RADIOWORLD

Your guide to radio technology

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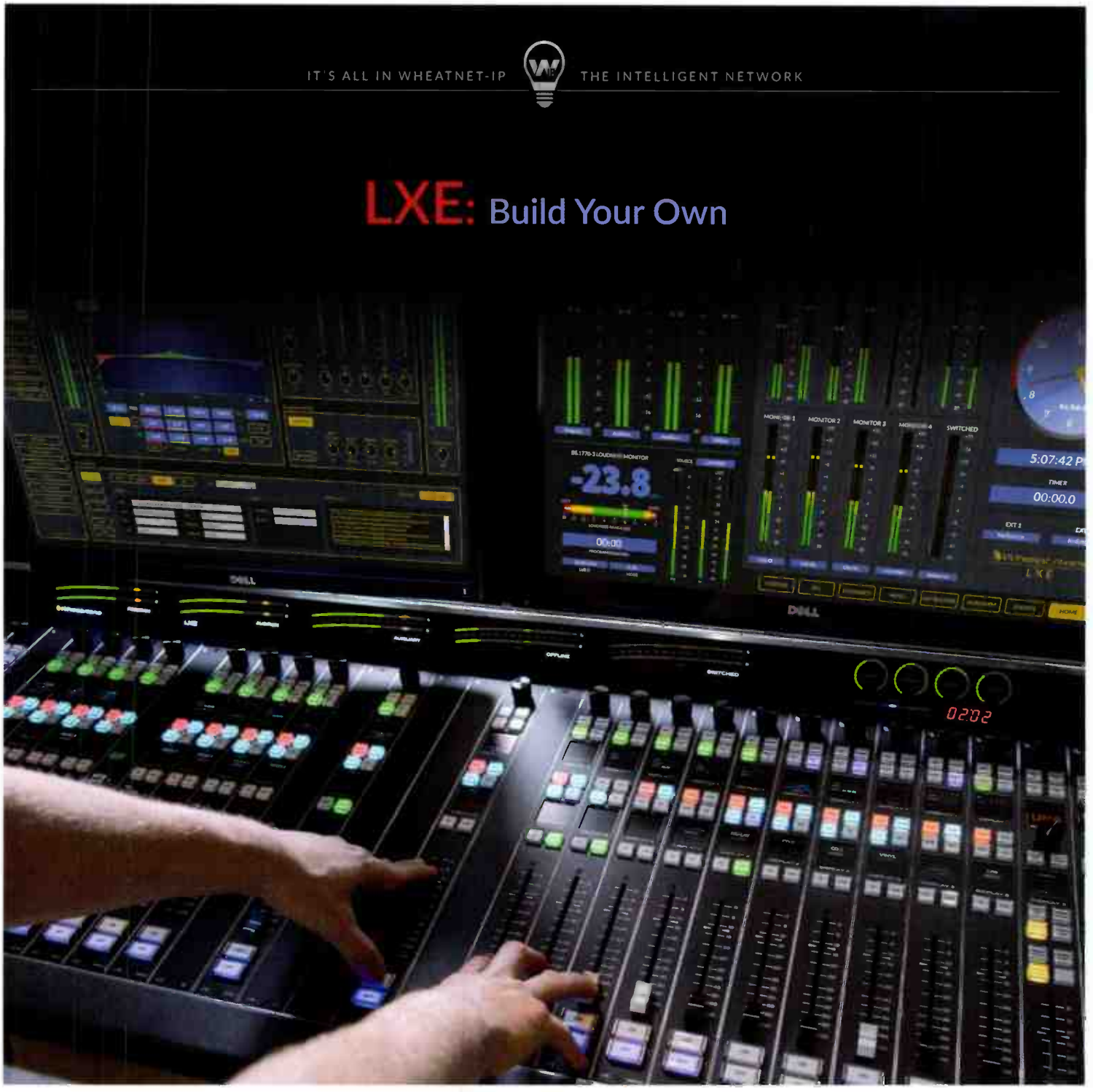
Curious, joyful & pushing limits

Steve Shultis embodies the values of his employer, New York Public Radio. He's the recipient of the Radio World Excellence in Engineering Award.

FUTURE



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Thank you for the privilege

A nice nod for RW to start the new year

Paul McLane
Editor in Chief

I'm pleased to share that for the second time in three years, Radio World has been chosen by Future plc, our parent company, as its "B2B Publication of the Year."

Given that RW only become part of Future in 2018, it's huge to have won this honor again. My colleagues and I want to thank you for helping make that possible.

On our company conference call in December, I explained that the industry that Radio World covers is going through changes that are both wrenching and exciting.

People who don't work in media often ask, "Radio? Isn't that last century's technology?" Everyone reading this has heard the question. But business experts have been underestimating radio's resilience and relevance since before Radio World itself was founded 46 years ago. The fact is that radio takes many forms today. As challenged as it can seem at times, our medium continues to evolve.

You can find examples throughout our coverage, whether it's iHeartMedia exploring the metaverse, or the director general of the BBC saying that his organization has to start thinking about when it will turn off all of its broadcast signals.

So the very definition of radio continues to change. Radio World evolves with it — offering our popular ebooks, our daily newsletters, our print issues, online events and much more. Like radio itself we intend to remain resilient and relevant.

Radio World is part of the AV Tech arm within Future's business-to-business division. While B2B encompasses many brands, the ones you might recognize include TV Technology, MIX, Systems Contractor News, Tech & Learning, Broadcasting & Cable, TWICE, TVBEurope, Residential Systems, AV Technology and the NAB Show Daily. We're in good company and proud to be honored among them.

RW is driven internally by the outstanding work of John Casey, Raffaella Calabrese, Elle Kehres, Lisa McIntosh, Will Shum, Nicole Schilling, Nicole Cobban, Rob Crossland, Jamie Franc and Michele Fonville with the crucial support of Carmel King. But none of us would be here without our valued advertisers and our treasured readers. Thank you for the privilege of working for you.

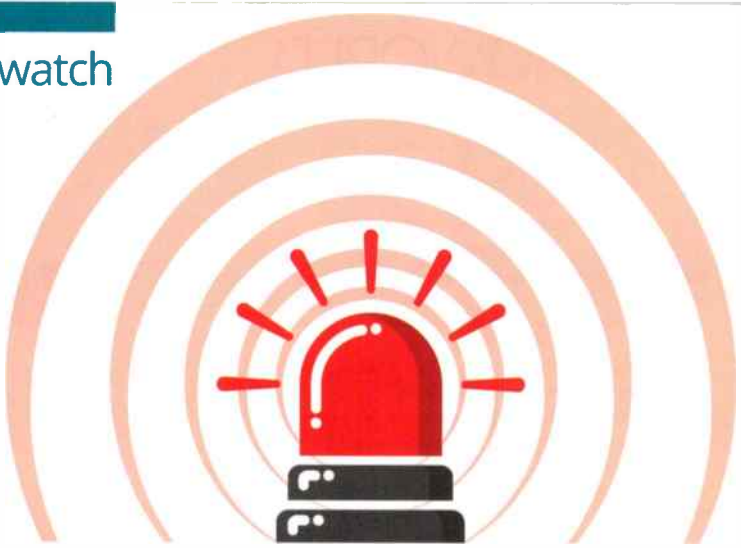
THIS ISSUE

NEWS

FEATURES

OPINION

EAS Changes Required by December 2023



The FCC recently issued a report and order aimed at improving the clarity and accessibility of Emergency Alert System visual messages to the public, including people who are deaf or hard of hearing as well as others who are unable to access the audio message.

This has implications for radio. EAS participants, including most U.S. radio stations, have until Dec. 12, 2023, to make changes to their EAS equipment in order to comply.

- Participants will have to prioritize CAP messaging by immediately checking for a CAP message whenever a conventional EAS message is received; and if there is a CAP version of the alert, that should be used instead of the conventional EAS message.
- There are changes in the text for the EAN "presidential" event code and the ORG code when used with EAN. The new EAN text required by the FCC will be "The United States Government has issued a National Emergency Message for the following areas ..."
- The FCC is changing the National Periodic Test message. For national NPT messages received via conventional EAS, a scripted text must be issued: "This is a nationwide test of the Emergency Alert System, issued by the Federal Emergency Management Agency, covering the United States from [time] until [time]. This is only a test. No action is required by the public." This means EAS devices must be updated to produce a stored script, unlike any other EAS codes. NPT messages received via CAP and regional NPT tests (i.e., with FIPS codes other than 000000) will be processed as before.
- National Information Center event code will have to be removed.

The above information comes from Ed Czarnecki, vice president of global and government affairs for manufacturer Digital Alert Systems Inc. and a member of the board of the EAS-CAP Industry Group.

Radio World asked him to help us sort out this latest FCC order as well as other recent actions and proposals from the commission related to EAS. Interested parties should read the full Q&A at *http://radioworld.com*, search "Czarnecki."

Above
A welcome sign is seen among debris as rescuers searched for signs of life at the Red Coconut RV Park in Fort Myers, Fla., on Oct. 5.

Writer

Randy J. Stine

Radio World's lead news contributor wrote recently about iHeartMedia's initiatives in the metaverse.

Lessons learned from Hurricane Ian

"At some point you just have to sit back and watch, and hope your backup plans all work"

The Gulf Coast of Florida is a hot spot for damaging hurricanes. Broadcast engineers know that the time to prepare is not while an eye wall is coming ashore.

The survival of infrastructure from such a direct hit is never assured, but planning, extra legwork and new technologies can go a long way to keep a station on the air or help it return in a more timely fashion.

The damage done by Category 4 Hurricane Ian in September was the subject of a Society of Broadcast Engineers WebXtra webinar. It featured Kevin Trueblood, CBRE, CBNT, associate general manager, technology and operations at WGCU Public Media at Florida Gulf Coast University in Fort Myers, Fla., and Aaron Schultz, IT director and assistant engineer at The Joy FM and its parent the Radio Training Network in Sarasota, Fla.

Kevin Trueblood

Aaron Schultz

Trueblood — who can rattle off names of past storms like Matthew, Michael and Irma and recount the damage that each did — says nearly every station in the Fort Myers market was affected by Hurricane Ian. WGCU(FM) lost its primary and backup STL links, Trueblood said, but was able to operate from an auxiliary transmitter site at its main studio.

While Sarasota was spared the worst, some tower sites were affected, Schultz said. WJIS(FM), Joy Radio's outlet in Venice, Fla., ran its transmitter site on a generator until its propane supply gave out several days after the hurricane. Roads to the station's tower site had been washed out, Schultz said, so a Nautel VS2.5 transmitter in a travel case, 12 kW gas generator and 55-gallon fuel tank with fuel had to be shuttled there via airboat.

What planning seemed to work and what would you do different?

Kevin Trueblood: Before the storm, we cleaned up our sites, topped off generator fuel and tested backups to make sure everything worked. What we could do better is ensuring we have enough people resources after the storm

— things like portable showers, port-a-potties, more food and more resources to support a large amount of staff who will be living at your studio for many days during and after the storm.

Aaron Schultz: Our pre-planning begins as we build each transmitter site. Redundancy is a necessary part of our operations. We use internet as our main form of STL almost everywhere, and because of that we install two or three forms of internet at each of our tower sites, typically a mix of fiber, cable, DSL, WISP and LTE, giving us the best chance of being on the air in any situation.

> **Each of our generators does a weekly fully loaded exercise and is maintained at least twice per year.**

Our yearly pre-hurricane planning usually occurs in early May, where we confirm all of our fuel levels at each of our transmitter sites and schedule fills where needed before the start of Hurricane season on June 1. We are meticulous when it comes to generator maintenance and testing. Each of our generators does a weekly fully loaded exercise and is maintained at least twice per year.

What would you do differently knowing the damage Ian did to broadcast sites?

Schultz: Have more fuel at generator sites. We had always planned for 3 to 4 days. After Hurricane Ian we are now planning for at least seven days of fuel at each of our sites, and for a few key sites where accessibility may become an issue, we are discussing expanding to 10 days.

Communication became quite a problem even around town. I live approximately 50 miles from where the storm made landfall, and while we never lost power, we lost internet at home for two days, and cell service was practically unusable for a week.

This storm has caused me personally to expedite my amateur radio test, so we could have a more robust form of communication, instead of a text to colleagues out-of-

Below
One of several airboats that helped shuttle people, equipment, tools and fuel to areas including the WJIS(FM) transmitter site.

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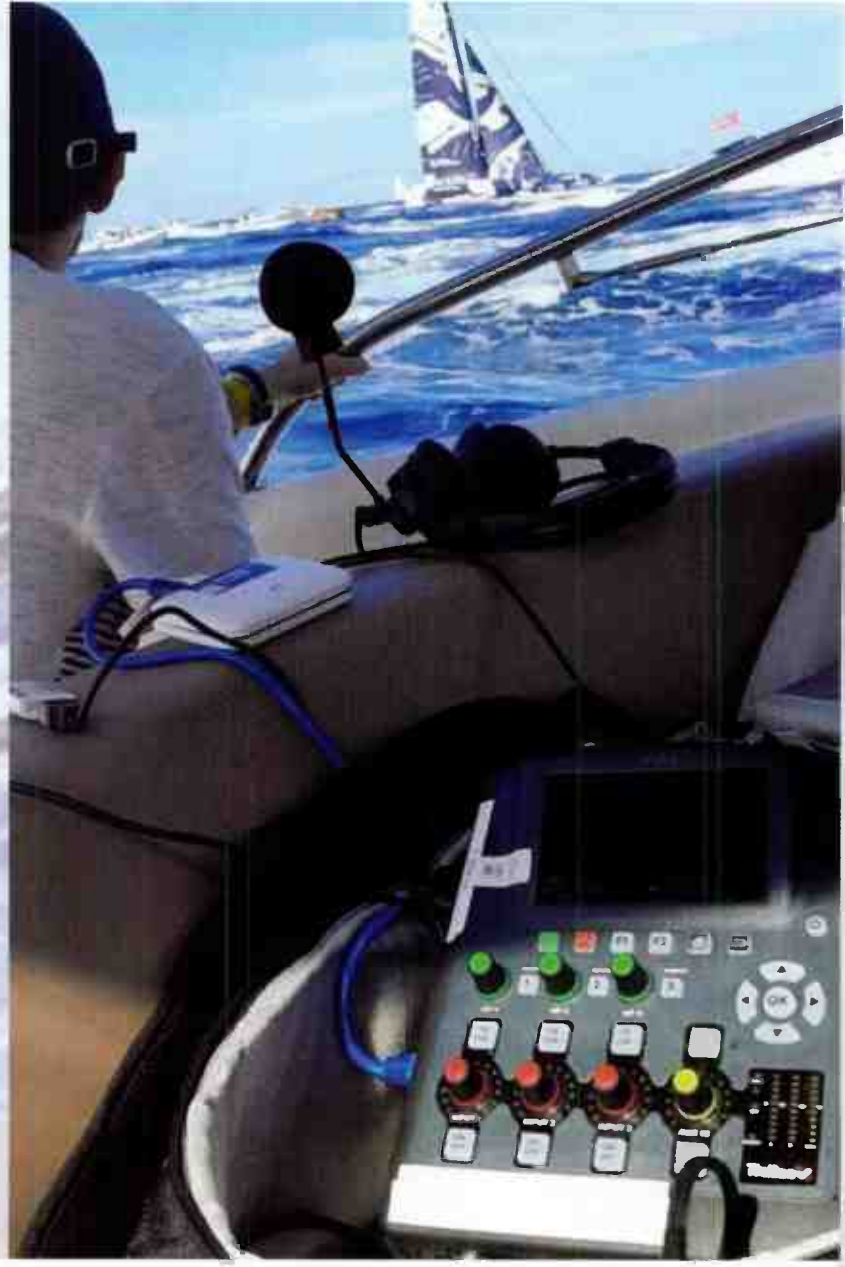

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Above
"This is the custom-made 55-gallon fuel tank and 12 kW gas generator," said Aaron Shultz. "This gave us about 50 hours of runtime before needing to be refueled."

state saying where we were, where we were going and when we planned to check back in.

What surprised you most about the aftermath and cleanup from the storm?

Trueblood: How many resources you'll lose, but also how quickly things rebounded. In the two days following the storm, 95% of our area was without power and without any water service due to water main breaks. But those things did rebound, and most sites had power and water restored in the following few days.

However, even after power was restored, cell service and internet service did not start reliably working in most areas until about four to five days after the storm.

Schultz: For us it was how fast power came back at most places, and honestly how quickly roads and access were restored once workers arrived. Second, how much the engineering community was willing to help each other. We had broadcast and cellular engineers willing to help in any way possible. We also extended a helping hand to other broadcasters in need, post-storm.

> **Even after power was restored, cell service and internet service did not start reliably working in most areas until about four to five days after the storm.**

How is the development of new technology helping engineers prepare? Aaron, during the webinar you mentioned a new fuel monitoring system.

Schultz: Security cameras at tower sites can give you so much information about what it's like at your site during a disaster as well as the added benefit of having a way to monitor who is around the tower site. Fiber internet and redundant internet have helped us immensely.

Monitoring of everything is crucial. We primarily use Burks at our transmitter sites, but we also monitor many aspects of our sites, including the UPS, the generator and the transmitter via SNMP with an open-source program called Zabbix.

For fuel tank monitoring, we use a product called Tank Utility to monitor our fuel consumption and fuel on hand at

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all of our tower sites. It updates periodically to a centralized web manager.

What is one piece of advice to other broadcast engineers when it comes to disaster preparedness?

Schultz: Redundancy, and testing your redundancy. But really you can only be so prepared. At some point during a disaster you just have to sit back and watch, and hope your backup plans all work.

Don't be afraid to think outside the box. Pool your resources. Maybe an employee has a small flat-bottom boat, an airboat, a tall lifted truck. Know what you have and ask around for what you may need.

Also stock up on fuel, motor oil, oil filters for your generators. You don't know how long you might be running on your generator, or how soon your generator maintenance company can get to you if you are running for an extended period of time.

We even purchased a diesel fuel transfer tank for our work engineering vehicle. It became invaluable in keeping us on the air and making it possible for us to travel areas to assist where there was no fuel for a few days.

Trueblood: Things will go down. Even your best plans will fail. What will get you through is being resourceful and knowing what you're capable of doing and who you know that can help.

To that end, make connections with your fellow engineers in the market and other broadcasters, particularly if you have shared sites.

Post-Ian, we were able to pool three separate broadcasters together to coordinate fuel delivery to one inaccessible site. Another broadcaster had an abandoned transmission facility we were able to utilize to get a station on the air whose site was flooded.

Are there other considerations that broadcasters sometimes overlook?

Trueblood: One thing to be very conscious of is the emotional toll it will take on your staff. After a disaster, your staff will be seeing and dealing with the devastation and telling the worst of the stories. That is, of course, in addition to their own personal losses.

In our case, several of our staffers had their homes destroyed or significantly damaged. Be prepared to give your staff a break and bring in additional staffing and resources to make sure everyone is supported so you can continue providing vital information to the public. And along with that, just patience and kindness. Because everyone is dealing with a lot.

Learn More

The webinar can be viewed at the SBE YouTube channel. Look for the Oct. 17 episode, "Engineering Before, During, and After Hurricane Ian."

John Bisset
CPBE

The author has spent over 50 years in broadcasting and is in his 32nd year writing Workbench. He handles western U.S. radio sales for the Telos Alliance and is a past recipient of the SBE's Educator of the Year Award.

Tips are GEP, too

Workbench submissions are encouraged and qualify for SBE recertification credit. Email *johnpbisset@gmail.com*.

Above
Brent Barber used AC splitter cables in the Dog Radio Studio to minimize low-current cable runs.

Right
These can help you create neater AC runs.

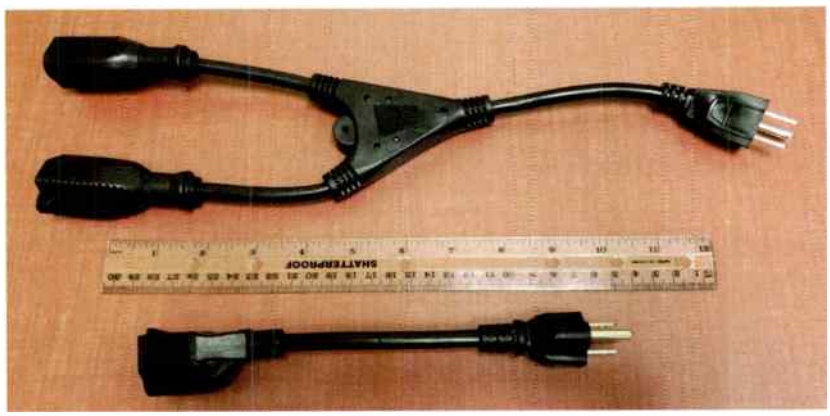
Surgical tweezers & hemostats — an engineer's tools?

Also, a resource to help you understand VSWR (from 1959)

Brent Barber is the AV director and radio/TV instructor at Crown Point High School, recently honored by the Indiana Association of Broadcasters as Radio School of the Year.

In constructing its studio, shown above, Brent minimized AC cable runs by using AC power cord splitters for low-amperage devices, and short pigtails to save AC outlet space when using wall-wart power supplies, as we've discussed here recently. Both are shown at right and are available from Amazon.

The station streams a hot AC format, hear it at *https://thedogradio.crowntownmedia.com/*.



"Clothespin! Stat!"

Veteran contract engineer and frequent Workbench contributor Stephanie Donnell saw the suggestion in our

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Above
A rubber grommet replaces a rubber band to secure these tweezers.

Below
A marketing image from the Arrowzoom website.

Oct. 26 issue from Art Reis, K9XI. Art used a rubber band to secure tweezers around a vertical bolt while he was replacing an LNB.

Stephanie has used a similar technique for years but instead of a rubber band, she uses a rubber grommet, as shown in the above photo. She keeps several sizes in her toolbox.

She adds that these are surgical tweezers that can hold vertically oriented hardware in place, but if necessary, other "tools" like an alligator clip can be pressed into service. If the bolts are long enough, even an old-fashioned wooden clothespin will work to keep them in place.

Another tool that can be helpful for holding delicate things are surgical hemostats. Stephanie remembers as a teen reading a suggestion in an issue of Popular Electronics to clamp a hemostat onto the lead(s) of a transistor to protect it from heat when soldered.

No reflection on you

Here's a resource tip for those interested in learning about voltage standing wave ratio, or VSWR.

Larry Wilkins, CPBE, was an engineering manager for Cumulus. In his "retirement," he oversees engineering services of the Alabama Broadcasters Association. Among other things Larry coordinates classes for radio and television engineers, a program that has benefited technical learners well beyond the Alabama state line.

At *www.al-ba.com*, under the Engineering tab, select "Continuing Education Series." Scroll to the bottom of the listed subjects and you will find an excellent tutorial on standing waves and impedance matching called "Understanding VSWR." The lecturer is John N. Shive of Bell Laboratories.

Shive developed a visual wave generator and uses it to explain standing waves and the standing wave ratio. The film also shows how transformers match different "line" impedances, and why you don't use 75-ohm coax to connect your 50-ohm FM exciter to the FM transmitter.

This lecture was filmed in 1959. Nevertheless I think you'll find the demonstration riveting, as the concept is explained thoroughly.

Recommendations, please

In addition to offering that free tutorial video to Workbench readers, Larry, who also chairs the Alabama State Emergency Communications Committee, poses a question: "What are stations using for an inexpensive, reliable FM tuner for EAS monitoring?"

Over the years, we've described a number of EAS antennas, including some do-it-yourself offerings, but I don't remember that we've discussed receivers.

Can you help? Email your suggestions (brand, model and cost) to *johnpbisset@gmail.com*.

Also remember you've still got time to submit your three most important items to check you visit a transmitter site. We'll summarize suggestions soon and have some useful prizes for the best entries.

Can you hear me in there?

Dan Slentz discovered a website that offers sound panels made in China and designed to fit on a standard door. Kits start at $150.

The Arrowzoom KK1184 kit includes polyester fabric panels that measure roughly 12 x 12 inches, in a choice of five colors. The site offers a 99 cent "sample" that options. If you "try and buy" let us know your thoughts. Check out *https://arrowzoom.com/products/*.

> **"Shive developed a visual wave generator and uses it to explain standing waves and the standing wave ratio."**

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Writer
Randy J. Stine

Shultis helps put radio's best face forward

New York Public Radio's CTO receives RW's Excellence in Engineering Award

Not too many people can brag about stashing a section of the original 1965 Alford master radio antenna from atop the Empire State Building in their office. For Steve Shultis, that piece of New York City broadcast history is a timeless keepsake.

"The heritage of broadcast in this city and the legacy of people like Andy Alford are very important to me," he said. "I have one of the 32 elements off the Alford antenna. It's about 120 pounds. And this particular piece is very important to me since after 9/11 we plugged a 1 kW transmitter directly into the Alford master antenna system to keep WNYC(FM) on the air for months until we could build out a full-power site" at 4 Times Square.

Above
Steve Shultis

Shultis, chief technology officer of New York Public Radio, is the recipient of the 19th annual Radio World Excellence in Engineering Award. The 35-year veteran of radio broadcast engineering is an integral part of New York Public Radio and the distribution of its innovative programming and content.

Recipients of the award represent the highest ideals of the radio broadcast engineering profession and reflect those ideals through contributions to the industry.

Shultis, 61, is responsible for all technology planning and oversight at New York Public Radio, including its state-of-the-art 85,000-square-foot broadcast studio, performance space and office facility. In addition, he oversees all business and broadcast IT platforms and network, broadcast engineering, telecom and MEP systems, Archive and asset management teams, A/V, podcasting and web streaming.

The organization's stated mission is "to make the mind more curious, the heart more open, and the spirit more joyful through excellent audio programming that is deeply rooted in New York." Its portfolio includes two major FM

stations in the city — classical WQXR and news/talk flagship WNYC — along with WNYC(AM) and four Class A FMs in New Jersey, which formerly comprised New Jersey Public Radio. It also operates WQXW(FM) in Westchester County, licensed to Ossining, N.Y.

Its broadcast complex in Soho in lower Manhattan occupies three floors of a 12-story building and includes The Jerome L. Greene Performance Space, a 6,000-square-foot live performance venue. The organization employs around 350 people, according to Shultis, including 70 in the newsroom.

"As knowledgeable as they come"

"Steve models forward-looking practices for how 21st century major-market radio stations look in today's car dashboards," said Paul McLane, editor in chief of Radio World. "The organization is doing that through public-facing metadata and visual displays and integration of NYPR's systems with HD Radio and the public radio MetaPub system. That's just one reason we selected him for this award."

> **"We have the most creative technical problem solvers in radio. I firmly believe that."**

Industry colleagues tout his vision for the digital future of radio.

"Steve is keeping NYPR on the cutting edge of radio broadcasting technology and he does his best to share what he learns and does at NYPR with the industry," said David Layer, vice president, advanced engineering at the National Association of Broadcasters.

"Steve is as knowledgeable as they come in the broadcast engineering community, and on top of that he's one of the nicest and friendliest people I know."

Shultis grew up in upstate New York and got his first taste of audio as an apprentice for record producer Albert Grossman at Bearsville Records, located not far from Woodstock, N.Y. In high school he worked at the recording studio after school managing the tape library, which included stocking tape and supplies like razor blades and splicing tape.

Above
Shultis with an element of the Alford master radio antenna that once hung on the Empire State Building.

"That was really something. Here is this famous jet-setter record producer, who worked with Bob Dylan and Janis Joplin, and he went through the local high school to find a student who might be interested in acoustics and audio recording to work for him. I think we can all learn from that. Here was a guy who gave a youth a chance at a vocation. It was really just dumb luck that I was right up the road from Bearsville Records."

Shultis would sit in occasionally on sessions, including those by Peter Tosh. The popular reggae artist once recorded with Mick Jagger of the Rolling Stones at the studio as Shultis looked on.

"I was the unnamed assistant running cables and doing gopher jobs, but it was still very cool. I also met Todd Rundgren and the Isley Brothers."

Shultis holds degrees in sound recording technology and music composition, so his focus on audio quality issues in broadcast radio is not surprising. His first job out of college was as a recording engineer in the music department at the University of California in San Diego and he even spent time as a plant mastering engineer for Sony Classical Recordings Inc.

In 1987, Shultis joined New York Public Radio. Today he oversees six technical teams with three dozen people

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PRESENTED TO

STEVE SHULTIS

Chief Technology Officer,
New York Public Radio

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Steve, thanks for your friendship and your contributions to this great industry!

nautel

From surviving hurricanes to 9/11 to the global pandemic to knowing the best diner near the WNYC(AM) site, Steve you have it covered. Unflappable and forward-thinking, you are an "engineer's engineer."

orban

Congratulations and well-deserved applause for your engineering accolades.

RCS

Congratulations on this well-deserved award! Thank you for being a valued colleague and a long-time friend of The Durst Organization - you're the best!

Our congrats to Steve, for his exemplary leadership in evaluating and helping develop the next-generation technologies for the radio industry and public radio.

XPERI

Thank you for the passion, positive energy and commitment to excellence that you bring to your job and to our industry.

RADIOWORLD

reporting to him. The teams include broadcast engineering, facilities engineering, IT, broadcast applications and infrastructure, archives, streaming and on-demand architecture.

"And within IT we have two teams — one for business and one for broadcast — with two separate directors. We have the most creative technical problem solvers in radio. I firmly believe that."

Those teams were critical for innovative implementation of technologies during the pandemic, including building a farm system of home studios to support the staff of its stations. "Honestly, the only reason for this award and this interview is because of the technical team we have here," he said.

Shultis, who reports to NYPR CFO Armando Gutierrez, says most of his major projects at the organization have morphed out of a business need. "Maybe that is a simplification. I'm a technologist and I love to play with technology. But you have to be able to pivot to what works best for the business. And have the vision and be flexible enough to adapt quickly."

Audio quality of the organization's stations is a top priority for Shultis, who says that in New York City, it's imperative that a station, whether it be commercial or noncom, sound exceptional.

"I am kind of biased by being in New York. Market Number 1's engineers all run a pretty tight ship. We are all peers and listen to each other and push each other. If you want to get better you want to compete against the best. We have the best of everything in New York City. It really promotes sharper skills and innovation."

Inset
Souvenir from a party in 2002 celebrating the restoration of full-power FM transmission after 9/11.

Above
Shultis in 2003 with a vehicle used for testing reception strength of experimental FM IBOC multicast channels.

Lots of bytes

Shultis has long advocated for podcasting and streaming as critically important radio media channels that need nurturing. Not long ago Shultis calculated that New York Public Radio was delivering a petabyte and a half (a petabyte is more than a million gigabytes) of digital content via podcasts and streams each month.

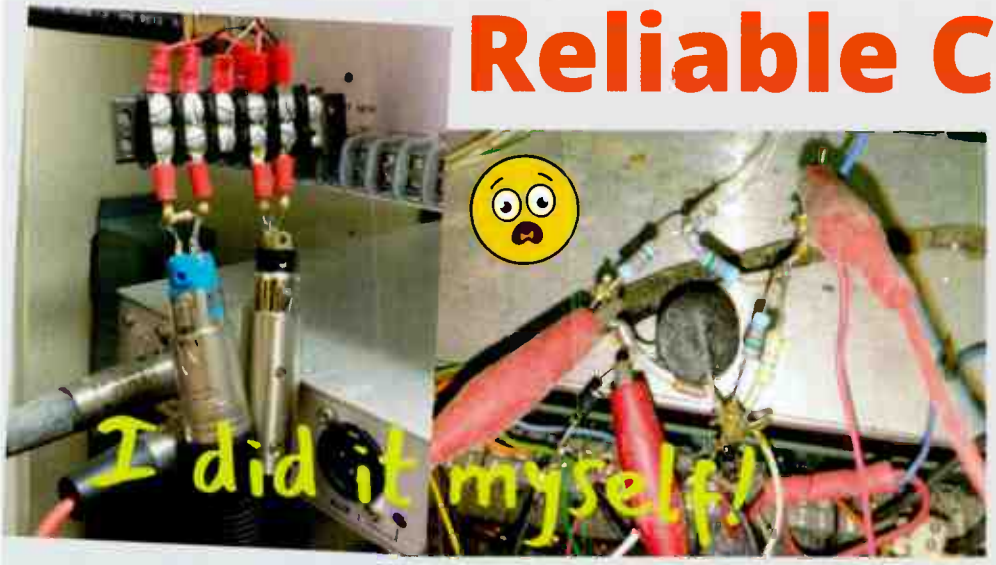
"And you have to be willing pay for it. Unlike broadcast radio where your expenses are generally locked in whether one person or a million people are listening. But if you are getting like 20 or 30 million audio downloads a month and you are delivering that much data through the ISPs, you have to pay for every byte. You need a lot of sponsorship to do that," he said.

Part of building a digital future for radio means maintaining relevance in connected cars, Shultis says, with a focus on how radio looks via visual content and published metadata.

His organization is hyper-focused on public-facing metadata and visual displays and integration of NYPR's systems with HD Radio. It is testing Rapid software from HD Radio developer Xperi, which automatically collects visual content and publishes it on digital radio platforms, terrestrial FM, online and mobile.

"It is obviously critically important for radio to look good in the modern dashboard with consistent metadata. When you tune to WNYC, not only will you see all the metadata there but also eventually the Top 10 podcasts on WNYC to take advantage of the connected car," he said. "I want to see a world where linear

> **"Market Number 1's engineers all run a pretty tight ship. ... If you want to get better you want to compete against the best."**



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- **2017–18** Larry Wilkins
- **2018–19** Russ Mundschenk
- **2019–20** Dave Kolesar
- **2020–21** Jason Ornellas
- **2021–22** Roz Clark
- **2023** Steve Shultis

Top right
Shultis rows out to the transmitter site of WNYC(AM) to survey damage after Hurricane Sandy in 2012.

broadcasts push people to the non-linear products like podcasts and vice-versa."

Shultis says he has a close relationship with Xperi engineers, and his stations have been at the forefront of recent developments to allow HD Radio stations to boost power levels. Several field tests using WNYC(FM) were conducted under FCC experimental authority last year and used by NAB and Xperi to develop a higher-power formula for FM HD channels to improve coverage without creating interference. The FCC is collecting comments on the proposal.

A recent ambitious project is the organization's new digital asset management system, Shultis says, which is a repository that is searchable and recoverable for internal staff. It is about to launch, administered by a small focused team.

"We have audio in there from 1937. It includes a huge number of valuable assets. We used to have silos of storage but had nothing that tied the whole company together. This unifies all assets, including production, taxonomy and marketing and legal and broadcast, in a single system," he said.

Eventually the library could be made available to the public and to researchers and be used as a revenue-generating tool for the organization, he says.

Crisis memory

WNYC was one of the orphaned FMs in the attack on the World Trade Center on 9/11, its transmission plant destroyed in the fall of the towers. It's a day Shultis will never forget.

"Our studios at the time of 9/11 were in lower Manhattan, about five blocks from the World Trade towers.

> **"I want to see a world where linear broadcasts push people to the non-linear products like podcasts and vice-versa."**

Of course we immediately lost WNYC(FM), housed with the other FMs on Tower 1, but we also lost the microwave STL to WNYC(AM) that was located on the tower. We restored that quickly using our backup leased land lines. But when the towers were hit, our building management issued an evacuation order.

"It was a milestone event for sure. One thing I do recall is the generosity of both the late John Lyons at 4 Times Square, and the entire Empire State Building Master FM committee, who bent over backwards to help us restore using space in their transmitter rooms and the combiner room."

Shultis says one career highlight has been serving with several broadcast industry support groups, including the National Radio Systems Committee. Shultis chairs the Data Services and Metadata subcommittee.

Top left
Installing a C Band replacement dish atop the city municipal building that formerly housed NYPR's studios and offices.

Top right
Hosting a tour of the stations' transmitter room at Empire in 2005.

"The thought that I'm a chair still blows me away. I'm incredibly proud of my peers for the important work they have accomplished and are accomplishing for the radio industry," he said.

In addition, Shultis is on the NAB Radio Technology Committee and working with Cox Media Group's Roz Clark within the RTC's Next-Generation Architecture working group, which is looking at the future of the entire radio STL chain.

"Bonneville's Jason Ornellas has been leading a sub-group focused on a next-gen virtualized platform for Nielsen, and I have been doing the same for EAS, basically articulating the benefits and needs for a modern platform for these two important pieces of the broadcast chain, for which the EAS part is now the very last component of the broadcast chain that is not yet virtualized and solely dependent upon hardware," Shultis said.

The organization is also a sustaining member of the Audio Engineering Society and typically sends upwards of a dozen or more staff to its annual conference in New York, he said.

"Since we have many team members who are involved both in remote audio production — live concert hall and other local venue broadcast and recording — as well as daily in-house live music production and broadcasting and the more typical radio newsroom engineering work, many of our engineers strongly gravitate and depend upon the Audio Engineering Society for peer papers, research and presentations and open dialogue with manufacturers that all works to further their craft."

Through his more than 35 years leading the technologies and infrastructures that support New York Public Radio and its forward-looking work, Shultis says the humans stand out the most.

"The people here have been amazing. I must say the passion runs deep, especially for those at WNYC. This has really been my only job, so it's all I know. But we all go the extra mile to make sure the stations sound their best. We are all perfectionists with a passion and put in long days. And many of my co-workers are people I started with 35 years ago. It's amazing."

Shultis and his family live north of the city. It's a scenic 70-mile train ride along the Hudson River. He raises ducks and chickens on his small farm and hopes to raise Nubian goats someday.

Writer

Wayne M. Pecena

CPBE, 8-VSB, AMD, ATSC3, DRB, CBNE

Member, SBE Education Committee

Is SNMP really that simple?

We conclude our series with a look at Simple Network Management Protocol

This is the eighth and final part in a series.

Is the Simple Network Management Protocol really simple? Like many technology-related questions, the answer is "it depends."

SNMP was created by the Internet Engineering Task Force and defined by a series of IETF Request for Comments, or RFCs, as a means to monitor and control devices in an Internet Protocol, or IP, network. SNMP is used widely in information technology environments from equipment providers such as Cisco, Juniper, Microsoft, Ubiquiti to many others.

More important to the broadcast engineer is the increasing popularity of SNMP in broadcast-specific equipment. A quick look at familiar industry products from brands like GatesAir, Nautel, Telos, Tieline and many others reveal SNMP is implemented in their equipment today.

SNMP version 1 was adopted in the late 1980s, defined by RFC 1157. It has matured to the current offering, version 3. SNMP v3, defined by several RFCs, was adopted in 2004 and incorporated missing security enhancements from the previous release versions. These enhancements focused upon encrypted communications and authentication. Previous versions of SNMP are now considered to be deprecated.

SNMP operates at the Application Layer of the OSI model and is considered one of the core protocols within the IP family. The User Datagram Protocol or UDP is utilized for all SNMP communications directed to or from designated UDP ports 161 and 162.

Maybe SNMP is considered simple because there are only three system components: The SNMP Host Device, the SNMP Agent and the SNMP Manager.

The SNMP Host Device is the hardware device that is monitored and/or controlled. An SNMP Agent is the software application executed on the host device that caches performance data that is monitored on the device. The gathered data is either pulled from the device or the agent may proactively send data upon an event.

The SNMP Manager is the heart of a SNMP system, acting as a centralized collection point to poll agents for the desired performance data or accept events that occurred. The Manager contains an SNMP Management Information Base (MIB) associated with each type of device being monitored or controlled. The MIB is a hierarchical database using Object Identifiers (OIDs) to define the specific parameter to be monitored or controlled.

Or maybe SNMP is considered simple because the command set consists of just four basic and three enhanced commands:

Basic Command Set:	Enhanced Commands:
- GET	- GET NEXT
- SET	- GET BULK
- RESPONSE	- INFORM
- TRAP	

The GET command is issued by the manager to a host device to retrieve a variable or a set of variables at a desired polling interval. The RESPONSE is the information returned by the host device to the manager. The SET command allows the manager to change a variable on a host device. And the TRAP command is an alert sent by the host device to the manager rather than waiting for a GET command from a polling interval.

The additional three commands making up the SNMP command set allow bulk operations to more efficiently poll or

About This Series

This article is based on an excerpt from the Society of Broadcast Engineers CBNT/CBNE Study Topics webinar series, designed to assist those seeking SBE certification and to provide others a broad overview of IT as used in broadcast engineering. This webinar and many others are available to anyone for a modest fee, with members receiving a discounted rate and free to those with the SBE MemberPlus upgrade. Consider joining if you are not a member at *sbe.org*.

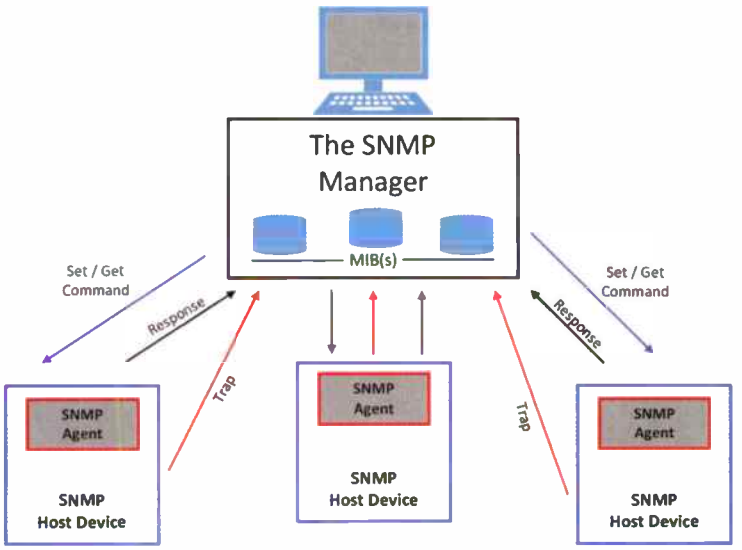
gather large amounts of data in a structured manner from a device.

Ease of use

For most, SNMP is considered simple because of the ease of interfacing with supported hardware devices. Specifically needed is an IP connection to the host device being monitored, which is often the familiar RJ-45 Ethernet cable. Many broadcast engineers have encountered the multi-conductor point-point wiring array of up/down relay closures, scaled analog metering voltages and logic-level status indicators encountered when interfacing a transmitter remote control system. The ease of an SNMP interface will likely be appreciated with a single RJ-45 Ethernet cable.

However, simplicity does not come without some complexity in other areas.

The complex part of implementing SNMP can be found in the programming or configuration of the SNMP Manager to poll devices to obtain data for display of desired operating parameters and/or acting upon events occurring. A broadcast engineer wants to receive email or SMS text alerts when error conditions occur or performance parameters go out of tolerance; the laborious task of setting these up can be eased by an SNMP manager that offers Graphical User Interface design tools or GUI screen-creation wizards.



Above
Simple Network Management Protocol System

Another area of potential complexity is the variety of the SNMP options available, ranging from open-source managers to commercial manager platforms capable of monitoring thousands of devices with appropriate price points. As more of the broadcast technical plant becomes an IT-based system and more broadcast equipment providers incorporate SNMP in their products, don't overlook the power and flexibility of a centralized SNMP-based monitoring system alerting you to system performance and fault reporting. When shopping for broadcast system equipment look for SNMP support and the appropriate MIB from the equipment manufacturer.

Please let us know what you thought of this series. Email the author at wpecena@sbe.org *or Radio World at* radioworld@futurenet.com.

BROADCAST EQUIPMENT EXCHANGE

Writer

Don Angelo

Veteran broadcaster, consultant, member of the Buffalo Broadcasters Hall of Fame and chairman emeritus of the Buffalo Broadcasters Association

Comment on this or any article. Email *radioworld@futurenet.com* with "Letter to the Editor" in the subject line.

Will listeners find you in the dashboard of tomorrow?

You'll have to give them a good reason

In 1960 Ed Murrow asked the question that still begs an answer: "What are we to say and how are we to say it?"

Marconi changed the world when he invented wireless communications that gave us radio. David Sarnoff added video to radio, creating national TV. Then came global satellite communications, the computer, the internet and smartphones.

These means of communications have given humans the opportunity to bring the world together through education and better understanding to create peace and love among all generations forever.

But local TV became a slave to national TV entertainment content that put us all to sleep, failing in its opportunity to touch people in each community. Local radio became a jukebox, the possession of giant corporate groups that duplicate a small number of easy-to-program formats across hundreds of markets with fewer broadcast people.

A new world is on the horizon — 5G, quantum computing, next-generation robotics and artificial intelligence are about to change the world again. Plans are in place to take your steering wheel away, but in the meantime, your next vehicle will have a big-screen dashboard to control everything, replacing your old radio with no tuning or volume knobs.

A recent Radio World article quoted a Lexus official saying the company has no plans to remove AM radio. But your dashboard big-screen interface infotainment system will combine AM, FM, satellite, Apple music, Amazon music, etc., enhanced with metadata all in one. You'd best not try to change stations while driving. All must be pre-selected and programmed based upon your personal taste. Radio will become only one of many options on these main and sub menus.

The million-dollar question: Is your programming unique and memorable enough to convince listeners to go through the multiple steps to set up their favorite sources to listen to?

How stations use their metadata will help them become better competitors. How radio uses visual presence and that metadata will separate it from the crowd.

What will listeners select on these new screens? It will not be the boring standard-fare corporate radio lineup of canned formats delivered by low-paid voice trackers to 300 markets simultaneously around the clock.

The music industry is in turmoil without a plan and has no direction while the music talent pool has dried up. The only thing left is oldies of the decades.

Meanwhile, growing numbers of 18-to-49 listeners are moving away from music radio by programming their own favorites into their smartphones and other personal devices.

Innovators like Drake and Chenault, who reinvented radio with their syndicated "Less Talk More Music" top 40 pop-rock formats, are dead. All we get today is 10 variations of rock formats, country, sports and talk. There seem to be no more unique and super-talented on-air personality stars. What happened to comedy?

Radio and TV can only be saved by fresh, innovative, creative concepts — new and different content that does not exist today. John Malone said content would be king. What would radio do without automated formats?

The question still begs an answer. What do we say and how do we say it? Anyone have an idea?

metamorworks/Getty Images

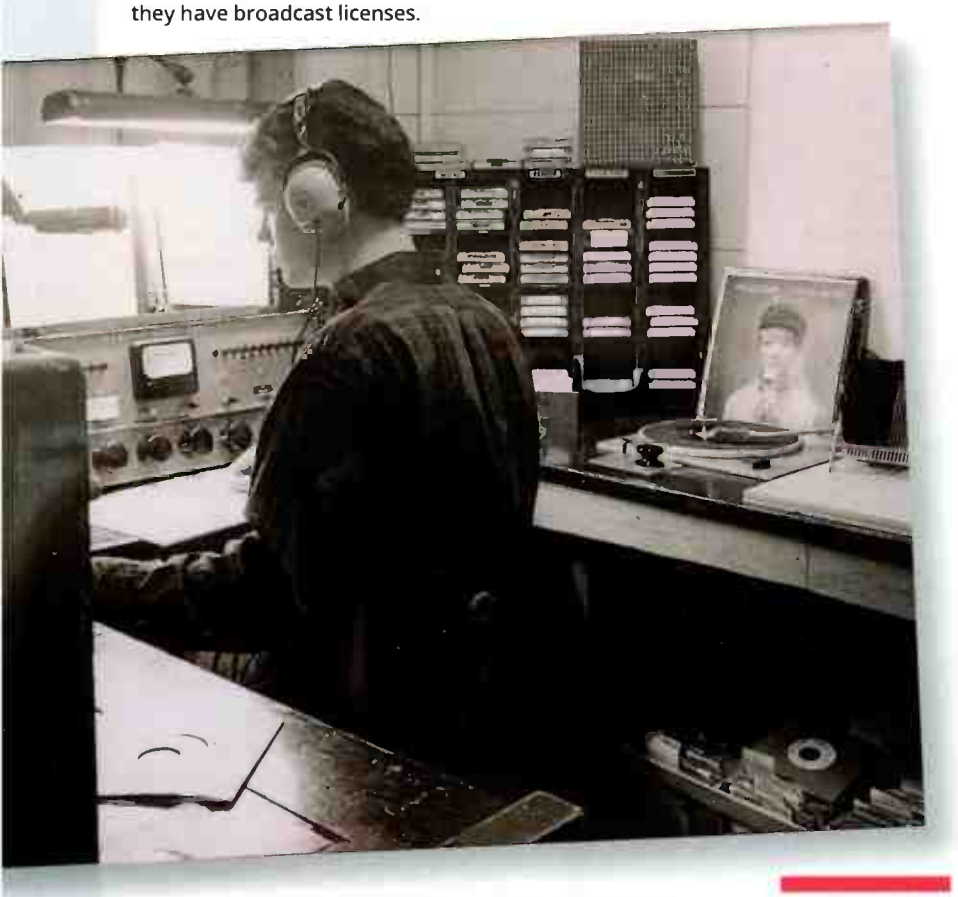
Colleges, think twice

I think having an OTA, brick-and-mortar station is still a good idea for colleges ("Don't Sell That License," Oct. 26), but they need to look at their communities and find a niche.

That happened here in San Antonio when Trinity University was about to sell KRTU to Educational Media Foundation. Instead, they kept the license and got AT&T to give them a big check to upgrade the signal.

The format flipped from classical/jazz to pure jazz (while the kiddos get to play their tunes at night). Now we have a service that you'd never expect for a blue-collar market like San Antonio. That plus TPR's programming is helping attract tech companies that don't want to pay Austin prices.

So colleges should think twice about their situations if they have broadcast licenses.



College radio is how I found a career, so I'm a fan. In my case, it was campus carrier-current radio back in 1966–67. My parents thought I'd gone mad! But somehow I found my way. Attached is a photo of the control room from 1967. This was WQAD in Wright Quadrangle at Indiana University.

Gary Keener
San Antonio

Getty Images/EzumeImages

Audio quality shouldn't make listeners crazy

Regarding the problems of audio quality that Dan Slentz heard on the radio during "An Annoying Drive Through the Middle of Ohio" and described on *radioworld.com*:

In my neck of the woods, the engineers, PDs and even air talent are tuned into technical quality and will immediately report an issue to me or station management.

Just last week, a morning show host reported that a very slight left-channel hum had suddenly appeared on the output of the production computer she uses daily. Yup, very low level, not likely to be audible on-air in most listening environments, but with headphone gain cranked this aging engineer could hear it. Massaging a couple of connections between that computer and its audio wiring made it disappear.

I have a very fussy PD with golden ears. It took me awhile to fine-tune audio processing to please him and myself at the same time.

FM and HD sound great, and folks visiting from other company clusters marvel at how good we sound. This is no accident. It takes more than good engineering talent. It requires all staff members to show some interest in their (our) product. Even our sales folks have chimed in about how we sound and where multipath might have been annoyingly bad. I've used their observations to alter audio processing and plan for replacement antennas and new coverage patterns.

Ira Wilner
Chief Engineer
Monadnock Broadcasting Group
Saga Communications
Keene, N.H.

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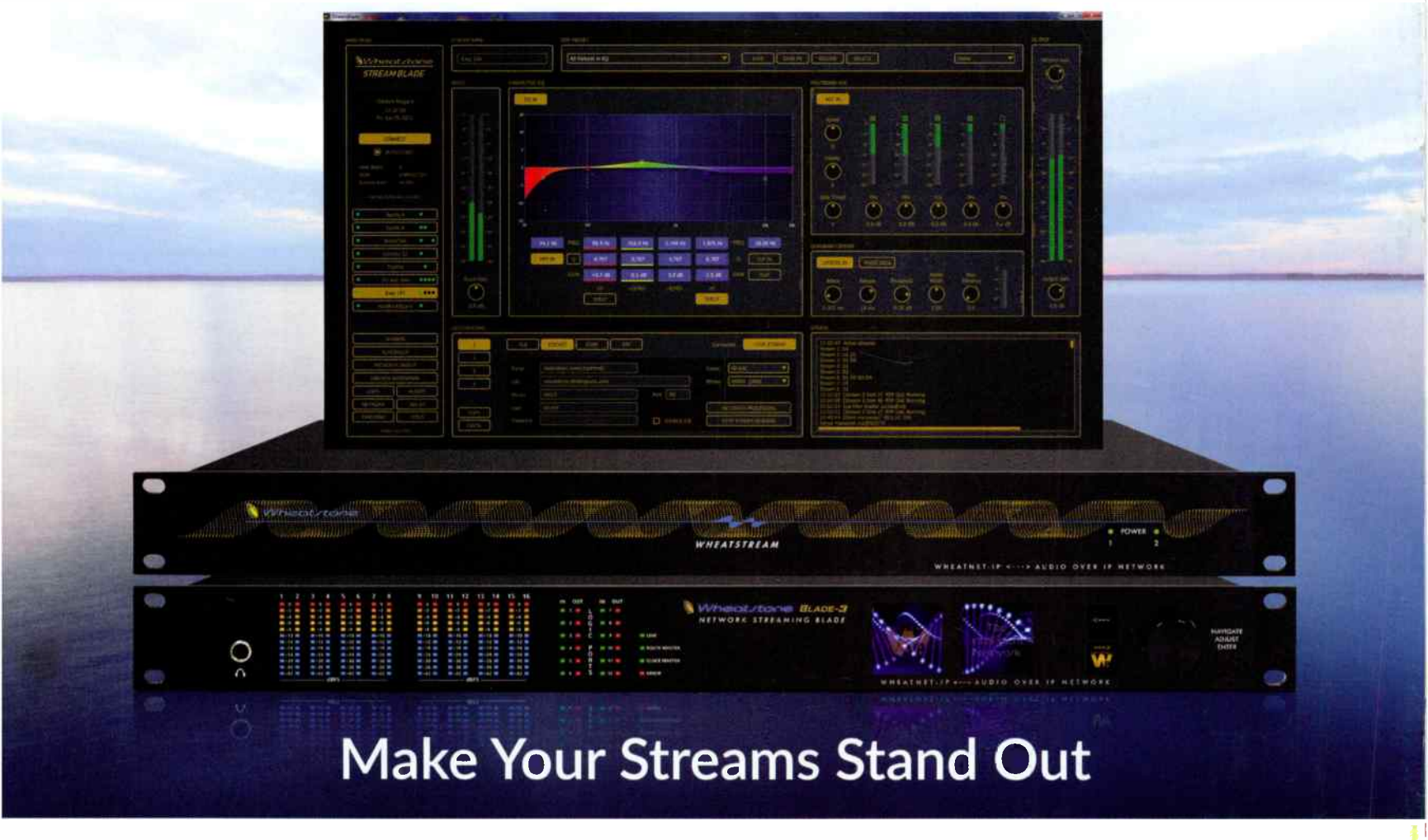

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