr, James Atkinson, Daniel McCabe, Richard Dyer, Bradley Kendrick, Luke McGinley



Homeland "Good Night"

Showtime • Showtime Presents, Fox 21, Teakwood Lane Productions, Cherry Pie Productions, Keshet
Nominees: Larry Long, Nello Torri, Alan Decker, Larold Rebhun
Production Sound Team: Matt Fann, Jack Hill



House of Cards "Chapter 14"

Netflix • Donen/Fincher/Roth and Trigger Street Productions, Inc. in association with Media Rights Capital for Netflix
Nominees: Lorenzo Millan, Nathan Nance, Scott R. Lewis

MINISERIES OR A MOVIE



American Horror Story: Coven "Fearful Pranks Ensue"

FX Networks • 20th Century Fox Television
Nominees: Bruce Litecky CAS, Joe Earle CAS, Doug Andham CAS
Production Sound Team: Steve Hurserstel, **Betsy Lindell**, Eric Heigle, **Erik H. Magnus CAS**, Leonard Suwalski, Daniel Kuzila



Fargo "The Crocodile's Dilemma"

FX Networks • MGM and FX Productions
Nominees: Mike Playfair, David Raines, Mark Server, Chris Philp



Killing Kennedy

National Geographic Channel • Scott Free Productions for National Geographic Channels
Nominees: William Britt, Mark Linden, Tara Paul
Production Sound Team: Doug Bishoff, David Strayer



Sherlock: His Last Vow (Masterpiece)

PBS • Hartwood West for BBC/ Cymru Wales in co-production with Masterpiece
Nominees: John Mooney, Howard Bargroff, Doug Sinclair, Peter Gleaves
Production Sound Team: Stuart McCutcheon, Abdulkader Amoud



Treme "Sunset on Louisianne"

HBO • HBO Entertainment in association with Blown Deadline Productions
Nominees: Bruce Litecky CAS, Andy Kris, Blake Leyh

COMEDY OR DRAMA SERIES (HALF-HOUR) AND ANIMATION



Californiation "Kickoff"

Showtime • Showtime Presents, Aggressive Mediocrity, And Then...
Nominees: Daniel Church, Todd Grace, Edward C. Carr
Production Sound Team: **Abel Schiro**, Lance Wandling, Mike Mesirow



Modern Family "The Wedding, Part 1"

ABC • Picador Productions and Steve Levitan Productions in association with 20th Century Fox Television
Nominees: Stephen A. Tibbo, Dean Okrand, Brian R. Harman
Production Sound Team: **Srdjan "Serge" Popovic**, **Dan Lipe**, Ken Strain



Nurse Jackie "The Lady With the Lamp"

Showtime • Showtime Presents, Loinsgate Television, Jackson Group Entertainment, A Caryn Mandabach Production, Clyde Phillips Productions
Nominees: Jan McLaughlin, Peter Waggoner
Production Sound Team: Brendon O'Brien, Joe Savastano



The Simpsons "Married to the Blob"

FOX • Gracie Films in association with 20th Century Fox Television
Nominees: Mark Linden, Tara Paul



Veep "Detroit"

HBO • HBO Entertainment in association with Dundee Productions
Nominees: Bill MacPherson, Richard Davey

Names in **bold** are Local 695 members

VARIETY SERIES OR SPECIAL



The Beatles: The Night That Changed America

CBS • AEG Ehrlich Ventures, LLC
Nominees: Larry Reed, Tom Holmes, Al Schmitt, Giles Martin, Josh Morton



The 56th Grammy Awards

CBS • AEG Ehrlich Ventures, LLC
Nominees: Tom Holmes, Eric Johnson, John Harris, Eric Schilling, Mikael Stewart, Ron Reaves, Tom Pesa, Michael Parker, Pablo Munguia, Paul Sandweiss, Bob LaMasney



The Kennedy Center Honors

CBS • The Stevens Company in association with the John F. Kennedy Center
Nominees: Tom Holmes, Paul Sandweiss, Dave O'Donnell, Josh Morton, Patrick Baltzell



The Oscars

ABC • Academy of Motion Picture Arts and Sciences
Nominees: Paul Sandweiss, Tommy Vicari, Biff Dawes, Pablo Munguia, Kristian Pedregon, Patrick Baltzell, Michael Parker, Bob LaMasney
Production Sound Team: **Larry Reed, John Perez, Eddie McKarge, Dan Vicari, Debbie Fecteau, Ric Teller, Hugh Healy, David Bellamy**



The Voice Episode 619A

NBC • Mark Burnett's One Three Inc. and Talpa Media USA in association with Warner Horizon Television
Nominees: Michael Abbott, Kenyata Westbrook, Robert P. Matthews Jr., John Koster, Randy Faustino, Ryan Young, Christian Schrader, Tim Hatayama, Michael Bernard, Andrew Fletcher, Bill Dietzman, Eddie Marquez

NONFICTION PROGRAMMING



The Amazing Race "Part Like the Red Sea"

CBS • WorldRace Productions, Inc.
Nominees: Jim Ursulak, Dean Gaveau CAS, Jerry Chabane, Troy Smith
Production Sound Team: **Bruce Beacom, Darren Brower, Alfredo R. del Portillo, Fernando Gironas, Randall Good, Mickey McMullen, Tyson Schaffner, Ryan Sevy, Steve Tejada, Barry Weissman**



American Masters "Jimi Hendrix: Hear My Train a Comin'"

PBS • A Production of FuseFilms and Thirteen's American Masters for WNET
Nominees: Eddie Kramer, Steve Crook



Anthony Bourdain: Parts Unknown "Tokyo"

CNN • Zero Point Zero Productions
Nominee: Brian Bracken



COSMOS: A Space Time Odyssey "Standing Up in the Milky Way"

FOX/NatGeo • Fuzzy Door Productions and Cosmos Studios, Inc. in association with FOX Broadcasting Company and National Geographic Channel
Nominees: Mark Hensley, Joel Catalan, Paul Arnoff, David Torres
Production Sound Team: **Darryl L. Frank, Brian Copenhagen, Alex Usatine, Tom Williams**



Deadliest Catch "Careful What You Wish For"

Discovery Channel • Original Productions, LLC, a Fremantle Media Company for the Discovery Channel Broadcasting Company and National Geographic Channel
Nominee: Bob Bronow CAS

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Operating the camera for KRLD



At KTLA in early 1970



In his home studio today

A PROFILE OF

Hal Hanie:

56 Years in Broadcasting

Dwight David Eisenhower was President in 1957 when William (Hal) Hanie began his career in television at KRLD, the CBS affiliate in Dallas. Tailfins were all the rage for cars and *The Howdy Doody Show*, the iconic children's show from the '40s, was still on the air; it would run for another three years. Videotape had been introduced only a year prior and, in some markets, copying programs was still done by kinescope, a process that involved shooting a monitor screen with a motion picture camera.

by David Waelder

Television in the '50s was a young and rapidly developing industry but Hal Hanie entered the field well prepared for the rapid technological change he would experience. Drafted into the Army during the Korean War, he took advantage of an opportunity to complete his service in the Air Force. They gave him twenty-two weeks of training in electronics school and additional training in control tower school that included instruction in radar. On completing his four years of military service, he continued his training in trade school and also worked at the radio station run by the school. His first real job was with Collins Radio, now Rockwell Collins, a manufacturer of broadcast transmitters, microwave transmitters and relays. When he took the position at KRLD, Channel 4 in Dallas, he already had a solid background in electronics and related disciplines.

At KRLD, he worked nearly every position in television at one time or another. He also maintained the transmitter for the station's sister radio facility located in the same building.

He did television remotes for events, like football games, all over Texas. He also did video recording and worked instant replay, a new feature developed at CBS by Tony Verna. In those days, sports events were recorded on two-inch videotape and any portion of the tape might be played back for on-air review. Locating the right cue point for the desired play was the difficulty in any on-the-fly playback situation. The video recorder was fitted with a mechanical counter and the operator would hold the timer at zero until the

play started. For replay, he would back up the tape to the zero point or a few seconds before to provide time for lock-up. Later, with the use of one-inch machines, operators like Hal Hanie would often turn the reels by hand to find the cue point, and then turn the reels forward by hand to provide slow motion. With the later machines, a system of identifying plays by laying down beep tones on the cue track that were audible to the operator on rewind replaced the mechanical counter. Providing instant replay was one of his responsibilities throughout most of his career, both in Dallas and here in Los Angeles, up until 2009 when the Clippers ended their over-the-air contract with the station and KTLA ceased original sports programming.

The Kennedy assassination in Dallas was his most memorable experience while at KRLD. He recalls seeing Lee Harvey Oswald at the Dallas police station and observing how cool and self-possessed he appeared to be. Jerry Hill, one of the policemen who found the sniper's nest in the Texas School Book Depository and later helped capture Oswald at the Texas Theatre, was one of two police officers working part-time at KRLD as a police liaison and well known to the staff at the station. Hanie remembers this as a chaotic time, exciting but stressful and disturbing. And, he had occasion to evaluate the performance of the crack staff from CBS in New York who came to Dallas to cover events. Nelson Benton, now regarded as a veteran newsman, was just beginning his career and appeared a young fellow "shaking in his shoes" when Hanie observed him.

Photos courtesy of Hal Hanie except where otherwise stated



Hal Hanie's work at KRLD coincided with the beginning of videotape recording. The station installed an Ampex VR-1000, a \$50,000 (in Eisenhower dollars) monster that weighed 1,111 pounds in the crate. (From the rescued archives of KRLD, courtesy of Andrew K. Dart and akdart.com)



At a slo-mo controller in the KTLA truck in Palm Springs



The Piper Archer II is a favorite with Hal. This one is a rental but identical to the plane he owned.

In June 1969, Hanie moved to Los Angeles and started work at KTLA. He joined IATSE at that time. (His work at KRLD had been under an IBEW contract.) He stayed at KTLA for forty-four years. Combined with his twelve years at KRLD, he has 56 continuous years of experience in television.

At KTLA he continued to do instant replay for sports and did videotape playback and recording for all sorts of programming. He did the recording for *Donny and Marie* and *Dinah's Place*. He has fond memories of the people working both shows.

He worked many other shows including *The Richard Simmons Show* and *Mary Hartman, Mary Hartman* and others too numerous to recall. He edited *Backstage* with Johnny Grant and recalls that Grant could never remember names so he would call everyone "Tig," short for "Tiger." When Hal Hanie asked him what he would call a woman, he thought for a moment and answered, "Tigress."

Gene Autry owned the station when Hal Hanie first came to work at KTLA. Hanie remembers him as a benevolent boss who often treated employees to lunch in his private box at Angels games. The Tribune Company purchased the station in 1985 and initiated policies that were more corporate. They sought to renegotiate the contract and eliminate seniority status. Hal Hanie was proud to walk a picket line to protest that move. He also served awhile as Shop Steward for the Videotape Department at KTLA.

He recalls a time at KTLA in 1991 when the station brought in some green production staff to work the morning news. They were so inept that they couldn't coordinate the teleprompter copy to match the video clips and mismatches were common. Finding themselves adrift, the reporters would often break up laughing. The Producer of the *KTLA Morning News* encouraged them to play along with the errors rather than glossing them over and striving to retain dignity. The newscasters, thinking the show was probably on the verge of cancellation anyway, went along and discovered that ratings improved. Viewers liked the casual presentation. After that, every news program in town was copying the loose format. Three of the reporters from that time, Mark Kriski, Sam Rubin and Eric Spillman, are still with the station.

In addition to his regular work at KTLA, Hal Hanie operated a small, community radio station from a studio adjacent to his home. FCC regulations are quite demanding regarding regular broadcasts and he needed assistance to keep things running regularly. He used interns from Columbia School of Broadcasting, Santa Monica College and Cal State Northridge, trading technical training and experience for help with operations. He did regular remote broadcasts of high school football games, both home and away. That was a complex operation requiring stringers to prerecord interviews with the coaches that he would edit into a pre-game show. During the game itself, he had a professional announcer and a color man providing continuous coverage that he would feed into a phone line for broadcast. Eventually, he became the "sustaining

member" of that particular charity and it became too much to carry while also working a full-time job at KTLA. The radio station is no more but he still maintains a recording studio that he uses to make demo tapes and transfers to digital media.

Operations at a TV station are now largely automated but, during his career the systems required considerably more attention. Chroma Key demanded very exact lighting to prevent bleed at the edges. Genlock used to be so fragile that just touching a camera could cause the signal to lose lock. Equipment required alignment daily, or even more frequently, and he used to be responsible for tweaking color and density on a vector scope. Now, a computer generally handles this chore digitally. And there was a time when he needed to keep a rag soaked with solvent to clean heads on the fly to prevent image breakup caused by emulsion build-up.

The continuing process of automating procedures eventually encouraged Hal Hanie to retire in 2013. When the station completed the automation program and linked several tasks to one computer, they offered him the option of retraining. He had done that at several stages in the past but thought, at age eighty-two, it was time to step aside. William (Hal) Hanie retired as a Gold Card member of Local 695.

His other passion is flying. He used to own a 1977 Archer but airplanes are an expensive hobby and he had to let it go. But his license is still current and he was planning a trip to Texas when we interviewed him. We wish him blue skies.

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RECORDING SOUND FOR *EDGE OF TOMORROW*



by Stuart Wilson, AMPS

The first challenge for us was keeping up with the man! He doesn't waste a second; he walks onto the stage, barely breaks step to have a mini-pit stop where he sits on a wooden box (no artist's chair for him) while hair, makeup, costume and sound all do their finishing touches and bam!—he's off again onto the set and straight into the scene. We needed to be there, like coiled-springs ready, to wire up this man or be left behind.

Above: Tom Cruise on the battlefield.
(Image courtesy of Warner Bros. Entertainment)
Right: Stuart Wilson at his cart.



Matching pace with Tom Cruise (TC) as he powers his way through the project was just one of the elements that made work on *Edge of Tomorrow* exciting. Quite a bit of the action of this film, directed by Doug Liman and co-starring Emily Blunt, takes place on the battlefield. The brief is that Cruise, Blunt and their squad would be airdropped onto a beach in the middle of a huge battle and have to fight their way inland. The battlefield was full of shell-hole craters, mud and water. Multiple cameras, simultaneously stationary and handheld, would cover action that would include partially improvised, seven-way dialog that ranged from quiet muttering to full-scale yelling. Oh, and they would be wearing full-body armor, called Exo-suits, with weapons mounted on them and constructed from dozens of parts with several articulated joints.

The elements we faced included:

- The Exo-suit body armor could be noisy when they moved around.
- There was little chance of getting a boom microphone anywhere near.
- There would be wide shots for action and scale at the same time as intimate shots between the soldiers.
- The explosives and gunfire were going to be loud.
- The weather was set to be wet and windy.

It's enough to set any Sound Mixer's alarm bells ringing on multiple fronts although the bells were largely inaudible over the din of the action.

I decided I had to get at least one wireless microphone, if not two, working on everyone at all times—and they had to work well! It's my first time to work with Tom Cruise and I have the impression he's not going to want to spend much time getting his microphone fitted and finessed every day.

I looked at the designs for the armor suits and consulted with the Prop-Modellers to find a way to build microphones into them. That way when Tom Cruise was in costume, he would already be mic'd.

Working cooperatively with Pierre Bohanna, James Barr and their crew, we built a box to be fitted on the front of the Exo-suit. The box was drilled out to make space for a lavalier with a furry windscreen that we concealed behind a mesh screen, and painted to match the Exo-suit. We found that even a millimeter of variation higher or lower in the mount made a huge difference to the coloration of the sound, so it was critical to have them precisely vertical and positioned as high in the box as possible. At the end of each day, we would open up all the boxes to dry them out and make sure there was no slippage in the orientation of the microphones inside.

We also fitted microphones in the helmets to help us cope with the huge dynamic range of the performances and give us coverage when a shell blast threw a load of wet debris on top of the chest-mounted boxes. We did have a couple of microphones destroyed during the shoot but, all in all, they survived pretty well.



Tom Cruise with Director Doug Liman. (Photo: David James, courtesy of Warner Bros. Entertainment)



Exo-armor



Rugged boxes were drilled to hold the microphones and painted to match the armor.



Conditions were so chaotic that the mikes required wind protection even in the boxes.



The fit was snug but the mikes were well concealed and protected.



With the mesh screen fitted, the installation became part of the rig.



The rig was tested at every stage.

The team who built the Exo-suits was responsible for getting the actors in and out of them every day, making necessary adjustments and keeping them all working smoothly. They were a crack team, and ready with a can of oil to prevent squeaks.

One of the important sets was a 'Drop Ship,' a troop-carrying aircraft that was built on a gimbal suspended from the roof of the stage. The actors were all hooked on with restraint wires in an upright position, already in their body armor, ready to be dropped when bomb-bay-type drop doors opened beneath them. They then dropped fifteen feet for real before being held by the wires.

Once the doors were closed and the access steps slid away, no one could get in or out. We built a PA system inside using some rugged horn speakers that would look right on-camera, so the Director or Assistant Director could communicate with the cast.

This was a phenomenally noisy rig, built twenty feet above the ground. There was no possibility of reducing the noise of this rig, but it sounded quite in keeping with the big machine it was supposed to be, so the best thing was to go with it. We suspended a couple of Schoeps omnis from the ceiling to capture FX in sync and all the clanking, groaning and motor noise of the ship sounded great. These microphones were placed away from where the dialog was happening so they could pick up a continuous track of FX (recorded on discrete tracks) which could cover and blend edits from one shot to another. This recording was used to help keep the sync dialog usable.

I had fun putting a homemade contact microphone (from the Sound Artist/Field Recordist/Composer Jez Riley French) directly on the huge winches that drove the motion of the rig. That gave some really interesting low-frequency tones and clunks to add

into the mix at the dramatic moment the drop-doors swung open. A benefit of the noise level was that the actors had to yell their lines, keeping the balance of voice to noise usable. Again, we used two microphones as much as possible, one in the helmet and one on the chest. We used Audio Ltd. mostly and Zaxcom for the really loud voices.

There are many benefits to working with an actor like Cruise, as he is aware of all aspects of the process, including a sensitivity to sound. When he walked onto a barracks set that had plastic interlocking floor tiles and said they were a bit noisy to walk on, the Art Department had to find a solution. There must have been around four hundred tiles in that floor and they put three men on the job of filling each of the thirty hollow sections on the underside of EACH moulded plastic tile, with silicon glue and precisely cut pieces of carpet. I'd like to imagine that would happen if a Sound Mixer made a comment on a noisy floor!

A scene landing a helicopter in the middle of London's Trafalgar Square, one of the main focal points of the city, presented another challenge. Nothing of the sort had ever been done before and the shot necessitated closing down the entire area for the morning. TC was to board the helicopter in another part of the city where Boom Operator Orin Beaton would put the microphones on while I set up with the filming unit in the Square. The plan was that, as the chopper landed, TC would step out, immaculately dressed in his U.S. officer's uniform, flash that famous smile, meet up with a waiting British officer, and they would talk as they walked to a waiting car, get in and drive off.

I had told TC that I wanted to put two wireless microphones on him for this scene, one set to a high level, the other set low and in two different frequency blocks in case of any unpredictable inter-

ference on the day. He was open to this idea but wanted to test it a few days before, to see that it could be done without affecting the immaculate look of the costume. I was grateful for this as the shot was nerve-racking enough. The cameras would be rolling from the moment the chopper appeared in the sky until they drove away in the car at the end of the scene—it had never been done before, we might get only one shot at it and we didn't want to risk a visible sound pack spoiling the shot. We put the microphones on, mounted the packs on the ankles, and pulled and flapped the trousers to make sure we wouldn't see any lumps in the downdraft of the helicopter blades. When TC gave the thumbs-up, we were good to go and it turned out to be a great scene. In the end there was a lot of RF around that morning that wasn't present on the scout so it took an Xmas tree of antennae to bring in enough signal, but we got it! We all had to be in military costume in case we were seen from the air so we had to rationalise that we were in the Royal Engineers Corps and that wireless operators play a crucial role in modern warfare!

I have never encountered anyone so relentlessly POSITIVE as Tom Cruise. Every day for five months, he was always giving at least 100%. If there was anything he wasn't happy about with the filming, he always had a good reason and whatever the problem was got fixed, which would invariably improve the shot. He's very demand-

ing of himself and those around him but if you do a good job, he shows his appreciation. He is absolutely in control of what he is doing in his performance and behaves like he is the luckiest guy in the world to be able to do what he does—making movies. His professionalism, talent and commitment both impressed me and took some of the edge off an assignment with more than the usual amount of trudging through mud.

Left to right: Sound Mixer Stuart Wilson, 2nd Boom Operator Tom Fennell, Boom Operator Orin Beaton. Not shown: Sound Trainee Henry Dyer. (Photo: David James)





The Nagra Seven recorder

The NAGRA Seven

by David Waelder and Brendan Beebe

The new Nagra Seven, a two-track recorder with a touch-screen interface, is a small jewel. Like all the iconic Nagras, it is made in Switzerland to exacting standards. Limited to only the two tracks, it is primarily intended for use by radio reporters and others who don't need a high track count. Still, it can be fitted with a timecode circuit and is entirely suitable in production work as an adjunct recorder.



The Nagra Seven and the Sound Devices 633



Many components in a small space but still organized and serviceable

It's also of interest to media professionals because of its flexible design concept. Software provides for multiple configurations that can be recalled to meet various assignment demands, and circuit boards may be installed to provide capabilities not commonly found in a battery-operated recorder.

The timecode system, when installed, operates from a very stable temperature-controlled crystal (TCXO). In addition to all the standard frame rates, it is capable of user-selected pull-ups and pull-downs.

All Nagra Seven recorders are provided with full iXML Metadata and Ethernet connectivity that can send files by FTP. It is also possible to fit a circuit board to provide ISDN or Wi-Fi and 3G connectivity. The ISDN link can serve just as a connection for recording phone conversations but is also potentially useful for doing in-the-field re-recording. The recorder can be set up so

that a director in another town, or another continent, can hear a recording as it was being made and at a quality level suitable for judging takes.

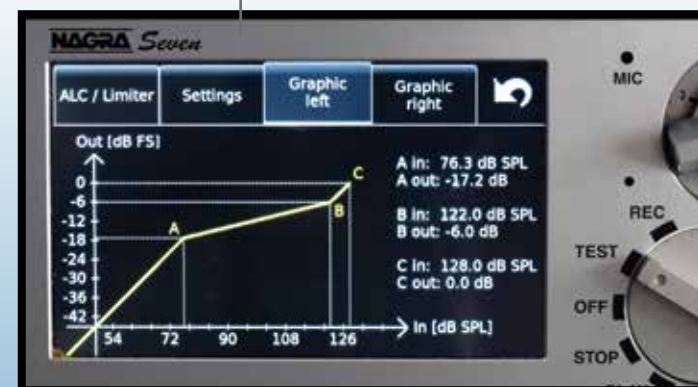
The editing function is another remarkable feature in a small recorder. When fitted, it provides non-destructive editing capabilities right on the recorder. The display screen shows an audio waveform that may be cut and pasted to a new file. An interview that wandered over topics might be edited before being uploaded to a radio station while preserving the original file. This might also be useful for occasions when the recorder is left running in a car that goes off to do remote work. The resulting hours-long file might be trimmed for inclusion with dailies materials without the risk of making permanent cuts.

Brendan Beebe took the machine for a week when working *The After* for the Amazon network. He was positively impressed by its performance and specifically mentioned the extensive and flexible settings for preamp filters. With the ability to tailor roll-off slopes and limiter parameters, it was, he said, more like a studio mixer than a recorder in its capabilities.

Brendan referred to it as a "gentleman's portable recorder" and gave particularly high marks to the performance of the preamps and the headphone amp and to the flexible touch screen with intelligent shortcuts. "It would be difficult," he said, "to have poor sounding audio on the Nagra Seven."

At \$3,300 for the base machine and \$3,800 with the timecode option, it's reasonably priced for a professional Swiss recorder. Being very light and offering outstanding performance out to 192 kHz sampling frequency, it's a good choice for sound effects recording. With only the two tracks, its applications in production are limited but it's also a window into thinking at Nagra.

Opposite page (bottom) and below: Many configurations are possible



THE SERIOUS SIDE OF COMEDY

ON THE SET OF ANCHORMAN 2

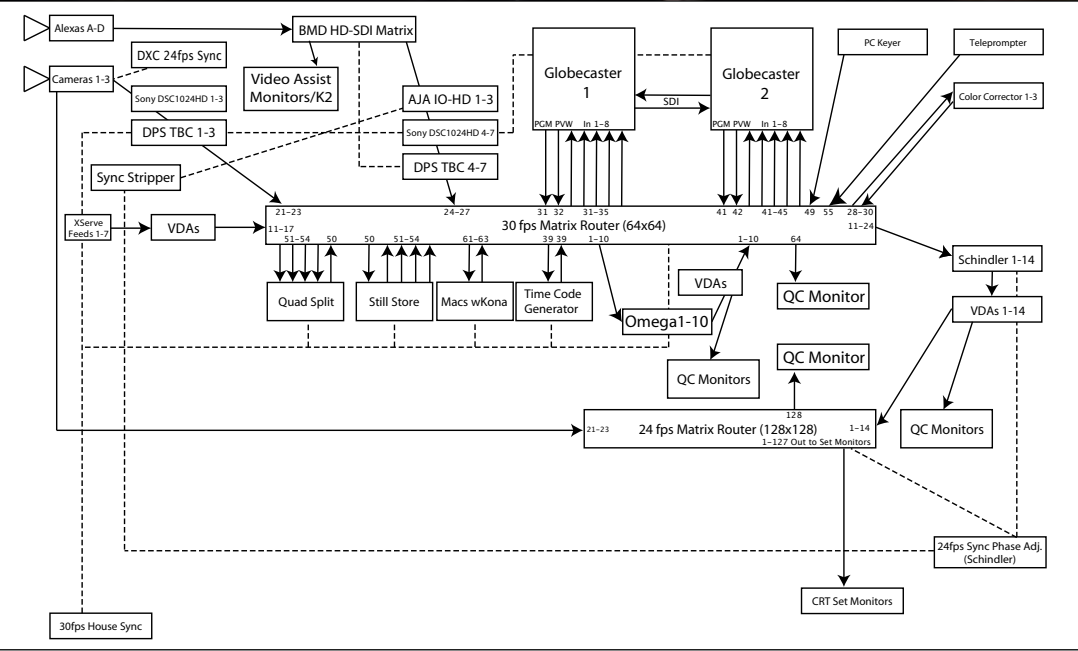
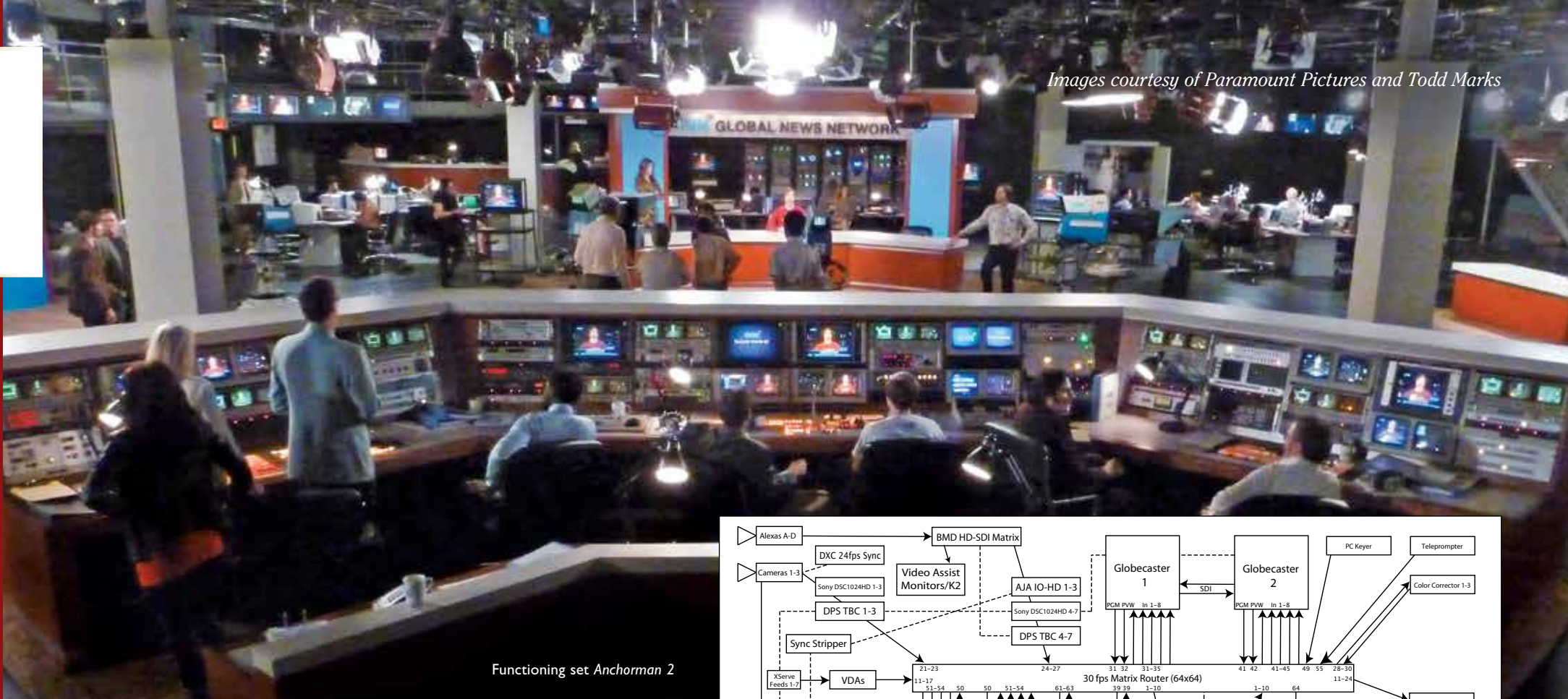
This account of the very complex business of building and operating a largely functional TV studio for *Anchorman 2* was drawn from an interview with Todd Marks, Jeb Johnenning and Perry Freeze on June 1 and an interview with Ben Betts on July 5.



It began, as these things do, with an availability check. The primary task was to build a functional CNN-style television studio circa 1980, and the secondary task would be to acquire and create era-specific video playback content for the studio.

The call went to **Todd Marks**; he would be the **Computer and Video Playback Supervisor**. Recognizing the scope and complexity of the assignment, he immediately set about assembling a team of Local 695 Video Engineers. He brought in **Perry Freeze** as **Video Playback Coordinator**, **Jeb Johnenning** as **Video Playback Engineer**, and then **Ben Betts** as **Supervising Engineer**. Later, he added **Chris Adams** and **Phil Haskell**, who provided invaluable support.

Among the first tasks was to draw up a budget, an assignment made more difficult because they had yet to be entrusted with a script. There were general notes of what might be needed but no scene plan or comprehensive gear list. Todd and Ben had experience putting together a fictional television studio, working together on *Deep Impact* and independently on several other shows like *Studio 60 on the Sunset Strip*. They had some of the necessary elements and collaborated on a speculative budget. Jan Pascale, the Set Decorator, had a strong working relationship with Todd from their work together on *The Internship*. This helped as they wrestled with determining the needs and sourcing all the era-specific equipment. Perry worked with Todd breaking down the extensive list of graphics and playback content as the Art Department provided more details.



The intricate routing plan required to accomplish the complex task of creating a functioning 24-frame studio that combined HD camera feeds (scaled, cropped and converted to SD), with SD camera feeds, graphics, pre-built video clips, live switching and more... (Diagram courtesy of Ben Betts)

To dress the GNN studio, the fictional start-up news organization, they would need more than 125 **CRT** monitors of assorted sizes, four electronic lighting panels, four electronic control panels, four satellite trackers, four audio mixers, four video mixer boards, three studio news cameras, six portable news cameras and a bunch of other support gear.

Much of the gear would come from Ben's company, Digital Image Associates, but they also drew on the resources of History for Hire, Todd Marks' company, Production Suppliers, and Jeb Johnenning's company, Ocean Video, as well as from Playback Technologies.

Making a complete television broadcast studio is difficult enough but this was a period story, set in the early 1980s. In the video world, thirty-year-old equipment is antique and getting it all to work well enough to at least appear functional was one of the challenges of the project. To assist in this process, the team recruited **John Monsour**, a self-taught video engineer of legendary ingenuity.

Todd Marks: John is one of the original twenty-four-frame engineers. He's the one who did the original Apple commercials. He's the one who figured out how to take the Mac Pluses and modify them to go twenty-four frame.



1. In the control room, the video crew used the GlobeCaster switcher to combine live and pre-built elements. The “on-air” video was then routed out to the GNN studio monitors.

2. Ron Burgundy (Will Ferrell) points to the weatherman, Brick Tamland (Steve Carell). On the monitors behind Ron, the live weather-map composite is just one of many that helped to create the realistic looking news room.

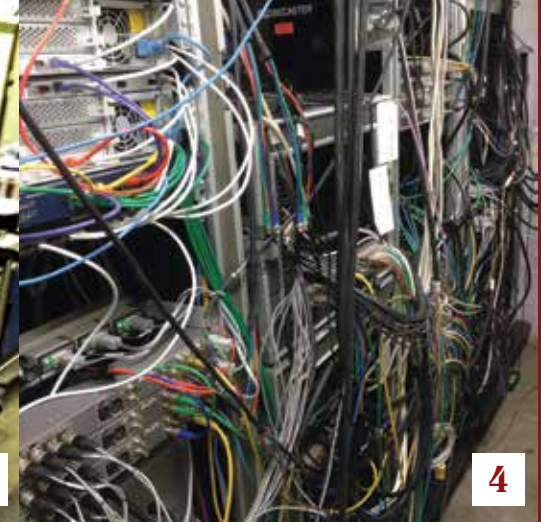
3. The “real” GNN studio engineering and control room included equipment for master sync, genlock, timecode master clock, camera control, other engineering functions and the video production and playback systems, distributing the images to the studio’s CRT monitors.



2



3



4



5

The pedestal cameras rented from History for Hire had been gutted and were really just empty shells. Just to get an image to appear on the video viewfinders required reinstalling functional camera circuits within the empty boxes. They ended up fitting a smaller and more modern box camera within the empty lens housings. But then there was an issue of rigging control cables to the lenses of the cameras so that the operators could run the zoom lenses from the controls on the pan and tilt handles. The focus controls from the period were manual rather than electric and operated from lines similar to speedometer cables. Two factors made this complicated: first, the original thirty-two-inch cables were not long enough to reach within the camera shell and be routed to the replacement camera in the lens housing and, second, the original lines drove Fujinon lenses and these were Canon lenses with a different coupling. Longer cables were unavailable from any regular source but John Monsour found a Venice Beach supplier of speedometer cables for hot rods who was able to fashion a cable and coupling at the needed length.

By long tradition, movies are projected at twenty-four fps. Video is normally distributed at 30 fps (actually 29.97 frames) so, to avoid seeing a noticeable and distracting strobe effect on CRT monitors, some means must be found to reconcile the discrepancy whenever video monitors appear in the image. The workaround is to process the video so that it runs at exactly camera speed and can be locked to the camera, one frame of video to one frame of camera image. (We call this video sync.) This same practice applies even when an electronic camera, like an Arri Alexa, is used to make the movie,

although the speed for a digital camera is 23.98 frames per second rather than the 24 frames of a film camera. This sort of alteration is necessary to allow the production cameras, the Alexas, to photograph the functional prop video cameras and also see the images on their viewing monitors. It’s also needed whenever the output of the functional prop cameras must appear on a monitor.

So, everything must be changed over to twenty-four frames to be filmed by the production cameras. But not quite. There are several points in the routing process where a traditional image may still be needed. The vintage signal processing units were designed to run at thirty frames and would balk at a lower frame rate. These were used to provide **Chroma Key** or to insert “**lower third**” or period-specific graphics.

John Monsour came up with an effective but complex scheme to address this need for different frame rates. He modified the cameras and their genlock circuits to scan the CCD at 23.98 fps, instead of 29.97. This involved a custom circuit board, tightly integrated into the entire camera system, attached to the side of the existing box camera. The cameras were genlocked back at the CCUs via a custom 23.98 sync generator. The 24-frame composite video signal was then fed into the 24-frame matrix video router. The RGB signals were scan-converted back to 30 fps and fed into the 30-frame router. The CRT viewfinders in the vintage cameras had been replaced by History for Hire with LCDs, so it was necessary to send a 30 fps signal back to the cameras, strip the chroma out and then re-color correct them within the camera housings.

The cameras were further modified to have “tally” lights that could be activated on demand. For a long time, studio cameras have been fitted with a red light, called a tally light, that would identify the live camera for the talent. For use in the movie, where dramatic needs might not be exactly in sync with the operation of prop cameras, the tally lights had to be custom-wired. Relays were built and wired to a controller at the CCU station, so that the tally lights could trigger following the **GlobeCaster** switcher or be manually turned on/off.

Since they also incorporated video monitors, it was necessary to apply this same clock-rate adjustment to the teleprompters.

The first budget, providing for all of the capabilities Todd and the team thought would be needed, landed in the production office with a thud. Immediately there were questions like “why do we need this?” and “what’s that for?” Todd and Ben set about grinding the budget down to the bare essentials.

As luck would have it, they had a scene on the first day of production in a smaller video studio set. They shot a sequence with Will Farrell (Ron Burgundy) and Christina Applegate’s character, Veronica, at WNBC, a working television station in Atlanta. This smaller studio served as a good shakedown for all of the gear and also provided production with a good opportunity to appreciate why these particular elements and capabilities were important to the overall film.

4. Some of the many miles of cables that had to be hooked up and run after all the gear arrived from Los Angeles.

5. While Todd Marks supervised the playback from the set, the engineering and graphics team (who were crammed into two attached former storage rooms) worked diligently to provide all the live mixed video, and pre-built graphics. Any of the fifteen video “feeds” coming from the room could be individually routed to any one of the 150 monitors on set. From left to right: Ben Betts, Phil Britton, Chris Adams, Jeb Johnenning, Shawn Noushinfar.

6. Both live and pre-recorded images were fed to the nearly 50 monitors built-in to the GNN “control room” console. The finicky old CRT monitors required being adjusted and color matched several times a day.



6

About three weeks later, the team returned to Atlanta, with gear optimized for the task, at least as much as these things can be worked out in advance. They had shipped the gear ahead by rail, 3,500 pounds on six pallets in the first shipment and more than double that in the second. The total shipping weight was more than four tons! The engineering work and operational functionality of this equipment gave the show capabilities that enhanced the whole process.

They had ten days to get everything wired and functional in the fictional GNN studio. There were many difficult moments due to the age of the gear, and the amount of graphics and playback necessary for Day One in the studio. Then the real work began. There were two aspects of this: operational and content.

Just keeping everything routed correctly, cued and ready to play in a constantly changing environment is a huge task. For instance, the vintage CRT monitors were all about thirty years old and tended to be balky and erratic; some days they'd work fine while other days individual units would refuse to work or would show color differently from their companions. Not all of the monitors were vintage CRTs; some of the camera viewfinders were LCD displays. Each design handled visual data a bit differently so keeping it all evenly illuminated, period-consistent and simply operational demanded constant attention.

Todd Marks: And also because we're dealing with CRTs which are inherently finicky and these are twenty-, thirty-year-old machines sometimes—what looked good on one would look completely out of scale on another or the color was completely screwy. We went through, before we started the production, and tried to match as closely as we could but...

Jeb Johenning: Isn't that what NTSC stands for? Never The Same Color twice.

Reasoning that the start-up of a new TV network might experience some glitches, Todd and Perry devised a clever way to cover the occasional slip-up:

Todd Marks: ...in the news offices, in our "wall of fifteen," the day before they go on the



The GNN News Wall. The video playback team produced and created 15 unique international news feeds for just this one scene. They ended up generating in excess of 100 unique video loops that played in the GNN studio and news offices.

air, we set the horizontal off on [the bottom corner monitor] so that it was kind of rolling slowly [and] we put an extra in front of it pretending to tweak it...

Little tricks like that could cover the occasional glitch but, for the most part, the gear had to work flawlessly or it would draw attention away from the story. More than one hundred monitors had to display images in some shots, wall moni-

tors had to show matching color, video camera monitors needed signal to be converted to black & white for period authenticity and everything had to be locked synchronously together.

Providing content for all those monitors was a large part of the assignment. This seems simple enough for the material generated by operating the functional prop cameras but it was still necessary to route the signal appropriately, sending the 29.97 signal to the right place for Chroma Key or **Schindler** processing, send the 24-frame version to the monitors that needed the slower frequency and keep it all coordinated. But there was also the matter of providing additional content beyond just the camera feeds.

A credible TV news center has more images up on the monitors than just their own anchors in the studio. There are reporters posting stories from the Mideast, from Washington and from across town. They needed images of those reporters; the baseball games they were covering, advertisements that would play between news stories, in short, anything that might play on a TV network. Just like the real television network, the fictional studio is a beast with a voracious appetite.



Monitors were mounted on rolling carts and would often be introduced to a shot at the last moment.

Mobile Monitor Carts

When they weren't actually filming in the GNN studios, the entire playback crew was preparing a repertoire of clips to show on the monitors. They would pose their newpeople in front of a green screen and then composite in the Taj Mahal or the Capitol Building in the background. They also made fake period commercials:

Ben Betts: [For] one of the commercials Todd mocked-up in his hotel room, he literally bought a can of beans, put them into a saucepan, shot it with his camera, [and] that became a commercial that we used. I mean, they had no budget for most of this stuff.

Sean had some stock footage. He made a fake airline commercial just out of stock footage. He added graphics and cut it together. [This is] on a Saturday, in Perry's hotel room, working on little pieces trying to come up with more material 'cause we didn't want to get caught with our pants down ... 'cause commercials are a great thing for something like this. [When] you need to cut to something, a couple stock commercials gives you something that's safe to roll to. It doesn't tie you into any part of the story.

It is possible, of course, to burn-in images to all the monitor screens throughout a scene. Production will often gravitate toward that solution because it means that they can postpone decisions about what should appear on the screens. Doing it live on the day requires considerably more planning and coordination, but there are good reasons for making that commitment. First, it simply looks better and more natural to have all the elements together in one place.

Jeb Johenning: I mean, I don't think it ever looks as good when you burn-in an image versus doing it for real because there are these subtle little things like just even the glow of the monitor reflecting onto the desk or onto a glass or all these little glints or some such—you know, again, like you said earlier, something's just off.

Also, a task that's pretty simple, inserting one image into one monitor face, becomes considerably more complex when a single shot requires fifty or more inserts.

Todd Marks: No, we want to do it live—as much as we possibly can—so as long as it's not something that we're supposed to be on the television that we haven't shot yet, which is impossible for us to do, we try to do as much [as we can] practical because it makes it better for the director, it makes it better for the actors, it makes it better for the editors, you know, even if they have to go in and sweeten things a bit later...

The live interactive video performance makes it possible for the actors to react and improvise within the scene. One of the most iconic interactions in *Anchorman 2* would not have been possible without this flexibility:

Ben Betts: The fact that everything works was great. 'Cause they really had a teleprompter there and the twenty-four-frame teleprompters were really used by the cast, just like they would in a real broadcast. We had that one infamous scene in the movie that was just a little throwaway thing in the original script, that just became hysterical.

[Steve Carell improvised a scene predicated on his weatherman character wearing green pants for St. Patrick's Day and then discovering that his legs disappeared from the composite image.]

Ben Betts: It was one of the first trailers for the movie. Because Steve Carell got out there and just ran with it. An improv comedian and a green screen opens you up to a lot of possibilities...

This is the kind of thing that's really only possible if all the components are working and interacting so the actor can see the effect and play with it. Done with images composited in Post, many of the comic possibilities would have gone unrealized.

Keeping all the elements running and coordinated live on set puts heavy demands on the agility of the production crew. Jeb Johenning and Perry Freeze and Ben Betts and Sharouz (Shawn) Noushinfar, the GlobeCaster TD/Engineer, and also Chris Adams and Phil Haskell, were kept scrambling every day.

Todd Marks: ...we had to be on our toes during the studio stuff and we had to change things up on the fly and, you know, they'd come up with stuff two days before and say, oh, we're going to have a scene where they're talking, Ron's talking to four different people at the same time. And so, their thought is—well, we'll have to shoot these individually and cut them and do it all in Post. And we're like, no, we can do it all live.

Perry Freeze: It was a lot of planning and a lot of work going in—on top of all the other daily stuff that we were shooting in the studio. And then, I think they said, "Action!" and then did a couple takes—they were over and done in twenty minutes.

This determination to handle as many components as possible live requires planning and commitment but pays dividends in spontaneous performances and an authenticity in the performances. For *Anchorman 2*, Todd and his team were up to the challenge.



The 4-camera live feed shot. Three cameras were placed in different areas of the GNN studio set building. All the feeds ran back to the control room where the live quad-split image was stitched together.



Champ Kind (David Koechner) and Ron Burgundy (Will Ferrell) smoking crack



Brick Tamland (Steve Carell) loses his legs on live TV



Todd Marks, Perry Freeze, Ben Betts at "GNN Offices" set (old Georgia Archives Bldg.)



Todd Marks

The Computer and Video Playback Supervisor, Todd was the leader of the *Anchorman* video team.

Ben Betts

As Supervising Engineer, Ben assembled the necessary gear and worked to make it, and keep it, operational.

Jeb Johnenning

His responsibilities as Video Playback Engineer were to have all the needed elements on hand and cued as needed.

Perry Freeze

As Video Playback Coordinator, he assisted Jeb Johnenning, as well as being Todd's right-hand man.

John Monsour

John came on the project as a Consulting Engineer and was instrumental in rebuilding old, sometimes gutted, equipment to run in a production environment.

Chris Adams, Phil Haskell and Sharouz (Shawn) Noushinfar provided support on location.

Glossary for highlighted words

Schindler Imaging Standards Converter Custom-designed scan converter that converts, color corrects and genlocks 30 fps computer/video signals to 24 fps or 23.98 fps signals.

GlobeCaster The Broadcast DVE system and Production Switcher that switches live video signals, triggers tally lights, performs various key functions (Down Stream Key, luma/chroma keys) and Digital Video Effects.

Chroma Key A process for compositing two images so one appears atop the other. One figure will be photographed against a color background, often green, that is not represented in the second image. A computer drops the green background and affects a seamless merger. Typically used to superimpose a weatherman over the weather map.

NTSC The National Television System Committee is responsible for specifying technical standards for broadcast television in the United States. The 120-volt, 60 Hz electrical power in use in the US requires different configurations than are in use in Europe and other places using 220-volt 50 Hz power. The term "NTSC" often refers to standard definition 30 fps (29.97) video signals.

Lower Third Literally, the lower third portion of a television image. Graphics, station IDs and text crawls are often placed in the lower third of the image.

CRT Short for Cathode Ray Tube, it denotes the older technology of televisions, before flat screens.



Ben begins the wrap-out at the GNN News Offices.

Just add water

...or mud, sweat, dust, etc.
Your choice.

Even if you don't, the real world probably will.



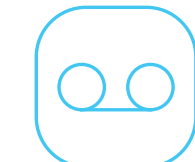
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