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FCC Adopts Compromise on Translator Interference

But don't expect an end to the legal fights that one expert calls "contentious and expensive"

Getty Images/Martin Barraud

ANDY J. STINE

ne Federal Communications Com- on says changes it adopted to FM lator interference rules in May will ice the interests of full-service and translators.

Those services increasingly have been at loggerheads. A drastic jump in the numbers of translators over three decades — from 1,850 in 1990 to approximately 8,048 in 2019 — was followed by an uptick in interference complaints from existing full-service FM stations.

The commission does not compile data on how many interference cases have been brought to its attention or caused translators to go silent. One observer familiar with the process estimates there are at least 40 such complaints being handled at the FCC, and some have waited as long as 18 months for a resolution.

The new rules are intended to make it easier for translator operators to change frequencies in interference situations; strengthen complaint requirements; set an outer signal strength limit on actionable complaints; and expedite the translator complaint resolution process.

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PRSS Program to Cultivate New Technical Talent

Aims to address engineering "brain drain"

COMMENTARY

BY ERICH SHEA

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

To some extent, every industry suffers a steady exodus of skills and talents when people retire, enter other lines of work or otherwise bid farewell to their former discipline. Public radio is particularly vulnerable to this phenomenon.

If you visited the most recent PREC conference, you may have noticed that the majority of attendees were on the "wise" side of life. If public radio is to continue growing and thriving, particularly in a multimedia world, it is crucial that we increase the number of people, at all skill levels, devoting themselves to this essential industry.

To assist with the "brain drain" that public radio faces, NPR Distribution has launched the Public Radio Engineering Training Program, a technical certifica-

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CONTENT
Managing Director, Content Paul J. McLane, paul.mclane@futurenet.com, 703-852-4628
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, 212-378-0400 x512
Publisher, Radio World International
Raffaella Calabrese, raffaella.calabrese@futurenet.com, +39-320-891-1938

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Advisory Group Lays Out 14 Key Proposals to Improve IPAWS

Priorities: expand its reach, integrate with new tech, support multimedia options

ALERTING

BY SUSAN ASHWORTH

Modernizing the Nation's Public Alert and Warning System

Report from the FEMA National Advisory Council

February 15, 2019

FEMA

The nation's emergency alerting system has evolved dramatically over many years, but few stakeholders believe the system is perfect or that its evolution is complete.

Now the Federal Emergency Management Agency has a series of 14 well-vetted recommendations from its own National Advisory Council, about how to improve the reach and reliability of IPAWS, the Integrated Public Alert and Warning System.

"As IPAWS moves into the future, FEMA must continue to promote the integration of alerting into existing and new dissemination technologies," said the NAC in a report issued in February called "Modernizing the Nation's Public Alert and Warning System."

"It must expand IPAWS reach into the special needs and multilingual communities, and support multimedia presentation, while maintaining the capability to deliver simple text and audio when and where needed."

The report released a total of 14 proposals broken into five themes that targeted specific areas of concern and opportunities for improvement. Those key areas include:

1. Improving alerting authorities' ability to transmit effective alerts
2. Improving public and congressional understanding of emergency alerting
3. Optimizing technology
4. Identifying and adopting current and future technologies and
5. Initiating cross-functional management and administration of IPAWS

Each recommendation also included a timeline for estimated implementation and a checklist of things to consider.

It's probably no surprise that the theme with the greatest number of suggestions was how to go about improving an alerting authority's ability to transmit an effective alert.

"These recommendations create a set of standards for alert originator training and certification with annual updates, so preparation and resources are current and consistent," the report said.

The NAC team suggested the creation of a central-

(continued on page 4)

Figure 1 – Recommendation Implementation Timeline

IMPLEMENTATION TIMELINE														
	Recommendation #													
Themes	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	M	M	M	M	S									
2						M	S							
3								L	S					
4										M	S	S	S	
5														S

Key
S = Short-term: 12-24 months (should be able to use existing practices and staffing)
M = Mid-term: 24-36 months (may require development of new practices or staffing)
L = Long-term: 36-48 months (may require additional policies, staff, or funding)

The report's recommendations are divided into five themes as listed in the accompanying article. This chart shows the recommended implementation timeline.

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IPAWS

(continued from page 3)

ized 'round-the-clock help desk with cross-functional tools and best practices for both new and experienced originators.

According to the report, the first priority for the IPAWS system is that it easily allow an alert originator to develop timely alerts that will allow members of the public to take appropriate protective actions. As a result, the NAC team offered suggestions on core message characteristics — thinking about the way the message is presented, how such a message can be cancelled or updated and how originators can quickly report false alerts.

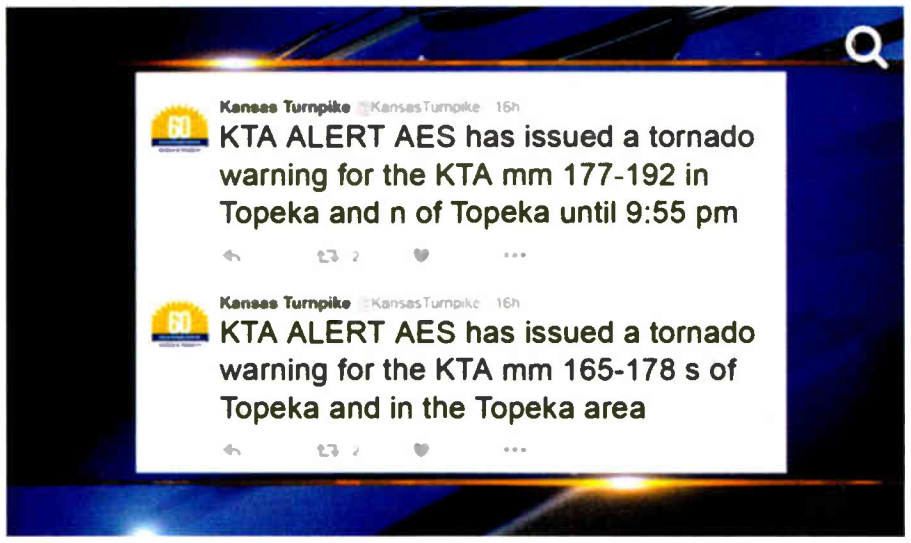
That led to proposal number two: The suggestion that FEMA should develop multijurisdictional templates for alerts and warnings that will offer provide guidance and best practices for emergency alerting.

"These recommendations create a set of standards for alert originator training and certification with annual updates, so preparation and resources are current and consistent," the authors wrote.

Among other recommendations under this theme are suggestions that FEMA work with stakeholders to increase awareness of IPAWS; that FEMA work with subject-matter experts to develop training, testing and credentialing of alert originators; and that the agency establish 24/7 online and phone support.

That first recommendation — working with additional stakeholders — is a key one, said Digital Alert Systems Senior Director of Strategy & Regulatory Affairs Ed Czarnecki, who served on the iPAWS subcommittee that drafted the final report.

"In terms of prioritizing what FEMA could look at in the near term (12 to 24 months), FEMA would be well served to expand its engagement with the broad range of stakeholders involved in alert and warning systems," Czarnecki said. The goal is to "build that critical feedback loop between IPAWS and the diverse array of technology developers, alert originators and disseminators like broadcast and cable," he said.



The report recommends efforts to educate the public about the differences between public- and private-sector alerts. Here, the privately owned Kansas Turnpike Authority reported a warning from AccuWeather Enterprise Solutions, while the National Weather Service did not issue a warning.

BUILDING AWARENESS

The report also emphasized the importance of beefing up public knowledge of the IPAWS system. As part of "Improving public and congressional understanding of emergency alerting," this education includes briefing the public on the difference between official IPAWS alerts and other types of alerts.

Why is this significant? Take one case in 2016 when the Kansas Turnpike Authority, a privately owned roadway operator, sent out tornado warning alerts to their nearly 12,000 subscribers. According to the National Weather Service, there was no tornado warning.

Since there were no official government warnings, the situation caused public considerable public confusion. The local chief meteorologist on KSNT(TV) went on air soon after to reassure those in the area that there was no sign of an impending tornado on radar.

"Currently, it is not easy for the public to recognize the difference between an IPAWS-distributed and private sector-distributed alert," the report authors said. "Several private sector-distributed alerts have confused the public and eroded confidence in — and compliance with — alert guidance."

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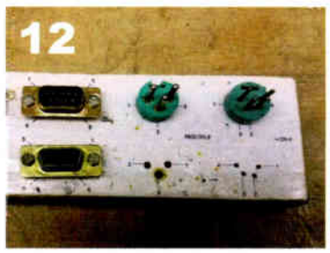

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The report also proposed that FEMA educate lawmakers about needed improvements to the nation's emergency alerting systems by, among other things, clarifying the need for multiple and redundant alerting technologies and encouraging the use of public media broadcast capabilities to fill gaps in rural and underserved areas.

COMMON PRIORITIES

There are a number of priorities that pop up across all 14 proposed themes. One of those is that it's vital for the alerting community to establish a series of best practice procedures across all levels of the emergency alerting strata. Another is that there needs to be an additional effort placed on educating the public about alerting and how individuals should respond in case of an emergency.

For example, the top recommendation under the theme "Optimizing technology" is that FEMA must lead the development of a comprehensive standard set of communication tools — be they visual images, pictograms, transcripts or captioning — so that populations can easily understand an alert.

This is even more important as populations become increasingly diverse; it's paramount that IPAWS ensures that people with disabilities and those with limited English proficiency receive and comprehend alerts in a timely manner, the report said. It noted that uneven distribution of alerts in various languages was an issue during the 2018 Northern California wildfires.

"Local agencies, which originate most alerts, vary widely in their capacity to generate alerts in languages other than English," said California's Office of Emergency Services in the wake of the wildfire that destroyed 18,000 structures and killed 86 people. "In many cases, this capability varies depending on which language-skilled staff happens to be on duty when an alert is required."

Currently, it is not easy for the public to recognize the difference between an IPAWS-distributed and private sector-distributed alert.

— *Report excerpt*

The report proposed, as an example, that FEMA develop a nationwide, standardized hazard symbol set for use by alert originators and for public outreach.

The report also proposed that FEMA develop a policy for redundant alert origination as noted in the section "Identifying and Adopting Current and Future Technologies."

"Considering that a jurisdiction's primary alerting capability can be compromised and/or fail during a catastrophic event, alternate alert origination is a critical life-saving capability," the report said. It cited the malfunctioning of part of the alert system in Texas during Hurricane Harvey and damage caused to the communications infrastructure in the Caribbean islands during Hurricane Maria. In the latter case, emergency management officials were unable to issue a WEA alert to notify residents of where to find shelter, food and water.

The report also includes details on considerations such as staffing needs and equipment requirements. The complete version can be found at *www.fema.gov/media-library/assets/documents/177192*.

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TRANSLATORS

(continued from page 1)

Translators will still be required to leave the air until interference complaints with full-time stations can be resolved. But the FCC did reduce the impact that a single listener can have. Previously, one complaint, at any distance from the desired radio station, could result in an FM translator having to cease operations. That's something that irked translator operators and raised concerns that claims against translators were being used to "game" the system.

The FCC deserves credit for endorsing a common-sense compromise for reviewing FM radio listener complaints alleging interference from FM translators.

— *Dennis Wharton, NAB*

Under the revised rules, the minimum number of complaints to support an interference claim ranges from 25 for a station with over 2 million people in its protected contour, down to six complaints for a station with fewer than 200,000 people in the contour.

"Most important[ly], we want to receive fewer meritless complaints, and make those we do get easier to resolve," FCC Chairman Ajit Pai said in a statement.

The commission believes that the minimums will prevent translators from having to reduce power or suspend operations based on claims supported by just one or two complaints and reduce disputes over whether claims have been substantiated.

Translators remain secondary services that can be displaced by new or modified full-power FM signals that move into their service areas, according to the FCC. "The actions taken herein are designed to protect translator stations from specious interference complaints while preserving their fundamental characteristic as a secondary service," the commission stated.

The FCC also declined to modify its rules to distinguish between co-channel, first-, second- and third-adjacent channels for the purposes of translator interference.

The commissioners were unanimous in voting for the changes, and the National Association of Broadcasters supported the outcome.

In a statement, NAB Executive Vice President of Communications Dennis Wharton said, "The FCC deserves credit for endorsing a common-sense compromise for reviewing FM radio listener complaints alleging interference from FM translators. FM translators have been enormously helpful extending the reach of AM radio stations. We're pleased the FCC continues to embrace ideas that foster the revitalization of AM radio."

CHANGING FREQUENCY

David Oxenford, communications attorney with Wilkinson Barker Knauer LLP, wrote on his Broadcast Law Blog that one component of the changes will be a critical tool for translators — the one that allows them to slide to any available FM channel to alleviate interference with an existing FM station.

"In the past, channel moves have been limited to moves to adjacent channels that would be considered a minor change by the FCC. In many markets, this will provide the translator operator more opportunities to continue to operate its translator, if it does in fact create areas of new interference," Oxenford wrote.

"Of course, in some spectrum-limited markets, there may not be an alternative channel on which a new translator can be authorized."

The FCC says it will accept a simple engineering statement of mitigation of interference at the requested frequency and deem it sufficient as a threshold standard to permit the translator applicant to request a channel change as a minor modification.

FORMULAIC APPROACH?

Scott Flick, a partner with Pillsbury Winthrop Shaw Pittman LLP, has some concern about the minimum listener complaint requirements.

"This means that FM translator interference proceedings are going to be less the result of independent listener comments and more like petition drives, possibly facilitated social media movements where a broadcaster distributes a template to listeners for complaints and then solicits the right number of complaints from the right areas," Flick said.

"I'm afraid that what we will see instead is a formulaic approach to establishing interference that will reward those stations that are the best at driving the submission."

Flick, who handles commission-related business for media-sector clients in Washington, said the rulemaking procedure "offered intrigue" because the issue had broadcasters on both sides.

"The split told us a lot about which broadcasters see FM translators as a major vehicle for content distribution versus those who are more concerned about the adverse impact FM translators may have on their full-power stations. It was fairly easy for these two contingents to find common ground on the FCC's proposal to allow FM translators to easily change frequency where necessary to prevent interference, as that was a win-win for both groups," Flick said.

FM translators are an increasingly important resource for broadcasters. The FCC's AM revitalization initiative has resulted in hundreds of new FM translators starting up, Pai said.

"AM broadcasters around the country have told me that the chance to get FM translators has allowed them to improve their programming, expand their listenership and stabilize their financial position," Pai said. Further, translators now play a role in digital broadcast strategies because they can be fed by HD Radio subchannels.

But comments filed by several large broadcast companies during the proceeding reflect the delicate nature of the proceeding for some.

Cumulus told the FCC it could provide a "unique perspective concerning issues in this proceeding," given that at the time of its filing in 2018, it operated 25 licensed translators and held construction permits for 53 additional translator stations.

Cumulus urged the commission to allow FM translators to move to any available channel as a minor change, including channels in the reserved band. It supported a 54 dBu contour and asked the FCC to raise the minimum number of listener complaints to support an interference claim be raised to six.

Meanwhile, a joint filing in 2018 by iHeartMedia, Beasley Media Group, Cox Media and Urban One, all of whom operate both full-service and FM translator stations, asked the FCC to "act consistent with the secondary service nature of FM translators" but cautioned against the establishment of a 54 dBu contour limit for the remediation of FM

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FOUND IN TRANSLATION

The FCC said its amendment of Part 74 of the rules regarding FM translator interference will:

- Provide added flexibility by allowing FM translator stations to change frequency to any available same-band channel as a minor change in response to interference issues
- Establish a minimum number of listener complaints, proportionate to the population the complaining station serves, that a station would need to submit with any claim of interference
- Standardize and codify the required contents of each listener complaint as well as additional information that a complaining station must submit with the minimum number of listener complaints
- Establish interference resolution procedures that reduce the involvement of complaining listeners with remediation efforts
- Implement an alternative process for demonstrating that interference has been resolved using technical methods mutually agreed upon by the complaining station and translator station
- Establish an outer 45 dBu contour limit for the complaining station within which interference complaints will be considered actionable
- Establish a minimum number of additional listener complaints that must be included in any waiver seeking to establish a claim of interference outside the complaining station's 45 dBu contour

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TRANSLATORS

(continued from page 6)

translator interference complaints.

"The evidence supplied in the record does not support a contour limit any greater than the desired station's 42 dBu contour," the joint commenters wrote.

IN THE CONTOUR

The FCC's move establishes an outer 45 dBu contour limit for the complaining full-service FM station within which interference complaints will be considered actionable.

"After review of the data provided in the record, we conclude that setting a complaint limit at the 45 dBu contour best balances full-service, secondary service and listener interests by providing a contour limit that encompasses the bulk of full-service core listenership while limiting complaints at the margins of listenable coverage," the FCC said.

The commission staff considered recommendations from commenters that ranged from the 34 to the 60 dBu contours.

The FCC left open the door for complaints beyond the 45 dBu contour but the burden of proof in those cases will be much higher, according to the report and order. "We will consider requests for waiver of the 45 dBu contour limit where the requestor demonstrates the existence of a sizable community of listeners outside the 45 dBu contour limit. We recognize that in certain circumstances a radio station may serve a community outside its 45 dBu contour with programming that by its nature attracts 'determined listeners' — listeners who may tolerate poor reception (or purchase a higher quality antenna) to receive the desired station," the FCC wrote.

Some translator owners have complained of being targeted by distant full-service FM broadcasters through interference concerns.

For example, Aztec Capital Partners filed a petition in 2017 seeking a "rebalancing of the equities in the FM translator rules" with the goal of "protecting local listeners of fill-in area FM translators." Aztec wanted to rebroadcast programming from WHAT(AM) on a fill-in translator in the Philadelphia metro at 92.1 MHz. However, it said, a complaint by Clear Communications alleged potential interference with the latter's full-power Class A FM, WVLT, on the same frequency in southern New Jersey, about 50 miles away. Aztec Capital Partners eventually chose to rebroadcast its Spanish Hits AM on a different FM translator it acquired in north Philadelphia, thus resolving the WVLT objection, according to a person familiar with the case.

Melodie Virtue, a principal with Garvey Schubert Barer, said the contour rule change will not end interference complaints.

"I do think it will serve as more of a bright-line test to figure out what the goal line is for people dealing with complaints, whether they are full-power licensees, translator applicants or FCC staff dealing with these contentious expensive fights, which, by the way, are likely to still be contentious and expensive."

Virtue, a communications attorney who specializes in FCC filings and applications, said one potential pothole for FM translators might be the need to protect the 45 dBu contour of the complaining station in areas outside the translator's 60 dBu contour at the application stage.

"In addition, the fact that the FCC set a waiver standard of a minimum of 20 complaints outside of a complaining station's 45 dBu contour also gives the complaining station another way to defeat the new rule. I'll be curious to see how easy or hard those waivers are to get," she said.

The FCC wrote in its report and order: "We are persuaded by comments advocating a high burden of proof of listenership outside the 45 dBu contour that such requests must include at least 20 complaints from listeners outside the 45 dBu contour of the desired station in lieu of — or, optionally, in addition to — the required number of complaints within the 45 dBu contour."

RESOLUTION TIMELINE

The FCC has set 90 days as the timeline for translator stations to resolve interference claims. However, it acknowledges that each case of interference is unique, so it said it would allow the Media Bureau to deviate slightly from that.

"Because each complaint is fact-specific, we direct the bureau to provide an explanation to the parties if it issues shorter or longer deadlines appropriate to the claim," the FCC wrote. "We anticipate that 90 days, as suggested by NAB, will be an appropriate final remediation timeline for most situations."

Commissioner Michael O'Rielly expressed gratification for the remediation deadline changes, which he said will make the process more predictable.

"While we expect many interference complaints will be resolved through relatively simple remedies, including the option to change channels by filing for minor modifications, some will require a more extensive process," he said in a statement. "For those that are more complex, we preserve the bureau's authority to extend the timeline at their discretion with an accompanying explanation documented in their correspondence with the parties."

NOT ENOUGH DIFFERENCE?

Not everyone believes the FCC has struck a fair balance.

Mark Lipp, a communications attorney at Fletcher, Heald & Hildreth, told Radio World in an email that he believes the FCC has favored full-service stations with its changes: "That is to be expected, but by doing so, they harm the AM stations that have now become dependent on these translators. Perhaps the FCC could have created one standard for translators rebroadcasting FM stations and another standard for AMs that are the primary stations."

Lipp, who has clients on both sides of the interference issue, said he believes the FCC also favored full-service FMs when it adopted the 45 dBu contour.

"I think the 45 dBu contour will cause too many translators to be forced to modify their facilities, change channels (if possible) or go silent. A better solution would have been the 54 dBu as proposed by the FCC in the NPRM," Lipp wrote in the email.

He doubts that the revised rules will expedite the complaint resolution process. "I don't think it will make enough difference. Currently, contested proceedings are taking 18 months to get resolved."

The split told us a lot about which broadcasters see FM translators as a major vehicle for content distribution versus those who are more concerned about the adverse impact FM translators may have on their full-power stations.

— Scott Flick

NEWSWATCH

WASHINGTON STATE CREATES "FIRST INFORMER" STATUS

Washington this spring became the 11th state to pass legislation to ensure that broadcasters can gain access to their facilities during declared emergencies.

Backers said the bill was a culmination of three years of effort by broadcasters, the Washington State Association of Broadcasters and the state's Emergency Management Division to ensure broadcasters can gain access to transmitter and studio facilities during time of a declared emergency.

The bill was passed unanimously by the state legislature and was signed by Gov. Jay Inslee in April.

To participate in the program, technicians must be registered as a First Informer Broadcaster as part of the Washington Business Re-Entry System. They will then have authorization to access studio and transmitter facilities to restore broadcast operations and disseminate safety and recovery information to listeners and viewers.

Broadcasters are still required to follow the direction of incident commanders as it relates to safety issues in declared emergency zones.

Key language prohibits authorities from confiscating resources — fuel, food, water and other essential materials — brought to the site by a first informer broadcaster, according to the Washington State Association of Broadcasters.

The legislation is similar to one in Oregon that passed in 2015.

At the federal level, Congress recently updated the definition of essential service providers that have access to relevant facilities even during federally declared emergencies.

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Cover all Bases with ViA

Bill Eisenhamer, Chief Engineer (Left) with JR Rogers, Technical Director

The Tieline ViA has been the backbone of the San Diego Padres road play-by-play live broadcasts.

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Bill Eisenhamer
Chief Engineer, Entercom San Diego

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TRAINING

(continued from page 1)

tion initiative designed to create, preserve and update mission-critical professional skills essential to the broadcast radio industry.

The PRETP offers individuals interested in a career in RF engineering an educational path to skills accreditation, with the hopeful result that a new generation of technical leaders and innovators will be developed to keep pushing public radio ever forward.

CERTIFICATION LEVELS

Three different levels of certification are available in the PRETP, with offerings dedicated to entry level, mid-level, and advanced-level certifications.

The entry level certification, known as Certified Public Radio Operator, is focused on those who are new to the industry and want to develop technical skills specifically around RF. These could be recently graduated engineers considering different disciplines or seasoned technical professionals working in other disciplines who wish to join the radio industry.

The mid-range program, Certified Public Radio Technologist, and the advanced-range program, Certified Public Radio Engineer, are more geared toward those already in the radio industry who are looking to supplement their current engineering or IT experience with an RF focus. Participants in these two programs can look forward to a deeper dive into RF engineering, and they will also be immersed in antenna systems course work.

The PRETP is an attempt by NPR Distribution to help cultivate a new generation of radio talent to carry us into the future.

Each level of certification will have required reading and course material and will conclude with an exam by the Society of Broadcast Engineers, a professional organization for engineers in broadcast radio and television that offers certifications in various radio frequency (and video and audio technology) areas for its members. Throughout the process, NPR Distribution will track each participant's progress and issue the appropriate certifications upon completion of the courses.

The Certified Public Radio Operator certification is considered the entry level starting point for participants and has no prerequisites required. The course material will be drawn from the SBE Certification Handbook for Radio Operators and will also feature a basic satellite skills training course supplied by the Global VSAT Forum. Participants must pass the SBE Radio Operator certification exam and obtain GVF Satcom Professional Certification before they're able to take the more advanced PRETP course. Upon completion, participants will be confirmed to know basic knowledge to operate radio station equipment and systems and will understand FCC rules and regulations.

Certified Public Radio Technologist is the mid-level program for those in IT or engineering disciplines and requires that they have obtained the entry level operator certification. This course will focus on FM and AM antenna systems and will require the passing of the SBE Broadcast Technologist Certification Exam, which includes questions on electronic fundamentals and FCC rules and regulations. Upon completion, participants will know how to set up, operate and maintain station equipment, and they will also have a working knowledge of FCC regulations.

The Certified Public Radio Engineer is the advanced-level program and requires participants either have the "technologist" certification or have five years of RF engineering experience. This certification will also focus on AM and FM antenna systems and will require the passing of the SBE Broadcast Radio Engineer Certification Exam, which will include questions on electronic theory, safety and FCC rules and regulations. Upon completion, participants will be certified as being able to set up, operate and maintain station equipment including transmitters and terrestrial and satellite antenna systems. Successful graduates will also have specialized knowledge of FCC rules and regulations.

DESIGNED TO BE ECONOMICALLY FEASIBLE

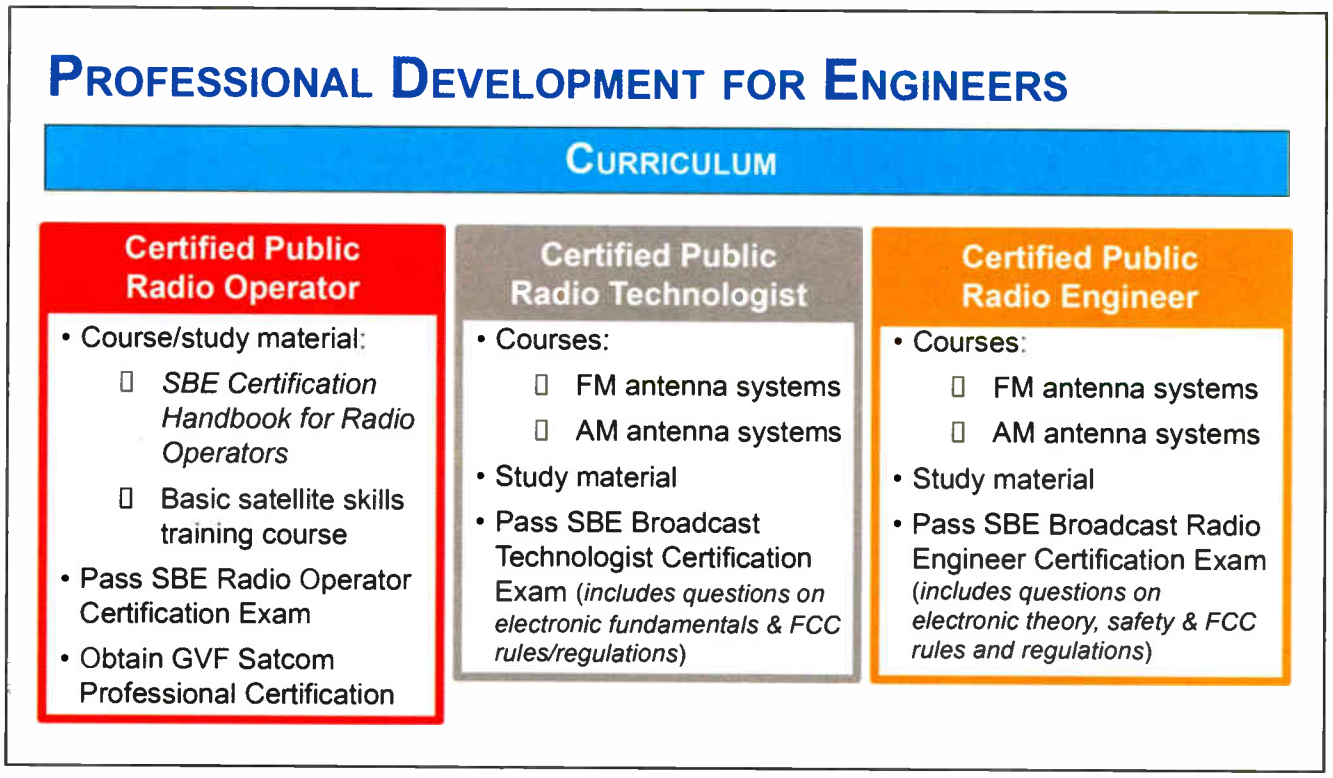
The PRETP has been designed with station economics in mind, with each course being offered for much less than other common certification programs. The price for the entry level Certified Public Radio Operator has been set at $1,700 per participant. This includes all courses and materials, the SBE and GVF exam fee, paid admission to the annual NAB Show and Public Radio Engineers Conference, a custom NAB guide, and one year's membership in SBE. This course is a prerequisite for the mid-level and advanced-level certifications, and all participants must pay the set fee for the course.

Both the Certified Public Radio Technologist and the Certified Public Radio Engineer programs are priced at $1,400 for SBE members and $1,700 for non-SBE members. There are also discounts available to those participants who cannot attend the NAB and PREC shows: SBE members for either certification pay $700 total without NAB and PREC admission and non-SBE members for either certification pay $900 without NAB and PREC admission.

The curriculum for each of the three courses is based on current SBE and GVF materials, requirements and testing and was designed to be laser-focused on the RF industry, providing training in areas and on subjects commonly experienced by public radio engineers. The actual exams will be administered to participants via local SBE chapters, and NPR Distribution will process test results and then issue the appropriate certificates.

The PRETP is an attempt by NPR Distribution to help cultivate a new generation of radio talent to carry us into the future. As public broadcasting works to maintain and strengthen its place in the always changing media landscape, a well-stocked army of trained engineers can only help lead the way.

More information about the program, including an application document, is available at *http://prss.org/certification*.



At the 2019 Public Radio Engineering Conference, NPR Vice President of Distribution Michael Beach announced the new training program alongside a brief PowerPoint presentation. This slide breaks down the different curricula for each level of training.

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World Radio History

A New Twist on an Old Block

Also, guess what Buc Fitch found in his workshop?

WORKBENCH
by John Bisset
Email Workbench tips to johnpbisset@gmail.com

Jerry McCarty spent more than three decades at the college of engineering at the University of Michigan. He handled the technical end of its distance learning program, starting out with Instructional Television Fixed Services microwave, then migrating to videotape delivery and some videoconferencing. Along the way, they picked up a Ku Band uplink, which is still in use for occasional news feeds to the national networks.

During Jerry's 34 years there, he was a part of two major moves, both of which required the buildout of new facilities. It goes without saying that Jerry soldered a lot of connectors.

He saw our May 8 tip on soldering XLR connectors and wrote in to say that he loves the idea of using a clipboard to hold connectors down.

Jerry also sent a photo of his version of the wood block discussed in that column, to hold connectors in place — see Fig. 1. This one has to be at least 25 years old, and includes connectors for holding DB-style plugs. Jerry's adaptor has served the staff well, especially with the added notations for those who can't see the pin numbers on DB-style connectors anymore!

If you build one of these, maybe include the wire color and polarity on the XLRs — remember, Pin 2 flips from one side to another depending on the sex of the connector! The project shouldn't take more than a couple hours to build, and cost is minimal. Jerry adds that the coffee stains are optional.

Since retiring from Michigan, Jerry got involved building an AM/FM station and still does some work there and at the university.

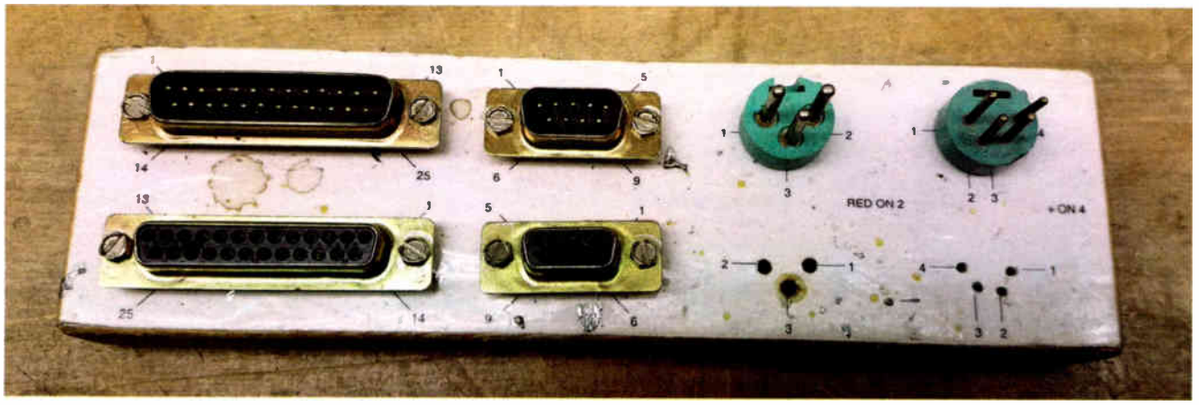

Fig. 1: An easy way to wire up not only XLRs but DB connectors, too.

When consulting engineer Charles "Buc" Fitch, P.E., isn't fixing things, he's cleaning up his shop. Buc sent along a few pictures of what he found in one of his part bins.

About 10 years ago, Buc repurposed a maritime mobile VHF two-way into a base station for a weather station for Honduras. He modified the receiver to monitor the outgoing transmission and made some more mods to the transmit side for continuous operation.

The output was about 10 watts (which covered the local village) and was one of the first of the NOAA weather channels. It was called Weather Channel One or WCO. At the time, the folks living there used a lot of "family radio walkies" that had NOAA channels on them. So WCO was a great way to get out not only information about the weather, but community announcements, as well.

While cleaning up the shop, Buc came upon the carcass of a second unit that he harvested for module spares. Upon careful inspection, Buc found these nifty "knurled nuts and bolts," shown in Fig. 2. Someone had secured the top shroud cover with "quick-off"

(continued on page 15)

It goes without saying that Jerry soldered a lot of connectors.

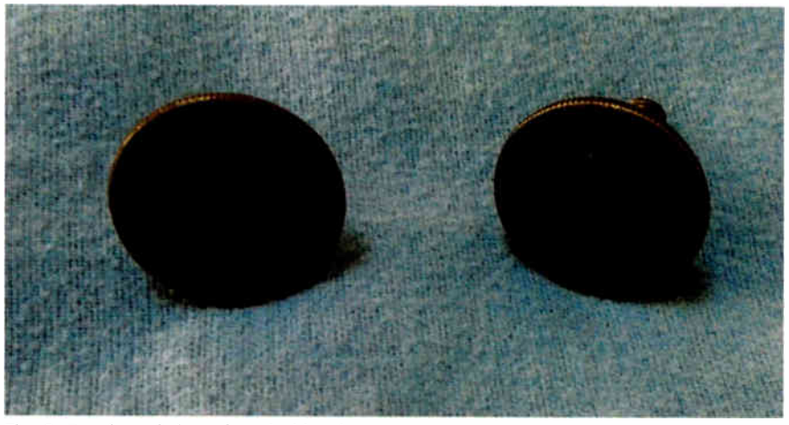

Fig. 2: Buc found these knurled knobs.

I'm always amazed at the finds that project engineer Dan Slentz comes up with. His latest is from Walmart. Its online store is selling acoustic foam panels; a 96 count pack of 12 in. x 12 in. x 1 in. squares is about $96. Smaller combinations of the panels are available.

Putting together a small podcast studio? A six-pack of the same dimensioned panels is $10! Head to *www.walmart.com* and enter "acoustic foam panels" in the search block.

The only review stated that the buyer ordered black and got grey panels — there's apparently no way to specify color, though the site says color choices are available. If you don't care what color you get, this option may be for you.

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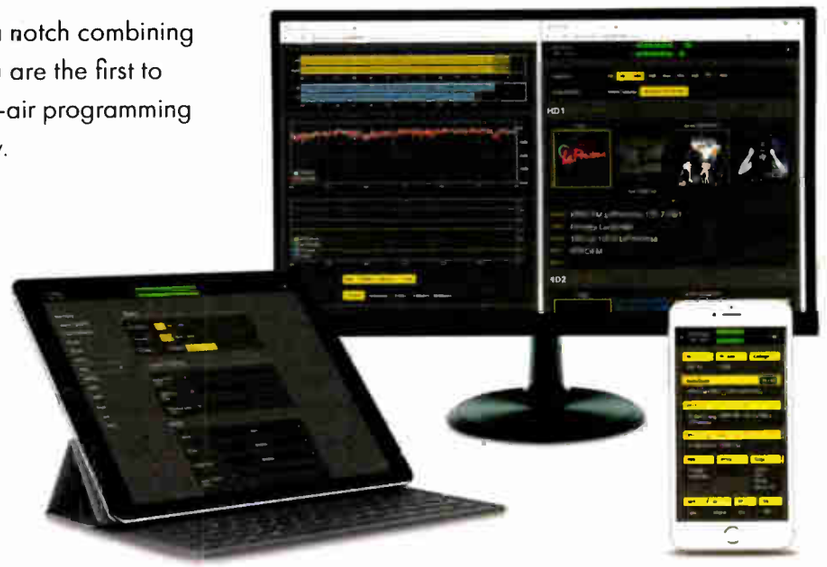

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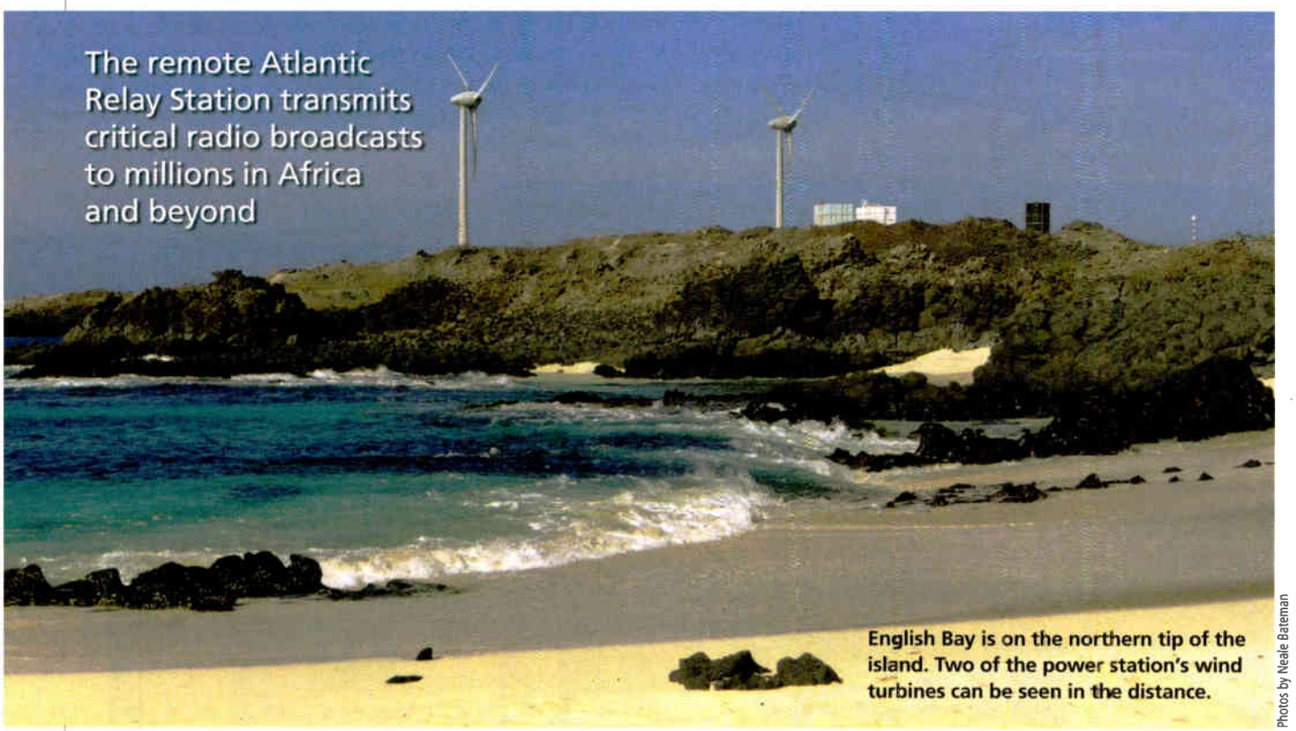
Managing SW Broadcasts From Ascension Island



English Bay is on the northern tip of the island. Two of the power station's wind turbines can be seen in the distance.

Photos by Neale Bateman

BY NEALE BATEMAN

ENGLISH BAY, ASCENSION ISLAND — A six-mile stretch of volcanic rock in the middle of the South Atlantic Ocean is home to the BBC's Atlantic Relay Station.

Now managed and operated by Encompass Digital Media on behalf of the BBC World Service, the stations' six powerful shortwave transmitters on Ascension Island beam program in a dozen or more languages to some 30 million listeners in north, west and central Africa.

It's a remarkable and fascinating diversion for a digital media business better known for providing video streaming, TV playout and OTT services — but it's not only the shortwave transmission site on Ascension that Encompass is responsible for. The company's engineers also run the island's power station (consisting of five diesel generators and five wind turbines) as well as a reverse osmosis desalination plant, supplying electricity and drinking water to the island's population of more than 800 people.

A BRIEF HISTORY

Originally garrisoned by the British Navy in the early 19th century, Ascension Island, a British overseas territory, proved to be a useful stopping off point for ships crossing the Atlantic due to its location almost half-way between Africa and South America. It remains a strategic communications and logistics hub for both the United Kingdom and United States.

The United States built an airbase on the island during World War II and later expanded the runway to allow for larger aircraft — it even served as an emergency runway for NASA's Space Shuttle, although thankfully it was never used.

The British Royal Air Force also has a military base on the island, sharing the same runway. It was a key base during the Falkland Islands conflict in 1982.

The European Space Agency maintains a monitoring base there along with a small monitoring site for NASA and the United States Department of Energy.

In the mid-1960s, the BBC built a relay station at English Bay on the northern tip of the island to transmit shortwave radio broadcasts to Africa and South America, plus a power station to provide the electricity.

A LIFELINE FOR AFRICA

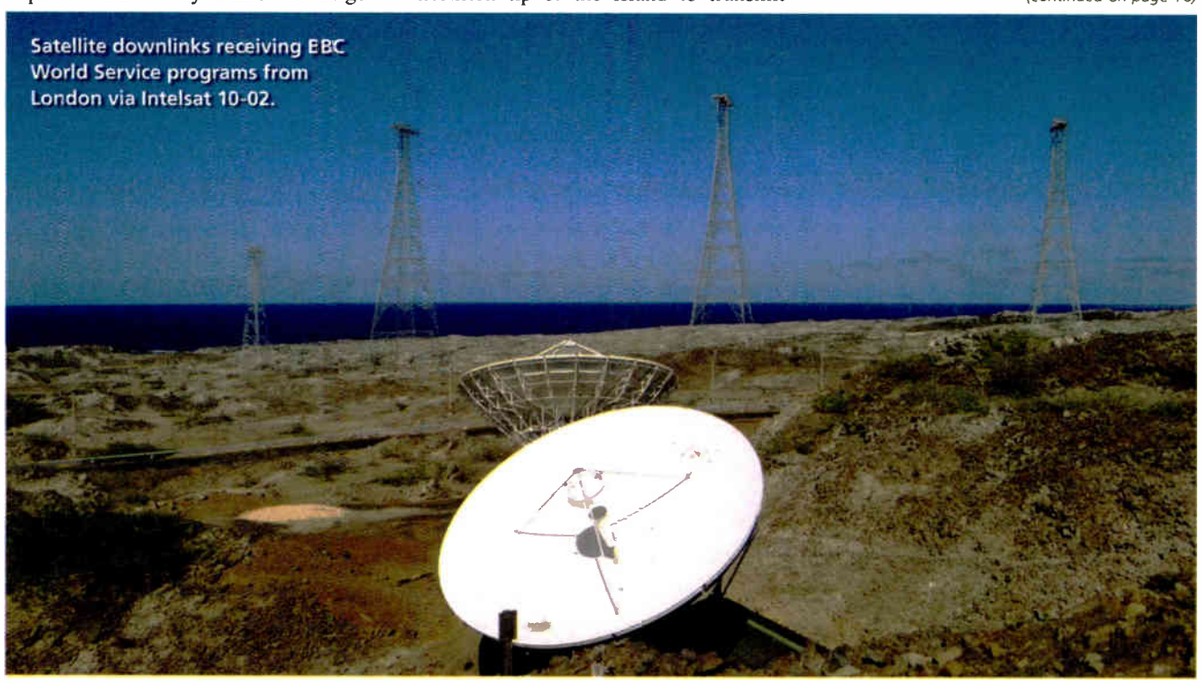
For more than 50 years, the Atlantic Relay Station has transmitted critical radio broadcasts to millions of listeners in some of the remotest parts of Africa. The daily broadcasts include transmissions in English, French, Arabic, Hausa, Somali, Swahili and several other African languages, and more recently has added transmissions for other international broadcasters as well as the BBC.

For more than 50 years, the Atlantic Relay Station has transmitted critical radio broadcasts to millions of listeners in some of the remotest parts of Africa.

The shortwave transmitters include two 250 kW Marconi BD272 transmitters originally installed in 1966 (and still in daily use) and four 250 kW RIZ K01 transmitters, which are also capable of transmitting in Digital Radio Mondiale mode.

Each transmitter can be switched to one of more than 20 antennas, which consist of HF curtain arrays beaming

(continued on page 16)



World Radio History

Fig. 3: The flip side shows the discs glued to the bolt top with heavy-duty epoxy.

Fig. 4: Buc burnished away all the crud. Here's what he found.

Fig. 5: All cleaned up and ready for service.

WORKBENCH

(continued from page 12)

bolts. Buc thought these had come this way from the manufacturer.

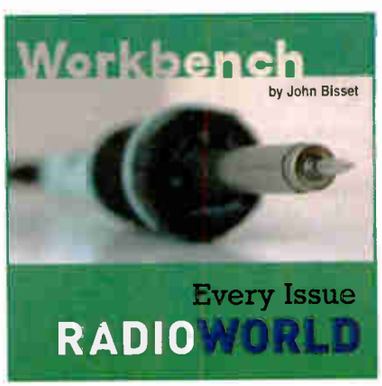
It turns out that some innovative engineer or tech person had taken the supplied screws and modified them to this nifty fix. These knobs, which were glued to the top of the screws and seen in Fig. 3, were actually weather-beaten and crudded-up U.S. quarters. In an area where tools may be scarce, the serrations along the edges of the quarters added substantial friction for quick removal of the unit top — without tools!

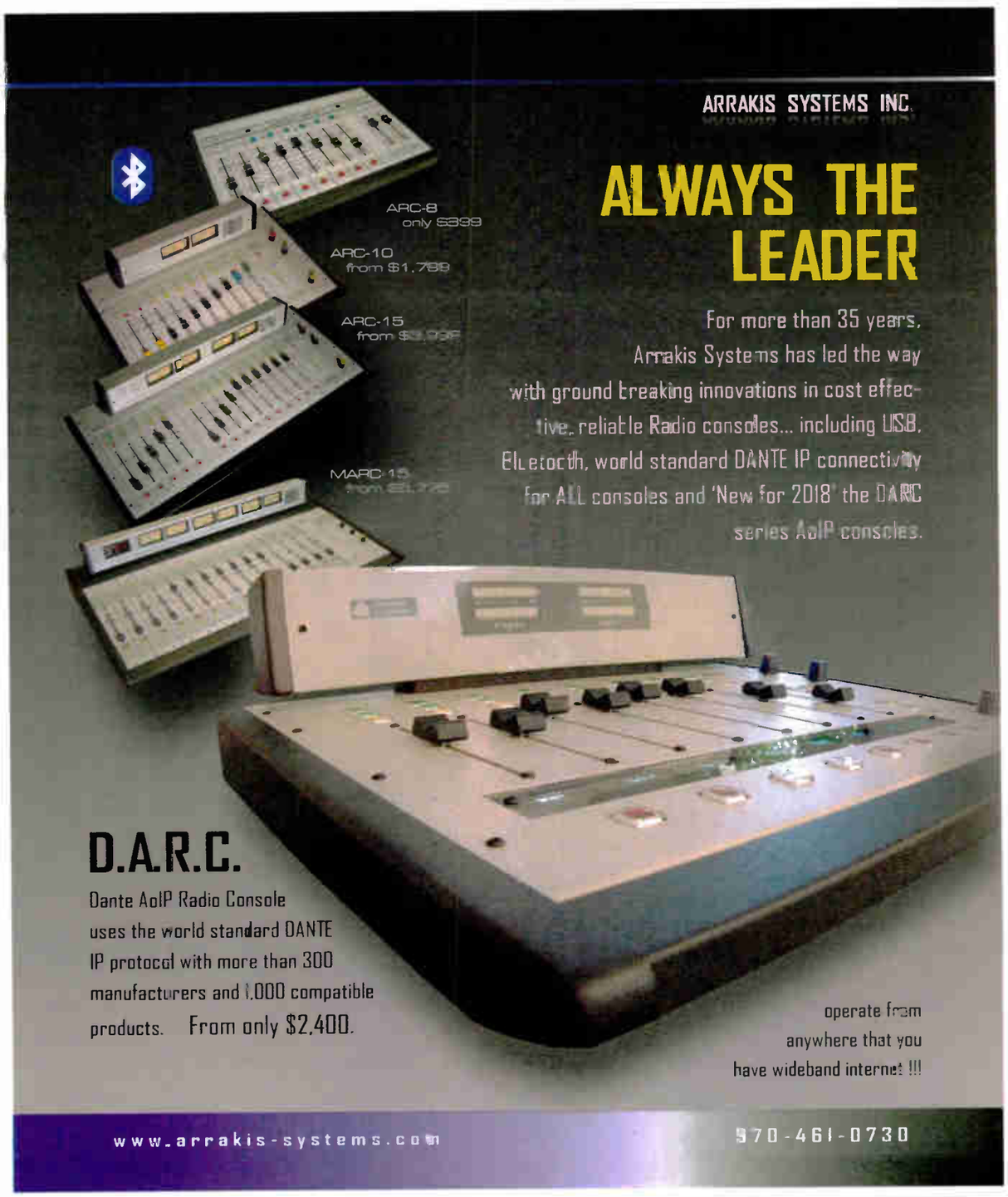
After cleaning up the knobs with a little buff wheel included with Buc's latest Dremel-brand tool (Fig. 4), you can see they are 1970 and 1973 quarters. The finished product is neat, simple, easy and inexpensive — even accounting for the 50 cents for the quarters.

Seeing the shiny quarters made me think of Buc's next project: homemade quarter cufflinks! Stand by.

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.

Author 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 is SBE certified and is a past recipient of the SBE's Educator of the Year Award.





World Radio History

ISLAND

(continued from page 14)

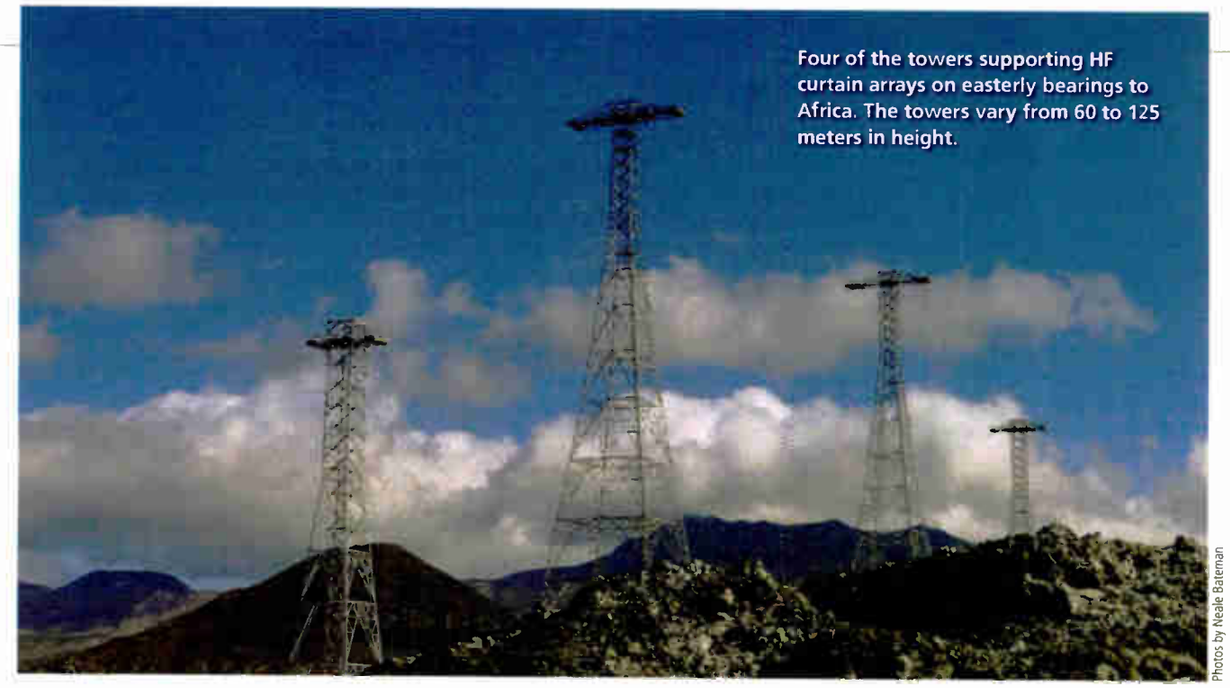
toward target areas in Africa and South America. Programming from London is delivered via satellite, with resilience and backup feeds provided by Encompass. The power station is staffed around the clock with engineers taking remote control of the transmitter site outside of peak broadcast times.

TRANSMISSION

Ascension typically transmits around 1,800 hours of program each month on shortwave for the BBC and other broadcasters. Most of these are beamed into Africa, but with the massive footprint of a shortwave transmission, some frequencies are also audible across much of Europe and the Middle East. Although the BBC closed its shortwave service for North and Latin America some years ago, the ability to transmit westward still exists.

There are currently no regular scheduled DRM broadcasts from Ascension Island but it has recently transmitted several digital test transmissions to South Africa and Brazil, proving that DRM on the shortwave bands (DRM30) can reach vast international audiences and deliver high-quality audio as well as data services.

The station's engineers also maintain the island's FM transmitters on Green Mountain (an extinct volcano), which broadcasts BBC World Service and the British Forces radio service (BFBS) to the local audience of servicemen and women, civilian contractors and their families.



Four of the towers supporting HF curtain arrays on easterly bearings to Africa. The towers vary from 60 to 125 meters in height.

Photos by Neale Bateman

OPERATING CHALLENGES

Atmospheric conditions, seasonal variations, sunspots and a host of other factors determine the propagation of shortwave transmissions and therefore affect the audibility of the signal in the target area. Encompass' specialist team of frequency managers plan all of the BBC's transmissions and work closely with other international broadcasters to choose the optimum frequencies at various times of the day. But in the case of Ascension, that's the least of the problems of operating a high-power transmitter site on a large volcanic rock in the middle of the ocean.

Getting supplies, spares, and, of course, staff on and off this remote island, nearly 2,000 miles off the west coast of Africa, is an enormous logistical challenge. Advance planning is essential; everything has a lead-time of several weeks if not months. When the transmitter station needs a spare part, you can't just drive to the local store or order on-line. A supply ship from the U.K. calls at Georgetown several times a year, but the islands' only "convenience store" usually sells out of fresh fruit and vegetables within the first week of a new delivery.

Until a little over a year ago, reaching Ascension Island was relatively straightforward; an RAF plane bound for the Falkland Islands used to touch down on the island twice a week to refuel. However, there is currently a major project being undertaken to repair and resurface the runway and until this is completed, regular access is limited to much smaller military planes.

There is one commercial flight a month from Ascension's nearest neighbor, Saint Helena (more than 800 miles, or a two-hour flight away) that links with Johannesburg, but these few military and commercial routes are the only opportunities to get people and goods to and from the island.

Without all of the vital resources and services provided by Encompass engineers, the daily shortwave broadcasts simply wouldn't happen, let alone the 24/7 power and water supply to the island's population. The 800 or so people living on the island are in a unique position, and they have to work together in order to survive.

The shortwave transmitter station is as important today as ever, broadcasting to one of the BBC's largest audiences in the world — all from a rock in the middle of the South Atlantic.

Neal Bateman works at Encompass Digital Media, managing the transmission and distribution services for BBC World Service.

One of the original 250 kW Marconi BD272 HF transmitters, installed in 1966 and still in daily use.

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World Radio History

Understand Your Dish to Keep Your Audio Online

Satellite receivers present some unique challenges; here's how to address them

TECHTIPS

BY MARK PERSONS

When I was the contract engineer for three local radio groups some years back, an interesting event occurred. It was a summer day and a call came from a station that had just lost its audio feed from a Ku band (12 GHz) satellite dish. Before I could even go out the door, another station called with the same problem.

The sky was black with clouds and street lights were coming on. There was no rain, however; moisture stayed in the cloud cover.

A look at one satellite receiver confirmed the signal had gone away. Then the C band (4 GHz) satellite receivers went silent. Satellite programming on *all* of the radio stations in town was unavailable.

The event lasted for about an hour until the clouds dissipated. C band satellite receivers came alive first, followed by Ku band.

Today, relatively small consumer television satellite dishes often lose signal when it rains. Fortunately, the broadcast industry uses larger dishes to avoid most annoying outages.

In RW's Oct. 24, 2018 issue, the article "A Sampler of Common Sense Helpers" featured an anecdote about a problem in which some, but not all, transponders were working on a C Band satellite dish with an LNA (low-noise amplifier).

Fig. 1 shows the configuration where two 90 degree N elbow adapters were combined into an innovative and convenient U arrangement. As it turned out, the distance between two sharp right angles resulted in notching two transponders from the received signal. All other transponders were fine. Replacing the adapters with a short flexible cable solved the problem. The wavelength of a 4 GHz C Band signal is only 7.5 cm (2.95 inches) and about 2 cm (0.79 inches) for Ku Band. Significant portions of a wavelength and right angles combined to create the situation.

While we don't see many LNAs anymore, the moral is that unexpected things can occur when handling microwave RF signals.

WIND

A major troublemaker for satellite dishes, as you know, is wind. You've seen it where a weather event caused misalignment of a satellite dish.

I've gone so far as to fabricate steel struts that attach to the sides of dishes with the other ends fastened to the dish pole or even to screwed-in ground anchors. However, those supports need to be detached before any realignment can be done.

I made it a practice to mark the locations of adjustments so the dish can be put back to where it started before things went wrong. Those spots are on the fixed pole mount to its rotatable portion. A permanent marker works well for that. I also marked the elevation adjustment and feed horn polarization. It is easy to do and saves lots of time in the future.

Fig. 1: LNA with two 90 degree elbows

Then, of course, there are tornadoes and straight-line winds that can demolish a dish. Fig. 2 shows such a dish at a station in northern Minnesota. Even the feed horn was swept away, never to be seen again. This was on level ground — imagine trying to keep a dish aligned on a tall building!

Fig. 2: A storm-damaged satellite dish

COLD WEATHER

Years ago, when I still had brown hair, I was a contractor for all of the local radio stations. A call came at midnight from a station where the satellite audio feed had failed. It was a *cold* winter night, –54 degrees to be exact.

I drove out of the garage and down the street. Soon, the steering on my car became a bit stiff and difficult to handle. I made it across town to the station and took the time to pull out the satellite receiver book while warming my hands. It fell open to the specifications page. There it was — the receiver down converter was rated for service to –50 degrees F. That was the clue.

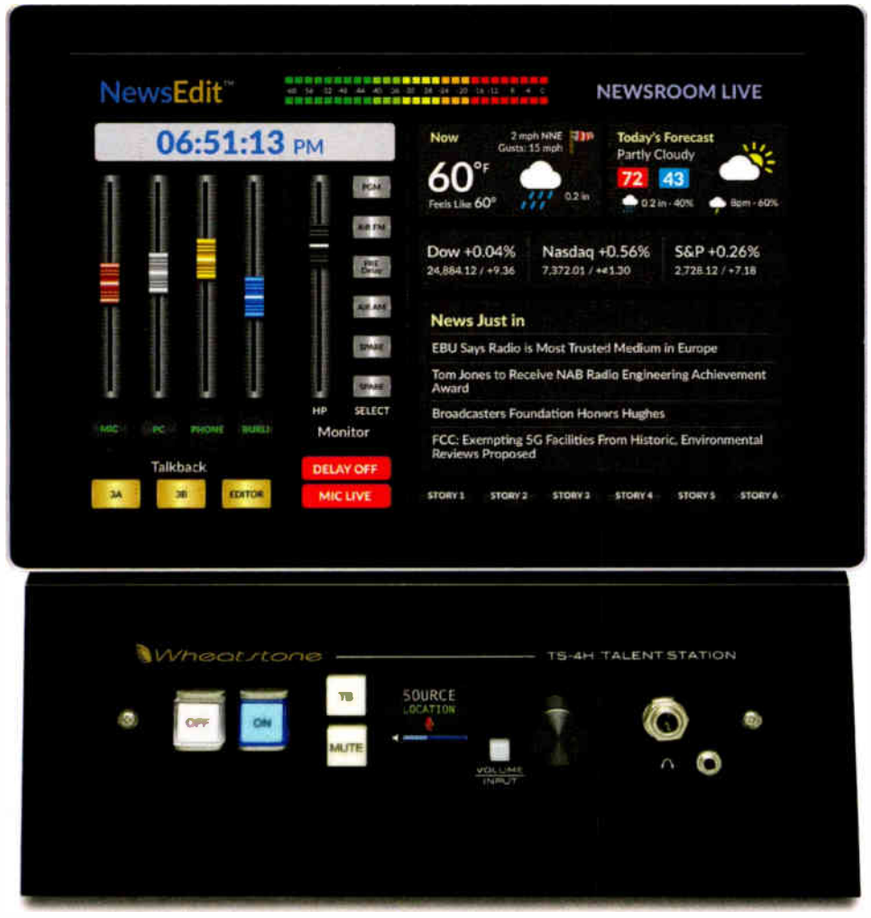
Soon, I had a floor rug wrapped around the downconverter at the cold satellite dish. I hung my trusty 100 watt trouble light under it. That was back in the days when lights were incandescent and produced a lot of heat when running. Back inside the studio, my hands were just recovering from sub-freezing temperatures when an announcer yelled, "It's working again!"

The next spring found me digging in a coaxial cable so the down converter

(continued on page 20)

World Radio History

NEWS DESK IN UNDER 1 SQ FT



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SATELLITE

(continued from page 18)

could be mounted indoors where the temperature was an even 72 degrees, summer and winter. Problem solved.

Yes, we engineers are tasked to be problem-solvers. It is in our DNA to examine a situation and come up with an answer. Rarely did I go to a transmitter site without taking away a list of things that needed to be purchased to keep the building and equipment in good repair. Often that involved improving something that failed, rather than replacing it for another failure down the road.

TERMINOLOGY

Many people don't understand the vocabulary of satellite technology.

How many times have you heard that a satellite audio outage was caused by "sun spots"? You might politely correct people by saying the event is similar to an eclipse where the sun is aligned with the satellite and the dish. The meager satellite transmitter is drowned out by billions of watts of broadband RF noise from the sun. No wonder a satellite receiver can't decode a signal under those conditions.

You can also tell the station staff that they can confirm such an event by looking for the shadow of the low-noise block downconverter. If it is centered, or nearly centered, you know the dish is looking at the sun. That applies to most dishes, but not the ones where the LNB is designed to be off-center intentionally.

JUST THE RIGHT CURVE

The physics behind a satellite dish are simple but can be mechanically difficult. Dishes are typically RF reflecting parabolas that must be exactly shaped so a satellite signal will arrive at the LNB from *all* parts of the dish.

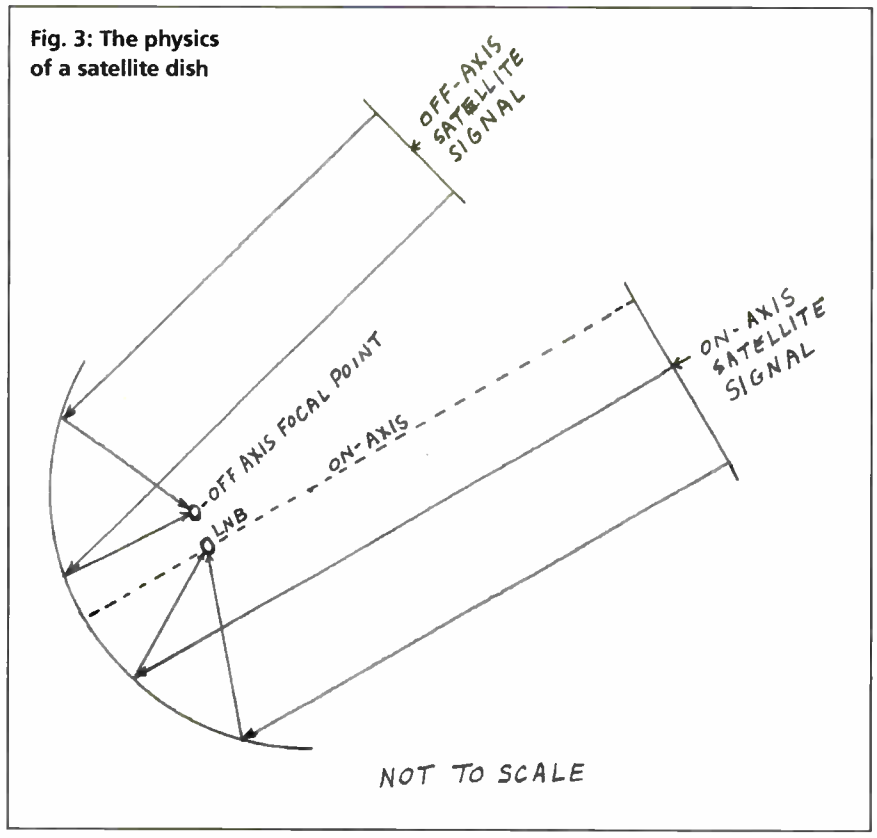

Fig. 3: The physics of a satellite dish

Think of a dish as an optical mirror where light focuses on a single point. Radio waves follow the same principles as light, except you can't see them. A satellite signal heads toward Earth as a wave front. The system works correctly when a wave striking the satellite dish then bounces off to arrive at the focal point (LNB) as a combined signal.

The dish shape is a double-edged sword. Signals arriving straight in (on-axis) reflect and *add* at the focal point, while off-axis signals are reflected to a different point, or are just scattered away from the LNB. As they say, the angle of incidence equals the angle of reflection.

A parabolic dish is good at focusing received energy at one point. That is why a dish looks at just one satellite, not others nearby in orbit. A warped dish might reflect signal to the wrong point, causing low dish gain. Ouch!

OUT IN FRONT

Placement of the feed horn and LNB is critical, too. Misalignment at the focal point, even by just a few centimeters (fractions of an inch), could mean the difference between a reliable dish and one that is a marginal performer. That usually happens when a dish is warped.

You've seen this one, too. The satellite signal goes away, and you find a bee or hornet hive in a feed horn. Those critters love a location like that. It is away from animals and somewhat sheltered from rain.

A warped dish might reflect signal to the wrong point, causing low dish gain.

Any electrically transparent material can be used to cover the horn. A little plastic sheet, or even plastic food wrap, will do. It's a maintenance item.

Be sure to mark the EbNo, a signal-to-noise performance number, on the front of every satellite receiver. It is easy and quick to check on regular inspections and will tell you when trouble is brewing.

Hey entrepreneurs, how about developing a curved broom that will help clear snow and debris from satellite dishes?

Knowing the facts helps you be a better engineer. It makes perfect sense.

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

Mark Persons, WØMH, is an SBE Certified Professional Broadcast Engineer and SBE Engineer of the Year for 2018. Mark recently retired after more than 40 years in business. His website is www.mwpersons.com.

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Tieline Puts Excitement in Small-Market Stations

Ohio broadcaster wants to sound like the "big boys" but without their budgets

USERREPORT

BY CHRIS ROBERTS
Owner/Operator/Engineer
WERT(AM/FM), WKSD(FM)

VAN WERT, OHIO — I have owned WERT(AM/FM) and WKSD(FM) since 1995. WERT 1220 kHz is a 250 watt nondirectional station with a 29 watt night-time authority, licensed to Van Wert, Ohio, since 1958. In 2016, I added a full-power 250 watt translator operating at 104.3 MHz. WKSD 99.7 MHz is a Class A FM station licensed to Paulding, Ohio, a community approximately 12 miles north of Van Wert.

Being farming communities, both stations carry early morning agricultural programming as well as a full complement of sports — covering six high schools as well as the Ohio State Buckeyes and University of Toledo Rockets. Thanks to long-time local ownership and heavy involvement in the community, WERT and WKSD enjoy a loyal audience and have been very successful in competing with the many other stations in adjoining larger markets.

WERT's Scott Alan and Ron Burt are courtside with the Tieline Report-IT.

SMALL-MARKET MAGIC

What small-market radio station owner/operator hasn't been envious of the high-quality sound of the "big boys," especially for remotes and sports play-by-play? Well, I can tell you, this one sure was. The dialup telephone connection was the best we could do, while other stations, not so cost-encumbered, seemed to be able to show up and broadcast from anywhere with a sound indistinguishable from that of their studios. For the little guys like me, cost is everything; that kind of equipment purchase cash outlay was out of the question. Then along came Report-IT from Tieline.

Bridge-IT XTRA is back at the studio to receive the live game feed.

Everyone on my staff has a smartphone and knows how to download a free app. When I discovered that I could get that quality sound (in both directions) by installing a relatively low-cost Tieline Bridge-IT codec at the station and link to my individual staff members through their free Tieline apps, that changed everything. Who knew that most smartphone mics sound that good?

Suddenly, impossible remotes became possible. Basketball and football games sounded like the big leagues, and staff members and even some clients could simply use their smartphones to send everything from sports and weathercasts to copy changes in their spots. (We have a lot of sponsors who voice their own commercials.) Our Sunday morning church services are even broadcast using Tieline Report-IT and the church's own smartphones and devices.

The day my Tieline Bridge-IT XTRA showed up I had a high school football game with an early evening start time. Thanks to the accompanying two-page, 10-step quick start guide, I had it on the air less than an hour after taking it out of the box.

Am I impressed? Yup. Did I break the bank? Nope. In fact, I bought a second one. Now, the sky is the limit.

For information, contact Dawn Shewmaker at Tieline USA in Indiana at 1-317-845-8000 or visit www.tieline.com.

ABOUT BUYER'S GUIDE

Radio World publishes User Reports on products in various equipment classes throughout the year to help potential buyers understand why colleagues chose the equipment they did. A User Report is an unpaid testimonial by a user who has already purchased the gear. A Radio World Product Evaluation, by contrast, is a freelance article by a paid reviewer who typically receives a demo loaner. Do you have a story to tell? Write to **brett.moss@futurenet.com**.

World Radio History

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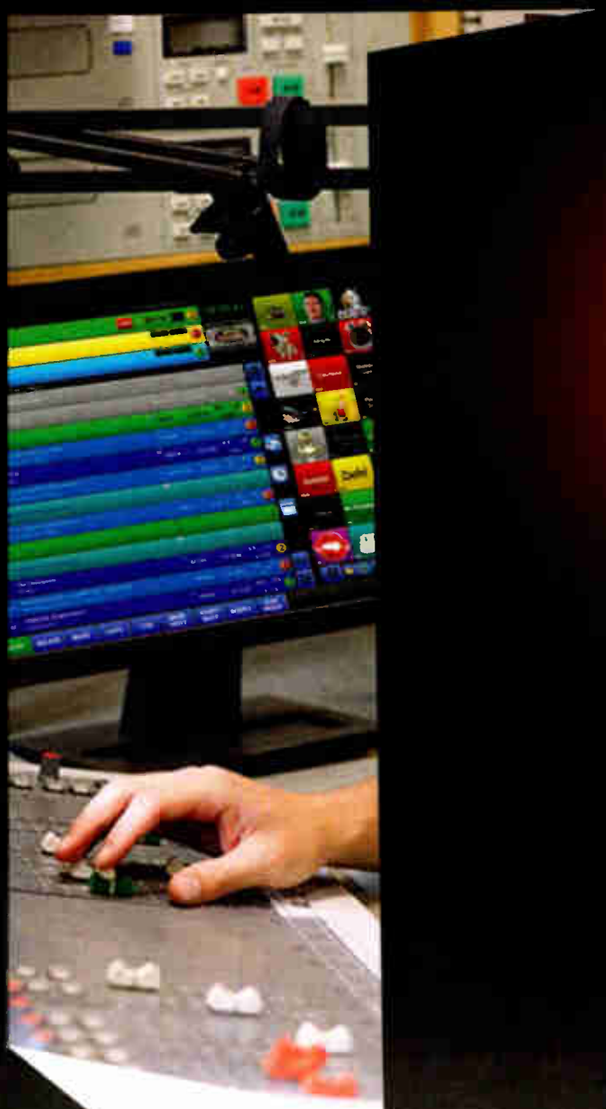

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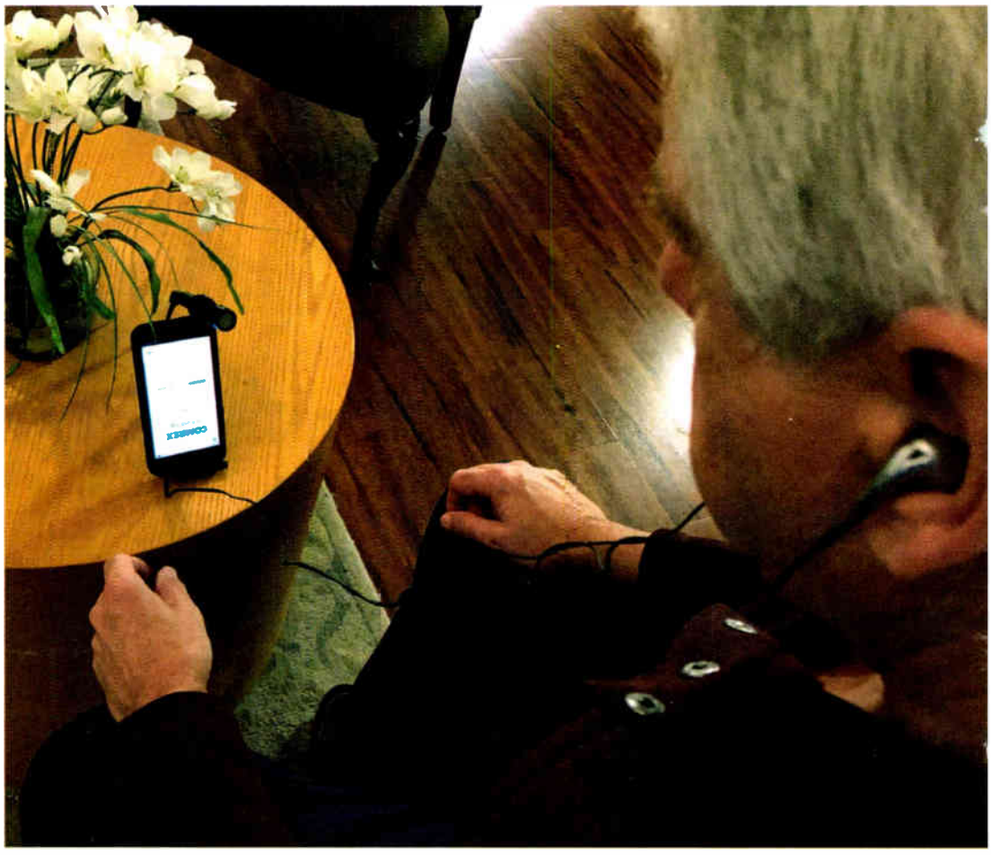
World Radio History

Comrex FieldTap — Just What the Doctor Ordered

Smartphone app comes to the rescue when the hardware codec has a problem

USERREPORT

BY JOHN PAUL
Host
"Car Doctor Radio Program"



Remote interface tools get smaller and smaller.

BOSTON — I host the "Car Doctor Radio Program," a car advice call-in show that airs on Saturday mornings with Salem Media on WROL(AM) 950 kHz. I think of it as a second opinion show. If you've gone to your garage and they've given you their thoughts on your car, and you're not quite sure about what they've said, you can call me, and I'll tell you whether I think it's reasonable. My full-time job is with AAA, and I see this as a way to help by sharing my expertise.

While I go to the studio regularly, I also need a way to be able to do my program remotely. I enjoy traveling and regularly have opportunities to do remotes from events like the Boston Auto Show.

I have a Comrex BRIC-Link unit and I love it, but I always want to make sure I have a backup. Comrex FieldTap gives me peace of mind. I know that if the internet fails for whatever reason, I'll be able to call in to the codec at the studio, connect quickly and sound better than I would on a regular phone call. It's a free app, it's easy to use, and it makes me feel good to know that I'll have a quality-sounding option no matter what happens.

Prior to downloading FieldTap, I had been using the Linphone app. FieldTap is similar, so the transition was easy. Once you've entered and saved the call information, you just press one button and boom, you're connected to the codec at your studio. Recently, I called in from the road to do a segment on "The Answer With Joe Ligotti." The producer was surprised that I was using a phone app, and said that it sounded much better than a usual call.

FieldTap isn't a replacement for a codec; but for emergencies or short remotes when you need to cut back on equipment, it works well.

During a remote last year, we encountered a situation in which we needed FieldTap as a backup. We'd tested the networks and everything else the night before; but during the remote, there was a problem with their router, and the internet went out.

I quickly grabbed my phone and connected to the studio with FieldTap, and we used it for about 15 minutes until the Wi-Fi came back on. We cut to a commercial break, and then reconnected with the BRIC-Link, and were able to continue seamlessly.

Knowing that this backup is available makes things easy for me and for station managers who are trying to sell remotes to prospective advertisers.

Every time I've had to call Comrex technical support, the folks there have been able to answer my questions. They're great at giving me clear answers, and seem to understand that not everyone is an engineer, so I leave with a clear understanding of what I need to do.

The only gear I need to sound great with FieldTap is my iPhone, my small plug-in microphone and a pair of earbuds. Not too long ago, we needed a van full of equipment to accomplish a remote like that, and it wouldn't sound nearly as good. FieldTap is a valuable and simple tool to have in my back pocket.

For information, contact Chris Crump at Comrex in Massachusetts at 1-978-784-1776 or visit www.comrex.com.

TECHUPDATE

AEQ CONSOLES ARE APP-CONTROLLABLE

The AEQ Arena, Forum and Capitol consoles have applications for remote control and operational assistance.

Forum and Capital virtual consoles are Windows- and iOS-compatible apps that faithfully reproduce every and all the operational features of switches, rotary encoders and faders, the company says.

The complete functionality of the physical control surface is available on a software application and can run in parallel with or completely substitute for the control surface, temporarily or permanently, locally or remotely. With the particular app installed on a tablet such as an iPad, users can remotely assist or relieve the operator of the console or make adjustments when the studio is unmanned during, for example, weekends.

All slides, meters, status indicators, hybrid and phone system controls are operational through the app in real time. The same is true for parameters such as equalizers, high-, low- and band-pass filters, compressors/limiters and noise gates.

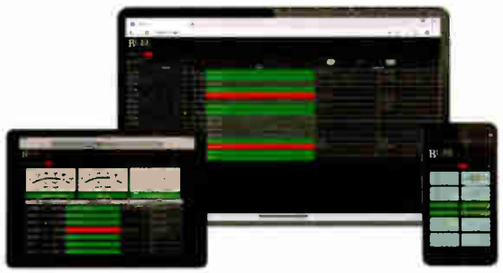
Customizable features include changing the number and size of VU and peak meters.

For information, contact AEQ in Florida at 1-800-728-0536 or visit www.aeqbroadcast.com.

World Radio History

TECHUPDATES

BURK INTRODUCES ARCADIA CLOUD SERVICE



Burk Technology says that its new Arcadia Cloud Service delivers fast, secure web access to remote sites for managers and engineers on the go. Users launch a browser window to monitor and control all remote sites over one encrypted web link.

Graphical views and alarm logs are generated automatically for all sites. Custom screens highlighting critical information from multiple sites can be created on the fly and stored for future use. Burk says Arcadia's responsive user interface adapts to fit each browser's screen size, enabling easy viewing on smartphones, tablets or PCs.

Arcadia runs on the AWS Virtual Private Cloud inside a company's firewall, continuously polling all Burk ARC Plus- and ARC Solo-equipped transmitter sites at a rate of 100 sites per second using fast, light Warp Engine connections. Remote logins are secured and encrypted by TLS.

Network Operations Centers running Burk's AutoPilot software can leverage the Arcadia cloud-based communications architecture. AutoPilot custom views and alarm logs in the NOC refresh continuously from the Arcadia cloud server, which Burk says increases network efficiency and improves coordination among multiple operators and facilities.

Burk says cloud server instances are updated as needed and are maintained to a 99.9997% uptime. The in-memory cloud database scales as required, offering high performance for very large networks and cost-effective operation for smaller installations.

For information, contact Burk Technology in Massachusetts at 1-978-486-0086 or visit www.burk.com.

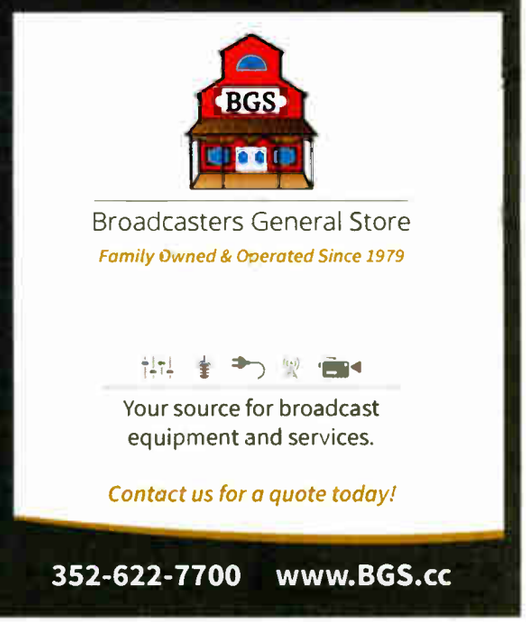
WHEATSTONE SHOWS LXE APP

Building off of its NAB Show demonstration of the LXE Glass virtual console, Wheatstone now highlights the touchscreen-based Remote LXE app.

It is a virtual mixer interface that provides complementary production functions for separate operators using an LXE board over an IP connection.

Real-time fader tracking and live synchronization of buttons and controls between the virtual surface and the physical LXE board offer an independent, yet shared user experience for multiple operators — or as a tool for engineers to remote in to correct operator setup issues.

For information, contact Wheatstone in North Carolina at 1-252-638-7000 or visit www.wheatstone.com.



World Radio History

TECHUPDATES

AXIA HIGHLIGHTS IP-TABLET MODULES FOR THREE NEW PRODUCTS

Axia says its introduction of new Radio Virtualization offerings at this year's NAB Show marked the next step in its disruptive AoIP technologies.

The latest additions to the software module lineup allow the company's IP-Tablet to remotely control additional products, now including Telos VX Enterprise and Telos VX Prime+ VoIP phone systems and the Axia iQx IP console.

The newest version of Axia IP-Tablet software coupled with the iQx allows broadcasters to put a foot into the world of virtualization, giving them the ability to be connected to several consoles at once and to use and share AoIP resources on the network or in the cloud, all from a touchscreen or a tablet. For those who still want a physical board, the iQx, which is a surface and mix engine in one, can take control of all AoIP streams within a Livewire+ AES67 environment.

With the addition of the iQx module to the IP-Tablet software, users gain the ability to control the console from any remote location. Axia also demonstrated IP-Tablet's compatibility with Burk Technology's remote software at the NAB Show. By using an HTML5 window within the IP-Tablet software, users can remotely control and monitor a transmitter site. Axia says that whether users prefer control by touchscreen, tablet or physical surface, they can use any kind of program, from anywhere, once connected to the virtual world of AoIP.

For information, contact Axia Audio/The Telos Alliance in Ohio at 1-216-241-7225 or visit www.telosalliance.com.

NEOGROUPE'S NBSSMART MANAGES INVENTORY ON THE GO

Software developer NeoGroupe has released a new version of its NBSSmart application.

NBSSmart, which works with NeoGroupe's asset tracking system, allows radio stations to easily carry out an inventory check. It also lets staff scan an item and immediately access its historical information, including details about the vendor as well as scanned documents including invoices, a picture of the item and more.

With NBS, technical teams and administrative staff can easily communicate with each other regarding assets. In addition, the company says, keeping information current is "effortless."

The application runs on smartphones and tablets and is available for iOS and Android.

For information, contact NeoGroupe in France at +33-9-72-23-62-00 or visit www.neogroupe.com.

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CCA FM8000G Trans 107.9, great cond; 4-Bay Jampro antenna w/deicers; 3-bay Shively antenna FM. D Brockman, 606-965-3436.

AUDIO PROCESSING (INCLUDES ON-AIR)

WANT TO BUY

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

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

MICROPHONES/ HEADPHONES/ SPEAKERS/AMPS

WANT TO SELL

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

WANT TO BUY

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

MISCELLANEOUS

WANT TO SELL

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

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

WYBG 1050, Messina, NY, now off the air is selling: 250' tower w/building on 4 acres; 12' satellite dish on concrete base; prices drastically slashed or make offer. 315-287-1753 or 315-528-6040

WANT TO BUY

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

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

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

I'm looking for KFRC radio special of Elvis Presley which aired on January 8, 1978. I'd be willing to pay for a digital copy. Ron, 925-284-5428.

EMPLOYMENT

POSITIONS WANTED

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

SITUATIONS WANTED

Manager-engineer with multiple decades of experience in many areas, seeks full-time executive level position (G.M.) or higher with CCM, modern Inspo, or G-rated family-friendly secular format(s). Prefer warm climates. Send complete details to: radiogm@hotmail.com

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MISCELLANEOUS

WANT TO BUY

I'm looking for the Ed Brady radio show in which he did a tribute to Duke Ellington, the station was KNBR, I'd be willing to pay for a digital copy. Ron, 925-284-5428.

I'm looking for KTIM, AM,FM radio shows from 1971-1988. The stations were located in San Rafael, Ca. Ron, 925-284-5428.

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

Looking for a broadcast excerpt of a SanFrancisco Giant's taped off of KSFO radio from 1959, interviews with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a home-run by Willie Mays and Felipe Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or ronwtamm@yahoo.com.

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

Looking for KSFX radio shows, Disco 104 FM, 1975-1978. R Tamm, 925-284-5428.

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

RECEIVERS/ TRANSCEIVERS

WANT TO SELL

Johnson Electronic SCA880 module, 67/92 Khz, 417-881-1846.

WANT TO BUY

AM Stereo radio. Call 417-881-1846.

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WANT TO BUY

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10 KW	1988	BE FM10A, Dual 5 KW
10 KW	1998	Nautel FM10, Solid State
20 KW	2004	Continental 816R2C
20 KW	1991	Harris HT20CD
25 KW	2004	Harris HT25CD
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Used AM Transmitters

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

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TRANSMITTERS/ EXCITERS/ TRANSLATORS

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World Radio History

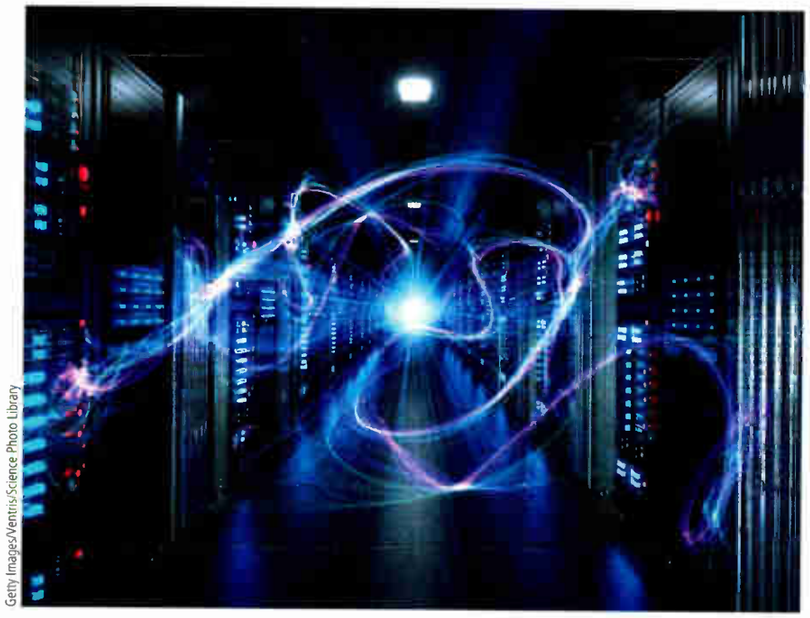
Audio Over IP Enters Its 20th Year

AoIP is just now gaining full steam for the radio industry, Sacks says

COMMENTARY

BY MARTY SACKS

The author is vice president of sales, support and marketing at the Telos Alliance.



Getty Images/Ventris/Science Photo Library

I know it's hard to believe, but AoIP for broadcast is almost 20 years young.

The Telos Alliance first began its work on what became Livewire in 1999. As I sit down to write this article, I am struck by the amount of time we've been working on this tech, telling its story and selling it.

However, I'm most amazed at how widely and deeply it has been adopted over the years, especially considering the resistance to it on several fronts, including industry vendors who were deeply invested in 1960s-era time domain multiplex technology and who told customers AoIP wouldn't work. The early adopter customers were trend-setters for sure.

Now AoIP is fully mainstream and almost no gear is sold that isn't IP-capable — even if it only works at the edges of the network (although this is clearly not an ideal topology to take full advantage of all AoIP has to offer).

For those who are just joining the discussion, audio over IP uses commercial off-the-shelf IT hardware made popular by enterprise users to power businesses (data and voice-over-IP networks) and build audio networks for broadcast and media content facilities. Ethernet switches and other hardware that is commonly used to build traditional data networks for government, hospitals and Fortune 500 companies can be easily architected to route audio and other program associated data, as all are IP packets.

The advantage of such an approach is cost- and time-savings in building facilities, along with the flexible scalability and the self-healing properties of IP networks.

THE PATH TO UBIQUITY

AoIP has passed through three significant milestones to become so popular, including:

1. Rapid adoption in radio studio facilities. The first real event to popularize AoIP was the adoption by radio facilities worldwide. Though Telos stood alone for a few years, other manufacturers have since developed AoIP products and helped customers understand the advantages of — and adopt — AoIP. Many AoIP studios have been built across the world and have proven the idea and the technology's reliability.

2. Creation of the AES67 standard. A big concern over interoperability of AoIP was addressed by the creation of the AES67 standard. Several manufacturers worked on a committee over a few years to iron out parameters for how audio should be shared amongst different AoIP equipment providers. Telos Alliance played a key role, including helping to underwrite the effort's cost, but we also salute the work of Kevin Gross, who headed the committee; Andreas Hildebrand from ALC NetworX; and our own Greg Shay, who contributed at a very high level to this work. Now, the AES67 standard has leveled the playing field and is a standard that allows all AoIP AES67-compliant gear to interoperate, regardless of native protocol, which has in turn widened adoption.

3. Creation of SMPTE ST 2110 standard. The final factor is SMPTE 2110. This suite of standards has been largely driven by the work of the Alliance for IP Media Solutions in an effort to adapt AoIP to the television production and transmission environment. ST 2110-30 is based on AES67 and was developed to make audio as compatible as possible with video. By using AES67, SMPTE 2110-30 allows audio equipment to work well with the rest of the 2110 suite. The television industry has fully bought-in and has accelerated adoption, which will power next-gen TV solutions like ATSC 3.0.

FOUNDATION FOR THE FUTURE

As Telos founder Steve Church was fond of saying, "When it's all IP there are no limits ..." The future is intriguing to the people we talk to every day, with

(continued on page 30)

READER'S FORUM

CONTRACTOR CLARIFICATION

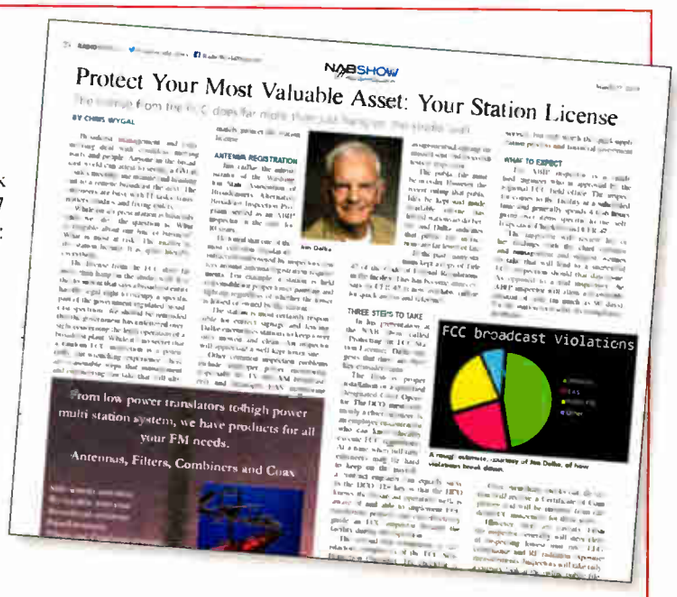
I was catching up on reading my Radio World back issues and an article by Chris Wygal in the March 27 issue caught my eye ("Protect Your Most Valuable Asset: Your Station License").

He mentions that contract engineers may be used in place of employees for DCOs. This might need to be clarified, as any AM directional or an AM over 10 kW must use an employee, not a contractor. The employee doesn't have to be full time, however.

According to CFR 2010 Vol. 4 Sec. 73-1870 (*https://tinyurl.com/y3nf6g64*):

> *b) Chief operators shall be employed or serve on the following basis: (1) The chief operator for an AM station using a directional antenna or operating with greater than 10 kW authorized power, or of a TV station is to be an employee of the station on duty for whatever number of hours each week the station licensee determines is necessary to keep the station's technical operation in compliance with FCC rules and the terms of the station authorization.*

Station owners should check with their attorneys for the most current info on this, of course.


NABSHOW

Protect Your Most Valuable Asset: Your Station License

BY CHRIS WYGAL

ANTENNA REGISTRATION

THREE STEPS TO TAKE

WHAT TO EXPECT

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Having started in broadcasting in 1967, I have seen many changes over the years and am surprised this had not been updated.

Walter J. Ellis
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World Radio History

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Nostalgia for the Good Ol' Days

A broadcaster reflects on four decades of radio and predicts what's to come

COMMENTARY

BY HARRY HOYLER

This year will mark my 43rd year in broadcasting. I, like many of our fellow broadcasters, have been in and out of the biz on several occasions.

I recently began writing and telling stories to friends and family about broadcasting and the ups and downs. I substitute teach in a local school district and broadcast high school sports. Obviously, when I teach, the subject of broadcasting comes up.

I am sad to say, but I have to be honest with young people by telling them there appears to be no future in broadcasting. The FCC, satellite, corporate ownership and automation have almost put the final nail in its coffin.

When I first sat in front of a mic there were still plenty of mom-and-pop operations.

Automation was basically still a future thing. The closest techniques to automation (that I witnessed) were Instacarts and reel-to-reel tape with hours of music recorded. The stations where I worked used the tapes so the jock could get long bathroom and smoke breaks. Cart machines were not used for music.

Jocks were busy in a control room, taking meter readings, delivering live commercials, PSAs and liners. Jocks generally had to keep a keen eye on the turntables for scratches in the vinyl and a bad stylus or cartridge. Strangely enough, we didn't call an engineer to fix a turntable; we did it ourselves. Same with lights on the board, drive wheels on cart machines and the forever squeaky carousel cart rack.

Today, with only a few exceptions, we get to hear the very mechanical voice of someone sitting in a sterile control room who is totally clueless about broadcasting. Most appear to be rather brainless and without any talent.

Over the years I have automated stations, but have *never* fully automated a station. I still believe we serve in the public interest and are the first line for news and weather.

Out of the 15 or so stations here, it is probably safe to say that 95% of the broadcast day is satellite. Live news is minimal and is delivered in the rip-and-read format (plagiarized from the local newspapers). There is not a radio news person at any of the stations.

The commission simply is not as interested in radio as they were before the early '70s.

I am an avid radio listener to local radio, and I DX a lot. DXing on the AM band is all but gone now. I am in northwest Arizona, and "back in the day" KOMA, KOA, KSL, WWL, KRLD, KVOO and a few others boomed into the area, no more. KSL and KOA still manage to make the trip but not with the clarity of past years.

DISMAL AT BEST

Local radio here is dismal at its best. All of the stations are owned by two separate corporations. Now, don't get me wrong; I am a capitalist and believe in the dollar. I have managed and owned stations and know what has to be done to make the "nut."

Weather is the saddest of all. We recently experienced a crippling snowstorm. Not a peep from any of the stations. I called one station and questioned why weather, road, electrical outage and shelter reports were not being aired. You'll love this. The answer was, "Oh, we're satellite and only sell advertising." Welcome to corporate ownership.

FM EXODUS

I am still angry at the commission for allowing AM and FM stations to split. This caused a mass exodus of, primarily, FMs to leave their original city of license and head for what would become an overcrowded metro area. The corporations have the FCC in their back pockets, make no mistake about it. No logical thinking human would allow so many small towns to lose their stations.

Okay, I'm ready for the backlash. "We had to move because the market dried up, and we couldn't make it." I find that a lame excuse. Corporations paid huge amounts of money for licenses they knew their attorneys could move and upgrade and ultimately sell the license for a massive profit. Wave enough money in front of a fool, and they'll jump at it every time.

I know, however, there were many stations sold due to the owner(s) getting old or dying — excuse accepted.

I enjoy telling students about the good old days, spinning records, taking music requests, talking with the listener, and if you were comfortable with the listener, putting them on the air. I remember lowering power at an AM and then putting on a long record then running to the tuning shack to change the tower pattern. In a rain storm that was a real treat. "American Pie" and "In-A-Gadda-Da-Vida" were popular for pattern change.

Now, if you contact the commission with a solid plan for a low-power FM in a small city, the answer is usually: "The market is already overcrowded and a new frequency is not available." This, for the most part, is hogwash.

The commission simply is not as interested in radio as they were before the early '70s.

It is also widely known the corporations will fight any new license tooth and nail. The corporations actually have a monopoly on radio broadcasting.

REMOTE MEMORIES

I enjoy speaking with youngsters about radio. Their eyes actually light up when I tell them about the shenanigans we pulled at remotes: Sitting in a horse trough full of cherry Jell-O (That stuff stains the skin!). Sitting in the basket of a 100-foot crane hanging over a car dealership. Holding 24-hour remotes at businesses. Hogtying pigs in a muddy rodeo arena. Pushing Oreo cookies down the long corridor of a shopping mall with our noses. And of course, no remote résumé would

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NOSTALGIA

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be complete without a good donkey softball game.

One time, I ran more than 150 feet of Belden wire from a woman's house so I could broadcast a six-man football game in the Texas panhandle. The field was lighted with car headlamps. The best thing was that we won.

Students find it almost unimaginable that these remotes were done without a cell phone.

I honestly miss those days, when radio was king and meant something to a community. Radio stations were the lifeline for news, weather, sports and school closings.

I would stay glued to WKY in Oklahoma City and anxiously wait for Danny Williams to tell us school was out for bad weather. We all knew Williams, Dale Wheba, Johnny Dark, Charlie Tuna and several others who kept us entertained on Oklahoma City radio stations WKY, KOMA and KOCY.

At night, I could listen to the big names out of WLS, WWL and KXOK. And who could forget the 250,000 watt flamethrower in Mexico with Wolfman Jack?

Radio was much better back then. We could have cared less about a little static; that was part of listening, as was jumping in the car and pushing the radio buttons to hear our favorite song or jock.

I guess if I live long enough and hit the lottery I will buy another station in some small city and bring back old-time radio. If I pay the bills and make a few bucks, that will be just fine. I think I would find a location where the station was stolen by some glutinous corporation and then buy the license back and move the station back to its home.

Wishful thinking...

AOIP

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AoIP serving as that future's foundation.

Here's one example: Consider that transmission sites in many parts of the world now have IP-based connections between studio and transmitter via low-cost Ethernet radio systems, MPLS or similar so that linear and bandwidth-efficient AoIP studio transmitter links are now proliferating with advantages, including higher-quality audio paths, lower cost, higher flexibility and greater monitoring and audio/data exchange capabilities. Our new Omnia MPX Node will transmit a full stereo composite signal with RDS at data rates as low as 320 kbps.

Now AoIP is fully mainstream and almost no gear is sold that isn't IP-capable — even if it only works at the edges of the network.

Another popular option is the non-traditional console. A console can now be a tablet or touchscreen with or without the actual traditional surface. The "screen-based" console provides the ability to heavily customize the user interface for an individual or show. The operator can also move around inside or outside the traditional studio to create the best broadcast on their terms, as opposed to being tethered to a console. Broadcasters have much more flexibility when doing remotes and the like.

The infrastructure options are also very interesting: No longer are facilities forced into using the traditional approach of assembling a group of purpose-built boxes connected via analog wiring, AES3 or even the preferred method using AoIP. We can use combinations of hardware and software as needed.

We are unlocking the software from the boxes to allow them to run in virtual environments, taking full advantage of the efficiencies and redundancies that the IT industry has brought to the rest of the world. Telos Alliance now has several products running in virtual machine environments, which we enjoyed showing visitors at NAB Show 2019.

This said, we remain committed to continuing to produce world-class hardware products because the same innovations we offer today and are working on for tomorrow can be easily be made available across our full range of hardware and software offerings.

Next-generation topology, again leveraging best practices in IT, allows efficient use of IT hardware and offers great reliability and redundancy for 24/7/365 applications. The options are plentiful as the audio paths for even the most basic radio and TV facilities grow in complexity as streaming, ad insertion, OTT and other game-changing business opportunities are presented to broadcasters.

Rack rooms can be smaller and require less cooling and conditioned power, yet accomplish more per square foot. There is even the potential for pieces of the station's infrastructure to actually locate in the cloud — very attractive for larger group broadcasters that share common systems amongst all their network or affiliate stations. Both noteworthy and comforting, this tech is proven and can scale to magnificent proportions, yet can be eased into one studio at a time for those who have smaller projects.

So while we've come a long way since those early days when we were developing the first AoIP protocol for broadcast in our labs 20 years ago, AoIP is just now gaining full steam for the radio industry, and the TV industry is following suit. But more importantly, it is the substrate upon which all future facility operations and standards exist, whether they are physical or virtual. The future for AoIP is bright indeed, and we, for one, are excited to be a part of it.

Radio World welcomes comments on this or any article.

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