

SUMMER 2009
VOLUME 1 ISSUE 2

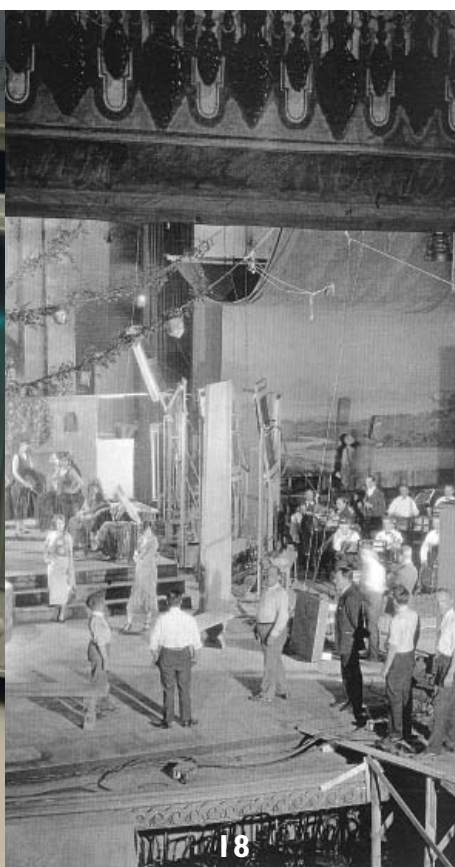
695 QUARTERLY

THE OFFICIAL PUBLICATION OF I.A.T.S.E. LOCAL 695





12



18



26

Features

Local 695 Emmy Nominations	10
PSC Solice Evaluation	12
<i>The pros and cons</i>	
When Sound Was Reel 2.	18
<i>Reviewing early sound on film</i>	
Review of RF Day.	23
<i>Zax-Net & the RF spectrum</i>	
Navigating the Horse Latitudes	24
<i>A list of things to do</i>	
Larry Levinson Productions	26
<i>Demonstrating against family-unfriendly practices</i>	
What Every Video Engineer Should Know . .	28
<i>Grounding: How to protect yourself</i>	

Departments

From the Editors & Business Representative	4
From the President.	5
News & Announcements	6
<i>Job update, In Memoriam & more</i>	
Education & Training	8

Cover: Warner engineer George R. Groves recording Fanny Brice for the movie *My Man*, circa 1928 (Courtesy George R. Groves Estate)

From the Editors

Welcome to the second edition of the 695 Quarterly. It was quite a lot of work getting the inaugural spring issue out; having to go through design choices and prospecting for articles, but it was well received and the reaction to it has been very positive

With all the work of getting a periodical up and running behind us, we're now having fun working on gathering new articles that you provide to us. We promise to keep up the high standards we have strived to establish.

One of the goals we set for this magazine is to communicate to the film and television community, as well as our membership, that Local 695 has the technical expertise and professionalism to be the leaders in the digital, new media landscape.

You may have noticed that Local 695 has been evolving the last few years. Our educational programs are in full swing,



with many of these events available for viewing from our website at 695.com. The 695 Quarterly, the Local 695 Membership Directory and a new computer system to assist the business representatives are all ways Local 695 is stepping up to meet the challenge of the new media world.

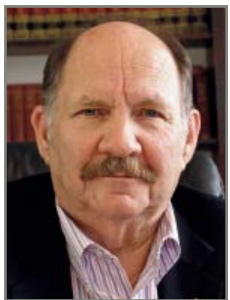
We greatly appreciate all the support we received on our first issue. Please keep the stories and ideas coming as we begin work on the fall issue.

You can reach us 24/7 at our email address: mag@695.com.

Faternally,
Eric Pierce, David Waelder and Richard Lightstone

From the Business Representative

It was reported by a trustee of the Motion Picture Industry Pension and Health Plans (MPI Plans) at the recent 66th IATSE Convention that **tens of millions of dollars are lost**, which would otherwise be residual contributions paid to the MPI Plans, because of the illegal reproduction (“**Piracy**”) of motion picture and television programs. The immediate direct effect of this “Piracy” and loss of residual contribution to the MPI Plans is a significant reason the cost of healthcare is being passed on to our members and threatening the pensions we have worked so hard to maintain.



Reacting to IATSE International President Matthew D. Loeb’s Convention Report on “**Piracy/Intellectual Property**,” the 836 delegates assembled at the recent 66th IATSE Convention, unanimously approved President Loeb’s report and passed the following resolution:

“Therefore Be It Resolved, that the IATSE and its Locals take measures to lobby government, promote legislative and regulatory safeguards and partner with the industry at-large in securing the motion picture business from piracy.”

It is evident that the continual loss of MPI Health and Pension contributions lost by such “Piracy” must be stopped. The administration of IATSE Local 695 is dedicated to effect the necessary laws and action to eliminate the illegal reproduction and transmission of this “Piracy,” and protect our members’ health and pension benefits.

A coherent strategy requires input both from you and from the business community. Please provide my office with your thoughts concerning this “Piracy” problem. Please contact us at Local 695’s business office or Local695@695.com and/or (fax) 818 760-4681.

Good content and good reading.
James A. Osburn

695 QUARTERLY

I.A.T.S.E. Local 695
Production Sound Technicians,
Television Engineers,
Video Assist Technicians and
Studio Projectionists
Certified & Chartered September 15, 1930
A California Nonprofit Labor Corporation
Incorporated July 31, 1951, State of California
Affiliated with the A.F.L.-C.I.O.,
California State Federation of Labor,
and L.A. Central Labor Council

5439 Cahuenga Blvd.
North Hollywood, CA 91601
(818) 985-9204 (323) 877-1052
(818) 760-4681 fax
local695@695.com
www.695.com

BUSINESS REPRESENTATIVE
James Osburn

PRESIDENT
Mark Ulano

VICE PRESIDENT
Jay Patterson

SECRETARY-TREASURER
Susan Moore-Chong

RECORDING SECRETARY
Elizabeth Alvarez

SERGEANT-AT-ARMS
Dean Striepeke

EXECUTIVE BOARD
Laurence B. Abrams
Agamemnon Andrianos
Scott Bernard
Courtney Goodin
Richard Lightstone
Andy Rovins

BOARD OF TRUSTEES
Allen Bernard
Gene Cantamessa
Eric Pierce

695 QUARTERLY CO-EDITORS
Richard Lightstone
Eric Pierce
David Waelder

695 Quarterly
Inquiries or suggestions
mag@695.com

PUBLISHER
IngleDodd Publishing

ADVERTISING DIRECTOR
Dan Dodd
(310) 207-4410 ext. 236
Advertising@IngleDodd.com

From the President

We are a technical Local; education keeps us afloat. In fact, we are obligated to a permanent kind of student-hood in our work. This Local has acted with a clear-eyed urgency to this end, establishing an industry model for preparation with our education program.

We are not alone. It was clear to our delegation at the IATSE Quadrennial Convention in Orlando, Florida, this past July, that a “pulling together” across the Alliance was taking place and education was the uniting factor.

Your representatives, Jim Osburn, Scott Bernard, Ed Moskowitz, Elizabeth Alvarez, John Coffey and myself, witnessed and participated in the transition to a new administration, lead by International President Matthew D. Loeb. A generational changing of the guard was endorsed with a purposed view to the future. Busy in our committee assignments and actively networking with our peers throughout the Alliance, we were struck by telling moments about where things seemed to be heading.



Poor economic policies and shortsighted politics of the recent past continue to reap their harvest of anxiety, making this the very moment that our collective pursuit of excellence is most needed. An important step toward meeting this need was the intensive curriculum being offered at the convention by the National Labor College (NLC) based in Silver Spring, Maryland. The NLC offers classes in the development of union skills and labor leadership, as well as bachelor’s degrees in several labor areas. The two-hour session the College presented drew an overflow crowd estimated to be near the total number delegates (836) in attendance at the convention. This was a highly motivated group of people committed to getting better at this labor thing, meeting another highly motivated group of people, whose job it was to teach them how to do it. It was good news.

Other issues high on the agenda were demand for strategies to repel the assaults being made on healthcare reform, and film piracy as losses into the billions hampered away at our members’ financial well-being. The organization seemed to be coming together in new ways, preparing for the coming storm. Realignment and reconciliation was everywhere in the air as President Loeb, Jay Roth from the DGA, and others spoke directly to the issue of current and future turbulence in our industry. Until a new business model with effective distribution and mutually beneficial payment formulas emerges, reading how things may play out will continue to be a challenge.

Make no mistake; this was not an empty Kumbya moment. It was more than 800 hard-core trade unionists rededicating themselves to getting good, getting tough, getting ready! Solidarity, on a practical level was emerging. We’re going to need it.

Faternally,
Mark Ulano
President I.A.T.S.E. Local 695

DISCLAIMER: I.A.T.S.E. LOCAL 695 and IngleDodd Publishing have used their best efforts in collecting and preparing material for inclusion in the 695 Quarterly Magazine but cannot warrant that the information herein is complete or accurate, and do not assume, and hereby disclaim, any liability to any person for any loss or damage caused by errors or omissions in the 695 Quarterly Magazine, whether such errors or omissions result from negligence, accident or any other cause. Further, any responsibility is disclaimed for changes, additions, omissions, etc., including, but not limited to, any statewide area code changes, or any changes not reported in writing bearing an authorized signature and not received by IngleDodd Publishing on or before the announced closing date.

Furthermore, I.A.T.S.E. LOCAL 695 is not responsible for soliciting, selecting or printing the advertising contained herein. IngleDodd Publishing accepts advertisers’ statement at face value, including those made in the advertising relative to qualifications, expertise and certifications of advertisers, or concerning the availability or intended usage of equipment which may be advertised for sale or rental. Neither IngleDodd Publishing nor I.A.T.S.E. LOCAL 695 have any responsibility for advertisers’ statements, and have not investigated or evaluated the authenticity, accuracy or completeness of the information provided by any person or firm listed in the 695 Quarterly Magazine. Readers should verify claims made in the advertising herein contained, and are requested to report to the Publisher any discrepancies which become known to the Reader.

NEWS & ANNOUNCEMENTS

Help During Tough Times

During these tough economic times, it's good to know that our industry has some very good organizations to provide help, and please remember to put these organizations on your donation list:

Actors Fund of America (actorsfund.org)

The Actors Fund is a nonprofit, nationwide human services organization providing programs that support the unique, essential needs of all who work in entertainment and the performing arts—on stage or camera and behind the scenes. The Fund is a safety net, offering quality services and individual attention to our community, giving all a responsive place to turn in times of need or crisis.

The Actors Fund Social Services offer comprehensive programs designed to meet the critical needs of entertainment professionals throughout their lives. Social workers provide crisis intervention, individual and family needs assessments, and develop long-term plans including ongoing support, education, information and referrals. In addition, financial assistance can be provided for essential living expenses such as rent, utilities or medical costs.

To request assistance, please contact:

Eastern Region

212 221-7300 ext. 119
intakeny@actorsfund.org

Central Region

312 372-0989
dtowne@actorsfund.org

Western Region

323 933-9244 ext. 55
intakela@actorsfund.org

Motion Picture & Television Fund Foundation (mptvfund.org)

The Motion Picture & Television Fund cares for you, your family, colleagues and friends. Going far beyond traditional healthcare, MPTF offers a continuum of care for the very young to the elderly by providing quality healthcare, child care, residential living and care for older adults, as well as social and charitable services.

Emergency financial assistance is available for qualifying industry members who experience financial hardship due to illness, disability, unemployment or other reasons.

Will Rogers Motion Picture Pioneers Foundation (wrpioneers.org)

The Motion Picture Pioneers Assistance Fund serves members of the motion picture entertainment industry (exhibition, distribution and trade services) who are encountering an illness, injury or life-changing event.

Emergency grants are available for housing, food, utilities and burial or cremation for members of the motion picture industry with 10 recent years of employment.

For more information, contact the Social Services Department at 888 994-3863.

Union Plus Programs (unionplus.org)

The AFL-CIO created Union Privilege in 1986 to provide union members and their families with valuable consumer benefits. By using the collective buying power of unions, we are able to offer a valuable, discounted products and services exclusively to working families. Union members qualify for a 10% discount with AT&T Wireless.

JOB UPDATE

Advertise Your Special Skills

Occasionally, the office gets calls looking for crews with special skills such as speaking a foreign language, mountaineering or working in extreme conditions. Make it easy to find you by entering your particular skills in the searchable text area of the online directory at 695.com.

695.com
695.com

In Memoriam

GARY BLACKWELL
Utility Sound Technician
Nov. 7, 1941 – Oct. 15, 2008

WILLIAM B. VOGT
Y-6 Technical Test Engineer
Mar. 11, 1928 – Sept. 22, 2008

GERALD PIERCE
Utility Sound Technician
Apr. 27, 1918 – Mar. 4, 2008

Contract Services Administration and Training Facility

On September 16, CTATF and CSATTF will be merging and moving to a new facility in Burbank. This means you can take care of all Industry Experience Roster (EIR) paperwork, including I-9's, and take Safety Pass courses all in one location.

The new address and contact info is:
2800 Winona Avenue, Burbank, CA 91504
CSATF: 818 565-0550
Safety Pass: 818 847-0040
csatf.org

Introducing Andre Kiichi Pierce



Born September 1, 2009, at 1:26 p.m. Weighing 7 lb 14 oz & 20 3/4 inches long to proud parents, Eric Pierce & Yoko Sasaki.

Stay Connected at www.695.com

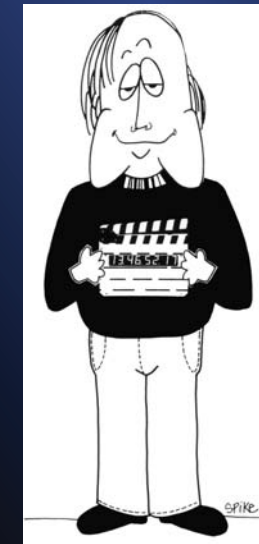
Read important Local 695 news, get announcements about upcoming events, access the new Available for Work List with real-time updates, take advantage of free classified ads, use the searchable Membership Directory (now accessible by non-members too!), keep your member profile up to date and more.



If you're already registered: Be sure to login and verify that your email address is current.

If you're not already registered: It only takes a minute to register, so do it today!

DENECKE, INC... PRODUCTS TO HELP YOU FOCUS ON SOUND.



DCODE TS-C



DCODE SB-T

DENECKE, INC.
25030 Avenue Stanford, Suite 240 • Valencia, CA 91355
Phone (661) 607-0206 • Fax (661) 257-2236
www.denecke.com • Email: info@denecke.com



EDUCATION & TRAINING

by LAURENCE B. ABRAMS

Summertime Sessions on the Move



On May 30, Local 695 member Steve Schuneman offered a demo and training session for the **Cuemaster** fishpole system. Steve demonstrated how this vest-harness-mounted articulating fishpole can be used in production to extend the capabilities of a traditional fishpole. After the demonstration, each attendee had a chance to “strap in” and put the Cuemaster through its paces, getting a good feel for how it works and what it can do.

During June, Local 695 conducted a pair of four-day hands-on training sessions at the IDEAS Lab in Van Nuys, both conducted by IDEAS Lab instructor Jennifer Penton. The first class, called **“Pro Tools on Production,”** was geared toward the on-set use of DigiDesigns’ Pro Tools software and related hardware products as they would be used in production for music and dialogue playback. The second four-day class focused on Apple’s **“Final Cut Pro”** products as used in the field by video assist engineers who synchronize and manipulate audio and video elements for on-set playback. Both of



these classes were filled to capacity.

Tim Holly, demystifying FCC rules and regulations

On July 18, Local 695 held **“RF Day”** at Bexel Corporation in Burbank. Local 695 member Tim Holly, an engineer at CBS

Studio Center, presented **“RF and What the Digital TV Transition Means for Radio Mic Users.”** When television stations across the country flipped the switch on June 12 in compliance with FCC requirements for broadcasters to convert from analog to digital broadcast, the entire landscape of radio frequency usage shifted dramatically. Because radio microphones and wireless video are utilized in virtually all film and television production environments, it’s critical for our members to understand how these new FCC mandates affect our work. Tim detailed the significant impact of this change and of other FCC rules and regulations and he offered specific guidelines and strategies for sound mixers and video operators who



695 members follow along with instructor Jennifer Penton during a Pro Tools software training session at the IDEAS Lab



RED engineer Craig Ferguson answers questions about the RED



face this new RF environment on a daily basis. This presentation was recorded on video and can be viewed on the Local 695 website, along with accompanying support documentation and downloadable reference materials.

Also at “RF Day,” Glenn Sanders, president and designer at Zaxcom, Inc., showed how the newly introduced **Zax-net** and related products dramatically alter the way wireless microphone systems could be used on production. Glenn described each of the components of the system and then offered a demonstration of how encrypted communications between the digital recorder, the mixing panel, radio mic transmitters and receivers, IFB and the slate can be tied together with Zax-net

to create an entirely new on-set workflow. Functions that seemed to draw the most interest from attendees were transmitted data encryption, SD recording in the transmitter, and remote control of transmitter settings. Video of this presentation is available on 695.com.

See sidebar: “Review of RF Day,” page 23.

On August 15, Local 695 conducted an all-day training session called **“RED Digital Cinema: Camera Overview and On-Set Workflow Methods”** at the Local 80 stage in Burbank. This seminar was geared toward data capture engineers, video assist engineers and production sound mixers, boom operators and utility sound technicians who work with the

RED camera. Presentations were made by Local 695 member Casey Green, RED spokesperson Ted Schilowitz, and Michael Cioni from Lighttron Digital, with additional tech support from a team of five engineers and specialists from RED Digital Cinema Camera Company. The day proved to be extremely valuable not just for our members but also for the representatives of the RED camera, who were very interested to receive direct feedback and suggestions from the data capture and sound people who will be using their equipment in the field.

We are continuing to offer our **“Fisher Boom: One-on-One Intensive”** training, having just recently conducted our 50th training session. As far as we know,

you can’t get this type of training anywhere else but from Local 695. More and more HD production means longer and longer shooting takes, which means there’s a growing need to consider the use of a Fisher Boom. Don’t miss the chance to get personalized training on this important piece of equipment.

For further details, announcements and information about additional training resources, visit www.695.com/edu.

Laurence Abrams, Local 695 Education Director, has been a boom operator since joining Local 695 in 1980. Laurence has also been on the Board of Directors for 17 years and the Webmaster for www.695.com since its initial launch.

Congratulations to the Local 695 Emmy-Nominated Production Sound Mixers and Their Production Sound Teams!

The 2009 Creative Arts Emmy Awards was held on September 12 at the NOKIA Theatre L.A. LIVE, Los Angeles, and will air September 20 at 8 p.m. on E!

Emmy-nominated 695 members are in brown.

Outstanding Sound Mixing for a Comedy or Drama Series (One Hour)

24 “10:00 PM - 11:00 PM” William Gocke, CAS, Todd Overton, Mark Overton, Corey Woods

Taking Chance T.J. O’Mara, Jason Benjerman, Dustin Chiocchi

Battlestar Galactica “Daybreak” (Part 2) Rick Bal, CAS, Greg Hewett, Matthew Willoughby-Price

Outstanding Sound Mixing for a Miniseries or a Movie

24: Redemption William Gocke, CAS, Todd Overton, Mark Overton, Corey Woods

Boston Legal “Last Call” Clark King, CAS, Bill King, Nick King

Generation Kill “The Cradle of Civilization” Colin Nicolson

Outstanding Sound Mixing for a Comedy or Drama Series (Half-Hour) and Animation

House “House Divided” Von Varga, Ken Strain, Juan Cisneros

Gifted Hands: The Ben Carson Story Jeffree Bloomer, CAS, Anthony Cargioli, Michael Faba

Entourage “Pie” Tom Stasinis, CAS, Debbie Pinthus, Tom Curley

Lost “The Incident” Robert Anderson, CAS, Ken King, CAS, Colin Jones, Jon Mumper, Mark Gresh, Nohealani Nihipali

Grey Gardens Henry Embry, James L. Thompson, Ron Stermac

Flight of the Conchords “Unnatural Love” Alex Sullivan, Gioia Birkett-Foa



The Office “The Michael Scott Paper Co.” Benjamin Patrick, CAS, Brian Wittle, Nick Carbone

Scrubs “My Jerks” Joe Foglia, CAS, Eric Pierce, CAS, Kevin Santy, Anna Wilborn, Brion Condon

30 Rock “Kidney Now!” Griffin Richardson, Chris Fondulas, Bryant Musgrove

Weeds “Three Coolers” Jon Ailetcher, CAS, Dave Hadder, Fred Johnston

Outstanding Sound Mixing for a Variety or Music Series or Special

81st Annual Academy Awards Ed Greene, CAS, Dan Wallin, Robert Douglass, Patrick Baltzell, Pablo Munguia, Mike Parker, Debbie Fecteau, Jeffrey Fecteau, Jim Ridgley, Ric Teller, Juan Pablo Velasco, Mark Weber, Toby Foster, Mike Cooper, Steve Anderson, Michael Aarvold, Larry Reed, Alex Guessard, Tom Pesa, Hugh Healy

American Idol “Finale” Ed Greene, CAS, Randy Faustino, Andrew Fletcher, Mike Parker, Gary Long, Christian Schrader, Debbie Fecteau, Dennis Mays, Pete San Filippo, Rick Teller Beijing 2008 Olympic Games Opening “Bruce Springsteen Super Bowl Halftime Show” Ed Greene, CAS, Brendan O’Brien, Pablo Munguia, Robert Douglass, John Cooper, Monty Carlo, Troy Milner Patrick Baltzell, Skip Kent, Debbie Fecteau, Jeff Fecteau, Rick Teller, Peter Dahlstrom

Dancing With the Stars “Episode 710A” Evan Adelman, Eric Johnston, John Protzko, Butch McKarge, Boyd Wheeler, Paul Chapman, Steven Chin, Judy Frenkel, Melissa Reid, Pete Kudas, William McKarge

The 51st Annual Grammy Awards Tom Holmes, Eric Johnston, Mikael Stewart, Ron Reaves, John Harris, Eric Schilling, Michael Parker, Tom Pesa, Bob LaMasney, Michael Abbott, Rick Bramlette, Jeff Peterson, Andrew Fletcher, Barry Warrick, Andre Arango, John Bell, Billy McCarge, Dave Rickmears, JP Velasco, Pablo Munguia, Steven Anderson, Craig Rovello, Bill Kappelman, Peter San Filipino, Ric Teller, Damon Andres, Eddie McKarge, Paul Chapman, Dennis Mays, Bruce Arledge, Michael Faustino, Kirk Donovan, Dave Bellamy, Grant Greene, Rod Sigmound, John Arenas, Matt Campisi, Jim Fay, Thomas Ryden, Hugh Healy, Peter Gary, Max Feldman, Hardi Kamsani, Anthony Lalumia, Charles Campbell, Rocky Graham, Gary Epstein, Mike Babbitt

Outstanding Sound Mixing for Nonfiction Programming

The Amazing Race “Don’t Let a Cheese Hit Me” Jim Ursulak, Jerry Chabane, Dean Gaveau, CAS, Bruce Beacom

American Idol “801/02” Jeff Fecteau, Debbie Fecteau, Daniel S. McCoy, CAS, Kamal I. Humphrey, Chris Tront, Bennie McRae

Deadliest Catch “Stay Focused or Die” Rik Elliott

102 Minutes That Changed America

Survivor “The Poison Apple Needs to Go” Robert Mackay, Terry Meehan, Christopher Kelly, Sterling Moore



Audio Solutions for the Film and Video Industries

SOLICE AUDIO MIXER



PPSC PROFESSIONAL SOUND CORPORATION

- * 8 INPUT CHANNELS WITH POWER, PARAMETRIC EQ PRE-FADE LISTENS
- * SUPER QUIET PRE-AMPS WITH VARIABLE GAIN AND PRECISE LIMITERS
- * INFINITELY VARIABLE HIGH PASS FILTERS
- * INDIVIDUAL CHANNEL METERS BOTH PRE AND POST FADE
- * INPUT CHANNELS 1&2, 3&4 CAN BE GANGED FOR STEREO RECORDINGS
- * ALL CHANNEL ASSIGNMENTS CAN BE PRE OR POST FADER
- * INDIVIDUAL LINE OUTS ON EVERY INPUT, PRE OR POST FADER ASSIGNABLE
- * 8 MIX BUSES FOR VERSATILITY
- * SLATE MICROPHONE
- * REMOTE ROLL
- * SUNLIGHT READABLE PPM METERING
- * PRIVATE LINE FOR BOOM COMMUNICATION
- * COMM - FOR FULL DUPLEX COMMUNICATION
- * SPEAKER OUTPUT FOLLOWS MIXER HEADPHONE SELECTION FOR PLAYBACK JOBS
- * 8 BALANCED OUTPUTS ON FULL-SIZE XLRs

PSC Solice EVALUATION



by David Waelder

The current trend toward multi-track recording makes heavy demands on the small mix panels traditionally used on location. Where a four-input Sela was once more than enough, today, even a six-channel Cooper can come up short. There are two responses to this challenge: one can use one of several very capable panels made for the music market or choose one of the new generation of mixers made especially for film production. Only two contemporary film designs are readily available today, the Sonosax SX-ST (about \$20,000+) and the PSC Solice (about \$10,000). The primary competition, the Yamaha O1V96, can be purchased in any Guitar Center for only \$2,700 and offers a blizzard of routing and configuration possibilities. It's not hard to understand the attraction of the digital panels—indeed; my co-editors in this journal are both proponents of the Yamaha.

I continue to favor purpose-built equipment, even at premium prices. There are distinct advantages including: a smaller footprint, lighter weight, efficient energy use and a premium look and feel to go along with that premium price.

At 16 inches x 16.5 inches and three inches tall, the Solice is a full-size panel and almost an exact size match to the Sonosax SX-ST. It's considerably smaller than the Yamaha and, at 15 pounds, less than half the weight of the digital panel.

With a maximum draw of only 20 watts (and typically less than 14 watts) to the Yamaha's 75 watts, it is easily four times as efficient. Many are dismissive of this sort of advantage. After all, 75 watts is no more than an ordinary light bulb and movie sets usually have enough power to light up the sky. If one only works in series television or major pictures, power might not be an issue. But I have found myself working smaller projects—still large enough for a sound cart and a panel mixer—where I was expected to operate on batteries. In one example, we were on a horse ranch in Thousand Oaks, California, shooting available light, and often without power for three or four hours. In that environment, the extra 50 watts demanded by the Yamaha plus the extra 18 pounds are a burden. Since the Yamaha requires AC power, there is also the matter of an inverter to run it from a battery. Heavier mixer + bigger battery + inverter + stronger battery tray on the cart all produce a very much heavier package. Lighter weight and greater efficiency are the payoffs of purpose-built equipment.

LIMITERS

A good limiter enhances the recording and provides considerable peace of mind for the operator. Signal-to-noise ratio is improved if one can record a little hotter, secure in the knowledge that the limiter will smoothly control any unexpected peaks.

Ron Meyer believes in using test equipment to precisely calibrate limiters so there are no external adjustments on the Solice. Adjustment pots are available on the circuit board for those with the expertise to use them.

We listened to passages at normal levels and then at levels of outrageous over-modulation to test how limiters coped with hot signals.

Friends! Romans! COUNTRYMEN! **LEND ME YOUR EARS!**

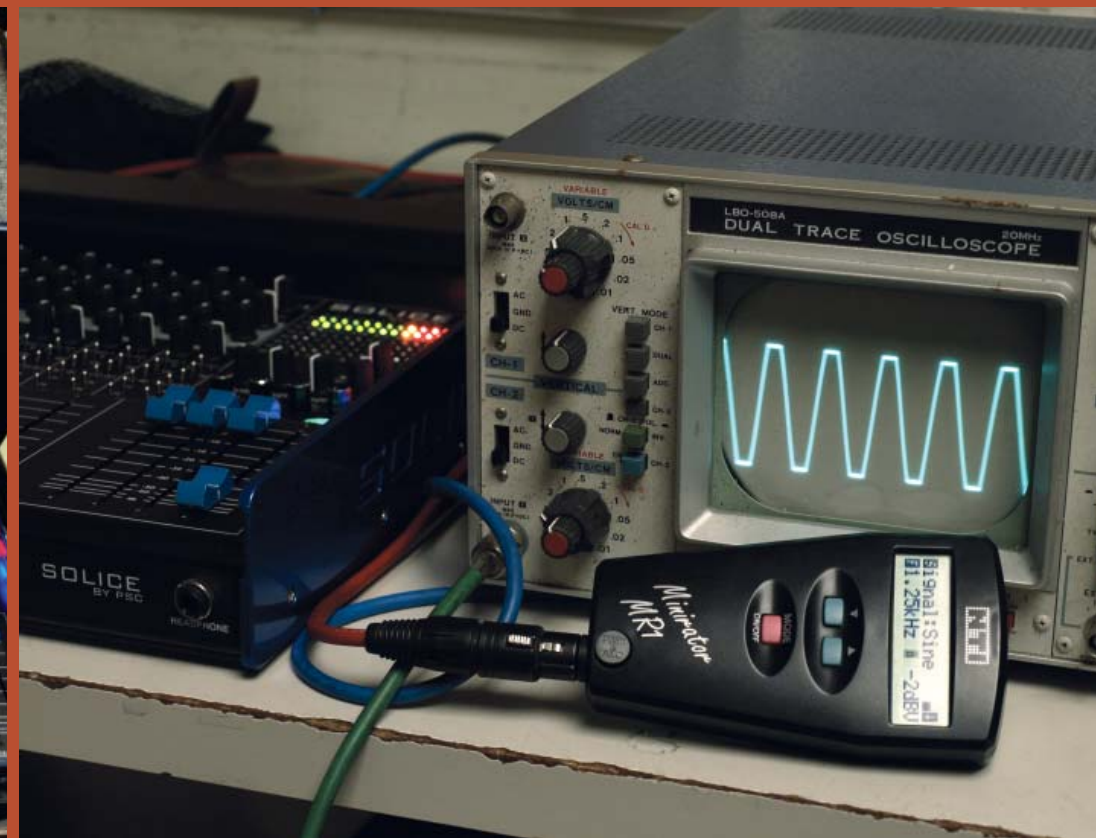
Settings for each channel precisely match the others and the action tamed sudden spikes without any audible clamping or pumping.

Comparing their performance to the Soundcraft and the Mackie 1642 was quite simple. These panels have no limiters. Advantage: Solice. While some recorders, like the Deva and the Sound Devices, have their own capable limiters, it is still useful to have that facility at the mixer. One sometimes must feed signals to components, like video cameras, that either have no limiters or limiters that cannot be relied upon.

Listening to the same overloads with a Cooper, the results were very similar to the Solice. Levels were well controlled without any obvious clamping. While the difference was subtle, the Cooper seemed to produce a slightly livelier recording while still controlling the overloads. The Cooper does not enjoy a great reputation for its limiters but these were set up in accordance with Glen Trew's recommendations and that does seem to produce a better result than the factory default setting.

Comparing the Solice with the Sonosax SX-ST I found, at first, that the Solice produced a more pleasing result. While both smoothly controlled overloads, the Sonosax seemed to use more compression. This is counter to expectations so I went back to re-test. The Sonosax has a panel-mounted threshold control. When set at mid-point, the limiter tended to engage too hard; results were better when it was backed off a bit. With the limiter in the Sonosax optimally tuned, the results were slightly better than the Solice. Overloads were seamlessly controlled and dynamics were maintained.

Since optimal threshold settings are, to some extent, interrelated with channel gain and with the amount of overload, the ideal setting is a constantly moving target requiring operator familiarity with the settings. Still, the Solice employs a "soft-knee" limiting circuit rather than a "brick wall" style limiter, like the Cooper, and I thought it could do better. I made some A-B comparisons for Ron so he might appreciate the differences and he immediately set about re-tuning the Solice limiters for a more gentle action. Reviewing the results, I think the Solice limiters are now as good as anything I have heard. They catch the occasional surprise and still allow a lively track. The action of limiters is a very subjective matter and Ron's commitment to making them work to an operator's preference is as important as any particular setting.



Solice vs. Sonosax SX-ST. Panels were tested side by side with an Aaton Cantar used for A-B monitoring and level calibration

Matching Sennheiser MKH 8050 mikes supplied identical signals to each mixer



Even in today's environment of radio booms, where the effective pre-amp is often riding on the boom operator's belt, the question of how it sounds is still relevant. A top-quality mixer with lots of quiet gain offers the option of running a hard wire for very quiet scenes. Checking the published specifications for the commonly used mixers, Cooper 106 and 208, the Yamaha, the new Sonosax and the Solice, I found they were all very close to one another with S/N figures varying from a low of 128 db to a high of 130 db.

To test if they do the same job, we set up two panels side by side. AC power for everything assured that each unit received adequate power. Using an external tone generator, we set up inputs for matching levels at each mixer. Identical Sennheiser MKH 8050 microphones were rigged on a stand with a double mount and routed, one to each mixer. In-line high pass filters permitted running the mixers flat without any distracting low-frequency rumble. The line out of each mixer was fed to an Aaton Cantar that was used for monitoring. Microphone trims on the mixers were adjusted to yield matching levels on the Cantar meters. By pressing the pre-fade buttons on the Cantar, it was possible to A-B the output of each mixer.

We first tested it against a Cooper 106, long a standard of performance for location mixers. Listening to headsets plugged directly into the mixers, it was immediately apparent that the headphone

An oscilloscope pinpointed when each unit ran into clipping

amp of the Solice had considerably more bottom end than the Cooper; room rumble was more easily discernable on the Solice. Switching to the Cantar for monitoring, the mixers sounded essentially identical with normal voice readings. To check for system noise, we moved the microphones about 10 feet from speaking voices and asked for quiet readings so that it would be necessary to push the faders way up to get a proper level. Again the results were

Each of the four headphone outputs has an independent routing switch and volume control

to our ears. The Solice had considerably more gain available but the units tracked together right up to the point the Soundcraft ran out of oomph. Like other boards in its class, the M12 requires AC power although a 12-volt modification is available. It is considerably larger and heavier than the Solice.

Listening to a Mackie 1642-VLZ3, we found they sound very alike

A top-quality mixer with lots of quiet gain offers the option of running a hard wire for very quiet scenes.

very similar but, with repeated listening, we thought we could hear a touch more low end on the Solice for a slightly warmer rendition. Gain capabilities and noise floor seemed about the same.

Using the same rig, we compared the Solice to a Sound Devices 442. Again, at normal levels, the two sounded identical. Pushing the gain, we found the Solice to be very slightly quieter. It also seemed to have about four db more gain available than the Sound Devices unit.

In testing against the SoundCraft M12, a small mixer made primarily for music recording, the two consoles were absolutely identical

with strong program material. With weaker signals, some discrepancies in tone became apparent. The Mackie seemed to be stronger in mid-ranges while the Solice had more extended low and top ends. Curiously, the Mackie sometimes seemed to sound better in that the voice was more prominent, but the Solice had the more accurate rendition.

The Solice was essentially identical to the Sonosax SX-ST in performance. With the assistance of several members of the sales staff at Location Sound, we listened carefully to the same sources with identical microphones and could hear no difference whatsoever. There were some small differences in limiter action (see Limiters

sidebar) but no difference in tone or noise. Pushing the consoles to their absolute limit, the Sonosax had one db, or possibly slightly more than one db, of additional gain. (At high levels of amplification, the background noise of even quiet locales is considerable and tends to float slightly, making exact calibration difficult.)

We checked our listening impressions with some objective testing. Frequency sweeps from a tone generator were dead flat on the Cooper. On the Mackie, sweep levels tended to float a few db up and down although there was never a large deviation. The Solice was quite flat throughout its range with no “float” but with a slight roll off below 40Hz. This is consistent with information from Ron that the HiPass filter is never completely disengaged. Since the HiPass filter would normally be fully on-line to control rumble, a slight attenuation at extreme lows is not a concern.

Connecting an oscilloscope to the output buss, we checked for headroom. How much extra signal a pre-amp will pass without distortion should, in a modern circuit, be something that can be calculated from the voltage of the system. Premium battery operated mixers typically work at 12 volts and may be expected to have 20db, or slightly better, of clean headroom. Higher operating voltages may yield slightly improved performance but at the expense of working efficiency. Panels operating from AC would theoretically have greater capabilities. An excellently realized design will exhibit slightly, but only slightly, better performance and there is plenty of room for disappointment in a poorly executed design.

Testing the Cooper, we counted 22db of clean gain before the waveform began to flatten out. A fine performance from a 20-year veteran.

The Mackie, in spite of its AC power supply, did not do nearly as well. With the Solice we counted better than 24db before clipping. Meters on the Cantar and output levels set on the Neutrik generator are not really precision lab equipment so these figures should not be regarded as absolutes. Clearly, however, they indicate performance from the Solice that is comparable with the best available.

Routing capabilities with the Solice are prodigious. There are eight output busses and any input may be assigned, singly or in multiples, to any output. Assignments are made with a cluster of dedicated switches and may be either pre or post fader. With clearly labeled switches, confirmation of routing is simple. There are also individual channel feeds, with individual level control and pre-post selection, so two multi-track recorders could be supplied independently. There’s even a dedicated input for your iPod.

Four headphone outputs, each with its own volume control and its own set of routing assignments, feed the two boom operators, the mixer, and video village. One user, trying out the panel for the first time, described the complexity as “a little wack.” The complication serves a useful purpose in allowing two boom operators to each hear only their own mike and also permitting a distinct feed to the village. This does require a bit of mental accommodation but soon makes sense. The mixer must follow a particular channel assignment to achieve distinct boom feeds but this is a minor issue that does not inhibit flexible use of the panel. There is a simple setting to cut through the clutter: setting any feed to position “X” allows it to track the “Mixer” settings. So, if “Director” (Video Village) is set to “X” and the mixer switches from “1-2 Mix” to an ISO Track, the Village will also hear the ISO.

It’s a very capable panel. Making such a high-quality product for \$10,000 in a limited production run is remarkable when you consider that the Cooper 106 sold for more when it was first introduced about 20 years ago and the 208 recently sold for \$14,800. Ron Meyer of PSC not only met his price goal but he did it while using components, like P&G faders and NKK switches, of the highest quality. The only cost-saving strategy I can identify is building the whole mixer onto a single circuit board rather than a modular construction where each channel has its own board. That does mean that the entire mixer must go in for service if a component fails but that seems a reasonable trade off.

The Solice is elegantly designed and incorporates many of the elements that made the classic Sonosax so attractive. High side panels, machined from billets of aluminum, provide a protective border for the knobs and switches. Lettering on the panel is engraved on the underside of a Lexan sheet so that it doesn’t

- Private line and slate switches disengage program audio to the headsets. This can be a distraction when trying to cue a boom operator. (Ron has revised the routing so the boom operator will continue to hear audio at a slightly reduced level.)
- When routed to individual feeds, the boom operators do not hear the slate mike and, at some distance from the cart, would not know when to call “speed.” (Ron is correcting this.)

These are minor issues. Ron has produced an elegant, versatile and functional panel. Some of the consumer models can do many of the same things or can be adapted, with the addition of a Sound Devices pre-amp here or a recorder limiter there, to accomplish the same ends. But the result is rather like using a Honda Civic, instead of a pickup truck, to haul plywood. Yes, you could attach a trailer and get the wood to the construction site but that’s a clumsy arrangement.

I did have some quibbles. I brought them to Ron’s attention and he immediately set to finding remedies.

wear away in use. Lights showing levels at the individual channels and at the output busses are under the Lexan so the mixing panel doesn’t become an element in set lighting. This also yields a relatively wide field of view of the meters. A protective cover slides into grooves cut into the side panels. The side panels are powder coat painted in a two-step process that lays translucent blue atop a silver finish to yield a “candy” color like a custom fifties hot rod. In a business where perceptions often trump realities, there is no harm in looking good.

I did have some quibbles. I brought them to Ron’s attention and he immediately set to finding remedies.

- The private line switch actually makes a slight mechanical clicking noise when pushed so it cannot be used if the mixer is close to the action. (For reasons related to protocols for stuffing circuit boards, this may be difficult to remedy.)
- In addition to mechanical noise, the PL and Slate circuits also made a loud electrical click when engaged. This would soon become tiresome for a boom operator. (Ron discovered that the electrical click is actually the slate microphone hearing the switch and is building in a momentary delay to mute the mike when the switch is being pressed.)
- There’s no switch to engage or disengage the EQ circuits. Switch control is useful for two purposes: it permits equalization to be disabled so there is no risk that inadvertently disturbing a dial will affect the sound. And, permitting EQ to be quickly monitored with an In/Out switch helps in determining optimal settings. (This will have to wait.)



Each channel is assigned to busses 1-8 by toggle switches. Left = pre-fader, middle = no assignment, right = post fade

ACKNOWLEDGMENTS

We are indebted to Ron Meyer and PSC for generously entrusting us with a Solice to test. We are also grateful to Location Sound and The Chinhda Company for making test equipment available.

We sought to involve as many people as possible in the listening tests. Robert Sharman and Erik Magnus both brought in mixing consoles and participated in the listening evaluations. Gene Cantamessa and Sam Hamer were both pressed into service when they came by the Local and Bill Hansen and Robert Anzalone assisted with tests run at LSC. Mike Paul and Tom Brandau provided consultation, although I am solely responsible for errors and omissions.

Circumstances did not permit checking specifications on all possible alternatives but, if there is sufficient interest, we could run a clinic at the Local and have people bring in their mixers for competitive evaluation.

When Sound was Reel 2



Disc dubbing operations at Warner Bros. Studio circa 1930 (Courtesy George R. Groves Estate)

A REVIEW OF EARLY SOUND ON FILM DEVELOPMENT

In the spring 2009 issue of the 695 Quarterly, I discussed some of the changes which have been wrought in the area of production sound recording over approximately the past 20 years. In this installment, I will attempt to cover some of the various formats employed for motion picture sound recording dating back to the first talkies, and discuss the implications of each.

This is by no means an exhaustive study. For clarity, I am leaving out a few intermediate stages of the use and development of some early systems. For those who wish to do further reading, I have included some additional references at the end of the article.



Vitaphone logo

In the early 1920s, Western Electric teamed up with Bell Laboratories engineers and began research on both sound-on-film and disc systems.

After Western Electric purchased the patent for Lee De Forest's Audion amplifier in 1913, work on a viable film sound system began in earnest. Early development in this area was carried out at the Western Electric plant located in Brooklyn, N.Y. By 1925, the Western Electric development work related to sound recording for film was acquired by Sam and Harry Warner, in a move that probably helped to establish the fledgling Warner Bros. studio as a serious contender in the motion picture business (which continues to this day). Probably one of the earliest instances of a viable sound on film production was *Stringed Harmony*, which starred the guitar performer Roy Smeck, with an introduction by Will Hays. (As head of the MPPDA, Hays would often



be the target of directors for his widely despised "Hays Code.") Made in early 1923, the film premiered on April 15 at the Rivoli Theater in New York.

Smeck later appeared in the premiere of the Warner/Western Electric Vitaphone system with the release of the musical *Don Juan*, starring John Barrymore and Mary Astor on August 6, 1926. However, despite critical acclaim and huge box office, the film was unable to recoup the huge investment (\$546,000) that Warner's had made in the production. With their backs against the wall, Adolph Zukor, then head of Paramount, offered Sam Warner a position as executive producer at Paramount, with the understanding that he would bring the Vitaphone system along with him as part of the deal. During this particular period, Sam and his brother Harry were at odds with each other over the future of sound for Warner's pictures (Harry's famous quote being, "Who the hell wants to hear actors talk?"). Sam saw this as an opportunity to advance his interest in the new medium and readily accepted Zukor's initial offer.

The deal collapsed, however, with the death of Rudolph Valentino on August 26 of the same year. Without its leading man, Paramount was in trouble and the deal was never consummated. With no further immediate offers, Sam eventually won Harry over to his view and production commenced on a Vitaphone short titled *A Plantation Act*, which featured Al Jolson uttering his trademark line, "Wait a minute, you ain't heard nothin' yet!" While there is little information about how the short fared (it was, in fact, lost for a number of years, later to be found at the National Archives.), Sam and Harry nonetheless proceeded to embark on production of *The Jazz Singer* in June of 1927.

Although *The Jazz Singer* is widely credited as being one of the first feature "talkies," it was, in fact, preceded by the production of

Fox Movietone's release of *Sunrise* in September of 1927. However, that film contained no sync dialogue, only an accompanying music score (although it didn't prevent it from gaining the first Academy Award for "Unique and Artistic Production" in 1929).

Sadly, Sam Warner would not live to see the results of the process he had fought for. On the eve of the New York premiere of the *The Jazz Singer*, he succumbed to complications from pneumonia. Despite this setback, the premiere of *The Jazz Singer* went ahead as planned, opening at the flagship Warners Theater in New York City on October 26, 1927.

The Jazz Singer was a huge gamble for the brothers Warner. Still suffering from the financial setback related to *Don Juan*, along with the capital investment in the Vitaphone system, the studio was on shaky ground. Adding to the woes of the studio, they also lost money on a radio station (KWBC) which Sam had purchased in early 1925. With studio losses mounting to more than \$330,000 (a huge sum in 1926), Harry Warner would stop taking salary, and he and his wife Rea moved to a smaller apartment.

Although Abe and Harry Warner were unable to attend the New York premiere of the film (having returned to California in the wake of Sam's death), they nonetheless made sure that the screening of the film would go as planned. Although the running time was only 89 minutes, the show comprised 15 reels of film and 15 sixteen-inch Vitaphone discs. Unlike the production of *Don Juan*, *The Jazz Singer* featured sync dialogue and any mistake on the part of the projectionist in cueing the disc at the start mark would result in public humiliation and failure for Abe and Harry. (Although I have been unable to find any direct citations on who the projectionists were during this period, I'm sure they must have been chewing their knuckles off, knowing they would have their heads handed to them if anything went wrong.)

The reaction of the audience at the premiere was stunning. As reported by Harry Warner's daughter, Doris, the uttering of Jolson's "Wait a minute" provoked a huge response on the part of the crowd, who would subsequently applaud after each musical number. After the show ended, the audience turned into a "milling, battling, mob," as described by one journalist, and began chanting "Jolson, Jolson, Jolson!"

Despite the huge success of the opening, however, the critics were not of universal acclaim. While *Variety* called it "[u]ndoubtedly the best thing Vitaphone has ever put on the screen ... [with] abundant power and appeal," *New York Times* critic Mordaunt Hall was more demure, commenting, "not since the first presentation of Vitaphone features, more than a year ago [i.e., *Don Juan*], has anything like the ovation been heard in a motion picture theatre... The Vitaphoned songs and some dialogue have been introduced most adroitly. This in itself is an ambitious move, for in the expression of song the Vitaphone vitalizes the production enormously. The dialogue is not so effective, for it does not always catch the nuances of speech or inflections of the voice so that one is not aware of the mechanical features."

Critical commentary notwithstanding, *The Jazz Singer* went on to become a huge success, reportedly grossing more than \$2 million

by Scott D. Smith, CAS

in box office through the end of 1931. This achievement would catapult Warner Bros. into the ranks of the “Big 3” studios (Paramount, First National and MGM). After two years of struggling, the studio was now flush with cash. Now thoroughly convinced of the future of “talkies,” the brothers went on to produce a string of Vitaphone hits including *Lights of New York*, *The Singing Fool* and *The Terror*. It also allowed them to move out from the “Poverty Row” section of Hollywood into a larger facility located in Burbank (the site of the present studio lot). In addition, the brothers bought stock in rival First National, which added to their growing theater operations.

The overwhelming response to *The Jazz Singer* was not lost on other studios of this period. Although silent films were still being produced, their numbers were diminishing quickly. Howard Hughes halted production of *Hell’s Angels* to accommodate the new sound process, and Universal Studios would go on to make both a silent and sound version of the classic *All Quiet on the Western Front*. The sound revolution was on its way.

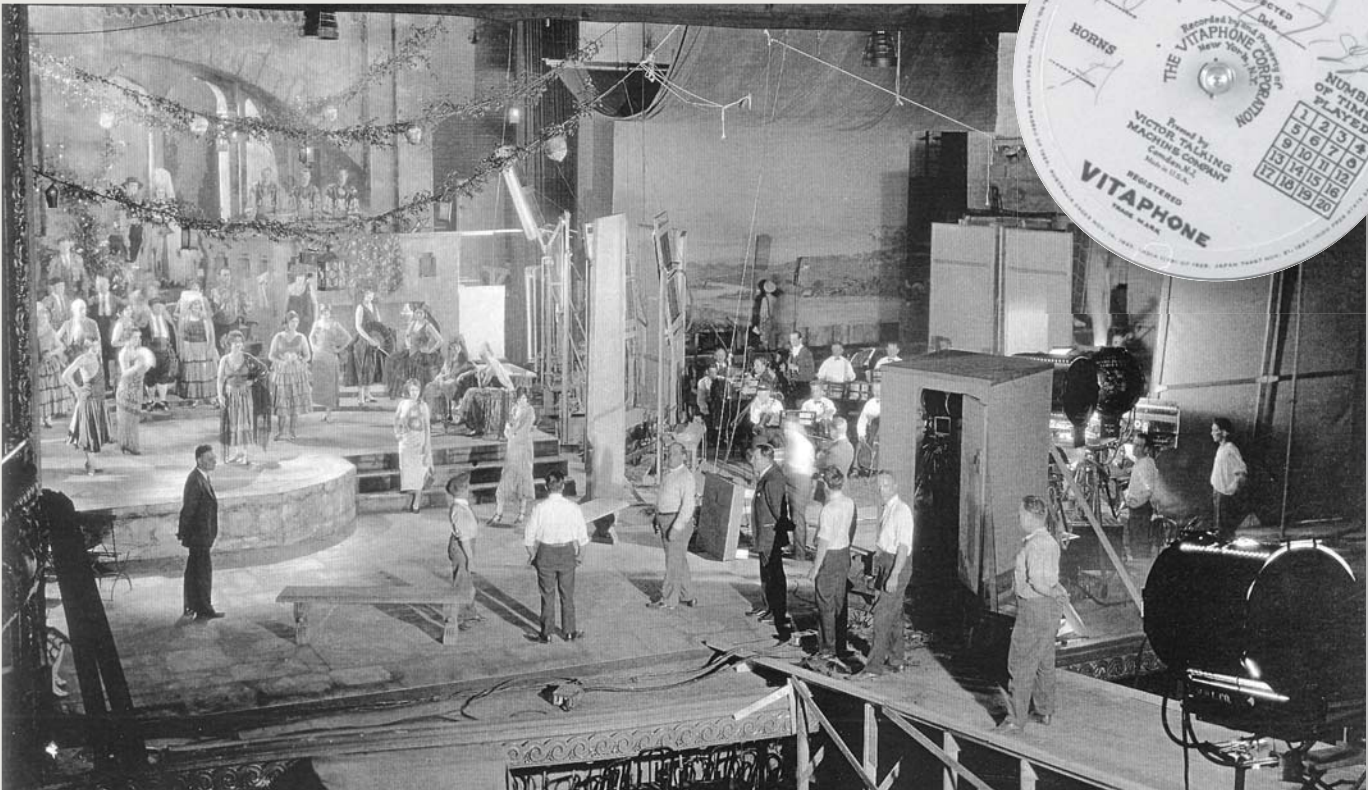
The Vitaphone Process

While not the only process for making sound motion pictures, the Vitaphone system had taken advantage of some of the early development in disc recording, which gave it an edge in quality over other the systems being developed during the late 1920s. Using 16-inch transcription discs recorded at 33 1/3 RPM (as opposed to the prevailing 78 RPM), the Vitaphone projection system employed a unique mechanical interlock system whereby the turntable was driven directly from the projector drive mechanism. Discs were

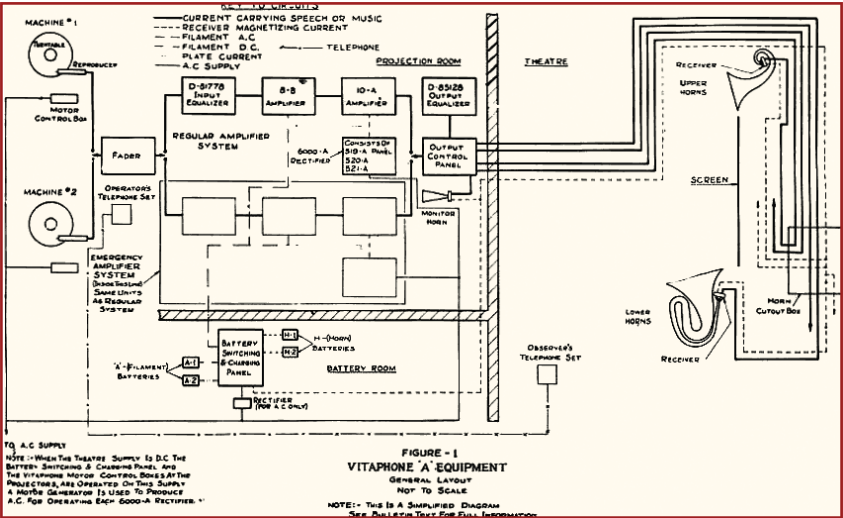
recorded from the inside out (as opposed to the usual practice of recording outside in), utilizing a reproducer cartridge equipped with a steel stylus. A further feature of the turntable allowed the arm bearing point to be moved in a short arc around the circumference of the turntable, which allowed the projectionist to “fine-tune” any sync errors between picture and sound. Those Western Electric engineers were a clever bunch of guys. The slower speed of 33 1/3 RPM allowed for a reproduction time of 11 minutes, which matched the length of the 1,000-foot film reels. This also established the rate of 24 frames per second as the standard for sound motion pictures.

Original recordings were typically made with a basic cutting lathe and a four-input mixer. Although the lathes turned at a constant speed, there was no direct synchronous connection with the camera, so all recordings were essentially made “wild.” The subsequent original discs containing music cues; dialogue and SFX were then mixed together using a system comprised of multiple turntables equipped with “Strowger Switches” which were initially developed around the turn of the century for automatic telephone exchanges. After re-recording to a “master” disc was complete, the discs would be sent to Victor for stamping.

However, despite the advantage of sound quality, there were problems. Most obvious of these was the issue of maintaining sync, both during re-recording as well as projection. One skipped groove would produce an unmanageable error between picture and



Above: Vitaphone set at Manhattan Opera House
Above, right: Vitaphone disc pressing. Notice check boxes to mark off number of plays.
(Courtesy George R. Groves Estate)



Vitaphone sound reproducer system

sound. Further, the discs were only good for about 20 plays using a steel stylus, after which they were useless. (A checkbox system was used to track the number of plays.) Distribution was complicated by the need to ship both film reels and discs, which frequently got separated or lost.

Clearly, there needed to be a better way to marry sound and picture together.

The Fox/Case Sound-on-Film System

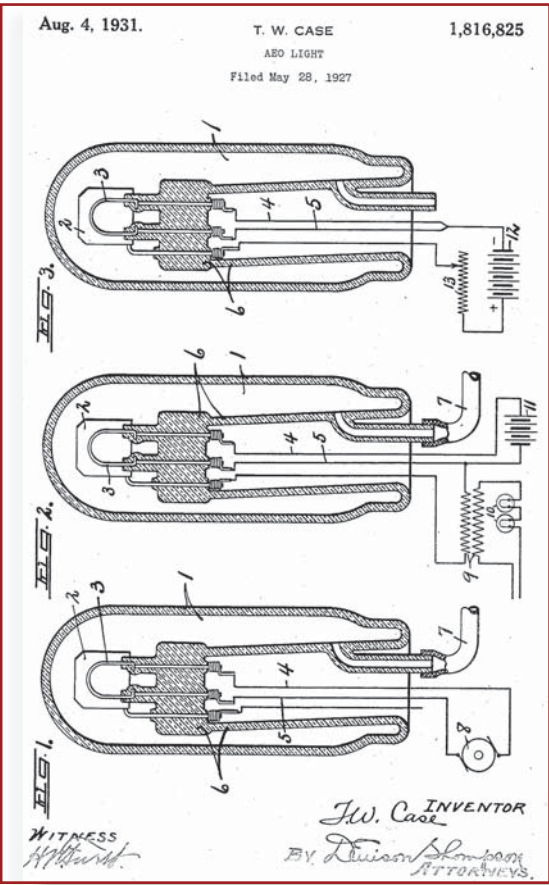
Although it had the resources of AT&T and Western Electric behind it, the Vitaphone system was not the only sound recording system being developed in the early 1920s. Prior to selling his rights for the “Audion” vacuum tube to Western Electric, Lee De Forest, in conjunction with Theodore Case and Earl Sponable, had been working on a competing process for sound-on-film recording. The early form of this system utilized a “glow tube” developed by Case in 1916. Comprised of a combination of rare earths and inert gases, the AEO Light (as it was later called) could produce a varying source of light which corresponded to the modulations of the electric signal fed from the output of the Audion amplifier. The light produced by the tube was focused on a narrow slit, which in turn was focused through a lens onto the edge of the film emulsion. The subsequent image would yield a series of gray or black lines, which could be reproduced with a similar arrangement of lenses and slit, with an exciter lamp as the light source, and a phototube assembly to pick up the varying light modulations. These minute electrical impulses were in turn amplified using the De Forest Audio system.

A commercial version of the Case-Sponable system was manufactured by De Forest, and marketed under the name of Phonofilm in 1923. A series of short films (mainly vaudeville acts and some Max Fleischer cartoons) were produced using this system in 1923 and 1924. Although this system solved the issue of sync between sound and picture (as well as the problems related to separate discs), it suffered from quality issues, most notably poor HF response and excessive wow and flutter, which made reproduction of music problematical.

Frustrated by the lack of progress under Lee De Forest (who was

having financial difficulties during this period), Case and Sponable severed ties with De Forest and continued further development in their system, which would ultimately render the Phonofilm system obsolete. Principal among the improvements was moving the sound attachment from above the projector to a position below, establishing a 20-frame offset between picture and soundtrack (which would become the standard still in use today). Further, they adopted the Western Electric speed of 90 feet per minute as the standard running speed for sound films (which also prevails to this day).

During this period (1926), Case and Sponable attracted the attention of the Fox Film Corporation, which was anxious to come up with a competing sound system



Case AEO Light patent

that would avoid infringing on the Vitaphone process. In July of 1926, they formed the Fox-Case Corporation. In November of that year, they released their first commercial entertainment short starring Raquel Meller. This would form the basis of what became known as the Movietone sound system. Regular newsreel film exhibitions using this system commenced in 1927.

Western Electric had not by any means rejected the sound-on-film process. While the quality of disc reproduction was superior to that of the Case-Sponable system, Western Electric engineers realized that they would ultimately need to provide a solution which



would allow for direct recording onto photographic film if they were going to remain viable in the market. With the extensive resources of AT&T and Warner Bros. behind them, Western Electric developed a unique system of light modulation comprised of a set of narrow metallic ribbons which were placed within a magnetic field, and modulated with current from an amplifier. Known as the “light valve,” this system was introduced commercially in the early months of 1928. Despite still needing some improvements, the light valve offered so many advantages over the cumbersome Vitaphone process that it was quickly adopted by Fox and other studios. By March of 1930, the Vitaphone system was dead (although Warner’s would continue to use the Vitaphone name as its trademark for film sound releases).

Next installment: The race is on: the battle between Western Electric and RCA in film sound development.

Thanks to Sources

Although it’s not possible to credit all the sources utilized for this article, the author would like to thank the following people and organizations for help in assembling the resources for this piece: Warner Bros. studio archives, Universal Studio archives, Doug Hart (Widescreen Museum), The Vitaphone Project, Wikipedia, Mark Ulano, John Mullin, AES, SMPTE, Nicholas Bergh, AMPAS, Edward W. Kellogg and the George R. Groves Estate.

Additional reading:

1. *The History of George R. Groves*, sound mixer (and later head of the Warner Bros. Sound Department from 1957 to 1972) during the Vitaphone era. www.georgegroves.org.uk
2. *History of Sound Motion Pictures* (Edward W. Kellogg SMPTE Journal) www.aes.org/aeshc/docs/smppte/movie_sound/kellogg-history1.pdf
3. Moving Pictures That Talk (Mark Ulano, CAS) www.filmsound.org/ulano/index.html
4. The Vitaphone Project www.picking.com/vitaphone.html
5. The Widescreen Museum www.widescreenmuseum.com
6. Wikipedia http://en.wikipedia.org/wiki/History_of_film#The_sound_era

Review of RF Day

by Richard Lightstone & Eric Pierce

The first half of Local 695’s “RF Day” was the highly anticipated demonstration of the latest Zaxcom invention “Zax-Net.” A Deva or Fusion recorder and the IFB 100 anchor the system.

Using a 2.4GHz RF signal, Zax-Net sends IFB audio, time-code, metadata and remote control commands to any Zaxcom wireless: the ERX1, ERX2 and TRX models.

The ERX2 can be connected to a time-code slate and will automatically display proper time-code and metadata as entered through the Deva or Fusion. (The ERX1 and 2 are new products. ERX2 has a built-in time-code reader/generator and output to continuously jam digital slates. No photo was available as of writing).

Zaxcom’s President, Glen Sanders, demonstrated operation of the ERX2 with a Denecke time-code slate. When the sticks were open, it displayed the Scene and Take metadata along with time-code and user bits as entered into the Deva/Fusion.

The highlight of the session came when Glen wired five audience members with Zaxcom transmitters. While conversing with Glen, each was recorded on the installed SD cards but not on the Deva. Using Zax-Net to control the transmitters from the Deva, Glen directed the five units to replay audio simultaneously and he synchronously re-recorded it all to the Deva in a single pass. This capability permits RF problems like hits and drop outs to be easily corrected in the field.

Here is a list of the Zax-Net features:

- Remote control of wireless microphone parameters. Commands include pre-amp gain, TX frequency, internal recording mode and transmitter standby.
- Remote distribution of time-code to Zaxcom digital recording wireless microphones. Ensures the transmitter’s back-up recording time-code stamp matches that of the Deva/Fusion and camera.
- Wireless virtual multi-track playback of wireless transmitter recorded audio. This feature will synchronize any number of Zaxcom wireless transmitters for time-code-referenced playback so a Take can be re-recorded by Deva/Fusion with the original time-code as if it was being recorded for the first time.

Following Glen Sanders, Tim Holly, Local 695 member and RF coordinator for CBS Radford Studios, took the stage to give a



presentation on the RF spectrum. Tim provided the participants with a detailed booklet as well as a PowerPoint presentation as he covered the recent RF spectrum issues affecting sound and video professionals in our industry. Audience participation throughout the event kept the pace lively.

Beginning with how digital broadcasting has changed the RF landscape, Tim explained how the digital television broadcast signal is different from analogue and how it affects our audio and video RF transmitters.

The white spaces, the areas we’ve traditionally used between television stations, have completely changed with the redistribution of television frequencies. And much of our former working frequencies are being reassigned to LMRSS (land mobile radio). Tim explained how to find new frequencies as well as what to do when those don’t work in a particular location or on a different day, as well as the reasons that happens.

Spectrum analyzers are an important part of finding clear areas to use for our RF equipment and many choices are available. They are invaluable tools; whether it’s a wide range digital analyzer, hand held portable or one built into an RF receiver. Tim spent a good amount of time in understanding how analyzers work.

Other issues discussed were: Manufacturers claims to be part 15 compliant; do these really apply to us? Part 74 does! How and why to keep clear of Land Mobile Radio Public Safety, SETI and Amateur frequencies. Licensing sound and video operators; is it necessary? How to keep out of trouble with the FCC.

Both of these presentations from “RF Day” are available for viewing along with their reference material on 695.com.



NAVIGATING THE

Horse Latitudes

This last year, with strike threats and productions running away to whatever state had the most attractive rebate program, was challenging for nearly everyone. For most of us it's already too late to choose rich parents so any advice or coping mechanism is likely to be a bit too little, too late. Even so, there are things one can do to help in present circumstances. Better times will come but they will probably be followed by another slowdown sometime after and there are definitely things one can do to be better prepared next time.

- The Local 695 website maintains an availability list. This has the potential to be a very useful resource if people would adopt the habit of checking and using it before just calling the usual suspects. It's a way of more widely spreading the work and experience base.
- There is an active program, again run through the website, encouraging members to trade out workdays to benefit members who may be just a few hours short of qualifying for MPH. The best way to be a beneficiary of this system is to extend a helping hand on those occasions when you have a relative abundance, casting your bread upon the waters.
- When work is abundant, immediately receiving every phone message is less critical. When there may be only one call per month, it is critical that every message get through. Use the quiet time to review your voice mail message and delivery system and tweak it for optimal effectiveness. What if someone calls late at night or when you are out to dinner or a movie? You don't want to make your family life miserable just for a single day of work but you do want to make certain that all your associates have every operative phone number and good ways to get in touch with you.
- Some members supplement their income by taking work teaching the craft to others. There are several schools in the Southern California area that might provide teaching opportunities.
- The Local administers courses in a variety of disciplines including Fisher Boom work and Pro Tools. Some of these courses are fully paid by funds from Contract Services and some can be taken at a reduced rate. Expanding skill sets is a good way to open up work opportunities and quiet times can be put to productive use by taking the required training.
- Quiet times can often be opportunities to develop products that can be sold to fellow crafts people. This might be the time to investigate making that specialized boom stand or sliding boom pole grip or rack mount video monitor frame.
- And, finally, just as Harrison Ford used to work as a carpenter so he didn't feel compelled to accept every crappy acting assignment that came along, it can be a good thing to develop a marketable skill that can help tide one over the rough spots. Long-term success is sometimes a matter of being able to hang in there.

Demonstrators Take on Larry Levinson Productions



by David Waelder

Larry Levinson Productions is a busy production company. According to International Representative Gavin Koon, they shoot 30 to 60 shows per year, all without a union contract. Although some key players earn living wages and even have health benefits, many employees work long hours at effective wages as low as \$8

per hour. People who have worked for Levinson Productions report that they are enticed with the promise of health coverage on the third project worked but the opportunity to work that third project is commonly denied to anyone who is not a department head. There are also reports of sloppy adherence to standard safety procedures.



Laurence Abrams and International Representative Gavin Koon at June demonstration

The IATSE has long been trying to organize Levinson Productions but the company is stubbornly resistant. They hunkered down and weathered a five-week strike on the production of *Megastorm*. Seeking to bring pressure from another direction, the International focused on Hallmark, the largest Levinson client. To bring the family-unfriendly practices of Levinson Productions to the attention of family programmer Hallmark, the International organized demonstrations at the Studio City offices of Hallmark Movie Channel. To date, e-mail solicitations have drawn more than 200 union members to three demonstrations in May and June, communicating that Hallmark cannot count on business as usual while a major content supplier denies overtime and health benefits to employees.

Local 695 members have been represented at all of these activities. In addition to staff members Scott Bernard and Laurence Abrams, participants included Ted and Sam Hamer, Coleman Metts, Jerry Wolfe, Jerry Boatner, Brion Condon, Eric Pierce and David Waelder. Demonstrations typically start around 10 a.m. and run until noon or a bit after. The International provides coffee, Danish and parking. Participants report good camaraderie and a chance to network. Whenever there is a chance encounter on a set with a fellow demonstrator from one of the other locals, there is a special sense of shared purpose. Please come out and join us, if you can, the next time you receive an e-mail alert. Let's keep the pressure on.

International Representative Peter Mareley addresses the crowd at June demonstration



What Every Video Engineer Should Know and How to Survive the New Age of Digital Media

Grounding: How to Protect the Life of Your Gear, Your Signals, Your Crew Members and Yourself

by Ben Betts

As the camera operator leans in to check the shot, he screams in shock as a spark arcs from the eyepiece to his forehead. Upon investigation by the dolly grip, it is determined that the video coax is responsible.

We have literally witnessed video cables melting and catching on fire. Last year on a feature film in Downey, the call went out on Channel 1: “Ummmm, video guys ... your wire is on fire!” You can easily imagine what that can do to your equipment, not to mention fellow crew members. It also doesn’t help your reputation as a video professional to be known for your lethal exploding wires. Although, it might just garner a bit more respect for your potential cannon-fuse video cables.



This is more common than you might think, and it’s merely an example of the hazards of poor wiring, ground loops and different ground potentials. We’ve all witnessed the problem, usually evidenced by hum on an audio line or noise in a video monitor. The typical solution is to lift the ground pin on the power connector. This often will limit the amount of apparent noise and seemingly solve the problem. However, by defeating the electrical ground, you’ve just opened Pandora’s box of electrical hazards.

Why is this happening and what is going on? All of our audio, video and computer cables have grounding and shielding wires in them. These are typically also connected to the chassis ground of the equipment, which is supposed to be attached to Earth ground via the power connector. If you disconnect the ground from one of the power connectors, the small shielding wires in the signal cables become the ground path. Positive electrical current is always trying to get back to ground, taking the shortest route to get there (path of least resistance). Hopefully, this is the heavy-gauge wire in the power cable, but it could also be via anyone or anything in contact with the ground. (Remember why we don’t use hair dryers in the bathtub anymore?)

There are specific safety reasons why electrical codes (NEC Article 250 section 21[d]) require grounded conductors. That third pin is not just to make it easier to plug in the polarized plug in the dark, but to protect the public from electrocution hazards.

The noise in the audio or hum bars on the screen are often the result of two different ground potentials. On a film set, this is typically caused by mixing two electrical sources, like a generator and the “house” or local power. Due to audible noise, the generator is usually placed as far away from the production set as possible. Theoretically, the Earth ground (usually a stake, literally driven into the ground) should be the same on both the permanent structure and the temporary generator. However, due to all the variables common with the exotic film locations we visit and human nature, undoubtedly they will be different.

A great deal of confusion comes from those who know enough about electrical wiring to literally be dangerous. We see plenty of power cords with only two conductors that work fine, and the neutral (white wire, silver screw and wider pin on a polarized plug) is attached to ground at the Main Electrical Service Panel anyway, so what’s the big deal? The third pin, as a ground conductor (green or bare wire), was first added in commercial devices with metal enclosures to protect users from accidental shock, should a short circuit occur. Because many homes still only had two-prong plugs and devices without metal enclosures don’t pose much of a threat, UL adopted a standard for “double-insulated”

Ohms Law and Current Loss

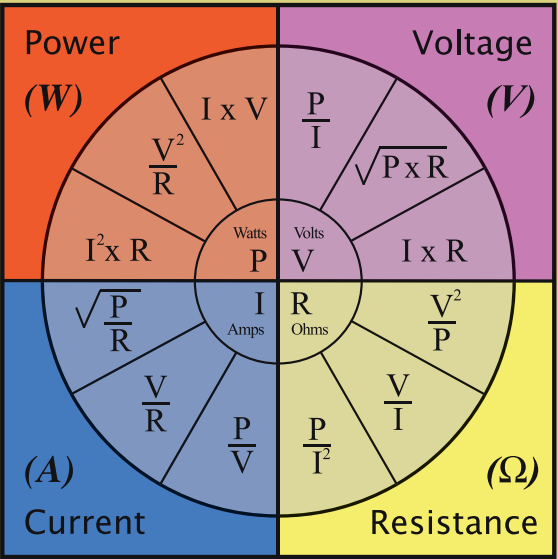
Everything that conducts electricity offers some amount of resistance, whether it is wire, a light bulb or power supply in electronic equipment. Every electrical device has a label stating how much power it draws, listed in either Watts or Amps. If you take that amount and apply it to Ohm/Watt’s laws, you can determine how much resistance that device offers.

- Power, measured in Watts, commonly referred to as “P”
- Current, measured in Amps, commonly referred to as “I”
- Voltage, measured in Volts, commonly referred to as “V”
- Resistance, measured in Ohms, commonly referred to as “R”

The most important formulae for calculating voltage and current are “Ohm’s Law” and “Watt’s Law”:

Ohm’s Law is Voltage equals Current times Resistance (V=IR)
Watt’s Law is Power equals Voltage times Current (P=VI)

You can also combine Ohm’s and Watt’s laws, so Power equals Current times Resistance times Current (P=(IR)I or P=I²R) etc.



As far as power cables go, if a conductor is larger, it will generally offer less resistance. For standard 120V U-ground copper electrical extension cables (stingers), you will often find several gauge cables in use. The most common are 12, 14 and 16 AWG.

NEC Load Carrying Capacities			
110/220/440 VAC			
Stranded Copper wire 167° F (75° C)			
AWG (gauge)	Conductor Diameter (Inches)	Resistance per 1000' (Ohms)	Max 3-wire transmission (Amps)
8	0.1285	0.6282	50
10	0.1019	0.9989	30
12	0.0808	1.588	20
14	0.0641	2.525	15
16	0.0508	4.016	8

devices whose enclosures were isolated from electrical connections and didn't allow the consumer to handle any conductive materials. This is why your blender, lamp, hedge trimmer and clock radio don't need grounded plugs. However, in the information age, devices employing high-frequency components, such as computers, required RF shielding, typically in the form of a metal housing that has to be attached to ground. This reintroduced the three-prong plug to consumers, re-spawning the need for the "ground lifter."

The ground lifter is probably the most misunderstood, misused and most dangerous 49-cent object available at just about every grocery, hardware and convenience store. If you look closely, they all have a metal tab or wire (usually green), that is SUPPOSED to be attached to a supposedly grounded electrical box. The intention is to adapt a three-wire grounded plug to a two-wire receptacle, while maintaining the ground connection. Of course, you rarely see ground lifters used how they were intended. In fact, many people decide to "make their own" by breaking the ground pin off cords and cube-taps. This is not only a bad idea, but strictly prohibited by the NEC. The lack of a ground is also why "Zip cord" and "Add-a-taps" are no longer supposed to be used on film sets.

OK, so I'm not supposed to disconnect the electrical ground? How can I fix the problem? The best way to solve noise generated by ground loops is to avoid them in the first place by wiring things correctly. Never mix AC power from two different sources. In other words, decide where you are going to plug in all the production equipment; either the house or generator, not both. When in doubt, just run another stinger, following the signal path and plug everything into the same source. If you're sharing signal cables with different departments, make sure everyone is

You have to use large-enough gauge electrical cables to supply adequate voltage at the required current. This is not only to provide enough power for the device to work, but also to allow a large-enough ground conductor for proper shielding. High voltage drops quite quickly over long distances and if the device draws a large amount, it will need heavy-gauge cabling in order to be powered adequately from a long distance away.

To put this into real numbers, if you are powering a Plasma screen that draws 12 Amps (1440 Watts), you would have to use at least a 14AWG stinger. For every 100 feet of 14AWG cable, there will be an extra $\frac{1}{4}$ ohms of resistance, meaning you'll lose about three volts. That doesn't seem like a lot of lost voltage, but you couple that with all the other irregularities in the power system, crappy 16AWG OSHA cords, cheap power strips etc. and before you know it, that Plasma's power supply is under voltage and you're getting noise and weird artifacts on the screen. If you move up to a 12AWG stinger, the larger conductors offer less resistance, so you'll have less voltage drop over the long distance. Generally, bigger is better, so when in doubt, go with the largest gauge cord available.

This is why most stingers on a film set are 12AWG. Even though 12AWG cable is rated at 20 Amps and a standard U-ground receptacle is only rated at 15 Amps, the heavier gauge helps compensate for the voltage drop over distance.

I imagine this was probably way more that you really wanted to know about electrical cords, grounding and power formulae. If nothing else, I hope I have conveyed a little appreciation for our little friend, the ground wire. Just like driving a car, we need to occasionally stop and realize that some of the things we take for

The best way to solve noise generated by ground loops is to avoid them in the first place by wiring things correctly. Never mix AC power from two different sources.

on the same power (i.e., house vs. genny). If you still have a noise problem, break the ground on the signal cable, not the power cable. Ground isolating devices, such as "Humbuckers" may be used to prevent the shield from becoming the electrical ground path. Keep in mind that, by using them, you will be disrupting the signal shield and may expose the signal to RF interference by potentially turning the shield into an antenna. It's generally better to use the Humbucker near the signal destination instead of the source. Never touch both sides of a ground-isolating device at the same time or you may become the ground path yourself and be rewarded with an electrical shock.

A potential hazard of plugging all of your equipment into the same source is overloading the power cables. Therefore, it is not a bad idea to have a basic understanding of power factors and principles as they apply to our electrical system (see Ohms Law sidebar). You too can know enough to be dangerous!

granted, casually using every day, can be deadly if not treated with a little understanding and respect.

In the next installment, I will attempt to discuss some new tools and technologies that modern video-for-film engineers might find useful during production.

Ben has always had a passion for integrating audio, video and computer technology. He holds a bachelor of science degree in telecommunications management, is active in I.A.T.S.E. Local 695, a licensed C10 Electrical Contractor and THX-Certified Engineer. Among his work experience, he built one of the first microcomputer CGI-rendering farms for Amblin Imaging, logged more than 12 years as supervising engineer on Paramount's various Star Trek TV series and feature films, recently acted as video technical director for Studio 60 on the Sunset Strip, and currently is the key video engineer on NBC's Chuck at Warner Bros.