



Photo by Rob Goldberg
radio

On-Air Exhilaration. Every Single Day.

What makes Wheatstone consoles best-of-class?

Breakthrough technology with award-winners like WheatNet-IP Intelligent Network & bus-minus. Unique design ingenuity. Precision production/starship-grade materials. Obsessive Wheatstone quality. FullTime support.*

What does all that get YOU? Absolutely spoiled...



LX-24 Control Surface

Exceptional console at every level, fully loaded and completely customizable.



L-8/L-12 Control Surfaces

Outstanding companion to the LX-24, perfectly sized for newsrooms, etc.



IP-12/IP-16 Control Surfaces

Precisely designed and engineered for peak performance at mid-size stations.



The IP Network is IN the BLADE...Like DNA

Each powerful BLADE-3 (point-of-use interface) contains the entire WheatNet-IP Intelligent Network to route I/O, access sources, add processing, mix to/from any device. Plus routable logic, silence sensing, gain control, automated mixing, discovery/control, and much more. Format agile: AES67, MADI, AES/EBU, TDM, Analog, and AoIP.



*Includes on-site commissioning, in-factory total-system proof-of-performance testing, installation support, and real 24/7/365 service. We don't mess around.

Learn more: wheatstone.com/consoles

Wheatstone
BROADCAST AUDIO PERFECTIONISTS®

Designed and built in the USA. Phone +1-252-638-7000 | wheatstone.com | sales@wheatstone.com
World Radio History

For address changes and subscription renewal, please visit radioworld.com and click on the "Subscription" button. To submit letters or story proposals, to request writer's guidelines, or for other editorial matters, email the editor at radioworld@nbmedia.com.

EDITORIAL STAFF

EDITOR IN CHIEF, U.S. Paul J. McLane
GEAR & TECHNOLOGY EDITOR Brett Moss
TECHNICAL ADVISER Thomas R. McGinley
TECHNICAL EDITOR, RWEE W.C. "Cris" Alexander
PRODUCTION EDITOR, RWEE Karen Lee
CONTRIBUTING EDITOR Emily Reigart
CONTRIBUTING EDITOR John Bisset
WEB EDITOR Michael Balderston
INTERNATIONAL EDITOR IN CHIEF Marguerite Clark

EDITORIAL CONTRIBUTORS

W.C. Alexander, Susan Ashworth, James Careless, Harry Cole, Ken Deusch, Mark Durenberger, Charles Fitch, Christopher Friesen, Harold Hallikainen, Donna Halper, Craig Johnston, Alan Jurison, Paul Kaminski, John Kean, Peter King, Larry Langford, Mark Lapidus, Daniel Mansergh, John Merli, Jim Peck, Mark Persons, Stephen M. Poole, Carl Lindemann, James O'Neal, Tom Osenkowsky, Rich Rarey, John Schneider, Randy Stine, Richard Strickland, James G. Withers, Tom Yemon

ADMINISTRATION & PRODUCTION

PUBLISHER John Casey
EDITORIAL DIRECTOR Paul J. McLane
PRODUCTION MANAGER Karen Lee
ADVERTISING COORDINATOR Caroline Freeland

AUDIENCE DEVELOPMENT

VICE PRESIDENT | CORPORATE DIRECTOR OF AUDIENCE DEVELOPMENT Meg Estevez
CIRCULATION MANAGER Kwentin Keenan
ASSOCIATE CIRCULATION MANAGER Michele Fonville

SUBSCRIPTIONS

Radio World, P.O. Box 282, Lowell, MA 01853
TELEPHONE: 888-266-5828 (USA only 8:30 a.m. – 5 p.m. EST)
978-667-0352 (Outside the US) FAX: 978-671-0460
WEBSITE: www.myRWNews.com
EMAIL: newbay@computerfulfillment.com

CORPORATE

NewBay Media LLC
PRESIDENT AND CEO Steve Palm
CHIEF FINANCIAL OFFICER Paul Mastrorandi
CONTROLLER Rick Ng
VICE PRESIDENT OF DIGITAL MEDIA Robert Ames

VIDEO/BROADCAST GROUP

EXECUTIVE VICE PRESIDENT Carmel King
VICE PRESIDENT / SALES DIRECTOR Eric Trabb

ADVERTISING SALES REPRESENTATIVES

US REGIONAL & CANADA: John Casey, jcasey@nbmedia.com
T: 212-378-0400, ext. 512 | F: 330-247-1288
US REGIONAL: Michele Inderrieden, minderrieden@nbmedia.com
T: 212-378-0400, ext. 523 | F: 301-234-6303
EUROPE, AFRICA & MIDDLE EAST:
Raffaella Calabrese, rcalabrese@nbmedia.com
T: +39-320-891-1938 | F: +39-02-700-436-999
LATIN AMERICA: Susana Saibene, susana.saibene@gmail.com
T: +34-607-31-40-71
JAPAN: Eiji Yoshikawa, callers@world.odn.ne.jp
T: +81-3-3327-5759 | F: +81-3-3322-7933
ASIA-PACIFIC: Wengong Wang, wwg@maschina.com
T: +86-755-83862930/40/50 | F: +86-755-83862920
CLASSIFIEDS: Michele Inderrieden, minderrieden@nbmedia.com
T: 212-378-0400, ext. 523 | F: 301-234-6303

Radio World Founded by Stevan B. Dana

Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by NewBay Media, LLC, 28 East 28th Street, 12th Floor, New York, NY 10016. Phone: (703) 852-4600, Fax: (703) 852-4582. Periodicals postage rates are paid at New York, NY 10079 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 282, Lowell, MA 01853.

For custom reprints & eprints please contact our reprints coordinator at Wright's Media: 877-652-5295 or NewBay@wrightsmedia.com
List Rental: 914-368-1024, jganis@meritdirect.com

Globe graphic ©iStockphoto.com / Edward Grajeda

Copyright 2017 by NewBay Media, LLC.
All rights reserved.
Printed in the USA



KEAN

(continued from page 1)

Kean's interest in radio and broadcast engineering began when he was attending the University of Washington, although more from extracurricular activities than formal academic studies.

"The interest in broadcasting developed through my work as manager of the student radio station, KCMU. I filed the FCC application and paper work to get a Class D FM license, as well as doing much of the studio construction and all of the transmitter and STL."

At the same time, Kean was working six nights a week as an announcer for KUOW(FM), a 100 kW public station in Seattle. He made friends with the chief engineer Hal Syrstad, who offered Kean advice on the application process and eventually donated some equipment to help the startup operation.

After graduation, Kean was asked by the Regional Library for the Blind to build a



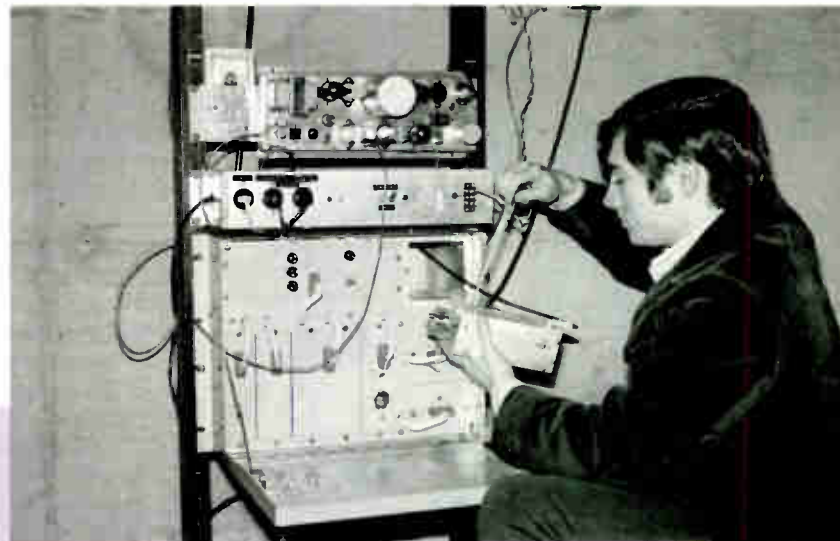
When Eric Small moved his business back east, John Kean became chief engineer of KBZT(FM), "K-BEST" in San Diego.

radio reading service that would air on a subcarrier of KUOW, the Evergreen Radio Reading Service. The project lasted about four years; then he worked for the Corporation for Public Broadcasting, investigating multipath performance of FM systems. He soon was contacted by Eric Small, who convinced him to join up with Eric Small & Associates and relocate from Seattle to San Francisco.

"At that time, Eric was working closely with Bob Orban on the development of the Optimod 8000," Kean recalls. "I became the first customer service engineer for Optimod. The

8000 was unlike any processor that came before, and a lot of engineers didn't quite know what to make of it. I got a lot of questions like, 'How do I connect my CBS Volumax to the Optimod?'"

When Small elected to move his business to New Jersey, Kean stayed on the West Coast and took a position as chief engineer of KDTZ(FM) in San Diego. His first task was moving the studios out of a church basement and into the suburbs.



While attending the University of Washington in Seattle, Kean joined with fellow students in the School of Journalism to gain Board of Regent approval for a student FM station. He prepared the FCC application, built the transmitter facility and helped build the studio. This shows him tuning the transmitter.

"The station turned out to be very successful. They were often tied for first place in Arbitron, and working there was really a great experience."

GOING DIGITAL

In 1980, Kean heard from Dick Cassidy, who offered him a job with NPR. He made the move to Washington, where he stayed until 1986. His work — which included developing rules for protecting TV Channel 6 while allowing maximum power for educational FMs — brought him in contact with Jules Cohen, who offered him a position.

"Jules was amazing," recalls Kean. "He was a brilliant man." Cohen's firm was called only half-jokingly a "finishing school" for D.C. consultants. Kean subsequently went to work at Moffet, Larson & Johnson, where he had the opportunity to travel around the world while performing advanced engineering studies; that was followed by four years as director of wireless architecture for XO Communications, a nationwide provider of data and IP services.

Then he got the call from Mike Starling, asking if he wanted to return to NPR to join a new venture called NPR Labs. Kean signed on as chief technologist and was there from its launch in 2004 until his position was eliminated during budget cuts in 2015.

Kean R&D work, much of which can still be seen at <http://nprlabs.org/research>, included development of an interactive

(continued on page 5)

CORRECTION

In the April 12 issue, we incorrectly stated that PBCore received a grant from the National Endowment for the Arts. The funding came from the National Endowment for the Humanities.

RADIO

(continued from page 1)

iHeartMedia — which only can foster the radio industry's ability to compete against its many new competitors."

In some ways, the business could use that kind of jazzing. There have been plenty of headlines focusing on debt burdens, such as "Cumulus Media Blocked on Proposed Debt Restructuring" (Wall Street Journal) and "iHeartMedia CEO Bob Pittman's Efforts May Not Be Enough to Avoid Looming Bankruptcy" (Variety). And the competitors Fratrik mentioned have made themselves felt, with over-the-air revenue continuing to hover last year rather than grow, even with a hot presidential election.

Nevertheless radio has a story to tell, and there's evidence it's being heard.

Some 82 percent of adults tuned into AM/FM in their primary car in the past month, according to Edison Research and Triton Digital. Radio's digital ad income continues to climb, and the Radio Advertising Bureau emphasizes that radio is the country's top reach medium, reaching 247.4 million weekly based on Nielsen data.

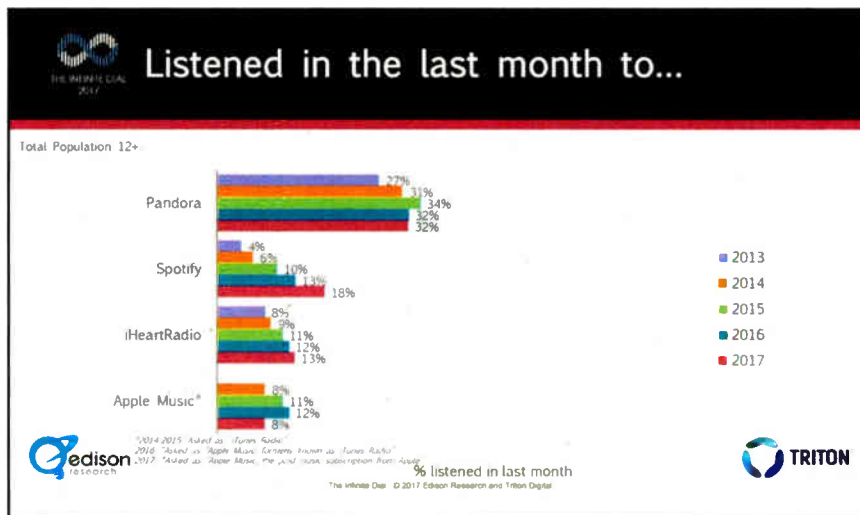
All of this provides a nice context for AdWeek's headline "Reach Is the New Black: Advertising's Mass Reawakening," subtitled "Narrow targeting has its uses, but TV and radio offer greater impact."

FAN AT THE COMMISSION

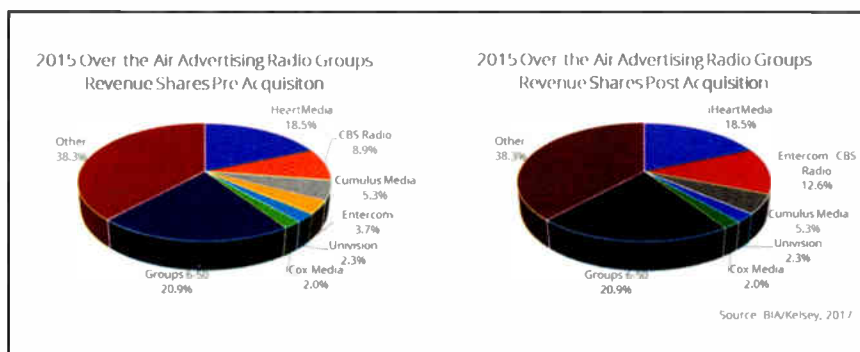
Helping radio feel some mojo again is the presence of an unabashed fan on the eighth floor of The Portals building in Washington. Ajit Pai helped do away with frustrating public file requirements and now has been elevated to chairman by a Republican president whose dynamic headline-making cannot obscure his business mindset.

How long has it been since people heard a chairman of the Federal Communications Commission sing radio's praises so frequently, as Pai has: "Wherever I go, I always try to visit some radio broadcasters if I can, because I think what they do is so unique, it's so local, it's so social, it's increasingly mobile too."

Don't look for him to implement an FM chip mandate, but there are plenty of deregulatory issues to be explored. The Trump/Pai combination has given



Among online radio brands, Spotify's surge in awareness is reflected in a slide from "The Infinite Dial 2017" report by Edison Research and Triton Digital. Pandora remains the top source.



The merger of Entercom and CBS Radio will affect the competitive landscape for U.S. commercial radio, as seen in a graphic from BIA/Kelsey.

rise to talk of whether the commission might do away with "subcaps" limiting how many stations a company can own in the same service in one market. Perhaps it will kill rules about cross-ownership, too, rules Pai has criticized.

"Our media ownership regulations, like any regulations, have to match the realities of the modern marketplace," Pai told Radio World last month. "In this area in particular, some of our rules have become yellowed with age. The core of them, as you know, were created in 1975, and anybody sentient would recognize that the marketplace has changed dramatically since then." Perhaps the FCC might even consider easing the main studio rules. It's an issue that Pai said he'll look at "with particular care."

In AM revitalization, broadcasters are watching to see when the next translator windows will open and whether the FCC might further tweak technical rules, including nighttime protections for legacy clear-channel AMs. The commission did recently give AMs more flexibility in locating FM translators.

However, broadcasters also are keeping an eye on efforts to reform the federal tax code. "Ad tax deductibility is shaping up as a potential big fight," National Association of Broadcasters

available only on the Internet; those folks are spending more than 14 hours per week with it now. More people are using cellphones to stream in the car, too.

Podcasting's remarkable second chapter is now a multi-year trend. It is a good example of a platform that can offer both competition and opportunity. An estimated 42 million people age 12+ have listened to a podcast in the past week — 15 percent of the population compared to 7 percent four years ago. Many in radio embrace podcasting because of its compatibility with radio programs and talent.

Much of that listening happens on the road; yet AM/FM radio remains the number one audio source in the car, according to Infinite Dial, while the categories of online radio, satellite and podcasts, though growing in the car, still trail OTA radio, CD players and personal music there. And making waves at home are "smart speaker" systems — Amazon Alexa and Google Home — though the number of owners is relatively small right now.

What technical issues will radio be talking about, coming out of the spring show?

Technologists are worrying about how Nielsen captures headphone listening in PPM markets. They're figuring out how to use drones to inspect towers and measure antenna performance.

They're talking about studio "virtu-

Our media ownership regulations, like any regulations, have to match the realities of the modern marketplace.

— FCC Chairman Ajit Pai

President/CEO Gordon Smith told Inside Radio recently. And facility managers have concerns about the TV spectrum "repack" process, which the NAB believes will bring "unprecedented logistical and operational challenges" and may force bystander FMs to move antennas or reduce power temporarily.

A CONNECTED WORLD

Meanwhile, the diversification of radio's universe of mobile and home audio platforms continues.

The "Infinite Dial 2017" report by Edison Research and Triton Digital indicates that online radio listening keeps growing, particularly in younger demographics. An estimated 140 million people listen weekly to AM/FM stations online or to streamed content

alization" and exploring expanded uses of metadata. They're studying hybrid radio to make listening more of a two-way digital experience; they're moving more urgently from the disappearing ISDN infrastructure. They're repointing or replacing thousands of dishes to capture feeds from the AMC-18 satellite. And they're focusing on cybersecurity, thanks to hacks on streaming STLs and predictions of a world that soon will have 50 billion connected devices.

That list, of course, barely brushes the surface. Expect to read more about these trends and many others in coming issues.

Paul McLane is editor in chief of Radio World. A version of this story appeared in the NAB Show Daily News; it is copyright NAB.

On the road to HD Radio broadcasting?
Nautel has you COVERED.
nautel.com/HDradio nautel

THIS ISSUE

APRIL 26, 2017

NEWS

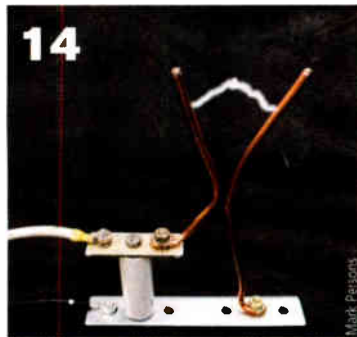
John Kean Explores Technology's Pathways	1
Radio Hopes For Boost in Deregulatory Climate	1
In Case You Missed It	8
EBU Releases Digital Radio Report 2017	10

**FEATURES**

Readers, Please Weigh in on These Questions	12
Understanding Arc Gaps for AM Systems	14

GM JOURNAL

Do You Need Trained Sales People?	20
Summer Is Perfect for Crowd-Pleasing Promotions	22

**STUDIO SESSIONS**

NSO Plays NPR	24
---------------------	----

OPINION

Why I Support the Right to Repair Revitalization and Interference: Fact vs. Science Fiction	29
Reader's Forum	30

KEAN*(continued from page 3)*

high-resolution online mapping system for FM and DTV; coverage increase as provided by elevated IBOC digital sideband power, including asymmetrical sidebands; determination of potential interference to consumer DTV receivers from NCE FM stations, related to the old FCC 73.525 rules based on analog sets; AICCS, a study of compatibility between IBOC and analog FM, including host compatibility and first-adjacent interference susceptibility; and algorithms for multipath prediction, both analog FM and IBOC digital, with synchronous FM booster networks and development of geographic mapping tools.

Doug Vernier, founder, president and senior engineer of V-Soft Communications recalls, "When NPR Labs was established, John's name and the lab's were nearly synonymous. He was the first in the industry to introduce cognitive testing to determine the level of interference perceived by a listener."

Starling, now general manager of WHCP(LP), noted the breadth of Kean's activities.

"John founded the Evergreen Radio Reading Service in Seattle, which positioned him perfectly as the engineer to call away from his perch at XO Communications to test IBOC compatibility with SCAs. My first formal encounter with John was when NPR engaged him to conduct the final substantive testing required for the NRSC's ultimate IBOC endorsement. His legendary work with Bob Orban and Eric Small stand alongside his patient hours of weekly phone tutelage to engineers around the globe on all matters of audio and RF technology. He is a broadcast engineer's broadcast engineer."

Geoff Mendenhall, technology advisor for Gates Air, said, "I believe that one of the most important contributions that John has made to the advancement of FM IBOC HD Radio was his work on the maximum allowable, symmetrical and asymmetrical IBOC digital sideband levels, taking into account the D/U ratios on either side of the IBOC channel. His development of the online sideband increase calculator was a significant aid to broadcasters in determining how much they could increase their digital sideband levels."

NOT TOO LOUD, NOW

Although Kean is probably best known for his work with HD Radio, he has been heavily involved with audio too. He considers himself to have a "kind of schizophrenic personality" when it comes to engineering projects and interests.

"I can be heavily involved with RF, but then switch to audio for a while, then

NEWS

With Mike Starling, right, in the original RF laboratory of NPR Labs.

go back to RF. Recently, audio loudness standards has become a real passion for me."

His work on managing loudness for streaming audio began about five years ago. "I was asked by NPR Digital Media to choose the best audio codec for

Internet streaming. In the course of that study, I realized that there was an even more challenging problem to solve, namely the mismatch in loudness from stream-to-stream and from content-to-content. And in doing that research, I

(continued on page 6)



MEET SAM...

Your Trusty Station Watchdog

Are you OFF AIR? EAS alert received? Request line ringing? Transmitter site intrusion? The Systems Alert Monitor ("SAM") lets you know now!

- Video messages alert personnel to take action!
- Monitors up to 15 systems for faults or status
- Easy to set up text, colors, display time, etc.
- Plays audio alerts and sends email messages
- Use any HDMI video monitor (not included)
- Display your station logo when idle

SAM is eager to watch over you! Woof!

www.henryeng.com

WE BUILD SOLUTIONS: DIGITAL SOLUTIONS. ANALOG SOLUTIONS. FUNCTIONAL. RELIABLE. AFFORDABLE.

HE HENRY ENGINEERING

Phone: 562.493.3589 • email: henryeng@aol.com



KEAN

(continued from page 5)

discovered that a loudness metering standard had already been developed in Europe and was really the solution to our problem.”

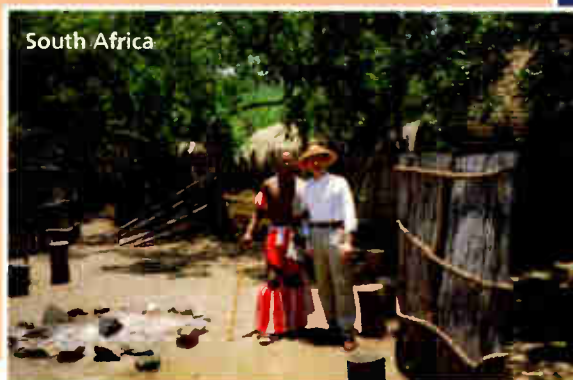
Loudness measurement, he says, is important for audio production and distribution because it solves that mismatch.

“When you figure out the loudness mismatch, a lot of other things fall into place. You don’t need as much audio processing, and the listeners tend to like it better as well.”

John W. Reiser witnessed the impact of Kean’s work when Reiser was senior engineer at the Federal Communications Commission.

“I first met John Kean through the activities of the Washington Section of the Audio Engineering Society. At the time, the FCC was considering relaxing its rules to permit non-commercial stations to lease their FM subcarrier capacity, in order to financially support their operations while still providing existing radio reading services to the blind.

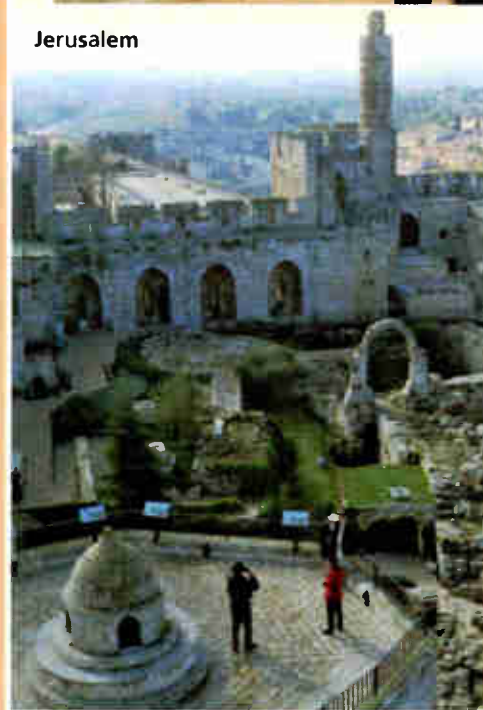
“One option was to permit the use of higher-frequency subcarriers and also increase the maximum FM modulation level so the main program modulation would not be reduced,” Reiser said. “John was the lead researcher in evaluating these FM modulation standards, and I was the FCC engineer responsible for reviewing the proposed changes, as well as implementing the rule changes. John’s research resulted in FCC rules being adopted that not only benefited



South Africa



California



Jerusalem



Oman

The work at Moffet, Larson & Johnson led to many adventures and travel opportunities, including international projects.



Kean built an advanced audio testing lab at NPR, which led to studies for the Consumer Technology Association and others.

the public and educational stations, but also the commercial FM broadcasters as well. This is only one of his many legacy projects that have benefited broadcasting worldwide.”

DRONES AND MORE

When he’s not working on broadcast-related projects, Kean, age 66, has been catching up on work around the house, as well as taking hikes through the Grand Canyon and Philmont Scout Ranch in New Mexico.

He has thought of retirement, but: “I am thoroughly enjoying work with Cavell Mertz, especially the recent research on the use of drones for measurement of broadcast antennas. Also, I’m active on several AES committees. There’s plenty for me to do in the foreseeable future.”

Doug Vernier told Radio World that Kean has been tireless in spreading his knowledge “far beyond the public radio industry,” with numerous presentations for NAB engineering conferences, IEEE and AES. He has also been a contributing author for three NAB Engineering Handbooks and is a frequent contributor

(continued on page 8)

RUNNING A LIVE BROADCAST

ACCESS 2USB

Ultra-portable IP audio codec designed for versatility

On May 23rd, 2016, Belgian broadcaster Jonathan Vanooteghem went the distance to conquer an unprecedented feat — he completed a live broadcast while running the City Run of Ghent with the help of his Comrex ACCESS 2USB Portable.

I wanted to combine my two favorite hobbies: athletics and making radio. Why shouldn't I do them both at the same time?

— Jonathan Vanooteghem



WWW.COMREX.COM | 1-978-784-1776

Come see us in Las Vegas at the 2017 NAB SHOW!
Booth #C1633 April 24-27 | Las Vegas Convention Center



COMREX

KEAN

(continued from page 6)

to Radio World Engineering Extra.

An indication of Kean's experience and stature is that he has worked with at least six other recipients of the NAB Radio Engineering Achievement Award: Wallace Johnson, Jules Cohen, Bob Orban, Geoff Mendenhall, John Reiser and Ben Dawson. There are no doubt many more whose influential careers have entwined with his.

Since 1959, the NAB has recognized the work of exceptional broadcast engineers, one in radio, and one in television, with the Engineering Achievement Awards. John Lyons of The Durst Organization is this year's recipient of the NAB Television Engineering Achievement Award, and Catherine Badalamente of the Graham Media Group is honored with the Digital Leadership Award. Recipients are nominated by their peers for significant contributions to advancing the state of the art in broadcast engineering.

Tom Vernon is a longtime contributor to Radio World. He profiled Tom Mintner here in February; see radioworld.com, keyword Mintner.



Among regular projects at Cavell Mertz, Kean has helped in the development of an RF measurement drone, which provides precision measurement of television and FM signals from transmitting antennas. This was presented at the Broadcast Engineering and IT Conference. Here the vehicle is shown in early flight testing.

IN CASE YOU MISSED IT

Radio World and its NewsBytes e-newsletter complement one another; the magazine brings you news analysis, features and deep-dive coverage 26 times a year while the daily newsletter provides a more immediate snapshot of one day's regulatory and technology headlines. To receive the free newsletter, click the *Subscribe* tab at radioworld.com, then *Newsletters*.

Here's a sampling of what NewsBytes readers learned about in recent weeks:

► Ron Nott, Consultant and Supplier, Dies

He was regarded widely for his work to prevent lightning damage.

► NAB Pushes Back Against Prometheus Translator Request

Prometheus had asked the commission not to proceed; NAB pushed back, and the commission subsequently began taking applications from AMs under revised rules that ease site limitations for their FM translators.

► Former FCC Official Roy Stewart Dies

The former head of the old Mass Media Bureau oversaw the transition to the Media Bureau.

► APRE Selects Mansergh for Achievement Award

The CTO of KQED(FM/TV) is honored by the Association of Public Radio Engineers.

► NAB Presses the FCC Again on Ownership Limits

During a March 29 meeting with members of



Chairman Pai's office, the associated reiterated that the time has come to eliminate or substantially loosen broadcast ownership rules.

► NABOB: Subcaps Must Stay

A change being championed by some broadcasters would effectively undermine efforts to revitalize AM radio and have a disproportionately negative impact on minority-owned AM radio stations, says the National Association of Black Owned Broadcasters.

► FCC Rules WSKQ Radio Broadcast Was Indecent

The agency ruled that a radio broadcast over a decade ago qualified as indecent and reached a consent decree with the New York station for a \$10,000 fine.

HONOR ROLL

Recipients of the NAB Engineering Achievement Award are listed here. Beginning in 1991, radio and TV winners were named; radio winners are shown.

1959 John T. Wilner
 1960 T.A.M. Craven
 1961 Raymond F. Guy
 1962 Ralph N. Harmon
 1963 Dr. George R. Town
 1964 John H. DeWitt Jr.
 1965 Edward W. Allen Jr.
 1966 Carl J. Meyers
 1967 Robert M. Morris
 1968 Howard A. Chinn
 1969 Jarrett L. Hathaway

1970 Philip Whitney
 1971 Benjamin Wolfe
 1972 John M. Sherman
 1973 A. James Ebel
 1974 Joseph B. Epperson
 1975 John D. Silva
 1976 Dr. Frank G. Kear
 1977 Daniel H. Smith
 1978 John A. Moseley
 1979 Robert W. Flanders

1980 James D. Parker
 1981 Wallace E. Johnson
 1982 Julius Barnathan
 1983 Joseph Flaherty
 1984 Otis S. Freeman
 1985 Carl E. Smith
 1986 Dr. George Brown
 1987 Renville H. McMann
 1988 Jules Cohen
 1989 William Connolly

1990 Hilmer Swanson
 1991 George Marti
 1992 Edward Edison & Robert L. Hammett
 1993 Robert M. Silliman
 1994 Charles T. Morgan
 1995 Robert Orban
 1996 Ogden Prestholdt
 1997 George Jacobs
 1998 John Battison
 1999 Geoffrey Mendenhall

2000 Michael Dorrrough
 2001 Arno Meyer
 2002 Paul Schafer
 2003 John W. Reiser
 2004 E. Glynn Walden
 2005 Milford Smith
 2006 Benjamin Dawson & Ronald Rackley
 2007 Louis A. King
 2008 Thomas B. Silliman
 2009 Jack Sellmeyer

2010 Steve Church
 2011 L. Robert du Treil
 2012 Paul Brenner
 2013 Frank Foti
 2014 Jeff Littlejohn
 2015 Thomas F. King
 2016 Andy Laird
 2017 John Kean

The award winning combination



(((ViA)))

Join the #ViARevolution



Merlin
PLUS



www.tieline.com

317-845-8000
sales@tieline.com

Tieline 
The Codec Company

EBU Releases Digital Radio Report 2017

Annual report offers an overview of digital radio rollout across Europe



The European Broadcasting Union's Media Intelligence Service Digital Radio Report 2017 emphasizes the importance of teamwork in the implementation of digital radio.

The organization's annual update on digital radio advances in Europe suggests that stakeholders working together is the best indicator for success when making the move to digital radio.

MIS points directly to Norway as an example of this; the country recently became the first European country to begin switching off its FM signals. On the flip side, the report shows that progress toward digital radio has slowed in markets like the Czech Republic and Poland where stakeholders have not been able to reach a consensus on the specifics of a digital radio rollout.

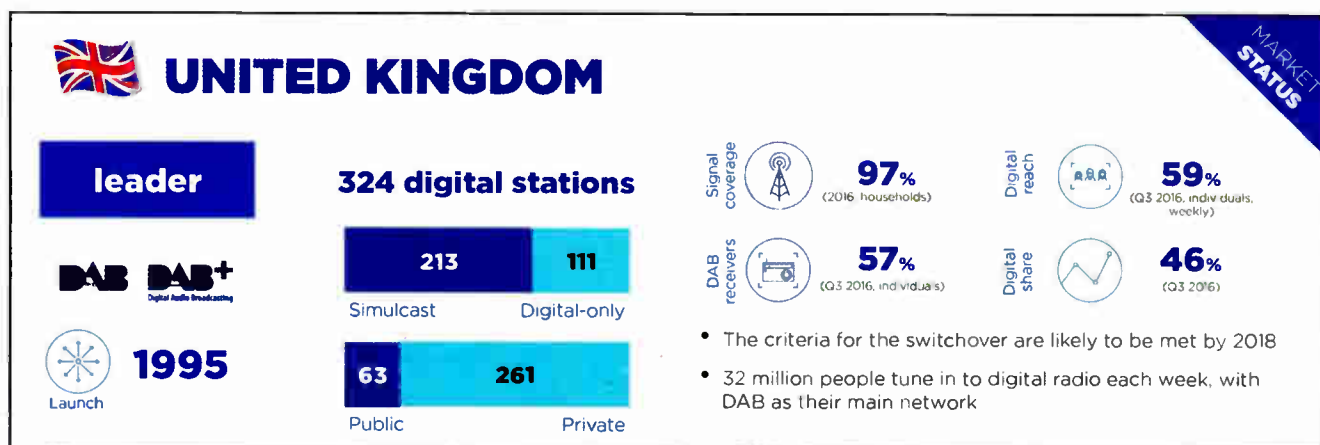
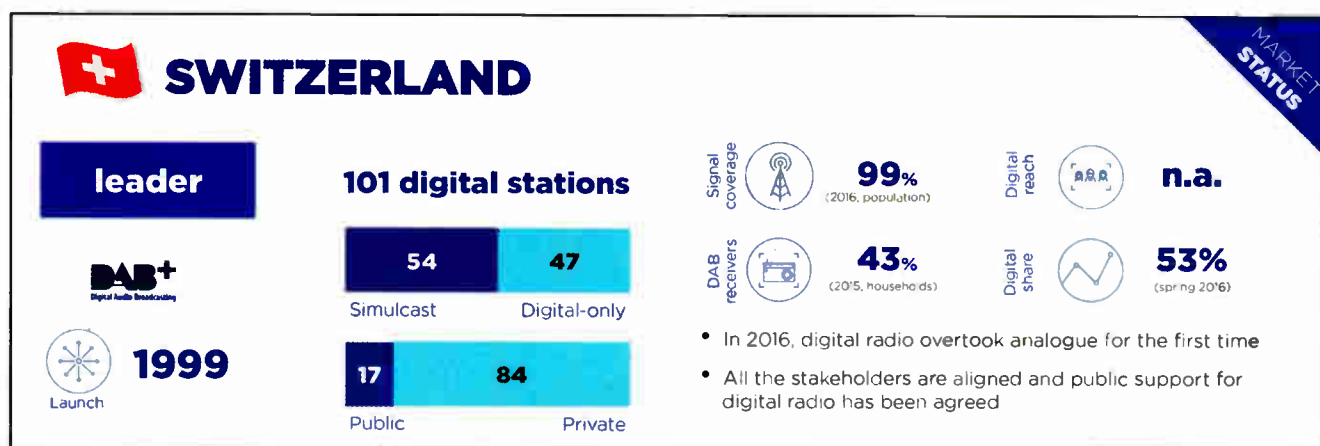
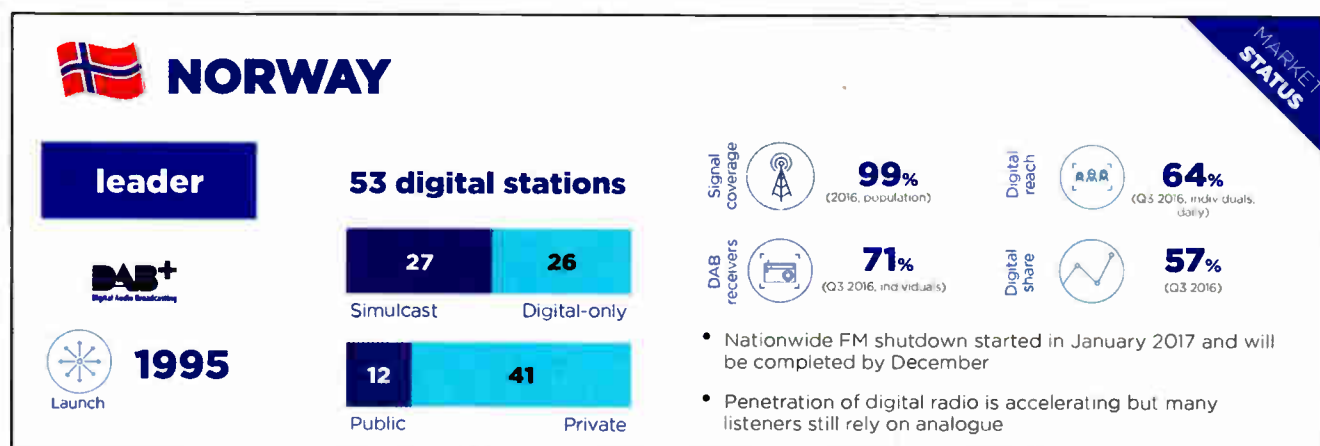
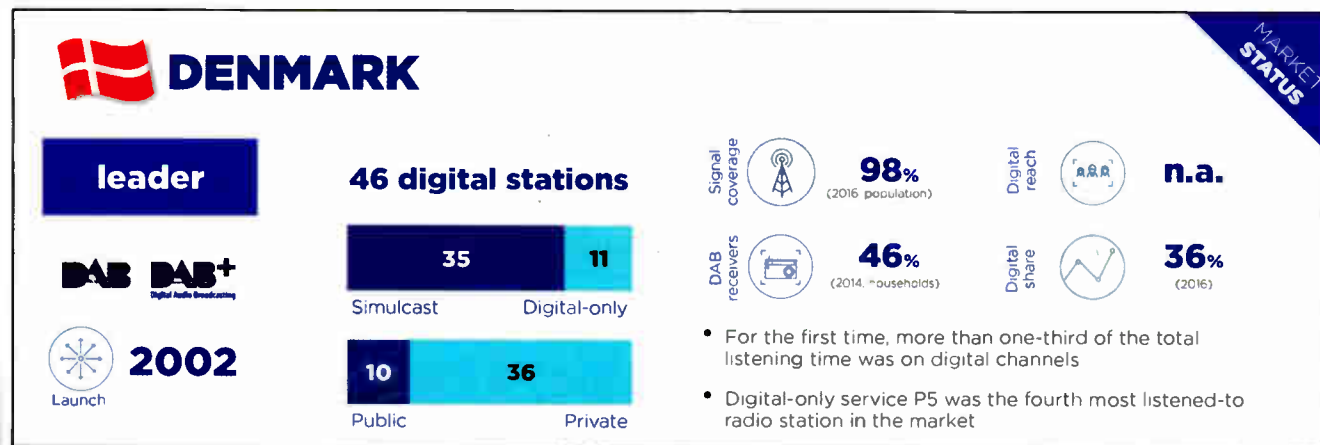
The 2017 report highlights which European countries are leading the way in the transition to digital radio, which are embracing it, countries that recently launched digital radios services and those currently without a market for digital radio. The study offers detailed outlines of the plans for each country in the four categories.

In addition, the report points to major developments for digital radio in Europe in areas such as technology, policy and regulation, public communications, consumer electronics and the car industry.

The graphics at right provide a snapshot of the situation in four countries deemed to be "leaders." Other categories are "Embracers," "Newbies" and "Wait-and-See." See the full report in PDF form at <http://tinyurl.com/DigitalRadioReport2017>.

WRITE TO RW

SEND A LETTER TO THE EDITOR:
Email radioworld@nbmedia.com with "Letter to the Editor" in the subject field.
Please include issue date.



First We Invent. Then We Innovate.



Introducing Axia IP-Tablet!

Axia invented AoIP for broadcast in 2003. Not one to rest on our laurels, we've continued to bring you the finest in broadcast tech. Part of our innovation is thanks to the largest network of AoIP broadcast equipment companies, the 100+ Axia Livewire partners. When you have Axia gear, you are part of a growing, innovation-driven ecosystem—not locked to just one company's vision of the future.

Witness the latest from Axia, the award-winning IP-Tablet, designed by our partner IP-Studio. This one-of-a-kind product removes cumbersome monitors from the studio by virtualizing the monitoring and control of your gear on a conveniently mounted touchscreen. The IP-Tablet adds great value to your Axia console purchase, putting your most used console functions right at your fingertips!

Invent. Innovate. Repeat.

TelosAlliance.com/axia/ip-tablet



Readers, Please Weigh in on These Questions

Also, here are some coffee maintenance and skin-care tips just for radio engineers

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

Broadcast engineer and inventor Joe Stack suggests an item that may be helpful for engineers: O’Keeffe’s Working Hands hand cream. Joe’s hands get dry in the winter months, and he ends up with cracks on them that can be quite painful.

Joe has tried various solutions but says Working Hands is great. It’s not greasy and not scented, and it actually helps heal up any tiny cuts you might have.

Joe discovered the cream at Home Depot; places like Walmart have it now too. It’s about \$7 and comes in a plastic screw top can, just like shoe polish.

Veteran radio and television engineer John Collinson writes that Tom Osenkowsky was absolutely correct when he wrote here about the importance of capacitance ESR in many circuits. He identifies audio circuits and switching power supplies as two of the paramount situations in which this is crucial.

The Sencore LC-53, LC-75, LC-102 and LC-103 are the most valuable tools John knows for thorough analysis on critical electrolytics. The downside? These instruments are almost impossible to buy.

Prices from numerous sources are often far higher than when the units were new.

To make matters worse, John has an LC-102, which has a problem that drives it far out of calibration — and he can’t find anyone who can fix it.

Someone must have ended up with the intellectual property when the company changed hands, so if anyone can point faithful readers of Workbench to a reliable repair facility for the great old Sencore test gear, that would be appreciated.

In the meantime, consider some of the newer ESR test devices found on the internet and mentioned in our column.

John Collinson offered additional comments that I want to share with you.

The first has to do with blinking LEDs. Back in the early 1990s, the radio stations employing John were using Wheatstone A500 consoles. Like everyone in those days, engineers were constantly changing the ubiquitous #387

bulbs used in the on and off buttons. Despite the resistors the manufacturer used to keep the filaments slightly warm, they still burned out.

John switched to LED replacements (after cutting out those resistors) and soon experienced a new phenomenon: After a couple months, some of the LEDs started flashing at maybe a 2–3 Hz rate. When one began blinking, it would always do so any time it was on, so it wasn’t intermittent in any way. John checked sockets, supply voltages, contacts — everything was fine.

Changing the LED “bulb” corrected it immediately, for a few more months. All channels experienced this problem sooner or later, and no one John talked to could explain the phenomenon.

On those LED replacements, you could actually see the tiny LEDs inside the end of the unit. As John recalls, there were two groups of four, and often one group would flash while the other one stayed steady.

By the time John left that station, he had collected a copious handful of bad units, and to this day he’s never heard anything in the physics of an LED which would explain this behavior. Then, last year during the NAB Show, John saw an LED replacement lamp in the hallway of a hotel and it appeared to have the exact same type phenomenon. Any thoughts, readers?

John also reminds us about the rodent infestation of transmitter site electrical boxes: Don’t forget your outdoor boxes! Critters love pad-mount transformers, which are nice and warm.

If you live in fire ant country, you know they seem to have a strong affinity for electrical boxes. Once John found them packed so heavily into the pressure switch on an outdoor well pump that they shut down the pump.

And it’s not just ants. Yellow jackets love the shelter of ATUs, which, if running slightly warm, can also attract snakes. It goes without saying that field mice certainly love these places, as well.

Sprinkle a few moth balls inside to keep the snakes out, and remember to seal holes and cracks.

John warns that like mice, ants will eat right through urethane foam and many types of caulk. Stainless steel wool (which resists rusting) is a better solution.

Fig. 1: Heal dry, cracked hands with O’Keeffe’s Working Hands.



UHF transmitters, in the days before unitized beam supplies, often had individual “pole pig” type electric transformers that were good at converting snakes into grounding sticks.

John is living in Florida; he says power company personnel have told him that squirrels are their biggest nemeses. Their ability to chew through insulation and some metals makes them a nonstop headache.

We have discussed muffin fans in the column, focusing on uses for these compact cooling devices. Although John Collinson lacks a picture, he’ll paint one with words. John was known for consuming copious quantities of coffee but not having the patience to wait for it to cool down to chugging temperature. One of his engineers took a spare muffin fan and tie-wrapped it to a 7-inch plastic tape reel (for stability), and immediately he had a great little coffee cooler.

(Our editor Paul McLane writes: “Where’s a photo when you really want one?”)

On that note, here’s another coffee tip.

In one of my Workbench SBE presentations a few years back, I showed a coffee warmer designed by West Virginia

Radio Corp.’s Randy Kerbawy.

Randy took a large metal coffee can and cut a cave-type entry in the side, using a nibbling tool. He made the passageway large enough to fit his Weller soldering iron and stand inside. The coffee cup sat on top of the can, which was warmed throughout the day by the hot soldering iron.

We’ve written about Serial-over-IP adaptors in the past, and John Collinson wrapped up his informative note saying he has tried a few.

It’s been his experience that these work great in-house, across a LAN, but he has yet to find one that works well across the public internet. John suspects they can’t handle the jitter.

Again, do you have any thoughts and experiences you want to share? Email them to me, along with your snail mail address, so we can recognize you.

Contribute to Workbench. You’ll help your fellow engineers and qualify for SBE recertification credit. Send Workbench tips to johnpbisset@gmail.com. Fax to (603) 472-4944.

Author John Bisset has spent 46 years in the broadcasting industry and is still learning. He handles West Coast sales for the Telos Alliance. He is SBE certified and a past recipient of the SBE’s Educator of the Year Award.

Remote Signal Monitoring



MODELS

635 FM
637 AM
638 HD
662 DAB+

SiteStreamer™

WEB ENABLED MONITORS



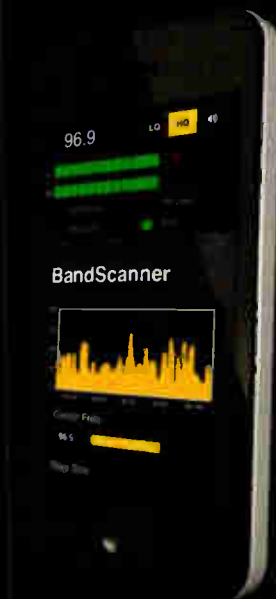
Web-enabled receivers for remote signal monitoring



Streams off-air audio or wired audio feedback



Browser interface enables remote tuning, displays audio levels, logs signal history, error messaging



FEATURES

- Remote monitoring of transmitter
- Extended tuning range
- Dynamic Web Interface
- Email/SMS error messages, SNMP
- Auxiliary audio input
- Easy to set-up & use

Come visit us at NAB - Booth: N8029

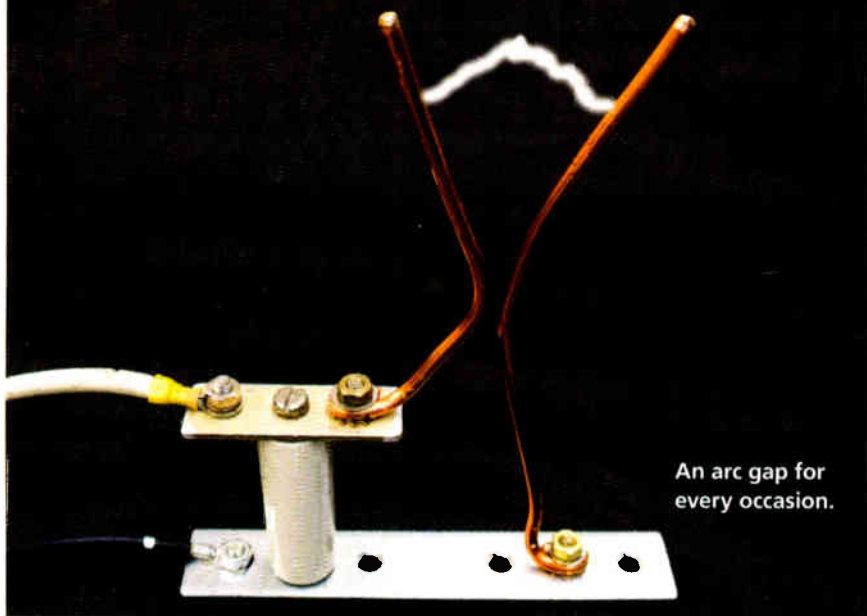


Better Radio Since 1972
www.inovonicsbroadcast.com

INO **INOVONICS**
BROADCAST

Understanding Arc Gaps for AM Systems

You can never have too many arc gaps!



Photos by Mark Persons

TECHTIPS

BY MARK PERSONS

Fig. 1 shows a hand-built arc gap, sometimes referred to as a ball gap, for use in AM broadcast transmission systems. Gaps like this are proven technology to “arc over” from RF to ground and help protect AM broadcast equipment against high voltages from static electricity and lightning strikes.

My preference is to put one at the 50 ohm input and another at the antenna of all antenna coupling networks. They also should be installed in AM phasors where transmission lines enter from each tower. Another good place for one is at the input side of the phasor where transmitter feed lines come in. The idea is to limit the maximum voltage to a safe non-destructive value by diverting excess energy to ground. The project I am describing is “on the cheap.”

EASY TO DO

Two arc gaps of different sizes are shown in Fig. 2, but the theme is the same. The larger “L” piece is a standard plated corner brace, sometimes called corner iron or angle bracket, available



from local hardware stores. Brass acorn nuts are used on each end of the gap, which is good practice for this kind of device. They have a smooth rounded face where the arc should occur.

I used a 1/4-20 tap to put threads in the bracket. A 1/4-20 machine screw, with lock washer and nut, allows for adjusting the gap dimension without laying hands on RF at the other side of the gap.

The smaller L bracket is made of aluminum and is also threaded to

Porcelain is brittle and it cracks instead of giving.

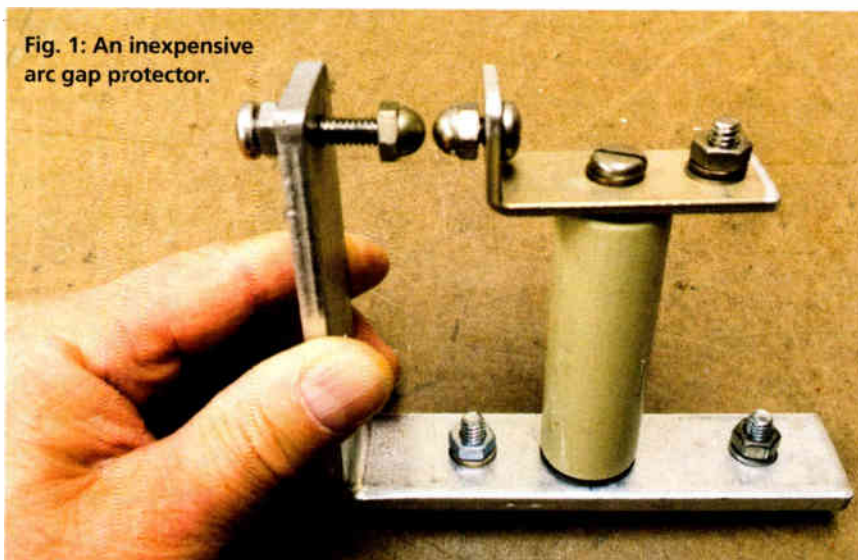
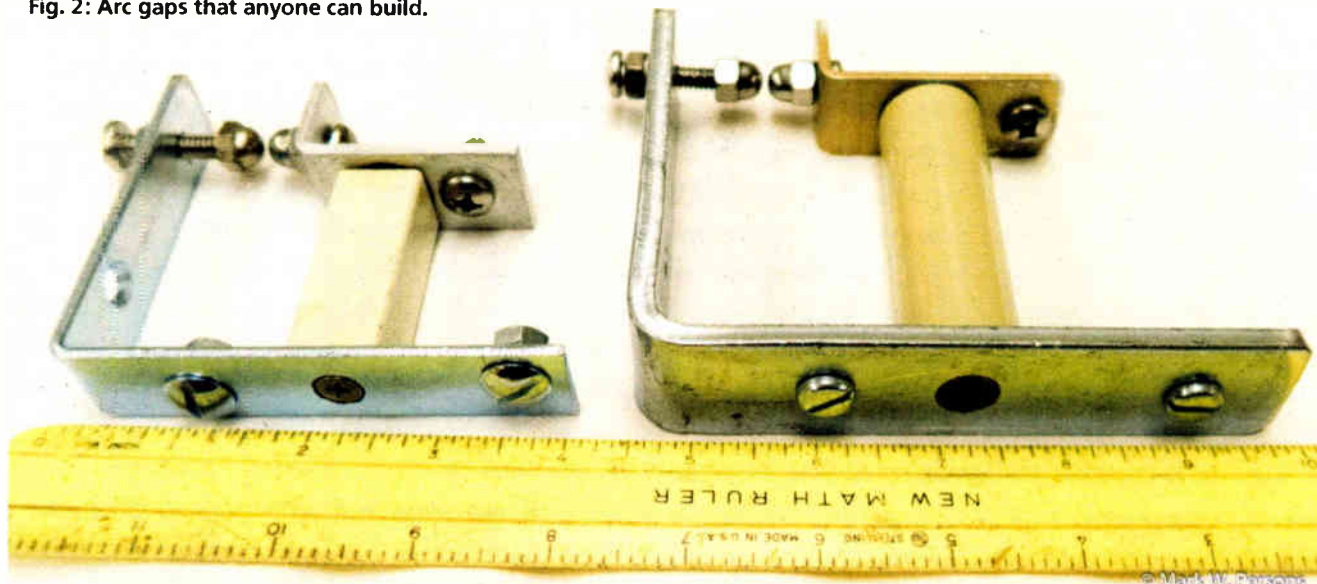


Fig. 2: Arc gaps that anyone can build.



accommodate plated brass hardware. I use non-ferrous metals in RF circuits because they will not vibrate at the radio frequency, heat up and sometimes melt.

Don't laugh — it has happened in high-power systems. You gotta think about these things!

If in doubt, use an ordinary bar magnet as a test tool. You should not use any hardware for RF if it is attracted to a magnet. Yes, the larger angle bracket is steel, but it is not on the RF side: it is on ground and not conducting RF.

A 2x3/4-inch square porcelain insulator is bolted to the two L brackets. The large arc gap has a 3x1-inch diameter insulator. The bottom bolt for each insulator has a flat head and is recessed to be flush with the bottom surface of the bracket. I do this by using a much larger drill bit to provide a bevel where the mounting hole is. Yes, there are fiber or nylon washers at each end of the insulator to help prevent breakage, especially during temperature changes. Porcelain is brittle and it cracks instead of giving. Also, I like to round off corners, if for no other reason than to prevent injury as my hands work on the device.

Construction of these devices assumes you are handy with tools and like to build things. Parts for this project came out of my junk box but would cost less than \$10 new. Machining and assembly time for each one was about 30 minutes. (Maybe I should have been a machinist instead of a broadcast engineer!)

Nice, new arc gaps are available from several sources, including Kintronic Labs (kintronic.com). One of their most popular models is the AG-3-1.5B, which sells for \$185.

INSTALLATION & PLACEMENT

Two steel bolts with lock washers and nuts will hold this arc gap assembly

(continued on page 18)



Leave Your Competitors in the Dust

Introducing VOLT, the hotrod new processor from Omnia that gives you more processing power and sonic performance in one rack unit than others give you in three. Sharing technological lineage with top-of-the-line Omnia products like the Omnia.11, VOLT drives you faster, with exciting sound that will take you from zero to 100 in seconds! In the race for electrifying, competitive, market-leading sound, VOLT puts the competition squarely in the rearview.

TelosAlliance.com/VOLT

Omnia
THE TELOS ALLIANCE



This Finger Controls Your Revenue. What's It Gonna Choose?

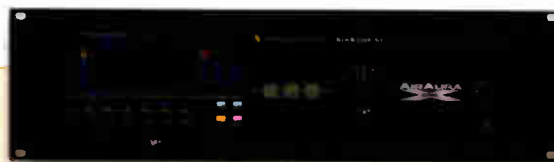
This finger has Irritable Tuner-Button Syndrome. It's caused by sound from outdated audio processors.

Advanced new technology for sculpting powerful, persuasive sound. Integrated processing tools – Mastering Limiters, Intelligent AGC, AirAura Spectral Control, Vorsis Bass Tools, Multipath Control, and of course Baseband 192 for the all-digital processor to transmitter chain at near zero latency. These tools share data interactively, constantly optimizing your settings for consistency, track after track.



FM-55/AM-55/FM-25

Superior processors that bring startlingly loud and clean sound to new price points.



AirAura X1

Extraordinary touchscreen processor features and super fine resolution audio.



Aura8-IP

BLADE-3 that gives you eight stereo channels of killer audio processing anywhere on your network.

Wheatstone processors come with presets crafted by our own processing gurus. Our beautifully engineered GUIs give you amazing control. Upgrade to Wheatstone. Keep your listeners tuned in and your management smiling.

Learn more: wheatstone.com/processors



Designed and built in the USA. Phone +1-252-638-7000 | wheatstone.com | sales@wheatstone.com

World Radio History

Solid Precision... Raw Metal to Heavy Metal

(or pop, jazz, classical, h.p-hop, AOR, CHR, top 40 oldies, talk, etc)

Ultra-precise metalwork and fabrication using lightspeed-class materials and techniques. Advanced surface-mount technology for flawless circuitry. Meticulously assembled by people who've made their careers crafting these consoles for years. From concept to delivery, each Audioarts AIR Series console is a Wheatstone thoroughbred, designed and built to be the centerpiece of your studio.



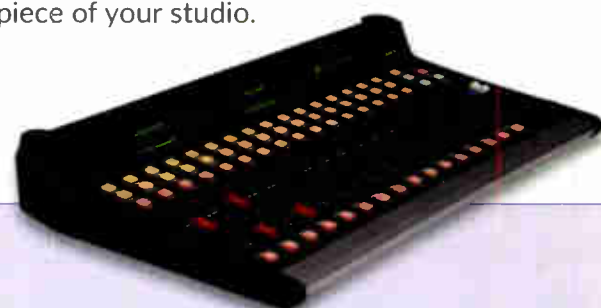
AIR-1 USB

Compact 8-channel powerhouse, 2 mics/6 Lines.
Great for small stations and remotes.



AIR-4

Remarkable 12-channel console, A/B, & Mix Minus.
Major market features at a small market price.



AIR-5

Phenomenal 16-channel console, built for studios that have
a lot of inputs. Sometimes you need a fader for everything.

Super Quiet mic preamps, built-in USB, hybrid-ready phone input channels, talkback, and much more.
Perfect for any professional broadcast studios, remotes, LPFMs, podcasters, and streamers.

AIR Series Consoles: Hardcore Pro From Start to Finish

Learn more at audioarts.com/air



ARC GAPS

(continued from page 14)

down, usually to a metal surface. That surface needs to be at ground potential or a wire must be connected to that end of the arc gap to put it at ground potential.

It is especially critical to install an arc gap wherever the system has a Delta brand antenna ammeter or similar toroid sample transformer. See Fig. 3.

The best location is on the antenna side of the sample coil where lightning is most likely to come in. Run the RF conductor as close to the center of the transformer as possible. Remember, lightning will take the shortest path.

That conductor to transformer bushing distance should be larger than the arc gap spacing. If the transformer has a black mark across its white bushing, chances are it has been hit by lightning. The usual symptom is the sample output voltage will double, causing major metering problems.

Not having any lightning available at the moment, I connected a neon sign lighting transformer and carefully turned on the power.

Arc gaps of this type should be used inside, not out in the elements. In addition, you want to mount them in such a way that the acorn nuts are horizontal from each other. That will allow an arc to clear quickly. Mounting an arc gap vertically can lead to a continuous arc that does not quench easily.

One important attribute of this design is the arc distance is held constant over time because of its rigid mountings. You don't want it to be flimsy and cause problems.

DON'T TRY THIS AT HOME

A Jacob's Ladder, not to be confused with the movie of the same name, is shown in Fig. 4.

Jacob's Ladders are sometimes used as arc gaps in high-voltage situations to naturally and dramatically quench arcs after they start. This one has #6 solid copper wire where the arc occurs.

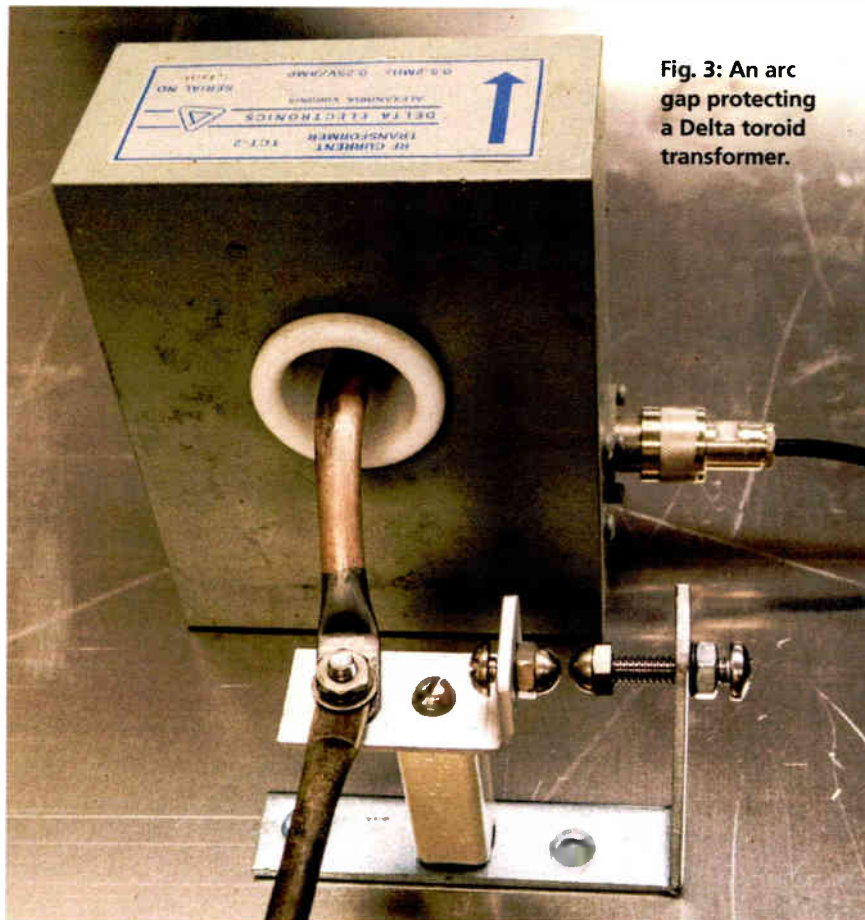


Fig. 3: An arc gap protecting a Delta toroid transformer.

Not having any lightning available at the moment, I connected a neon sign lighting transformer and carefully turned on the power. The arc you see started at the lower narrow part, then progressed up the wider space until it popped off the end and went out.

SETTING THE ARC GAP

How much spacing between points is enough or too much?

Nautel's transmitter people researched the subject and published a paper; you can access the PDF at tinyurl.com/rw-nautel-gap. The company is big on lightning protection to enhance the reliability of their transmitters.

Here is more from another Nautel paper:

Radio Frequency	Power Correction
540 kHz = .159 inches	1,000 watts, multiply by 1.05
1000 kHz = .125 inches	5,000 watts, multiply by 1.30
1700 kHz = .076 inches	10,000 watts, multiply by 1.83

All of that assumes 50 ohms impedance with no reactance at sea level. Wider spacing is required for higher altitudes. Diameter of the ball (acorn nut) plays into this as well. High positive or negative reactance can be a real wildcard in the equation. AM modulation, as you know, adds 50 percent or more RF power on peaks and of course more voltage.

For me, it is easier to set the gap wide, then slowly reduce the spacing while the station is fully modulated. It can be an exciting moment when the arc occurs! I then back off the gap to twice the distance and tighten it down.

DON'T WAIT

Storms with lightning can even happen during winter months in Minnesota. It is surprising but true that we get thundersnow. That's right, snowstorm conditions in dry air can bring high static charges and lightning at times.

Make it part of your routine maintenance to check all arc gaps for cleanliness. You might be surprised to find gaps badly pitted from arcing. Filing the edges smooth might be required. Be glad they helped save the equipment while sacrificing themselves in the process. It is cheap insurance and makes perfect sense.

Mark Persons, WØMH, is a Certified Professional Broadcast Engineer and has more than 40 years' experience. His website is www.mwpersons.com.

Comment on this or any article. Write to radioworld@nbmedia.com.

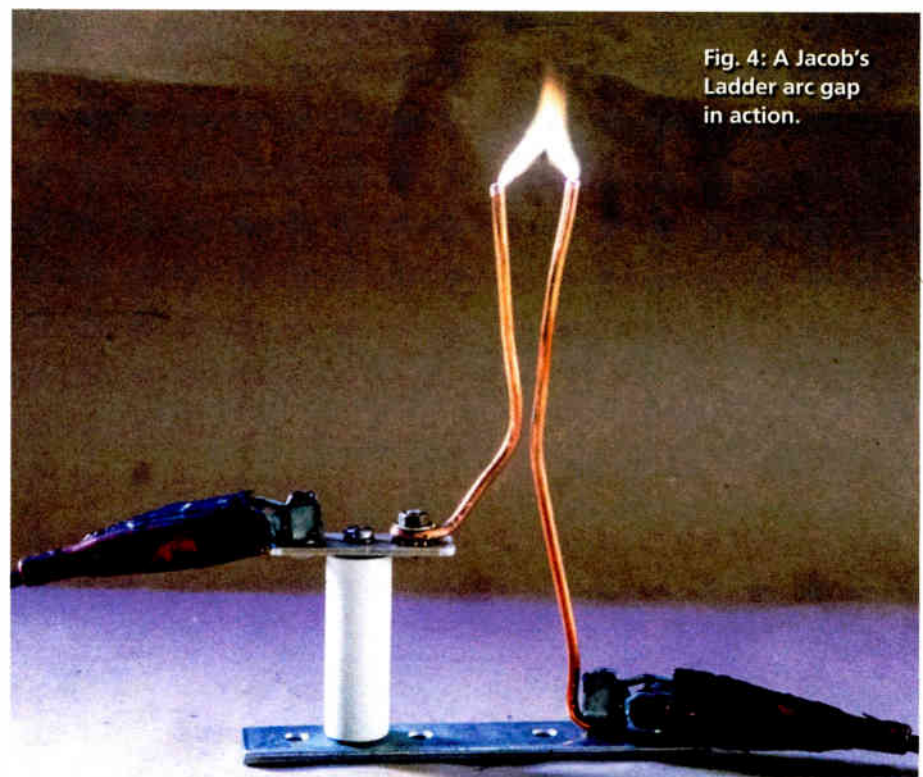


Fig. 4: A Jacob's Ladder arc gap in action.

Photos by Mark Persons

REAL. VIRTUAL. RADIO.

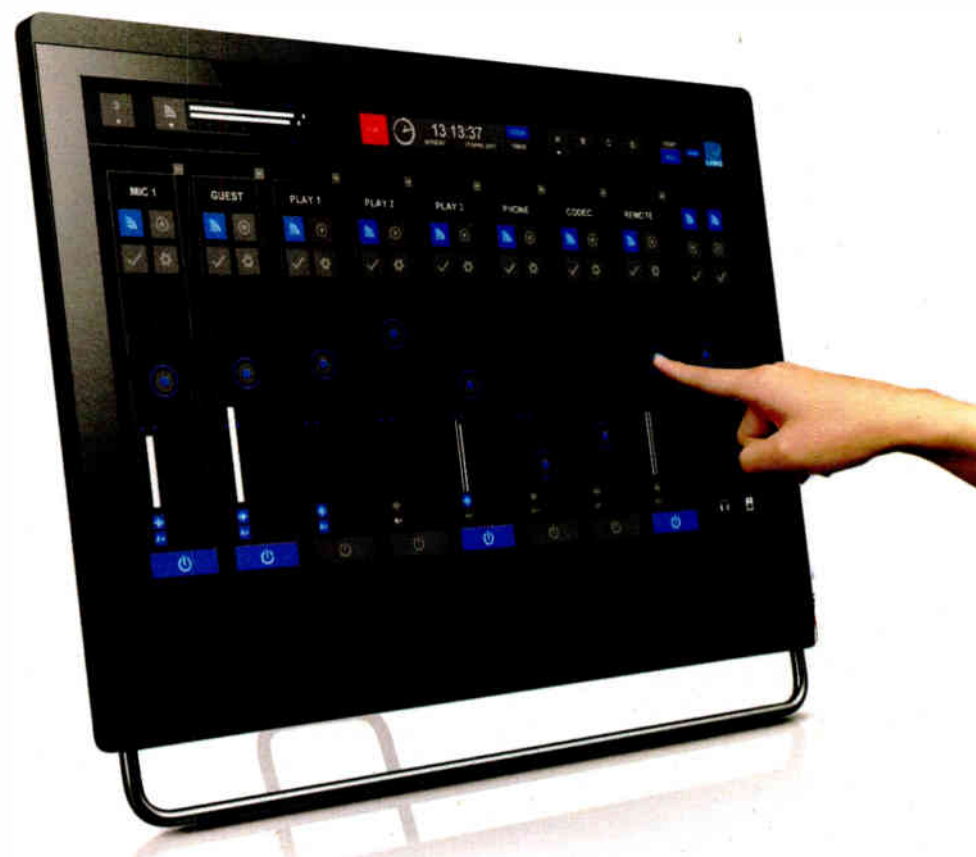


Introducing the virtual radio console. Now at your fingertips.

You know that playout computer in your studio? It could be doing a lot more for you than just playing music. Thanks to the staggering power of the modern computer, it could also be taking phone calls, managing remote talent, generating audio streams — even mixing your station's program audio. Why depend on expensive, dedicated hardware? All you need to build a complete studio is a multi-touch enabled computer and a suite of professional software apps.

Say hello to R3LAY, the virtual radio console that takes full advantage of your studio PC. It's not just a soft mixer: R3LAY is a virtual mixing environment. Its modular approach lets you choose the tools you need from a variety of professional broadcast software – remote codecs, VoIP phone systems, sophisticated audio processors, virtual patch bays, streaming encoders and more – by leveraging the immense power of today's COTS computing platforms. With R3LAY, you can host an entire studio's worth of broadcast tools on a single PC.

R3LAY Virtual Radio Mixer software makes it all possible. R3LAY's clean, intuitive multi-touch interface gives talent a familiar, console-like mixing interface that accommodates all of today's diverse audio types: AES67 / RAVENNA streams, analog or digital inputs, and PC software with WDM or ASIO interfaces. Add the functionality you need with apps from R3LAY partners like Broadcast Bionics, Orban, Source Elements, and StreamS, and you've got an entire broadcast studio on your playout PC — or a mobile studio on a laptop that's ready to go anywhere.



Unlock your potential with the power of software.
R3LAY, from Lawo.

Read more at www.R3LAY.com

www.lawo.com

© 2017 LAWO AG. All rights reserved. Other company names, product names or trademarks mentioned are the property of their respective owners.

Do You Need Trained Sales People?

You know the answer — yes — but U.S. higher education institutions don't

CONTINUING ED

BY DICK TAYLOR

Of course you need more trained, ready-to-hit-the-ground-running sales people on your team.

Radio is the number-one mass media in reach and frequency in 2017. As Iowa farmers taught me when I lived in that state, you've got to make hay when the sun shines.

I decided to write this article because I learned that when I leave my university after seven years of teaching radio sales classes, both introductory and advanced, these classes will no longer be taught as part of the curriculum.

I find that ironic.

When Matt Bevin was elected Kentucky's governor, he said higher education needed to provide the skills that Kentucky businesses and industry needed.

In conjunction with the Kentucky Broadcasters Association, I conducted a survey of the state's 300 radio stations in June 2013, and the number one position stations indicated they needed to fill was that of sales representative.

LACKEY

Flash forward to 2017. I started my research by calling Kentucky Broadcasters Association President/CEO Henry Lackey to see if the 2013 information was still accurate.

I asked Henry how critical the teaching of broadcast sales in colleges was to the future of the radio industry, and he quickly responded: "It is extremely important!"

It's why KBA invests \$30,000 annually into the KBA WKU Radio Talent Institute (of which I was the founding director in 2013). The RTI spends five of the nine days of the institute covering radio sales and conferring Radio Marketing Professional certifications from the Radio Advertising Bureau upon the students.

"I think this program is extremely valuable," Lackey said.

FARBER

The Radio Advertising Bureau serves the sales arm of the industry. Erica Farber is passionate about generating revenue for radio. When I told her about the future (or lack thereof) of my sales classes, she immediately wondered how widespread this might be across the colleges and universities of America.

Erica plans to conduct a study through the Broadcast Education Association and will be reaching out to its executive director, Heather Birks, who told me "this is

TERRIBLY important" to her. (Yes, Heather used all caps on "terribly" in her email to me.)

Erica said she's very interested in learning what the RAB can do to help broadcast schools increase their focus in this area — one considered a critical need for the radio industry.



LEVY

Before founding sales training company Revenue Development Resources, Mark Levy, CRME, was RAB vice president in charge of sales training.

Today, Mark also runs the National Association of Broadcasters Media Sales Institutes, a 10-day intensive sales training boot camp held after college graduations. Students learn the basics of media sales, including winning sales strategies, networking, creating effective presentations and closing sales. MSI partners with Arizona State University, Florida A&M University, Howard University and Ohio University.

Mark told me that one of the big problems he sees with professors is that they've never actually sold radio in their lives. They try to teach sales strategies out of a book. It can't be done. He said Larry Patrick, founder of Patrick Communications, would invite college educators to do an internship to learn what it's really like to sell radio advertising.

Mark said colleges need to act like they do when hiring football coaches. They don't hire Ph.D.s to coach the football team, and teaching radio sales should be about hiring people who've done it successfully and can mentor students into winners in sales.

MIMS

Bruce Mims, Ph.D., is co-author of "Keith's Radio Station" (Ninth Edition) and professor of mass media, Southeast Missouri State University.

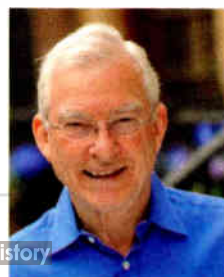
Bruce told me as soon as he began teaching full-time in 1989 he was aware of the cry from the radio industry about the need to teach sales. He said his department's advisory council, state broadcast association and countless others at BEA, CBI and NBS conventions have told him how critical the need is for training in this area.

The sad fact is that none of the faculty has any meaningful background or experience in selling media. This has had a chilling effect on department-level discussions.

The other thing people outside the academy don't realize is that there are stiff turf battles inside colleges and that business departments try to prevent any other department from teaching any sales classes since they feel that's their area of expertise.

WARNER

Charles Warner is a blogger at Media Curmudgeon, teacher at The New School at NYU, Forbes columnist and author of "Media Selling" (Fourth Edi-



tion). I was introduced to him by my good friend and radio visionary John Parikh, president/CEO of Joint Communications.

Charles was immensely helpful in helping me to transition from a market manager for iHeartMedia to broadcast professor. I use his textbook in my sales classes. He is beginning work on his fifth edition of this excellent textbook that will include digital sales and programmatic buying.

He suggests that the problem in hiring experienced teachers for teaching sales versus Ph.D.s lies with the accreditation process. In order to satisfy these requirements, it often means hiring terminal degreed faculty, as opposed to those with street smarts.



GRANT

Augie Grant, Ph.D., is president of the Broadcast Education Association and journalism professor at the University of South Carolina.

At USC, Augie said they hire two kinds of faculty: Ph.D.s for research and teaching duties; and journeyed faculty with master's degrees, who have real-life learning versus book learning to do the skills training part of their program.

ALBARRAN

Al Albarran, Ph.D., author and former chair of the department of media arts at the University of North Texas, told me that he hired Lee Salzberger when the latter retired from BELO Broadcasting to be an adjunct professor at the University of North Texas for 10 years.



When Lee retired from teaching at UNT, no one could be found to teach the classes for the next two to three years. Then when Albarran stepped down as department chair, a new chair moved the program in the direction of film (this appears to be occurring at my university with the change in leadership as well).

CONNELLY

Don Connelly, CRME, is professor and department head, department of communications, Western Carolina University. He is a career radio guy with a master's degree — like me. He is the head of his department, and his university offers a concentration in broadcast sales. He personally brings 23 years of professional radio experience to his school.



He partners with the RAB to offer the RMP certification to his students. He estimates that there may be only 10 institutions of higher education that offer such a media sales intensive program as Western Carolina does. He also said that it's a challenge hiring experienced faculty, those whose years in the industry have taught them all they know, as opposed to those who learned from a book.

WHAT HAVE I LEARNED?

What I learned is that the academy has a snobbery that prevents it from hiring the people needed to

(continued on page 22)

HIGH CAPACITY EVENT STUDIO TRANSMITTER LINKS



outdoor unit



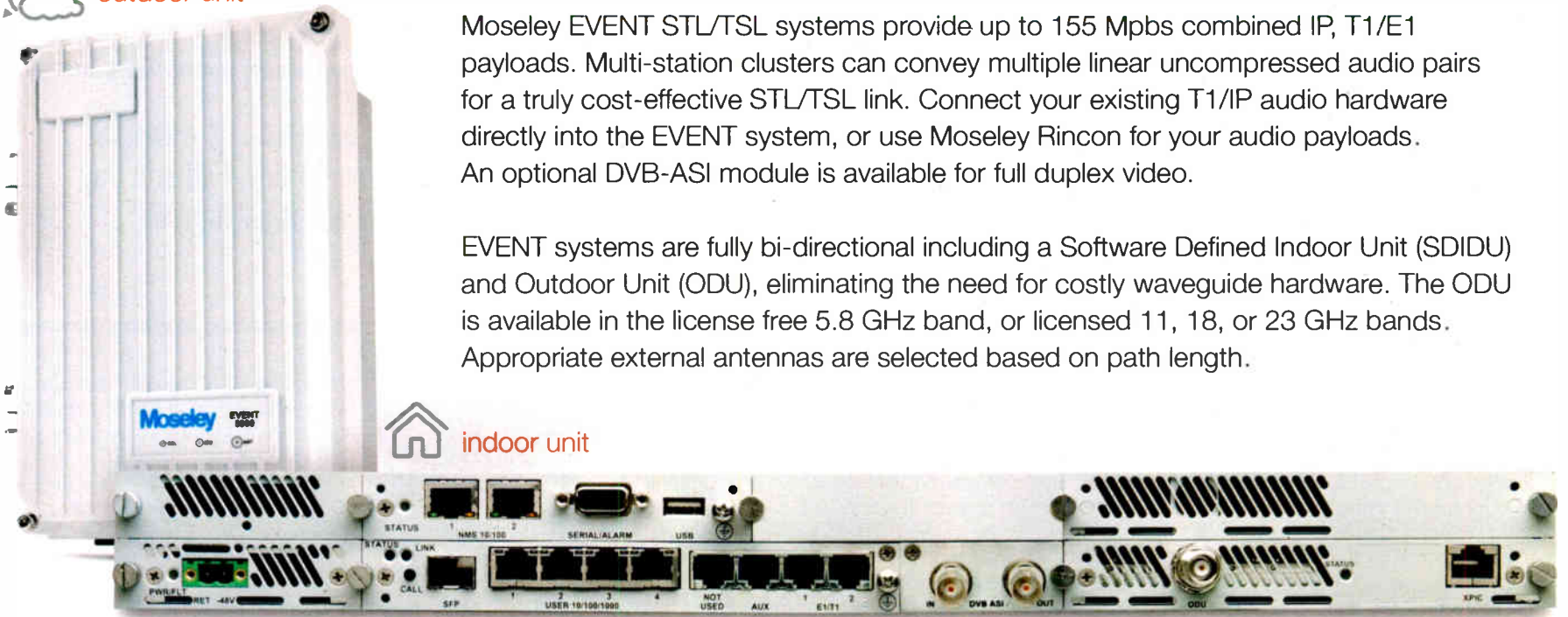
TAKE ADVANTAGE OF WIRELESS HIGH-PAYLOAD STL/TSL CAPACITY

Moseley EVENT STL/TSL systems provide up to 155 Mbps combined IP, T1/E1 payloads. Multi-station clusters can convey multiple linear uncompressed audio pairs for a truly cost-effective STL/TSL link. Connect your existing T1/IP audio hardware directly into the EVENT system, or use Moseley Rincon for your audio payloads. An optional DVB-ASI module is available for full duplex video.

EVENT systems are fully bi-directional including a Software Defined Indoor Unit (SDIDU) and Outdoor Unit (ODU), eliminating the need for costly waveguide hardware. The ODU is available in the license free 5.8 GHz band, or licensed 11, 18, or 23 GHz bands. Appropriate external antennas are selected based on path length.



indoor unit



INTELLIGENT SYSTEM DESIGN



Spectrum-scalable digital radios with user-selectable data rates enable broadcasters to have greater flexibility in STL planning and future growth. The integrated T1/E1 and Ethernet interfaces allow for a combination of T1/E1 and IP packet data.



IP APPLIANCES AND APPLICATIONS

Offer IP transmitter control, surveillance security, and site monitoring to reduce downtime, and protect valuable station assets while saving travel time to the site.



REMOTE MIRRORED SERVERS

From the transmitter site, offers backup of business records and programming content to get you back on the air quickly in the event of a studio outage.



EMAIL AND INTERNET ACCESS FROM THE TRANSMITTER SITE

Saves engineers time accessing manuals or technical support from manufacturers during maintenance sessions.



SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP)

Full SNMP package with GUI provides easy monitoring and configuration changes.

Contact The Moseley Sales Team to Custom Configure Your EVENT STL/TSL Today!

moseleysb.com

Visit us at NAB Show Booth #N7106
World Radio History

Summer Is Perfect for Crowd-Pleasing Promotions

Warm weather offers opportunities for radio to get front and center in the community



With warm weather finally hitting most of the USA, it's time to get your radio station brand and personalities outdoors and in front of people.

Let's spark your thinking with a few proven promotions that are not only crowd pleasers but often attract outside media coverage as well.

Get out your sunscreen and get in the mood by reading this article outside.

WITH THIS BROADCAST, I THEE WED

Everyone loves a wedding! I've had the good fortune of marrying a number of couples on the air, and in front of crowds of people on a few occasions, each time coming away feeling as if the station had scored a major win.

A prime example is what Radio 104.5 in Philadelphia is doing this June. The alternative station, owned by iHeartMedia, is planning a really cool wedding ceremony for one lucky couple at the station's 10th annual birthday celebration at BB&T Pavilion.

To enter, couples are being asked to create and post a video on YouTube, expressing why they want to get married on stage during the festival featuring The Killers, Bleachers, Foster The People, Kaleo, Marian Hill and Andrew

McMahon in the Wilderness.

A panel of judges will post final contender submissions on radio1045.com. Next, listeners will vote on the final winning couple. While on the website, listeners can also register to win tickets to the show. At the festival, DJ Mike Jones will officiate and the bride and groom will have their first dance while being serenaded by Andrew McMahon.

The icing on the wedding cake is that the new mister and missus will receive an all-inclusive honeymoon at the five-star Sandals Royal Bahamian in Nassau, Jamaica.

Kudos to Radio 104.5 for dreaming up such a great vehicle to get in front of a huge crowd outside!

And think of the other boxes they've checked off: exposure on YouTube; station website traffic; database collection with contest entries; potential media coverage; and the many photos and videos that will be shared on social media from the actual event. To top it all off, the event has many sponsors.

SUMMER HOLIDAYS, BIG AND SMALL

While it's too late to plan something for Mother's Day activities this year, built-in crowds will be attending events in your community during Memorial Day, Father's Day and the Fourth of July.

If you don't have the time or staff to plan your own thing, there are certainly local community events that will welcome your offer of on-air promotion, help hosting the stage and possibly even bringing in shared revenue from sponsors.

If you have to pick one, July Fourth

is the most universally celebrated event over the U.S. summer and leaves a lasting impression on so many Americans that it is a natural fit for any format. At the very least, enter a float or a station van/truck into a parade.

If you have any energy left over from Independence Day, July 5 is National Bikini Day. This is a natural for any beach community; numerous sponsors who specialize in being near the ocean will no doubt want to participate by showing off their products and services. Swimwear fashion shows (staged on the beach, of course) are always a hit.

PROMO POWER



Mark Lapidus

action. It's the last big blowout of summer, and people are looking for excuses to join in large outdoor group activities.

Are you hesitant to participate in outdoor activities because most of your talent voice-track the station from somewhere else? Don't be. For a reasonable talent fee, most talent I know will

Built-in crowds will be attending events in your community during Memorial Day, Father's Day and the Fourth of July. Or how about celebrating National Watermelon Day?

Include surfing demonstrations, show off new jet skis and boats, and you'll attract a crowd every time.

Want to capture that small-town feeling? National Watermelon Day is Aug. 3. From eating contests to spitting seeds to growing the biggest watermelons, the fruit that's 92 percent water is 100 percent fun.

Need more time to plan? There's no excuse for missing out on Labor Day

gladly come to the city they rarely see, because they feel a strong connection with the community. A friend of mine who voice-tracks a lot even has an answer ready for locals when they ask him where he lives. He responds, "Near the airport!"

Get outside and go local!

Find more Mark Lapidus at www.radioworld.com under the Columns & Views tab.

TRAINING

(continued from page 20)

teach the classes that the radio industry wants to be taught. Until this changes, don't expect more colleges and universities to teach in this area, despite the industry's critical need.

Let me share my experience in seven years of university teaching.

Degrees and publishing in academic journals is valued over real on-the-job experience and publishing in trade publications (like Radio World) or blogs that are widely read (*Dick-TaylorBlog.com* now has more than 75,000 readers all over the world).

Radio keeps the exciting career of sales a deep dark secret. Students who have taken my introductory broadcast sales class discover a career they never knew existed. I've had students who came to the university to be a TV anchor or reporter or disc jockey who have had the light bulb go off in their head and switch to media sales. These students also have been the ones who graduated with a job waiting for them.

Madison Ogg is a senior at Western Kentucky University and wrote, "Dick Taylor was my broadcasting sales professor and I can truly say he taught me everything I know about the power of selling. I had no intent to study sales before I came to WKU, but with his vast knowledge, experience and passion he shows for sales, Mr. Taylor was able to help me find the career path I'm pursuing now."

The radio industry needs sales talent. It's already out there and would love to be a part of our industry.

But if they never get a chance to know what we offer, they will go into other careers — and that will be radio's loss.

Dick Taylor is a Certified Radio & Digital Marketing Consultant and assistant professor of broadcasting at Western Kentucky University in Bowling Green, Ky. He joined the faculty of its School of Journalism and Broadcasting after a 42-year career in radio. He is director of the KBA WKU Radio Talent Institute and is on the board of the New Jersey Broadcasters Association.



Work smarter. Anywhere.

Remote access is here!

Simian Radio Automation with iPad,
iPhone and Windows remote.



Call (888) 274-8721
(888) BSI-USA-1
or email us at sales@bsiusa.com

NSO Plays NPR

"All Things Considered" borrows the band for the day



BY BRETT MOSS

On Feb. 27, National Public Radio decided to walk a tightrope, without a net. It brought in members of Washington's National Symphony Orchestra to provide a little live background music for the day's "All Things Considered."

It was an ambitious project to say the least. A very busy Andy Huether, technical director of NPR's Studio 1, and NPR's Managing Director of Technology Strategy and Audio Engineering Chris Nelson took some time out from their preshow preparation to give Radio World a peek inside how they made this event happen.

Radio World: Describe this ambitious project.

Andy Huether: Several times in the past, our afternoon news program "All Things Considered" has invited musicians to be a "band for a day" for the show. All of the music that is part of the show — breaks, themes, interstitials,

etc. — is played live from our Studio 1 performance space and routed to the on-air Studio 31 and mixed into the show. "ATC" has hosted Los Lonely Boys in 2012 and Thievery Corporation in 2015, and our early show "Morning Edition" hosted Yo La Tengo also in 2015. Monika Evstatieva, the producer and director at "ATC" who originally came up with the concept and master-minded the previous ATC appearances decided to try to outdo herself by asking the National Symphony Orchestra to come and bring as many players as they thought they could fit into the studio. That turned out to be about 75.

RW: That's more than just a typical band or soloist. Can you handle a group this big and have you handled such a group before?

Huether: We're very thrilled for this opportunity and ready for the challenge of capturing the performance. We haven't had quite as big a group in this studio before, but between myself

and co-engineers Neil Tevault and Brian Jarboe, we have a fair amount of experience in both this studio and venues across the country.

RW: What particular problems does a large ensemble bring with it?

Huether: Well, fitting them all into a 45-foot x 60-foot studio is probably the least of our challenges (that's just barely the size of the NSO's stage layout!), but mainly I'm concerned with how the room will respond to this many players. The layout will be fairly cramped, so I believe getting microphones placed appropriately will take some work not just in terms of real estate, but more importantly in getting them to capture the ensemble with enough breathing room and avoiding comb filtering issues.

The dynamics of the orchestra are also a concern; louder passages may affect balance and overload a space of this size. This will be the first time we've had a group of musicians in the

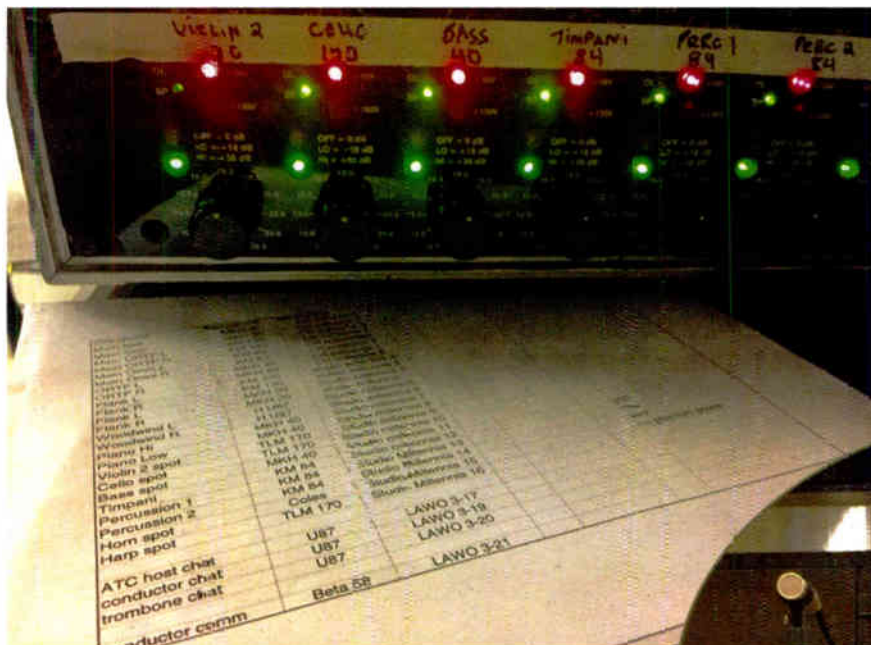
studio capable of the high SPL of a full orchestra at fortississimo!

RW: In many ways this is a throw-back to the days when some radio stations actually had an in-house orchestra.

Huether: That's a very interesting observation. Obviously, economics and flexibility have played large roles in the decline of that practice amongst broadcasters. It's fascinating to consider that what was once a standard practice has become a novelty special broadcast. It really puts one in awe to imagine the talent and discipline of everyone involved in those productions, especially when confronted with the challenge of doing just this one!

RW: Is all of this work being done by in-house technical staff or do you have to call in extra hands or rent extra equipment?

Huether: NPR has a long history of producing music programming, and we have a vast amount of institution-



The microphone input list resting below one of the Millennia Media HV3D eight-channel preamps.



Andy Huether works with laptops and the Lawo mc²66 console.

al knowledge and quality gear that we can tap into. So yes, we have lots of resources in-house!

RW: Who are the key people in this project?

Huether: As I mentioned, Monika Evstatieva, a producer and director with "All Things Considered," is the mastermind behind the whole idea, and she's been coordinating logistics with the NSO Production Managers Daryl Donley and Krysta Cihl and planning program and song selection with Director of Artistic Planning Nigel Boon. Carline Watson is the executive producer of "ATC" and is responsible for greenlighting and overseeing the project and how it fits into the structure of her show. Ari Shapiro and Audie Cornish are very excited to be hosting the show that day, and Audie will be running down two flights of stairs to our performance studio for the last segment of the show when she'll chat with conductor

Steven Reineke and trombonist David Murray. I've had a lot of support from my fellow technicians Neil Tevault and Brian Jarboe and Electronics Engineers Joe Mills and Gene Gerhiser as well as the wider engineering team includ-

ing Chris and Technology Strategist Kevin Wait. The Facebook video production is being spearheaded by Claire O'Neill and Becky Lettenberger, and Colin Marshall is the technical director switching that video. There are many people working hard to make this happen and I wish I could credit them all!

RW: What are the key concerns or failure points to be watched?

Huether: Communication is always key when dealing with multiple locations



A microphone tree in Studio 1.

coordinating a single broadcast. The Lawo MADI network we have throughout the building provides a huge amount of flexibility and interconnectivity. There are PTT panels that provide communication between any positions in any studios in the building. We've also set up a Polycom video conference system between Monika who will be in Studio 1 control room and Jinae West who will be directing the show from Studio 31 control room. Our shows all run on very regimented clocks that divide the hours into segments, breaks, funding credits, etc., and we'll be able to route the timecode signals of the clocks

that count down these segments from Studio 31 down to Studio 1. We want to be sure we have music ready when Jinae needs it in the studio!

RW: Do any of the instruments present their own problems?

Huether: The instrument I'm most concerned about is the room itself! More than any individual instruments, the balance of the whole seems like it will be most challenging. The assumed acoustic signature of an orchestra is going to be set in a concert hall, so recreating that feel in a smaller space, maintaining a good balance and natural sound will be our goal. Without the space and volume of a hall in which the instruments can blend on their own, we'll need spot mics on almost all the sections.

The nature of the performance as interstitial music in a news show also presents problems in being able to be prepared for what will be played. Generally, directors of our shows will choose music that suits the tone of the news pieces they abut, choosing recordings from a large library of music immediately before and even during the show. Using live performers with a limited rehearsed repertoire, those choices become more difficult. The show is trying its best to solidify the run of the show to make this easier, but it is a news show, so it's impossible to nail it down 100 percent.

RW: Describe the signal route (and equipment) that gets the sound from the player's instrument all the way into the distribution system and the mix.

Huether: We're using a wide array of microphones to be sure we have choices to achieve the best sound: Neumann RSM 190, KM 140, KM 63, KM 130, U 87, TLM 170, KM 84, Sennheiser MKH 40, MKH 20, Coles 4038 ... all through our cleanest outboard preamps, Millennia HV3D. The Studio 1 console is a Lawo mc²66, and I'll be adding

(continued on page 26)

<p>Studio Items Inc.</p> <p>Mic Booms On-Air Lights Speaker Mounts www.studioitems.com</p>	<p>TORPEY TIME <i>(The Good Time People)</i></p> <p>Clocks Up/Down Timers www.ram68.com</p>	<p>Dixon Systems</p> <p>News Mixers Line Matchers USB Audio Codecs www.ram68.com</p>	<p>RAM Systems</p> <p>Broadcast Furniture Systems Integration Sound Absorption Panels www.ram68.com</p>
--	---	--	---

NSO AT NPR

(continued from page 25)

space with a TC Electronic 6000 processor. Master Control will route the Studio 1 program up to Studio 31 through our Lawo switcher, and Zach Coleman will be mixing "All Things Considered" in Studio 31 on a Lawo Sapphire console. Talent microphones throughout the facility are all U 87 for consistency, and we'll be using them in Studio 1 as well for the chat at the end of the show.

RW: That's an impressive mic tree. What's the complement and layout?

Chris Nelson: On the far ends of the microphone tree are Neumann KM63s spaced omni. This was the pair that was chosen for the main pick up of the orchestra for the broadcast.

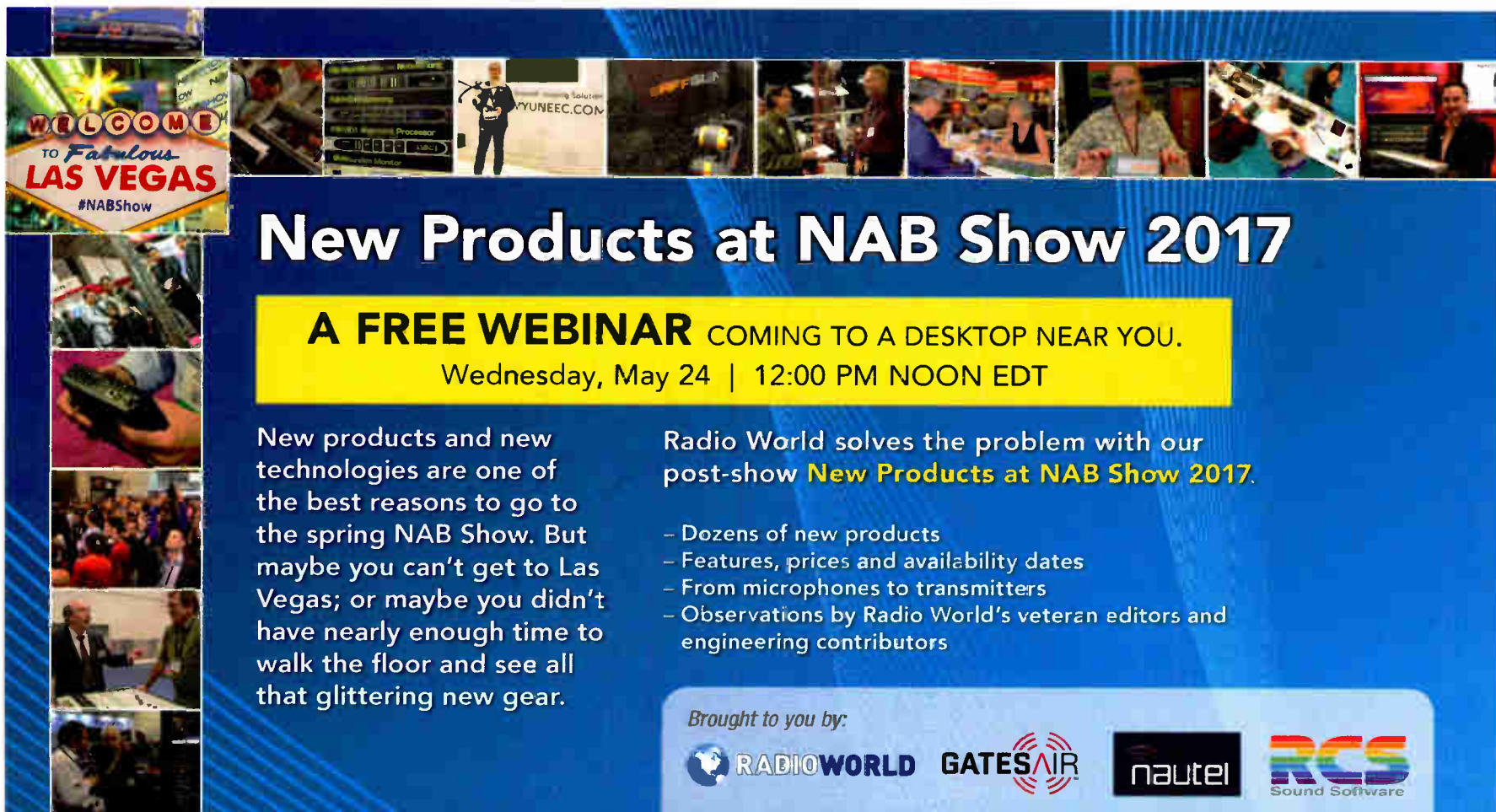
In the center of the tree, the two black microphones stacked on top of one another are a Sennheiser MKH 40 and Sennheiser MKH 30 in a mid/side configuration. There are also two pairs of microphones in an ORTF configuration in this arrangement. The top pair is Neumann KM140s, the bottom pair is Sennheiser MKH 40s.

Ultimately the main mix was comprised of Neumann KM63s in a spaced pair configuration; mixed with some Sennheiser MKH 20 flanks about 10 feet to the left and right of the conductor. We also used a handful of spot mics which are identified on the input list.

Tell us about your own unique radiolaudio project, buildout or broadcast. Email bmoss@nbmedia.com.



The view from the Facebook video feed production desk.



New Products at NAB Show 2017

A FREE WEBINAR COMING TO A DESKTOP NEAR YOU.
Wednesday, May 24 | 12:00 PM NOON EDT

New products and new technologies are one of the best reasons to go to the spring NAB Show. But maybe you can't get to Las Vegas; or maybe you didn't have nearly enough time to walk the floor and see all that glittering new gear.

Radio World solves the problem with our post-show **New Products at NAB Show 2017**.

- Dozens of new products
- Features, prices and availability dates
- From microphones to transmitters
- Observations by Radio World's veteran editors and engineering contributors

Brought to you by:

RADIO WORLD **GATESAIR** **nautel** **RCS Sound Software**

TO REGISTER FREE, VISIT: <http://radioworld.com/webinars/15>

ACOUSTICS



AcousticsFirst
Materials to Control Sound & Eliminate Noise

888-765-2900

ANTENNAS/ TOWERS/CABLES

WANT TO SELL
CCA FM800G Trans 107.9, great cond; 4-Bay Jampro antenna w/deicers; 3-bay Shively antenna FM. D Brockman, 606-965-3436.

AUDIO PROCESSING (INCLUDES ON-AIR)

WANT TO BUY
Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST - 214 738-7873 or sixtiesradio@yahoo.com.

Wanted: real plate reverb. abgrun@gmail.com.

AUTOMATION EQUIPMENT

WANT TO SELL
DIY-DJ Version 2.0 is now available. Over 500 copies of DIY-DJ, a Linux based radio automation system, have been distributed and now version 2.0 is available. Voice tracking, join satellite feeds, do unattended sports and remote events, temperature announce, scheduler, automatic cut editing on import, and much more. It's FREE. If you are using version 1.0 or would like to try DIY-DJ, go to krwsfm.com, register and download your free full version. The only thing we ask is that you let us know if and how you are using the software. Call (406) 679-0527 or email krws@digitaldevelopment.net for a copy today.

MICROPHONES/ HEADPHONES/ SPEAKERS/AMPS

WANT TO SELL
1934 RCA 77A double ribbon microphone, originally used by Arthur Godfrey at WFBR Baltimore. 100% perfect condition. Contact Bill Cook, 719-684-6010.

WANT TO BUY
RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 214 738-7873 or sixtiesradio@yahoo.com.

MISCELLANEOUS

WANT TO SELL
I'm selling between 150 and 200 cassette tapes that consist of old-time radio shows, sports shows, some local New York radio talk shows, etc... Must take entire collection and the price is negotiable. Please call me for details and, my phone number is 925-284-5428.

Radio broadcasts of Major League Baseball, NFL, and some college football games that are on cassette tapes, approx 100 to 125 games, time period of entire collection os from the 1950's - 1970's, BO. Must purchase entire collection. Contact Ron, 925-284-5428 or ronwtamm@yahoo.com

WYBG 1050, Messina, NY, now off the air is selling: 8-channel Harris/Gates console; 250' tower w/building on 4 acres; collection of very old 78s dating back to 1904; 12' satellite dish on concrete base; prices drastically slashed. 315-287-1753 or 315-528-6040

WANT TO BUY
Collector wants to buy: old vintage pro gears, compressor/limiter, microphone, mixing consoles, amplifiers, mic preamps, speakers, turntables, EQ working or not, working transformers (UTC Western Electric), Fairchild, Western Electric, Langevin, RCA, Gates, Urei, Altec, Pultec, Collins. Cash - pick up 773-339-9035 or ilg821@aol.com.

2" plastic "spot" reels 6.5 or 8" diameter, as used for quad video. Wayne, Audio Village, 760-320-0728 or audiovlg@gte.net.

Equipment Wanted: obsolete, or out of service broadcast and recording gear, amplifiers, processing, radio or mixing consoles, microphones, etc. Large lots preferred. Pickup or shipping can be discussed. 443-854-0725 or ajkivi@gmail.com.

I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR, KSF, KOFY, KCBS, KQW, KRE, KTIM, KYA, etc, I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at ronwtamm@yahoo.com.

Looking for a broadcast excerpt of a San Francisco Giant's taped off of KSFO radio from 1959, interviews

CONSULTANTS



OWL ENGINEERING, INC.
Consulting Communications Engineers
5844 Hamline Ave. N., Shoreview, MN 55126
651-784-7445

- AM/FM/NCE Applications
- Allocation and Upgrade Studies
- Insurance - Investigation & Claims
- ANSI and NRSC Measurements
- AM Directional Array, Design, Tuning and Proof using Method of Moments
- Tower Detuning
- Intermodulation Studies
- Radiation Hazard Evaluation and Measurements

Fax (651) 784-7541 E-mail: info@owleng.com "Member AFCC"

with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a homerun by Willie Mays and Felipe Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or ronwtamm@yahoo.com.

Looking for KFRC signoff radio broadcast from 1930 Andy Potter, running time is 0:22 & also the KLX kitchen the program guest is Susanne Caygill, a discussion of women's affairs with a long promotion for Caygill's appearance at a local store. Anne Truax, Susanne Caygill, running time is 13:44. Ron, 925-284-5428 or email ronwtamm@yahoo.com.

Looking for KTIM FM radio shows from 1981-1984 if possible unscoped. R Tamm, 925-284-5428 or ronwtamm@yahoo.com.

RECEIVERS/ TRANSCEIVERS

WANT TO SELL
Johnson Electronic SCA880 module, 6792 Khz, 417-881-1846.

WANT TO BUY
AM Stereo radio. Call 417-881-1846.

RECORDING & PLAYBACK HARDWARE

WANT TO BUY
1960s-vintage MacKenzie Repeater machines, magazines, spare parts and manuals, complete or "parts" machines considered, James, 870-777-4653.

Large or small collections of 16" transcriptions or 12" transcriptions, not commercial LPs. Bill Cook, 719-684-6010.

Schnader telecriptions 16 mm musical films produced in the early 50 s. Bill Cook, 719-684-6010.

Standard Short-tune series. Bill Cook, 719-684-6010.



GRAHAM BROCK, INC.
BROADCAST TECHNICAL CONSULTANTS
Full Service From Allocation to Operation AM/FM
Field Work: Antenna and Facilities Design
Over 45 years engineering and consulting experience
912-638-8028
202-393-5133
www.grahambrock.com



Doug Vernier
Telecommunication Consultants
Broadcast Engineering Consulting
AM/FM/TV/LPTV/DTV
Custom mapping service
Frequency searches
Propagation prediction
FCC application preparation
V-Soft
Software for your PC
(800) 743-3684
www.v-soft.com

STATIONS

WANT TO SELL
(2) LPFM radio stations for sale, located in the NW part of central Florida on the gulf coast, covers the county, get out of the cold weather, come to Florida, call or write for particulars, 352-613-2289 or email boceey@hotmail.com or Bob, PO Box 1121, Crystal River, FL 34423.

TAX DEDUCTIBLE EQUIPMENT

Donations Needed: All Volunteer, Non-profit Low Power community radios stations need Equipment. Will offer tax deduction letter, You determine donation value, We will pay shipping. Equipment shared between three Wisconsin stations. Looking for Mics, Mixers, field equipment, etc. You name it. Email: Dan@WIECradio.org.

www.radioworld.com

Buying used equipment?
Selling used equipment?

YOU'RE IN THE RIGHT PLACE!

RADIOWORLD
Broadcast Equipment Exchange

For more information, call Michele at 212-378-0400 ext. 523

TEST EQUIPMENT

MULTI-STATION CONTROL
for your Sage-Endec or DASDEC

with our **Multi-Station Relay Adapter**

- Control up to 3 additional stations for a total of 4
- 100% Compatible with both the original Sage SE1822, the new Digital SE44 and now the Digital Alert Systems DASDEC™ when used in the analog audio mode
- Both rack mount (MSRA-RM) and table top (MSRA) units available
- Master & individual station recessed front panel multi-turn EAS audio gale controls
- Individual left and right channel EAS activity LED indicators for each additional station
- Test button for easy setup
- Screw type pluggable Eurostyle connectors for positive and secure connections
- Fail Safe gold clad relay contacts in case of a power failure, 2 relays for each station

MSRA-RM only \$699, MSRA only \$625.00

Also, our **Multi-Station Relay Expander** with relay contact output only for controlling digital switchers and routers

MSRE-REM (1U)

- All of the same features above excluding the audio features and only 1U high (MSRE-RM)
- 2 gold clad form "C" relay outputs for each station

MSRE-REM only \$329.00, MSRE only \$299.00

For details on these and other innovative products for the broadcaster, call or visit us on the web at www.demengineering.com

2174 Chandler St. Camarillo CA 93010
805-987-7881 800-244-0487

You're Here!

...and so are the potential buyers for your products and services.

DAD What's in your studio?

Radio World's Classifieds section is a great place to find things for your business, and a great place for prospects to find you!

Contact Michele at 212-378-0400 ext. 523 or email minderrieden@nbmedia.com





Rebuilt Power Tubes 1/2 the cost of New!

Se Habla Español

ECONCO

Se Habla Español

Tel: 800-532-6626 Web: www.econco.com
 Intl +1-530-662-7553 Fax: +1-530-666-7760



TRANSMITTERS/ EXCITERS/ TRANSLATORS

**AM Ground
Systems Company**
 Complete AM Ground
System Services
amgroundsystems.com
 866-22RADIO

WANT TO SELL
 Wanted working or not,
 TFT 8900 Series Reciter. Jeff
 Parker, 540-875-9906.

**Run your
employment ad
on our website
for only
\$2 per word!**
www.radioworld.com
 Call Michele
 for all the details at
 212-378-0400
 ext. 523
minderrieden@nbmedia.com

TUBES



Keeping you on the
air since 1934!
 ISO 9001 Certified

NEW POWER TUBES

Triodes
 Tetrodes
 Pentodes

NEW SOCKETS & REPLACEMENT PARTS

Worldwide Availability
 Made in the U.S.A.

Call (800) 414-8823
 Int'l (650) 846-2800
 Fax (650) 846-3795

Visit our Website at
www.cpii.com/eimac

 Innovative power products solutions

DISTRIBUTOR DIRECTORY

The following distributors serving the broadcast industry
 would be glad to help you with any of your requirements.

CORNELL-DUBILIER
MICA CAPACITORS
 FROM STOCK

JENNINGS VACUUM
CAPACITORS
 FROM STOCK

HIGH ENERGY CERAMIC
CAPACITORS
SURCOM ASSOCIATES
 5672 El Camino Real, Suite K
 Carlsbad, California 92008
 (760) 438-4420 Fax: (760) 438-4759
 e-mail: link@surcom.com web: www.surcom.com

**SPACE AVAILABLE
212-378-0400 x523**

Make Your Move.



Advertise!

For more information contact
 Michele Inderrieden at
 212-378-0400 ext. 523
 or minderrieden@nbmedia.com

EMPLOYMENT

POSITIONS WANTED

Are you a small market station needing a good nuts & bolts engineer in the Los Angeles area? I will make your station shine! CET, fully FCC Licensed. Available for Full/Part-time/Contract work. Available immediately. Mitchell Rakoff, 909-446-6820, mitchellrakoff@yahoo.com.

Experienced radio station manager seeks new management opportunity. More than 39 years experience in radio. Willing to relocate. Family-friendly format(s) preferred. Send details about your management opening to: radiogm@hotmail.com.

Extremely knowledgeable and articulate racing writer/talk show host Adam Amick is available for shows, correspondent, features, etc. Check out www.bleacherreport.com for samples. Call 214-384-5812 or email: adam@rubbinsracingshow.com.

Reach Radio Professionals!

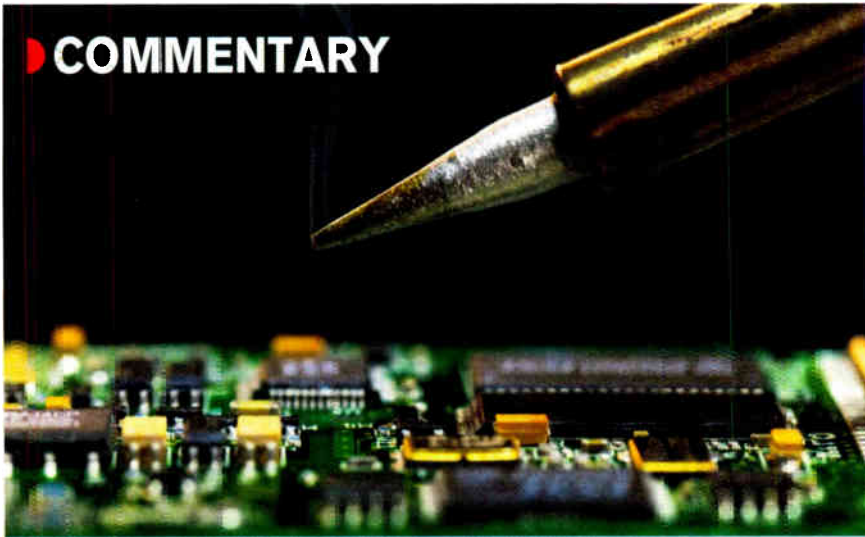
For more information,
 including
 rates & deadlines,
 call Michele
 at 212-378-0400 x523.

**Advertise
today!**



Why I Support the Right to Repair

We should be able to repair our own equipment, and service docs should be reasonably obtainable



istockphoto/fuchschen

BY STEVE JOHNSTON

The world of electronics repair seems to be changing.

At one time we could expect that a company making an electronic product would provide at least basic service literature (description of function, block diagram, schematics) to people who owned the product and any repair personnel they might employ. When companies no longer wanted to support the products, they would allow the info to be shared among users and repair techs; ultimately, as a company passed from the marketplace, the information would go into the public domain.

With development of the internet, some companies (or at least owners of the names of those companies) decided there was money to be made by reselling that old information as "content" on the web. An example is the Heathkit Company; after decades of disuse, the company name was purchased by a firm in California, and cease-and-desist letters went out to prohibit user sharing of the service literature online.

This change might be frustrating for engineers and technicians, but there is something even worse brewing.

Increasingly in recent years, companies have been unwilling to share basic service literature — even mere schematics — because they claim designs of their products are "proprietary." You can forget about these outfits providing the information free to owners; you can't even buy it!

Among companies taking this approach, the most well-known offender is Apple. They have gone so far as to try

to make it illegal to repair their products if you are not an Apple Authorized Service Center. And they won't provide service info to anyone else.

Engineers and technicians have pointed out that with a close look at the hardware, one can see it is quite ordinary — the circuits are usually straight from examples on the datasheets of the components. In my view, the "proprietary" stuff might be the software inside the chips — which wouldn't be documented in the service literature anyway — not the hardware. Yet these companies hold that all the information is secret.

I've read that some automobile manufacturers are trying this legal approach as well. If they get their way, we won't be able to get service info, and no one except dealers would be allowed to repair the vehicles commercially.

Some companies go so far as to claim the purchaser does not even own the product; we are only "licensed" to use it.

These attitudes have spawned a movement among professional service technicians and home repair hobbyists called the "Right to Repair." This philosophy holds that we should be able to repair our own equipment (or choose who to hire to do a repair), and that the same service documentation available to "authorized" repair facilities should be reasonably obtainable by users or independent service shops.

HOW THIS AFFECTS ENGINEERS

An issue of this sort that I encounter as a broadcast engineer is the idea that "there are no user-serviceable parts inside."

A well-known provider of uninter-

ruptible power systems and power management devices was the most recent company to pull this one on me. We had a model of their products deployed at many of our studio and transmitter sites, and after a year or two of service they all started to fail, one after another. I analyzed the problem and saw that the same failure mode was common to them all. A Zener diode appeared to be slightly underrated and eventually would short.

I tried to work with the manufacturer to get the service info — even just the specs of the failing Zener diode — but they denied there was a problem and would provide no technical details of their product. Their excuse was "no user-serviceable parts inside."

that if they didn't provide that info with their products I would not be buying it. The company chose to forego my order rather than release the information. I gladly placed my order with a competitor, who provided a good manual with the basic service information I require.

LET ME DECIDE

Discussing this with several broadcast equipment manufacturers, I found attitudes mixed.

Most companies make service documentation available to purchasers and encourage engineers to repair the equipment. But a few took a negative view, saying "Radio stations don't repair stuff anymore" or "If I put that information out there my competitors will steal it."

Access to basic service information is important to our industry. As broadcast engineers, we should be able to

Access to basic service information is important to our industry.

I traced out the circuit and made the repair, but it took longer than if I'd had the documentation. The failure to acknowledge a known problem, and the "no user-serviceable parts inside" statement, has soured me on this company's products and I will be far less likely to do business with them.

Another example: A couple years ago I was going to purchase a number of new modulation monitors for my company's transmitter sites. I ordered one to try it out, but there was no service info at all included — just a one-sheet "user guide." I asked for the service manual and was told that it was proprietary information and not available. I said

decide if a failed device should be repaired or replaced and to what level we will pursue a repair. The ability to service professional equipment to the component level is very important to me, even if we do not pursue it in every instance. I feel I have the right to repair anything I own, and for professional products I expect the manufacturer to provide the basic info that makes this practical.

Steve Johnston is the director of engineering and operations for Wisconsin Public Radio.

Comment on this or any article. Email radioworld@nbmedia.com with "Letter to the Editor" in the subject field.

HOW TO

SEND A LETTER TO THE EDITOR:

Email radioworld@nbmedia.com with "Letter to the Editor" in the subject field. Please include issue date.

COMMENT ABOUT ONLINE STORIES:

Post your opinions about any Radio World story using the DISQUS commenting tool. Just scroll down to the bottom of any story on the Radio World website: radioworld.com.

CHANGE YOUR MAILING ADDRESS:

Visit radioworld.com, click on the subscription button and follow instructions to change a subscription address.

CONTRIBUTE FREELANCE ARTICLES:

Email radioworld@nbmedia.com and request our Writer's Guidelines.

OPINION

Revitalization and Interference: Fact vs. Science Fiction

Mark Fowler says the protection enjoyed by Class As under antiquated rules is illusory

COMMENTARY

BY MARK FOWLER

The pending "Revitalization of the AM Radio Service" rulemaking, MB Docket No. 13-249, offers the opportunity for a long-overdue revision of the FCC rules to align AM technical standards with reality.

The antiquated standards we live with today still define AM signal levels for service contours and the levels of undesired signal interference. These standards were designed in the 1920s and 1930s. Rural families like the fictional Waltons gathered around the family tube radio set to listen to Jack Benny and "The Grand Ole Opry." Electronic external interference did not exist.

Clear-channel licensees want the commission to retain these old, crusted, irrelevant interference standards as if time stood still.

"PRO-SERVICE" AGENDA

Extensive changes in AM allocation standards have not been considered since an "AM improvement" rulemaking proceeding over 25 years ago.

The comments of the engineering consulting firm du Treil, Lundin and Rackley Inc. in the AM Revitalization proceeding provided detailed information on research into the present-day environment of noise and man-made interference. They explained that a 1986 "AM improvement rulemaking" included "a misguided attempt to legislate an

AM radio Utopia by pretending to 'out-law' interference between stations and hoping new receiver technology would overcome the ills of AM radio."

The ambient interference situation has become much worse, not better, for AM stations in the last 25 years. True "revitalization" of the AM band now calls for focusing on how the rules can be changed to promote a "pro-service" instead of "anti-interference" agenda. That pro-service agenda may require undoing other changes that were made in the name of interference reduction which have proven counterproductive.

The controversy surrounding the FCC's proposal to change the daytime protected contour for Class B, C and D stations from 0.5 mV/m to 2.0 mV/m is critical and deserves careful consideration. The AM Radio Preservation Alliance opposed any change at all in the protected contour level out of concern for increased interference between stations, rather than considering steps to account for present-day environmental interference conditions. However, the interference calculations underlying the alliance position were shown to be defective by several expert engineers in their reply comments.

The Association of Federal Communications Consulting Engineers said in its reply comments that "the AM Radio Preservation Alliance employs an incorrect definition of interference in identifying the areas where actual interference would be caused to the signals of Class B, C and D stations. The Alliance's analysis portrays a much larger



Mark Fowler

area of interference than would be the case *if desired/undesired signal ratios* were analyzed."

As to interference standards for clear-channel Class A stations, Carl T. Jones Corporation and dLR were joined by Hatfield and Dawson Consulting Engineers LLC in suggesting that, instead of the proposed standards, the FCC should adopt a method that takes into account the *actual nighttime interference level*, which in *reality* is the desired/undesired signal ratios calculated for Class A stations.

This real-world standard would replace the 80-plus-year-old, single-signal overlap avoidance method that wrongfully assumes a Class A receives no interference at all within its 0.5 mV/m 50 percent of time skywave contours.

Importantly, their reply comments provided information on the actual

interference levels at licensed domestic Class A stations. Hatfield's reply comments were particularly striking in noting, "Calculation of the actual levels of interference received by Class A stations presently licensed shows that not one of them in the contiguous 48 states is actually protected to its nominally protected value at its transmitter site, much less at the skywave nominally protected contour."

BENEFICIAL CHANGE

The rule change offered by these consulting firms would actually promote improved local nighttime service by other classes of stations. Importantly, it would also improve service from Class A stations that employ directional antennas at night, all without raising the interference levels that Class A stations already receive. Other reply comments demonstrate that the potential service benefits of a change to Class A actual interference levels will increase primary service to millions by many broadcasters.

Conclusion: The protection afforded Class As by antiquated rules is illusory, i.e., they *provide no real protection* as they do not eliminate the *actual interference* experienced by the Class As since the beginning. It's past time to exit from the alliance's 1920s time machine and get back to the future.

In this way, more people will receive strong AM service from broadcasters now handcuffed by the past; and no actual increased interference to the clear channel stations will result.

The writer was chairman of the FCC from 1981-1987. He is chairman of LN2D LLC, a digital signal processing company.

Comment on this or any story. Email radioworld@nbmedia.com.

ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

PAGE	ADVERTISER	WEBSITE/URL
11	Axia - The Telos Alliance	www.telosalliance.com/axia
23	BSI	www.bsiusa.com
7	Comrex Corporation	www.comrex.com
1	ENCO	www.enco.com
5	Henry Engineering	www.henryeng.com
13	Inovonics Inc	www.inovonicsbroadcast.com
19	Lawo	www.lawo.de
21	Moseley Associates	www.moseleysb.com
4, 14, 22	Nautel	www.nautel.com
15	Omnia - The Telos Alliance	www.telosalliance.com/omnia
31	Radio Show	www.radioshowweb.com
25	Ram Broadcast Systems	www.ramsyscom.com
9	Tieline Technology	www.tieline.com
2, 16-17, 32	Wheatstone Corporation	www.wheatstone.com

READER'S FORUM

RADIO LUMIÈRE

I want to thank Radio World, Marguerite Clark and Ben Barber for the beautiful, descriptive article ("Haiti: Inovonics Lends a Hand," <http://tinyurl.com/rw-lumiere>). It was a great pleasure to host Ben on his trip and to work with him during those days. He was mostly hands-on while I stood by and watched. The Inovonics-donated equipment has greatly improved the signal quality of the stations.

I have had the pleasure of being involved with Radio Lumière since 1965, just six years after its founding when it was still a single AM station. Sixteen years I spent living in Haiti and helping to build up the network; the rest have been on a consulting basis from the U.S. and short-term trips. On behalf of the Haitian people and entire Radio Lumière staff, I thank everyone who has made it possible over the years.

*Jerry Miel, PE
Green Valley, Ariz.*





Radio's Ultimate Destination

September 5-8, 2017 | Austin

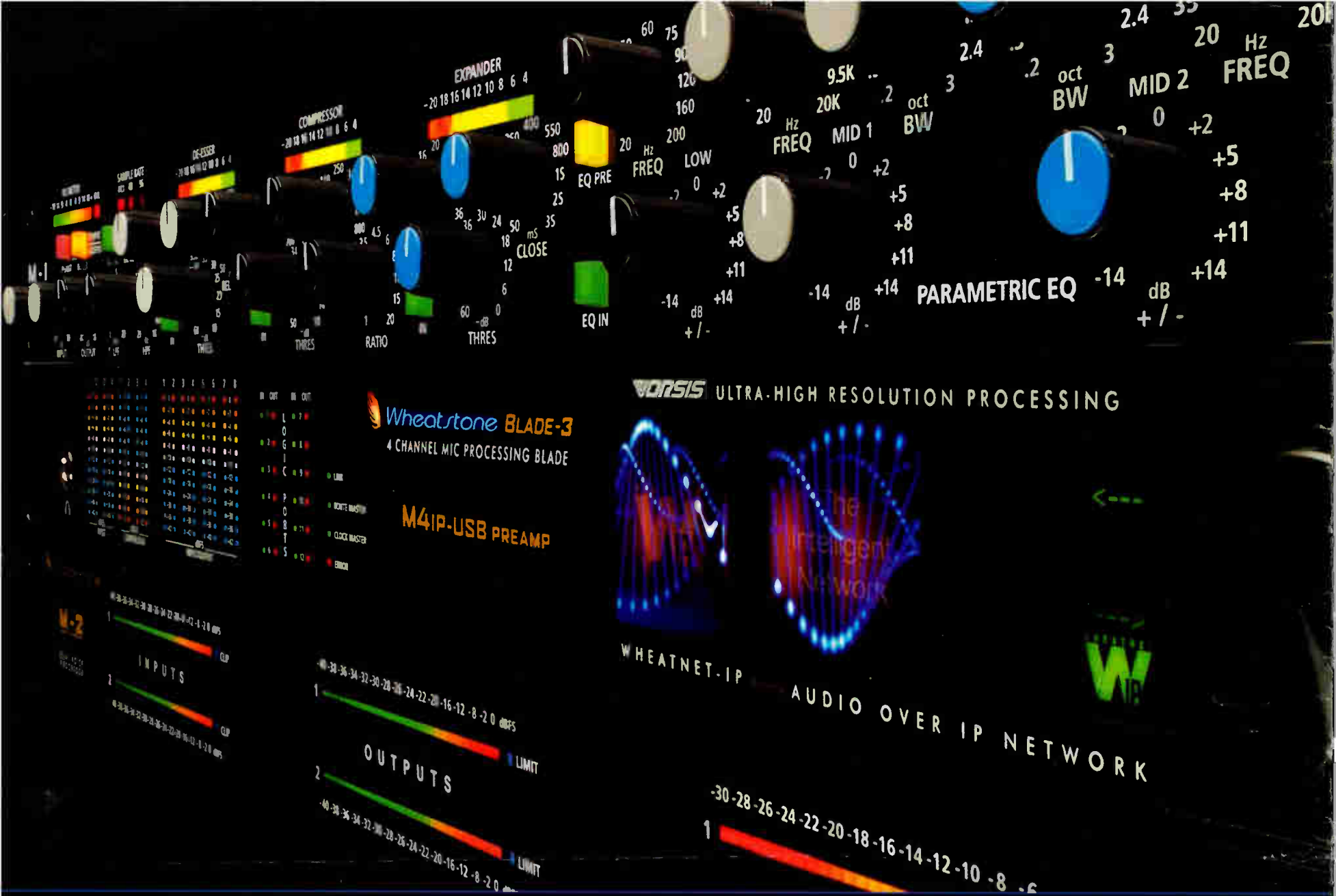
It all begins after Labor Day.

The first 300 registrants get the Early Bird discount.

Hurry while supplies last!

Visit **RadioShowWeb.com**
and **register today!**





Make Them Sound Great

Push your talent's voice beyond the limits and dominate the airwaves

Wheatstone Voice/Mic processors give you everything you need to make voices grab listeners by the ears.

For our SQ (Super Quiet) mic pres, we emulated and hot-rodded legendary studio preamps to sound incredible for modern radio.

Our compressors, limiters, & EQs are maximized for vocal smoothness, allowing your talent to stand out on-the-air.

Wheatstone's Graphical User Interfaces give you deep, intuitive control to tweak our world-class presets and save those you create.

The result? Voices that can sound superhuman.

Wheatstone M-Series Voice/Mic Processors

M-1: single channel with knobs and buttons • M-2: dual channel with multiband compression • M4-IP USB: four-channel networkable BLADE-3

Learn more at wheatstone.com/superhuman-voices

