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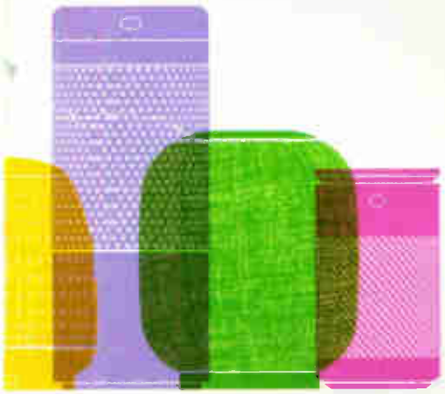

Smart Speakers Grow in Importance

Media companies, marketers and agencies explore how to capitalize and monetize

BY RANDY J. STINE

People are talking to Alexa; but the smart speaker isn't the only one listening. Radio industry leaders are paying attention — designing digital plans to make listening to their own streams on voice assistant platforms as easy as possible.

Smart speakers in the home have expanded the audio landscape quickly. Radio broadcasters have been watching this trend from its outset, as we have reported, and they continue to seek ways to take advantage of the voice-driven technology.

How Americans consume audio is always evolving, experts say; but smart speakers continue to be on the leading edge of change right now. A recent blog post by Westwood One was headlined "Smart Speaker Popularity Continues Full Speed Ahead." Jacobs Media's Techsurvey 2019, which polls radio listeners, found that about one in four of their homes have a speaker. More broadly, the Consumer Technology Association puts the number at 31%. Some estimates are even higher.

Interestingly, uptake appears to

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Business hand found, Getty images.denizbayram; Speakers: Getty Images/smartboy10; Skyline: Getty Images/Leontura

Fall Radio Show Seeks to Leverage Transformation

Industry gathers in Dallas this month **Page 26**

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CONTENT
Managing Director, Content Paul J. McLane, paul.mclane@futurenet.com, 845-414-6105
Senior Content Producer — Technology Brett Moss, brett.moss@futurenet.com
Content Manager Emily M. Reigart, emily.reigart@futurenet.com
Technical Advisors Thomas R. McGinley, Doug Irwin
Technical Editor, RWEE W.C. "Cris" Alexander
Content Director — International Marguerite Clark
Contributors: Susan Ashworth, Dave Beasing, John Bisset, James Careless, Ken Deutsch, Mark Durenberger, Charles Fitch, Travis Gilmour, Donna Halper, Craig Johnston, Alan Jurison, Paul Kaminski, John Kean, Peter King, Larry Langford, Mark Lapidus, Jim Peck, Mark Persons, Stephen M. Poole, James O'Neal, Rich Rarey, Jeremy Ruck, John Schneider, Randy Stine, Tom Vernon, Jennifer Waits, Chris Wygal
Production Manager Nicole Schilling
Managing Design Director Nicole Cobban
Senior Design Director Karen Lee

ADVERTISING SALES
Senior Business Director & Publisher, Radio World
John Casey, john.casey@futurenet.com, 845-678-3839
Publisher, Radio World International
Raffaella Calabrese, raffaella.calabrese@futurenet.com, +39-320-891-1938

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Connectiv

Jay Tyler's Top 5 AoIP Trends

Whatever you want us to do, we can do it using AoIP logic controls, codecs and connectivity

COMMENTARY

BY DEE McVICKER

Jay Tyler

Radio World's new ebook "AoIP for 2020" is our biggest to date. This article is one in a series of articles exploring that topic. Author Dee McVicker handles marketing and communications at Wheatstone.

There is far more to AoIP than routing and connecting things. It is because of AoIP that we can pan studio cameras at exactly the right moment or load an entire studio of controls onto a tablet, for example.

Where is this all going?

Here are the top five AoIP trends, according to Jay Tyler, Wheatstone's director of sales, who has been involved in hundreds of studio projects.

Native AoIP across distances. There's a lot of sharing going on these days, from sharing VOs and bumpers between sister stations and sports venues to putting everything into one main operating center for several stations scattered across a region. Being able to move native IP audio and control across distances is why. The cost savings are significant in terms of staff, infrastructure and workflows, and disaster recovery doesn't get much better than having your essential operation up in a cloud or in another Zip code while dealing with a disaster situation in the studio.

"We don't care where music lives," Tyler said. "We can pull it in or we can control it remotely. We can mix it remotely, send it to your transmitter site, bypass the studios, whatever you want us to do, we can now do it using a combination of AoIP logic controls, codecs and connectivity."

Native IP for phone-ins, too. Connecting VoIP phones directly into the AoIP network without hybrids or stepping through analog-digital conversions means you can do so much more than just route one or two mic feeds down the phone line. You can split feeds, set up multiple sends, customize talkbacks, routing and conference feeds — all possible now that VoIP phones can connect directly into the native IP audio environment.

SNMP everything. "Everyone wants to know what everything is doing, and they're doing it with SNMP," he said. SNMP is a set of standards used for monitoring and managing data from servers, printers, hubs and switches. AoIP networks and devices that are SNMP-enabled have MIB files that define relevant data points for monitoring bitrates, temperatures, signal flow and other network details.

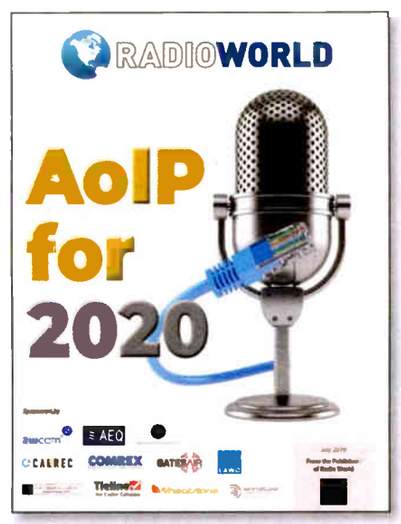
For example, WheatNet-IP BLADE I/O units have MIB files with data points for monitoring as well as alerting if a particular port is dropping packets or if a device is heating up and about to fail. In addition to devices containing MIB files, an SNMP browser or management tool is needed for managing networks.

Virtual interfaces into the network. UIs into the IP audio network are taking many forms today, from signal monitoring and switching control panels to news desks complete with talkback button, metering and weather, sports and stock market feeds. Meanwhile, according to Tyler, standalone virtual mixing consoles such as Wheatstone's Glass LXE are popular in mid-market production rooms because they're affordable to set up and use, and extremely serviceable for today's production needs. With native audio IP able to cross distances as mentioned earlier, we can now tap into and control signal streams inside or outside a facility from any user interface available, whether it's a multi-touch flatscreen or a mobile phone.

AES67 Everywhere. AES67 is no longer an afterthought. This audio transport standard is becoming an important part of the AoIP landscape as we move more and more audio between network systems. Also up and coming are complementary standards based on NMOS and AES70, which promise to add discovery, control and connection management to the interoperability mix.

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

Read the free ebook "AoIP for 2020" under the Resource Center tab at *radioworld.com*.



NPR Distribution Offers Emergency Kits

With CPB backing, the project makes backup kits available to public stations

EMERGENCY PLANNING

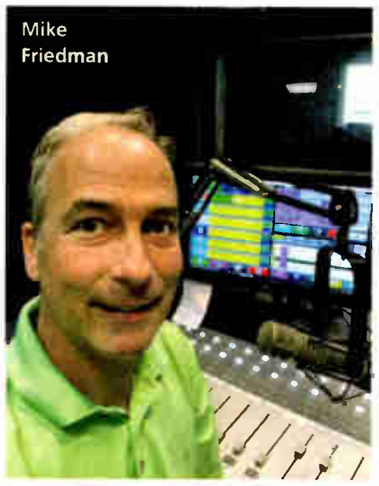
BY ERICH SHEA

The author of this commentary is manager of communications and outreach for NPR Distribution.

Over the past few years, disastrous storms and wildfires have crippled public radio stations and taken them off the air in New Jersey, Puerto Rico, California and many other locations. At the same time, the forthcoming FCC repack and the constant threat of obtrusive construction projects leave many stations fearful that events beyond their control could impact and disrupt their broadcasts.

Fortunately, NPR Distribution, which manages the Public Radio Satellite System (PRSS), has created a solution to help stations plan ahead and protect themselves and their broadcast operations.

The PRSS Station Emergency Kit is a suite of emergency backup transmitter kits and portable studio systems that



can be used by public radio stations in the event their on-air operations are disrupted by natural disasters, construction activities or other potential threats. The emergency kits are the product of a collaboration with the Corporation for Public Broadcasting (CPB), which provided the necessary funding, and comprise emergency transmitter, antenna and studio kits (see sidebar).

"One of our mandates is to deliver best-in-class technologies, business practices and support to help public radio stations reach their audiences, and these emergency kits are a unique and important way to provide assistance when it's needed most," said Michael Beach, vice president of NPR Distribution. "Station managers do themselves a favor when they plan in advance for technical contingencies, and we're happy to offer another tool they can rely on in the event of a disaster or if they see one looming on the horizon."

MODEST FEE

With funding from the CPB, NPR Distribution created, assembled and tested the kits with an eye toward making them available for a modest fee to stations on a temporary basis until their broadcast infrastructure is restored. The transmitter kit costs $275 for the first month and $550 for each subsequent month. The antenna kit fees are $100/$200 and the studio kit fees are $200/$400. Stations cover shipping.

NPR Distribution, which kicked off the project by developing three emergency transmitter and antenna kits and two emergency studio kits, will also be in charge of shipping the kits out to stations that submit a request and to maintaining them when they have been sent back.

A key component of the kits' development involved field testing the kits

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Photo by Mike Friedman

Dale Williams helps set up the antenna.

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Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by Future US, Inc., 11 West 42nd Street, 15th Floor, New York, NY 10036-8002. Phone: (703) 852-4600, Fax: (703) 852-4583. Periodicals postage rates are paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 282, Lowell, MA 01853.

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at two stations in Virginia, namely WVTF in Roanoke and WCVE in Richmond.

"We made certain the stereo pilot worked, we accessed the transmitter remotely via the internet and then drove within a few miles of the site to evaluate coverage, which we found to be about four to six miles," said Mike Friedman, RF engineer for WCVE, which is owned by VPM.

"The antenna is very simple to assemble. For the mast assembly, you will find everything you need, and the entire process probably took us a total of 30 minutes to erect."

(continued on page 6)

WHAT'S IN THE KITS

Emergency Transmitter Kit

Three emergency transmitter kits will be available. Each transmitter is air-cooled and runs on 120-volt, 60 Hz AC power using local power or a generator. Each kit will consist of the following:

- One Nautel NHB-VS300 300-watt FM transmitter with internal frequency agile exciter, which supports 87.5 to 108 MHz and integrated audio processor
- One INOmini 638 FM receiver for "off-air" monitoring with level meters
- One Furman Power Conditioner PL-Plus-C
- One 12' N-N jumper cable
- Two 25' Ethernet cables
- Three 30' XLR cables
- One Pelican heavy-duty rack case

In addition, by request NPR Distribution can also provide a 1-5/8" to N adaptor or a 3-1/8" to N adaptor for connecting into an existing line and antenna

Emergency Antenna Kit

Three antenna kits will be available to the system that consist of:

- One Allen Dick Band II Broadband FM antenna
- One 75' flexible transmission line
- One 30' portable BlueSky mast with guy ropes

Emergency Studio Kit

Two emergency studio kits have also been developed, with each containing the following:

- One RODECaster Pro audio mixer and recorder
- Three Shure SM58S dynamic microphones
- Three Shure desktop microphone stands
- Three pairs of Audio-Technica ATHMx-40 headphones
- All necessary cables and adaptors
- Pelican road case with foam insert

TRANSMITTER KIT (NAUTEL VS-300)

STUDIO KIT

RODE CASTER-PRO CONSOLE

ANTENNA MAST KIT (BLUE SKY MODEL AL-1)

KITS

(continued from page 5)

Friedman added that one person could set up each of the kits, though he said it eases the situation considerably to have a colleague help, particularly with the 30-foot antenna mast.

Asked if the kits as tested would provide a viable alternative if his station went off the air, Friedman replied, "Absolutely. It's wonderful for NPR Distribution to offer an emergency broadcast alternative so that we can continue to serve our communities. In the event of a disaster at your transmitter site, you have to do what it takes to get back on the air. NPR is providing a bundled solution and the only question is what exactly do you need, given your situation."

According to NPR Distribution's policies on the kits, stations desiring to use a kit must contact the PRSS Help Desk with the dates needed, whether the need is immediate or one planned for several months in the future. They will have the option to use the kits for up to 90 days and may renew the contract if needed.

The antenna set up by WCVE

Photo by Mike Friedman

Stations will be required to contact NPR Distribution, before the date when they originally agreed to return the kits, if they wish to extend the duration of their contract for the kits.

NPR Distribution has been striving to anticipate and address challenges faced by public radio stations before they occur. This is evident in its Public Radio Engineering Certification initiative, which seeks to help create the next generation of technical leaders in the industry, as well as the Future System initiative and its emphasis on a next-generation hybrid system of satellite and terrestrial content distribution.

More information on the station emergency kits, including pricing and how to order them, is available at *http://prss.org/station-kit*.

SPEAKERS

(continued from page 1)

increase significantly in major markets like New York and Philadelphia, where nearly 50 percent of homes have one, according to recent data from Nielsen. It tracks the number of smart speakers found in PPM panel homes.

Jacobs Media's Techsurvey indicates that the most common use of a home smart speaker (at least by the radio listeners Jacobs focuses on) is asking a general question, but a quarter listen to music from an AM/FM radio station. Fifteen percent listen to news or talk from an AM/FM station.

IMMEDIATE OPPORTUNITIES

Analysts interviewed for this story expect the home speaker movement, led by Amazon's Alexa and Google's Home, to continue to expand into more homes. Changing economics created by technology advances appear to have created a sense of urgency among major radio group owners to bulk up efforts to reach audience via home smart speakers.

The Jacobs survey found that 9% of respondents say they listen to a lot more radio since owning a smart speaker. The respondents were fairly evenly split among those who listen for music and others who listen to news/talk radio stations.

That same survey found that just over half of listeners say all or most of their AM/FM radio listening is done in the car, which leaves broadcasters scrambling to fill the home listening market, experts say.

Bob Kernen, chief operating officer for jacAPPS, the mobile app developer division of Jacobs Media, said savvy radio broadcasters are focused on smart speakers as a new way of getting radio into — or back into — the home.

(continued on page 8)

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SPEAKERS

(continued from page 6)

"Broadcasters are focusing more on their digital streams, but the opportunities go way beyond that," Kernen said.

"Podcasts are another immediate opportunity."

Capitalizing on Amazon skills to make sure internet streams can be found easily on voice-driven technology platforms is important, Kernen said.

"It's all about getting the invocation name right. And that's getting tougher and tougher as more and more skills get produced, because you can only get one. Then stations need to promote that on the air," Kernen said.

Radio broadcasters typically guard their streaming numbers closely, so it's difficult to estimate the overall growth from home speaker listening, several observers told Radio World.

Major broadcast groups like National Public Radio and iHeartRadio are making significant efforts to penetrate the home speaker space, but many other ownership groups are diving in too.

"LONG INTO THE FUTURE"

Larry Linietsky, senior VP of operations and business development for Cumulus Digital, said the radio broadcaster has put a lot of emphasis on the smart speaker segment.

"We have Alexa skills for 367 of our 428 stations, and we have Google actions for 17 of our largest podcasts," Linietsky said.

Cumulus' digital department works on streaming, podcasting, web and station application solutions. It has developed Alexa and Google home skills that help extend radio messages into digital consumer touch points, Linietsky said.

"Via our partnerships with iHeartRadio and Tunein, we have access points on all smart speakers through numerous methods. We think smart speakers bringing shared listening behavior back into the home, which is something radio has always been good at.

"Cumulus looks at the percentage of listening per month that is coming through smart speakers and it is about 20% of total online listening hours in 2019. That's from nearly zero percent in 2017," Linietsky said.

The broadcaster's digital platforms for streaming include websites/desktop, mobile apps, connected TVs and smart speakers. The majority of the company's streaming occurs on mobile and desktop, according to Linietsky.

Meanwhile, Beasley Media Group is extending its brand to be "highly relevant across as many platforms as possible," including smart speakers, said Justin Chase, EVP of programming for Beasley.

"As good as our Alexa skills are now, we are in the process of improving them and rolling out skills on the Google platform. Beasley sees the incredible growth of smart speakers and we will continue to be committed to the strategy long into the future," Chase said.

Beasley was the first major broadcast company to roll out custom Alexa skills, Chase said, and the company is seeing at least 20% of its streaming audience on smart speakers.

GOING DEEPER

The move from tabletop home radios to smart speakers will likely benefit AM radio stations with poor signals facing increased signal interference, according to James Cridland, a radio "futurist" watching the space closely.

"The research shows that people use more audio after they purchase a smart speaker, and they are in a shared space like the home, which is beneficial," Cridland said.

So far aggregators that provide live streaming and on-demand audio services are doing a pretty good job at the basics, Cridland said, especially those owned by the radio business, like Radioplayer in Canada, the U.K. and parts of Europe; RadioApp in Australia; and iHeartRadio in Canada and the United States.

"However, TuneIn appears not to care about radio, frequently carries outdated and wrong information about stations, and is a poor experience, especially with smart speakers," Cridland said. "It's a disappointment that the radio industry continues to be so reliant on a partner that is so disinterested in them."

Podcasts and on-demand content on smart speakers are not especially popular, Cridland said, and are likely better suited for headphone listening.

"Some broadcasters are adding additional streams to smart speakers; others are even dabbling with contesting, on-demand sports reports and audio event calendars. But a smart speaker seems ideally positioned to carry the live radio station output," he said.

Radio broadcasters will follow when listening patterns shift, said Mike Bergman, senior director technology and standards at the Consumer Technology Association.

"If these personal digital assistants become a dominant mode of entertainment in the home, radio is certainly smart to find penetration opportunities," Bergman said. "If a broadcaster is not tapping into connected speakers they are probably missing out."

NAB says it touting the benefits of voice assistants in the home, believing smart speakers now allow local radio broadcasters to reach millions of listeners.

"Music listening and tuning into news

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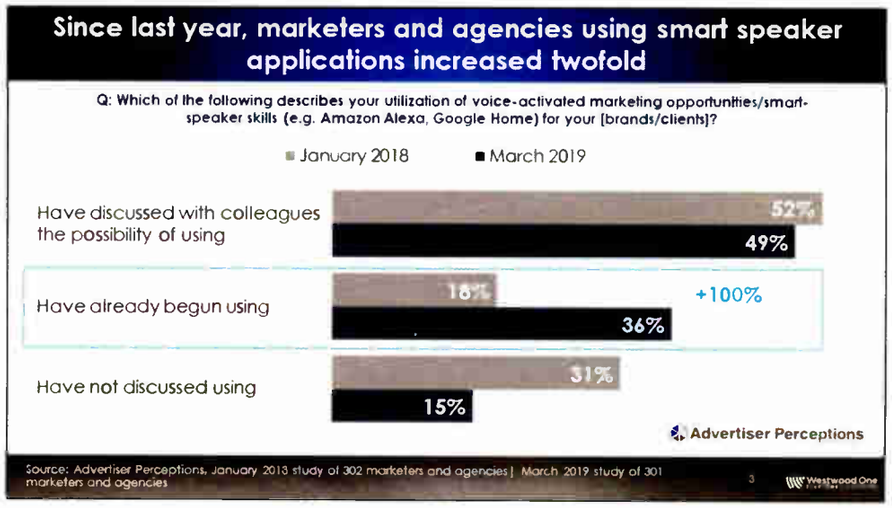

A graphic from the "Westwood One 2019 Audioscape" report indicates that marketers and agencies are "immersing themselves" in voice-activated advertising. The increase in use since early 2018, the report stated, "is stunning." Data was gathered by Advertiser Perceptions.

RADIO GETS ITS SHARE

The following are highlights from the "Westwood One 2019 Audioscape" report, which uses data from Edison Research and Advertiser Perceptions.

"AM/FM radio and Amazon Music lead in share of smart speaker time spent listening" — The report found that in the second quarter of this year, AM/FM radio (18%) and Amazon Music (17%) led in share of listening on a smart speaker, according to Edison Research. "This is a result of AM/FM radio stations developing voice-activated applications to enable listening on smart speakers and their aggressive promotion of Alexa and Google Home listening."

"Smart speaker ownership growth isn't slowing down" — It said the number of Americans who reported owning a smart speaker increased threefold from the second quarter of 2017 to the same period two years later. Estimates on ownership vary, but Edison Research put it at 30% of Americans owning a smart speaker now.

"Marketers and agencies are immersing themselves in voice-activated advertising" — This is shown in the graphic in the main story and is based on research by Advertiser Perceptions. It also found that among media agencies and brands that haven't started using smart speaker applications, "their likelihood to use these marketing initiatives within the next six months has increased."

"Millennial podcast growth is powered by ethnic and female audiences" — The Westwood One report also explored trends in podcasting and found that in Q2 of this year, millennial 18–34 podcast daily reach grew 13% over the prior year, to 17.3%. "Driving this growth is 18-34 African Americans, Hispanics and women. These segments are growing faster than the overall 18–34 demo."

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Battle Lines Deepen in Interference Debate

A number of organizations also express concern over how U/D ratios will be used

BY SUSAN ASHWORTH

People with strong feelings about translator interference complaints continued to argue in August over recent rule changes. One technical consulting firm said the use of a particular measurement ratio could usher in a series of "dire unintended consequences."

In May the Federal Communications Commission adopted new proposals to streamline rules relating to interference caused by FM translators and adopted specific changes to expedite resolution of complaints.

The FCC allowed translators to resolve interference issues by changing channels. It also standardized information that must be submitted, established new resolution procedures and set a new outer contour limit for interference complaints to be considered.

But in the months since, a number of organizations have called on the FCC to reconsider various aspects.

"NEGATES ITSELF"

The LPFM Coalition believes the rulemaking doesn't meet certain statutory requirements in the Communications Act and the Local Community Radio Act of 2010.

Among other concerns, it believes the FCC outcome fails to provide improvements for LPFM stations; that it undervalues multiple listener interference complaints from a single building; and that it requires that interference complaints contain data points that measure underlying interference using a calculation rubric that excludes any measure of interference. The coalition said the latter stipulation "is essentially a rule that negates itself."

That calculation, the undesired-to-desired (U/D) ratio for determining interference, was raised in a separate filing by technical consulting firm Skywaves Consulting LLC.

It said the imposition of standard U/D ratios using standard FCC contour methodology could usher in a series of "dire unintended consequences."

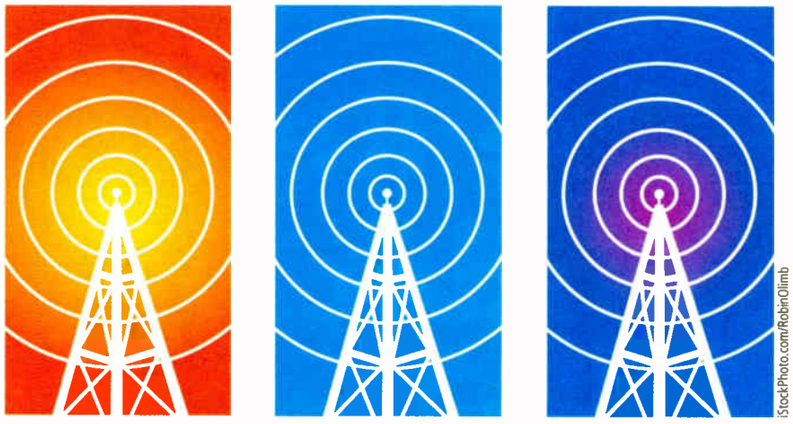
Skywaves said the use of a contour-based U/D study for each complaint is useful outside the protected contour but not within it. "The U/D ratio decreases within the protected contour as you approach the protected transmitter. Therefore, it appears that the new rule would eliminate from consideration all complaints of co-channel and first-adjacent channel translator interference within a protected station's protected contour," Skywaves wrote.

> **[I]t appears that the new rule** would eliminate from consideration all complaints of co-channel and first-adjacent channel translator interference within a protected station's protected contour.
>
> —Skywaves Consulting

"This is clearly not an intended result, and this portion of the rule should be reworded to make it clear that the U/D ratio criterion applies only outside the protected contour."

According to the counsel for the LPFM Coalition, the commission should issue a stay of the objectionable rulemaking aspects and rescind those provisions or issue a notice of further rulemaking to fix them.

Low-power station KGIG in Salida, Calif., agreed with the coalition's stance, saying that conclusions in the rulemaking conflict with precedent and fact and could contravene the Administrative Procedure Act.



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The LPFM Coalition's stance also drew support from REC Networks, a consultancy that expressed specific concern about the use of a -20 dBu U/D ratio for determining interference.

"This standard, coupled with the 45 dBu outer limit, would mean that a station could formulate an interference complaint in areas where the new FM translator only places a 26 dBu contour," REC Networks said. "This can open the door to more fraudulent and frivolous claims against very well distant translators."

"REHASHING"

The National Association of Broadcasters said the LPFM Coalition "simply rehashes previously rejected arguments" that the Local Community Radio Act of 2010 requires equivalent regulation for LPFMs and FM translators.

The association asked the FCC to reject the coalition's concerns about the rule requiring multiple listener complaints using separate receivers at separate locations (and thus that multiple complaints from one building are to be counted as a single complaint).

The NAB also said the coalition's argument fails to meet a necessary list of four standards for a stay; the coalition responded saying "NAB is wrong on the law" and that no mandatory stringent four-prong test applies.

The NAB did not address the U/D issue in its first filing. In a subsequent one, the NAB said that it agrees with Skywaves' assessment that the order's requirement of a contour-based U/D study for every interference complaint could unintentionally impede consideration of legitimate translator complaints.

A group of several big-name broadcasters, filing jointly, praised the commission's order as a balanced approach while expressing concern about the U/D threshold. They include Beasley Media Group, Cox Media Group, Entercom Communications, iHeart Communications, Neuhoff Corp. and Radio One Licenses. These groups have both primary FM stations and translators.

They said the order will undoubtedly bring more consistency, predictability and speed to the process of resolving translator interference situations. But they said there is a real, if rare, possibility that the U/D threshold for actionable complaints could impair legitimate interference complaints based on listeners within a desired station's protected contour.

The group recommended that the FCC consider exempting listening locations from the U/D showing if they are within the desired station's protected contour.

SPEAKERS

(continued from page 8)

programming are two of the top uses for smart speakers. As smart speaker ownership continues its growth, local radio will benefit greatly from this new opportunity to engage with our audience," said Zamir Ahmed, VP of media relations for NAB.

Other tech leaders say radio is making significant gains in stream counts and time spent listening by promoting specific skills to find local stations on smart speakers.

"We have seen data that show radio groups that promote their skills on air are measuring more than 50% of digital listening on smart speakers," said Pat Higbie, CEO and co-founder of app developer XAPPmedia.

The company works with NPR and Cumulus on delivering voice interactive campaigns for advertisers like Chex, Mattress FIRM, Case Knives, ADT, Walmart, Lagunitas, Target and others. XAPPmedia is pushing radio clients to maintain a high level of on-air promotion of skills.

"The potholes are there for stations that stop the on-air promotion of skills, because Alexa and Google Assistant are becoming more prevalent in the car, so radio owners must keep their stations top of mind in order to stave off competition in the car," Higbie said.

"In addition, having your radio station only accessible behind an aggregator skill reduces discovery and your ability to hone the listener experience."

Voice interactive advertising is changing radio monetization on smart speakers, Higbie said. Voice interactive ads include a call to action for listeners to connect with the advertiser via Alexa skills and Google Assistant actions, he said.

How to Get Rid of That Mouse in the House

Also, read about Tom Norman and the case of the hidden capacitor

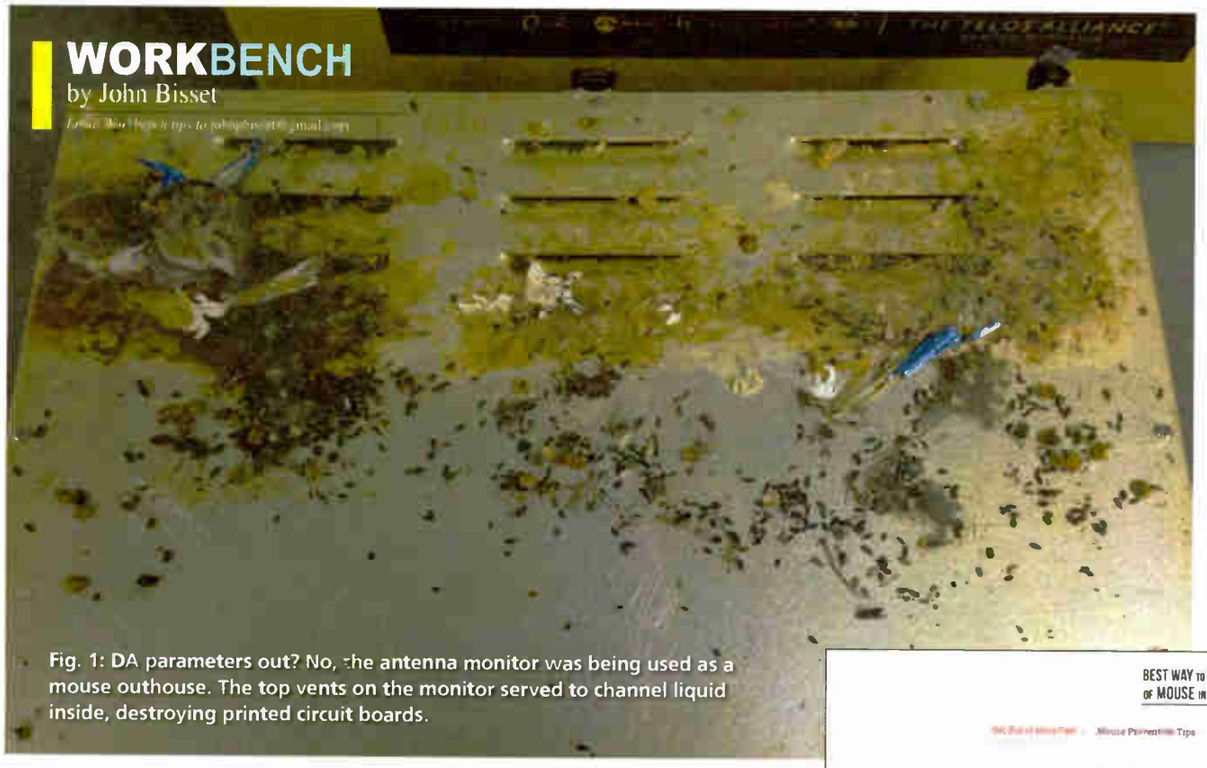

Fig. 1: DA parameters out? No, the antenna monitor was being used as a mouse outhouse. The top vents on the monitor served to channel liquid inside, destroying printed circuit boards.

"The early bird gets the worm, but the second mouse gets the cheese."

Component old age is not the only cause of equipment failures. Another, more disgusting, one is vermin infestation, which will become common again now that cooler weather is upon much of the nation.

If you haven't taken steps to place bait traps and moth balls around your remote transmitter site, now is the time.

Fig. 2: A useful resource can be found at *www.bestwaytogetridofmouseinhouse.com/mouse-infestation/#risks.*

All sorts of animals are attracted to the warmth of your transmitter building; and they will quickly set up home, sometimes in or on your equipment. See Fig. 1.

Stop the problem before it begins. Rodents like to travel along walls; place your glue or bait traps there to snag them before they get into your equipment racks.

Little black mouse droppings on the floor of the building or enclosure are a signal for action. If you find that your site has been infested, protect yourself while removing nest and droppings. Wear gloves, a gown and above all a mask to avoid breathing hazardous airborne pathogens.

John Wells has written a useful tutorial on illnesses spread by rodents and offers useful tips to ensure their removal. The URL is in the caption for Fig. 2. YouTube also has a number of videos; search "removing mouse infestation" for tips.

Broadcast engineer Tom Norman read with interest our discussion about Frank Hertel's experience with electrolytic capacitors in an FM exciter. It brought back memories that may be useful for other readers.

Tom remembered an instance in which a remote control system failed. His tests couldn't produce a reason, but its operation remained horribly intermittent. Tom decided to station himself at the transmitter site until he could figure out what was wrong.

He started with the usual, checking power supply voltages using a VOM. No issues. He checked the same power supply rails with the 'scope. Still nothing wrong.

At one point in the circuit, one of the power supply voltages was further regulated using a three-terminal regulator. Scoping the output of that regulator, he hit the regulator with freeze mist. The tiny amount of ripple disappeared.

(continued on page 14)

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WORKBENCH

(continued from page 12)

Tom is not sure what possessed him to check the input terminal of the regulator, but when he did he saw significant ripple. Why was there more ripple on the input of this chip than was present at the output of the regulated power supply feeding it? He froze the chip again and it calmed down.

Tom replaced the chip. No difference. That's when he considered what was attached to the input and output terminals of the chip. You guessed it: There was a small electrolytic on the input. Tom replaced it. The power supply calmed down, but he still had erratic behavior from the remote control unit.

Tom's next step was to freeze mist all the active components. He was about to freeze a 741 Op Amp but inadvertently touched it with the little straw from the nozzle of the can of mist. The remote control unit went from erratic to totally dead. He poked the Op Amp again, no difference. He froze it. Back to erratic operation. Tom replaced the Op Amp. Operation was still erratic. Checking the schematic, he noted power supply bypass electrolytic capacitors on the power supply pins. Tom replaced those capacitors. Still erratic.

Pulling out what little was left of hair, he removed the Op Amp and stuffed in a fresh one. Problem solved.

This all took place shortly after a huge electrical storm during which Tom had witnessed multiple direct strikes to the tower.

Although not certain, Tom sees two issues here. One is that lightning can affect components deep inside a circuit, where normally you'd expect them to be safe and sound. His guess is that the electrolytics, being old, failed due to the exacerbating influence of the lightning. Then, for reasons he cannot fathom, one or the other of the Op Amp's power supply bypass capacitors became inductive and caused oscillations whose peak voltages exceeded the limits of the 741 Op Amp, thus frying it. Although this is speculation, it reminds us that electrolytics should be replaced every seven years or so.

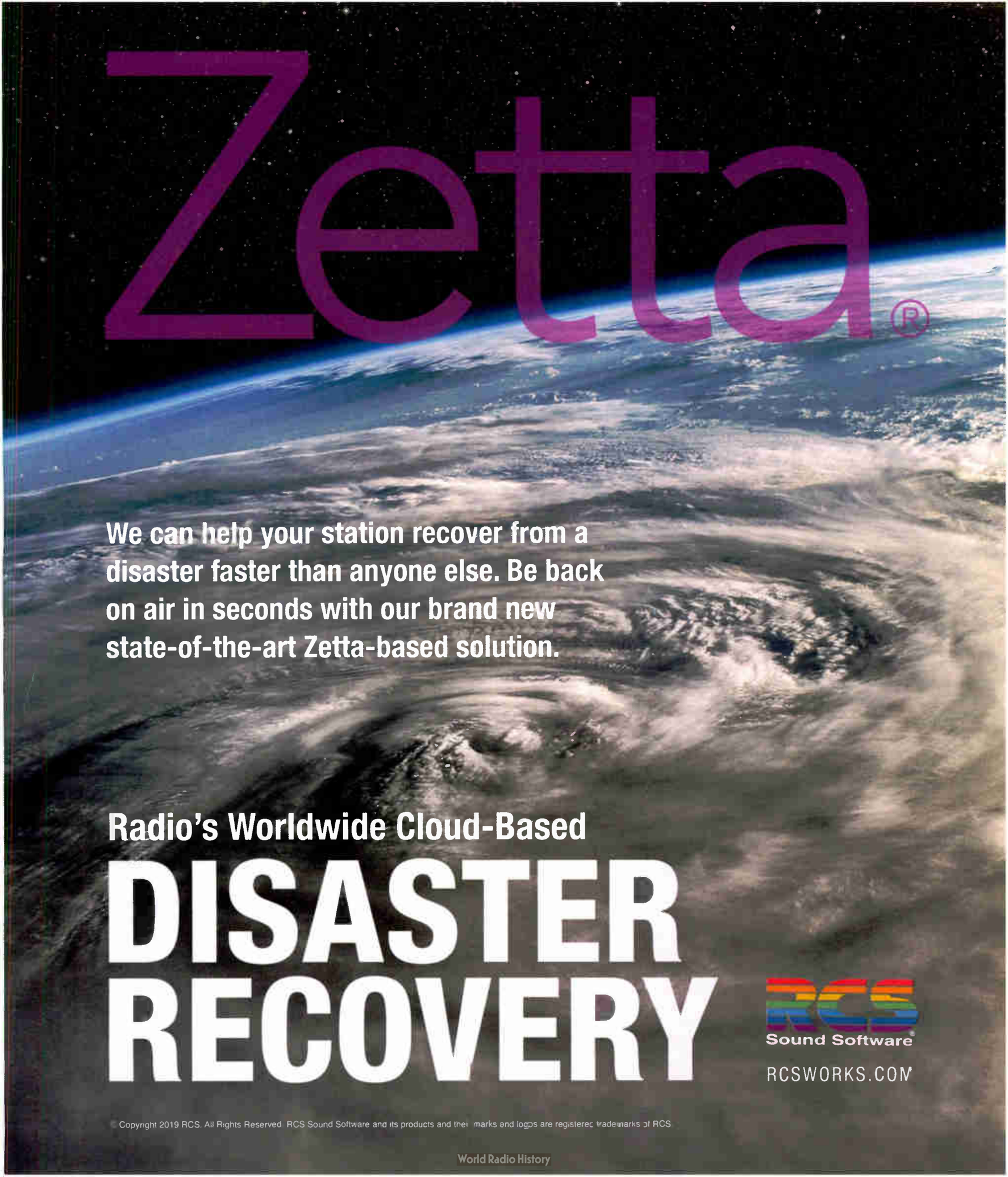
Tom also recalls that as a station engineer, when he found Mallory-brand electrolytic capacitors in a piece of equipment, he would shotgun all of them. He said he'd had so much difficulty with Mallory electrolytic capacitors that he specified that new equipment must not contain any electrolytic capacitors of that manufacture.

Why was there more ripple on the input of this chip than was present at the output of the regulated power supply feeding it?

Tom writes that he still carries this prejudice, even while acknowledging that things may have changed since then. He doesn't do much bench work now, but from time to time he will design little circuits for use in his home environment, and when he orders capacitors, he selects another manufacturer — which is funny, because Tom has never had a Mallory Sonalert fail.

Contribute to Workbench. You'll help your fellow engineers and qualify for SBE recertification credit. Send Workbench tips and high-resolution photos to johnpbisset@gmail.com.

John Bisset has spent 50 years in the broadcasting industry and is still learning. He handles western U.S. radio sales for the Telos Alliance. He holds CPBE certification with the Society of Broadcast Engineers and is a past recipient of the SBE's Educator of the Year Award.



Remote Controls Have a History All Their Own

Transmitters and processors may get the attention, but remote controls have long played a key role

ROOTS OF RADIO

BY TOM VERNON

If you were to name a piece of broadcast equipment that is neglected, forgotten or taken for granted, the transmitter remote control would probably be high on the list. Nevertheless, remote controls have their own history, technological breakthroughs, pioneers and industry leaders.

From the earliest days of broadcasting, many stations had a remote transmitter site, and FCC regulations of the day stipulated that an engineer with a First Class license be on duty at the transmitter during hours of operation. Their duties were to keep the transmitter log, taking required meter readings every 30 minutes, as well as maintaining the transmitter parameters within FCC regulations. That meant keeping power output within in a plus 5 and minus 10% window, carrier frequency +/- 20 cycles, and modulation between 85 and 100%. These are things we take for granted today, but they required continuous scrutiny in the early days of broadcasting.

Those early transmitters were prone to frequent breakdowns. Electronic components of the day were not that reliable, particularly when high voltage and RF were involved. An engineer had to be on site to make timely repairs.

With advances in technology, transmitters became more reliable. The FCC regulations remained in place, however, and the transmitter engineer's unofficial duties often were extended to include bench repairs and maintenance of equipment, rewinding carts and dubbing agency spots.

FCC ACTION

Gradually, the driving forces for remote control of broadcast transmitters mounted, and change was in the air. But it didn't happen overnight.

Harold Hallikainen, engineer for manufacturer QSC LLC, said the FCC's rollout of remote control authorization spread slowly across the broadcast spectrum.

"In 1950, the FCC proposed authorizing remote control of Class D NCE FM stations, which had a power output of 10 watts or less. The foundations of subsequent rules can be seen in this first proposal," he said. "Control circuit faults could not activate the transmitter, and any faults causing loss of on/off control would shut down the transmitter. No telemetry was specified. Since all comments were in favor, the rules were adopted.

"In 1952, the FCC discussed the possibility of remote control of non-directional AM stations and FM stations, both at or below 10 kW," he continued. "The complicating factor of emergency frequency changes to comply with Conelrad requirements was also debated."

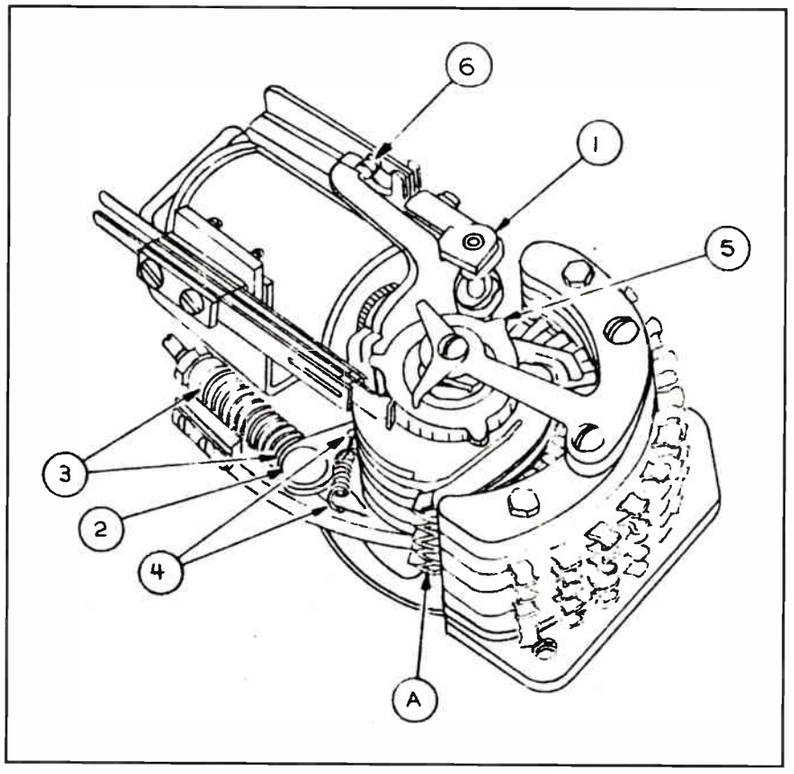
In 1953, this authorization was granted. "Following a prolonged comment period, the commission authorized remote control of high-power and directional radio station in 1957. Television had to wait even longer. UHF stations were authorized in 1963, VHF in 1971."

Radio broadcasting has long borrowed hardware and technology from the phone company. When engineers began to envision how a transmitter remote control would work, stepping relays were the logical choice. As the foundation of the rotary-dial telephone system, a stepping relay was basically a pulse-driven, multiple pole 1 x 10 switching matrix.

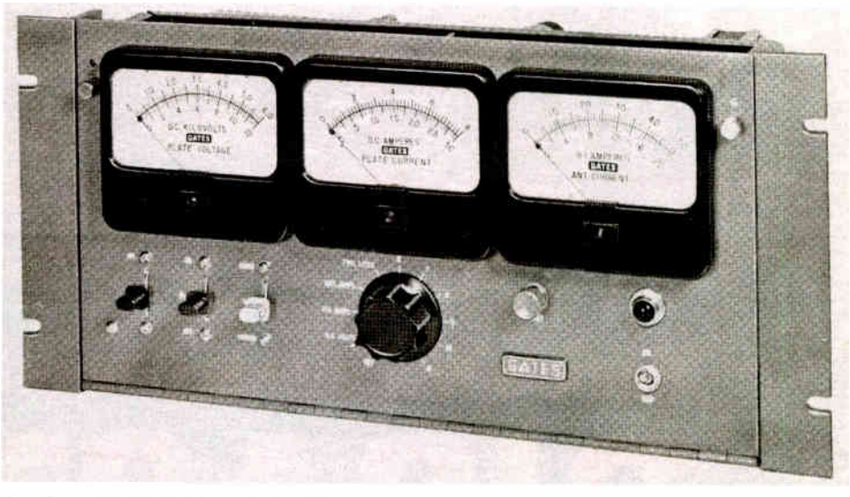
As manufacturers designed the first remote controls in the mid-1950s, basic elements began to emerge: a studio and transmitter unit, each with a four-pole stepping relay. One pole was for metering +, one for metering –, a third for raise functions and the fourth for lower functions.

Connection between the studio and transmitter units was by two phone lines, each with DC continuity. One was for metering, the other control. Both wires in the control pair worked against ground in a "simplex" arrangement, providing two independent control circuits. A DC voltage generated at the studio usually held in a relay at the transmitter side that controlled plate on/off, fulfilling the FCC requirement for fail safe.

All these systems had calibration pots on the transmitter side for each channel. When the engineer made the FCC-required weekly calibration of the remote control, he would call the studio and the operator would give the local meter readings. The engineer would adjust the calibration pots so the remote meters agreed with the transmitter readings. There was also a single calibration control on the remote unit, which was used to compensate for changes in loop resistance of the phone line, which varied as a function of temperature and humidity.



The Moseley PBR-30 manual included this image detailing the lubrication points of stepping relays. Blended oil, watch oil and graphite oil were used at different points.



The Gates RDC-10AC is typical of first-generation remote controls, with 10 metering/control channels accessed by stepping relays in the studio and transmitter units. Two phone lines with DC continuity were required for control and metering.

AUDIO TONES

One of the pioneers in remote control systems was the Rust Industrial Co. Inc. of Manchester, N.H. Founded in 1954 by W.F. Rust Jr., it also introduced a strip chart recorder for transmitter logging in 1958 and its advanced AUTO-

(continued on page 18)

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Lots of talking to do? 8x Mic/Line card with Phantom power does the trick.

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Got DANTE®? No problem. Power Core equipped with a DANTE expansion card gives you access to a whole world of pro-audio devices. Two mirrored ports with onboard SRC provide 64 channels of I/O.

If four front-panel MADI ports aren't enough, you can add more. Dual-port MADI expansion cards give you two SFP ports with 64 channels each.

Power Core is already the highest-capacity AoIP node + console engine in the world. 8 rear-channel expansion slots make it capable of even more.

Dual-redundant power, of course. Our hardened internal auto-switching power supply is backed up with an inlet for external power too.

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R/C

(continued from page 16)

LOG product line in 1964. The company moved to Cambridge, Mass., and later Everett, Mass.; it appears to have gone out of business in 1974.

Gates also got in the game early with its popular RDC-10AC, as well as the long-forgotten RCM-20, which worked with audio tones rather than DC voltages, an innovative approach in 1955.

A 10-channel remote control was adequate to control two transmitters, but when large directional arrays were involved, or later, television transmitters, something more robust was called for. Gates introduced the RDC-200, which added three more stepping relays to provide 39 channels, and used a rotary telephone dial to access them. Other manufacturers developed similar offerings.

With some refinements to the metering and control circuits, this stepping relay infrastructure would be integral to most remote control systems for the next 20 years. These relays were not without their issues, however. The combination of rapidly turning the selector switch and a high-capacity phone line could cause the studio and transmitter steppers to get out of sync, resulting in erroneous readings. Stepping relays also required regular maintenance for reliable operation. That included lubricating wiper contacts and moving parts.

Courtesy Harold Hallikainen

Introduced in 1975, the Moseley TRC-15 used digital techniques to eliminate stepping relays.

Moseley Associates was one of the first companies to embrace digital techniques in the design of remote controls. Its PBR-15 and -30, introduced in 1970, eliminated the stepping relay from the studio end. In place of the traditional 10-position rotary switch for channel selection was a ganged 16-position (on the PRB-15) push button switch. Binary numbers were generated by the push button assembly. They were then encoded to the stepper drive generator.

Control functions were handled by a 920 Hz audio signal that was briefly interrupted to send pulses to the stepping relay at the transmitter. Different tones were added to the 920 Hz for raise and lower. Metering signals were generated by applying the sample signal to a voltage controlled oscillator.

The successor to Moseley's PBR-15 was the TRC-15, introduced in 1975. The PBR and TRC looked identical, but the TRC performed all control functions using frequency-shift keying technology. It also eliminated the troublesome stepping relay from the transmitter end. A control demodulator with SN74154 decoders and 7404 hex inverters connected to an individual relay for each of the 15 channels.

NEW OPTIONS

These Moseleys and other audio-based control systems had the advantage of needing only one phone line, resulting in an immediate reduction in operating costs. But there were far more important benefits to these new systems.

Once audible or subaudible tones were used for control and metering, several options became available for interconnecting the studio and transmitter units. In addition to traditional phone lines, there was the possibility of audible control over internal 110 kHz subcarrier generator and demodulator. Usually these signals rode from the studio to transmitter piggyback on the STL link. Subaudible metering returns in the 20–30 Hz range could be accomplished on FM stations via an SCA channel, which could also be used for background music or other programming. For AM operations, the subaudible metering signal was returned on the AM carrier. Modulation of the subaudible tones was set to around 5%.

Gradually, Moseley gave remote control circuitry a complete makeover, using TTL logic circuits, voltage controlled oscillators and other digital techniques. The one remaining weak link was the analog panel meter. Offset and gain drift were constant. Checking the zero set and CAL adjustments before taking a set of readings was mandatory. The analog meter precluded using the Moseley for any of the automated control and metering systems that were beginning to emerge. Also, the numerous scales on the meter could be confusing to non-technical operators.

In 1977, the Moseley TRC-15 and PBR-30 remote controls finally got digital panel meters. But they didn't come from Moseley, rather from a small start-up company just down the road from the remote control manufacturer.

Harold Hallikainen's company, Hallikainen & Friends, developed the TEL 171 to meet this need. The genesis of the TEL 171 was really an FCC inspection at a station where Hallikainen was chief engineer.

"The inspector dropped our Bauer 707 from 1 kW to 250 W, and asked the operator for the readings," he said. "The operator read the wrong scale and gave the 1 kW readings, since everything doubled going from 250 W to 1 kW. This incident, the difficulty of calibration and misplaced decimal points were the things that inspired me to design the TEL 171."

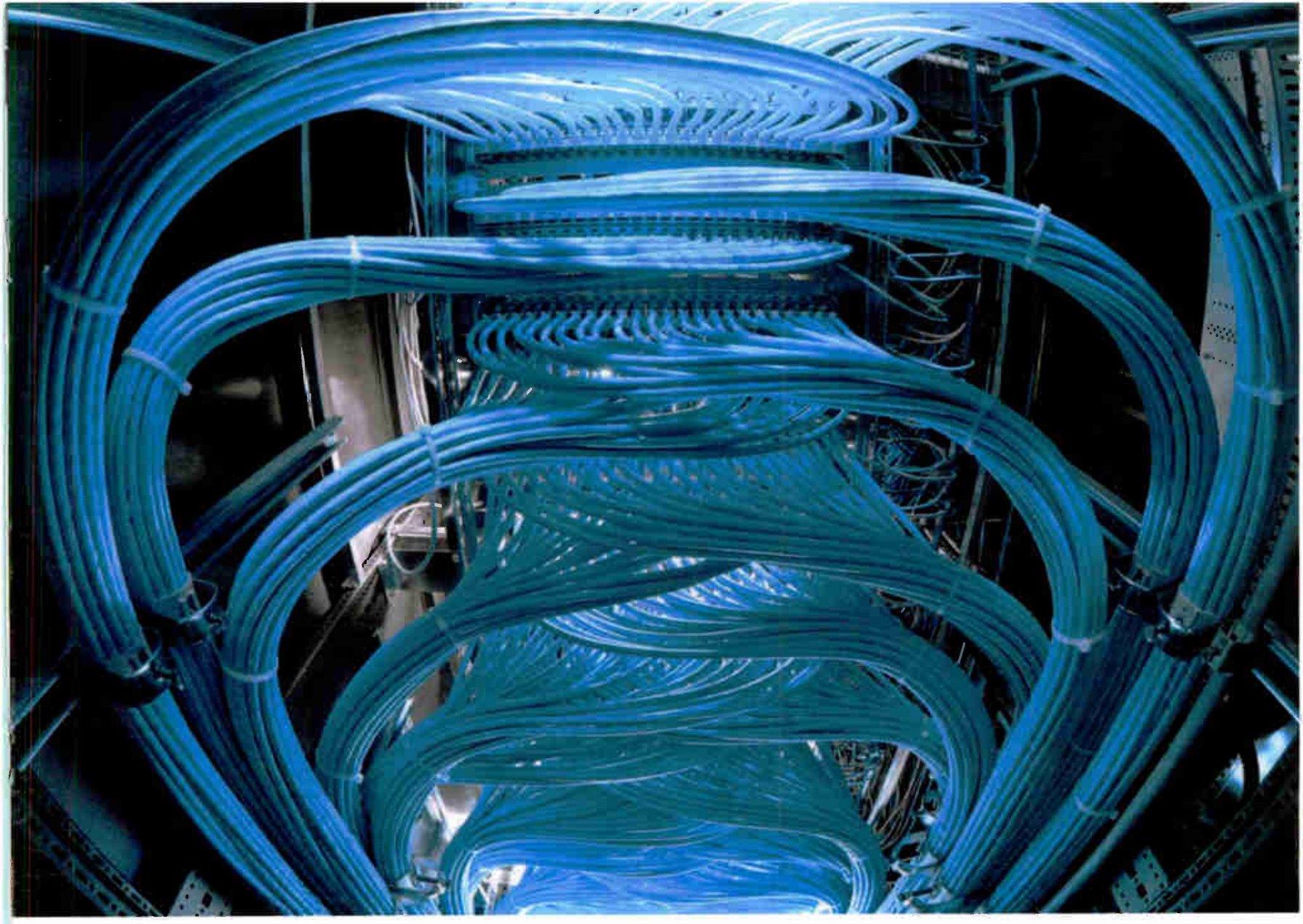
He adds, "It originally did not have a display at the transmitter site. KCBS said they'd buy one if we could make that happen. There was not enough power available to run an LED display off of the floating power supply. Around that time, the DF 411 chip was introduced. That made it easy to drive an LCD, so that was used for the transmitter display." Hallikainen doesn't recall exact numbers but estimates that a few thousand TEL 171s were sold.

The TEL 171 could be more than a digital display option. A DB-25 connector located below the display made available binary-coded channel select lines, raise-lower functions and the multiplexed BCD reading. Bill Bordeaux of Interstellar Engineering designed the ITO-177 (Intelligent Transmitter Operator). It plugged into a Commodore 64, and made the TRC-15A/TEL-171 controllable via BASIC programming.

SMOOTH UX

Other manufacturers were bringing digital to their remote controls, and had a different approach than Moseley.

(continued on page 20)



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MusicMaster
SCHEDULING

R/C

(continued from page 18)

TFT introduced the model 7601 in 1982. It used FSK modems on each end. The Harris 9100 fully embraced the then-new FCC ATS rules enabling unattended operations. The emphasis was shifted from remote control of transmitters to facilities control. The logging software included trend analysis, enabling users to locate problems areas and anticipate failures.

Throughout the 1970s, Moseley had been the innovator in remote control technology and had the high end of the remote market to itself. When Gentner came on the scene, it changed the game with its VRC-1000.

Utilizing the DTMF tones from a phone, along with speech synthesis, Gentner eliminated the studio side of the remote control. All that was needed was to dial the site, enter the password and follow the menu options. It also meant the transmitter could be controlled from anywhere. The issue of how to accomplish the fail safe was resolved with a silence sensor. The concept of telephone access was developed by John Leonard of Moseley, who later sold the design to Gentner.

Microprocessors arrived in the early 1970s, powering the first generation of personal computers. Soon, they were being embedded in various electronic devices.

In 1980, Moseley introduced the MRC-1, the first microprocessor-based remote control, using an 8-bit Motorola 6802. It comprised one control terminal and up to nine remote terminals. Each remote site had 32 channels available. Alarm parameters could be created for each channel, and an automatic logging option enabled regular printout of transmitter logs. A CRT option duplicated all the functions of the MRC-1 control panel, and could simultaneously display data from all 32 channels at one site.

The coming of the internet was another game-changer for remote control technology. But as Peter Burk, president of Burk Technologies recalls, the roll-out was rather protracted.

"In the early days of the internet, it could be difficult to get a connection to a remote transmitter site. Two solutions emerged, an Intraplex connection, or alternatives such as cellular modems, licensed and unlicensed wireless and satellite."

Burk's first internet-based remote control was the ARC-16, which was able to control multiple transmitter sites. Even more impressively at the time, the system enabled site-to-site control.

The Burk Technology ARC Plus Touch is an IP-based remote control that uses a combination of distributed I/O connections and an integrated SNMP manager. Up to 256 channels of metering, status and control are possible.

Courtesy Harold Hallikainen

Hallikainen & Friends' TEL 171 gave the Moseley TRC-15 remote controls a digital panel meter and enabled remote control of a transmitter via the DB-25 connector.

As with much of broadcast technology, the cutting edge for remote controls largely has shifted away from circuit cards in rack-mounted boxes to software running on PCs. Burk's Auto Pilot enables multi-site, PC-based facilities management for Burk remote controls. The interface is customizable, and reports can be tailored. They can be printed automatically or emailed as a PDF to station personnel. AutoPilot includes network management functionality, bridging the gap between broadcast and IT by including SNMP and ping with traditional I/O.

The remote control segment has always been specialized. Ask an equipment dealer today and they'll tell you about options from companies like Burk, Davicom, WorldCast Systems, Broadcast Tools, Broadcast Devices, Sine Systems and CircuitWerkes.

So what's in the future for broadcast remote controls? Right now, the greatest force driving innovation seems to be artificial intelligence, although Peter Burk prefers the term machine learning.

"Our goal is to look at the wealth of data that is now available at a transmitter site and deliver predictive analytics. For example, assume your transmission line has developed a small leak, but the nitrogen tanks are keeping up with it. If you check the pressure, it will be OK. If the sensors are tracking the flow, however, they will see an increase. In this case, we would want the software to give you an alert to check the system before the nitrogen runs out and you have an emergency."

Another trend is to understand that the remote control is now a part of the Internet of Things; equipment users and designers plan accordingly.

"One of the challenges is that IoT generates an enormous amount of information, and we need to find a better way to reduce this data down to actionable information," he said.

Burk adds that human access to the IoT raises some interesting challenges. "Alexa and other smart speaker technologies bring with them the promise of the voice-activated Internet, as well as the challenge of building seamless interfaces. At the same time, accessing IoT via the screen of mobile devices is exploding, and the need for a smooth UX or user experience is paramount."

Tom Vernon is a longtime contributor to Radio World. Comment on this or any story. Email radioworld@futurenet.com *with "Letter to the Editor" in the subject field.*

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The Internet's Impact on International Radio

Many broadcasters saved money by moving from high-power shortwave transmissions to the web. But at what cost?

RADIONET

BY JAMES CARELESS

OTTAWA — During the height of the Cold War (1947–1991), the shortwave radio bands were alive with international state-run broadcasters, transmitting their respective views in multiple languages to listeners around the globe.

The western bloc's advocates were led by the BBC World Service and included Voice of America, Radio Liberty/Radio Free Europe, Radio Canada International and a host of influential European broadcasters. The eastern bloc's de facto team captain was the USSR's Radio Moscow (with its unique hollow, echoing sound), supplemented by broadcasters in Soviet satellite countries (like East Germany's Radio Berlin International) and allies like Fidel Castro's Radio Havana Cuba.

Then 1991 arrived, and the Cold War apparently ended with the fall of the Soviet Union and the destruction of the Berlin Wall.

In the seeming peace that followed, many governments no longer saw the sense in spending millions on multi-megawatt transmitters and vast antenna farms to keep broadcasting their messages globally. The leader among them, the BBC World Service (BBCWS), trumpeted the web and webcasting as modern, cost-effective alternatives to expensive shortwave broadcasting (along with satellite radio and leasing local FM airtime in the countries they used to broadcast to). This is why the BBCWS ceased shortwave transmissions to North America and Australia in 2001 and Europe in 2008, while retaining SW broadcasts in less-developed parts of the globe.

"It is my understanding that it was the BBC that started to spread the notion that shortwave was dying or already dead," said Bob Zanotti, co-host of Swiss Radio International's popular "Listener Mailbag" show "The Two Bobs" from 1970 to 1994. He now runs the English-language Swiss information webcaster *www.switzerlandinsound.com*.

"Swiss Radio International accepted this uncritically and was the first to announce the complete closure of its shortwave operations. Later, others like Radio Netherlands, Radio Sweden, Deutsche Welle and Austrian Radio followed suit." So did Radio Canada International, Radio Australia, Radio Budapest, Radio Portugal, Radio Finland, Radio Denmark and even Radio Moscow. Renamed Voice of Russia in 1993 (and Radio Sputnik in 2014), this Eastern European powerhouse left the shortwave bands for good on April 1, 2014.

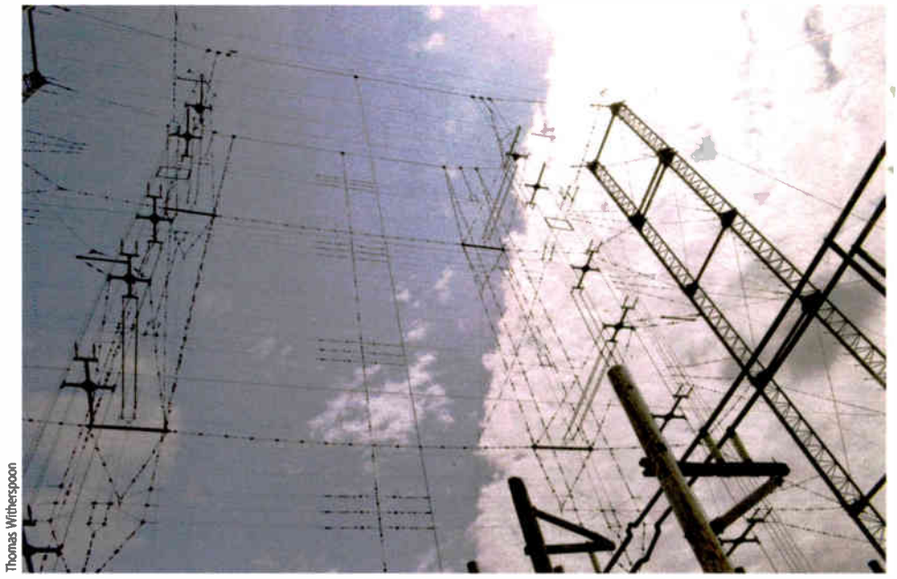
Now it is 2019, and another Cold War has resumed with the West on one side and Russia, China, Iran and North Korea on the other. But this time, many of the powerful international voices that brought Western news and views to nondemocratic countries are now only found on the web — where adversarial governments can easily block them.

"In my opinion, the abandonment of shortwave for international broadcasting was a mistake," said Zanotti. "It was based on what many believed to be the end of the Cold War. However, events since then have proved that to have been a false (and even foolish) notion.

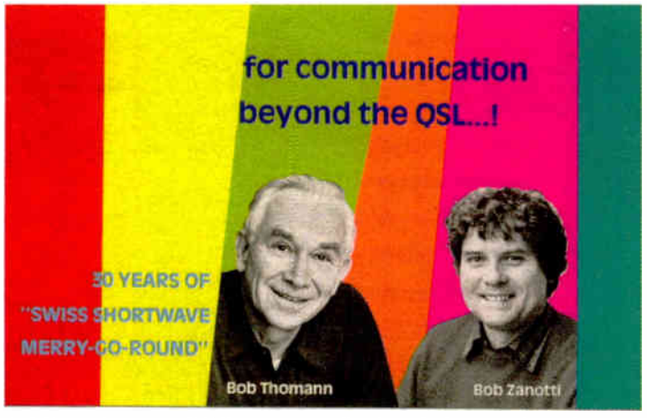
"Today, there is very little uncensored information available

Postal Service of USSR

Radio Moscow 50th anniversary commemorative stamp.


Thomas Witherspoon

Some of the antenna arrays at the Edward R. Murrow Transmitting Station near Greenville, North Carolina.



A QSL card sent to SW listeners confirming their reception of "The Two Bobs" on Swiss Radio International.


Verne Equinox/Wiki Commons

Radio Canada International's Sackville, New Brunswick, transmission facility is now demolished.

on shortwave. Classic information and entertainment are also practically nonexistent," he added. "The clever Chinese strategy seems to have been to wait for all the major western shortwave players to leave the scene, and then move in to fill the vacuum, making China Radio International virtually the only shortwave show in town."

THE SEDUCTION OF THE WEB

The official reason the BBC World Service moved away from shortwave (although not entirely) was because the web was where most 21st century listeners were going.

"Digital technology has undoubtedly come of age. Now the hype over the internet revolution is behind us, the real benefits to businesses and to broadcasters are shining through," declared then-BBC World Service Director Mark Byford when he delivered the 2001 Cornwall Lecture.

"For the World Service, it means that people who could never receive our radio transmissions in the 42 languages can now listen to live output, or catch that program they particularly want to hear, at a time when it suits them, anywhere in the world.

"For media users, the internet unlocks a whole new world of information tailored to you as an individual," Byford continued. "You can listen to a program when you want. You can have your say to a global audience."

The BBC World Service's web-first focus was subsequently adopted by many state-run broadcasters, who also cut back on their shortwave broadcasts (or left the band entirely) in favor of the web.

There was logic to this argument: "Large government broadcasters have always tried to reach the 'influencers' in a country, those who might eventually help guide a country's policy and international relationships," said Thomas Witherspoon, editor of the shortwave listener website www SWLingPost.com. "And the great majority of these influencers, according to audience research, have moved to social media and the internet as a source of information."

The unofficial reason for so many governments leaving shortwave was to save money. "Shortwave broadcasting is expensive when compared with streaming or 'broadcasting' online," Witherspoon said. "The power requirements of shortwave transmitters pumping out 50, 250 or 500 kW is substantial, and the infrastructure — the large antennas, feedlines, transmitters, power supplies — all require regular maintenance from expert technicians."

Money was a major factor in the death of Radio Netherlands (in Dutch: Radio Nederland Wereldomroep), which was succeeded in other media (including the web) by RNW Media. But it wasn't the only factor; populism also played a part.

"In 2012, public international radio in The Netherlands had to stop broadcasting," said Jennifer Bushee, RNW Media's communication and stakeholder manager. "The Dutch government had decided to cut the subsidy to Radio Nederland Wereldomroep by 70%. The broadcaster was no longer seen as relevant, and there was a real effort to reduce subsidies from conservative or even more right-wing politicians … So we were cut off and had to go off the air."

ASSESSING THE IMPACT

It is true that the web has changed the very nature of international communications. In the past, only the most powerful broadcasters could address the world, simply because it took massively expensive transmission farms to send the signals out. Today, anyone can do it from the convenience of their laptop computer and their local ISP.

This said, moving away from shortwave has plunged many once-distinct international broadcasters into obscurity — and in some cases, into extinction — precisely because they are competing directly with the millions of streaming services the internet has to offer. (This extra choice has certainly cut into the audience for shortwave radio, as has the growing variety of multiple media sources in countries around the world. This said, shortwave audiences were and are not measured by any ratings services, so evidence as to their decline is mainly anecdotal.)

"What really disappoints me are the international broadcasters who have stopped shortwave in favor of internet, usually because it's much less expen-

(continued on page 24)

SHORTWAVE

(continued from page 23)

sive to operate, but ostensibly because the internet is 'new technology,'" said Jeff White, general manager of the commercial United States-based shortwave broadcaster WRMI Radio Miami International. "Then they end up some months later shutting down their internet broadcasts and websites also, leaving the world with no means of hearing official broadcasts from these countries. This is particularly the case in Europe."

THE SHELL OF A TITAN

In its Cold War heyday, Radio Canada International was one of the world's most listened-to international shortwave broadcasters. Popular programs like "The SWL Digest" made RCI announcer/producer Ian McFarland into a bona fide shortwave star. (Even today, airchecks of the SWL Digest are being shared online.) They were broadcast from RCI's Atlantic Ocean transmission farm in Sackville, New Brunswick.

Sackville's North American/European reach was so good that many international broadcasters rented it as a relay site. (Historical note: According to RCI's website, the first Montreal home of the then-named Canadian Broadcasting Corp.'s International Service was "a former brothel and garment factory.")

Founded in 1942 during World War II, RCI prospered until the 1991 thaw in the Cold War. Then the cuts made by successive cash-hungry governments began: First the number of broadcast languages were cut back, followed by the replacement of RCI-produced content with domestic programs made by the Canadian Broadcasting Corp.

Eventually some RCI-produced content returned, but the cuts continued: By 2012, an 80% cut in federal funding forced RCI to abandon SW and satellite radio broadcasting entirely and retreat to *www.rcinet.ca*. The famed Sackville transmission farm was torn down two years later.

"In the wake of the 80% budget cuts, RCI is down to 23 staff members, editor-in chief included, and is now part of Radio-Canada's News department," said Soleïman Mellali, RCI's web editor-in-chief. (Radio-Canada is the country's French-language public broadcaster.) "Content is produced on weekdays to cover all seven days."

It took an extensive amount of staff training to get RCI's web content to its current level, said Mellali. "The team had a solid radio background but felt uneasy about RCI's transition to web-only, which has left them a bit off kilter."

The effort has paid off. According to Mellali, RCI's number of monthly visitors has tripled since its web was made more user-friendly. "Social media participation has (also) increased," he said. "On Facebook, for instance, we've shot up from 1,200 fans to over 18 000."

Jeff White

General Manager Jeff White in the control room of WRMI Radio Miami International.

Nevertheless, RCI's transformation into a web-only service has substantially narrowed its scope, said McFarland, and the service's ability to reach listeners worldwide.

"When RCI deserted the shortwave bands in favor of the web, the service's philosophy also changed," McFarland said. "It went from appealing to basically anyone who was interested in Canada, in what was happening here and our relationship with the rest of the world, in favor of broadcasting to people who might be interested in immigrating to Canada.

"Meanwhile, the computer was now the only way to hear broadcasts from Canada: Listeners in African, Asian and European countries who tuned to Canada on cheap shortwave receivers were no longer a segment of the worldwide listening audience that RCI was interested in reaching," he added. "This change in target audiences was a great slap in the face for RCI's long time and very loyal listeners around the world who held Canada in very high esteem for many decades of successful broadcasting on shortwave."

Other international broadcasters who have abandoned shortwave for the web have likely experienced this loss. The reason: Access to "high-speed internet is not a universal thing," said Colin Newell, a shortwave enthusiast since 1972 and operator of the shortwave listener site *www.DXer.ca*. "It is surely widespread and available in the oddest of places, but it is not universal or universally reliable."

Colin Newell

SW writer Colin Newell flanked by Canadian Mounties.

VULNERABILITY TO CENSORSHIP

When it comes to the fallout from international broadcasting moving to the web, there is one fact that everyone agrees on: the internet's vulnerability to censorship by hostile powers.

Back when international programming was delivered via multiple high-powered shortwave transmitters using many locations and shortwave frequencies, "jamming of broadcasts was an expensive and often ineffective method of blocking 'the message,'" said Newell. Today, "jamming is as simple as a few clicks of a mouse on a national internet service. Full-scale censorship is a significantly easier technological exercise."

The bottom line: Today's international broadcasters are nowhere near as capable as their Cold War predecessors were in getting messages through to the "other side" — and those who rely solely on the web can't guarantee content delivery at all.

This is a textbook case of irony. By eschewing shortwave for the web, many international broadcasters have lessened their ability to serve their target audiences at all times and in some cases, eliminated this capability entirely.

Take RCI: During the Cold War, its shortwave signals managed to reach listeners in the Soviet bloc. But today? Should he ever want to, Vladimir Putin could cut RCI off from Russian audiences in seconds.

It is possible that RCI could return to shortwave broadcasting. But this would require building a new transmission farm.

The demolished Sackville site isn't available. Several New Brunswick Mi'kmaq indigenous communities purchased its cleared 90-hectares in 2017 to add to the Fort Folly First Nation reserve. But even if it were, the Canadian government seems unlikely to spend the money required to build a replacement shortwave facility. This is likely true in other countries that have demolished their shortwave transmission sites as well.

The inescapable conclusion: Moving to the web has fundamentally compromised international broadcasting's ability to do its job, compared to what it could do back in shortwave's glory days. And unless something happens to motivate governments to reinvest in expensive shortwave broadcasting, this will remain the case.

James Careless reports on the industry for Radio World from Ottawa, Ontario.

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Radio Show Features "Tech Tuesday"

Broadcast executives also to explore implications of federal deregulation

BY PAUL McLANE

A day devoted to technology-oriented sessions is a new feature of the Radio Show coming up in Dallas. That's one of the efforts by the National Association of Broadcasters and Radio Advertising Bureau to freshen and reimagine their annual event.

Show planners announced during the spring NAB Show that the fall show would get a new look and a more casual feel. The conference also puts a more visible emphasis on voice, podcasting, streaming and other technologies in the modern consumer audio ecosystem. Organizers are aiming for "a convergence of all who thrive in the audio and media space."

Among highlights, veteran broadcaster Mary Quass will be honored. And the broadcast financial community will discuss implications for radio of the current deregulatory environment in Washington.

Courtesy David Layer/NAB

Exhibits will be open Wednesday and Thursday of show week.

IF YOU GO

Where: Hilton Anatole, Dallas

When: Sept. 24–26

How: radioshowweb.com

How Much: $499 pre-show rate for NAB/RAB members, up to $949 for non-members onsite. See site for packages for groups, students, young professionals, spouses.

TECH TUESDAY

Tech Tuesday is free for NAB and RAB members; others pay $199 pre-show, slightly more on site. The day's content is aimed at engineers, technology professionals and managers involved in radio station operations.

Topics promised include audio-over-IP, RF transmission, visual radio, streaming audio, remote backhaul, audio production and processing, data acquisition and protection, and hybrid radio applications. Tech Tuesday registration includes access to show exhibits, which are open the ensuing two days; there were about 70 registered exhibitors as of late August.

Here are highlights of Tech Tuesday:

Opening and Keynote: 10 a.m. — NAB Radio Engineering Achievement Award recipient Gary Cavell will speak about the importance of technology and of continuing education for engineers. He'll be introduced by NAB EVP/CTO Sam Matheny.

Vender Breakouts: 10:35 a.m. — Attendees can hear from RCS President/CEO Phillippe Generali about the company's Zetta Cloud Disaster Recovery offering, which the firm calls a "cutting edge safety net" for radio operations; and from Comrex veteran Chris Crump about ensuring reliable transmission of IP audio using the internet.

AM Radio's All-Digital Future?: 11:20 a.m. — Radio World readers know about the tests and early deployment of digital-only signals on the U.S. AM band. This session brings together several experts including NAB VP of Advanced Engineering David Layer; Hubbard Broadcasting Senior Broadcast Engineer Dave Kolesar, who switched off the analog on WFED(AM) in Frederick, Md.; and Xperi Senior Manager of Broadcast Engineering Russ Mundschenk, recipient of the most recent Radio World Excellence in Engineering Award.

Lunch: 12 noon

Vendor Breakouts: 1:30 to 4:10 p.m. — There are several sets of concurrent presentations during the afternoon hours. They include Dielectric Senior RF Engineer Derek Small exploring the "black magic of filter tuning"; Nautel Sales Manager (Central) Jeff Welton discussing ways to optimize an installation with HD Radio; a presentation by ENCO Systems; GatesAir Product Line Manager Kevin Haider providing a "walkthrough" to understand the differences between Generations 3 and 4 of HD Radio technology; and Telos Alliance Senior Solutions Consultant Kirk Harnack highlighting the latest implementations of IP technology for networked audio and control.

Networking Break: 3 p.m.

"What's Next in Radio Tech?": 4:15 p.m. — A panel of industry veterans share insights into where our industry is going. Moderated by Radio World Editor in Chief Paul McLane, the group includes iHeartMedia Strategic Partnerships Group President Michele Laven; New York Public Radio CTO Steve Shultis; RadioDNS Project Director Nick Piggott; Xperi SVP of Radio Joe D'Angelo; and Goldman Engineering Management President Bert Goldman.

Closing Remarks, 5 p.m. — Wrapup by NAB VP of Technology Education and Outreach Skip Pizzi.

Reception, 5 to 6 p.m. — Hosted by NAB's Sam Matheny and Skip Pizzi.

MORE SHOW HIGHLIGHTS

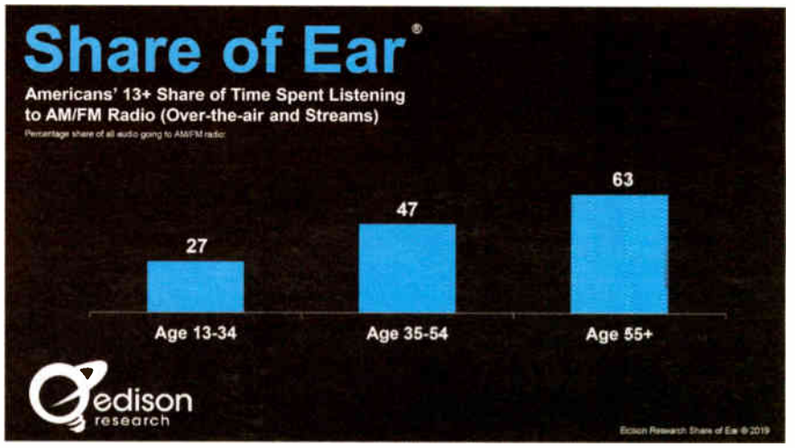
Here's a sampler of other notable events.

Pillsbury holds its annual Broadcast Finance event on Tuesday. The theme: *"Radio Unleashed: Preparing for a New Regulatory World."* Firm partner Scott Flick moderates a discussion of the opportunities for broadcasters presented by deregulation, like the elimination of the main studio requirement and the FCC's potential relaxation of local ownership rules.

Flick was quoted by organizers saying, "That the FCC is recognizing radio's challenges where listeners' audio alternatives — and the competition for ears and advertisers — have grown exponentially may be as big a game-changer as the new competition itself."

The panel includes Bill Hendrich, EVP of radio for Cox Media Group; Garret Komjathy, SVP of media and commu-

(continued on page 28)



Edison Research has been doing interviews with younger consumers to learn their attitudes toward radio and audio, with an eye toward improving time spent listening for those demos.

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RADIO SHOW

(continued from page 26)

nications for U.S. Bank; Beth Neuhoff, president/CEO of Neuhoff Communications; Susan Patrick, managing partner of Patrick Communications and co-owner of Legend Communications; and David Santrella, president of broadcast media for Salem Media Group. …

Plenty has been said and written about the explosive growth in podcasting; but how does podcasting really fit into the business goals of Radio Show attendees? A Wednesday session *"The Podcast Revolution"* will include Carter Brokaw, president of iHeartMedia's digital revenue strategy; Neal Carruth, NPR's general manager of podcasts; and Oren Rosenbaum, emerging platforms and podcasting agent at United Talent Agency. The moderator is Conal Byrne, president of the iHeartPodcast Network. …

NRG Media Chairman/CEO **Mary Quass** will receive the **National Radio Award** during the Wednesday luncheon *"2020 and Beyond: Insights from the Top."* Quass formed New Radio Group in 2001, later named NRG Media, which has 45 stations in the Midwest. Her career began in the late 1970s when she worked as an account exec. She purchased her first radio station in 1998, forming Quass Broadcasting Co., which became part of Capstar Broadcasting and, in turn, Clear Channel.

The luncheon program features a conversation with broadcast leaders Mary Berner of Cumulus Media, David Field of Entercom and Bob Pittman of iHeartMedia about strategies for a constantly shifting audio landscape.

Fred and Paul Jacobs will lead a Wednesday session, *"You're Not Just in the Radio Business Anymore,"* to learn from people who have made successful career transformations. Fred launched Jacobs Media in 1983 and is credited with creating the classic rock format. Paul is president of jacapps and VP/GM of Jacobs Media. …

Charlotte Jones Anderson knows something about building a brand as an executive with the Dallas Cowboys.

Charlotte Jones Anderson is executive vice president and chief brand officer of the **Dallas Cowboys**, and the Radio Show convention is happening in her backyard; she's a logical speaker to share strategies for "building a world-class brand around the customer experience." She speaks on Thursday. …

Author Gary Vaynerchuk, aka **Gary Vee**, will talk Thursday on the topic *"Attention Is the New Currency."* He is chairman of communication firm VaynerX and CEO/co-founder of VaynerMedia. …

Author Gary Vee says, "Attention is the new currency."

Thursday also brings a session led by **David Fisher** on the art of storytelling, for which the media industry has gained fresh appreciation in an era of podcasting, smartphones and smart speakers. Fisher, who began his career writing for Joan Rivers, is the author of more than 80 books and is an accomplished ghostwriter. The session is called *"Sound. Voice. Story. Success."* …

Also on Thursday, **Edison Research** will present research on driving audience engagement and leveraging audio trends. "The Secret to Longer TSL" will be led by Vice President Megan Lazovick and deal with attracting and retaining listeners and best practices to optimize advertising. "Lazovick will also provide exclusive analysis of audio listening trends and content preferences and offer insight on how radio can effectively compete with and embrace other platforms," organizers said.

They noted that while radio's reach remains strong across all ages, time spent listening to radio has fallen much faster among younger listeners than older ones, according to Edison. The company has done interviews with young listeners about their attitudes about commercials, audio platforms and radio programs. …

This year marks the 30th anniversary of the **Marconi Radio Awards**. Organizers invited several previous honorees back as emcees and presenters. **Delilah, Rickey Smiley** and **Tom and Kristi** of "The Bob and Tom Show" will do the honors.

EXHIBITOR LIST

Exhibits are open Wednesday Sept. 25, 10 a.m. to 6 p.m., and Thursday Sept. 26, 9 a.m. to 5 p.m. Listings are as of late August. Check onsite resources for complete list.

ABC Radio 211
Adder Technology 224
AnalyticOwl 231
Aptivada 210
Benztown/Vipology 133
Bob and Tom Radio Network 144
Bonneville Distribution 216
Broadcast Depot 232
Broadcast Software International 229
Broadcasters General Store 100
Burbio 220
Burli Software, Inc. 248
Calrec Audio Ltd. 234
Comrex 105
Cool Radio Streaming 146
Dielectric 101
DJB Software Inc dba DJBRadio 213
Elenos Group 112
ENCO Systems, Inc. 133
ERI-Electronics Research, Inc. 200
FirstCom Music 247
GatesAir 125
Jutel Oy 219
Libsyn 233
LocalIQ 153
Logitek Electronic Systems 225
Marketron 107
Matrix Solutions 246
Miller Kaplan 217
Moseley Associates, Inc. 135
MusicMaster 238
NAB Member Services 155
NAB Public Service 156
NABEF 157
Nautel 136
Podcast Studio 159
Powergold Music Scheduling 244
Premiere Networks 150
PromoSuite 206
Radio Advertising Bureau 154
RadioDNS 151
RadioMax 214
RCS 120
Registration 158
RF Specialties Group 227
Rohde & Schwarz 226
Second Street 145
Shively Labs 132
Sierra Automated Systems & Eng. Corp. 223
SoCast 235
SoundExchange 205
SoundID 201
Specialty Data Systems Inc. (SDS) 245
Streann Media 152
SuiteLife Systems/NFB Consulting 202
Sun & Fun Media 209
TalkRating 215
Tieline Technology 102
vCreative 141
Veritone, Inc. 243
WAVSTAR, LLC 228
Weather Metrics, Inc. 222
Wedel Software 230
Wheatstone Corp. 204
WideOrbit 127
Win-OMT Software 249
WorldCast Systems 203
Worldwide Communications Consultants, Inc. 218
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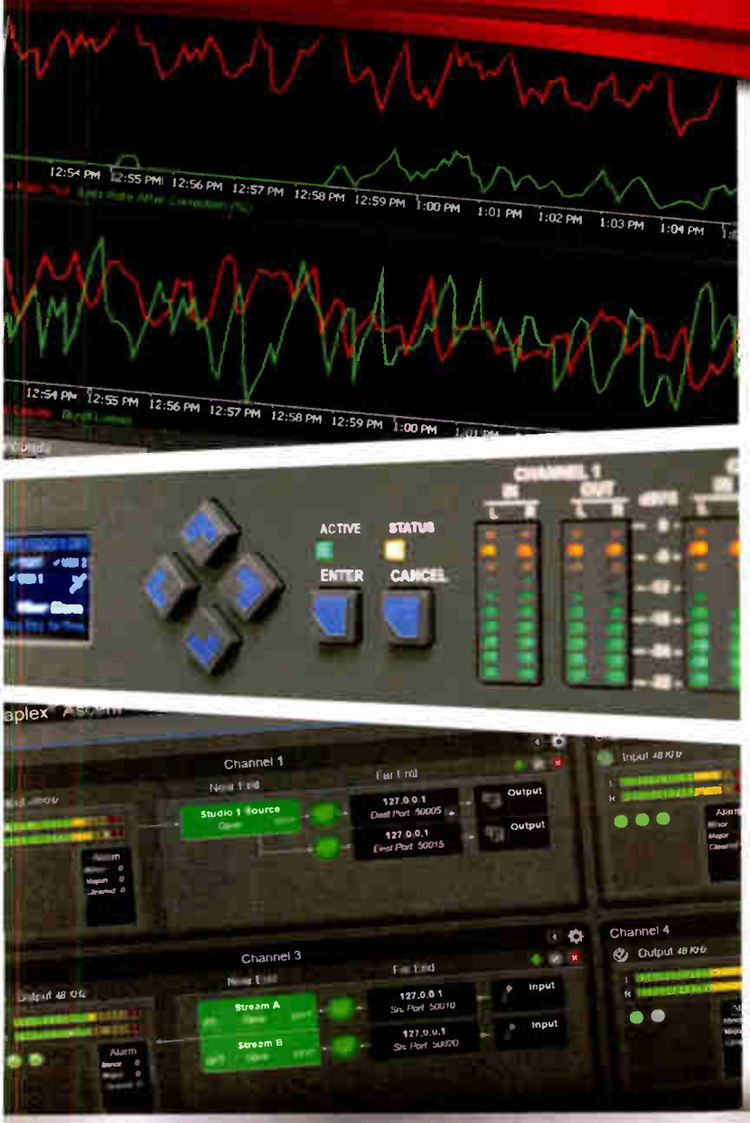

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PROMO POWER

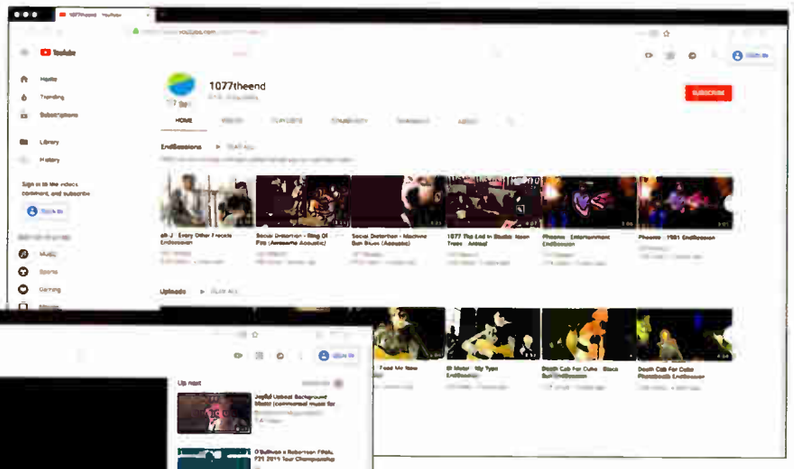
Mark Lapidus

I once created a custom coffee product for a radio station.

It's not as weird as it sounds. We wanted to promote an upcoming new morning show and one day while sipping my morning beverage, it occurred to me that a good cup of coffee delivers the attributes of a morning show. Both products wake people up, make them cheerful, have a distinct flavor, etc.

So I got our friendly neighborhood roaster to make me a good blend — which I then labeled with the name of our morning show — and sold our brand by the pound at his café. Next, through an advertising agency, I placed commercials on our direct competitor.

Then I called the press to let them know. That we were able to advertise on a direct competitor was big, somewhat scandalous news. Of course, now you can advertise every day on a direct competitor without the shenanigans, and you'll have a lot more impact than even one high-school type of stunt.



Want to increase ratings? Find your target audience on YouTube.

Want to go where few stations do, but where your listeners entertain themselves every day? Advertise on YouTube!

While Facebook, Instagram, Twitter, Snapchat and others get all the press, Google's YouTube has been taking over the planet. Oddly, some don't even think of YouTube as a social channel even though it has all the community elements that enable engagement. If that doesn't impress, perhaps this state-

ment from Google will: "In an average month, 18+ year olds in the United States spend more time watching YouTube than any television network. On mobile alone, more 18- to 49-year-olds watch YouTube during prime time in the United States, than they do the top 10 prime-time shows combined. Over the last two years, the number of small and medium-sized businesses advertising on YouTube has doubled."

Why, for the most part, is local radio missing in action? Too many station leaders/decision makers feel that outside advertising either isn't needed for a broadcast radio station, or that it's a luxury. It's a bit ironic and even hypocritical that folks who rely on advertising sales themselves are willing to say that it's not necessary. Now more than ever, radio needs reinforcement outside itself to show relevance.

Now more than ever, radio needs reinforcement outside itself to show relevance.

While it takes substantial investment for radio commercials to be meaningful on broadcast television or cable, radio stations of any size can afford some level of YouTube video campaigns. I say this because of the amazing targeting and capability to cap bids of advertising. Target by age/gender/Zip code/household income and many shared traits, or by preferences that match your format. Plus, you can pick a channel (music, news, etc).

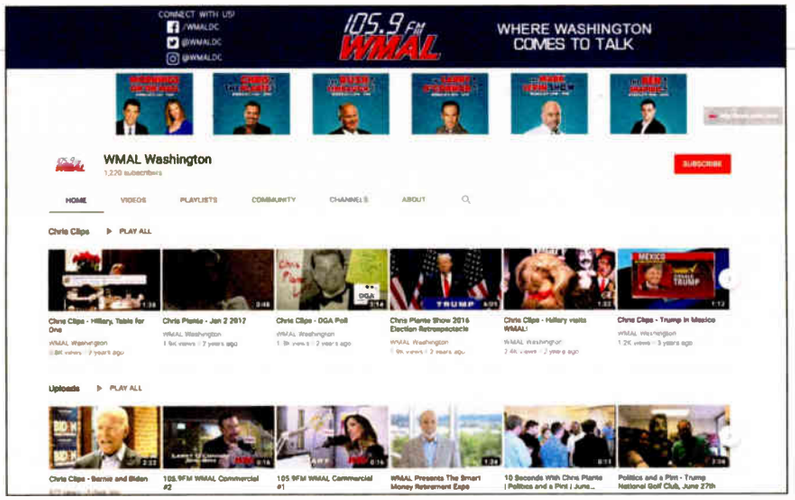
Cost per thousand depends on demand, so you'll want to start with a small test. Ads could be as low as $0.05 to $0.25 each — and if you use "TrueView," you pay only for ads watched. Ad formats include non-skippable, skippable in-stream ads, bumpers and many more. You can even sequence ads, meaning that each person sees a series of ads/promos you create in order.

(I am also a big believer in having a station channel on YouTube, and we'll cover that in an upcoming article.)

You'll be getting back a lot of key performance indicators (KPIs) on your campaign(s), so you'll also be learning about your audience behavior as you proceed.

Your listeners may lie to their parents, wife, husband or kids … but they are not going to lie to their search engine. If you choose to find your target audience on YouTube by using their search behavior, you'll be hitting a real sweet spot — and that is the absolute truth!

Mark Lapidus is a longtime contributor to Radio World. Email him with comments or your own promo successes at marklapidus1@gmail.com.



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Adventures in 1970s AM: The Big Kahuna

Do not try this at your station

FIRSTPERSON

BY KEN DEUTSCH

In 1959 Hawaii became our 50th state, making travel to that delightful island group easier and less expensive. During the next few years there was a bit of a nationwide Hawaiian craze, which included a brief interest in island music, or at least a mainland version of same. And then there was the Big Kahuna.

"Kahuna" in Hawaiian means "wise man," but somehow that got mangled in translation to the point where radio stations, beginning with KHJ(AM), Los Angeles, turned it into a goofy contest that soon spread across our nation with cheap knock-offs trickling down to markets like, say, Toledo, Ohio, home of WOHO(AM).

Even though I arrived at WOHO in 1972, there were still plenty of people on staff who remembered this promotion from 1966. Apparently the station sent a male employee out on the streets of Toledo dressed in a grass skirt, colorful Hawaiian shirt, sandals and (groan) a fake bone in his nose. From the pictures I saw, this costume made the guy look more like the Wild Man from Borneo that appeared at county fair sideshows rather than a native Hawaiian.

Usually the 7 p.m.–midnight jock had to "volunteer" to play the part because these appearances were made during the day. Our cheap general manager never offered additional compensation for being The Big Kahuna because it was an "honor," and because, he insisted, the "lucky" jock should do it in the spirit of cooperation and team spirit. Yeah, right.

WOHO announced on the air that "The Big Kahuna" was coming. Just those words with some Hawaiian steel guitar music in the background. That went on for weeks, and then the station sprang for some billboards to build anticipation.

The week before the promotion swung into high gear, the on-air announcements expanded to include the contest rules. If a listener saw The Big Kahuna anywhere in Toledo, he or she needed only approach this individual and ask, "Are you WO-HO's Big Kahuna?" And if the listener had approached the right person and not some other individual wearing a grass skirt, The Big Kahuna would bestow upon the listener a "valuable" prize such as a coupon for a free Arby's Roast Beef sandwich (worth up to $1.50 at the time), two tickets to a local movie theater or perhaps a coupon good for one free cupcake at a local bakery.

All the prizes were traded out, meaning the station paid nothing for them. It's hard to imagine getting excited about a prize worth less than $5, but these were the days before big lottery payouts and before inflation had decimated the buying power of a dollar bill.

Often The Big Kahuna would call the WOHO DJ live on the air from a two-way radio in the station vehicle, a 1965 blue Ford Thunderbird (also traded out) emblazoned with the station logo. The conversation on the air would sound like this:

DJ Buddy Carr: *Hello, Big Kahuna! Where are you calling from today?*

The Big Kahuna: *Hey, Buddy, I'm at the Westgate Shopping Center on Central Ave. right now, and there are some lovely young women here. You want to say "Hi," girls? (Sounds of teenage girls screaming in the background). You should see these chicks, Buddy. They're real cute! Yeah, we're giving away a boatload of prizes out here, so you should tell everyone to come out and join us for the fun. Remember, all you have to do is find me, which isn't hard because I'm the one in a Hawaiian shirt and sunglasses, and ask me if I'm WO-HO's Big Kahuna! If it's me, you get a prize!*

DJ Buddy Carr: *OK, B.K. We'll look forward to talking to you next hour. Aloha!*

If a listener approached the right person and not some other individual wearing a grass skirt, The Big Kahuna would bestow upon them a "valuable" prize such as a coupon for a free Arby's Roast Beef sandwich.

And so it went for a few weeks, or until the station ran out of free coupons. I'm told that an appearance by the Big Kahuna could garner a mention in the local newspaper, a feat that would be unheard of now.

Usually this promotion went well, but on at least one occasion it didn't. A WOHO DJ named Chuck Charming (not his real air name but close) was playing The Big Kahuna and decided to take the station cruiser over to a bar one night, while still wearing his native get-up. A policeman saw him in the dark parking lot and approached The Big Kahuna. Chuck was fairly inebriated at the time and was unable to explain his weird clothing or why he had an open bottle of alcohol in his car, not that there could really be a plausible explanation for such circumstances.

The Big Kahuna's next personal appearance was at the Toledo police station downtown where he was forced to call WOHO's general manager to come down and pick him up. I'm sure free Arby coupons were generously distributed to the local gendarmes that night.

Ken Deutsch is a writer who lives in sunny Sarasota, Fla., and has a book of these tales available, "Up and Down the Dial."

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Stitcher's Flexible New Facility in Manhattan

The podcast producer built studios for creating podcasts. Find out what's in them.

Studio C at Stitcher Studios

Photo by John Muggenborg

FACILITY PROFILE

BY STEVE HARVEY

Podcast network Stitcher recently moved into its new headquarters in Midtown Manhattan, building out a 2,000-square-foot production complex comprising three studios, two edit rooms and two isolation booths designed in concert with WSDG Walters-Storyk Design Group. The new facilities have been outfitted to accommodate Stitcher's typical workflow, which can often involve collaboration between talent, producers and engineers at the company's offices in Los Angeles and San Francisco.

Romina Larregina, partner, director of production at WSDG, reports that her biggest challenge was ensuring consistency between the new studio spaces. "One of the things that Stitcher looked for was identical sound in every room. That was challenging, to make sure that the reverb time was the same in all the studios, even though the shapes, sizes and volumes were different," she says.

The floating floor, room-within-a-room design provides critical isolation for speech recording, both from the potentially noisy neighborhood, where the company occupies an entire floor in a building overlooking Bryant Park, as well as between studios. To achieve consistent responses within each space, WSDG implemented custom low-frequency absorption, soffits, ceiling treatment and corner treatments to target specific frequencies, says Larregina. WSDG installed RPG's hybrid BAD diffusion/absorption panels at the listening position in each control room, she adds.

John DeLore, senior production manager

Photo by Jared O'Connell

According to John DeLore, senior production manager at Stitcher's New York office, the choices of audio technology at the new facility were a combination of recommendations from Larregina and the WSDG staff and from Stitcher's Los Angeles and New York teams. Key to the company's content creation workflow is a Dropbox scheme implemented by Dave Seidel, Stitcher lead systems engineer, he says.

Every studio is hooked up to an SNS (Studio Network Solutions) EVO shared storage server hosting Dropbox, DeLore explains. Those Dropbox folders are synchronized everywhere within Stitcher's network, enabling engineers, producers, hosts and other contributors to collaborate from multiple locations, handing off and updating audio files as work progresses.

(continued on page 36)

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STITCHER

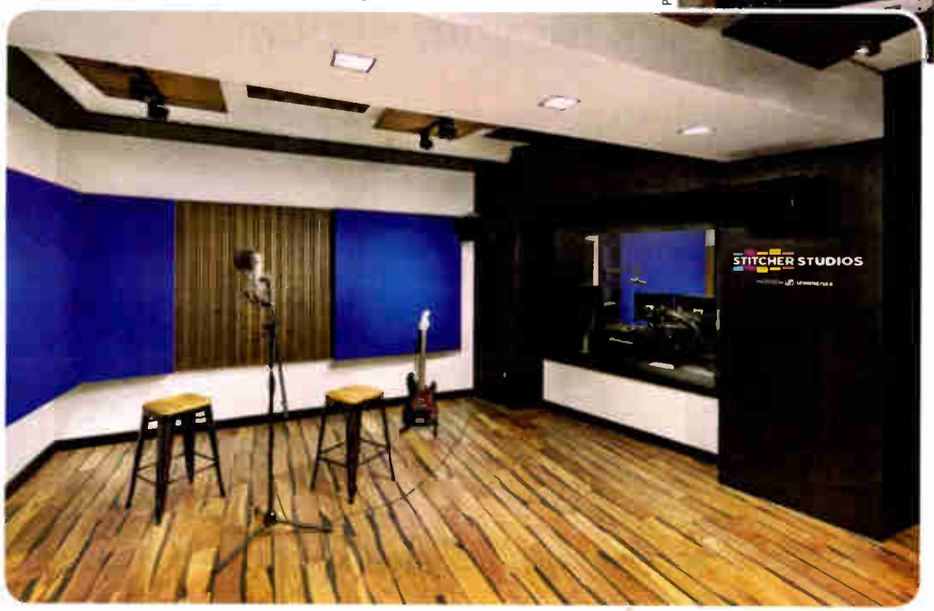
(continued from page 34)

While the Stitcher app is one of the preeminent podcast listening platforms — it has been described as the most popular alternative to the default Apple podcast app — Stitcher is also a content network with a large catalog of original programming. Much more than simply spoken word, Stitcher Premium shows such as "Wolverine: The Long Night," Marvel's first scripted podcast, and "Stranglers," a documentary series about the Boston Strangler that DeLore produced, feature layers of sound design and custom music, produced in-house.

"Our belief here is that the future of the medium will mirror TV and film," says DeLore. "As the marketplace becomes more and more crowded with content, attention to technical and artistic details will be a big part of creating content that stands apart from the rest."

Voice recording may take place in one room, editing in another and mixing in yet another, so certain pieces of gear are standardized at the new facility and between Stitcher locations. Each of the new control rooms features an Allen & Heath Qu-16 console, the desk of choice at the L.A. facility, DeLore reports. "It has a good reputation, good sound, it's solidly built and doesn't crash. We love that it's got the Qu-Drive function; we can hook up a drive and do a multitrack backup in parallel with Pro Tools," he says.

Photos by John Muggenborg



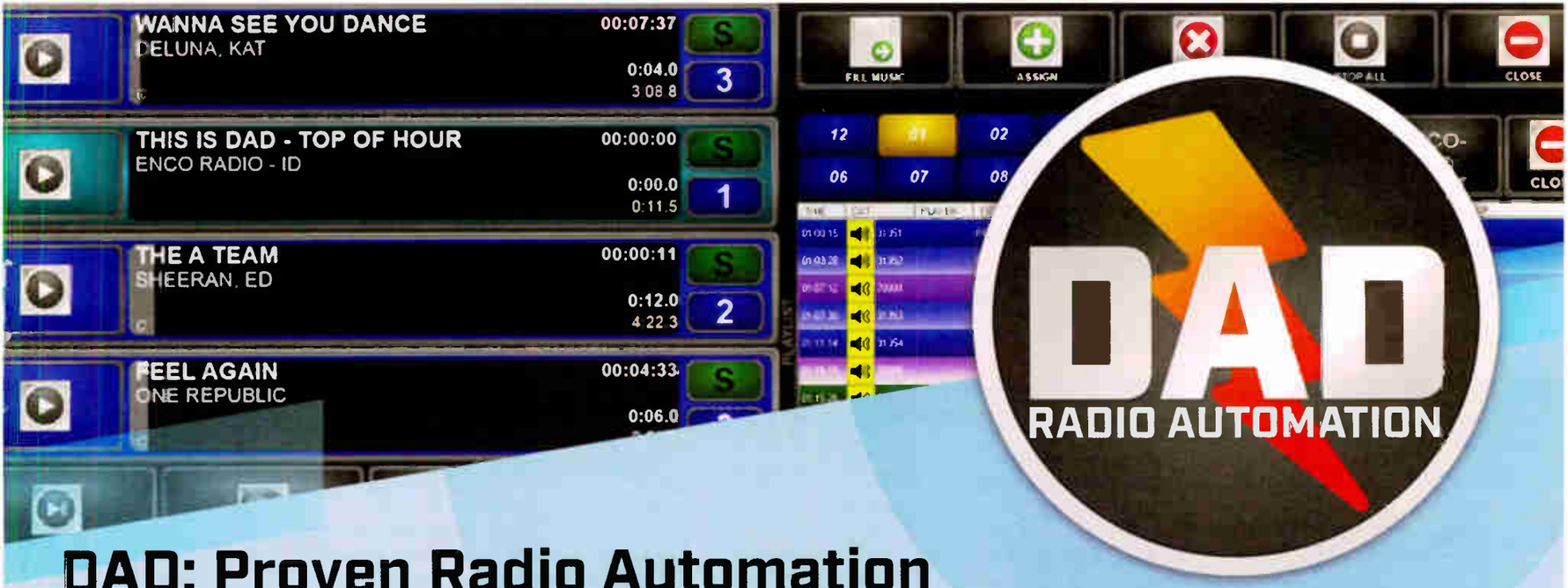
All the recording facilities in Stitcher's new headquarters, including Studio A's control room, seen here, were designed by Walters-Storyk Design Group.

Microphones throughout are Shure SM7B dynamics, paired with Cloud Cloudlifter CL-4 mic activators to enhance and boost the signal level going into Pro Tools, without noise or artifacts, says DeLore. "It's a flat mic, really clear, with no coloration. We have other mics in our closet in case somebody wants to come in and use a U 87 or an RE20."

Each of the three studio control rooms and the two edit bays also include a pair of arm-mounted SM7s, he says, for added flexibility. Mimicking the company's West Coast Earwolf studio setup, "The engineer can be on-mic from the control room" if desired, he says. "And if the interviewer wants to engineer, we have mics in the room."

Conversely, computer screens enable remote operation of Pro Tools from the recording spaces. "The Allen & Heath boards have Bluetooth remote capabilities from a tablet, so we've also experimented with that," says DeLore.

(continued on page 39)



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STITCHER

(continued from page 36)

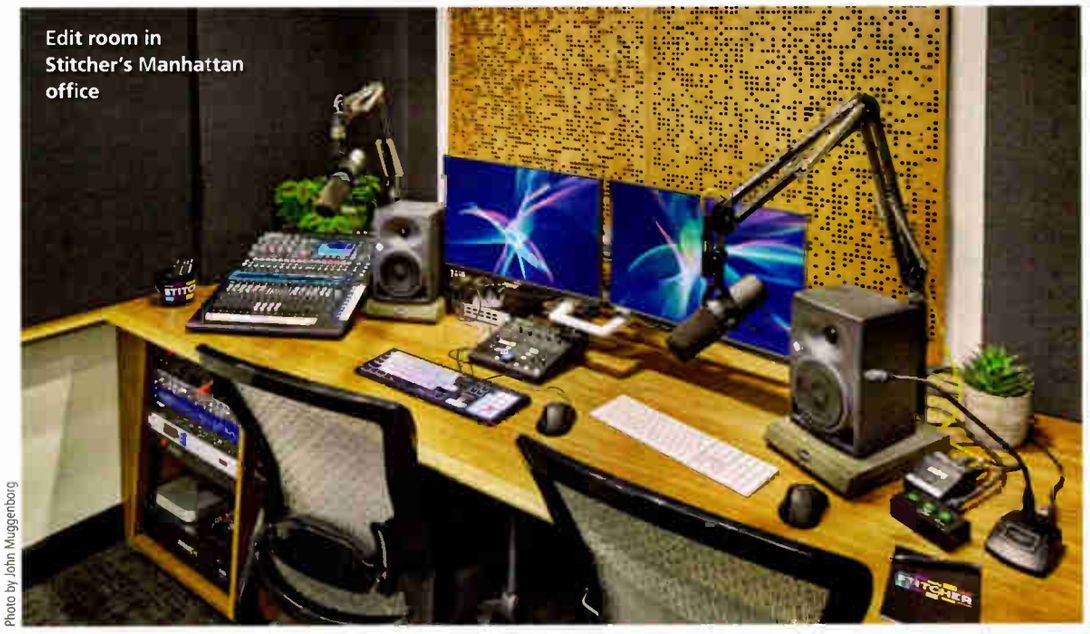
About 75% of sessions involve just a host and a guest, he says, in person or on the phone (the studios are equipped with Telos Hx series telephone hybrid units). For that reason, the control rooms offer two channels of AEA RPQ2 mic preamps. "It's giving us a little extra juice and a little extra color and warmth," he says.

Studio A, a larger space that incorporates an isolation booth and a sound lock, is multiuse. "It's designed for large ensemble recordings, for original podcast score recording and for doing a live music podcast, hopefully; nobody has cracked that code yet, but it's going to happen and I'm sure we'll be in that space."

Control room A houses an A&H Qu-32, for its extra inputs, and additional outboard, including a Grace Design m103 channel strip. "Whether you're recording a voice for a spoken word podcast or a musical lead vocalist, we wanted Studio A to have some boutique options in the mic pre department."

Additional processing for music production includes a Warm Audio Tone Beast, a Foote Control Systems P3S stereo compressor and a Lexicon MX400 reverb. "Lexicon is great and we're all familiar with it," says DeLore, whose background includes time working at Right Track Recording in Manhattan, as well as Gimlet Media and WNYC Radio. Since launching the facility, Stitcher has added a Boston upright piano, a drum kit and an Ampeg bass amp, he also reports.

Monitoring in the studios and edit rooms, on Larregina's recommendation, includes Neumann KH 120 two-way speakers, while the A Room additionally features a pair of three-way Neumann KH 310 monitors. "At the point of ingest, we're just listening to voice," says DeLore, "so we need to be able to hear everything at a good listening volume, and the Neumann is a clean speaker. The 310s are designed to provide a wider sweet spot, which is ideal for podcasts which can have production teams of four to five people who need to all sit in the studio and be able to hear the same mix." A PreSonus Monitor Station V2 manages source selection and speaker level control in every room.



Edit room in Stitcher's Manhattan office

Photo by John Muggenborg

The studios and control rooms feature Sennheiser headphones. "Sennheiser are the official headphones of Stitcher. As part of that partnership, we also stocked our mic closet with a nice selection of Sennheiser and Neumann microphones."

In addition to the studios and edit rooms are a pair of iso booths where producers can escape for a mix or playback session. Summing up the entire facility, DeLore notes, "Everything is set up with as much flexibility as we could build into it."

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KRK Rokit G4 Monitors Keep It Clean

New generation includes three two-way models and a 10-inch three-way

PRODUCT EVALUATION

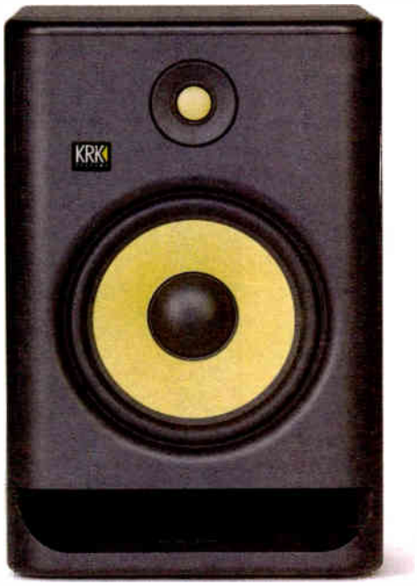
BY MIKE LEVINE

KRK's popular and affordable Rokit line of near-field studio monitors has now reached its fourth generation, replacing the G3 models and ushering in a significant redesign. The new lineup includes three two-way models, the Rokit 5 G4 (5-inch woofer), Rokit 7 G4 (7-inch woofer), Rokit 8 G4 (8-inch woofer), and the three-way Rokit 10-3 G4 (10-inch woofer). The 4-inch and 6-inch models in previous lineups have been dropped from the line, while the company has added the 7-inch version.

For this review, KRK sent me a pair of both the Rokit 8 G4 and Rokit 5 G4, so we'll focus on those.

The G4 models are physically similar to their G3 predecessors. The black composite cabinets are close in height, width and depth to the models they're replacing. The monitors themselves are lighter, however, thanks in part to redesigned Class D power amps that are smaller and lighter. The total weight of a Rokit 5 G4 monitor is about one pound less than the Rokit 5 G3. The Rokit 8 G4 is about four pounds less than the Rokit 8 G3.

Another significant difference is the composition of the woofers, which are



The Rokit 8 G4, like the other monitors in the series, has matching Kevlar woofers and tweeters.

now made of Kevlar instead of the glass Aramid composite of the G3 Series. The G4 tweeters are also Kevlar. According to KRK, the Kevlar not only reduces distortion but offers superior damping capabilities and is more resistant to resonances and ringing.

Like the G3, the G4 monitors are front-ported. However, KRK enlarged the ports and made them wider and taller. The company describes the new ports as being "scientifically tuned." I had to chuckle when I read that, because what else would you use besides science to tune a speaker port? All kidding aside, the point they're trying to make is that they used their expertise in speaker development to design the port and other physical characteristics of the monitors to work harmoniously and create the best-sounding result.

The G4 monitors feature isoacoustic pads on the bottom panel, just like on the G3 line. These are designed to help decouple the monitors by reducing the transfer of vibrations from the cabinet into your desk or monitor stands. Though not as thick as dedicated third-party monitor pads, they definitely help and are a nice extra.

DISPLAY OF PLENTY

Other than the larger ports and tweeters now in the familiar KRK yellow (the tweeters on the G3s were black), the G4 monitors don't look all that different from the front compared to their predecessors. On the back panel, however, you'll find some pretty significant differences.

For one thing, instead of separate 1/4-inch balanced and XLR inputs, you now get a combo input. What's more, KRK no longer includes the third input option from the G3s, an unbalanced RCA input. From my point of view, that's no great loss. If you want to connect the monitors to the line out of your stereo system, you can always get adapters.

More importantly, the EQ and volume knobs that were on the back of the G3s have been replaced with an LCD display and an encoder knob. The G4s are equipped with DSP Room Tuning EQ, which can be accessed with the encoder, with a visual assist from the

(continued on page 42)

PRODUCT CAPSULE

KRK SYSTEMS
Rokit 5 G4 and Rokit 8 G4

Thumbs Up
+ Accurate and consistent sound quality
+ Tight-sounding bass
+ Rokit 5 G4 offers good bass response for its size
+ DSP-based EQ offers plenty of room-tuning options
+ Encoder/LCD interface allows for precise L/R matching
+ Acoustic pads on bottom help with decoupling
+ Good value for the money

Thumbs Down
– Slightly higher prices compared to G3 monitors
– EQs offer preset values only

Prices: Rokit 5 G4 ($179 each); Rokit 8 G4 ($299 each)

Contact: KRK Systems/Gibson at 1-800-444-2766 or visit *www.krksys.com*

ROKITS

(continued from page 41)

display. You also get a range of setup features, which make the G4s more customizable than previous versions.

Pressing the encoder turns on the LCD, and shows a home screen, which features a volume control along a frequency graph that will show any EQ settings you've already made. Turning the encoder adjusts the volume, which is represented in the LCD by a slider and a numerical readout making it easy to set precisely (a much better solution than some monitors on the market, which sport analog volume knobs that aren't detented). Pressing the encoder lets you select the EQ or setup categories.

Because my studio acoustics tend to reduce bass, I ended up setting the EQ to the low shelf +2 dB boost at 60 Hz.

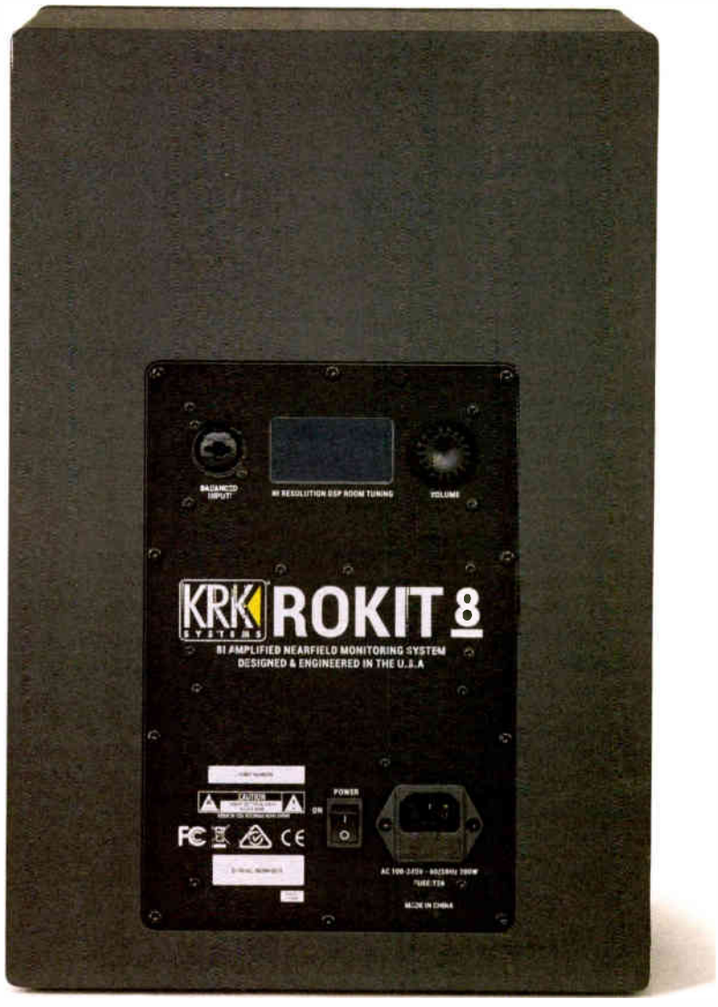
The EQ section offers five different filter types for customizing the frequency response to your room acoustics. You get four presets plus flat in both the low EQ and high EQ categories. This arrangement makes dialing in adjustments easy, but doesn't allow you to customize the boosts and cuts or the corner frequencies.

Low Shelf is designed for situations where you have a bass boost due to placing the monitors close to a wall or corner. Its presets include a –3 dB or –2 dB cut at 60 Hz. You also get a low-shelf option that boosts by +2 dB at 60 Hz.

Low Peak is a peak filter that cuts –2 dB at 200 Hz with a wide bandwidth. KRK refers to it as a "desk filter," because it's meant to reduce muddiness caused by reflections off of a console or table. There's also a setting that combines the Low Shelf and Low Peak filters in one.

For cutting or boosting highs, you get both shelving and peak EQs. These include High Shelf, which cuts by –2 dB at 10 kHz. Another combines a high-peak filter cutting –1 dB at 3.5 kHz and high-shelf filter cutting –1 dB at 10 kHz. On the boost side, you get a similar shelf/peak combination, which boosts +1 dB at those same frequencies, plus a high-shelf filter that boosts 2 dB at 10 kHz. The LCD shows a frequency graph for each setting, which gives you a visual representation of the effect of the selected filter.

The setup menu offers adjustment for backlight brightness and contrast for the LCD. You can also choose whether to light the logo on the front of the monitors, factory reset and settings, lock options and the standby function. With standby on, which is the default, the monitors will sleep when they've seen no signal for 30 minutes. They wake up automatically when a signal is detected, but it takes several seconds. (When I first encountered a wake-up situation with the monitors, I thought something was wrong with my system, because I hit play and no sound came out. Then it popped on, and I realized that the monitors had been in standby.)



The back of the G4 speakers have been redesigned and feature an encoder-and-LCD user interface for dialing in EQ and setup changes.

REALITY CHECK

I have been using the Rokit 8 G4 and Rokit 5 G4 monitors in my studio for the last couple of weeks. Because my studio acoustics tend to reduce bass, I ended up setting the EQ to the low shelf +2 dB boost at 60 Hz.

I started just by listening to a lot of different types of musical styles, switching back and forth between the 8-inch and 5-inch — everything from bass-heavy styles like hip-hop and EDM to midrange-heavy rock music to genres with wide frequencies and dynamic ranges such as jazz and orchestral music.

On the 8-inch monitors, the bass sounded full but not flabby. Mids were vibrant, and the highs were plenty bright. They were almost bright enough that I considered cutting them with the EQ, but I decided against that.

The 5-inch models impressed me right off the bat with their bass response. Although they obviously don't go as deep as the 8-inchers, the bass was present and didn't feel like it was dropping off the table when I switched to them from the Rokit 8 G4s. They are quite punchy-sounding, too. For example, kick drums cut through nicely. Overall, their frequency response was surprisingly full for 5-inch speakers.

KRK says that the matching Kevlar drivers provide a consistency in imaging, which I found to be the case. The speakers have a wide sweet spot.

The company also claims that new models create less ear fatigue. That's a harder one to judge, and I didn't come away with an opinion one way or the other about it.

I monitored with the 8-inch and 5-inch G4s exclusively on a couple of mixes I was working on. One was a rock song with guitars, bass, drums, keyboards and vocals, and the other a country-influenced instrumental track with pedal steel, banjo, acoustic guitar, electric guitar, bass and drums.

After I mixed the songs, I gave them the old "car test" and also listened on my living room speakers. I was pleased to discover that both mixes translated well.

MARKETPLACE

Opus Time: There's something comforting about seeing a new simple, little, shiny Barix box. The MA400 is described as an IP codec having the "flexibility and ease of SIP-based link establishment with the quality and efficiency of the Opus compression format ..."

Barix CEO Reto Brader explained, "Advanced broadcasters are moving away from static setups to SIP-based link establishment, particularly for remote contribution back to the studio such as from sporting events. That's where the MA400 SIP Opus Codec comes in, establishing the connection through dial-up and then encoding and decoding the audio signal."

Brader added, "... for SIP-based remote broadcast links the MA400 SIP Opus Codec is perfect."

The company says that the bidirectional MA400 is built on Barix's latest-generation, high-performance IPAM 400 audio module.

It features an analog, microphone-level input and line-level output. The new units share the familiar space-efficient form factor.

Info: www.barix.com

The balances remained accurate from one system to the next, and nothing jumped out as sounding out of whack. The KRKs were clearly performing as designed.

I was definitely impressed with the 5-inch and 8-inch Rokit G4 monitors and would have no problem using either in my studio on a regular basis. I like the sound of the new drivers and the redesigned power amps and cabinets. The LCD/encoder interface and the DSP-based EQ are easy to use and let you precisely match settings between the left and right speakers.

Although I didn't try out the 7-inch model, it features the same design, so I'm guessing that it will offer similar, accurate sound reproduction. I can't speak definitively to the Rokit 10-3 G4, because it's a three-way monitor and therefore a somewhat different animal. That said, based on the upgrades to the two-way models, I have a feeling it, too, will surpass its G3 predecessor in performance.

KRK has raised the prices a little on each model in the series, but the speakers are still quite reasonable and are one of the better monitor values on the market.

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About the EBU Media Technology Pyramid

This visual set of user requirements describes a comprehensive IP ecosystem of protocols

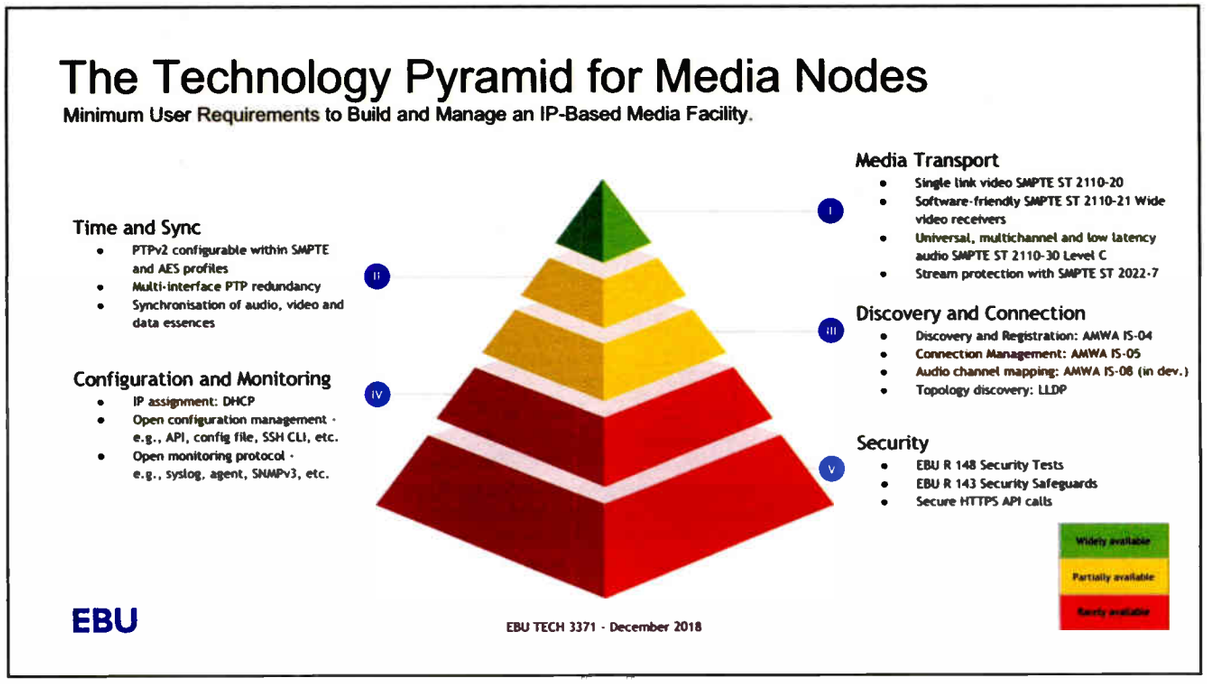
COMMENTARY

BY JOHN C. LEE

In Croatia in June, the World Broadcasting Unions' Technical Committee supported the completion of standards associated with the European Broadcasting Union's Technology Pyramid for Media Nodes.

"Broadcasters planning the move to new IP production facilities for television or radio should engage manufacturers with the Technology Pyramid for Media Nodes and ascertain their degree of compliance," said Michael McEwen, head of the WBU Secretariat. "Further, the missing standards need to be completed as soon as possible so that broadcasters can make the important migration to IP with the required assurance."

While the pyramid has clear relevance to the television industry, we share it because of the interest radio broadcasters have in the ongoing development of media IP. Radio World invited John C. Lee, P. Eng., chairman of the North American Broadcasters Association and World Broadcasting Union Technical Committees, to provide the background.



In order to achieve the speeds and bandwidths of next-generation television systems, broadcasters are migrating from HD-SDI to IP-based technologies. In December 2017, SMPTE published the ST-2110 set of standards addressing "Professional Media over Managed IP Networks" to support this migration. This set of standards addresses precision system timing (PTP), video essence, audio, ancillary data, etc., in an IP environment.

In December 2018, the European Broadcasting Union (EBU) published the "Technology Pyramid for Media Nodes" (EBU Tech 3371). This pyramid includes all the necessary elements to design, build and operate a fully operational, interoperable, fully plug-and-play SMPTE ST-2110-based, live IP production facility. The EBU Pyramid includes all the needed protocols for timing and synchronization, configuration and monitoring, discovery and connection, media transport and security. It can be viewed as a broadcaster's set of user requirements for a fully functional live IP production facility.

Along with SMPTE, other organizations have worked diligently to complete the various required protocols — namely the Advanced Media Workflow Association (AMWA) and the Joint Task Force on Networked Media (JT-NM). AMWA first produced Networked Media Open Specification (NMOS) IS-04 addressing "Discovery and Registration." IS-04 systems are intended to enable 'zero-configuration' deployments, reducing the necessity to spend time manually configuring equipment before connection to the network. AMWA's IS-05 addresses "Device Connection Management" which permits a control device to tell a receiver the stream it is supposed to take at any given time, a function analogous to routing.

JT-NM was tasked with addressing how all these standards and protocols (ST-2110, IS-04, IS-05, PTP, etc.) could fit together to build a complete live IP production system. TR-1001-1, entitled "System Environment and Device Behaviors for SMPTE ST-2100 Devices in Engineered Networks — Networks, Registration and Connection Management," is the JT-NM's first such technical recommendation and it aims to simplify the installation and configuration of SMPTE ST 2110-based facilities.

As more and more broadcasters begin to implement IP technologies in their production facilities, it is critically important that vendors address and implement all published standards and specifications in their shipped products. This will greatly alleviate the implementation challenges broadcasters will face. To this end, in April of this year, the EBU published R152 entitled "Strategy for the Adoption of an NMOS Open Discovery and Connection Protocol" to accelerate market adoption of these protocols.

In short, the EBU "Technology Pyramid for Media Nodes" describes a comprehensive IP ecosystem of protocols that empowers the design, implementation and operation of fully-IP production facilities.

The World Broadcasting Unions is the coordinating body for broadcasting unions that represent broadcaster networks across the globe. It was established in 1992. The North American Broadcasters Association acts as secretariat for the WBU. The unions that belong are the Asia-Pacific Broadcasting Union, the Arab States Broadcasting Union, the African Union of Broadcasting, the Caribbean Broadcasting Union, the European Broadcasting Union, the International Association of Broadcasting and the North American Broadcasters Association.

> **Broadcasters planning the move** to new IP production facilities for television or radio should engage manufacturers with the Technology Pyramid for Media Nodes and ascertain their degree of compliance.
>
> — Michael McEwen, WBU Secretariat

Write to RW
Email radioworld@futurenet.com with "Letter to the Editor" in the subject field. Please include issue date and story headline.

READER'S FORUM

NO ROOM LEFT ON FM

You published a long opinion piece by engineering consultant Charles Anderson titled "The FCC Failed on Translator Interference" (RW Sept. 1).

The title of the article is absolutely correct but not Anderson's message. Anderson goes into a bunch of gobbledygook about predicted contours and which predicted contour should count. The problem is that nobody listens to a radio station on the basis of its predicted contour, which in many parts of the nation can be wildly different from the station's actual coverage. This is particularly true in mountainous areas where nearby mountains can boost the average terrain.

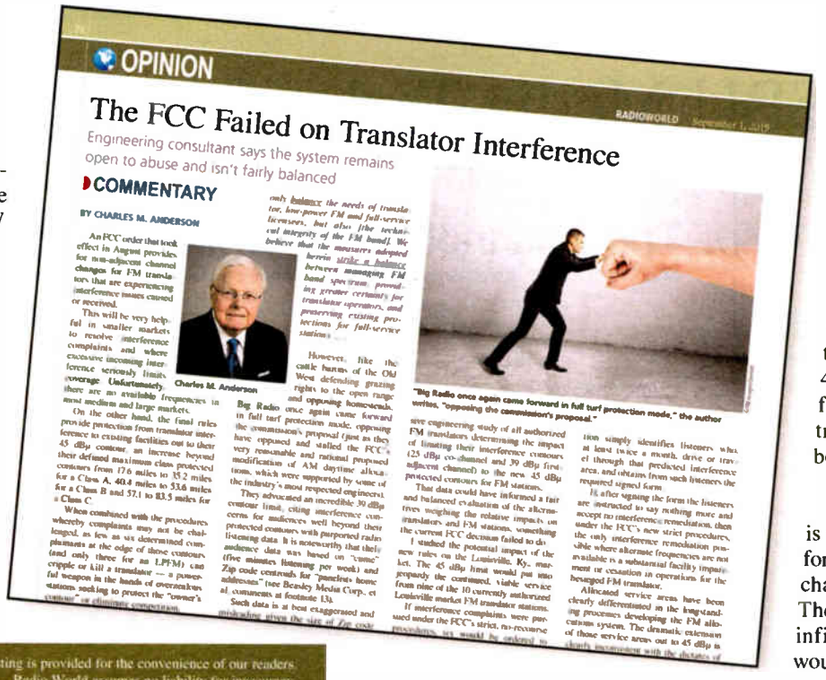
Let me give you an example: I live in Tucson and for many years I could drive around in my car and listen to KMLE, which is licensed to suburban Phoenix. KMLE is a professionally programmed country music station. One day without warning, a new station appeared on KMLE's frequency, a translator whose purpose appears to be to convert Mexicans from the Catholic faith to some Protestant denomination. I don't care if the Mexicans are Catholic or Buddhist. Perhaps the worst thing is that if you drive in the direction of Phoenix for about 40 miles you can't get a clear signal from either KMLE or the religious translator. You get a mixture of both fading in and out.

This benefits nobody.

The fact that no one can dispute is that the FM band has been around for about 75 years and not one new channel has been added in that time. The band obviously can't handle an infinite number of stations, and I would argue that saturation took place many years ago in most of the nation.

Another thing that evades me is how you can revitalize the AM band by moving the stations to FM. It's like trying to revitalize the horse by entitling every horse owner to a car. In this case the mentality is that there's a need for something so we'll do it, whether it is technically feasible or not. Cramming the already overcrowded FM band with translators does far more harm than good.

Paul S. Lotsof
Manager
KAVV(FM)
Benson, Ariz.


OPINION

The FCC Failed on Translator Interference

Engineering consultant says the system remains open to abuse and isn't fairly balanced

COMMENTARY

BY CHARLES M. ANDERSON

An FCC order that took effect in August provides for non-adjacent channel changes for FM translators that are experiencing interference issues caused or received.

This will be very helpful in smaller markets to resolve interference complaints and where excessive incoming interference seriously limits coverage. Unfortunately, there are no available frequencies in most medium and large markets.

On the other hand, the final rules provide protection from translator interference to existing facilities out to their 45 dBμ contour, an increase beyond their defined maximum class protected contours from 17.6 miles to 35.2 miles for a Class A, 40.4 miles to 53.6 miles for a Class B and 57.1 to 83.5 miles for a Class C.

When combined with the procedures whereby complaints may not be challenged, as few as six determined complainants at the edge of those contours (and only three for an LPFM) can cripple or kill a translator — a powerful weapon in the hands of overzealous stations seeking to protect the "owner's contour" or eliminate competition.

Charles M. Anderson

Big Radio once again came forward in full turf protection mode, opposing the commission's proposal [just as they have opposed and stalled the FCC's very reasonable and rational proposed modification of AM daytime allocations, which were supported by some of the industry's most respected engineers].

They advocated an incredible 30 dBμ contour limit, citing interference concerns for audiences well beyond their protected contours with purported radio audience data was based on "come" [five minutes listening per week] and Zip code centroids for "panelists home addresses" (see Beasley Media Corp., et al. comments at footnote 13).

Such data is at best exaggerated and misleading given the size of the code

"Big Radio once again came forward in full turf protection mode," the author writes, "opposing the commission's proposal."

AM DOESN'T HAVE TO GO AWAY

Jon Yinger and Dan Ramos have both predicted that the AM radio band will be sunset by the FCC (*radioworld.com*, search keywords Yinger or Ramos).

I would hope that they are wrong. AM radio is still a viable method of reaching out to a broad area of the country.

Here on California's Central Coast, clear-channel stations can be heard from San Francisco and Los Angeles. From 25 kW KNZR in Bakersfield to 50 kW KMJ, KFIG and even 5 kW KGST in Fresno come in with listenable signals albeit with some background noise.

At night the listening range can extend to several surrounding states. These stations, especially the 50 kW operators, provide continuous signals while driving long distances. In times of an emergency like widespread power outages, they could be the only information source available.

During a two-county power outage a couple of years ago, the only source for information came from KNX in Los Angeles. All the local stations were off the air. Cellphones were limited to text messaging and for five hours we sat by candlelight not knowing what was going on. Fortunately the local hams started relaying information, and after almost two hours KNX reporters finally had reports from PG&E.

I don't think AM radio should go away. I think the local low-wattage operators should fold up shop. They don't appear to be good stewards of broadcasting. Many times they are off the air or they have a carrier but no modulation for hours at a time. One weekend a station's automation hung up; apart from a backfeed of news from the network on the hour, there was no program material or station ID for two days, until I called them on Monday morning when the receptionist arrived. No one was monitoring the operation and no live answering service.

This kind of stuff goes on all the time. Why bother taking up space? We need to give the big stations more power and encourage the low-budget operators to leave the band.

Jan Lipski
Lompoc, Calif.

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