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On Interference, “We Need a Better Solution”

RW asked Ed Henson to shed light on discussions about translators vs. full-power signals

The following interview appeared in the recent Radio World eBook “AM Translators: What’s Next?” Ed Henson Jr. served on an NAB working group that proposed a rule change to facilitate resolution of interference complaints between translators — which are classified as a secondary service — and distant but full-power stations. We asked him about it.

Henson is president and owner of Henson Media, which has two AM stations (each with an FM translator) and two full-power FM stations, all in Kentucky. He is a media broker and valuation expert; member of the NAB Radio Board; board member and former president of the Kentucky Broadcasters Association; and son of a radio engineer.

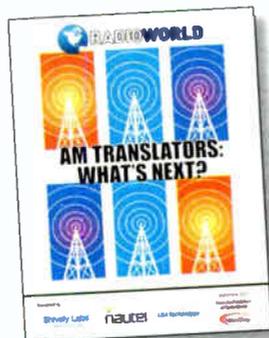
RW: Has the AM translator regulatory strategy generally been successful?

Henson: This proceeding has done a lot to help revitalize AM broadcasters. And it helped to revitalize the AM band as well, because it makes those stations more viable and people will keep those AMs on the air. AM stations can now do [more] high school sports. A lot of stations are daytimers with no nighttime signal, or have highly directional nighttime signals; now they’re able to provide service to that community. I’ve been in towns in Kentucky where people are very grateful; they can hear their station on AM, and now they can also hear it on FM.

RW: You expressed concern that AM stations put in such effort to build and promote translators, yet with one interference complaint, all that can be lost.

Henson: I have a lot of respect for the way the allocation rules and policies work, except when it comes to translators. From my perspective, the way translator interference issues are resolved is like the Wild West.

There were already many translators on the air prior to the 250-mile waiver move window last year, and there were about 1,000 filed to move translators; and there were 1,081 [applications] filed in the July window this year. So there are a lot of translators coming on the air. [Interference] is only going to get more prevalent. We need a better solu-



tion for it.
Read the full ebook at radioworld.com/ebooks.

Among the 1,081 applications filed in July by Class Cs and Ds, there were 93 groups of mutually exclusive applications involving 201 applications. But that would leave 880 singleton applications, and those stations are probably coming on the air pretty soon. And then of course the next window will open up in 2018.

I know of cases where stations had to hire a private investigator to investigate the person making the complaint to prove whether or not that person is a disinterested listener, or whether they have any ties to the complaining station.

I’ve heard people say, “There are

I have a lot of respect for the way the allocation rules and policies work, except when it comes to translators.

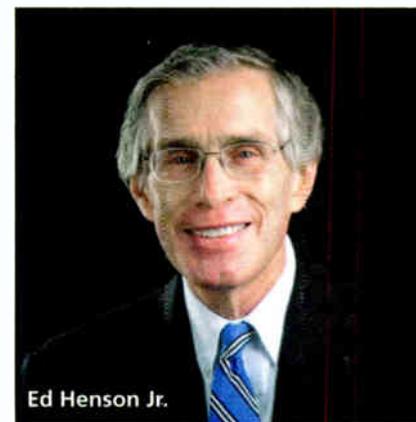
— Ed Henson Jr.

only 25 or 30 complaints with the FCC involving interference with translators; how big an issue is this?” But whatever that number is, on both sides of the equation, the full-powers and the translator operators, it’s a huge issue. They deserve a better system.

I represent broadcasters in Kentucky and West Virginia on the NAB Board. I approached the staff at the NAB because I’m getting a lot of comments from broadcasters in my district that we need a better system of resolving these complaints.

RW: So where does that effort stand?

Henson: We had a committee of eight people. We had [engineers] Jeff Littlejohn from iHeartMedia, Sam Wallington from EMF, Mike Cooney from Beasley, Sam Caputa from Emmis; but then you also had Bud Walters, who is a small-market broadcaster; Bruce Goldsen, an NAB board member and a small-market broadcaster in Michigan; and Dr. Chuck Anderson, a consulting engineer who is very knowledgeable about translators.



We made three proposals in January. The board adopted one and asked the NAB staff to file a request for rule-making at the commission. That request is pending at the FCC.

Currently, if a translator is on the air and a full-power station comes on the air and displaces it, that translator can move anywhere in the band to find a new home as a way to resolve that interference.

But say a translator is on the air and a full power comes and complains, “Hey, you’re interfering with me,” the only flexibility a translator has in that case — not displacement, but interference issues — is to move three channels up

and three channels down. So if you’re 101.1, you can go to 101.3, 101.5, 101.7 — or three the other way.

What we proposed is that the FCC would allow that translator to move *anywhere* on the band. Of course, it’s going to have to prove that the new frequency won’t cause interference; but this gives it more flexibility in finding a new home.

It won’t be a panacea, especially in larger markets, because it may be hard to find additional frequencies in larger markets; but in small and medium markets, in most of the country, you could probably find another frequency.

That helps full-power stations, because they get rid of the interference more quickly; it helps the translator because it can have more options to stay on the air; and it helps the public, who continue to get the service of the translator.

My personal view — and this is only Ed Henson Jr. talking — is that we also may need some kind of contour. We’d say, “Within that contour, we’re going

(continued on page 6)

Digging Into the American Archive: a Local History

How WGBH came to play an important role in the American Archive of Public Broadcasting

BY KAREN CARIANI

The author is senior director, WGBH Media Library and Archives, and project director for the American Archive of Public Broadcasting.

Many public radio stations in the United States had similar beginnings; this article gives a brief history of WGBH radio and information about the American Archive of Public Broadcasting.

WGBH is a leading public radio and TV station based in Boston. It traces its beginnings to the 1830s, when John Lowell Jr. bequeathed money to begin the Lowell Institute. Its mission was to fund free public lectures to help educate the citizens of the city.

During the mid-20th century, with the development of broadcast technology, and thus potential broader reach for the lectures, the Lowell Institute decid-

ed to broadcast the lectures via radio. Early broadcasts were on commercial radio stations, borrowing time when it was available. The Lowell Institute Cooperative Broadcasting Council (LICBC) grew tired of begging air time on commercial stations and never being able to develop a real schedule. In the late 1940s, the FCC began to issue more licenses to non-profit stations with the intent to increase the broadcast of educational programming; the LICBC took advantage of the opportunity to acquire a license.

WGBH(FM) went on the air in 1951 and WGBH(TV) followed in 1955. The call letters were based on the location of the transmitter on Great Blue Hill just outside Boston. The station's mission was to further the goals of the LICBC by broadcasting programming such as lectures and concerts, to educate and inspire the citizenry of Boston. The LICBC formed a consortium from the



Karen Cariani

leading educational and cultural institutions in the city to oversee the station. To this day presidents of four of these institutions remain on the station board of trustees.

RECORDING HISTORY

Originally, many non-commercial stations were on university campuses. WGBH originally was housed on the campus of MIT at 84 Massachusetts Ave. in Cambridge. Its first broadcast was a concert of the Boston Symphony. Early productions were local news and often reports of national events targeted for local audiences. The audience was limited to the geographic circle the

FROM THE EDITOR



Here is one in a series of guest commentaries in association with the Radio Preservation Task Force (<http://radiopreservation.org>). In November the task force will hold its second conference on Capitol Hill with participants from the public, private and educational sectors. They will focus on strategies for preservation and classroom implementation of historic federal, noncommercial and local radio recordings.

— Paul McLane

transmitter could reach. The station soon created new programming for children, like "Children's Circle" in 1952, and arts and culture programs like "The Creative Mind," which interviewed artists such as Agnes de Mille, who discussed choreography in 1958.

In 1961 there was a fire at the MIT studios. Much of the archive of early programs was destroyed. But the community came together to keep WGBH on the air. Radio was back on the air within 24 hours; getting the TV broad-

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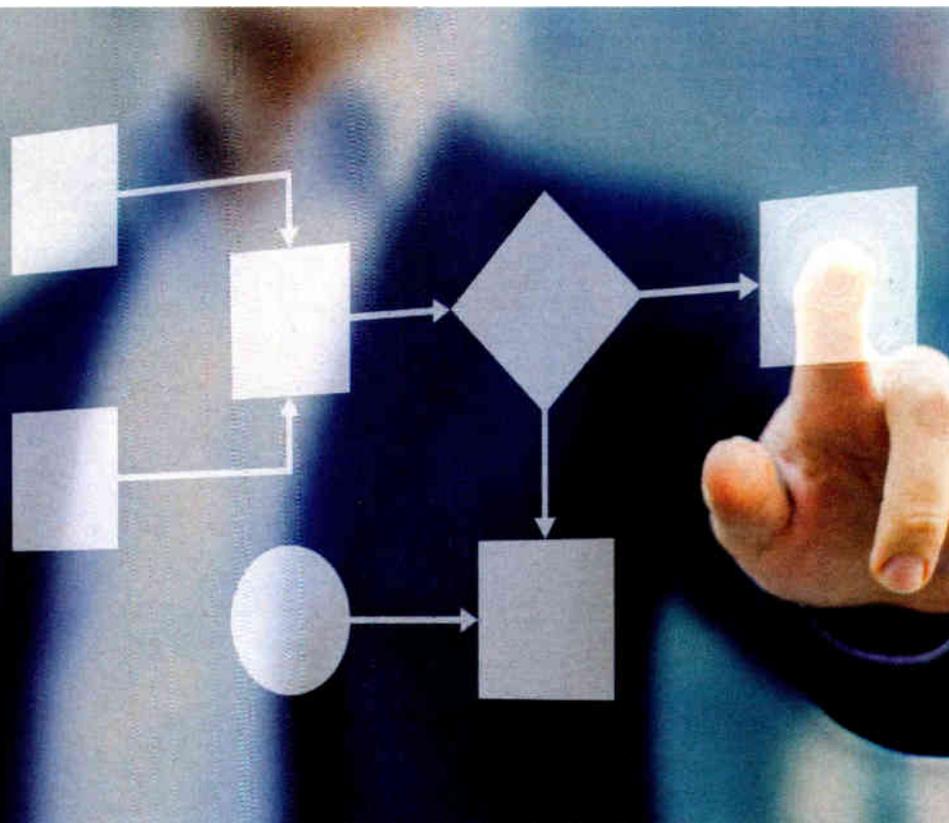
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OCTOBER 25, 2017

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The John Silva Collection, courtesy of Don Kent

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cast back on the air took a little more time.

At the new studios, WGBH continued to broadcast lectures and the symphony but also began to cover national events for local audiences. A loose network of stations formed called the Educational Radio Network, sharing reporting and programming to cover national events more effectively and economically.

In 1963, eight years before National Public Radio hit the airwaves, WGBH and this small network of radio stations teamed up to broadcast full, uninterrupted coverage of the March on Washington for Jobs and Freedom. As the march unfolded, quarter-inch tape rolled in Boston, recording speeches by Martin Luther King Jr. and John Lewis of the Student Non-Violent Coordinating Committee; music by Mahalia Jackson and a very young Bob Dylan and Joan Baez; an interview with Marlon Brando and much more — 15 hours altogether. These tapes, now in the WGBH Media Library and Archives and available online at Open Vault (<http://openvault.wgbh.org>), are the only complete audio coverage of the broadcast in existence.

Only ERN and CBS television offered complete live coverage of the March. Mainstream America had never heard Martin Luther King Jr. or other civil rights leaders deliver their full argument for their cause. The Educational Radio Network offered a chance for people across the country to monitor the events and absorb the message of civil rights.

FUNDING CHALLENGES

WGBH continued to produce programs like "Reading Aloud" for chil-

dren, but in the 1980s radio had less funding than TV. With the new PBS network, and satellite delivery, TV had broader reach. Major series like "Nova," "Frontline" and "Masterpiece Theatre" were grabbing attention and funding. Funding for radio was limited and the station put most of its efforts to broaden the TV reach with new productions.

Radio was, however, ahead of the game digitally with online streaming, taking advantage of the internet, podcasts and possible international collaborative broadcasts. It was much easier to stream and distribute via radio/audio than TV; rights are less complicated, file sizes are smaller and the technology is less complex.

At WGBH, radio has gotten a major boost with the resurgence of news programming. Not only does it broadcast the national feed from NPR but it also creates and airs local programs for the Boston audience. The programs continued to inform, entertain and educate, and are now once again getting more resources.

WGBH, like so many local public stations, began with a mission to educate the public, and it wasn't the only one to keep an archive. Similar types of programs exist at stations across the country. In order to help preserve this great heritage, WGBH and the Library of Congress were awarded the stewardship of the American Archive of Public Broadcasting in 2013.

AAPB

The American Archive of Public Broadcasting is a collection of radio and TV materials created by or for public

TV and radio in the US dating back to the 1950s. The goal is to preserve for historical purposes and for access by the public, the significant historical content created by public media, and to coordinate a national effort to save at-risk public media before its content is lost to posterity.

About half of the 40,000 hours in the initial digital collection are radio archives. The collection is being ingested into the Library of Congress preservation system for long-term preservation. Initial launch of the website (<http://americanarchive.org>) in February 2015 gave the public access to 2.5 million inventory records. All the media is accessible on location at WGBH and the Library of Congress and now about 20,000 items are available through the On-Line Reading Room to the general public in the United States.

The collection represents more than 100 stations across the country, and mostly locally produced content. Examples of highlighted local content can be found in the curated exhibits (<http://americanarchive.org/exhibits>). Some minimal cataloging to allow easier access by grouping programs into topics has been accomplished, but there is much still to do to improve access.

Today WGBH still records lectures to share with the broader public. Those programs are now part of the AAPB for a future audience. Radio continues to broadcast the rich cultural history of America. The American Archive collection creates an opportunity to discover radio history and local community history across the country over the last 60 years.

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SMART

(continued from page 1)

Mansfield, Ohio, recently spoke at the Texas Association of Broadcasters conference about how he uses Amazon's Echo and Alexa devices to serve his stations' viewers and listeners. Pat Higbie is CEO and co-founder of XAPPMedia, a developer of voice interactive radio strategies and custom skills; his company has created skills for more than 400 radio stations.

EARLY PROMISE

Although we are still early in the overall game for voice-activated technology in the home, there are strong indications of its positive impact on radio listening habits.

"Since launching iHeartRadio on the Amazon Alexa properties in July 2015," Radley said, "we have seen an unprecedented 300 percent increase year over year, with 3X growth to date in 2017 listening hours. The exciting thing for radio is seeing how the ease of voice control brings the radio experience back into the home with long extended listening sessions."

Meisse observed positive changes at his stations, and noted how it has changed radio listening in his own home.

"Our TSL and sessions on our streams are up significantly over the last two years. This represents a much larger growth than before these devices were on the market," he said.

"Prior to purchasing a smart speaker, my wife would be listening to Pandora when I got home for work; now I come home and she is mostly listening to broadcast radio on the devices via the stream. It has totally changed our listening habits. I now have five of them, and it is neat to see how it has brought broadcast radio back into the kitchen, living room, etc."

Higbie emphasizes an urgency in getting started with voice as quickly as possible. Not only is this the time when listening habits are being formed with a new medium, but it is also important to claim your brand.

"Many brands are repeated across the country. For example, there are four B95s. Only the first to launch on voice can be B95. When the others migrate, they will have to rebrand themselves as



Of the top 100 most reviewed Alexa skills, music and audio lead with 4.38 out of 5 stars, according to recent data from voicebot.ai.

B95Albany, B95.1 or B95 Country."

On this point Radley disagrees: "Amazon and Google will always try to give back the most relevant response based on the information provided to them, and it is our responsibility to make this as intuitive as possible to the user," he said. "Station names from the 'Play' intent *can* be duplicated because the rest of the data — frequency, call letters, location or combination of all of these — will not be."

BUILDING SKILLS

Optimizing for voice platforms such as Alexa takes organization, planning and skill.

"One of the quicker development options is a feature from Amazon called

Flash Briefings," said Meisse. "It allows you to publish local news content on Alexa devices. You can feed RSS feeds into Alexa and have her read them, or you can setup audio files that she plays. We have a 'WMFD Skill' that plays local news, sports, weather and the pol-

Cumulus, Cox and Greater Media.

"Voice-based software detection has a success rate of roughly 95 percent and keeps improving with demand and usage. However, there is still work to be done to improve returns and make the

(continued on page 8)

My wife would be listening to Pandora when I got home for work; now I come home and she is mostly listening to broadcast radio on the devices via the stream.

— Robert Meisse

INTERFERENCE

(continued from page 3)

to be very diligent about protecting full-power stations, resolving interference complaints, making sure these things don't drag on; but at some point, beyond that contour, before it becomes totally unreasonable, full powers are no longer protected."

Translators are secondary services and they must remain secondary services. But they're also rebroadcasting a primary service. We don't want to lose sight of that, either. So the question becomes, at what contour do you have that cutoff? If you get 10 broadcasters in a room, you'll get 10 answers.

My own view is that full powers should be protected beyond their FCC-protected contours. When you calculate HAAT for protected contours, the calculation is only done from two to 10 miles. Beyond 10 miles, it takes into account nothing about terrain, which can change dramatically. I think you need to go beyond protected contours. My own personal feeling is somewhere, at least 6 dBu more than in the protected contours — or you can make somewhat a good case for a 48 dBu contour — beyond that, full powers would no longer be protected.

Some of the great stations in my area are big Class C FMs, and they need to be protected. They provide a real service

for people. [But] if you have a thousand people listening to the FM translator, and maybe two or three people complaining they can't hear the full-power station 100 miles away, at some point I think the translator deserves — I think the FCC needs to look at it and say, "Where is the public being served the most?"

RW: Is there anything else you would want AM broadcasters to know to maximize a translator opportunity?

Henson: Not all translators are created equal. Any money spent on good engineering even before you file is money well spent. Make sure you get a competent engineer to design your translator.

The best way to avoid interference complaints is to make sure, when designing it, that you're looking for the frequency you want to be on; make that extra effort to look at the Longley-Rice studies; drive your signals and see where you don't hear other stations. Put a lot of effort into finding the right frequency for your translator.

Also, I don't even call it a translator, I just say WSON(AM), and WSON(FM). We embrace the fact that you can now hear our signal on FM.

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SMART

(continued from page 6)

phrases required to access these stations more natural intents.”

Higbie said smart speakers are much more than just another streaming channel; stations need to plan for the amount and kinds of interactivity that they want.

“For example, you may want to create a custom skill that changes the welcome message by daypart. Then, listeners are greeted by the voice of the personality who is on the air at that time.”

interactivity usually require someone with a great deal of tech savvy.” (To that end, his company now offers a “self-serve” portal, called Voice Radio, that is intended to let radio station staff who lack programming expertise build skills quickly.)

Smart speakers and voice-activated technology appear to be here to stay, and smart broadcasters should anticipate what is next.

“I always look at these new technologies as opportunities, not threats,” Meisse said. “They are additional ways that we as broadcasters can do what we

The exciting thing for radio is seeing how the ease of voice control brings the radio experience back into the home with long extended listening sessions.

— Steven Radley, iHeartMedia

Another option is time-shifted listening. “Not everyone is on a 9 to 5 schedule,” Higbie said. “That means that stations are losing drive-time listeners who would like to hear their morning or afternoon personalities. Now they can break out of the linear broadcast constraint. The best Alexa skills for radio provide listeners with multiple listening options, and on-demand access is an easy place to start.”

“AMAZING RETURNS”

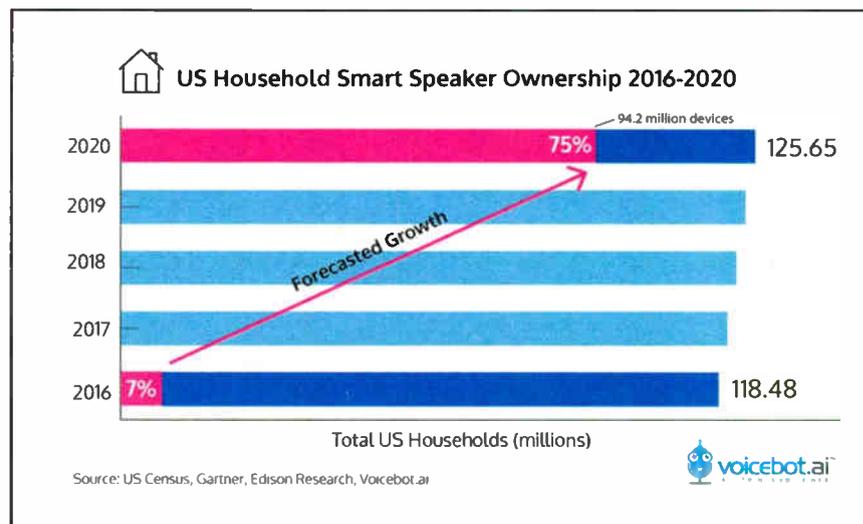
Deciding what you want to do with smart speakers determines the technical savvy necessary to create the skills.

“You need to have someone who has a strong technical background to create the skill,” Meisse said. “It’s not hard coding, but it is also not simple. You will need your content — news, sports, weather — as MP3 files on a secure server. Those then get coded into the skill via the developer account with Amazon. Once your skill is built and approved, you basically just keep those MP3s updated and promote to your listeners to get the WMFD Skill.”

Higbie echoes that the expertise required depends on the interactivity. “A decent programmer can build an average skill, but more advanced suites of

are in the business of doing, reaching people. The great thing is that you can also monetize them.”

Radley said broadcasters should keep up with the Amazon development documentation that is available publicly and changes that will emerge on the Music Skill Kit over the next year as it becomes more of an open source platform for supporting media content providers. “The shift of technology from



Data from the U.S. Census Bureau, Gartner and Edison Research show that just 7 percent of U.S. households owned a smart speaker in 2016, but that ownership is expected to explode over three years, reaching 75 percent in 2020. Source: voicebot.ai

broadcasters that have already committed to digital and now to voice is just at its infancy, and we are already seeing amazing returns.”

Higbie says that while smart speakers are a home-and-office phenomenon now, they won’t be confined there for long. “Amazon Echo is rapidly building a big audience for the Alexa voice service. While this is predominately in the home today, later this year it will include 15 million Ford vehicles and millions more from other auto manufacturers. This is not an audience of millions, rather an audience of hundreds

of millions in the U.S. alone.”

Finally, it is important for stations to take the long view on the smart speaker market. Amazon Echo holds about 90 percent of the market share, but that is likely to change, as Google Home, Microsoft Cortana, Apple HomePod and others jockey for position. That means stations must envision voice interactive radio as a multiplatform phenomenon.

Share your observations about how personal assistant technology is affecting the radio industry. Email radio-world@nbmedia.com.

GRABBING RADIO BY THE GRASSROOTS

Radio World contributing photographer Jim Peck visited the recent GRC2017 — Grassroots Conference in Albany, N.Y. He provided this group photo of some of the attendees, presenters and organizers from the end of the first day. The conference touched on a range of topics including programming, program production, station management and operation, fundraising and finances, marketing and promotion, legal, IT and technical along with experiences and advice from public broadcasting, nonprofit broadcasting and LPFM professionals.

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World Radio History

SBE*(continued from page 1)*

Leifer, 54, succeeds SBE President Jerry Massey and begins his term as president at SBE's national meeting in Denver this month. Joining Leifer on the SBE board are Robert "RJ" Russell as vice president of the society, Wayne Pecena as secretary and Jim Bernier as treasurer.

SBE, which has 114 local chapters and about 5,200 members, offers a variety of professional certifications and educational opportunities for broadcast and multimedia technology professionals.

RADIO "HAS IT ALL"

Leifer, CPBE, is senior manager of broadcast operations at American Tower Corp. He worked for Paxson Communications/Ion Media and Clear Channel/iHeartMedia for nearly 30 years. Before leaving the latter last year, Leifer was VP of engineering for South Florida.

Leifer and his wife Jill have been married for 25 years and live in Boston. They have four children and several grandchildren.

"I've had quite a diversified career. I've designed and built and managed a lot of facilities in radio, TV and IT," he said. "However, when I was given the opportunity to select between TV and radio, radio was undergoing the change from analog to digital platforms. At all of the SBE shows and chapter meetings, the vendors were showing off the new digital conversion opportunities and new ways of delivering audio using PC-based systems. This was a whole new way of delivery. This was the one chance to change the face of radio and get radio into the next generation of technology. I was excited about that and jumped in."

Leifer thinks radio still presents challenging opportunities for new professionals coming into the field.

"The face of radio has changed. The new face has IP at the forefront. The day-to-day of never doing the same thing over and over again still is there in radio. For anyone that likes doing many different things and becoming an expert in them, it's still the career for them. Radio has it all: computer networks, web-based streaming and video, RF transmission, live events, working through emergencies; and the

list continues," he said.

In his role as SBE president, Leifer said, he wants to grow membership and increase outreach through expanding the education it offers.

"Our web-based series of education programs has set record attendance. The webinars have had a tremendous response. We will continue to expand those offerings," Leifer said.

Though recent membership numbers have trended down — thanks to fewer available engineering jobs combined with retirements — the society leadership feels that overall its numbers have held up well.

"We want to be more inclusive. We want to reach out to those professionals who might not be called a broadcast engineer these days but are doing some of the same jobs," Leifer said.

"The broadcast industry is changing. The position of broadcast engineer and media professional is modifying. Instead of transmitters our members now might be managing audio streams now, but essentially they are still doing many of the same things. We want to make sure we include those people in our mix. The IT world in the engineering space is becoming a more prominent thing, and we must make sure we can accommodate those professionals."

Leifer said the group's national meeting presents an opportunity to focus on its membership and its needs for education and certification.

"The IT skill set is becoming increasingly important for our members," he said, noting that SBE offers Certified Broadcast Network Technologist and Certified Broadcast Network Engineer certifications, which he said have had good response. "And the overall modern IP-centric broadcast infrastructure has become more of a focus of ours."

The quick turnover of technology in the broadcast plant brings challenges in terms of implementation and reliability.

"The next big thing is something to allow the broadcast engineer to interface all of these systems and pieces in a more simplified manner. If you have digital consoles, digital STL and a remote control, there isn't one place to go to do everything. It needs to be streamlined," he said.

"IT developers have to stand and deliver now. Perfect the craft and make it reliable. The next big thing I expect is something that will allow the broadcast engineer to integrate all of these tech pieces in a simplified manner. Right now we still have kind of a hodgepodge of technologies. If someone can figure it out, then broadcasters could centralize even more of their operations."

RECRUITING

SBE acknowledges the challenge it and the broadcast industry continue to face in attracting young tech talent. Leifer said the group's mentoring program has helped.

"We have stepped up recruiting high and college students to the field. We are doing our best to support broadcasters who start programs to excite young professionals about the opportunities broadcast tech provides," Leifer said. "We are losing some numbers to retirement but we are making progress. There are young people entering the profession through the IT lane. Some broadcast groups, like Beasley and iHeartMedia, are bringing in young people to train them as the next generation of engineers."

Meanwhile, the workloads on existing broadcast engineers continue to increase, which makes education even more important, Leifer said.

"The job of the broadcast engineer is now more complicated than it was 15 years ago. It's because of the complexity of the technology. Members crave it so they can do their jobs better. If the workload is increasing, then the need

for education and training is growing," he said.

Leifer said he expects TV's spectrum repack to be the subject of many conversations among radio techs in coming months.

"Having backup facilities in ready condition will be vital. If a tower crew is coming on-site, communication with them will be critical. Most of these projects will not be one-day operations. They'll take weeks to complete. The key task of every engineer will be to minimize the impact on their broadcast facility."

SBE has applauded FCC Chairman Ajit Pai's AM revitalization efforts and supports ideas that will help bring relief to broadcasters and broadcast engineers, Leifer said.

"I'm excited to one day sit down with Chairman Pai and discuss with him ways we, as broadcast engineers, can help him and in turn help us. There are lots of different flavors to revitalization. FM translators for AM broadcasters is part of it; but that really doesn't fix the problem. It's a Band-Aid. The real fix is to abate the AM noise. Chairman Pai is totally aware of our willingness to help," Leifer said.

He noted that SBE worked with the FCC's Technological Advisory Council on a noise study for a short time in 2016, but then TAC tabled the study. "We certainly still support a noise floor study and would jump at the opportunity to help."

The FCC is doing a better job now of enforcement against pirate radio broadcasters, Leifer said, but is still short-handed to complete the job.

"The FCC does not have the Enforcement Bureau staff numbers to do proper enforcement. We wrote ex-parte comments to the FCC regarding staff reductions. We believe Congress is moving in the proper direction to get the pirates shut down."

IN CASE YOU MISSED IT

Here's a sampling of recent headlines delivered to Radio World readers in their free daily NewsBytes e-newsletter. (Click the Subscribe tab at radioworld.com, then Newsletters.)

► **Rosenworcel Wary About More Media Consolidation**

The Democrat delivered her first public remarks since returning to the FCC.

► **Radio Leads Broadcast M&A Activity This Year**

With a helping push from a notable radio deal, volume of U.S. broadcast station mergers and acquisitions reached about \$190 million in the

third quarter, according to estimates from media research group Kagan.

► **Ex-FEMA Head Calls out Apple Over FM Chips**

Craig Fugate joined the debate after Chairman Pai, Apple and NAB issued dueling statements about whether Apple's latest devices have FM tuning capability.

► **Trump Suggests NBC "License" Should Be Challenged**

NAB and others were quick to object when the president seemed to threaten license complications for those whose reporting he doesn't like.

► **FM Dominates Growth in Broadcast Station Totals**

FM spectrum is still very much in demand in the United States, based on the latest licensing data totals. The lower-power segments of translators and LPFMs have been particularly vibrant, but recent times have seen relatively healthy growth across that band.

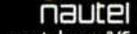
► **Broadcasters Send 10,000 Radios to Puerto Rico**

NAB, state broadcasters and Florida politicians arranged for delivery of battery-operated radios to island.

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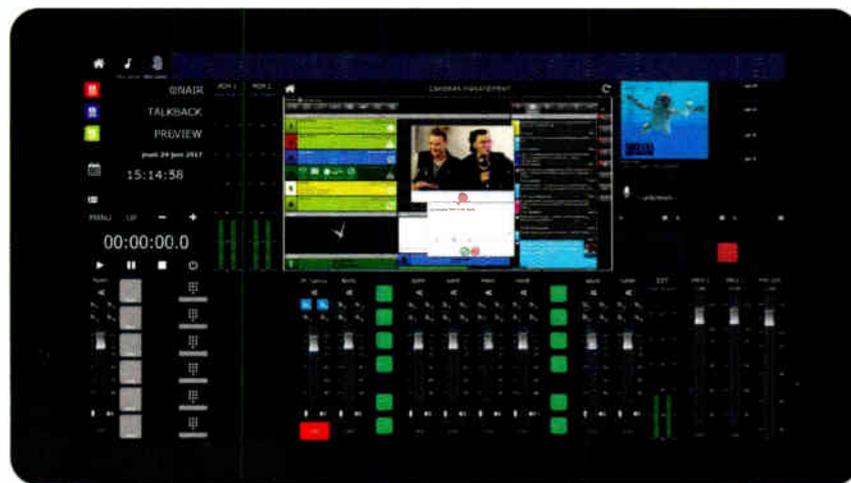


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Focus on UPS Power and Disconnects

Smart solutions reduce downtime and other problems

WORKBENCH

by John Bisset

Email Workbench tips to johnbisset@gmail.com

New Hampshire Public Radio's Steve Donnell writes that it's a great idea to have some kind of automatic bypass for UPS AC power that operates critical equipment. At NHPR, Steve has been using these for many years, and has found them particularly handy when replacing the batteries in a UPS.

There was a company by the name of Pulluzi, which produced pretty much the same thing described in the June 23 Workbench column. Unfortunately, they are no longer available.

However, Tripp Lite makes a "smart" bypass controller. In addition to providing primary/secondary source selection, you can also connect to it via a web GUI. The GUI lets you switch individual outlets ON/OFF, much like a Burk AC8.

One key element that should be taken into consideration when using any automatic UPS bypass relay is, if at all possible, to be sure that you use a separate AC outlet. This would be a breaker fed from a separate circuit breaker as the source for the secondary (non-UPS) power.

As rare as it is, Steve has seen more than one instance where a fault in a UPS causes the circuit breaker that feeds the

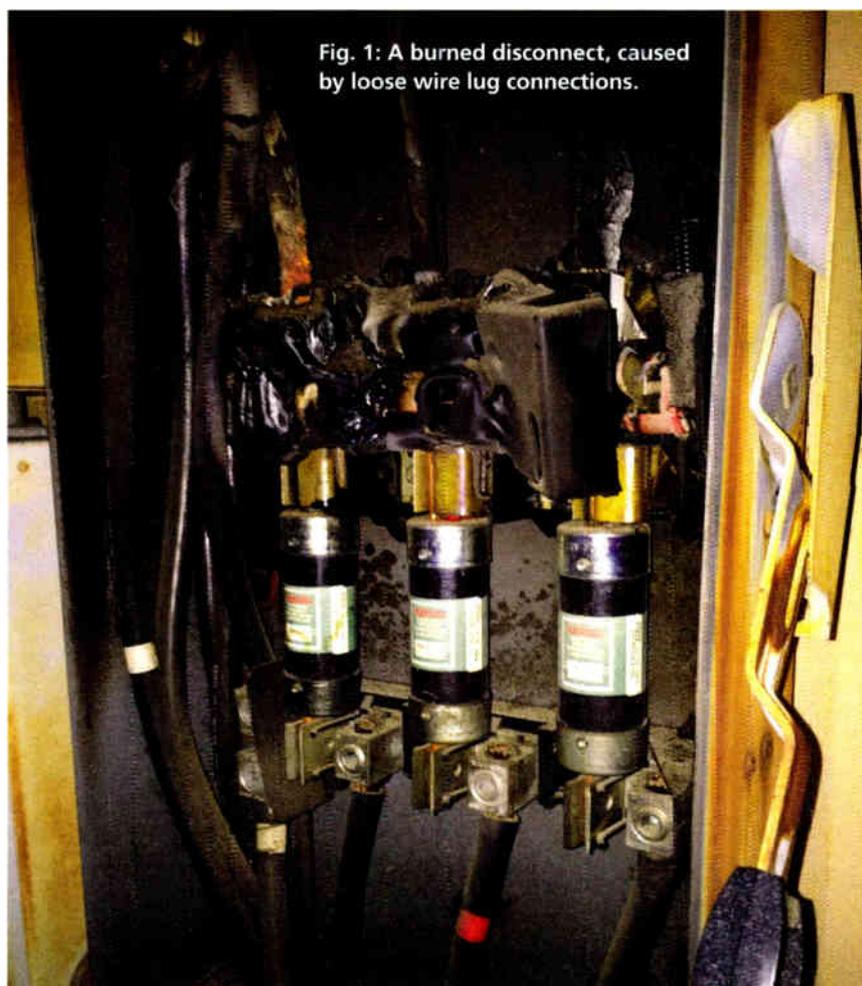


Fig. 1: A burned disconnect, caused by loose wire lug connections.

UPS to trip. The result will be the loss of secondary AC power as well.

From Pahrump, Nev., John Higdon agrees that in many circumstances the use of a UPS bypass relay can be valuable. However, over the past 40 or 50 years, some stark power situations have been found to thwart this solution.

First, using a relay to switch AC power to computers or microprocessor-controlled electronic gear of just about any variety is enough to hang up operation or cause a reset (and reboot) of the device. John once tried to use a standby/switchover type of UPS on a BE FXi250 exciter, and every time the UPS was called to action, the exciter crashed, got its operation corrupted, or developed some other problem that could only be corrected with a power recycle. John took the UPS out in favor of a homemade standby power protection system, which provided no glitches and no problems.

Steve has seen more than one instance where a fault in a UPS causes the circuit breaker that feeds it to trip.

Second, the behavior of APC standby UPSes is exactly as the article states and is why John has been phasing out those units (which result in more down time than up time when they are deployed). His replacement? An online UPS.

Yes, online units can be victims of dead or weak batteries; but due to their design, have the ability to frequently and thoroughly test all the batteries for load-handling capability. The result is notification of problems found, well before problems occur.

Even at home, John uses his own 48 VDC-based online non-interruptible server room power. John does like the high-end APC Symmetra, which is a very good small online UPS (12 KVA). The bottom line: The solution contained in the Workbench column is handy for a limited number of applications; but the real fix is to use a decent UPS, or fashion one of your own. It isn't rocket science! Just be sure to test it.

John states that most people don't have a handle on why UPSes have trouble with generator power. It isn't

(continued on page 15)

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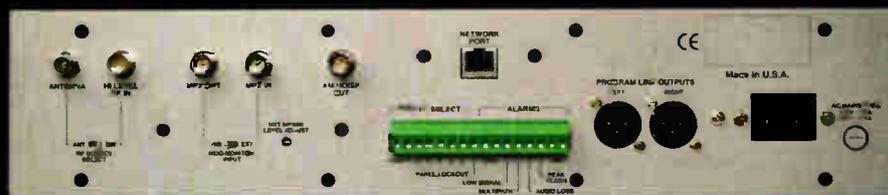
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Broadcasters Know How to Motivate Listeners

♥ RADIO DOING GOOD

BY MARK LAPIDUS

It's not every day that you get to entertain 50,000 of your friends, but thanks to Cumulus Media's WNBW(FM), folks in the Bronx enjoyed a massive free event featuring fireworks, family activities, balloon artists, magicians and music performances.

The R&B station was honored by the Bronx Borough president's office with a special proclamation recognizing their commitment to community service for the area. The proclamation read: "I, Ruben Diaz Jr., president of the Borough of the Bronx, am pleased to commend you for your generosity and goodwill to your neighbors and friends!"

HYDRATED AND HAPPY

In the desert, having water available for the needy is a must. Beasley Media Group's KKLZ(FM) collected more than 1,200 cases of water to benefit the Salvation Army of Las Vegas.

The effort was the brainchild of morning personalities Mike and Carla. It began with the team putting the word out that the Salvation Army was in dire need of bottled water, and it turned into a collection that helps thousands every year.

During Project: H2O listeners who dropped off a



Courtesy KKLZ(FM)

Cases of water take up a lot of space.

case of water received four tickets to KKLZ's Raider's pre-season viewing party, and people who donated five or more cases got a \$50 pizza gift card. Anyone donating one hundred cases received a match from a local car dealership.

Program Director Mike O'Brian said, "Most people think the city is just the Las Vegas Strip, but behind the lights, the marquees, the celebrities, and everything else that goes on, people should know there is a true community spirit here. This was a great example of that!"

TRADE IN FOR GOOD

In Orlando, Fla., iHeartMedia's WTKS(FM) is teaming up once again with local law enforcement and Crimeline to increase the safety of central Florida for the 19th annual Kicks 4 Guns. It's a program that asks Floridians to anonymously trade unwanted firearms for a gift card, no questions asked.

The drive was initiated because on-air personality Russ Rollins decided to make a difference when a local boy was murdered for his shoes.

Russ's idea was to create a gun buyback event that offers brand new shoes in exchange for guns.

Over the past 19 years, Kicks 4 Guns has collected over 10,000 guns, including illegal and stolen guns, pipe bombs, grenades, and a missile launcher.

FOR THE TROOPS

Hubbard Broadcasting's WARH(FM) in St. Louis collected several dozen suits as part of the "Boots to Suits" campaign. The fundraiser collected suits for local veterans returning to the workforce from deployment and were donated to "Dress for Success Midwest."





Is Your FM Station Soon-to-be-Displaced by the TV Repack?

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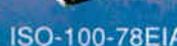


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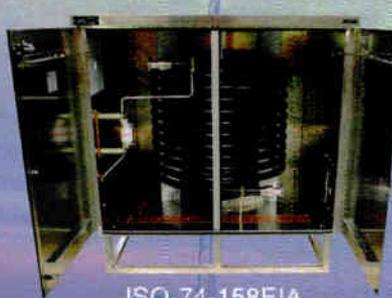
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WORKBENCH

(continued from page 12)

frequency or even voltage in the usual sense. The real problem is that at the moment a stand-by UPS switches the load back to main's power (which the generator is actually supplying), there is an instantaneous voltage drop of around 10–15 volts from the generator, for which the generator's voltage regulator compensates within a second or less. By then, the UPS has already interpreted that drop as "loss of mains power" and switches back to its own battery.

When the UPS sees proper voltage on the mains side (generator), it tries to switch back again. The voltage dip occurs again, and this process repeats until the batteries in the UPS are exhausted. The fix (and APCs have this capability) is to get into the UPS set up (or use the DIP switches, depending on the unit) and *desensitize* the voltage monitor in the UPS. This slows down its response time, so it ignores the voltage dip and stays with the generator power.

Speaking of power, Fig. 1 (page 12) shows what happens when you don't keep your AC lugs tight inside circuit disconnect boxes. The picture was sent in by William Bowin, chief engineer for North American Broadcasting, based in Columbus, Ohio.

The photo shows a 200 amp three-phase fused disconnect for one of the main transmitter sites that Bill maintains. The station had to switch to its backup site, awaiting a visit from an electrician. Bill notes that even though the disconnect is in the OFF position, power is not actually shut off because the mechanism is melted/welded.

Checking lug tightness is something that should be done every year or two on all your disconnects. Unfortunately, this example is on the "line" side, so checking the lugs cannot be easily accomplished without pulling the electric meter. Almost no one does that routinely, but the result may cause you to rethink that maintenance procedure.

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

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

MARKETPLACE

Bridging the Gap: In need of a multiformat IP audio interface for your broadcast network? Check out Digigram's Audioway Bridge.

Digigram neatly describes the 1 RU Audioway Bridge: "Serving as a gateway between legacy and IP audio equipment in the studio, or in multiple studios connected by a managed network, Audioway Bridge allows users to input MADI, AES67, Ravenna, Dante/AES67, Livewire+ or AES/EBU and route audio to output in any one of these formats."

Digigram's Pascal Malgouyard said, "Audioway Bridge offers the smart studio interfaces that allow for a seam-

less IP migration. This first product in the Audioway range demonstrates our depth of experience in designing mission-critical equipment for audio over IP applications."

The Audioway Bridge offers dual AES67 Gigabit 2 x 64 full-duplex I/O channels, and is equipped with both 64/64 MADI I/O and 8/8 AES/EBU legacy interfaces and PT master clock, with up to 20 millisecond receiver buffering, addressing all synchronization between IP and legacy audio.

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Field Service Tips: Grounding

You can never have too much lightning protection

TECHTIPS

BY MARK PERSONS

Radio World Engineering Extra's Aug. 9 issue featured an article on grounding by David Brender and was a good start for understanding the right approach to system grounding at a facility. (Read it online at radioworld.com, search "Brender.") Let me expand on it for radio stations.

Most studios and all radio transmitter sites have a tower in close proximity to a building. Each tower is a skyhook to bring lightning into the facility. We should think in terms of the path that lightning will take when a strike occurs.

The Nautel transmitter people have thought this through.

Ferrite cores tend to block lightning from traveling down a conductor. They are easy to install and are worth every penny.

Courtesy of Nautel, Fig. 1 shows an example of bad grounding technique. A lightning bolt can come from the tower and go through the transmitter on its way to the electrical service ground and the power line. The result is the transmitter acts as a "fuse" that can easily break open, so to speak, under high surge currents from lightning.

Fig. 2 is a schematic that shows how wiring should be routed. Nautel and I concur that a reference ground, which is a single point ground, should be employed at a site to work around a possible 20,000 amperes of peak current from 1 million peak volts of lightning. The goal is to have lightning bypass expensive equipment on its way to the power company.

Yes, I said "the power company."

They might not take kindly to this, but they are a path for lightning-induced energy, too.

Conversely, lightning from a power line could use a transmitter facility as a path to ground. A ground ring around the building is especially popular with cellular providers. They find it works, and we should follow their example. Note that the ring, with ground rods, connects to the reference ground at one point and nowhere else.

Having the transmitter and other expensive equipment on a non-lightning path is the right plan. You do that by putting electronic gear on a "stub," away from the reference ground. Lightning will come in from the tower and go to ground, not bothering to go to the stub because there is no path to ground at the equipment. Lightning should go to the

reference ground instead; it will usually seek the shortest path. A stub uses that idea well.

DESIGN WITH GROUNDING IN MIND

Ideally, the facility will be designed and built with all of this in mind. The best plan puts the incoming electrical service panel on the same side of the building as the tower. But that may not be the case in a facility you are working on. The task then is to route cables and grounds to produce the same results electrically. Easier said than done sometimes, but worth the effort, if it prevents just one equipment failure.

Fig. 3 from Nautel shows the mechanical layout of a transmitter plant with grounding designed to route lightning away from expensive equipment, using the stub idea. (Read more on this at <http://tinyurl.com/y7t8r5t6>.)

Most transmitter manufacturers send ferrite cores with their equipment for isolating power cables, coaxial cable lines, control cables, monitoring samples and audio feeds from lightning induced surges. You should look into purchasing some if your equipment does not have them. Ferrite cores tend to block lightning from traveling down a

(continued on page 18)

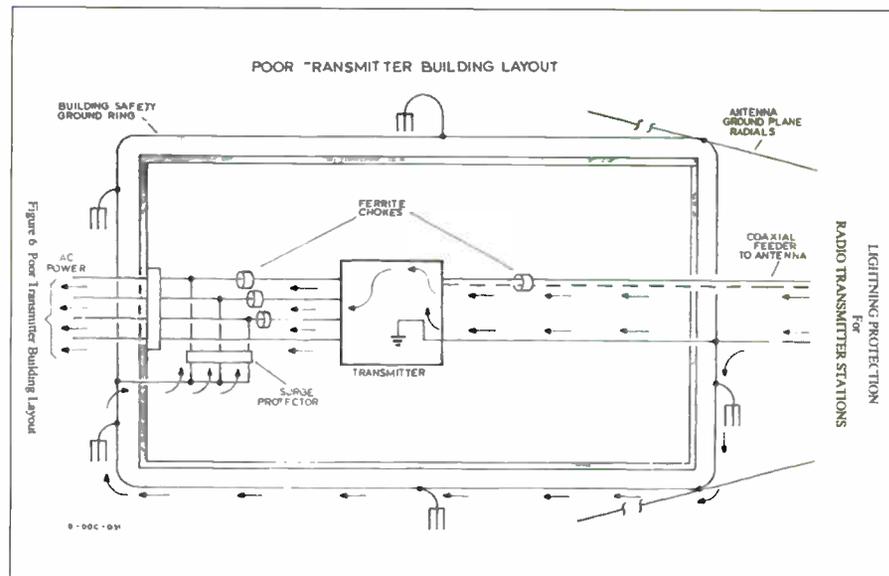


Fig. 1: Incorrect wire routing at a facility.

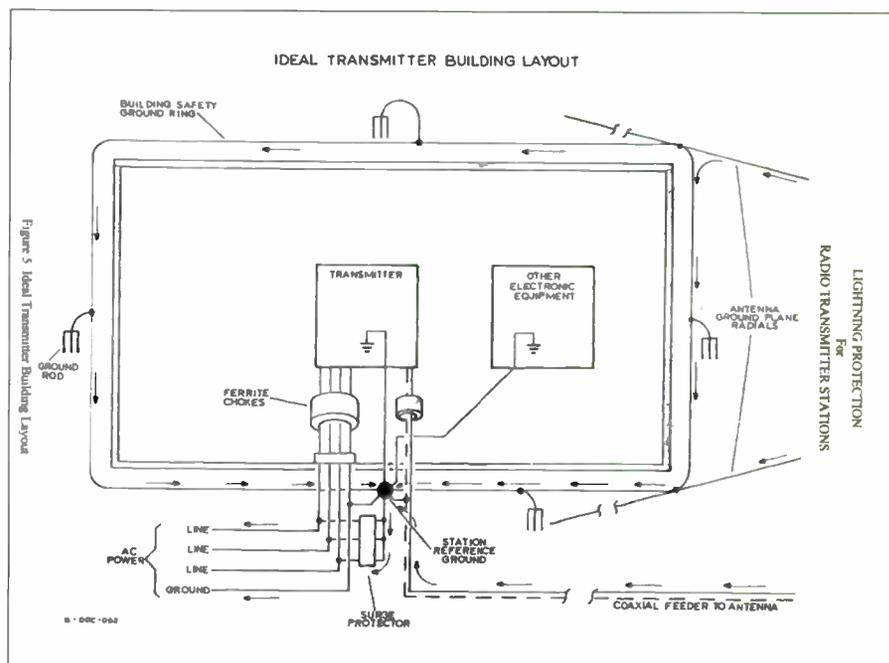


Fig. 2: Correct layout of building wiring.

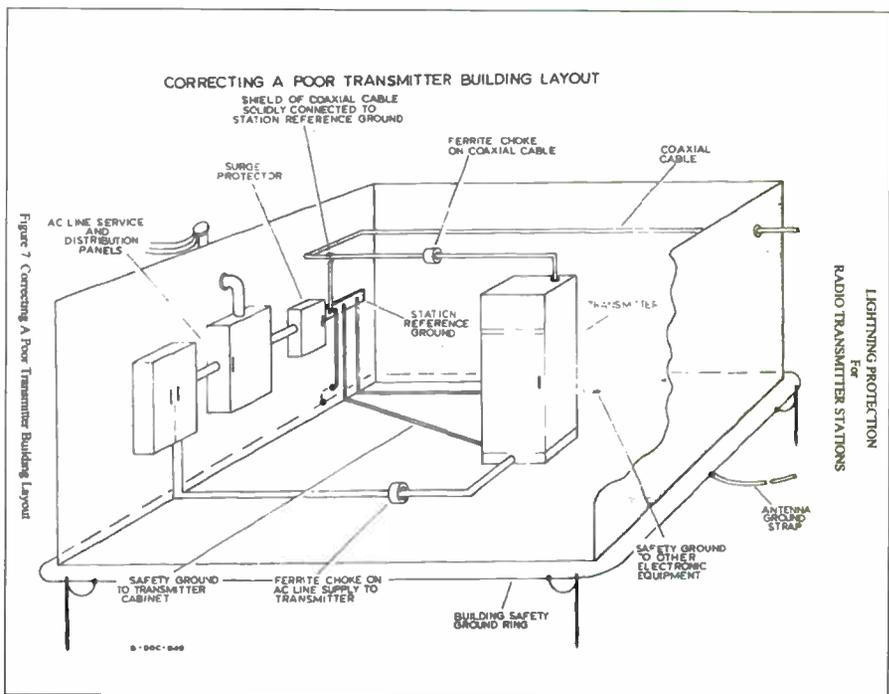


Fig. 3: Reworked ground routing at a transmitter site.

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LIGHTNING

(continued from page 16)

conductor. They are easy to install and are worth every penny.

Surge protection to reference ground at the power feed and other outside lines is important, too. There are many surge arresters on the market from brands like Eaton, EP2000, LEA, Transtector and others. The idea is to clamp excess voltage to safe levels.

Fig. 4, from a facility I built, shows a reference ground at the electrical

lightning, thus preventing it from continuing down a line into the building. That is because lightning does not follow curves well. It wants to go straight. Each cable then goes to a surge protector, which is bolted to the strap. You can see that on the right side of the photo.

PolyPhaser and CommScope are well-known brands. These devices limit the voltage between the center and outer conductors of a coaxial cable. They need to be attached firmly to the reference ground to do their work correctly.



Fig. 5: Cables tied to ground at a building entrance.

service entrance panel on the right. The National Electrical Code prohibited this at one time but now it is OK. Some local electricians and electrical inspectors may not be up to speed on the rule change.

Note a 3-inch copper strap was laid down so protection devices could be attached easily. Best to use stainless steel hardware to prevent corrosion by dissimilar metals.

One trick to prevent or reduce lightning surges on coaxial lines is to coil five or six turns of line to "choke"

Fig. 5 is almost as good. Again, all coaxial cables go to reference ground as they enter a building.

Chris Kreger at RF Specialties Group tells me the company does a brisk business selling lightning-protection products during storm season. The best approach is to install protection before lightning hits.

On the other hand, we should look at ways to prevent lightning strikes or reduce the intensity of strikes when they occur. One such technology is static dissipaters. The most well-known brand is

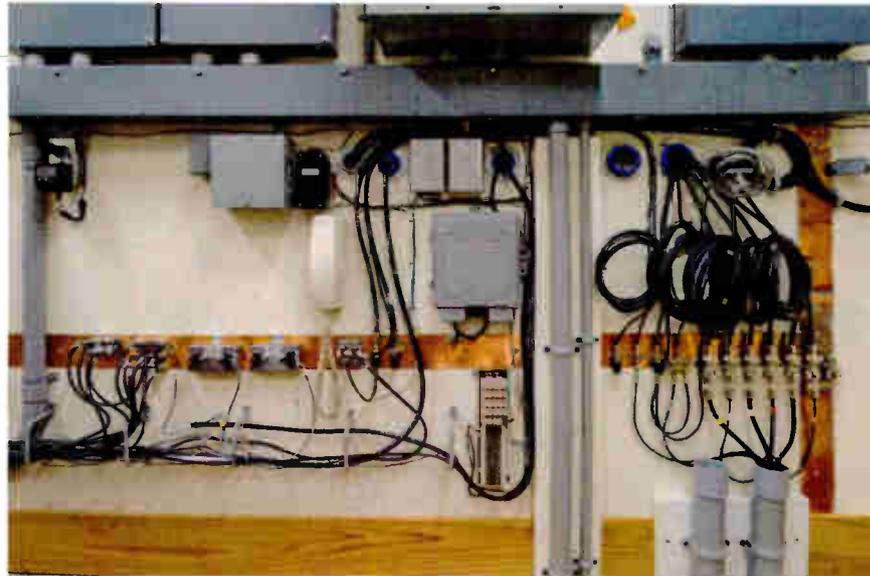


Fig. 4: Proper reference point grounding at a service entrance.



Fig. 6: A Nott static dissipater atop a tower.

Nott Ltd. They manufacture stainless steel needles that bleed static charges from the sky to ground. The goal is to reduce the voltage between the sky and ground so lightning will strike elsewhere or be greatly reduced in amplitude so a strike is less damaging. Fig. 6 shows a Nott EN-1 Eagle's Nest high on a tower. One dissipater typically is

placed at the top with smaller dissipaters every 100 feet or so down the tower.

Here's a real-world example: There is a three-tower AM transmitter site that suffered lightning damage every summer without fail. I was the contract engineer for the station and my request for static dissipaters was ignored. Another of my clients purchased the station and bit on the proposal to add static dissipaters to all three towers. The hardware cost was about \$2,500. Tower climbers put them on during normal inspection work. The investment paid off. Not one lightning-related problem has occurred in the 18 years since. Even when a tornado took down one of the towers, the rest of the facility survived without lightning damage.

To be truthful, there is no sure-fire method of protecting a facility from lightning, but thinking it through and working accordingly will go a long way to preventing problems.

Mark Persons, WQMH, is a Certified Professional Broadcast Engineer with more than 38 years' experience. His website is www.mwpersons.com.



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Map indicates the extended range from Wheatstone's processor with multipath control.

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Scottie Rice, engineer for KSDS in San Diego, shared his experience in putting a Wheatstone processor on the air in place of another top-of-the-line audio processor. He was able to increase the distance of his listening area substantially.

To see/read Scottie tell the whole story, go to
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USERREPORT

BY JOSHUA C. SMITH, CBRE, CBT, CEA, CBNT
Chief Engineer
Saga Communications of New England

SPRINGFIELD, MASS. — There actually are bathrooms at a few of my transmitter sites. Old ones. They don't actually *do* anything; most of my sites don't even have running water anymore. They are just testaments to a bygone era when a broadcast engineer essentially lived with the transmitter.

As much as we might miss it, the concept of a human being up at the tower site 24/7, taking regular meter readings and being ready for emergencies to hit seems charmingly anachronistic.

Remote control of our sites — and even studios to a large extent — is the name of the game now and for many of us, myself included, the biggest name in that game was “Burk” and its venerable ARC-16 remote control system. That white box with the green and red buttons and the big, black terminal strip panels has been almost ubiquitous at studios and tower sites during my engineering career.

All technology, though, must adapt to the inevitable changes in mission and infrastructure and the ARC-16 was no more immune to this than cassette decks and floppy disks. Burk has approached this brilliantly with its worthy successor: the ARC Plus Touch.

I started rolling out ARC Plus Touch systems as a replacement for my ARC-16 systems in 2014, starting with my stations in Springfield, Mass. Our ARC-16 system was always limited by the landscape (both technologically and geographically); modems over telco wires were increasingly unreliable (or unavailable) and a mountain cutting off line-of-sight to one of my tower sites made wireless telemetry a pipe dream — my predecessors believing that site would remain a standalone forever.



ARC Plus, and its ability to communicate over the existing IP networks I had, changed all that. For the first time in almost 20 years, one of my stations could real-time monitor its tower site from the studios without having to call in. If you can get a network connection there, you can get an ARC Plus system talking. The ease of connection gave me the opportunity to design flowcharts (using the Burk AutoPilot software) that can run on my PC or on the ARC Plus units themselves and can handle automatic response to emergency scenarios more effectively than ever before.

In the ever-growing number of sites I manage, I often felt hindered by the ARC-16's limited number of connections it could handle. The ARC Plus, leveraging the IP network infrastructure, leaves those four-site, 16 I/O constraints in the dust. Now, I can connect as many

sites as my IT director has tunnels for me to use.

Wiring is a breeze as well, with the ARC Plus system using streamlined Euroblock/Phoenix connectors rather than big, bulky terminal strips. This is a huge advantage in the cramped tower site racks. However, if you're in a rush (or just like the old IP-8 panels), they offer the IP-8 Adapter device, which maps your existing RC wiring to the ARC Plus system. If you want to cut down on the number of wires, Burk offers an assortment of PlusConnect direct transmitter interfaces for an impressive stable of transmitter manufacturers, as well as an SNMP interface that allows the system to monitor almost anything in today's Internet-of-Things. The ARC Plus itself features a touchscreen that holds up well in high-RF environments, with customizable colors and labels set up through the AutoLoad Plus software.

The only major trouble I ran into when installing the equipment was that the default communication port for the ARC Plus on the network conflicted with a port on many of my Cisco ASA devices, but the manual provided a variety of recommendations on other ports to use.

I have since continued installing ARC Plus systems in the three Massachusetts markets I handle, putting the final ARC-16 out to pasture in early 2017. But for one damaging lightning strike (don't forget to use proper grounding, with grounding posts conveniently located on the rear of each device), my ARC Plus equipment has been humming along ever since, keeping me safe, informed and on the air.

For information, contact Matt Leland at Burk Technology in Massachusetts at (978) 486-0086 or visit www.burk.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 bmoss@nbmedia.com.

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TECHUPDATES**INOVONICS ADDS HD RADIO EMERGENCY ALERTS TO 638**

Inovonics is adding a feature to the INOmini 638 FM/HD Radio SiteStreamer that enables it to monitor and log HD Radio Emergency Alerts Messages.

The 638 will alert station personnel with an email each time an HD Radio Emergency Alert is received, or create, save and later deliver a single email log with the start and



stop time of the alert received. In addition, the text of the message will be sent along for proof and verification of the alert information.

The 638 is capable of monitoring up to six stations to be preset for monitoring. The programming can be listened to over IP. A "round robin" function automates the 638 to check each programmed station for a preset time and then move onto another if there is no problem.

Monitoring items include program/silence detection, audio levels, pilot loss, signal metrics, RDS loss, RDS data that accompanies the FM program, and PAD data associated with HD Radio programming.

The unit can be operated remotely via an internet browser.

Inovonics expects to release the firmware version by the end of October, pending iBiquity certification. Existing users of the Inovonics INOmini 638 will be able to download the free firmware update and install it in their current units. The process takes a few minutes via a network connection.

For information, contact Inovonics in California at (831) 458-0552 or visit www.inovonicsbroadcast.com.

**HENRY ENGINEERING'S POWERTRACKER MONITORS TRANSMITTER SITE VOLTAGE**

Henry Engineering notes that one of the most important conditions to monitor at a remote transmitter site is the incoming AC line voltage.

Because most sites are at the end of a long run of utility wiring, the power supplied is susceptible to voltage variations. These can be long-term voltage sags or rises, as well as short-term dips and surges caused by other users on the electrical grid.

Any variation in supply voltage will have an effect on transmitter performance and should be closely monitored so that station personnel are alerted if the AC supply voltage goes outside of normal limits, the company says.

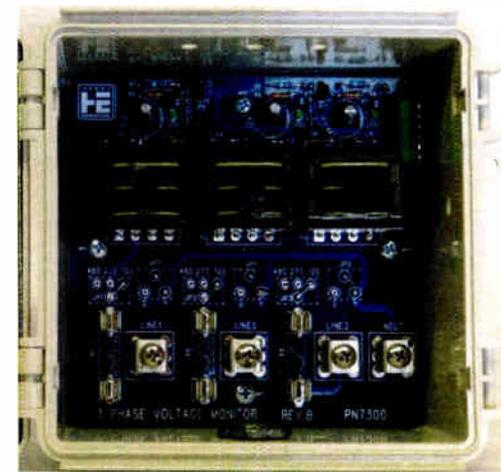
PowerTracker, a new product from Henry Engineering and Sine Control Technology Inc., allows transmitter site AC voltage to be monitored remotely using virtually any transmitter remote control/telemetry system.

PowerTracker is connected to the AC mains as close to the utility entry point as practical. PowerTracker generates a low-voltage DC output that is proportional to the AC input voltage. This DC sample is fed to a telemetry input channel on the transmitter site's remote control system. Once the system is calibrated, the DC sample can be monitored remotely to indicate the site's AC supply voltage. The remote control system's Hi and Lo limits can be set to trigger an alarm if the DC sample goes out of tolerance.

PowerTracker can monitor single-phase as well as three-phase Wye and three-phase Delta service. Any line voltage can be monitored: 120, 208, 240, 277 or 480 volts. Only one PowerTracker unit is needed to monitor all three phases. Once installed, PowerTracker needs no adjustment or maintenance.

PowerTracker is now in stock at all Henry Engineering dealers. The list price is \$395.

For information, contact Henry Engineering in California at (562) 493-3589 or visit www.henryeng.com.

**BELAR AMMA-2 AM MOD MONITOR WATCHES THE PEAKS**

The Belar AMMA-2 is a DSP-based, microprocessor-controlled, digital AM modulation monitor/analyzer that measures positive and negative peak modulation, peaks per minute, average peak modulation, modulation density and other parameters.

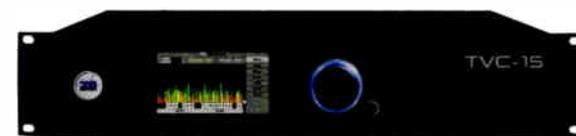


In addition to monitoring standard AM modulation, the AMMA-2 monitors modulation-dependent carrier level AM transmissions.

During MDCL broadcasts, Belar notes, the RF carrier level becomes a dynamic component of the AM signal. The AMMA-2 tracks the carrier, capturing the highest and lowest values of the carrier level, as well as the decibel ratio of the carrier high/low. Modulation readings are referenced to the carrier level appropriate for the MDCL system in use. The optional remote meter panel displays positive modulation, negative modulation, and carrier level simultaneously on three large analog meters.

The AMMA-2 features user-defined parameters and settings for maximum flexibility. Two large up/down Menu keys are used to cycle the 16-character alphanumeric display to the desired menu; the up/down Parameter keys are then used to select the desired setting. The unit configuration may be saved to the on-board non-volatile memory so the settings are retained in the event of a power loss. Belar WizWin software can also be used for unit control and graphic/logging capability of all AMMA-2 measurements.

For information, contact Belar in Pennsylvania at (610) 687-5550 or visit www.belar.com.

**25-SEVEN TVC-15 CONTROLS VOLTAIR**

25-Seven says stations Voltair enhancement to optimize their audio watermarking and help make informed programming decisions. The company said user suggestions for improving Voltair centered around two aspects: the ability to monitor at any point in the program chain, and a suggestion that enhancement could be more effective if it could detect and automatically adjust to changes in the source audio.

Now the company offers the TVC-15, a "modulation monitor for watermarking" that can be used as a stand-alone watermark monitor or set up as dynamic controller to a Voltair processor. These two functions are offered in a 2U package that can be deployed at the station or transmitter, and accessed over a VPN or internet.

TVC-15 is built on a separate algorithm than Voltair, and can detect watermarks off the air. It does not need to be paired with or "wrapped around" a single watermark encoder, as Voltair does, so it can "listen" at any point in a station's air chain, and provides a more granular picture of watermarking activity. This "lens" into the watermarking ecosystem provides an analysis tool for station programmers seeking the best encoding strategy and best watermarking practices.

Uniquely, TVC-15 can control the Voltair in real time. Its Intelligent Adaptive Enhancement closes the feedback loop, letting users control the Voltair processing based on moment-by-moment analysis of the air signal.

The company says TVC and Voltair work together like a continuous, intelligent automatic gain control on your hidden watermarks.

For information, contact the Telos Alliance in Ohio at (216) 241-7225 or visit www.telosalliance.com.

REAL. VIRTUAL. RADIO.



ruby – Radio never looked so good.

Meet ruby, the new radio console from Lawo. So elegant and uncluttered, you might think something's missing — and you'd be right. We've moved most of the controls that litter the faces of other radio consoles onto an intuitive context-sensitive touchscreen, while essential controls like faders and monitor selectors are right where you'd expect them to be. ruby gives you the best of both worlds: familiar physical operations, and a modern graphical interface.



ruby's powerful visual interface is designed for fast-paced radio, with fingertip access to source, bus, and mix-minus assignments, as well as EQ and dynamics processing — freeing your talent to perform instead of searching for settings. You can even use ruby's GUI-building app to centralize control of studio software and peripherals. With intelligent AutoMix hands-free

mixing and one-touch AutoGain mic calibration, your operators will tackle the most complex shows with ease. Even voice-tracking while on the air takes only the push of a button. Be prepared: your talent may actually thank you! And because ruby is engineered and built in Germany, it might just be the last console you'll ever need to buy.

ruby, from Lawo. The console with a refreshingly new point of view.

www.lawo.com

World Radio History

Signal Monitoring, Remote Control, Test and EAS

TECHUPDATES**2WCOM ADDS FEATURES TO A30 MONITORING SYSTEM**

2wcom says its A30 monitoring receiver provides a versatile range of options for measurement, control, alarms and demodulation.

Since launching the A30 last year, the company has added several features such as a DAB+ module and MPX measurement options. Additionally, the device can now function as a backup rebroadcast receiver and as a RDS-Data as well.



The A30 is designed to let operators configure system settings — parameters like RF level, pilot signal, MPX power and deviation, RDS synchronization, TA and PI — for each station individually. In addition, it offers various options for FM/RDS and DAB+ monitoring.

For example, the system's two integrated tuners can monitor two FM stations simultaneously day and night, but the second tuner can monitor up to 30 broadcasting stations using scan mode. Moreover, the web interface for MPX measurements allows technicians to control the MPX deviation according to the requirements of regulation authorities.

The DAB+ module allows the monitoring of parameters like RF level, FIC quality, audio level or image slideshow (SLS). If a value does not comply with the pre-settings, an alarm can be forwarded via SNMP, email or relay to a service center. Alarm activities are logged and stored with time stamp, type of alert and the equivalent frequency.

2wcom says that the A30 can serve as a backup source and the ISD (Intelligent Silence Detection), offering transmission security with its active and passive "loop-through" feature that loops through incoming external audio/MPX signals to its outputs via relays.

It is able to measure the incoming external audio/MPX source and in the case of signal degradation, switch the output source to an internal FM tuner.

For information, contact 2wcom in Germany at +49-461-662830-0 or visit www.2wcom.com.

**WORLDCAST AUDEMAT OFFERS CONTROL FOR BURK USERS**

WorldCast Systems released an option aimed at users of Burk remote controls. The DB37 Adapter bridges connections between the Audemat Control and existing Burk IP-8 wiring panels, enabling the technology to be installed without having to rewire physical connections.

WorldCast says the functionality and capabilities of its Audemat Control system have proven popular but that time and resources required to rewire a complete facility may be onerous for some uses. The DB37 Adapter aims to remove that requirement and enable them to use the Audemat Control without a full new installation.

Audemat Control is an IP-based broadcast remote control device that offers core telemetry features plus SNMP tools and the embedded intelligence of ScriptEasy scripting and programming software. ScriptEasy gives users ability to create "smart" sites, ones that can automatically take action to correct critical errors that affect operations.

The Audemat Control supports a large number of connections, providing 64 digital inputs, 64 digital outputs and 24 analog inputs, four serial ports, two Ethernet ports, four USB ports, one audio output, one audio input and one modem. The unit offers I/O termination panels with simple screw terminal connectors to enable connection to real-world signals. It features an extractable modem and removable SSD disk to ensure ease of maintenance. The voice modem offers DTMF capabilities for traditional remote notification and control.

For information, contact WorldCast Systems in Florida at (305) 249-3110 or visit www.worldcastsystems.com.

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BUYER'S GUIDE

Signal Monitoring, Remote Control, Test and EAS

TECHUPDATES

WHEATSTONE READS THE AUDIO NETWORK

Wheatstone's IP Meters GUI can provide a quick read of any audio source, destination or stream in the WheatNet-IP audio network.

The IP-MTR64 Meters GUI lets users display an array of metering and analysis for checking audio levels, signal density or even FFT readings at any point in the network.

Users determine how many in are in the "wall of meters" and where and what to meter: console inputs, mic outputs, the satellite receiver, studios, web streams, etc. In addition, a separate analysis window allows users to view one audio stream in a variety of informative ways, including FFT, 3D plot, oscilloscope, energy vs. frequency and spectral dynamic range. Meters can detect silence, so users can see at a glance if an audio stream has gone down, and where.

The style of metering can be curved, horizontal or vertical bargraph, and for reading peak levels, average levels and peak over average levels. You can set up one or two bright VU or PPM meters for instant loudness verification of on-air studios from across the room, for example, and add five or 10 or 30 side meters for checking levels of players and mics feeding those studios. Wheatstone says that combined with its build-your-own control interface app ScreenBuilder, this metering app can be used in powerful ways to monitor and help control signals and elements throughout a network.

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



DAYSEQUERRA M4 PROVIDES HD RADIO MONITORING

DaySequerra's M4 Series 2 is an AM/FM and HD Radio tuner that also monitors HD Radio Diversity Delay 24/7 with its proprietary TimeLock algorithm.

The M4 receives the off-air broadcast, measures the timing difference between the MPS and HD1 streams. Out-of-tolerance conditions can be reported via email and via its built-in webserver using any browser on your network. The M4 can be flash-updated using its Ethernet port and has six additional rear panel alarm tallies.

Features include: Can correct diversity delay issues by streaming correction vectors over Ethernet to an Orban 8600 HD, Omnia 7, Omnia 9 and Omnia 11, and any Wheatstone AirAura processor as well as GatesAir HDE200 exporter; stays locked to AM-FM analog, HD1 or selected multicast stream during power or I2E interruptions; does not automatically revert to analog; complete monitoring of HD Radio AM/FM broadcasts including FM multicast channels HD2 through HD8; user-selectable tuning steps and analog FM 50/75 µSec de-emphasis.

Other features include Artist Experience monitoring, station logo and advertising branding; built-in web server for remote control and logging using any browser on your Ethernet network; 15 presets per band; Artist Experience displays album art, station logo, and advertiser branding; remote Flash upgrades; RDS/RBDS monitoring; email alerts for loss of TimeLock, program audio, carrier or OFDM HD Radio Lock.

For information, contact DaySequerra in New Jersey at (856) 719-9900 or visit www.orban.com.

NAUTEL AUI COMPANION BRINGS TRANSMITTER CONTROL TO SMARTPHONES

Nautel says it is testing AUI Companion, a cloud-based application optimized for mobile device browsers, which brings critical transmitter parameters directly to the user. It will pair with Nautel's Advanced User Interface to supply key transmitter status parameters and certain control functions to a mobile device.



The award-winning Nautel AUI is installed on all modern Nautel transmitters. For all current models, the AUI can be accessed via a web browser. For GV, NV and NX transmitters, the AUI is also presented on a 17-inch front-panel touchscreen. The AUI is designed to give users 100 percent remote access to critical transmitter functions.

Comprehensive control functions available via the AUI include instrument-grade audio and RF spectrum analyzers, simple site control functions, SNMP support, extensive event logging, email notifications, presets, enhanced support services and more.

With its web-based access and comprehensive commercial-grade instrumentation, the AUI has proven popular among broadcasters; Nautel says it is deployed in approximately 7,500 transmitters.

The AUI Companion will ensure that key parameters such as power, efficiency and temperature are available at a glance no matter where the user may be.

For information, contact Nautel in Nova Scotia at (902) 823-5131 or visit www.nautel.com.

UNITED STATES POSTAL SERVICE

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e. Copies not Distributed		50	31
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For information, contact DEVA Broadcast in Florida at (305) 767-1207 or visit www.devabroadcast.com.

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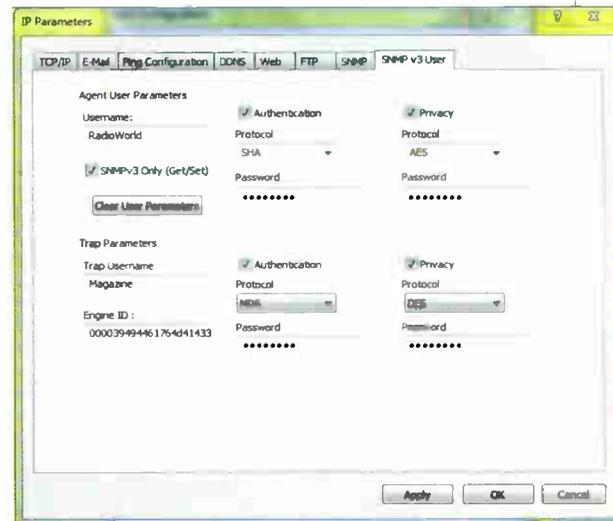
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I'm selling between 150 and 200 cassette tapes that consist of old-time radio shows, sports shows, some local New York radio talk shows, etc... Must take entire collection and the price is negotiable. Please call me for details and, my phone number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

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Doesn't Anyone Build Anything Anymore?

Recalling part of what made broadcast engineering fun

FIRSTPERSON

BY JAMES E. O'NEAL

My particular rant has been prompted by two almost simultaneous occurrences: (1) I was offered a soldering aid for review for TV Technology and (2) In connection with the review of a book on the life of TV pioneer Klaus Landsberg for the same publication, I was presented with a number of photos of his early Los Angeles television station. One of the photos was particularly striking — Landsberg is posing with transmitting antennas he apparently constructed for Paramount Pictures' experimental station, W6XYZ.

This got me to thinking about "the good old days," when the radio or television engineering staff at a broadcast operation was frequently called upon to design and construct equipment for the station.

While in some cases, this was a cost-cutting measure and kept otherwise "idle" techs busy (no offense intended), I'm thinking of all the time and talent that could go to waste back in the day when TV transmitters had to have a live "First Phone" operator at their beck and call, and on most days, all he or she needed to do was to turn the thing on at sign-on, take a set of meter readings every half-hour of operation, and then push the "big switch" again at sign-off. There were other similar dull and not-too-demanding personnel assignments too.

Fred Baumgartner and Nicholas Grbac in their recent "TV Operations Handbook" really got it right with characterization of a typical master control operator's shift as "fairly boring, punctuated by moments of terror."

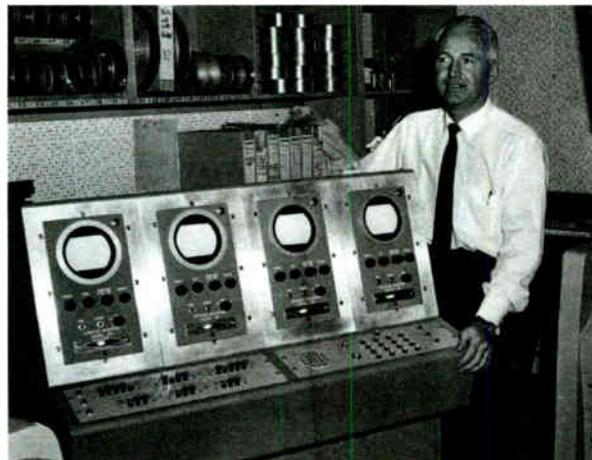
Another, sometimes very strong, reason for "rolling your own" was the unavailability of commercial equipment for the particular application. Either it just didn't exist, or the lead time for delivery made it an unattractive or impractical proposition to purchase an off-the-shelf unit.

For whatever reason, once upon a time, a lot of people at a lot of stations were involved in building (and designing) equipment for the broadcast plant.

WE SHALL MANUFACTURE

One excellent example of this was the WSM(TV) operation. (Tech person-

nel there once joked that the call sign stood for "We Shall Manufacture.") The station went on the air with a couple of "homebrew" image orthicon cameras (in addition to the two purchased from RCA), as well as a mostly homebrewed multi-hop intercity microwave linkage to Louisville, Ky., where the station obtained its NBC affiliate feed. (AT&T Long Lines didn't provide video service to Nashville, Tenn., when the station took to the air.)



KTLA's chief engineer, John Silva, designed and built the world's first "frame-accurate" videotape editor a decade before the advent of timecode. It used four special Hughes Corp. storage CRT units to freeze a predetermined series of images from the tape, allowing an editor to precisely select in/out-points. It was dubbed the TV-ola and Silva received a patent for his invention. Silva also pioneered airborne TV reporting with his invention of the "Telecopter."

Not long after the FCC TV "freeze" was lifted in 1952, the staff constructed a linear amplifier to boost the output of their "store-bought" transmitter to the new legal ERP limit of 100 kW. Somewhat later, a full-power VHF transmitter was fabricated on site and saw service for a couple of decades or so before being replaced by a commercial unit. The station also built a lot of its other gear, including transistorized distribution amplifiers. (And from all indications, it appears that the station's director of engineering, Jack DeWitt, was awarded the first patent for solid-state broadcast equipment gear, a video DA.)

Other stations and station groups were busy in the workshop also. Back in the early 1970s when Storer owned it, I took a tour of Atlanta's WAGA(TV) and was rather amazed to see the scope of their in-house construction operation, which included production and routing switchers. The station staff was not only

constructing gear for WAGA's use, but also for other Storer operations.

WAGA(TV)'s chief engineer at that time, Hugo Bondy, described the scope of his staff's accomplishments in a letter to the editor published in the June 1965 "Journal of the Society of Broadcast Engineers," which reads "... we're building as much of our gear as we possibly can. We can design and build far better gear (in some categories) than we can buy. We can build it for about 20 percent of store costs (assuming that you could buy some of it, which you can't). It is a good educational project for the crew and sparks up interest and morale."

Former NBC Television engineering employee Jay Ballard recalled that the build-it-yourself scenario once even extended to network level.

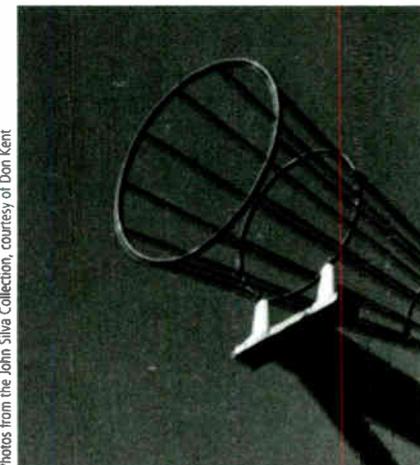
"The guys out at Burbank built a lot of gear for the system — power supplies, d.a.s, and the like," said Ballard. "They even used some manufactured modules to construct the audio consoles used in large network productions. Management saw this as a good use of their skills and slack time which might otherwise be spent on personal projects. There was also a financial incentive, as RCA's broadcast equipment division didn't offer the network any of the discounts they routinely gave to individual stations and station groups."

AN EDUCATION NOT AVAILABLE ELSEWHERE

Bondy was certainly right about the educational aspects of building equipment in-house.

I was once tasked with constructing a "wipe effects generator" for the production switcher at a TV station where I was employed. This forced me to do a lot of homework on video switcher and video special effects principles, knowledge that came in very handy later on. Ditto a "split-field" mod for an existing color bar generator, a variable frequency capstan motor power amplifier for an Ampex tape transport, and a number of others.

All of these projects proved invaluable in preparing me for what was to come later in my career. (This was especially true in connection with the wipe generator, when I was leaving the station a few years later for a better job, the senior supervisor confided that everyone else on the engineering staff had



Photos from the John Silva Collection, courtesy of Don Kent

The homebrew visual (upper conical assemblies) and aural (lower split ring dipole) antennas that were used by Los Angeles TV station W6XYZ (now KTLA). It's seen on the Paramount Pictures lot but was later moved to Mt. Wilson as part of the first TV transmitter installation there.

declined to take on the project before I came along. I was a new hire and went into it with the attitude that it was something I had to do to keep my job! So, in addition to a deep dive into switchers, I received an early lesson in politics.)

HOMEBREW DOESN'T HAVE TO MEAN UGLY

I have to point out that the homebrew gear I saw at WAGA and other TV operations did not have the appearance of electronic hobbyist or "ham shack" gear. It was almost always well-constructed and attractively packaged and labeled, as witnessed by the accompanying photo of the WSM(TV) transmitter.

I can't speak for the TV side of things, but Cincinnati radio giant WLW used to fabricate a lot of their gear, even microphones. The 50 kW AM rig designed and constructed by the station's R. J. Rockwell — though no longer in use — is still a part of the operation's Mason, Ohio, transmitter site and its appearance rivals contemporary commercial gear. (When put into service in the late 1950s, the Rockwell transmitter

(continued on page 30)

OPINION

How a State Broadcast Association Improved Its EAS

Successful NPTs are built on good systems

COMMENTARY

BY **MATTHEW STRAEB**
AND **LARRY WILKINS**

Matthew Straeb is executive vice president and chief technology of Global Security Systems. Larry Wilkins is contract engineer for the Alabama Broadcasters Association.

Prior to 2011, Alabama EAS system monitored Alabama Public Television Network and the Alabama Digital Satellite Network as their two sources for EAS alerts and tests. However, when ADSN was acquired by another company and moved out of state, the Alabama Broadcasters Association needed a new EAS message source.

ABA sought a solution to receive and deliver IPAWS CAP feed for EAS without relying on the internet in the event IP network failed. The parameters for the network included an existing footprint in the state, CAP compliance, access to FEMA's IPAWS and fewer activation steps to issue an alert.

After researching several companies and consulting with the Alabama Emergency Management Agency, ABA settled on Global Security Systems LLC as its new EAS provider and monitoring source.

Through the implementation of Alert FM, an FM RDS emergency notification system, in several Alabama counties, GSS already had an established footprint in the state, including a satellite network known as GSSNet.

GSS also had the capabilities to provide AEMA and the Alabama Law Enforcement Agency with an easy message dissemination through Alert Studio, which could also be connect to FEMA's IPAWS for the distribution of Wireless Emergency Alerts and Non-weather Emergency Messages to weather radios.

As part of the implementation process, ABA worked with AEMA to divide the state into eight operational areas and then designated two full-power FM stations per area to for GSSNet downlink equipment installation. Equipment was also installed at the two public radio station networks that have multiple towers around the state to bring the total of markets covered to 23. A Sage ENDEC was also installed at each station location so that each station could receive EAS Alerts to broadcast, as well as forward to other stations in the designated area.

Both AEMA and ALEA were provided with access for multiple originators to Alert Studio and were trained by GSS staff on inputting and sending an EAS message. The success of this



Matthew Straeb **Larry Wilkins**

system is due to a close relationship between the Alabama Emergency Management Agency, the Alabama governor's office, Alabama Broadcast Association and Global Security Systems.

Since its implementation in 2011, ABA has continuously had successful required monthly tests and national

public tests.

In 2016, The Alabama State Emergency Communications Committee with GSS support set up a special FTP server that monitors more than 100 EAS units around the state. This allows the SECC to continuously monitor the "health" of the state distribution system. It has also proved aid to stations in maintaining compliance with current FCC rules. A statewide data base is maintained to track the reception and relay of required test and/or alerts, both state and national.

With this system, we were able to observe the success of the recent national EAS test within minutes after it ran. This monitoring service is offered at cost to the broadcast station. We encourage the Federal Communications Commission and other broadcasters to consider this approach.

FUN

(continued from page 29)

had better specs than those of most FM stations, allowing WLW to claim that it was "the nation's highest fidelity station.")

Ballard recalled that the homebrew gear turned out by the NBC Burbank techs consistently performed well and did not look "homemade" in the slightest.

Trade publications, especially Broadcast Engineering, frequently published circuits and construction articles from readers. (The April 1968 BE featured an article on constructing a transistorized sync generator; this was not an "April Fool's" joke either.)

As I mentioned, home-brewing was fun and, at least to me, deeply satisfying. I hold in my own humble way, that there is something vaguely therapeutic in soldering a large number of connections. Perhaps this is one of the reasons that our industry is having trouble attracting "new blood." Removing gear from boxes, racking it up and screwing on connectors just isn't the same as laying out and punching a chassis, or designing a printed circuit board. Granted, the level of sophistication in today's television infrastructure — as well as the availability of relatively inexpensive off-the-shelf devices — makes in-house design and construction largely impractical. (Any takers on providing a circuit or construction article for a hardware HEVC compression unit, or maybe a UHD camera?)



This surviving example illustrates the quality of workmanship turned out by NBC Burbank technicians. The frame contains DAs and a chroma keyer. Date of manufacture is roughly established by the network logo at the top left of each module. It was used between 1959 and the mid-'70s.

I have to admit that "store-bought" is undoubtedly the best way to go for most of today's broadcast equipment, but there are still areas open in the broadcast plant open to "homemade." And remember, constructing a piece of gear need not be a complete "foundation to rooftop" project where each and every diode, capacitor, IC and wire is assembled on your workbench.

Marconi's first radio system was merely a conglomeration of other inventor's boxes; however, he was the first to string them together and produce a wireless communication system.

I'd really like to hear from you if you've been involved in home-brewing gear for your TV station, production house or remote truck. I think many of our readers would be interested too.

James E. O'Neal is a frequent Radio World contributor. He is technology advisor to RW's sister publication TV Technology and a retired broadcast engineer. Write him at jonealnb@aol.com.

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