



RADIO WORLD

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VOA Delano Station Goes on the Block

Historic wartime transmitting facility likely to convey to real estate developers



Photo by James E. O'Neal

The Delano station as it existed in the early 1990s. The large satellite dishes provided sharp contrast to the acres and acres of "curtains" and other HF antennas.

BY JAMES E. O'NEAL

Delano, the last remaining Voice of America WWII-era shortwave transmitting stations, was officially closed down due to budget cuts in September 2007 by its operating authority, the International Board of Broadcasting, a major support element of the Broadcasting Board of Governors. I authored an article then about Delano's closing ("Last of VOA's

Wartime Transmitting Stations Goes Dark." see radioworld.com, keyword wartime) and offered a bit of history about the station, which was constructed (continued on page 10)

Common Sense Matters With EAS

EAS expert Clay Freinwald answers common radio alerting questions

Engineers at stations throughout the United States are concerned about compliance with FCC Emergency Alert System operational rules; EAS has become perhaps the number one hot-button issue during commission inspections.

Of even more importance, engineers are worried about how well EAS will serve their audiences when real emergencies occur.

Radio World contributor and technical advisor Thomas R. McGinley conducted an email interview with Clay (continued on page 6)

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NextRadio Urges Wider App Adoption

Brenner: In 2014, the connected car gives way to the connected driver

BY LESLIE STIMSON

"My number one goal for 2014 is to get broadcasters to put more content into the app" — to invest in the NextRadio application beyond its free logo so more listeners can experience its interactive features.

So says Emmis Communications Senior Vice President/Chief Technology Officer Paul Brenner, president of the Emmis-backed NextRadio app business. He says user data show that consumer adoption can increase if more stations support interactive features.

The app provides local over-the-air reception on smartphones with enabled FM chips; the headset or speaker wire serves as the receive antenna. It adds interactive features, when stations support them, such as song purchase, song rating, social media coupons and geo-location services, all using the phone's data channel.

Sprint has pledged to embed and activate FM analog tuners in about 30 million devices over three years. In exchange, the radio industry pledged \$15 million worth of on-air ad inventory in each of the three years. Sprint also gets 30 percent of revenue from ads on the app, as we've reported.

The carrier told RW that as of early February, 11 models were available at retail that either come pre-loaded with, or can support, the NextRadio app.

Those are Samsung's Galaxy Note 3, Galaxy S4 Mini and Galaxy Mega; LG's G2 and G Flex; HTC's Desire (VMU), One, One Max and EVO 4G LTE; and the Motorola G and ZTE Max, both from Boost Mobile, a division of Sprint.

CONSISTENCY

Automakers and Sprint also want more stations to support the interactive features; they want the display and user experience to be as consistent as possible with those of digital audio offerings like Pandora, iTunes and other platforms.

Some 3,064 stations, up from 2,700 in the fall, are represented visually in NextRadio through the TagStation content service.

Of that figure, about 2,750 are using the basic, free level of integration; they uploaded logos to display default artwork in the app. The rest, around 300 stations owned by 22 radio groups, have paid to use TagStation to deliver album art and other interactive elements. Emmis owns 18 of those stations.

Some of these groups are delivering full data capability on all of their



Paul Brenner, left, of Emmis and NextRadio talks with Bob Struble of iBiquity Digital at CES. Emmis, Intel and iBiquity worked on the original app at the behest of NAB Labs.

Photo by Leslie Stimson

FMs, others are starting with some stations and plan to add interactivity to all of their stations over time, as we've reported.

The setup fee is \$400 per station; then a monthly \$35 fee covers album art, content management and TagStation serving content out to the NextRadio application. Emmis prefers to bills the latter annually at \$420.

New since last fall are Bryan Broadcasting Corp., One Connection Media Group and Schurz Communications Inc.

Other groups supporting advanced capabilities, in addition to Emmis, are Beasley Broadcast Group, Bonneville, Bott Radio Network, Carter Broadcast Group, CBS Radio, Cox Media, Cromwell Group, Entercom, Greater Media, Hall Communications Inc., Hubbard Radio, Lincoln Financial Media, Radio One, Radio Training Network Inc., Rome Radio Partners, Univision, Wilks Broadcast Group and YMF Media LLC.

While that list includes notable big groups, some of the largest radio companies, including Clear Channel and Cumulus, have yet to participate beyond free logos.

Hubbard Radio President/CEO Bruce Reese told RW that the app "makes us look like the other digital" offerings, like Pandora or other customized streamed content. Also, the interactivity "gives us a digital backchannel."

SLINGSHOT

To make it easier for stations to offer interactivity, Emmis has developed a software app called Slingshot, for those that want to use it. The broadcaster says it will make TagStation, which drives data to the NextRadio app, easier for stations to use; Slingshot is "middleware" that connects a station's automation system to TagStation.

Emmis has partnered with automa-

(continued on page 5)

Am I the Very Model of a Modern Multimedia Maven?

FROM THE EDITOR



Paul McLane

Consumer audio habits are changing, and radio companies are transitioning into multi-platform media providers.

I wondered what my recent consumption habits would look like, so I cobbled together the images on this page to represent a typical "day in Paul's radio/audio life." (I'd call this my personal sound cloud, but the term is taken.)

Hey, there's "Mike & Mike" of ESPN, whom I enjoy when driving into work, listening to their nationally syndicated banter via Red Zebra Broadcasting station WTEM(AM). "ESPN 980," on my car stereo. I love "the boys" as well as ESPN 980's fine local hosts in the afternoons.

There's also good ol' WTOP(FM), the news monster here in D.C., owned now by Hubbard Radio. Anyone who doubts the potential power of local

radio need only listen for a day. I usually tune to its 103.5 MHz signal in my car, though anytime something is going (threatening weather, traffic jams, warnings about terrorism), "TOP is the first place I tune, the first website I check.

Not depicted here is a CBC interview and bluegrass music, both of which I listened to in the car thanks to the fabulous noncommercial WAMU(FM), which extends its brand locally by using a translator to rebroadcast content from one of its HD Radio multicasts.

Once in the office, I want music without words (it's difficult to edit otherwise), so I listen to instrumental classical, fed to my desktop via Sky.FM. That service, launched 10 years ago, offers 60 channels of curated music; its marketing states, "Unlike other Internet radio companies, we actually have Channel Directors — real people who know good music — for each of our stations." Imagine that!

I currently use the freebie version of Sky.FM, so I accept its commercials. If

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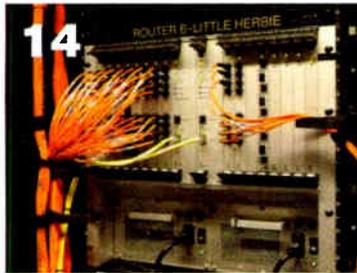


Photo by Bob Kovacs

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NEXTRADIO

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tion and middleware providers to make sure playout systems at stations can be used to deliver data through TagStation to NextRadio. Partners so far include TRE, PADapult, Center Stage Live, Jumpgate and Wide Orbit Automation for Radio.

Where supported systems are not in place, Emmis said it's working with stations to make sure additional purchases aren't necessary to get started by providing the specialized middleware link. Emmis says Slingshot works with current playout systems and is included, if needed, with a TagStation license.

IN THE CAR

Emmis is still in discussions with wireless carriers beyond Sprint about embedding and activating FM chips in cellphones. The broadcaster also sees the "connected car" as a possible growth area, so it has developed a prototype auto companion app, aided by funding from NAB Labs. A driver could thus experience the enhanced FM experience by NextRadio, either via smartphone or directly with an infotainment system.

Whereas a smartphone user who wants to listen to FM via NextRadio might have to pause another audio app and plug in the earbud antenna, a driver using NextRadio via the car would face no such obstacles.

"We're just going to add on this experience that lets them interact with the local station they're tuned to," Brenner said. "We're *enhancing* learned behavior as opposed to *changing* learned behavior."

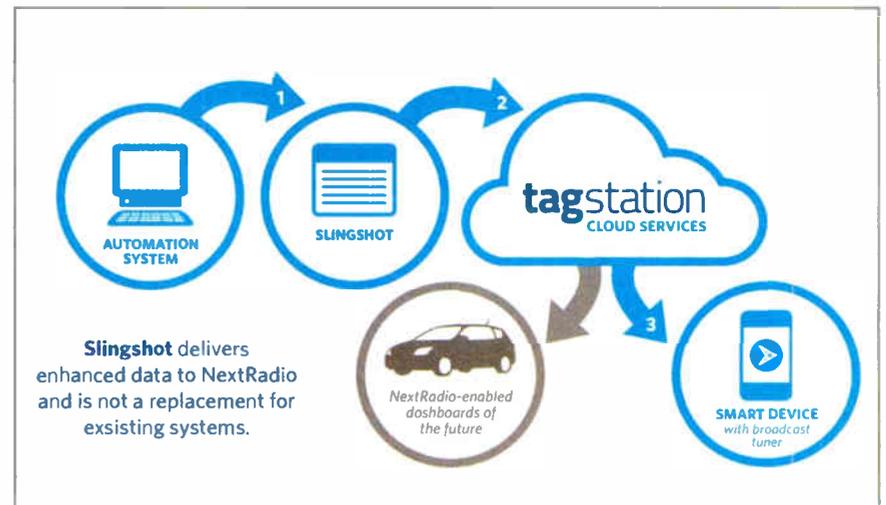
The prototype integrates HD Radio technology and IP-delivered services using the Ford Applink and OpenXC, the open development environment for app integration with a vehicle.

Using the auto app, the listener would hear audio through the FM analog or HD Radio car stereo. Paired with a smartphone, the app can deliver synchronized visuals to the car audio system; the driver controls the interactive elements using the steering wheel buttons. The app acts as a backchannel and sends commands back to TagStation.

Another possibility, according to Brenner: "All visuals are in the car, using embedded NextRadio, with either the car's integrated cellular modem sending commands back to TagStation or through the paired phone (using the customer's own data plan) back to TagStation."

In short, a driver could listen to the radio without having to program anything, and could interact with the radio using the steering wheel buttons, while also getting NextRadio's interactive benefits. "You're not having

NEWS



Slingshot connects a station's automation system to TagStation.

to reach for the phone or look at that screen," said Brenner. Other automakers, including GM, Honda and Toyota, have approached Emmis about the concept.

The auto app concept helps automakers with the issue of driver distraction caused by more advanced visual systems, according to Brenner.

Brenner's aim is to help connect the driver to the device while controlling the car and not having to look at a phone all the time. "I think that's what 2014 is — the connected car gives way

to the connected driver." NextRadio fits well into what carmakers are trying to achieve, according to Brenner.

Should automakers and NextRadio go further with the auto companion app development, each automaker would need to approve a version of the app for their connectivity system, like Ford Sync or Toyota Entune. Each automaker would then provide that app in its own app store. "They would ship a car with our app in the dash," said Brenner, who adds there remains a lot of work to be done on this front.

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EAS ANSWERS

(continued from page 1)

Freinwald, an engineer closely connected to EAS issues, to shed more light on practical questions still being asked about emergency alerting implementation, even now, long after the 2012 deadline for broadcasters to have Common Alerting Protocol-compliant encoders/decoders operational.

The Seattle-based Freinwald, owner of a technical service firm that bears his name, has chaired the Washington State Emergency Communications Committee since 1997. He received the Radio World Excellence in Engineering Award in 2007.

RW: What do the FCC rules now require of stations regarding basic EAS equipment that needs to be installed at all AM, FM, TV and cable TV facilities?

Freinwald: The FCC rules were changed a while back to include the requirement that stations are all connected to and polling the FEMA Integrated Public Alert and Warning System, in addition to their legacy over-the-air monitoring assignments. The requirements are the same for all the new LPFMs and LPTVs.

RW: How are the required station monitoring assignments established? Please differentiate between Local Primary One (LPI) and Local Primary (LP2) stations as well as National Weather Service, IPAWS and MyState server monitoring.

Freinwald: The FCC, in its Part 11 rules, charges each state EAS committee — meaning the SECC — to develop monitoring assignments. These are, as they have been for years, legacy/analog sources and do not include the FEMA/IPAWS Common Alerting Protocol server or any other system that may be used by a state (MyStateUSA, EMNet, GSS, etc.)

Whereas monitoring the FEMA/IPAWS system is a blanket FCC requirement, states do not address this issue or include it in their monitoring assignments.

It should be noted that the FCC oversees monitoring assignments to ensure that the sources of Emergency Action Notifications (Primary Entry Point facilities, affiliated NPR and Premiere Network affiliates) propagate to all



Photo by Chris Moores

This is where the duty officers hold forth 24/7 at the Washington State Emergency Operations Center near Tacoma, Wash.

radio, TV and cable systems.

An LP is a Local Primary facility — not necessarily a broadcast station — whose job it to monitor two redundant sources of national level EAS messages — Emergency Action Notifications or National Periodic Tests — and relay them to facilities within their coverage area. There is no requirement that this architecture be followed; for example, every station and applicable cable sys-

tem could monitor both sources and thereby eliminate the need for an LP.

Monitoring the NWS/NOAA Weather Radio is highly desirable due to the fact that the majority of public warning messages are weather related; however, there is no FCC requirement that this be done. There is, in my mind, a huge moral obligation to do so.

RW: For a long time, broadcasters' par-

ticipation in EAS has been described in FCC rules as "voluntary" for many functions. But stations cannot merely choose to completely "opt out." What are the minimum requirements?

Freinwald: Only part of EAS is voluntary. The participation by all stations and systems is required for the national level portion of EAS, such as presidential messages, EANs and, of course, testing of various portions of the system as described in Part 11 of the FCC's rules.

The carriage of public warning messages from other sources, National Weather Service, state and local governments, etc. is voluntary.

In the past, stations could "opt out," meaning should they receive an EAN, they could turn off their station or cable system rather than broadcast the message. The FCC eliminated this option. Today's rules require that everyone broadcast all national level EAS messages, which are likely to be messages from the president.

Stations can opt out of carrying messages from the National Weather Service, for example. They do not have to carry tornado warnings or civil emergency messages.

However, there is certainly a moral obligation to do so. What would happen if a broadcaster refused to carry a tornado warning and lives were lost as a result? I suspect that the outcome of

(continued on page 8)

MY RADIO

(continued from page 4)

I need a change at my desk, I'll pop a CD into my computer. Remember CDs? Or I pause to enjoy some classic country music like The Amazing Rhythm Aces via YouTube.

Still, most of my radio/audio listening is after hours.

There's WETA(FM), our outstanding local public outlet for classical music, including frequent local concerts. I like to crank Mozart in my apartment; I might listen using my smartphone, getting WETA's stream online over WiFi and accessed by my TuneIn app; I then dock the phone into a Coby home radio so I can turn 'er up. Usually it's WETA that wakes me in the morning. (I like to imagine my neighbors complaining to the complex manager about hearing too much Academy of St. Martin in the Fields.)

Speaking of TuneIn, that's one of my portals to online audio; it was founded in 2002 and backers include names like Sequoia Capital and Google Ventures. I find it easy to use to access Jazz24, produced by Pacific Public Media, the parent of KPLU(FM), and coming to me from the Great Northwest. TuneIn also lets me listen (I confess) to the occasional new age channel from, say, Belgium; I'd listen even more if they didn't interrupt my Zen vibe with what seem to be particularly jarring audio spots. (I keep forgetting to sign up for the paid version.)

I've listened to maybe four of TuneIn's 70,000 stations and 2 million on-demand programs.

Also at home, if hungry for familiar melodies, I toggle my docked phone over to iTunes; then Coby starts playing from my selections of Johnny Cash, Lady Gaga, Mark Knopfler, ZZ Top, Tony Bennett and Alison Krauss (sigh).

But my favorite content — especially when I want my cra-

nium stimulated by ideas — is "In Our Time," hosted by the remarkable Melvyn Bragg. I'm an unabashed, hyperventilating fan, as I noted recently on the Radio World blog.

"In Our Time" comes from BBC Radio 4, and I listen via iTunes podcast, downloaded via my home PC and played back mostly at the gym on my smartphone strapped to my arm. I am working my way up in time through its more than 500 episodes. I hope Baron Bragg, 74, keeps cranking out new ones for a long time.

So, on a given day, I listened to AM, FM and streaming, as well as songs and words I'd downloaded. I listened to content nationally syndicated, or fed from abroad, or produced up the street. I heard locally produced music hosted by savvy announcers; smart-ass chat by local sports talkers; and somewhat automated, if curated, streamed music with little personality injected. I heard radio via broadcast into my car, as well as time-shifted "radio" and other downloaded content via smartphone plugged into that car. I heard audio via streams into my bedroom, coming from traditional and "new" radio entities. While I didn't use a Bluetooth device, satellite, Spotify or Pandora, I've consumed or played with them, too.

To paraphrase Gilbert and Sullivan, it turns out that — in terms of consuming radio and audio — I am the very model of a modern multimedia maven.

This is the experience of one 53-year-old American male. Your results may differ. How has your personal consumption changed, and what does that tell you about the radio biz? Write me at pmclane@nbmedia.com.

The very definition of the word "radio" is under debate, as we've noted. But for me, the lesson of this experience is not that radio is doomed; far from it. Rather, radio is vibrant and proliferating, but also evolving. Radio companies — "multi-platform audio content providers" — must plan accordingly.





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EAS ANSWERS

(continued from page 6)

their "opting out" would, potentially, create some serious issues.

RW: Many EAS participants purchased new-generation encoding and decoding equipment when CAP and IP connectivity were implemented. But some are still using old legacy units for certain functions. How?

Freinwald: You can use what is commonly called a CAP converter. This is a unit that is connected to the Internet for receiving messages from CAP servers (national and otherwise) and relaying the messages to an older model EAS unit. I don't recommend this, as the newer EAS units contain a number of great features that a station might well find very useful.

RW: What exactly are the RWT and RMT record-keeping requirements? Can stations dispense with paper logs and rely on digital files and information contained inside the new-generation EAS encoders and/or stored on a LAN to demonstrate compliance?

Freinwald: Recordkeeping of EAS activity is certainly a good idea. Sure, you can keep these logs electronically; however, just like other items that a station keeps track of, stations need to be asking the question: "What is [our] procedure when an FCC inspector walks through the door?"

Just for discussion, let's assume that this takes place when all of the department heads are on a retreat and only the receptionist is in the building. Will that individual be able to demonstrate EAS compliance and show the inspector the logged information? And will they be able to perform when the inspector asks this person to send a Required Weekly Test? Automatic or computer logging does not relieve the station of EAS responsibilities.

RW: MyState and IPAWS servers are relatively new players in the EAS structure. Explain their roles.

Freinwald: MyState provides many services to state and local governments, including the distribution of CAP-based public warning messages — from the various message sources to the multiple systems that receive them to forward them to the public. Several states use MyState as their primary means of EAS message distribution, such as Washington, Wisconsin, Nevada and Idaho, for example. MyState is just one of several commercial enterprises that perform this task.

Washington State was one of the first to employ its own CAP server (provided by MyState) as a means of connecting the State Emergency Operations Center as well as counties and cities within the

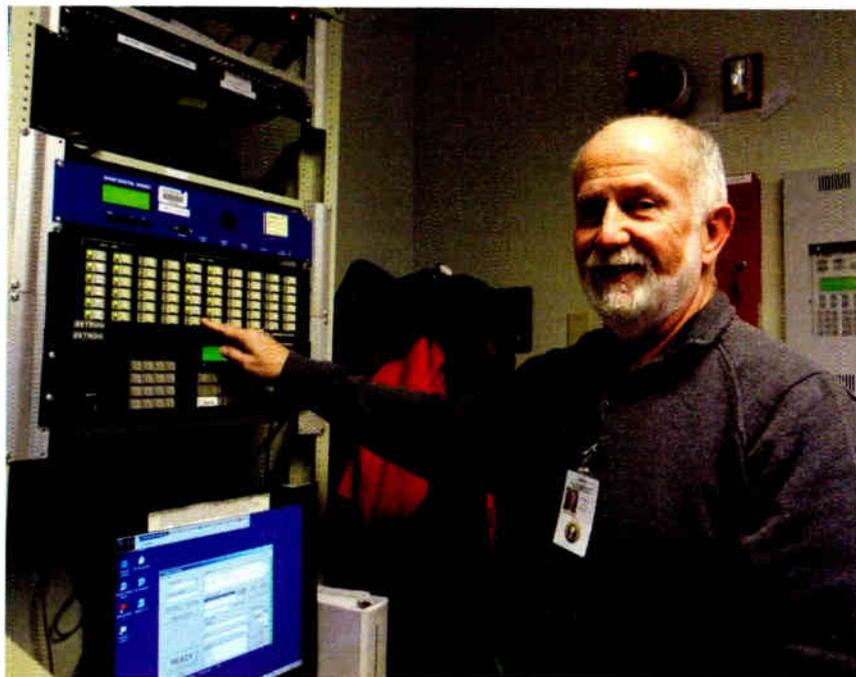


Photo by Chris Moores

Freinwald with the EAS encoding/decoding equipment at the Washington State Emergency Operations Center. From this location, the WS EOC launches legacy/analog EAS messages via CAP for the state. The panel he's pointing to enables personnel to target a message to a portion of the state.

state to broadcasters and other systems that reach the public. They were about four years ahead of the national FEMA/IPAWS system.

The FEMA/IPAWS CAP system connects the federal government to broadcast and cable systems in a similar manner and can be used by state and local governments completing agreements to do so and some are doing this, opting to not have their own state system. The NWS will be using this system in the future.

RW: Do we have to log these new sources as extra monitored assignments when they conduct tests?

Freinwald: The FCC wants to make sure that all stations are connected and receiving messages; logging is a means of assuring the regulators that the system is complete. At this point there is no formal logging requirement; however this could change.

RW: With EAS now relying more on Internet connectivity, what, in general, is in place or being used by FEMA and at the state levels for backup systems in the event a serious and widespread emergency occurs that takes down large portions of Internet and cell services?

Freinwald: This one of the reasons why the legacy EAS systems are remaining in place. For instance, EANs will not be distributed via the CAP systems, but rather continue to use the legacy/analog EAS circuits that have recently been augmented with the addition of Clear Channel's Premiere Networks. At most state and local levels, these systems remain connected and tested regularly. These new Internet-based systems

should not be thought of as replacements of legacy EAS systems but rather as augmentations.

RW: Engineers are spending a lot of time tracking more tests to make sure the required assigned monitored stations' required weekly and monthly tests were, in fact, received, relayed (when

Committees is working on this facet of EAS. I can't state for sure when the next national test will take place; however, we can be assured that the system will be tested again in the future.

RW: Amber Alerts have proven to be quite effective at locating and protecting children from harm's way. Are they required to be relayed when transmitted over EAS systems?

Freinwald: No. Just like severe weather warnings or civil emergency warnings, relaying them is 100 percent voluntary. As I have stated, I think it's repugnant that a broadcaster would choose to not wish to be a part of airing a message that could indeed save lives.

RW: Can the local announcers choose to read the alert information themselves as a local area news bulletin item?

Freinwald: Certainly!

RW: In general terms and based on your experience, what aspects of EAS do you feel need the most improvement for the system to better fulfill its mission of protecting the public when a local, wide area or national real emergency strikes?

Freinwald: The value of EAS could be considerably enhanced if it were more utilized for the benefit of our citizens.

We have somewhat of a Catch-22 here. First, broadcasters are reluctant to run many EAS messages because they

The station missing a Required Weekly Test or Required Monthly Test is obligated to find out why the test was missed and log the reason for the failure in their logs.

required) and logged. What is expected of stations regarding compliance for tests that were inadvertently missed or not executed properly by the originating station or entity?

Freinwald: Rules regarding what to do when a station misses a test have been in place for many years. The station missing a Required Weekly Test or Required Monthly Test is obligated to find out why the test was missed and log the reason for the failure in their logs.

RW: In November 2011, the FCC and FEMA conducted the first nationwide EAS test and learned a lot from that event. When will a follow-up test be conducted and how might it differ?

Freinwald: A great deal was learned from the last EAS national test and the FCC released a great number of details about it late last year. One of the CSRIC

are of poor quality or could be viewed by listeners as tuneouts, etc. Second, emergency managers and other sources of these potentially life-saving messages either don't understand how EAS works or don't wish to use it for fear that broadcasters will not air the message.

This problem can only be solved by working together. This is one of the major reasons for the existence of the various state and local EAS committees. I encourage every broadcaster with an interest in serving their fellow citizens to get involved to — cooperatively — improve EAS.

Got a question about EAS compliance? Send it to us and we'll pass it along with Clay Freinwald or the appropriate official. If we receive enough, we'll also publish them as a follow-up article. Write to radioworld@nbmedia.com

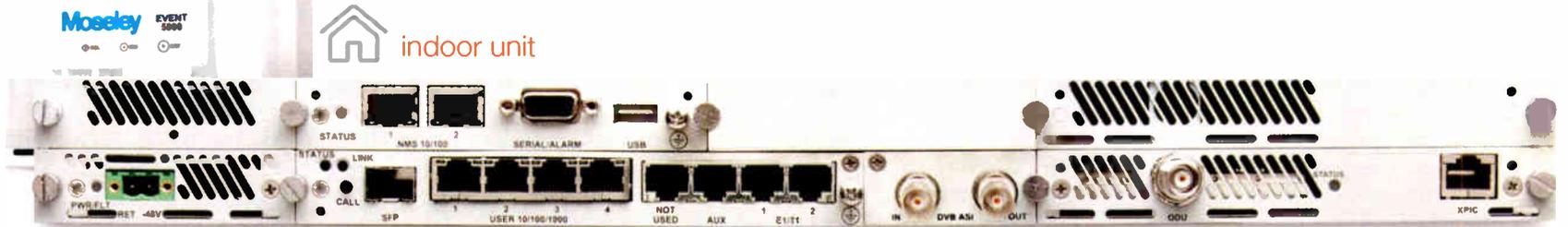
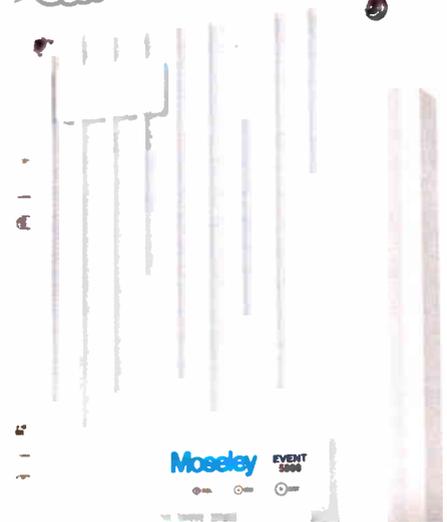
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DELANO

(continued from page 1)

and operated for the government by the Columbia Broadcasting System. It had gone on the air in late 1944 under the direction of the Office of War Information, which later became the VOA.

A recent posting to the Radio World website asked: "So, as of 2013, what is to become of this site?" Having spent several months of my life at the Southern California transmitting station — called a "relay" station then — I was curious myself and started making calls.

At the time of publication of my initial article in 2008, it was believed that the Delano transmitting station might be placed in "mothball" status and could possibly reopen. (Dixon, a sister station in northern California, was closed in 1979 and reactivated in 1983. It operated for another five years before permanent closure and dismantling.)

Some proponents hoped that if it were not reactivated, Delano could be made into a museum to show future generations what high-power shortwave broadcasting was like.

When the Delano plant closed, it was operating with four ASEA Brown Boveri 250 kW transmitters, but also depended upon 1960s-vintage Collins 250 kW units as well. All of the really "old stuff" — the original WWII-vintage Federal 200 kW transmitter and a couple of late 1940s GE 200 kW rigs — had been removed years before the 2007 closing; but the core building — including its wartime guard tower — had seen little change and provided a good idea of what HF high-power broadcasting was all about.

HOMELESS SHELTER

However, toward the end of 2013 I found that neither scenario was going to be played out.

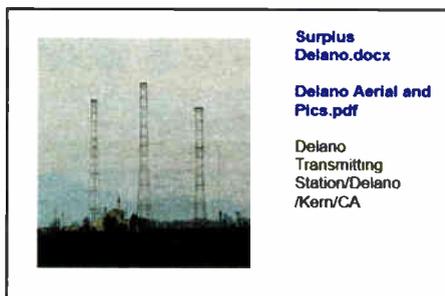
I contacted David Evans, a supervisory property management officer with the IBB, and learned that the Delano facility had been turned over to the General Services Administration for disposal.

Here's the way GSA listed the parcel:

PROPERTY DESCRIPTION: *The site consists of 800 acres located in the City of Delano, Kern County, Calif., about 35 miles north of Bakersfield, and 75 miles south of Fresno. The property is composed of one parcel that is approximately one square mile (640 acres) and three adjacent parcels measuring approximately 160 acres. There are 12 buildings and structures on site, including a transmitting building, warehouse and pump station. The total square footage for all of the 12 buildings and structures is 32,433 square feet. The site also contains numerous satellite receivers, transmitters and antennas. The main transmitting building and all of the associated buildings are located on the larger parcel.*

Evans informed me that early on, the U.S. Marine Corps had expressed interest in acquiring the Delano compound for use as a training facility. He stated that the Corps had inspected the facility in September 2012 and initiated the acquisition process by submitting an interim use agreement until the facility could be acquired.

Marine Corps interest waned; after that, GSA



Surplus
Delano.docx
Delano Aerial and
Pics.pdf
Delano
Transmitting
Station/Delano
/Kern/CA

Closeup from a GSA website, January 2014, under "Real Property Utilization and Disposal."

was legally obligated to offer up the property to the U.S. Department of Housing and Urban Development for possible use as shelter for the homeless. However, as of early December 2013, HUD had made no move to acquire it. My check in mid-January with the San Francisco GSA office, which has jurisdiction over the property, revealed that the window was still open for interested parties to acquire it for homeless shelter purposes. If there were no takers by mid-

February, the property would be offered for sale to the public. However, one last check with GSA shortly before publication revealed that the invitation to organizations that might wish to use the Delano facility to house the homeless had been extended until late April.

So Delano could still wind up as a homeless center, but if that doesn't happen by the deadline it will be placed on the GSA auction block for sale to the highest bidder and could eventually be developed into housing, offices, warehouse facilities, or any number of other purposes, including farming. (The Delano plant is in the heart of California's fertile San Joaquin Valley farmland, with a number of almond and citrus groves nearby.)

But it seems likely that the 70-year-old facility will never again be used for broadcasting purposes.

SLIP-SLIDING AWAY

Delano's permanent closing and dissolution reflect a general global downsizing in shortwave broadcasting since the ending of the Cold War.

Upon learning of the disposition of the Delano transmitting station, George Woodard, who was vice president of engineering at Radio Free Europe and Radio Liberty for 10 years and IBB director of engineering between 1997 and 2000, offered these words:

"I have to admit that some of the international broad-

casting functionality is being replaced by other media, so shortwave is not as important as it used to be," said Woodard. "But we should have kept Delano as a backup facility. I feel that it's important to keep both Delano and the IBB's Greenville, N.C., transmitting stations, as they're located on the country's coasts and both are on U.S. property; Greenville is especially important because of its coverage into Africa and the Caribbean."

The government's Greenville "Site B" HF transmitting station is still operational and was featured in an April 2011 Radio World article, "48 Years Old and Still a Flamethrower" (see radioworld.com, keyword flamethrower). However, its sister facility "Site A" was shut down several years earlier and remains in "mothball" status. The IBB's Bethany, Ohio, shortwave transmitting plant was permanently closed in 1994.

Woodard also offered his thoughts on continuing cutbacks and elimination of services by many of the world's shortwave broadcasters who cite declining listenership: "I feel like it's a self-fulfilling prophecy. They close the stations and then 'discover' that nobody is listening."

According to Evans, IBB transmitting stations are still operating in Kuwait, Sri Lanka, Germany, Botswana, São Tomé, Tinian and Saipan in the Mariana Islands, Bangkok and Udorn, Thailand, and in Tinang and Poro, Philippines. The Poro site could go dark in 2014.

Shortly after the 2007 Delano station closure, Mike Dorrough, manufacturer of audio level meters and a broadcast historian and archivist, launched a campaign to save the facility, offering a plan to turn it into a broadcasting museum.

"It's just tragic," said Dorrough. "I know that times change, but I really feel bad about it. If I could have afforded it, I would have bought the Delano facility and preserved it. We're just selling this country inch by inch."

Information on the Delano property is available from GSA at <https://resourcecenter.secure.force.com/pbs/SurplusNotices>.

James O'Neal is technology editor for our sister publication TV Technology; he writes in Radio World about broadcast history and technical pioneers.

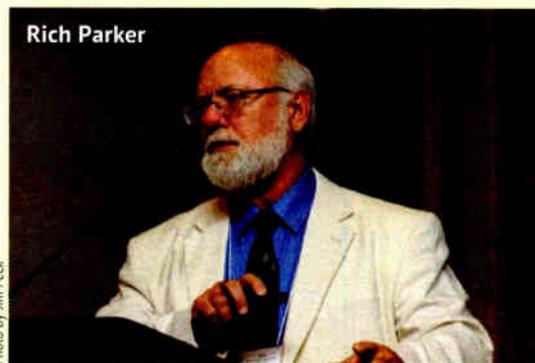
NEWSROUNDUP

RICH PARKER: Long-time Vermont Public Radio engineer Rich Parker is moving to Alaska in March. He's accepted the director of engineering position for Coast Alaska, a partnership of public radio stations in Southeast Alaska.

Parker, a founding member of the Association of Public Radio Engineers, says of Coast Alaska, "They are leaders in creative collaboration, providing integrated underwriting, development and engineering support that allows member stations to realize greater operational efficiency, while still retaining their individual community identity."

He's been at VPR for 17 years; for much of that time he was director of engineering. Recently Parker was appointed senior broadcast strategist and engineer, working with VPR Development and Engineering to lead VPR's strategic optimization of coverage and effectiveness for the two statewide networks.

Of his time at VPR, he tells RW he's most proud "of the opportunity to work with a talented management and engineering team to realize a grand vision — taking VPR from three stations in 1997 to a two-program service network of what will soon be 14 full-service FM stations and 13 translators. But my



Rich Parker

Photo by Jim Peck

best days are still when I'm able to solve a particularly difficult problem and get a station back on the air for our listeners, or when I can help a listener to solve a difficult reception problem — because in the end, the listeners are really what it is all about."

Parker will be based in Juneau. His responsibilities will be providing engineering management and technical support services for the studios, transmitters and translators of the seven member stations in Ketchikan, Juneau, Sitka, Petersburg and Wrangell.

His last full day at VPR will be March 7, and he plans to begin his new job by the end of March.

— Leslie Stimson

NEWSROUNDUP

EMMIS: Radio group Emmis Communications Corp. plans to buy WBLS(FM) and WLIB(AM) in New York from YMF Media for \$131 million cash. Emmis, which owns WQHT(FM) in the market, says the purchase will nearly double the company's annual station operating income. During 2013, WBLS and WLIB reported \$31.9 million in net revenues and about \$16.5 million of station operating expenses, excluding depreciation and amortization, resulting in some \$15.4 million of station operating income.

In addition, Emmis anticipates saving about \$3 million of annual expense by combining these stations with WQHT in New York. The WBLS/WLIB operations and studios have been co-located with WQHT since 2012. The acquisition is subject to regulatory review, however Emmis could begin programming the stations under an LMA in March.

ASCAP: The American Society of Composers, Authors and Publishers distributed some \$851.2 million in royalties to its members in 2013, up \$24 million from 2012. U.S. distributions totaled \$527.9 million, up 6.1 percent.

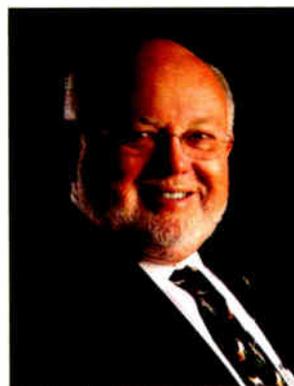
ASCAP says its revenues remained strong at \$944.4 million, led by a \$13.2 million increase in domestic receipts, primarily from its new media and general licensing areas. However, operating expenses rose, standing at 12.4 percent in 2013, vs. 11.3 percent the prior year "due to the litigation expenses incurred as a result of ASCAP's ongoing

rate court proceeding with Pandora, which is seeking to lower the royalties it pays to songwriters and composers," according to ASCAP.

HYUNDAI: Web aggregator Aha by Harman will be in the 2015 Hyundai Genesis, expected to be available this spring. Aha gives drivers the ability to access streamed music, entertainment and news stations and location-based services using their connected phone. HD Radio comes standard on the vehicle as well.

HD RADIO: Subaru is making HD Radio standard on its 2015 Legacy. The new models are expected to arrive at dealerships this summer. This is the third model to feature HD Radio as standard equipment, after the BRZ and WRX.

AM: Anyone wanting to file comments to the FCC regarding its AM revitalization proposals have until March 20. The commission extended the deadline to file reply comments to MB Docket 13-249. The Association of Federal Communications Consulting Engineers had asked the agency for a 60-day extension; the FCC extended the filing period for 30. Some 160 comments had been filed by early February, many suggesting technical solutions to AM's woes. See a sampling at radioworld.com/amcomments.



Russ Withers

RUSS WITHERS: Radio and television station owner Russ Withers died at age 76. He owned Withers Broadcasting, which has six television stations and 30 radio stations. The Illinois Broadcasting Association named him Broadcaster of the Year in 2005. Withers is a former NAB Radio Board chairman; his daughter Dana Withers, also a station owner, serves on the board now. For many years, Russ Withers was recognized by NAB as the individual broadcaster who helped raise the most money for the NAB Political Action Committee.

APPS: Jacobs Media-owned JacApps is offering mobile game apps to stations. The apps are station-branded and offer opportunities for sponsor messages. JacApps says they'll be released quarterly, enabling stations to plan for promotion and sales. The developer has created some 800 apps to date. It says advertisers want unique mobile sponsorship opportunities; in-game sponsorship "transcends low CPM banner ads," according to President Paul Jacobs.

FEMA: FEMA is seeking applicants to be appointed to its National Advisory Council, which coordinates federal preparedness, protection, response, recovery, and mitigation for natural disasters, acts of terrorism, and other man-made disasters. Applications (to www.fema.gov) are due March 14.

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An Adaptor You Shouldn't Be Without

With remote season coming, here's an item to add to your box o' tricks

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

Buc Fitch tells us about a neat little adaptor that will be useful during remote season. It is a matching pad that adapts 600-ohm line-level signals to 150-ohm microphone level, while maintaining impedances. The heart of the adaptor is an "H" pad, so named because the resistive components form the letter "H."

In this particular pad, impedance is transformed while dropping the audio level by 50 dB. The standard values of 300 ohms are on the two input legs, 75 ohms (such as video termination resistors, which are easy to get in 1 percent values) are in the output legs. A 1-ohm shunt resistor produces a theoretical 55 dB of voltage loss with a 600-ohm line in and 150-ohm mic impedance out.

This adaptor permits a line-level signal to be dropped low enough to feed a microphone input, without overdriving the input. This is an excellent pad value for +8 line levels in and a reasonable mic level out for typical mic inputs. An "H" pad is balanced by its nature, and usually works better than an unbalanced "T" pad.

The input and shunt resistors should be 1/2-watt, but the output resistors can be 1/4-watt. The pad should fit in an XLR-to-XLR barrel connector, as available from MCM (www.mcmelectronics.com).

Buc used a 20 dB 600-ohm inline XLR pad, which he found on sale there for \$2.99. He removed the MCM components and assembled the parts as described above. By using 1-percent resistors, Buc achieved good side-to-side balance and a nice match from line to mic level.

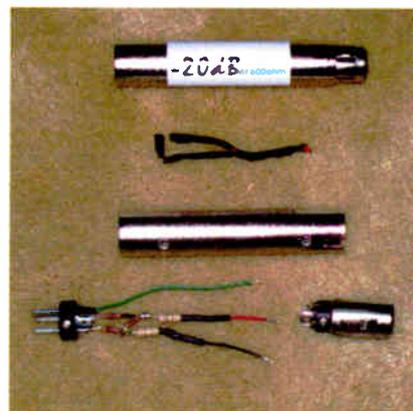


Fig. 1: One of MCM's standard barrel 600-ohm 20 dB inline pads, along with the pad components that were removed.



Fig. 2: The assembled parts, ready to be inserted in the MCM barrel connector.

Buc offers these assembly tips: De-solder the existing MCM pad from the female end first, then slide out the entire assembly from the male side. Construct the new pad, working from the male end and culminating with some very flexible leads.

Slide this assembly back in from the male end. The leads for the female end should be just long enough to be able to solder them onto the female connector when pulled out of the barrel. Then push the female end into the barrel and close it up.

To prevent any solder joints on the pad from touching the metal wall of the barrel, cover the pad assembly with shrink wrap.

The calculated loss is nearly -55 dB. The total cost for one of these adaptors should not run much more than \$6. Don't forget to label the adaptor!

Here are the parts needed:

- MCM parts**
(1) dB 600-ohm inline XLR pad, part 555-17835

Digikey parts

- (2) 75-ohm 1/2-watt 1-percent resistors, part CMF75.0HGCT
- (2) 150-ohm 1/2-watt 1-percent resistors, part CMF150.0HFCT
- (1) 1-ohm 1/2-watt 1-percent resistor, part CMF1.0HHCT

Reach Charles "Buc" Fitch at fitchpe@comcast.net.

Speaking of your remote kit, make time now to remove everything from your kit, test the equipment for proper function, and inspect the cables and connectors. Add fresh batteries for the wireless mics and ensure you have all needed accessories to accompany your equipment. It's better to come up short now than on the day of the remote!

I've seen engineers prepare remote kits in empty rugged plastic tool kit boxes, available online or at the big-box hardware stores. The rugged plastic beats the worn-out cardboard box, and looks more professional, too.

A little preparation will save you plenty of grief later.

One of the biggest complaints I hear, especially from engineers new to the industry, is the lack of good broadcast engineering books.

The SBE is working hard to provide excellent technical webinars and classes, and many of them are on-demand. (Head to www.sbe.org for information.) But as for reference books, many are out of print and can be found only in used book stores. This void is particularly evident when it comes to books about antennas. Oh, you can find some books that are chock-full of equations — but what about practical uses?

Consultant Frank Hertel sent a link to a practical design e-book that engineers should find useful. The free, downloadable, printable book, "Practical Antenna Design," was written by Elpidio Latorilla. It downloads as a PDF file. Find it at <http://bit.ly/1irFrVh>.

For engineers who need or want to build antennas without all the mathematical formulas, this book provides good explanations, illustrations and a parts list. A 200-page how-to-do-it manual, it covers ground plane, dipole and Yagi antennas, to name a few. A glossary of antenna terms is included. The illustrated designs are centered just above the FM band — between 140 to 150 MHz — but the designs can be adapted for other frequencies using conversion information at the back of the book.

Frank Hertel can be emailed at frankh@twc.com.

Contribute to *Workbench*. Send tips to johnpbisset@gmail.com. Fax to (603) 472-4944.



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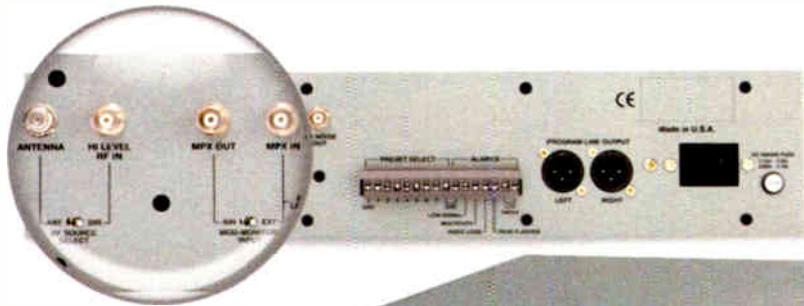


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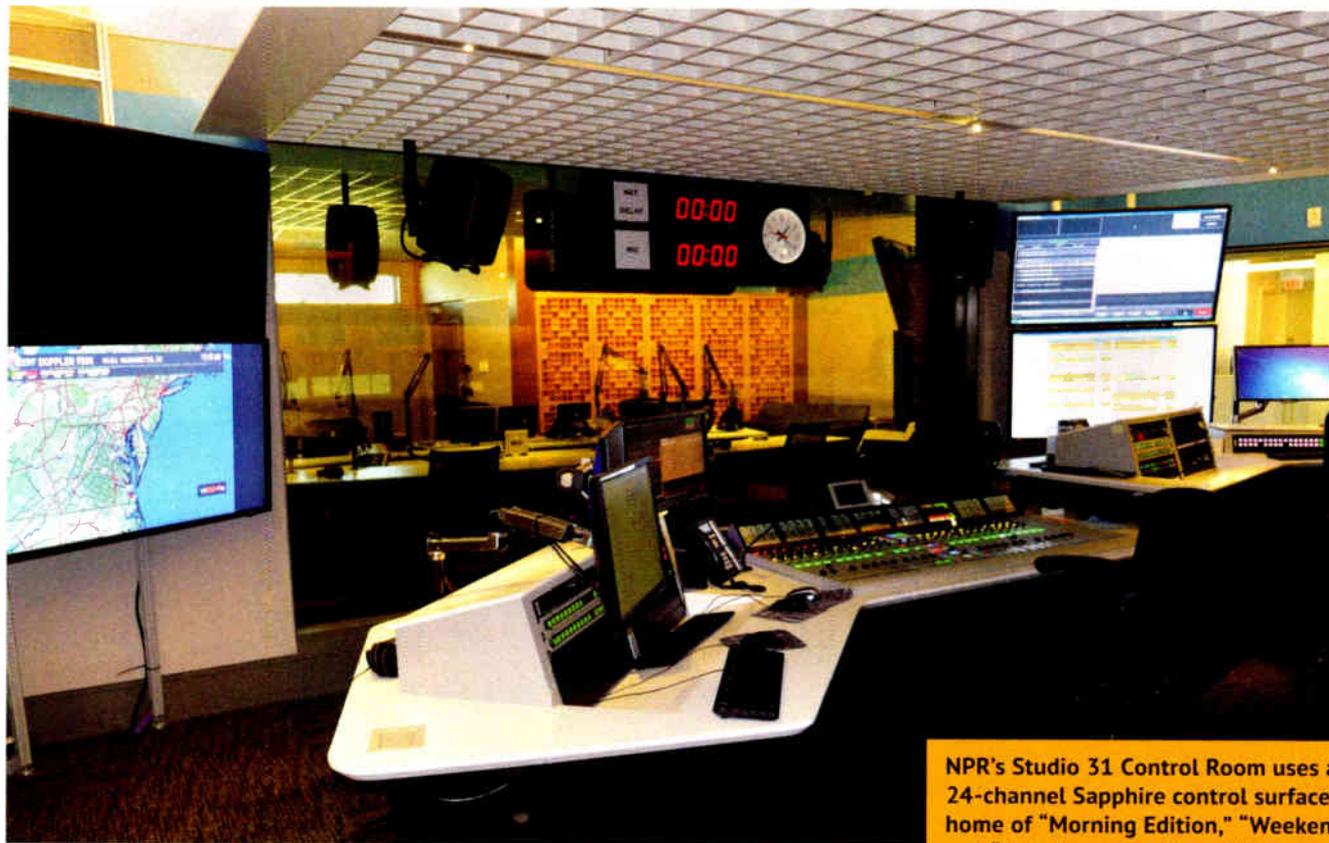
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- 24 hour thermal "burn in" test for each unit before shipping.
- Alarms for Peak Overmodulation, Signal Loss, Program Audio Loss and Multipath.



Lawo, NPR Partner for Audio Production

Company's digital technology platform powers new Washington HQ



The new headquarters of NPR in Washington has an extensive digital infrastructure supporting three broadcast studios, 10 production studios, six production booths, a high-end recording/events space and a centralized technical logistics center. It includes Lawo mixing consoles, routing matrices and I/O units as central components.

Radio World asked Herbert Lemcke, president of Lawo North America Corp., about the project.

RW: What was the nature of Lawo's role?

Lemcke: Back in 2009, NPR contacted us to discuss a small project, providing some equipment to outfit a new studio. They were looking to test a production environment without traditional consoles with faders and buttons. A crystal console core with a number of touchscreens running our VisTool software was installed to prove the viability of this concept for NPR's operations.

This project set the stage for a number of others, where new workflows for the future NPR building were prototyped and vetted.

With NPR's move from analog to digital, there were several challenges that emerged. As we worked through the initial design consultations, the project evolved from design of a single studio into the creation of a comprehensive infrastructure that would power NPR's

entire production operations. Together we designed an overall concept and a plan for the installation of radio on-air mixing consoles, routing matrices and I/O units, as well as specifying a customized equipment configuration.

Lawo provided knowledge transfer for management and technical staff, trained the operators and the service teams, and ensured that we had adapted the installations to accommodate NPR's unique workflow requirements.

RW: With whom did you work most closely on the NPR staff?

Lemcke: Shawn Fox, senior director engineering; Bud Aiello, director of engineering technology; Robert Butcher, engineering; Mitch Eaton, manager technical systems; and Dennis Byrnes, engineering, were our major counterparts throughout the various stages of the project. The systems integrator on this project was HA Design Group.

RW: Describe the technical infrastructure of the system.

Lemcke: NPR wanted to upgrade its broadcast and content production

NPR's Studio 31 Control Room uses a Lawo 24-channel Sapphire control surface. The studio, home of "Morning Edition," "Weekend Edition" and "All Things Considered," has natural wood sound diffraction panels and indirect lighting.

facilities, transitioning from remaining analog and legacy technologies to a fully digital infrastructure. The move was more than just a facility-wide system upgrade. Newer technologies were required in order to be more flexible

and to meet the changing needs of a 24/7 news operation.

It was a dream project for Lawo, since we specialize in providing flexible architectures for networking audio systems designed to support a customer's workflow requirements. In this case, we were able to work with the engineering and operations teams at NPR to address their needs and concerns, providing them with a system that allowed them to transition seamlessly into a flexible and interconnected digital environment.

The final design supported NPR's current operational needs but also allowed for expansion and addition of new capabilities without requiring a retooling of the basic architecture.

In addition, concerns about ongoing maintenance and upgrades were dealt with through a structure using two redundant Lawo Nova73 HD central audio routers and several connected redundant I/O units. This arrangement allows for smooth switching and servicing of I/O units and router boards, important in a 24/7 operation.

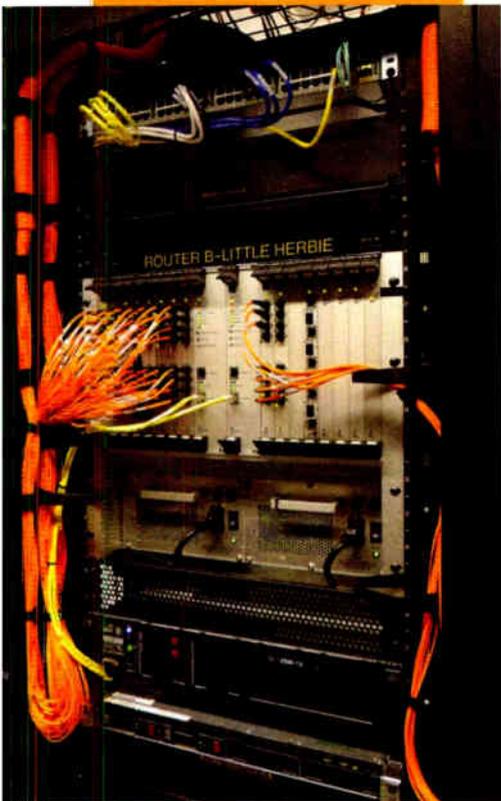
There are three large live production studios, five production and edit areas with four studios each, six telephone booths and a modern and open MCR area for quality control as well as support for the production facilities. There is a large multi-purpose production area that can handle any challenge, ranging from concerts to large discussion panels or various special events.

Any of these facilities can go on air at any time, with access to all resources



Greg Gavin, broadcast recording technician at NPR, controls audio using a Lawo Virtual Mixer panel, foreground, and Izotope audio processing software in the Master Operations Center, adjacent to the open newsroom. The large center screens show status of the Lawo routers, including alarms (lower display) and signal levels (upper).

In NPR's 10,000-square-foot Tier 3+ Data Center or "codex farm," the majority of remote lines integrate into redundant Lawo audio routers. This router frame is named "Little Herbie."



Germany, provide tech support?

Lemcke: We've done a number of similar projects, including some MCRs for the CBC in Toronto and Montreal, that are of comparable size. That said, the NPR facility is an exceptional case where Lawo and its partners LSB and DSA were able to supply the majority of the linear production technologies as well as the control and management systems that tied it all together. It's a very rare opportunity to build a complete radio broadcast production facility of this scale in a brand-new facility.

In TV broadcast, Lawo has pro-

vided not only consoles but complete router-based infrastructures for customers including Turner, NBC, Comcast, Fox and MTV. Lawo's subsidiary Lawo North America Corp. takes on project design, project management, developing concepts and technical structures and delivering, installing and servicing technical equipment. The services we provide include configuration and training for technical staff and operators. In addition to North American headquarters in Toronto, Lawo maintains sales and support teams in New York and Los Angeles.

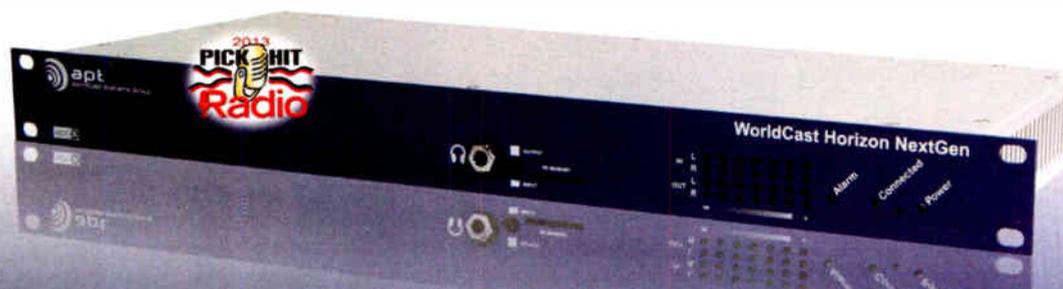
For this project I have to highlight Milo Woodhouse's role. He is one of our most experienced project managers and system specialists from Rastatt, Lawo's headquarters in Germany, who was stationed for 15 months in Washington to support the NPR team throughout this challenging task. He did a tremendous job, and along with the Lawo North America team, played a crucial role in making this project a success.

For more on this project see the story "Profile: Garrison Heads NPR Tech Operations" at radioworld.com, keyword Garrison.

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Cumulus San Francisco



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Larry Holtz,
All Classical Radio, Oregon



"SureStream technology has made possible something that was conventionally assumed to be impossible: having a high quality, real-time audio link over the open Internet."

Dan Houg, KAXE /
Northern CommunityRadio



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in the facility including the necessary communication infrastructure.

The final design includes a centralized, redundant routing system with two Nova73 HD routers, 70 Nova17 routers and seven Nova 29 routers. Each router type works with the others and supports unique work surfaces and software, enabling creation and exchange of files between any number and type of contributors, no matter where or how they choose to work within the facility.

Audio signals are distributed by the routers to the production areas by the Nova17 audio matrices. Work surfaces include three sapphire radio consoles, 20 eight-channel crystal consoles, 10 four-channel crystal consoles, and a large-format mc266 MKII production console to handle special events.

One of the unique elements is the use of LSB's "Virtual Studio Manager" for centralized, network control of routers and studio configurations, controlled in turn by a LineScheduler from DSA, which schedules and automates program-related routings and manages a large pool of codecs. This concept of multi-interlinked systems with overall accessibility allowed the most efficient use of studios, control rooms and edit booths.

RW: Are there comparable Lawo installations in North America; and how does the company, headquartered in

Jammin' Live and Local with WheatNet-IP: OK...the band just showed up...



Your jocks are on the air, doing their thing, and who should walk in the front door? Carrie Underwood or the Kings of Leon with a few instruments and a song in their pocket.

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It just so happens that we have a few audio engineers at Wheatstone who know their way around live mixing. Go to our website for some helpful tips on setting up live performers in your studio.

Read the rest of the story here: INN8.wheatstone.com



TS-22



TS-4



TS-22 w/optional turret

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These tiny talent stations are tremendously powerful. Both control surfaces feature microphone on/off/cough functionality, talkback buttons, and headphone amp with source selection and level control. The TS-22 adds six-button source selector, speaker with separate level control, built-in timer and six programmable buttons. Each connects to the Intelligent Network with a single CAT-6 cable.

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OK, this spread is an advertising space paid for by Wheatstone. But hopefully you'll find it informative, entertaining and compelling.



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The Dan Patrick Show took to the road - and brought our E-1 control surface with it...

...to cover all the happenings for its 350 affiliate stations during Super Bowl week. Our new M4-IP four-channel microphone processor went along too, and networked with the E-1 into the WheatNet-IP Intelligent Network. Meanwhile, back at the main Dan Patrick studios in Milford, Conn., engineers at a Wheatstone E-6 console were busy playing the show open, bumper music, call-ins and sound effects while receiving the remote signal from New York City, and then sending it all out to the world!

[Click here to learn more: INN8.wheatstone.com](http://INN8.wheatstone.com)



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How aggressive should you set the processing for podcasts?

Just enough to raise the audio above any ambient noise for listeners who don't have noise cancelling headphones, but not so much that you remove all trace of quality for those who are downloading low bitrate podcasts. Unlike other audio processors, our Aura8-IP (which has eight modes, one of which you can use for podcasting) lets you selectively add AGC, compression or limiting by bypassing the other sections to give you the right amount of processing needed for podcasting.

[Click here to learn more: INN8.wheatstone.com](http://INN8.wheatstone.com)



BLADE HONING 101

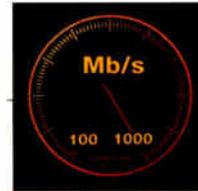
What's Inside A BLADE...part deux

Each BLADE on the Intelligent Network is exceptionally powerful... but do you know about the incredible functionality inside EVERY BLADE?

By now, it's a good bet you're aware of the WheatNet-IP Intelligent Network. You know about its advantages - how it's obsessively compulsive about redundancy. How it can repair itself, configure itself, run rings around the competition while still having much greater bandwidth (due to the WheatNet-IP system's Gigabit Ethernet throughput) - enough, in fact, to not only handle our increased functionality today, but well into the future.



Here's part two of our 2-part series entitled "What's Inside A BLADE". Obviously, we could go on forever. But we suggest you check WheatNet-IP out for yourself and learn just how much of a difference it can make.



Gigabit Ethernet

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DNA of the Entire Network Stored in Every BLADE

Every setting for every network device is stored inside every BLADE. Handy, if you ever need to replace a BLADE. Just plug it in and it learns from the network!



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[Visit us on the web to learn more! INN8.wheatstone.com](http://INN8.wheatstone.com)



I Like These Apps for Engineers

Mobile applications can facilitate network administration

RADIO IT MANAGEMENT

BY LAURA MIR

Over the last year, there has been a general increase in the number of mobile applications developed for engineering and network administration. Depending on the specific job functions of a broadcast engineer, many of these apps, although not necessarily specific to broadcast, can be a great tool to have in your pocket.

FING — OVERLOOK

Free

Fing makes network management available in a mobile environment. Fing brings the command line interface to your hand, featuring network discovery, service scan (TCP port scan), ping, traceroute and DNS lookup.

Fing can also trigger wake on LAN and collect MAC address and vendor information, making remote information-gathering a breeze. There is an integrated launch of third-party Apps for SSH, Telnet, FTP, FTPS, SFTP, SCP, HTTP, HTTPS and SAMBA should you wish to dive further into your devices.

Fing is available on almost all platforms, including Linux, Mac OS, Windows, Android, iPhone/iPod/iPad, Kindle Fire, Cisco Cius.

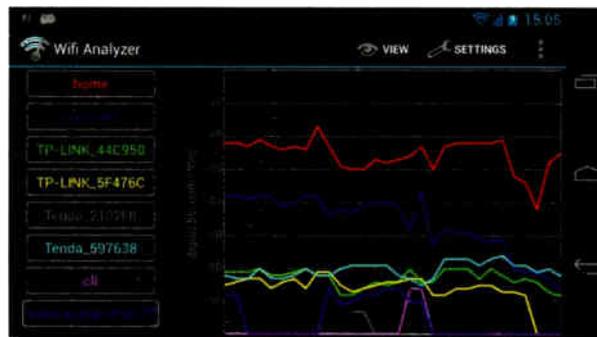
Give Fing a try. It is user-friendly, and can give you information on every device it sees on your network, and perhaps more importantly, find one that shouldn't be there. Fing will show every connection, and in some cases including better information than can be found directly from the router itself. With Fing you can also manage the names of the devices and assign icons, saving your connections for easy viewing and verification at a later time.

Load this free app on your phone now and be impressed with what Fing can find.

WIFI ANALYZER — FARPROC

Free

If you are planning to deploy a wireless router, make this app your first stop in selecting the best location and channel.



Wifi Analyzer

The WiFi Analyzer (Android) is a free app that gives five views on setting up a new AP (or modifying existing) to get better coverage and signal for your clients. Users can view a Channel Graph, Time Graph, Channel Rating, AP List and Signal Meter to best understand their surrounding WiFi competition.

The Channel Graph is a visually appealing, color-coded graph that shows each AP channel as a parabola on the graph with the vertical scale indicating signal strength in dBm.

The Time Graph can help track competing channels over time, or see why there is so much competition for signal during your peak usage hours.

The other screens are equally as helpful, giving ratings to each channel and presenting a list of names and encryption methods on the surrounding wireless APs.

Finally, what broadcast engineer doesn't like a signal meter? The WiFi Analyzer has a classic meter with moving needle that gives a real-time readout of signal strength of any AP the user selects. There is even a sound option in the meter that will emit a beep that increases in frequency from slow to very fast as the signal strength increases. The WiFi Analyzer is packed with useful information to help you get the most out of your wireless network.

JUICE SSH — SONELLI LTD.

Free

Remote tunneling capability is a growing need in network administration for stations, and another great tool to have in your sys-admin toolbox is JuiceSSH.

JuiceSSH (Android) is an all-in-one terminal. Going beyond just SSH, Juice

also supports connections via Local Shell, Mosh and Telnet. App developer Sonelli has 20 years of systems administration experience wrapped into this application, with the goal of making system administrators' lives easier when on the move.

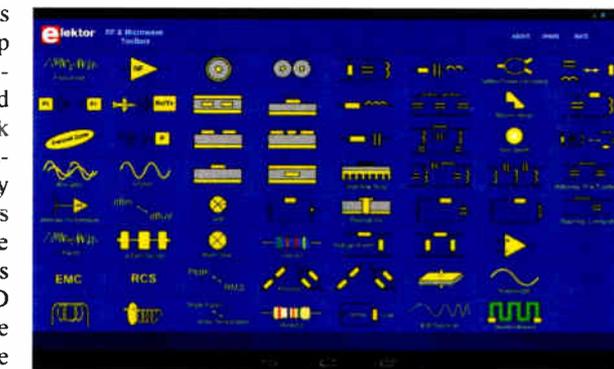
Some of the great features of this app include a popup keyboard for the SSH client with all the hard-to-find characters. Users can click URLs to open in a browser. The app supports copy and paste within sessions and gives the ability to save and share SSH transcripts to Dropbox, email and SD card. Juice supports multiple SSH sessions running in the background by pinging the remote host for a keep alive, and then when you need to resume the connection, you are ready to go. Juice also keeps the list of active sessions in the notification bar in order to tab between them.

This app keeps all your remote connection info in one place so you can access it quickly and reliably every time.

SSH TERM PRO — JAYANTI KATARIYA

\$4.99

For the Apple users out there, a great SSH and Telnet terminal app is SSH Term Pro (iOS). SSH Term Pro enables users to connect with any server that supports SSH2 or Telnet protocols using a password or RSA Key. It allows users to configure unlimited connections and save them for recall at a later time. There is a quick connect and disconnect from the home screen, and it will keep alive a session for 10 minutes, even in background. SSH



RF + Microwave Toolbox Lite

Term Pro gives plenty of user-configurable settings, including font types and styles, colors, size selections and style of scrolling. Users that require Telnet must purchase access separately through an in-app purchase.

RF+ MICROWAVE TOOLBOX

— ELEKTOR

Free; Full Version \$9.99

The RF+ Microwave Toolbox (Android) has most anything a broadcast engineer might need to reference or calculate.

The app features wonderful visual presentation of many useful tools for RF, microwave and general electronics, organized in a manner beneficial for the broadcast professional, student and electronic hobbyist. The lite version includes PI and T attenuator, Reflectometer (VSWR, return loss), mismatch error limits (VSWR, Return loss), parallel LCR impedance/reso-

nance, capacitor impedance, lowpass filter, capacitor plate calculator, and power and voltage converter.

The full version knocks the ball out of the park with 55 additional calculators. A sampling of just a few: noise floor (Kelvin, dBm), field intensity and power density converter (W/m², V/m, A/m, Tesla, Gauss, dBm, W), image

rejection (amplitude and phase imbalance), mixer harmonics (up and down conversion), peak to RMS (peak, RMS, average, CF), frequency band designations (IEEE radar band, military radar band, radio band, satellite, waveguide band), coax line calculator and twisted pair calculator.

This truly is an amazing set of tools.

Find more app ideas at www.radioworld.com/apps.

Laura B. Mir, CBNT, is a freelance broadcast engineer. She provides consulting and integration services in the D.C. metro area.



SSH Term Pro

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Small Market? Hire Local. Hire Smart.

Your station can provide community service — without going broke

What happens when a radio station in a small market becomes a music jukebox? The population suffers, and eventually, so will the owner.

While actual ratings may not be relevant to advertisers in small communities, results are vital. Commercials must motivate listeners to show up in stores or to order services from contractors and suppliers.

UNDERSTAND THE MISSION

For decades, radio has been the reliable source for everything local in a community. While it may seem odd to big-city folks to hear obituaries read on-air alongside scores from a high school basketball game, this is music to my ears.

Give me the lunch menu at the elementary school or tell me the name of the kid down the block who won the town hot dog eating contest, and I will present the owner with a gold star for understanding the mission. Inform me of a breaking weather condition — like



WIGO(FM) in White Stone, Va., created a sister website that covers local news and events; see www.middlenecknews.com/events.

a dangerous flash flood or lightning strikes — and I will guarantee you a place in the hearts of local listeners.

Anybody can create a music juke-

box; nearly everyone I know does this daily. And yet, what's happened to so many small-market stations? They sound just like their large-market coun-

PROMO POWER



Mark Lapidus

hyper-local website to do some of your on-air news for you, concentrating on highly listened day parts, like mornings and afternoons during the week and mid-days on Saturday and Sundays. If possible, sell (or give) local shows to community groups or religious organizations on the early morning weekends; they can put their own folks on the air to talk about local issues, play local artists or discuss zoning.

PLAY TO OUR STRENGTHS

On the revenue side, consider selling a direct mail piece two to four times a year in conjunction with a solid three-month radio schedule. Contrary to what the media tell you, don't believe that direct mail in small markets is dead. If the offer is a good one, a direct mail piece can move consumers to action. If you're not convinced, add a local coupon page to your website, then heavily promote it on-air.



In between, the ARC Solo is packed with the features you've come to expect from Burk. For uncomplicated remote control, there's nothing else to buy. Even the new Recordable Speech Interface is built in.

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Don't let anyone tell you that radio in small markets is dead and new media alone rule.

terparts — song after song, with that decidedly non-local, perfect-sounding voice track that doesn't even have the occasional regional accent.

Before you send me an email about how expensive it is to operate a small-market radio station, please reflect on what got you into broadcasting in the beginning of your career. Likely, you wanted to have an impact on listeners by telling them something they didn't know or by entertaining them.

GIVE THEM A CHANCE

So how does a small-market operator provide local community service today without going broke?

Hire smart. Hire local.

Give a chance to young people who are more interested in the experience than the salary. Hire part-timers who want to work in radio because it's so much more fun than their other job. As an owner, if you have the ability, do on-air work yourself. Cut a promotional deal with the local newspaper or a

What happens when a small-market owner has more than one station? Obviously, there will be more than one format, so the local, local, local approach can be the same and may even render some savings by utilizing the same staff over several stations.

Another note of encouragement to small-market operators: If a large, out-of-town company owns a competing station, they are highly unlikely to embrace this local strategy. It's not the accepted wisdom anymore, and those who advocate greater "body count" are perceived as being out of touch with corporate reality.

Don't let anyone tell you that radio in small markets is dead and new media alone rule. Only broadcasting efficiently reaches a mass, non-fragmented audience with high-impact messaging. Local small-market radio is where it's at today, and where it will be tomorrow, if we play to our strengths.

The author is president of Lapidus Media. Email marklapidus@verizon.net.

“Observations” Chronicles Life in Nevada

Nevada Broadcasters Association CEO talks public service radio

BY KEN DEUTSCH

Almost two decades years ago, Bob Fisher, the CEO of the Nevada Broadcasters Association (the “other” NBA), was sitting around a dinner table with his board of directors during a trip to Washington for an NAB State Leadership Conference.

“As the evening progressed and the ‘spirits’ seemed to move them, one of the Las Vegas radio guys had an idea,” said Fisher.

“He said I ought to have my own radio show. And a second radio guy said the same thing, and then a third guy, Mike Ginsburg, offered a challenge. He said to the other radio broadcasters from Nevada, ‘If you put the show on the air, so will I.’ Eighteen years later, after over 900 radio shows, we’re still on the air!”

Thus began the weekly Nevada Broadcasters Association public service program “Observations,” still hosted and produced by Fisher and airing on 35 radio stations throughout the state. There are also five network TV stations in Reno carrying the nonprofit talk program in northern Nevada. (See sidebar.)

IN THE BEGINNING

An early inspiration for Fisher’s love of radio was Minneapolis legacy station WCCO(AM), with its emphasis on public service, personalities, sports and farm reports.

“When I was growing up, I used to set up a card table and our Victrola in our den,” said Fisher, 66. “I would pretend I was doing a radio show, giving the weather, reading the news and talking about the Minnesota Twins. I guess I always wanted to be an entertainer, and decades later, I’m doing a real show.”

Fisher says that WCCO and the association have a characteristic in common: public service.

“We take our role with the Emergency Alert System seriously,” said Fisher. “And for 10 years I was the state coordinator and chairman of Nevada Amber Alert. In a lot of communities, and even in Las Vegas, nonprofit organizations want their local radio and TV personalities to serve as their emcees. Public service is part of our fabric.”

“Observations” covers many topics of interest to Nevadans, including but not limited to, healthcare, gambling, politics, crime and showbiz. On some occasions, these subjects overlap. Since 90 percent of the shows are produced in one of America’s entertainment capitals, Las Vegas, there’s no shortage of celebrities willing to drop by for a chat with Fisher.

“The remaining 10 percent of the

shows are recorded in Reno at the facilities of news/talk KOH(AM),” said Fisher. “Reno affords access to many state political leaders working in Carson City, the capital, who might not be available otherwise. The NBA is the only state broadcasters association to have a state-of-the-art radio studio in its office suite.”

GETTING TO KNOW YOU

Fisher believes the key to any interview is soliciting personal stories from his subjects, something beyond what is stated in press releases.



Nevada Broadcasters Association CEO Bob Fisher

“I did an interview with Senate Majority Leader Harry Reid,” said Fisher. “He opened up and talked about the suicide of his father and the impact that had on his life. You have to break through and get people to trust you. You do it by listening to what they are saying, not working with a script. I have never done an interview over the phone. I do them all in-studio because it gives me the opportunity to connect and listen better.”

Gary L. Campbell is the director of radio production for “Observations,” and he can attest to the fact that not all the shows are serious.

“I recall Bob trying to sing along with Mary Wilson from the Supremes on one show,” he said. “Now that was pretty funny.”

Over the years, Fisher has honed his interview style.

“I realize that the people are not tuning in to hear me,” Fisher said. “They want to hear from the guests. Also, over the 18 years I’ve been doing this, I’m proud that I’ve never gone ‘negative.’ I’d rather talk about the things that bring us together.”

NOT ALL ABOUT THE BENJAMINS

While Fisher receives a salary as CEO of the Nevada Broadcasters Asso-

ciation, he doesn’t take a dime for hosting and producing the radio or TV version of “Observations.” These are public service programs, and the stations donate their airtime.

The radio show is distributed online via Hightail (www.hightail.com). Because “Observations” is syndicated, it runs on different days and at different times in each market.

“I lobby in Carson City, and I’m amazed at the number of people who hear the show,” said Fisher. “I bumped into someone who recognized me and

THE TV VERSION

Radio World: How did the TV show come to be added to the radio show?

Bob Fisher: Ten years ago, prior to developing the TV version of “Observations,” all Reno television stations were asked to approve of the program, and they were given the choice on whether or not to air it. The focus would be entirely directed towards northern Nevada. This past January we celebrated our 500th show with special guest Nevada Governor Brian Sandoval.

RW: Is the radio show just the audio from the TV version?

Fisher: No. Separate entities and separate guests. Is there crossover sometimes? Yes.

RW: How is the TV show distributed?

Fisher: The television show is produced at the KRXI/KAME(TV) studios in Reno. Tapes are edited there and distributed to the ABC, CBS and CW affiliates.

RW: Is it supplied free of charge to the stations?

Fisher: Both radio and television shows are supplied free of charge to the stations. It is a membership benefit [of the NBA] and speaks volumes about public service in the state of Nevada. There is no advertising, although each participating station is encouraged to promote the show.

RW: Do you have some idea what it costs to produce the TV version?

Fisher: I have no idea of the budget for the show. The production staff at KRXI/KAME has always cared very much about the look and the quality of the program. They have absorbed all salaries and costs, including the set and lighting, production, editing and distribution. The NBA subsidizes closed captioning (\$12,000 per year) and absorbs the cost of our production director, who is a full-time employee of the NBA and has other responsibilities in addition to “Observations.” My time spent on producing and hosting these two shows is part of my job description.

When CBS Got Serious About Shortwave



Art Deco movement brought style to shortwave broadcast equipment

ROOTS OF RADIO

BY JOHN SCHNEIDER

The school of design called Art Deco reached its peak of development in the United States in the mid-1930s. The style is revered today in its surviving implementations — notably, in period buildings like those found in Miami's South Beach; in the streamlined designs of automobiles, trains and ships; and in a variety of consumer devices from the period.

Art Deco reflected everything that was modern, and so it was only natural to see it applied to the new technology of radio. Thousands of Art Deco radio receivers were marketed to the public, and the more attractive surviving specimens bring top dollar at art auctions today.

This was also true on the broadcasting side, where beautiful Art Deco studio and transmitter buildings were created.

In this image, we see it applied to a stylish transmitter created by RCA. This 10 kW unit was installed in 1937 by CBS at its shortwave station W2XE in Wayne, N.J. With its streamlined styling and sweeping lines, this might be the most beautiful transmitter design I've ever seen.

W2XE was begun in the mid-1920s by Alfred H. Grebe, an early manufacturer of radio receivers. It rebroadcast the programs of his AM station, WAHG in New York City. In 1926, he formed the Atlantic Broadcasting Company and changed the AM call sign to WABC.

William S. Paley bought the AM and shortwave stations in 1928, and so WABC became the flagship station for his network, the Columbia Broadcast System. (To avoid confusion, the call sign was changed to WCBS in 1947, when the NBC Blue Network was sold and became the ABC network. The ABC station WJZ then took on the WABC call sign.)

For a number of years, W2XE was simply a relay station for the programs of WABC and the Columbia Network, the same as its other shortwave station, W3XAU in Philadelphia. But in 1937, CBS decided to get serious about international broadcasting and formed a Shortwave Bureau.

A pair of Vee (half Rhombic) antennas was aimed at Europe and South America. The rotary switch seen above the transmitter allowed its connection to

either antenna. With more power and a high-gain antenna, W2XE then boasted an effective radiated power of 40,000 W. That was plenty of power to be heard around the world on the quiet shortwave bands of the time.

The new transmitter plant was dedicated May 12, 1937, by Elizabeth Ann Tucker, who was the new head of the Shortwave Bureau. She had worked for CBS Engineering since 1931 in a non-technical capacity. She soon developed a new program schedule that combined domestic CBS programs with special programs in English and Spanish for international audiences.

A QSL card from W2XE in 1939 shows operations on 6120, 6170, 9650, 11830, 15270, 17830 and 21570 kHz. The same transmitter was apparently used for all frequencies, and the station changed channels during the day as propagation conditions changed. Thirty-minute silent periods between frequency changes gave the engineers time to re-tune the transmitter.

In the 1930s, the FCC still considered shortwave to be "experimental," as indicated by the letter "X" in the call sign. This meant that shortwave stations could not broadcast advertising, and this — along with the congressional prohibition against any direct shortwave broadcasting by the U.S. government — discouraged most shortwave investment in this country.

Meanwhile, Germany had a power-

ful presence on shortwave, spreading Nazi propaganda around the world. And so, to counter this, in 1939 the FCC eliminated the experimental designation, which meant that standard broadcast call signs were assigned. W2XE became WCBX and began a dubiously successful attempt at international commercial broadcasting. Meanwhile, NBC and General Electric were also attempting to commercialize shortwave radio with their own stations aimed at Europe and Latin America.

This short period of commercial shortwave radio came to an abrupt end in 1941 with the bombing of Pearl Harbor. Within a few weeks, all commercial shortwave stations in the United States would be taken over by the new Office of War Information for government transmission of war news and propaganda to the European and Pacific theaters.

To get around the legal restriction on government broadcasting, CBS and the other station owners continued to operate the transmission plants, but all programming came from OWI studios in New York and San Francisco, with all operating costs reimbursed by the government. CBS moved its shortwave plant to Brentwood, Long Island, in 1940, and in 1943 added two more government-financed transmitters, which were heard as WOOC and WOOW. They also opened a new West Coast shortwave complex at Delano, Calif., in 1944.

After the war, Congress finally did an about-face on the issue of government shortwave broadcasting, with the result that most U.S. shortwave stations were purchased outright by the government and became the beginnings of the Voice of America.

Even if World War II had not interrupted things, it's unlikely that CBS or the other commercial broadcasters would have ever made any money with their shortwave operations. After the war, the shortwave bands found success only as an outlet for government propaganda and religious broadcasting. But for two short years, 1939 to 1941, the world enjoyed a brief taste of American-style commercial broadcasting on the international shortwave bands.

For other articles on early shortwave broadcasting, see these previous Radio World articles; find them with the given keywords at radioworld.com: "W6XBE at the Golden Gate Exposition, 1939," keyword W6XBE; "WCAU Used Shortwave in Philadelphia" and "A Sequel to the Philadelphia Story," both with keyword WCAU.

John Schneider is a lifelong radio history researcher. Write the author at jschneid93@gmail.com. This is one in a series of photo features from his collection; see more at the *Roots of Radio* tab under Columns at radioworld.com.



NASCAR on the Radio

How does the sound of the iconic races get onto the airwaves?



Motor Racing Network's 53-foot truck carries equipment; it functions as the remote operations center at the races.

BY PAUL KAMINSKI

What takes three networks, 38 weeks, teamwork, multiple cross-country trips, lots of RF, fiber, microphones and plenty of computer power? The NASCAR Sprint Cup Series. That's how these races get to a radio or audio stream near you.

Three networks cover the series, NASCAR's premier national touring series since 1949.

The oldest is the Motor Racing Network, or MRN, launched in 1970 by NASCAR Founder William H. G. "Big Bill" France as a subsidiary of the International Speedway Corp.

The Performance Racing Network was founded in 1979 and is a subsid-

iary of Speedway Motorsports Inc. The Indianapolis Motor Speedway Radio Network is focused primarily on coverage of the IndyCar Series, but for one weekend in late July it covers the Brickyard 400, held on the historic Indianapolis Motor Speedway oval. IMS produces its coverage of the 400 in association with PRN.

THE CREW

MRN, based in Concord, N.C., has the most broadcasts from all of the ISC tracks, independent tracks like Pocono and Dover. It's also busy with broadcasts from NASCAR's Nationwide Series and from all Camping World Truck Series races, and in 2013, all of the Grand-Am Rolex Series Sports Car Races.

Engineer Bob Wolfe works with MRN Chief Engineer Doug Watson and Satellite Engineer Mike Weaver.

MRN hauls in a semitrailer and satellite transmission truck. Wolfe says, "We have three broadcast trucks, a 53-footer, 40-footer and an 18-foot truck. The 53-foot unit gets the most work, doing about 33 venues per season."

Inside the broadcast truck, there's a main studio used to mix the broadcast, a two-person talk booth that can be used for on-air or recording and two edit suites used for recording and show prep. There's enough room for eight reporters to sit and work on show preparation before going into one of the booths or studios. The 53-foot unit gets a lot of work, and puts on lots of miles.

Wolfe says the truck travels about 30,000 miles a year. That pace presents the biggest technical challenge for the crew is repair work.

"The truck is out 6 to 8 weeks sometimes before coming back to the shop. When things break, they must be fixed on the road. Getting replacement gear to the truck, and then getting the gear that needs to be repaired back to the shop or a repair facility has its difficulties. The last time I worked at a radio station, it didn't bounce down the road," he says.

PRN, which is headquartered at the flagship of Speedway Motorsports, Charlotte Motor Speedway in Concord, N.C., originates race broadcasts from the Speedway Motorsports facilities — Charlotte, N.C., Bristol, Tenn., Fort Worth, Texas, Atlanta, Las Vegas, Loudon, N.H., Florence, Ky., and Sonoma, Calif.

Harrill Hamrick is the director of engineering/chief engineer for PRN, and also mixes the broadcast from the trailer they use as an on-site technical operations center. Bill Parrott primarily is responsible for PRN's RF operations. They are joined by Ben Blevins, Tracey Rice and Scott Hollingsworth,

(continued on page 24)



Motor Racing Network's Audio Engineer Todd Costello operates the board in the MRN trailer.

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NASCAR

(continued from page 23)

who rotate as the booth technician at specific races. The booth technician is responsible for ensuring the anchors have a solid link to NASCAR timing and scoring, and responsible for the booth audio gear.

Both MRN and PRN tie their anchor booth to their broadcast trailers via fiber. Hamrick says PRN uses a Telecast Adder II, "which allows for 24 channels of audio from the booth to the trailer, and eight from the trailer to the booth on a single strand of single-mode fiber. Our unit has two lasers for redundancy."

Pit reporters and turn announcers are connected by wireless microphone units. In the case of MRN, Wolfe says they use RF in the unlicensed band, so it's a matter of scanning the spectrum at each stop and choosing clean frequencies. PRN uses Lectrosonics Venue series receivers and UM450 belt-pack transmitters. Hamrick says PRN uses two frequencies at the track, one for pit reporters and one for turn announcers.

"We do coordinate the use of the frequencies where SBE [Society of Broadcast Engineers] frequency coordinators are available. We also coordinate against the folks at Broadcast Sports Technology, who provide RF for the television broadcasters."

MIXING

MRN and PRN use different protocols to get the broadcast mix of audio from anchor booth, turn announcers and pit road reporters to the radio and Internet stream.

MRN, says Wolfe, uses a dedicated uplink truck with an AVL Technologies dish and dual transmitters, as their primary link to WestwoodOne, formerly



Labeled wireless headsets are stowed away before and after the show. Each headset is assigned a user, a frequency and a physical location at the track.

Dial Global, the program distributor. For backup, "we also have two ISDN units on the truck ready to connect should both transmitters fail. And if all of that should decide to quit, we have a Comrex POTS unit ready to go."

Taking a different approach, PRN, says Hamrick, sends the mixed broadcast back to PRN studios in Concord, so the production director, can record the feed to produce a post-race highlight package that ends each broadcast. All of that is sent via ISDN to a Cumulus Media uplink, with a Comrex Vector as a backup.

Both PRN and MRN stream their broadcasts (post-delay feed) from their main studios. The uplinked feeds have contact closures for program start and finish, legal IDs, local commercial

MRN's Satellite Uplink Dish Truck.



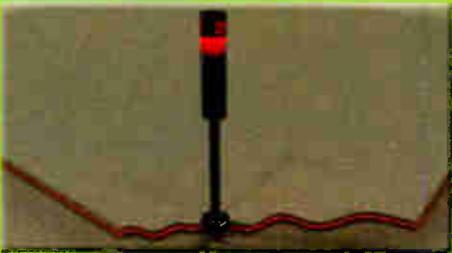
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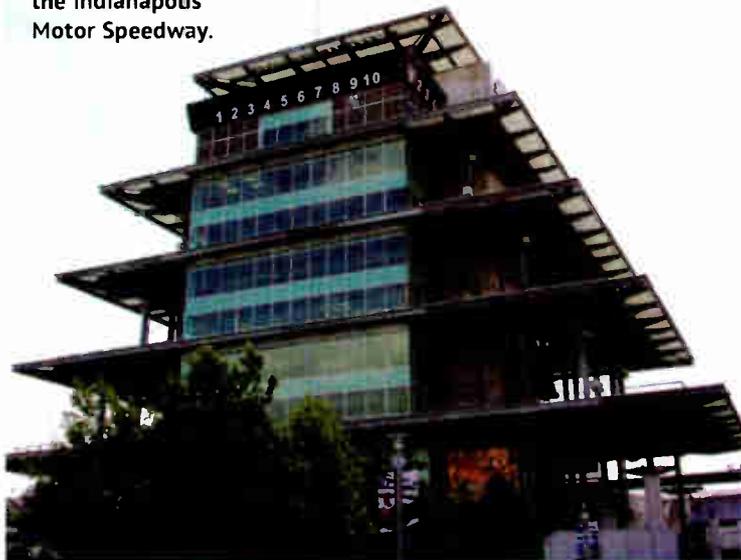
MICROPHONE ACCESSORIES



HEADPHONE CONTROL PANELS

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The Pagoda at the Indianapolis Motor Speedway.



insertion and if necessary, contact closures for a rain delay event. PRN uses a Rivendell Linux-based automation system from Paravel Systems, connecting by IP to their SAS router, to generate the commercial closures. It also generates data that Cumulus Media uses to effect regional commercial insertions.

Rick Evans is chief engineer for the Indianapolis Motor Speedway Radio Network. Most of his efforts are focused on coverage of the IndyCar Series and its crown jewel, the Indianapolis 500, the logistics of covering an event at the "Brickyard" are somewhat simpler. "Everything takes place on the 9th floor of 'The Pagoda,' where almost everything is permanently mounted. The pit and turn reporters are tied into the booth by RF."

IMS uses an ISDN link to Cumulus Media

to get the broadcast to its affiliates, but is looking into using a Comrex Access for backhaul to Cumulus' satellite uplink facilities.

Wolfe had these words of advice for those engineers and operators responsible for the technical operations of an important broadcast, the product of years on the road:

"Redundancy is the key. Have a backup for your backup. NASCAR doesn't care if our gear is down, they're still going to run the race, and we have to be ready. If you need one, take two; if you need two take four."

Paul Kaminski is proprietor of PK Communications Co., host of its "Radio-Road-Test" syndicated radio program. He has been a Radio World contributor since 1997. Email pkcommunicationsco@msrpk.com or tweet at msrpk_com.

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New Studio Gear to Watch For

Here's an audio flavor of what we'll be talking about this year

BY ALAN R. PETERSON

Heading full steam into 2014, there are a number of prominent trade shows to be getting ready for. You would be well-advised to get your NAB Show Las Vegas affairs in order, as that convention is slated for early April. Should you be bound for Europe, there is the 136th Audio Engineering Society conference rolling out in Berlin, also in April.

However, if like me, you had the opportunity to hit the 135th AES show in New York's Javits Center, your appetite for new and exciting audio technology has already been whetted. And if you were there, congratulations — the New York gathering posted its highest attendance in five years, with the official count pegged at 18,453 registrants.

According to AES officials, that represents a 16 percent increase in attendance since the last time the convention was in New York, in 2011.

EYEBALLS AND CABLE CLOTHING

The exhibit floor was loaded with technology for radio and television audio, music recording and live sound, as it always is. But just when things started looking a bit routine, leaving one feeling a little jaded, there was something just around the corner that would make any audio pro stop and pay close attention.

One such item was the Kaotica Eyeball, an odd little hollow foam sphere that goes



Redco Cable Maiden

over side-fire mics. While it looks like a pop filter, it actually is a tiny sound-absorbing "room" that fits right around a mic, pretty much killing all room resonance and the nasty echoes found in a less-than-pristine recording environment.

Making many an engineer smile was the lovely mannequin maiden at the Redco Audio booth. Tressed in festive threads, it wasn't until you looked closely and saw her garments were made completely out of the company's cable products.

Then there was the ProCast being exhibited by Miktek. For anyone involved in live webcasting or recording a podcast, this one-box solution combines a two-channel mixer and boom mic with a USB audio interface. Plugging into a laptop and starting the recorder, or connecting to a streaming service, the ProCast puts the show on line fast.

Miktek also exhibited its line of high-quality Tennessee-built microphones, among them the nine-pattern

CV3 tube condenser mic.

Speaking of podcasters and laptop broadcasters in general, the Blue Snowball and Snowball Ice USB mics are familiar go-to mics for that audio discipline. The company used the AES show to display its Spark Digital mic for both USB and iPad connectivity. The mic has been around since 2012, but still drew attention from folks who had never seen it.

RECORDING AND EDITING

Among digital audio workstations favored for radio production, a healthy number of users seem to have settled on Avid Pro Tools and Adobe Audition. The latter was not in attendance, but Avid and its large family of third-party developers were in town to introduce version 11 of Pro Tools. The newest version, when fully configured, offers 96 tracks of stereo audio — plenty for the most complex and complicated radio spots and promos.

For non-Pro Tools users, an alternative was Samplitude Pro X from Magix. The suite allows recording, editing, mixing and mastering of audio and MIDI, along with CD/DVD author-

ing. A step-up in the Magix line — Sequoia — is intended more for film post-production.

As I walked the floor of the convention, there was one inescapable conclusion: nearly every booth displaying a multitrack project as its demo favored Pro Tools as the preferred environment. That has to mean something.

Controlling that DAW just got a lot more interesting with the Raven MTX from Slate Media Technology. Where a hardware console should be, there is a smooth slant-top glass surface instead, covering a large monitor screen of your preferred software. The entire surface is a multi-touch virtual mixing console. No more mousing, no more physical faders; you can now affect your mix decisions right on the monitor screen with your fingertips.

Out in the field, the Zoom H6 handy recorder does what a lot of portable SD card recorders do not. You may record up to four synchronized tracks at a time, capture 24-bit/96 kHz digital audio, and change out the microphone capsules for different purposes and demands.

Tascam likewise introduced the DA-3000, a four-track digital audio recorder intended for audio capture when recording DSLR video. But with four available tracks, a peak limiter and phantom power, the DA-3000 is useful for roundtable recording and interviews for radio, when used with external mics.

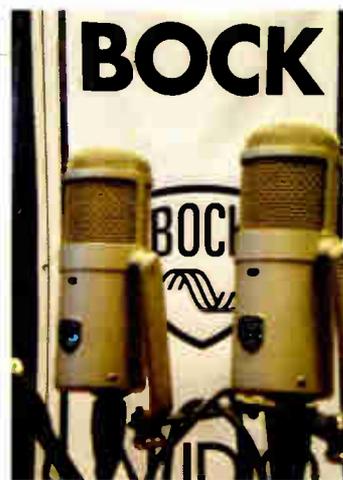
MORE MICS

Basic radio production equipment such as microphones is no longer a big deal at the NAB Show. With that in mind the AES show can actually be of more interest for people like me than the big spring show. And this year did not disappoint with many mic builders in attendance, showing their new wares.

Nearby Connecticut was well-represented, via Telefunken and its new M82 dynamic mic for vocals and kick drums; and the Charter Oak S700 Broadcast Condenser microphone. Both companies are based in the Nutmeg State.

Neumann used the occasion to formally introduce its TLM 107 condenser, boasting five polar patterns and a nice bit of sparkle around 12 kHz.

There is something about the classic Neumann silhouette that makes any mic look serious. With the Bock Audio mic line, it's not all about the look — these hand-built brass microphones are



Bock Audio's Neumannesque Microphones

built in small batches and sound great.

In the mid-1990s, AEA of California reintroduced the ribbon microphone to the world in a whole new design. This year, the phantom-powered N22 ribbon mic took to the floor. Cloud took the opportunity to reveal its own 44-A ribbon mic, with active Cloudlifter circuitry. Will anyone in radio broadcasting dare try these?

Earthworks has been making wide response mics for many years now. The SR40V microphone tops off at an amazing 40 kHz, in a deceptive handheld case more at home in a singer's hand.

Are you a fan of tube mics? The Gemini II condenser microphone from Sound Engineering has two tubes inside instead of just one. And the Vienna-based Lewitt GmbH makes a microphone — the LCT 940 — with the best of both worlds: the body contains both a FET and tube circuit.

ARE YOU LISTENING?

Of course, what good is a good microphone without a proper way to monitor what you are doing?

Yamaha was well represented with its MSP5 and MSP7 studio monitors and the white-woofered HS series. And Genelec was on hand displaying its 1237A and 1238A Smart Active Monitors, with AutoCal technology that automatically calibrates the speakers' response to the room. These monitors can accept both analog and AES/EBU digital inputs.



Shure SE846 Sound Isolating Earphones

How would you feel about earphones that probably cost more than your studio monitors? You might blanch at the \$1,250 price of the Shure SE846 Sound Isolating Earphones, but you will hear a better ear monitor. Separate drivers handle lows, mids and highs, and you may add or remove physical elements to alter response to suit your ears.

Alan Peterson, KJ4IVD, is an SBE-certified audio engineer, a longtime Radio World contributor and production director for the Radio America Network in Arlington, Va. Contact him at apeterson@radioamerica.org.

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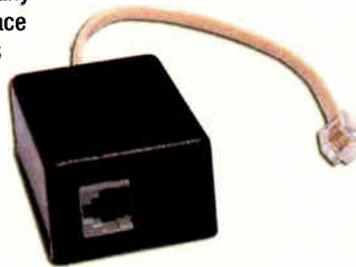
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Improving AM: Some Tough Decisions Ahead

Receiver issue may stop revitalization in its tracks

COMMENTARY

BY LARRY LANGFORD

Much of the discussion and comments to the FCC about AM revitalization have centered on interference and noise. These are serious issues standing in the way of the AM band being once again viable. But are we also missing the third side of the problem triangle, the receiver?

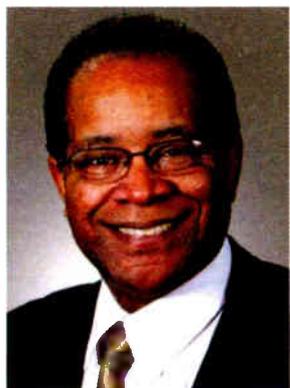
A major problem with AM is the inferior sound delivered to the user. There has been talk about an across-the-board power increase. This would, of course, provide some relief from the noise simply by overpowering it in some cases. But there is a downside to that solution, and it's a matter of money and questionable overall gain.

Take a simple two-tower AM directional operating at 1 kW.

If granted a power increase to 5 kW, the signal-to-noise on a typical radio might improve, but this would require not only a new transmitter at about \$35,000, but a new phasor as well at about \$25,000 to handle the additional power, and of

course, the tuning units for each tower, and maybe some new coax.

So with labor and engineering fees along with equipment, we are easily talking an investment of close to 100 grand and a much bigger power bill. But the audio will still be telephone-quality in the primary contour of the station— still inferior to all other entertainment audio because of the poor response and audible distortion of the typical AM receiver.



Larry Langford

IMMOVABLE

The issue of bandpass for AM radios has been debated for years.

Unless you're a rather young engineer, you remember all the hooplah over the implementation of the NRSC pre-emphasis and cutoff that was touted as the way to make AM close to FM with an audio response to 9 kHz on the radios that were to be built to complement that curve.

While the NRSC curve became mandatory for transmitters, the receivers never came en masse. And despite the



new push for AM improvement, sadly, I think the receiver issue may be the immovable object that stops revitalization in its tracks.

The elephant in the room is IBOC. All of us engineers know that you can't improve bandwidth and fidelity on AM radios and accommodate AM IBOC at the same time. We are going to have to make a choice.

IBOC on AM is just not cutting it. Can we finally admit that?

The adjacent-channel noise makes it impossible to open the bandwidth of a radio front end. Even the narrow radios of today emit hiss and noise from IBOC operations. Nighttime operation is an even bigger problem, with adjacent-channel skywave service made unlistenable. Yes, a lot of money has been poured into it, but it's a massive failure. Major 50 kW stations using it report poor receiver lock, even in prime signal areas during the day.

If we are going to make AM viable in the ears of the listener, we are going to have to kill AM IBOC and finally mandate a new receiver standard that requires a reasonably flat audio bandpass of 6 kHz. (Ironically, this is still less than that of a typical car radio in the 1950s!) Optionally, this bandpass could automatically narrow for weak signals.

At one time I was among those who said reducing bandwidth to 6 kHz was blasphemy. But the current allocation plan requires it to fight adjacent-channel interference, and truth be told, 6 kHz sounds very good if the receiver is well-designed. But this will only happen with a rulemaking to mandate acceptable response and distortion.

On the transmission side, the FCC should mandate a maximum negative

modulation level of less than 95 percent for AM. Such a limitation would eliminate some distortion issues present in existing transmitters and receivers right away.

The FCC decades ago mandated television standards to force inclusion of UHF tuners as well as FM standards that mandated stereo FM reception. This leveled the playing field and made both UHF TV and FM competitive. It's time for similar action for AM.

STOP WHINING

Receiver manufacturers need to stop whining about needing narrow operation to fight noise. Most AM listening is done at signal levels above 2 mV/m, plenty of signal to allow wider bandpass without letting in excessive noise. But that can only be true if IBOC is gone. Maybe 100 percent digital is eventually the answer, time will tell; but we can't have hybrid digital operation and improved quality analog at the same time.

If the FCC is *really serious* about improvement, they are going to have to "get some stones" to fight the iBiquity lobby, suspend AM hybrid IBOC for now and implement a long-overdue receiver standard that could be applied to new AM radios with a simple change in the chipset used in the receiver front end. Manufacturers need to realize that AM radios don't need to be built for DX operation where extreme selectivity is required at the expense of sounding good on *local* stations. Manufacturers will make the change if mandated. Look how fast the expanded band was implemented on AM receivers years ago, and no one complained about any cost increase, because there was none.

If we don't make changes that result in drastic improvement to the actual listening experience of the end user, we are just fooling ourselves on revitalization. And the only way to be that drastic on the current AM band is to improve the noise floor *and* the high-end response and distortion to at least be in the ballpark of other media.

You can get rid of all the noise and interference, change contour protection and increase power levels, but if what comes out is still rolling off at 2 kHz, you will never make a dent against FM and iPods. It's really just that simple.

Larry Langford is the owner and chief engineer of WGTO(AM) and W266BS Cassopolis, Mich. Reach him at larrylangford@aol.com or wgtoradio.com.

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

READER'S FORUM

USE HEADER TO PUT TEXT ON RDS DISPLAYS

RBDS is a great idea, but why did it take three years to finally have this report come to light? ("RBDS Gets Thumbs Up for Delivering Alerts," *radioworld.com*, keyword RBDS) When EAS is activated and the LPI (assuming it's an FM station) receives the warning, why don't they simply use the header to put RDS text from NWS, etc. on their RDS displays? Makes sense to me, especially if the Feds contribute some cash to the stations to implement the data over RDS. What are we waiting for?

John Pavlica
Toledo, Ohio

LET CUSTOMS ENFORCE PART 15

The FCC doesn't need to do anything to enforce its own Part 15 rules. (*radioworld.com/amcomments*) It just needs to work with U.S. Customs to require that all importers of products subject to the Part 15 rules submit a test report from an independent testing lab that verifies compliance. Everything would be managed by U.S. Customs as a part of the importation process (for foreign made consumer goods, at least). This is the way other countries do it, and it works.

John Schneider
Quincy, Ill.

The author is a contributor to Radio World.

READER'S FORUM

AM REFORM

The FCC does not have the political will to take on the Part 15 noise floor issue, and the noise floor is going to continue to rise since incandescent lamps have been outlawed. The only long-term solution is to reallocate TV Channel 6 to FM broadcast and allow AM stations licensed to operate at less than 5 kW or daytime only to migrate to 82–88 MHz.

*Bob Spain
Director of Engineering
Wyoming PBS
Riverton, Wyo.*

RADIO'S MISSING LINK

Oh! So that explains why I heard Pat Benatar's "Hit Me With Your Best Shot" on three separate stations while scanning in the car in Chicago a couple of days ago! ("MusicFirst: Radio Song Repetition 'Shocking'" on radioworld.com.)

Newton Minow had it wrong: Not just television but radio as well constitutes a "vast wasteland." While the NAB, RW, Cheap Channel, Crumulus et al shill for allegedly physics-defying "technologies" like IBOC, the "Missing Link" of content continues to rust and die, a now-irrelevant vestige of the dreamers and creatives, a natural enemy of the program directors and their slavish preoccupation with "surveys," all the while kowtowing to consultants.

Sigh. I could go on, but the GMs (all former sales liars) and their "staff" (those who are yet to be laid off in a desperate attempt to boost share value) have important meetings.

*Steve Lawrence
Retired Program Director
Chicago*

CORRECTION

A quote by National Association of Tower Erectors Executive Director Todd Schlekeway in the Feb. 1 issue was incorrect.

The text should have read:

NRSC MEASUREMENTS

Mark, I agree with you concerning the degradation of performance of tube-type transmitters ("Adjust Rules for NRSC Measurements," Feb. 1), but what about the solid-state AM transmitters, like the Harris SX and Gates series, that use large value capacitors in the modulator sections?

When those caps go bad and produce the dreaded "Harris slosh," the 60 kHz switching frequency suppression goes away and spurs of substantial amplitude can pop up above the required AM RF mask. I don't have much experience with AM transmitters newer than those vintages, so I'm not sure if newer designs by Broadcast Electronics, Nautel or Harris have that problem, but it would be pretty difficult for the FCC to separate things just on the basis of tubes or solid-state.

*Steve Brown
Radio Rangers
Minneapolis*

Mark Persons replies: In 20 years of doing AM NRSC measurements on as many as 50 stations a year, I found it was rare when a solid-state transmitter had a

NATE also is rebranding the convention NATE UNITE. "It summarizes our efforts to bring [together] the entire industry, and the carriers, tower owners and tower construction firms that are the largest part of our membership."

problem. Yes, the Harris SX and Gates series transmitters sometimes develop spurs. FM transmitters can have similar problems where frequent measurements are not even required. Annual testing does not "assure compliance" for the 365 days between measurements. Remember, every AM and FM radio station is required to stay within FCC limits, regardless of when it was last measured.



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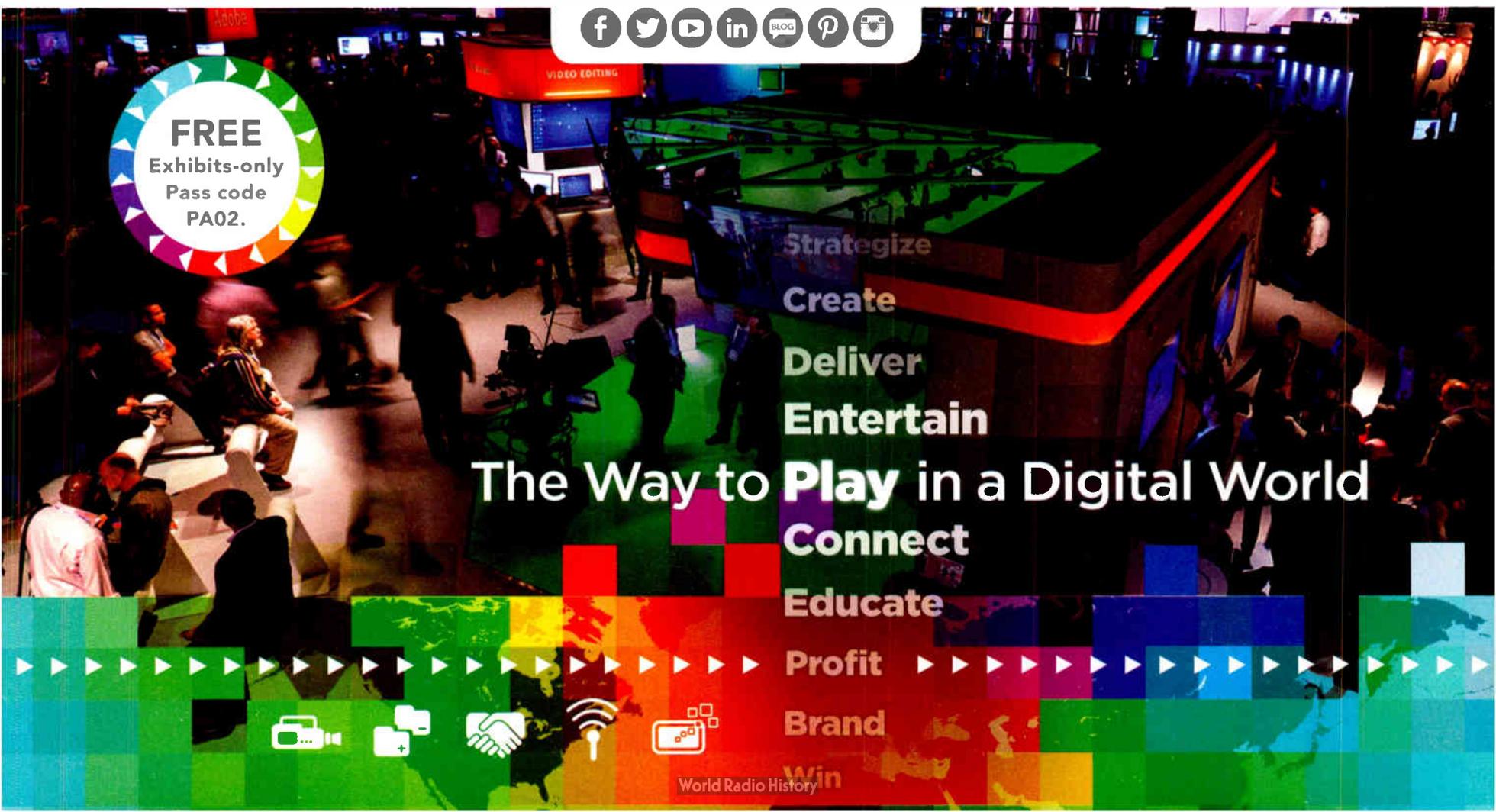
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