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Most People Don't Have a Plan

Entercom engineer Chris Tarr shares the benefit of his experience with cyber attacks

■ CYBERSECURITY

Radio engineers and technologists worry about whether their networks are adequately prepared to defend against cybersecurity incursions. We talked to Chris Tarr, CSRE, AMD, DRB, CBNE, director of technical

operations for Wisconsin at Entercom, which was one of several radio groups in the United States that have suffered recent ransomware attacks. Opinions are his own and not necessarily those of Entercom.

Radio World: How well prepared is the radio industry?

Chris Tarr: There's still a mentality that you can protect yourself and make yourself completely invulnerable. It's never a matter of *whether* it's going to happen to you; it's a matter of *when*.

Do what you can to fortify your systems, [but] you can put up the best fortress in the world, and once they're behind that wall, everything is fair

(continued on page 16)



Getty Images/Plume Creative

MMTC: Don't Eviscerate EEO

But smaller broadcasters say the burden of current rule compliance is significant.

BY RANDY J. STINE

The Multicultural Media, Telecom and Internet Council is worried that some broadcasters and state associations are trying to "totally eviscerate, diminish or cripple" enforcement of the FCC's Equal Employment Opportunity rules.

Some broadcasters have argued that current rules, "with their laudable goals," require burdensome paperwork and nonproductive effort, especially at smaller companies; they laid out those arguments as part of an FCC notice of proposed rulemaking.

MMTC recently replied with a 22-page letter from its President Emeritus and Senior Advisor David Honig to Chairman Ajit Pai and the other four commissioners. It says some broadcaster proposals are contrary to the intent of the NPRM.

RESET SMALL-STATION EXEMPTION?

MMTC found "common ground" with broadcasters on certain issues, including the need for the FCC to publicize its EEO whistleblower and anti-retaliation rules.

But it took issue with the over-

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Relationships Are Why Radio's Future Promises to Be Strong

Diverse audio streams and human connections are the keys to radio's continuing success

COMMENTARY

BY JOSE TORRABADELLA

The author is VP of broadcast at Barcelona-based BMAT.

This year, World Radio Day was dedicated to diversity — diversity behind the mic and in the newsroom, diversity in the airwaves' music and ideas. This focus comes at just the right time. Radio and radio-like audio are poised for growth, so long as they can woo younger listeners by reaching them where they are, via digital products like streams and podcasts.



Podcasts are a great springboard for diversity, allowing new voices to find and build an audience.



Radio knows how to create value for listeners and sponsors. Radio is great for discovery, as trusted voices introduce us to new sounds, new artists and new thoughts on cultural or political developments.

New digital platforms and media are inspired by radio's time-tested formats. Efforts on the part of streaming services to grow their user base, for example, draw on radio's ideas, linking music, engaging talk, friendly conversation and other elements into personalized radio-like channels.

PODCASTING

The podcast boom shows that the human element outweighs the algorithm in creating this value for listeners. The majority of broadcasters see podcasting as a good opportunity, one way or another.

We at BMAT see this. We are one of the largest global monitors of broadcasting for reporting purposes, carrying out 24/7 tracking of around 8,000 channels across 134 countries.

Podcasts offer potential listeners a chance to catch a beloved on-air personality whenever convenient for the listener. Podcasting lets broadcasters expand their offerings, curate experiences for specific audience segments and, importantly, experiment with new sounds, approaches and perspectives. Podcasts are a great springboard for diversity, allowing new

voices to find and build an audience.

We need to nurture these new voices in order to keep radio's audiences youthful. For music radio in Spain, where BMAT is based, the average age of listeners is 40, which means there aren't a lot of teens tuning in. Especially in first-world countries where there are so many other options, Gen Z and millennials are elsewhere. They're still tuning in, still listening, but not as much. Broadcasters need to think about how to engage with these audiences. This doesn't mean we should abandon terrestrial broadcasts, but instead, we could let new formats cross-pollinate with tried-and-true approaches.

We need to nurture these new voices in order to keep radio's audiences youthful.

These approaches endure and can flourish in the future, I believe, because they involve real human connection. Radio is the most widespread medium on the planet, and worldwide, its penetration is still higher than the internet. For many listeners, radio is still the best, if not the only, way depending on their location, to hear new sounds or catch up on news or important issues.

For me and for billions of other people out there, there's this feeling when you turn on the radio. You find your favorite station, and you come to trust the person's taste you're listening to. It's a relationship between you and the presenter, a relationship that means something in this era of on-demand audio content. It's a relationship that's still going strong.

Jose Torradabella works with the monitoring and reporting of song information, duration, audience and context for broadcasts on TV and radio channels across 134 countries.

A Look Inside Italy's Digital Radio Rollout

Through smart investments and service efficiency, DAB Italia is rapidly expanding the nation's digital services

In the northwest corner near the Swiss and French borders, the Gerdaz site covers the broad Aosta Valley region.



BY CLAUDIA KIENZLE

MILAN — Italy has been at the forefront of digital radio adoption in Europe for two decades, with three national and several local DAB+ multiplexes on the air today.

Approximately 83% of the Italian population can receive DAB+ broadcasts today, with well over 150 transmission sites from the three national broadcasters. These networks stretch from the northern border south through Italy's famous boot-shaped peninsula — with some networks extending into Sicily and Sardinia.

EVOLUTION

Of the three national services, DAB Italia has perhaps the most interesting history. The network operator, owned by private radio service providers, launched its initial tests in Northern Italy in 1998, and was actively involved in regulatory development for

the emerging medium. Those developments stretched into the second decade of the new century, resulting in DAB Italia's 2012 commercial launch.

The technology has continued to evolve and change in those ensuing 13 years — changes that brought new challenges and benefits. Notably, the introduction of a second-generation audio codec in 2007 shifted testing from DAB to DAB+

due to the enhanced service and quality capabilities that the latter offered.

"The launch of the MPEG-4 AAC+ Version 2 codec presented us with a more efficient audio encoding standard," said Hanns Wolter, technical director, DAB Italia.

"The previous MPEG-1 Layer II standard limited us to around 10 DAB radio services for each multiplex. The

second-generation standard doubled that capacity while also reducing the associated transmission costs. It was an important development in efficiency that has allowed us to protect our investments over many years."

Naturally, as with any early digital radio service, there weren't many possibilities of reaching an audience. "There were no DAB+ receivers in 2007," he said.



The Torcegno site covers the Trentino region not far from the Austrian border.

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"It took us at least four months to procure a DAB+ receiver for our own tests, and we could only verify the operation with test equipment. We immediately heard the audio quality improvements, and soon followed the efficiency benefits."

The efficiency largely comes down to the number of transmitters required. "We need 40 to 50 FM transmitters to achieve the same results that we do with 10 DAB transmitters on a single frequency network," said Wolter. "This really opened the door for commercial DAB+ radio in Italy, because those tests proved we could deliver cost-efficient digital transmissions."

EARLY INNOVATION

DAB Italia's efforts have paid off. With more than 120 live transmission sites from the Austrian border south through Naples, Italians with DAB+ receivers — currently estimated at more than 4.5 million — can receive 16 DAB Italia digital radio programs (three other channels are used for testing). Many are broadcast exclusively in DAB+, while others are also available as FM simulcasts.

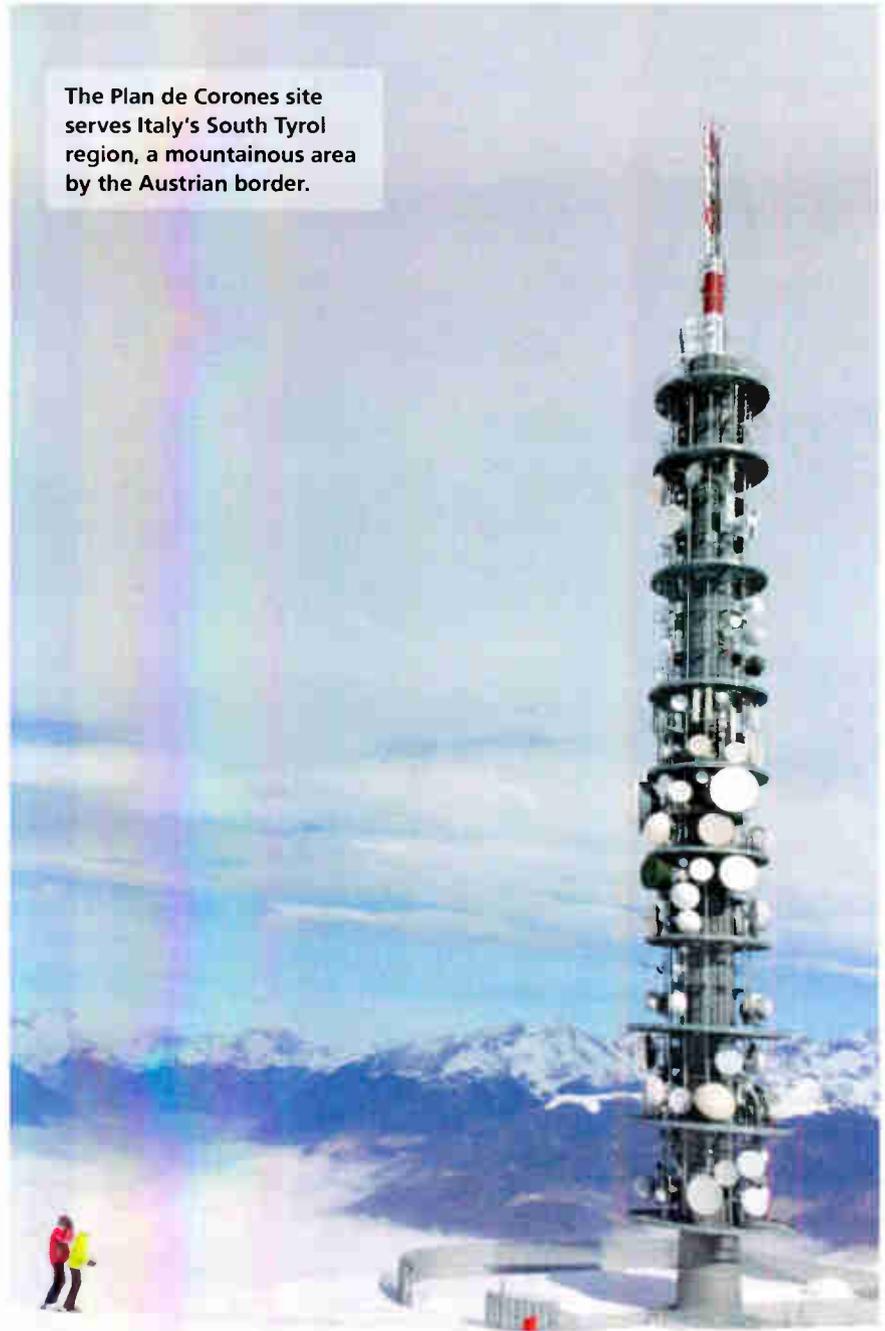
"We cover much of Italy, but we are still building the network," said Wolter. "We add between 20 to 30 transmitters a year. It's a continuous rollout intended for national diffusion."

That national perspective is mainly focused around road travels. "Italians drive a lot and are often stuck in traffic. Therefore, 70% of Italian radio consumption happens inside the car," said Wolter.

The early rollouts focused on major cities to address the most heavily traveled

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The Plan de Coronas site serves Italy's South Tyrol region, a mountainous area by the Austrian border.



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DAB ITALIA

(continued from page 5)

regions. Italy's geographical footprint expands over approximately 300,000 square kilometers (116,350 square miles), which means there are plenty of open highways, expansive countryside areas, and challenging terrain. Italy's two mountain ranges, the Alps and the Apennines, are monumental, with the latter running north to south through much of the country.

All of this means that to make a true impact, DAB Italia soon looked beyond the major metropolitan areas. "We sent a strong signal to the automobile industry: We are providing Italy with a network, and it's time to get DAB receivers into your cars," said Wolter. "Our tests showed that the performance and propagation were especially good in the valleys, and we were penetrating the more challenging mountainous terrain.

We were achieving capabilities that we simply could not do in analog."

TACTICAL APPROACH

The DAB Italia team tries to locate each transmitter site based on what will provide the best coverage, including rooftops and traditional high broadcast towers in cities, and hilltops to penetrate valleys in rural areas.

Regardless of location, each new site involves extensive planning and theoretical studies. "There are a number of hurdles and constraints in an SFN deployment," said Wolter. "We have to precisely calculate the delays across each transmitter for the receivers to decode the signals accurately. If the signals are outside a time interval of 246 microseconds, the RF interference contributed by the different transmitters will disrupt reception. Staying within that time interval will both influence and limit site selection."

By the seaside in northwestern Italy, the Monte Fasce site covers the Liguria region, including the capital city of Genoa.



The DAB Italia network has a mix of transmitters, including GatesAir (formerly ONEtastic) transmitters for recent deployments in Ferrara and Asti.

The site buildouts are simple by comparison. DAB Italia favors simple antenna systems from Kathrein or Aldena Telecomunicazioni, both of which Wolter says are simple to install and control. DAB antennas are approximately half the size of FM antennas, which makes it easier to place and position the antenna.

The network includes a mix of transmitters from six vendors, some of which are no longer in business. The most recent phases have utilized GatesAir S.r.l. (formerly ONEtastic) and Syes transmitters, both based in Italy (GatesAir S.r.l.'s parent company, GatesAir, is located in the United States).

"Over the last years we have supported these manufacturers in the development of their DAB transmitters with the capabilities we needed to operate correctly our network," said Wolter. "We worked closely with them on the software development side to access information on system performance. An important recent development is the integration of satellite receivers into the most recent transmitters they shipped. That removes the cost of external receivers. They are active listeners and respond to our requests."

DAB Italia has deployed 15 GatesAir's Maxiva transmitters since early 2019 covering a range of power levels and network requirements. "The first GatesAir transmitter we installed provides DAB+ service to the city of Verona, but we also have a number of medium-power transmitters and gap fillers. Most of these transmitters deliver power levels of 100, 250 or 450 W. But we have gap fillers as low as 25 W, and a few higher power systems that go up to 2.5 kW. All have a 40% efficiency rating, and the higher power transmitters reduce energy use by 15 to 20%."

The multiplexes come into the transmitter sites from eight radio content providers, using a Factum Radioscape system that takes in signals via IP, satellite and fixed radio links. DAB Italia

ingests the various contributed signals into the Factum multiplex, which combines and distributes the signals to the various transmitter sites.

"Our system is really a server farm," said Wolter. "Audio processing is handled by the content providers, and we manage distribution of the finalized signals. The Factum Radioscape system integrated encoders, which leverage Dolby or Fraunhofer audio codecs. Each has a digital audio interface or AoIP.

"We can adapt a broad range of bitrates based on the quality of the originating signal we receive," explained Wolter. "We rely on our content providers to appropriately process the audio for DAB, which is quite different compared to processing for FM. DAB offers more bandwidth, which means less processing is required. Too much processing will create a loss in audio quality."

The majority of DAB Italia's 19 channels are currently encoded at 48 kbps using HE-AAC+ Version 2 coding. Some are encoded with lower bitrates of 32 kbps, while others leverage higher bitrates of 64 kbps.

"It's an interesting compromise that still results in exceptional audio quality for the broadcast, provided the source signal is pristine," said Wolter. "You cannot correct a bad source with higher bit rates; the quality will not improve. The listener will just notice the problems more easily."

DAB Italia leverages the ETI protocol for contribution and distribution, but is looking at EDI for backup streams. "EDI had just been finalized as we began rolling out the network, and the modulators and transmitters at the time did not support it," he said. "We are looking to roll out a system that will seamlessly switch between ETI and EDI sources, which gives us the option of having either IP or satellite as the backup."

The Radioscape system includes an ETI output, and additional equipment then converts the signals to ASI before being sent into a DVB-S2 multiplex. The



To effectively serve the Piedmont region, a large Kathrein 10-bay, Band III Yagi antenna is top-mounted to the tower. The same tower supports a large, top-mounted Aldena antenna.

for digital,” said Wolter. “It’s mostly a different generation of technicians that have years of FM experience, but don’t quite understand digital radio. It’s very difficult to convince them to take a lap-top to the transmitter site.

“But we have found that most DAB transmitter failures are generic — things such as the power supply, or a software issue. The simplest and easiest way is to change out the transmitter at the site and take it back to the lab.”

Wolter said GatesAir has reduced the maintenance burden with more modern and clever designs. “It’s almost like a

Lego box, especially with their smaller transmitters,” he said. “They have interlocking parts and no cables. These are compact transmitters with separate amplifiers. It also makes for an interesting tunnel coverage solution, which we are now evaluating.”

Wolter expects to significantly expand the network over the next two years, taking the DAB Italia service to smaller cities, towns and roads, one by one. The most recent transmitters recently went on the air in Ferrara and Asti, which represents their expansion strategy into smaller cities.

“We will extend highway coverage further, focusing on areas that are underserved,” he said. “Our second step is to install a local transmitter in every major regional or provincial town. We ultimately expect to have a network of more than 400 transmitters throughout Italy, and to run it at approximately one-tenth the cost of a comparable FM network.

“Italy is closely interconnected with other European realities and we always keep an eye on new technical developments to keep our system at the highest level of reliability and efficiency,” concluded Wolter.

satellite receivers at each transmission site extract the ETI signal before sending the streams into the transmitters. Where older transmitters without integrated satellite receivers are used, DAB Italia leverages external extractors and receivers from 2wcom.

CAREFUL INVESTMENTS

As DAB Italia works with private radio service providers, they are limited to a certain annual budget. That budget is used to manage the rollout of new sites and maintain the existing network.

“We’re funded by FM revenues, which means we don’t have the budget to roll out 100 to 200 transmitter sites a year in a way that public networks can afford,” said Wolter. “It forces us to make thoughtful investments, and it has provided the opportunity to gain experience in building DAB networks.”

This also means that the network operator needs to use existing resources wisely. Therefore, labor and system maintenance require some very careful planning.

“DAB maintenance is a complex subject in Italy, as a large majority of the existing engineering base is not trained

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“Digital Sunrise” Webcast Available on Demand

Watch Radio World’s 90-minute deep dive into the potential of all-digital on AM



Hundreds of radio station owners, managers and engineers watched the webcast “Digital Sunrise on AM” in February, produced by the Radio World editorial team and sponsored by Nautel, Comrex and Xperi. The program is available now for free viewing on demand at <http://tinyurl.com/rw-sunrise>.

The FCC tentatively plans to allow U.S. AM band radio stations to turn off their analog signals and broadcast in all-digital HD Radio if they wish. Comments to the commission about this are due March 9, reply comments due April 6.

This page provides a sampling from the Radio World webcast.



Joel Oxley had to say “yes” before WWFD in Maryland could turn off its 820 kHz analog signal to broadcast only in all-digital. He’s senior VP/GM of Hubbard Radio’s Washington-based WTOP operation. “This has tremendous potential, especially in some smaller markets, especially markets where you can make a bit of a splash when you change a format,” Oxley said. “Going AM digital, especially if you already have a translator, would allow you to really get some extra coverage for an awful lot of people who are now able to get this in their cars.”



David Layer of NAB provided an overview of research that’s been done to date and how to find published results. He also peeked ahead: “The AM and FM bands are different services; there are different reasons for them to go all-digital. We have a notice of proposed rulemaking on all-digital AM and not all-digital FM, and I think that will come sometime in the future.”

All-Digital AM Potential

- Stereo audio, free from fading and noise
- Program Service Data (song title and artist, etc.)
- Data services on par with FM
- Emergency Alerts
- Demonstrate to automotive OEM’s AM band relevance
- Innovation is still happening on AM
- Broadcasters still investing in AM



Dave Kolesar, the engineer and program director who pushed Hubbard to experiment with WWFD, believes in a future for AM broadcasters “if we’re willing to go for it.” He said stations must be digital if they want a privileged place in dashboards that tune by visual metadata. “In the car receiver designs that I’ve seen, the radio would scan for available services and display them as logos on the screen ... It’s not inherently obvious that you’re tuning to an AM or FM station if it’s just a logo that you press for a program. It’s all done under the hood. That is going to be an equalizer for AM stations.”



HD RADIO BY THE NUMBERS



Over 64.5 million HD Radio-equipped cars on the road in North America
 + Over 3.8 million consumer HD Radio home and portable receivers
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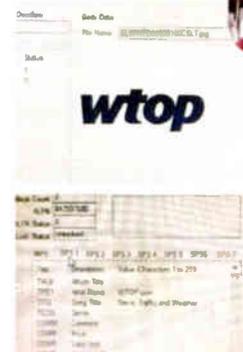
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- | | |
|-----------------------|-------------------------|
| 1 New York: 37.5% | 6 San Francisco: 31.1% |
| 2 Los Angeles: 34.3% | 7 Washington, DC: 24.8% |
| 3 Chicago: 23.3% | 8 Houston: 23.0% |
| 4 Philadelphia: 24.1% | 9 Boston: 29.2% |
| 5 Dallas: 22.3% | 10 Atlanta: 22.2% |

A key argument cited by supporters for authorizing all-digital on the AM band is the growth in the HD Radio receiver base in cars; Xperi released updated data for the Radio World webcast. Meanwhile, all-digital WWFD(AM) and its eclectic music format have now shown up in two consecutive ratings books in Frederick, Md. While its ratings are small, the station had gone decades without even making the cut.

WWFD-AM HD2, a proof of concept

- On-air testing of an HD2 has been performed
- Both HD1 and HD2 channels transmit title and artist data, as well as images
- Mono audio on both channels
- An AM HD may allow broadcasters to obtain a second FM translator, separately programmed from the main channel



In addition to music-friendly stereo audio, program service data and emergency alerts, HD Radio’s MA3 mode could bring another benefit. “For the first time, we tested an HD-2 on AM,” Kolesar said. “What this means is that an AM station could conceivably feed a second FM translator with a separate audio program. For a station in a small town, that means one AM broadcaster could effectively program two FM signals in a market. And of course all-digital AM makes this possible.” The FCC would have to confirm that this is allowable, should the commission authorize voluntary all-digital, but Xperi believes it would be.

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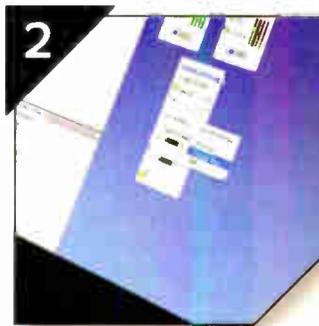
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World Radio History

EEO

(continued from page 1)

all tone of comments to the commission. "This proceeding is not about how to totally eviscerate, diminish or cripple EEO enforcement," Honig wrote. "Instead, the NPRM called for comments on how to improve the current EEO enforcement system."

The regulations disallow the use of race and gender in hiring decisions, while seeking to ensure that qualified persons, including minorities and women, can learn of and compete on an equal footing for job openings.

They also require broadcasters to take steps to provide notice of each full-time opening and participate in recruitment initiatives like job fairs and internship programs, along with additional steps.

According to the FCC, each year it audits the EEO programs of approximately 5% of both radio and TV stations. It also can review compliance at the time of a broadcaster's license renewal.

According to a summary on the Broadcast Law Blog, the back-and-forth began when the FCC asked for comments on its NPRM in MB docket 19-177, prompted by complaints raised in connection with abolition of the Form 397 Mid-Term report.

Much of the debate focuses on comments from a group of 82 broadcasters, represented by attorney John Garziglia of Womble Bond Dickinson, that submitted joint comments last year. They believe that the FCC's documentation and paperwork approach to nondiscrimination and employment diversity is not working.

"In the absence of evidence that the current FCC's paperwork and record-keeping requirements prevent or reduce discrimination, or increase employment diversity, the FCC should generally direct its regulatory efforts to finding effective ways to achieve the important goals of nondiscrimination and employment diversity," the group wrote.

The coalition of 82 broadcasters — some consisting of one or a few stations, others with dozens — titled its filing "EEO Enhancements" but concluded: "If the FCC's paperwork and recordkeeping requirements do nothing toward reducing discrimination or enhancing diversity, they should and must be jettisoned."

But it also told the FCC that its members have "no desire to lessen or

diminish the FCC's quest for diversity in employment, and full and transparent opportunities for all seekers of jobs in the broadcasting industry. To the contrary, [we] believe that the commission can do more to achieve its goal."

These broadcasters proposed requiring a wide outreach through a nationally or regionally recognized job-oriented website for every full-time broadcast station employment opening, no matter how few employees it has. "The placement of an internet posting for an open position at a broadcast station is something that most stations now do, and requiring it of all broadcast stations is not an undue burden and is an effort that may bring future broadcasters into the now exempted stations."

The group also proposes to put an end to the consideration of market-based "employment units," given the abolition of the broadcast station main studio rule, in favor of an examination of a broadcaster as an entire entity. It calls this "a more pragmatic and sensible definition of employment unit."

"In return, however," the broadcasters continued, they asked the FCC to reset the small-station exemption for EEO documentation and supplemental initiative requirements.

"Reduce EEO paperwork for small broadcasters by exempting entities with fewer than 50 full-time employees, which is the number ... regarded by the human resources profession as demarcating smaller from larger entities," according to the filing.

"DAMNING INDICTMENT"

The MMTC's Honig responded directly to several comments from the coalition, which he said "expressly advocated heading backward toward less enforcement, less accountability, and more opportunities for intentional discriminators. ... Their approach would help no one but the bad apples in their industries that seek to evade accountability for discrimination. Such comments are not responsive to the NPRM."

Moreover Honig is troubled by the "hostile language" in some filings.

"According to the 82 Licensees, EEO compliance imposes a crippling resource burden that simply takes away from the important task of broadcasting. There is no evidence to support this assertion."

Comments by state broadcast associations also caught the attention of MMTC. Associations wrote in a joint filing: "Many of the proposals presented in this proceeding would dramatically increase burdens on broadcasters while at the same time being of both questionable constitutionality and little practical utility in achieving the commission's stated goals."

In addition, the associations wrote, the FCC "has not found a single broad-

caster to have engaged in discrimination since the advent of the first EEO rules in 1969."

The National Association of Broadcasters echoed that theme: "To our knowledge, the commission has conducted tens of thousands of reviews of broadcasters' EEO programs since the rules became effective in 2003, without one finding of discrimination. This includes random EEO audits, mid-term reviews and license renewal examinations," NAB commented.

To this line of argument, Honig replied in his December letter: "The fact that an industry contains discriminators, but they never get prosecuted, much less held liable, is certainly not a strong argument for weakening the obviously insufficient EEO compliance program in place now. That is a damning indictment of the agency's enforcement program. It is simply not the case that broadcasting is the only industry in the nation whose thousands of employers included no racial or gender discriminators for the past 50 years."

MMTC said it believes its position is bolstered by comments by several individuals including Dr. Jannette Dates, dean emerita of the Howard University School of Communications, Dr. Valerie White, associate professor at the School of Journalism & Graphic Communication at Florida A&M University; and Zemira Jones, president and CEO of the All American Management Group and former vice president of operations for Radio One.

Another MMTC witness, Robert Neal, president and general Manager of WQID(LP), Hattiesburg, Miss., and executive director of the International Black Broadcasters Association, wrote: "It is absolutely without question that racial discrimination persists in the radio and television industries. I have seen extraordinary well-qualified African American managers, announcers and salespersons get shunted aside when jobs open up. Often they find out the jobs were available only after they were filled," Neal wrote.

"EDGE OF CONSTITUTIONALITY"

Whereas EEO supporters asked the FCC for more frequent EEO audits, the National Association of Broadcasters pleaded against this.

"Rather, the commission should minimize the unjustified burdens of EEO audits by eliminating audits for small broadcasters," NAB wrote. It added, "the record [FCC proceeding] lacks support for additional EEO rules and regulations."

The NAB estimated the cost of an audit in the \$3,000 to \$5,000 range. NAB also said that the commission "should be wary of imposing more EEO rules, as the current regime already flirts with the edge of constitutionality, and there is no evidence of discrimination in broadcasting that justifies additional regulation or that more EEO rules will actually increase employment diversity."

The association said additional EEO rules are unjustified and unnecessary.

DIGITAL SUNRISE

(continued from page 8)



The FCC recently declined to reconsider its choice of IBOC HD Radio as the sole digital radio standard in the United States. Digital Radio Mondiale Chair Ruxandra Obreja explained why she thinks the FCC should reconsider that, but critics say revisiting the decision would lead to confusion and delays and they note the lack of a receiver base in the U.S.

"For stations going to MA3, now and for the foreseeable future, we are waiving the licensing fee," said Xperi's Mike Raide, adding that a license signed now would be good in perpetuity, not expiring after a certain date. (The fee for the hybrid MA1 system was \$7,500.) Raide and Kolesar also described how WWFD performs under bridges and power lines, during severe thunderstorms and at edges of its coverage. Generally, in the urban core, Kolesar said, "You forget you're listening to AM radio. It just works."



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World Radio History

Fresh Solutions to Repel Pests

Also, step-by-step instructions to repairing old RE20 microphones

WORKBENCH

by John Bisset

Email Workbench tips to johnpbisset@gmail.com

Wouldn't it be nice if you could repel rodents, raccoons, roaches and ants all in one fell swoop?

Stop by your local big box store and look for Rodent Sheriff Spray (shown in Fig. 1). These pests hate the smell of mint, so your transmitter shelter, ATU or storage shed should stay pest-free — and as a nice bonus will smell minty fresh.

Frank Hertel, principal consultant with Newman-Kees, sent a link to another peppermint refill that works with the Air Wick Plug-In air fresheners. These refills cost less than other methods, and like the spray above keep your buildings pest-free and smelling pleasant.

Here's a link to the product: <https://scentfill.com/products/all-natural-fresh-peppermint>.

Joe Geerling is synonymous with engineering in St. Louis. Joe ended 2019 by leaving Entercom St. Louis to become director of engineering for the Covenant Network, also in St. Louis.

He dropped me a line recently about his son Jeff. Jeff is a software programmer and wrote a book entitled "Ansible for DevOps" (Fig. 2).

Ansible is a simple but powerful server and configuration management tool. Jeff's book will help those familiar with command line and basic shell scripting start using Ansible, to provision and manage anywhere from one to

Fig. 1: Rodent Sheriff mint spray deters pests and smells good too.

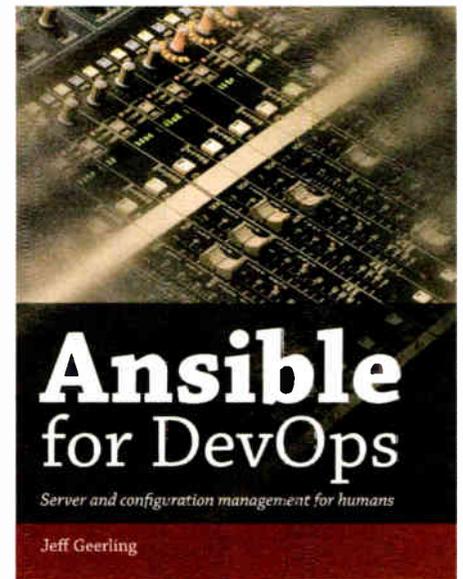


Fig. 2: A helpful resource

Although the job to replace the foam is time-intensive, the result is restoring a great-sounding microphone!

thousands of servers. The subject matter is increasingly relevant as more and more companies get into cloud computing. The book is available from Amazon for under \$20.

Jeff is also an avid podcaster. Joe writes that Jeff wanted to "up" his podcasting game and took an old RE20 apart in order to replace the internal foam.

There are a lot of old Electro-Voice RE20 mikes being dumped by stations because they no longer sound good, or have started to shed decayed internal foam. Perhaps you have one or two on your shelf. In most cases, as these mikes age, the foam supporting the capsule deteriorates. Although the job to replace the foam is time-intensive, the result is restoring a great-sounding microphone!

Jeff documented his experience, complete with pictures and step-by-step instructions, on a blog post. Read it here: <https://tinyurl.com/hpt3fux>.

I've spoken to a number of engineers who have found it difficult to acquire a reliable, versatile FM/AM/NOAA weather receiver.

The Watch Dog (WD-1) is reliable, versatile and features a real-time RDS

(continued on page 14)



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WORKBENCH

(continued from page 12)

decoder, making it a great choice for an EAS receiver. This compact receiver can also be used as a confidence monitor, and even provides an open collector alarm system. If you need contact closures, attach the optional Watch Dog Alarm.

Contact your favorite broadcast equipment distributor for more information or visit www.rfengineers.com.

Projects engineer Dan Slentz has found a free image and photo edit-

ing software for PCs that run Windows. Paint.NET features an innovative and intuitive user interface, which includes special effects. There is also an active online community to assist you.

Paint.NET started development as an undergraduate senior design project. It was intended as a free replacement for the Microsoft Paint software that comes with Windows, and the project had a mentor from Microshop.

The software is maintained by some of its creators, and Paint.NET has developed into a powerful yet simple photo editor tool.

Download Paint.net here: <https://www.dotpdn.com/downloads/pdn.html>.

Richard Parker shared a twist on using muffin tins to hold parts when disassembling equipment.

The Daiso Japan's Clear Plastic Document Case, Model A4L, is a clear plastic case with a snap-on top. But if you add a Daiso A4 magnetic sheet on the bottom of the tray, steel screws, nuts, washers and other parts stay put. The magnetic sheet is white, and could also serve as a "white board" for brain-

Moseley



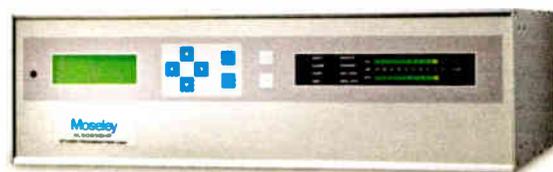
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Fig. 3: An inexpensive document tray with a plastic lid, from Daiso Japan, holds parts while equipment is being repaired.

storming during other projects.

Shown in Fig. 3, the plastic tray is available from the Daiso Japan online store and also from Amazon for about \$10 for two trays.

Looking for a way to stay educated in broadcast engineering best practices? The Society of Broadcast Engineers webinar archive is an excellent resource for learning the latest in broadcast engineering.

If you sign up for SBE MemberPlus membership, you'll have access to all existing SBE webinars, including the Workbench Tips Webinar.

Head to www.sbe.org for more information about SBE MemberPlus benefits and the society's webinar offerings.

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



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MARKETPLACE

Mix Mania: Originally announced last September, the Mackie ProFXv3 Series of audio mixers made their debut at January's music instrument bonanza, the NAMM Show.

The half-dozen mixers are intended for use both in live sound settings as well as for home studios, content creators and live streaming.

The new series is based around the six-channel ProFX6v3, 10-channel ProFX10v3, 12-channel ProFX12v3, 16-channel ProFX16v3, 22-channel ProFX22v3, and 30-channel ProFX30v3.

All the mixers have some features in common, including Mackie's Onyx mic preamps,



GigFX effects engine, 24-bit/192 kHz USB recording and shared design cues. The mixers also come with a variety of software, notably a copy of the Avid Pro Tools|First DAW, as well as the Mackie Musician Collection, a set of 23 Avid plug-ins.

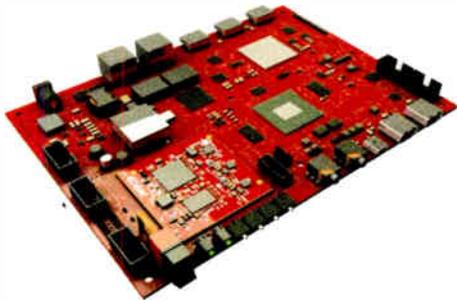
Mackie says that the Onyx mic preamps offer

up to 60 dB of gain, while its new GigFX high-resolution effects engine provides 24 effects such as reverbs, delays and more. The mixers feature a built-in USB interface; a dedicated Blend knob that swaps between DAW output and direct latency-free monitoring; single-knob compression; Hi-Z switches and more.

Avid plug-ins provided with the mixers include the 304C compressor and 304E equalizer. In addition, users will also get Waveform OEM DAW software with its DAW Essentials Collection of 16 plug-ins.

The mixers range from \$199.99 for the ProFX6v3 up to \$1,169.99 for the flagship ProFX30v3.

Info: www.mackie.com



To DPS or not to DPS:

Audinate's upcoming Dante AV Product Design Suite will ship this quarter. The PDS is intended to aid users in creating AV-over-IP products that employ the Dante AV technology used in 2,500 existing Dante products from 450 manufacturers.

The Dante AV Product Design Suite is designed to help OEMs to build an AV-over-IP endpoint with low latency over a 1 Gbps network. It provides interoperability for audio distribution and control, delivering independent, synchronized audio and video streams.

Based around the Dante AV module, the Dante AV PDS may be modified, branded and differentiated by OEMs via software, control and integration with other members of their product lines.

The Dante AV PDS is designed to be an AV-over-IP solution for the professional AV market, implementing a codec, local HDMI and HDCP, ancillary data channels, and control. The onboard Dante AV Module provides Dante clock synchronization, control, discovery, transport, messaging, management, updates and more. A set of hardware documents, design files and a software SDK allows OEMs to create complete, fully interoperable Dante AV products with end-to-end HDCP support.

Each Dante AV PDS contains two preconfigured Dante AV Endpoint Design Boards and five Dante AV modules in order to validate end-to-end performance.

Info: www.audinate.com



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CYBER

(continued from page 1)

game. A lot of companies do a good job of preventing people from getting in from the outside but not doing anything about people who actually get inside. The theme that I've seen [in other attacks] is nobody had a plan. Always assume someone is going to get in.

Everybody says, "Oh well we have backup so we're okay." A lot of people who have backups never check them. They never validate them, they never make sure they're working; and they don't realize how long it takes to restore that stuff. A lot of people get by with, "We've got antivirus, we've take backups of everything. We've got a firewall, we're good. Worst case is we just restore from our backups."

A lot of companies do a good job of preventing people from getting in from the outside, but not doing anything about people who actually get into the inside.

If backups are part of your plan, do you have a plan to check those every day, every two days? What's your plan for how many times a week you backup? Do you backup [only] certain files? Even if you're on the cloud, are you able to roll back if something gets attacked?

We haven't even gotten to the network part yet.

RW: Once a manager knows they need a plan, what's the next step?

Tarr: A plan is only as good as how you execute it. So what are the vital components of your operation? Once you've identified those, what happens if those were all to fail? How would you restore those? Even better, is there a way to really harden the network?

For example, by now everybody should be segregating their automation networks from their office networks. However, you can't do that 100%, you have to be realistic. Short of sneaker netting, and using thumb drives and stuff that can kill the infection, how can

you get files from Point A to Point B?

Something as simple as "How many file shares do you have, and how many do you really need?" Does everybody need to have access to everything? Really take a serious look at the roles of each individual in the organization. What do they truly need access to?

Then how can we isolate things? We know that an automation system isn't going to get the ransomware on its own, so look at what kinds of actions people could take to infect the network.

What if the program directors want access to the computers on that automation network? In the old days we'd just throw on another network card, put their computer on there and they're good to go. You can't do that anymore. So you look at maybe a thin client on your desktop, where there really isn't any

services other than sharing a video feed between the two machines.

Where do you keep your financials? Where do you keep HR stuff? How do you segregate that? Again, most of that is going to have to live on a network somewhere; what do you do to keep those files safe?

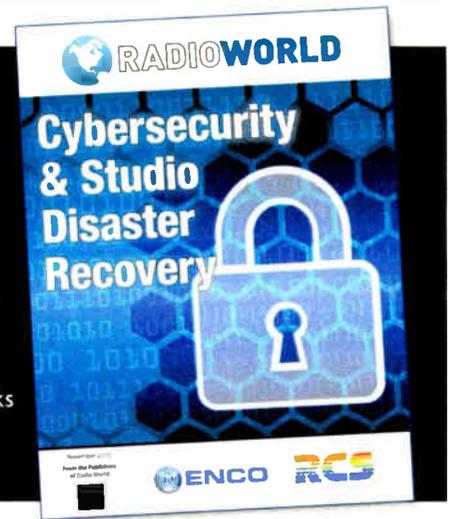
That's step number one, getting things locked down, network segregated, backup plans. You can't do just a single backup and hope for the best; you need to rotate backups, take backups offline so they can't ever touch the network. That's saved me more than once, where my backup was a disconnected drive so it never got touched. I was able to restore cleanly without any problems.

You want to validate those backups to make sure. There's nothing worse than putting a backup up, and realizing that it hasn't run for three months because of not paying attention.

How will you communicate [after an attack]? Most of the time your email is going to be down, everybody's computers are going to be off; so how do you communicate what's going on? How do you communicate to your advertisers so that everything is okay? Because the word will get out. How do you put logs together?

Assume that everything involved in your operation is off and there's nothing you can do right now about that. How do you manage that? Do you set up a Twitter account for employees? Do you

This article is from Radio World's ebook "Cybersecurity & Studio Disaster Recovery." We've now published more than 65 ebooks on a wide range of topics that are of interest to the broadcast technologist or manager including AoIP, next-gen codecs, cloud technology, digital radio, RDS, DRM, translators and more. All are free to read. Find recent editions by clicking the ebooks section under the Resources tab at radioworld.com.



prepare a list of their personal email accounts so that you can do a mass email with "Here's what's going on" status updates on what's functioning and what's not functioning?

Have you thought about how you're going to play back audio if your playback machines, heaven forbid, get hit? How are you going to bill clients? Spots, how are you going to bill them? A file server backup could take hours to days to restore. What do you do?

That's the holistic approach people are missing.

RW: I do have the sense that more organizations are trying to raise awareness on this.

Tarr: Unfortunately, there hasn't really been a lot of discussion, because companies are afraid to talk about it. Companies that have gotten hit are afraid to talk about it; they don't want to talk about where they went wrong for fear of somebody thinking that they're weak or incompetent.

That public station [KQED] that got hit a year or two ago, they really were upfront about the challenges that they ran into. But nobody has really taken the time to talk about from a broadcasting point of view, what the best practices should be.

When this happens to you, be clear and say, "Yes, it's a very common thing. Yes, we got hit by ransomware and everything's okay, data is secure, we have a plan and we're implementing it."

Getting hit with ransomware is not unusual. It's nothing to be ashamed of. The success stories are in how you limited how you were affected, and how quickly and efficiently you restored your systems. How quickly did you get your traffic system back up? We were scheduling spots on Monday following the weekend. That's where planning comes in. There will be things that'll be out of order for a week or two because they're low priority. [But] how quickly can you get your critical functions back up?

There's not enough dialogue about that in broadcasting.

RW: Ransomware catches people's attention. Should a broadcaster ever pay a ransom?

Tarr: No, you shouldn't. There's no guarantee that it's going to work.

There's a school of thought that the person who wrote ransomware is going to unlock it if you pay them, because it's their — for lack of a better word — reputation; but you just don't know. And payment encourages them; there's a potential to make yourself a bigger target.

That's why it's so important to focus not only on prevention but on response. If you can respond properly and you have a good plan, you don't need to pay the ransom, you will have all of the things you need to rebuild.

The only thing that I would completely harden in this environment would be your automation system, your bread and butter. That's easy enough to do because you don't have to have that on a public network

The problem that exists these days is that security is inconvenient. Unfortunately a lot of the people on the other side of the building, the creative people, the sales people — they understand inconvenience, they don't understand security. When you say, "No you can't move those files around, and no, you can't connect to that automation system," it's inconvenient, and they put up a fight. There has to be education there.

As long as your automation network is segregated physically, you can at least stay on the air. That is the number one. You can always hand-write logs, you can hand-write billing, but if you're not on the air, you've got a problem.

That's how you have to approach it: Different levels of importance. Being on the air is most important. Second, would be billing, how do we get the billings on, how do we reconcile? Then everything else. It's trivial to backup office computers and restore them. Nine times out of 10 there is nothing so critical on them that if you've got a three-

(continued on page 18)





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CYBER

(continued from page 16)

day-old backup, it's not the end of the world. We had computers that were offline for a week or two. When we got to it, we got to it.

RW: You mentioned automation but there are other vulnerable mission-critical systems, right? Remote control transmitter, interfaces, EAS.

Tarr: Those need to be firewalled and password protected. They're not going to get affected by ransomware, but you need to be smart about them. What a lot of people are turning to now are firewalls and virtual LANs so these devices are kept onto a separate subnet and you're only opening ports that are necessary to access them, changing default passwords.

I used to be able to love to get to my stuff from the outside world when I'm driving around or wherever I'm at, being able to log in and do stuff. Those days are over because if I can do it, anybody can do it. So now we're doing VPNs and virtual LANs to separate them from the office networks.

A lot of the stories you see, EAS boxes getting hacked and those Barix boxes getting hacked, was just because of sloppiness. We have a lot of engineers who are not IT guys, and a lot of IT guys who aren't engineers. It's one of the bigger problems in our industry, speaking of firewalls: We've built this firewall between IT and engineering. They don't understand each other's goals.

I'm lucky that I have a background in both, but in a lot of places, either engineering runs everything and you've got firewalls open and ports open, or IT is in charge and the engineer can't do anything.

A lot of IT guys don't understand broadcast stuff. For example, PSD or RDS data. Before point-to-point firewalls were common, you'd have a DSL connection at a translator site or whatever, you'd send that data over the public internet. More than once I've had an IT guy say, "Oh, you can't do that." Actually you can and you have to. And they just don't understand that.

Make sure that engineers and IT guys understand each other's goals. The IT guy has to know that there are going to be some things that have to get done

that may require special consideration on the engineering side. Engineers are going to have to understand you can't throw a bunch of ports open so you can get to your Burk. VPN or something else is going to be required.

A lot of security rides on that relationship.

RW: But when the head of a radio group reads a headline about a competitor being hit by a ransomware attack, calls the engineer in and says "How do we make sure this never happens to us," the answer can't just be, "We need a better relationship between engineering and IT," right? What does the engineer say to the CEO?

Tarr: You need to get stakeholders together and come up with a plan. It's hard to act as one cohesive unit if you've got these varied departments with their own priorities. You can't even

responded internally. We were back up and running very quickly. We had a solid plan. We worked over the weekend, we implemented the plan and it was a success.

We didn't look at this as a failure by any means. That's the mindset people have to have. It wasn't a failure that we got hit with ransomware; it's going to happen, it happens to everyone. Had we not been able to respond to it and had it crippled our business for a month, that would have been a failure.

The biggest thing I can say is, "Don't think for a minute it's not going to happen, or that just the basics are going to help you." This is a rapidly changing environment. A good security consultant is worth their weight in gold. Hire one and have them look at what you're doing, talk about what your job function is and what you want to achieve as a company. Get that advice.

do, make sure that it's firewall blocked and that you're only opening the ports you need to open. Make sure they don't touch each other, other than what you absolutely need.

Third, physical security. My server room is locked up because who knows what could happen, sabotage wise or information security wise? Even just curious part-timers can get in and wreak havoc.

Backups. Take lots of backups and verify them regularly. Preferably have a backup offsite. At the very least make sure you rotate and what I call "air gap" backups. Have a backup that's not connected to anything. Rotate them off. If the infection spreads, you've got a good clean backup to the restore from.

Obviously antivirus, those sorts of things. There's new software specifically for detection of malware or ransomware; they detect the moment that the malware tries to change a file, it throws out a couple of honeypot files and as soon as it touches one of those files and attempts to change it or lock it, it shuts everything down.

Antivirus is great but it's not a firewall and it doesn't really do anything for ransomware. It's kind of one of those "inch deep mile wide" pieces of software. You really want to get specific and look into smart firewall appliances that will stop it at the door. Short of having a security consultant, that's the next best thing: Have a firewall that inspects the packets coming in, and get something with a subscription to a database that keeps that up to date. If you could stop this stuff from getting in the door, that's 90% of the issue.

We all think we're the smartest guys in the room. Engineers are notorious for that. There's someone out there smarter than us working on what they're going to do next. Don't assume that because you've read the latest books and read the latest information that you're safe, because there's always somebody smarter and they're always out there trying to wreck your stuff. Part of a complete plan is assuming that it's going to happen. And if it doesn't, that's great. If it never happens to you bless you, but assume that it will and know what you're going to do, know how you're going to respond and make it automatic. Write the plan down, make sure everybody knows what the plan is, and then you ready to execute it when it's necessary.

As long as your automation network is segregated physically, you can at least stay on the air. That is number one. You can always hand-write logs, you can hand-write billing, but if you're not on the air, you've got a problem.

set up a security plan if you've got the program directors insisting they must have access to this or that.

Let's be honest, in a broadcast situation, a lot of times the engineers don't carry a lot of power, so they can't tell the program directors, "No, you can't do that." You need to get buy-in from the CEO all the way down to the part-time guys. Get everybody together in a room and say, "First of all, let's talk about how this could happen," or bring in a security consultant to talk about those things. The second part is to know that if this happens, we know what we're going to do, we know what the expectations are. To be able to say, "Yeah, we if we get hit, we'll be down for a day, but here's what we're going to do and here's the steps that we're taking to make sure that that plan can be executed." That makes you more confident: "We could get hit and you know what? We'll be okay."

RW: People reading this will be well aware of the attack on Entercom. Knowing you can't talk about every aspect, what can you share about what the company did or learned?

Tarr: Well, unfortunately I still can't. There's really not much I can divulge. The only thing I can say personally is that I was very proud of how we

RW: Other specific best practices to mention?

Tarr: I'll probably get in trouble with my boss for saying this, but I'm not a big fan of password changing. Once your password's out, your password's out. Password complexity is good, but the 90 days rule may not be very effective. It's not like a password gets leaked and then they sit on it for six months.

Obviously, education. Make sure that people understand: If somebody sends you a link to something, verify with them, call and say, "Did you send this to me?" Today's viruses and nastyware always look like they came from somebody you know. Unless somebody says specifically "I'm going to send you this," don't open it til you verify that they actually did.

We talked about hardening your automation network. Do not plug it in to the office network at all. And if you



Write to RW

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



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Awards for Your Community's Best

Use the music industry model to show appreciation and increase community standing



Usher is the host. Guest stars include Lizzo, Halsey and Justin Bieber. What's this all about? It's the 2020 iHeartRadio Music Awards live at the Shrine in Los Angeles with a national network television simulcast on Fox.

The list of nominees for this seventh annual event is equally star-studded: Ariana Grande, Bad Bunny, Billie Eilish, Camila Cabello, Cardi B, Daddy Yankee, Dan + Shay, Drake, Ed Sheeran, El Fantasma, Halsey, J Balvin, Jonas Brothers, Justin Bieber, Khalid, Kygo, Lil Nas X, Lizzo, Luke Combs, Maren Morris, Post Malone, Selena Gomez, SHAED, Shawn Mendes, Snow, Summer Walker and Taylor Swift.

Music fans are encouraged to participate by voting for winners in many categories: Best Fan Army, Best Lyrics, Best Cover Song, Best Music Video, Best Remix, the Social Star, Favorite Tour Photographer and Favorite Music Video Choreography.

Wanna attend? Considering concert prices these days, it's priced quite reasonably, ranging from \$75 to \$250.

Come on ... what is this — a commercial for the show? No, but I'd like you to view this as a model for creating awards to bestow as a local radio station.

GIVE YOUR OWN AWARDS

Why are awards important? When we show appreciation with awards, the mere fact that we're doing so positions the medium (you) as a leader, an authority, a vital entity to the community it serves. Radio stations are certainly accustomed to receiving awards, but we don't put enough focus on *giving* awards.

Stations must intelligently and actively assert ourselves as a major arbiter of what's important in the community.

The music award approach we are using as a model is reasonable on a local/regional basis and makes sense in markets with an active, supportive new music scene. Perhaps there's even a local music organization with which you can partner.

Behold, your award program creation checklist:

- A name that simply explains the award.
- Credible host(s) to deliver authenticity, celebrity and audience.
- Media partners, such as a local TV station, newspaper or website.
- A broad selection of nominees who will spread the word about their nomination. Create enough categories so you'll have multiple winners.

PROMO POWER



Mark Lapidus

- Judges who are admired or connected and can activate their circle.
- On-air promotion of the award that includes an audience voting element.
- External public relations outreach, maybe hiring a local PR firm.
- Advertising support — perhaps inexpensively on a highly targeted social media platform. A live awards ceremony that people can attend in person, hear on-air, comment on social media, watch streamed on television or via Facebook, YouTube or an app.
- A wrap-up of winners on-air that runs for several days after the event. Make certain to capture pictures and video for distribution.

Visual arts such as photography or painting can generate a lot of interest.

Teaching, coaching and mentoring are hot topics for families.

Environmental issues loom large on the minds of many young people, so creating a local "Environmental Action Award" will resonate in certain communities.

Awards take time to establish, so consider a multi-year approach. You'll know when you're on to something if your awards catch on outside your typical sphere of influence.



Perhaps music awards don't make sense for your format, or you're in a relatively small market. No worries. Awards are universally appealing, and there are plenty of other ways to achieve this fun and exciting form of connection and entertainment.

Instead, your station will want to brainstorm other themes that resonate with your local audience. Striking an emotional chord is important.

There was a time when local radio stations embodied these attributes just by existing at an organic level, but this should no longer be taken for granted. Stations must intelligently and actively assert ourselves as a major arbiter of what's important in the community. The most challenging part is that we also must earn the role by openly recognizing major talent — music or otherwise — in our communities.

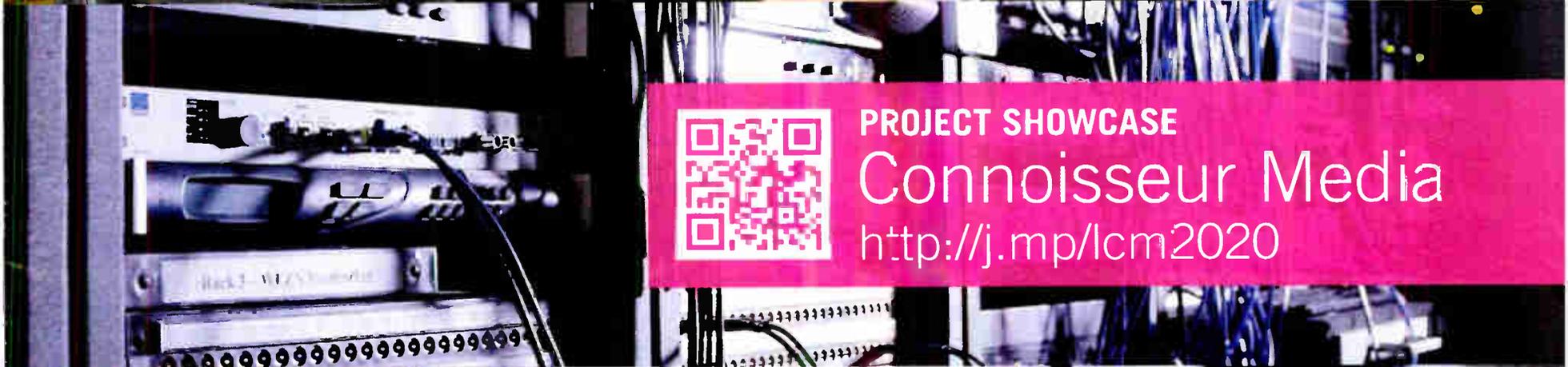
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Agnieszka Roginska

Audio Engineering Society
Began term as president in January



Rick Ramos
Katz Media Group

Promoted to senior VP of multicultural partnerships

Michael Descoteau

Synthax
Named broadcast sales manager, a new position



J.D. Crowley

Entercom
Chief digital officer will receive NAB Digital Leadership Award



Erika Beasley

Beasley Media Group
Promoted to vice president of digital content



Carla Wohl

Southern California Public Radio (SCPR)
Became senior VP of development



Jim Bohannon

Westwood One
Inducted into Missouri Broadcasters Association Hall of Fame



Brit Goldstein

iHeartMedia Pennsylvania
Named area president

Doug Ferber

Tieline
Named VP Sales, Americas




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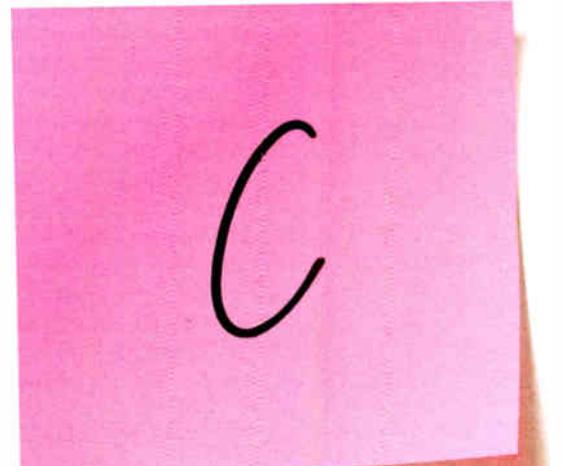
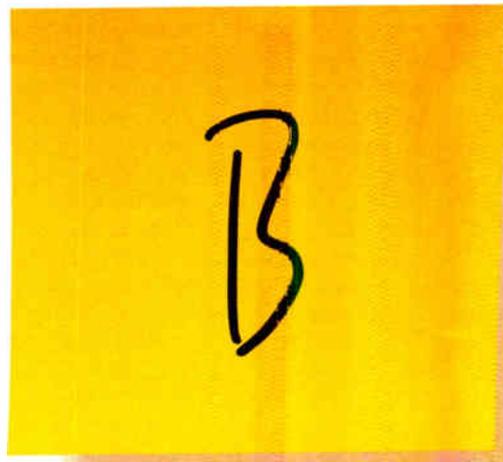
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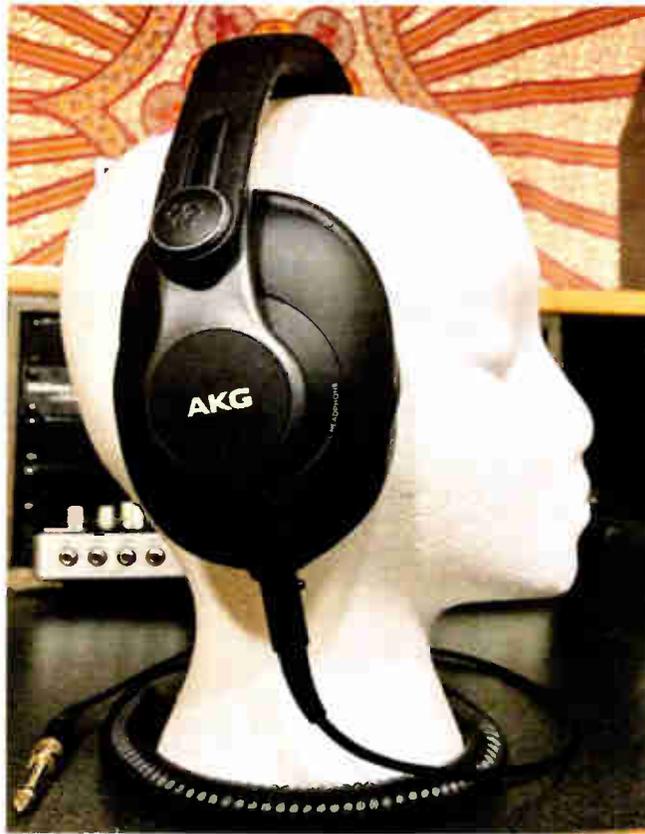
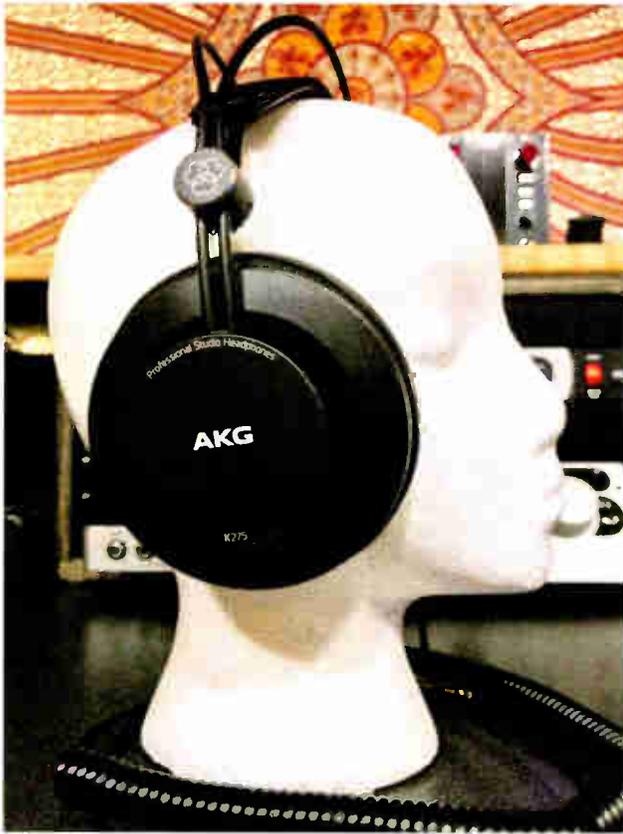
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- + Comfortable to wear for extended listening sessions
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- + Solid sound quality
- + Ships with three cables

Thumbs Down

- Not completely accurate for critical mixing
- Flattish low end (K275)
- Sound bump around 600 Hz (K371)

Price: K275 — \$99; K371 — \$149

Contact: AKG at 1-888-452-4254 or visit www.krksys.com



AKG K275 and K371 Headphones

Producer/engineer Rob Tavaglione puts his favorite AKG headphones aside to put the new K275 and K371 to the test at Catalyst Recording

PRODUCT EVALUATION

BY ROB TAVAGLIONE

I'm still a fan of the classic AKG K240s, once a familiar sight in many a radio station, with their open-backed design and rather open sound as well. However, the AKG K275 and AKG

K371 headphones reviewed here are closed-back and more in line with modern performers/recordists who like the tight isolation, extended bass and high SPLs of closed-backs.

K275

The K275s offer a round, closed-back, over-ear design and slow-retention foam ear pads. They don't look like it, but they fold right up for easier

transport, with a three-axis hinge and rotatable cups, and they come with a nice cinch-top storage bag. At 295 grams (0.65 pounds), these AKG headphones are slightly heavy in use, but still comfortable because of the soft ear pads. These headphones will only go so small, however, as the headband tension defines fit, so smaller people and those with bald heads might want to try them on before purchase.

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AKG K275

The large 50 mm drivers operate at a low-ish 32 ohms, enabling efficient use with a 109 dB SPL/V rating and wide response from 16 Hz to 28 kHz. Sonically, I found the 275s to have a warm high end, with more of a bottom end emphasis and plenty of low-mids, not the carved out middle that is so common. The low end isn't terribly defined, so I had trouble making mix decisions, but I found that performers liked tracking through them quite a bit. Bassists and guitarists appreciated the full, warm response, even if they weren't such a hit with vocalists.

(continued on page 27)

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MARKETPLACE

More Potential: Logitek has added Ravenna-compatibility to its JetStream Plus (pictured) and Jet67 AoIP audio routing engines, according to a press release.

In the announcement, President Tag Borland says the company “has always looked for better ways to manage audio” and described Ravenna’s solutions as “world-class” in terms of quality and performance standards.

JetStream Plus and Jet67 AoIP can already use Dante, AES67, LiveWire and, of course, Logitek’s own JetNet solutions to connect to other broadcast equipment, the company says. Logitek also touts the devices’ small footprint and high-density routing technologies.

Ravenna is an open networking standard developed by ALC NetworX for real-time distribution of audio and other media in IP-based networks.

Info: <https://logitekaudio.com>



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AKG

(continued from page 24)

The stereo imaging was strong, with a well-defined phantom center, and dynamics were slightly constrained at higher volumes (like most headphones). Although I wasn't able to mix on the 275s solely, I did find them a useful mix check for excessive low-mids and to make sure that higher-pitched elements were well represented.

The two big steel bands that are the backbone of the 275s seemed amply strong and durable, and the three cables provided (coiled, short straight and long straight) are connected via a nice LEMO connector, ensuring long life and durability.

K371

Even though the 371s are foldable, over-the-ear and closed-back, they're really nothing like the 275s. Here, the ear cups are oval, with a softer slow-retention foam, and their lighter 255-gram weight (0.56 pounds) makes for a comfier fit. These cans have ear cups on sliding bands, unlike the sliding headband of the 275s, which allows for a snugger fit. Plus, they still fold up (the ear cups and their support arms snap and fold inward).

Once again, we've got 50 mm drivers, but this time with pure oxygen-free voice coils (and the accuracy that reportedly brings). These phones have 32-ohm impedance but yield a very efficient 114 dB SPL/V, with an extremely wide frequency response of 5 Hz to 40 kHz.

The K371's sonic signature is decidedly different from the 275, with a tighter and more defined low-end response, more punch, still a warm top end, and upper-mids that are much more forward. Dynamics and imaging seem comparable to the 275s and sufficient.

I found performers liking these AKG headphones, too, with instrumentalists and vocalists enjoying them,



AKG K371

but bassists not so much (nor myself when mixing). As much as I loved the comfort and fit of these phones (I can wear them for hours without fatigue), I never could get over one prominent midrange frequency bump (around 600 Hz) that got in the way of my mix decisions. This response made vocal and upper instrument decisions tough, but I still found the 371s to be a great bottom-end reference checkpoint. Their nicely moderated bass response is well distributed and quite even across the spectrum, providing great insight to bass and drum mix decisions.

The three cables and storage bag complement the 371s as well, making them a good choice for users who wear headphones for very long periods of time, who want effective isolation and comfort, and those who like their guitars/vocals/snare more prominent than their kicks/basses/toms.

MARKETPLACE



Reaching for the Stars: Delta Meccanica has developed an FM combiner that it calls Star Point. It is capable of combining six medium- or high-power frequencies.

Previously the company offered combiners able to associate six frequencies for powers limited to 2 kW per transmitter.

Combining greater powers (i.e. 6 x 5 kW and 6 x 10 kW), the company says, is more challenging due to the size of the filters. "But the design flexibility of our cavities allowed us to design and create — with only slight configuration tweaks — a device capable of providing optimal RF performance in a cost effective way."

The firm adds that due to the above development, it no longer needed to design a "manifold" combiner, a configuration that it considers no longer valid for FM.

Delta Meccanica is also studying the possibility of implementing a compact version of the Star Point combiner.

Info: www.deltameccanica.com

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WYB6 1050, Messina, NY, now off the air is selling: 250' tower w/building on 4 acres; 12' satellite dish on concrete base; prices drastically slashed or make offer. 315-287-1753 or 315-528-6040

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

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Looking for a broadcast excerpt of a San Francisco Giant's taped off of KSFO radio from 1959, interviews

with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a homerun by Willie Mays and Felipe Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or ronwtamm@yahoo.com.

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

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How to Transition to AoIP in Five Steps

Tips for managing an analog exit plan

COMMENTARY

BY RICHARD MADDOX

The author is field service engineer for Wheatstone, Audioarts and PR&E products.

I'm often amazed at what engineers will do to keep older consoles on air.

If you're currently supporting analog and/or digital consoles designed in the 1990s and the aughts (2000–2009), I don't need to tell you of the challenges. Here are five proven steps for transitioning your facility to AoIP, whether that takes place this year or next.

Step 1: Convert Existing Wiring One Device at a Time

Almost all new between-equipment wiring uses unshielded CAT5e or CAT6 cables. These two CAT cables, which have identical specs for our uses, can be used interchangeably to connect analog audio, AES-3 audio, AoIP audio streams, Ethernet for KVMs and VoIP/SIP phones, and, of course, your facility's LAN connections. CAT6 has a thicker sheathing and tighter twists in its four wire pairs than CAT5e, which makes it more resistant to crosstalk but also slightly harder to handle. Many broadcasters have standardized on using UTP (unshielded twisted pair) CAT5e as their inter-connection cable of choice.

When moving to category cables to connect up just about everything, there are two main approaches: either buy pre-made "patch cables" in various common lengths like 6-foot, 15-foot, 25-foot, etc., or buy reels of raw CAT5e cable and bags or boxes of RJ45 plugs so you can create your own custom-length cables. It really boils down to how much time you have and how much you like crimping RJ45 plugs onto cables.

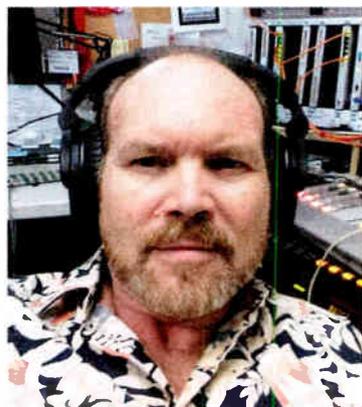
Since the IT industry uses CAT5e and CAT6 cables by the truckload, the price for category cabling and plugs means your cabling cost (whether making custom length cables yourself or using off-the-shelf "bagged" cables) for an entire facility is a fraction of what it would cost to run shielded balanced audio cables around your facility.

Step 2. Adapt, Adapt, Adapt

Most audio and broadcast equipment has not transitioned to adding an RJ45 jack for their analog or AES signals, therefore you'll still need XLR or TRS plugs on your cables which means you'll need to terminate your CAT5e cabling at one end to something other than RJ45. You could solder the plugs directly to the category cable wire pairs, but that's messy and time-consuming.

An easier solution that will cost about US\$20 is to use RJ45-to-XLR and RJ45-to-TRS adapters to connect new equipment using CAT5e without having to solder anything.

RJ45 adapters are available for just about every con-



Richard Maddox

necter type, but not for the AMP MOD IV plugs used since the mid-90s on all PR&E consoles (except Oasis). No one makes an RJ45-to-MOD IV adapter, but there are RJ45-to-pigtail adapters, so with a bit of hand crimping of the MOD IV terminals onto the pigtails, you can roll your own MOD IV-to-RJ45 adapters.

By the way, any custom MOD IV adapter you make can be repurposed later on as an RJ45 adapter for a satellite receiver or other equipment using D-sub and other non-standard jacks.

Step 3: Add I/O Devices

You're likely already familiar with the concept of distributed I/O, where one "I/O interface box" is mounted in each rack to connect all the equipment within that rack. Each I/O box then connects to a main router using a single CAT5e cable.

An AoIP system is configured in much the same way. For example, a WheatNet Blade is an AoIP I/O box with eight stereo inputs and eight stereo outputs on RJ45 jacks to connect local signals. The Blade then connects, again using a CAT5e cable, to a gigabit Ethernet switch to network it with the other Blades in the system so any discrete local input can be streamed to any other Blade or console in the plant, and any other system signal can be streamed to any local output on that Blade.

If you have a VistaMax system, or any brand of TDM router, with some spare I/O (like, say, eight unused AES ins and eight AES outs), then you're well prepared for beginning the transition to AoIP.

Connecting that spare AES I/O to an AES Blade (using sixteen CAT5e cables) means you now can convert one or two studios to AoIP consoles while continuing to use your existing router.

These eight "tie lines" allow signals from the new consoles (PGM, bus-minus, etc.) to feed the existing router, and the router system to send common signals like off-air-tuners, EAS, satellite feeds, hybrids, etc. to the AoIP consoles. Having a couple non-dedicated tie lines allows one to change signals as required from one system to the other.

Step 4: Add An AoIP Console or Two

It doesn't have to be all or nothing. Adding an AoIP console in the main studio, for example, offers a world of features, like source selection, bus-minus and audio processing on every fader, which were not available on any 20-year-old console. AoIP consoles typically cost about the same, or even less, than a 20-year-old console did when new. For example, an eight-channel AoIP console like the Audioarts DMX can be had for under \$8,000, pretty much the price for a NetWave-8 console from the early '00s.

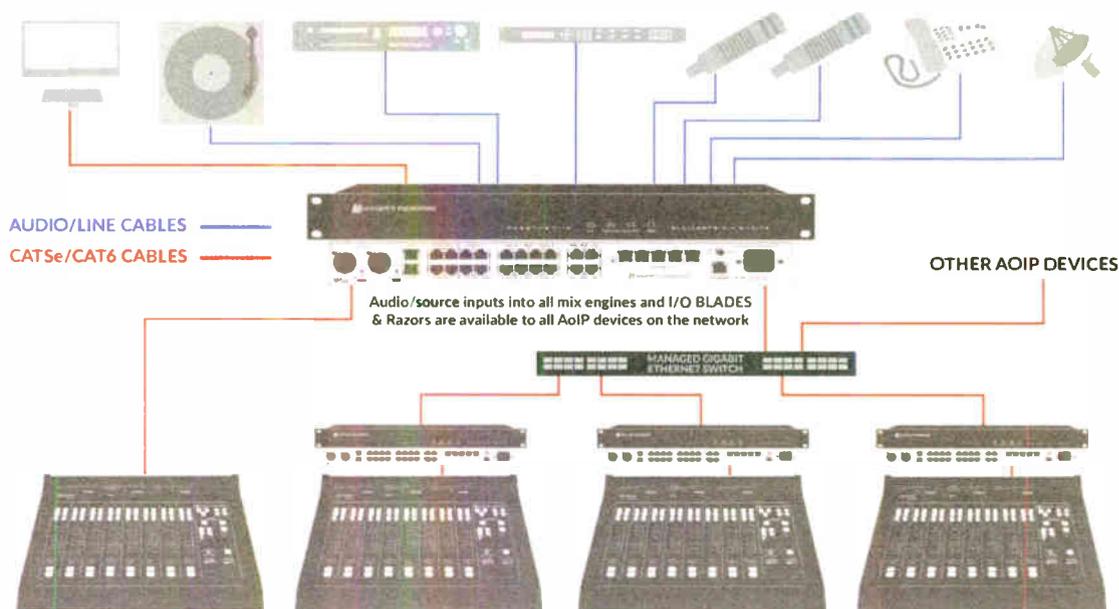
Step 5: Plan for Obsolescence

An analog exit strategy is crucial, whether you can do it all at once in a complete studio rebuild, or by updating one studio at a time.

Start by looking at all the activities that take place in your facility. Consider how you feed your air chain and your internet streams. Just about everything can be simplified by moving to AoIP. For instance, what type of playback system are you using? If it supports AoIP streaming, then you can kiss your audio cards and Bob boxes good-bye forever.

Same for your VoxPro and other PC-based audio editors. When you move to AoIP each server and PC that handles audio can be networked, using a dedicated

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A typical AoIP configuration showing all sources available to console surfaces and devices.

READER'S FORUM

NO RACISM. NO EXCEPTIONS.

In the Jan. 8, 2020 issue of Radio World is a stimulating article by Mark Lapidus about racism and radio. The author states, "Each of us benefits from enriching our self-awareness as regards social diversity and learning more about how others can do so as well."

As a lifelong broadcaster and someone who believes that *all* forms of racism should be extinguished, and as someone who is of mixed race, I have encountered the types of racism the author is hoping to bring awareness about.

However, one disturbing trend that seems to be quite popular today is that of acceptable racism against people who are white. In particular, white men. One cannot leave a comedy show today without witnessing, and being expected to accept and laugh about, racism against white people. Many TV shows and radio programs also seem to have adopted a policy of acceptable racism against white people, or in particular, white men. The author suggests that we readers check out a podcast that itself accepts racism against white people.

Racism is not OK in any form. Just because popular culture seems to think it is trendy to discriminate against Caucasian people does not make it OK. I would suggest to the author that he take time to research how racism is handled today, and how there is a much longer way to go than he thinks.

Paul Shinn



TOUCHSCREENS

I read the article "Today's Console Is Tomorrow's Touchscreen" with comments from Jason Ornellas (RW, Feb. 5).

I couldn't agree more with his observations except the comment, "I'm sure they will be common within 10 years or less." I think touchscreen control and status indication of audio for broadcast/podcast studios will be commonplace within the next few years, possibly as few as two.

Much of my work over the past decade has involved the design and build of stage and studio audio systems that are centered around digital audio mixing desks that have at least one and often two built-in touchscreens. Those front-of-house and monitor mixing consoles, part of an artist's or band's tour gear, are subjected to almost constant teardown, transport and setup rather than sitting safely in a secure studio; and they are usually no worse for the wear.

The touchscreens in the consoles usually have soft rotary encoders as part of the assembly and can easily be removed and remounted in case of damage or malfunction, so service isn't that complicated when required.

I've built a couple of podcast studios recently using touchscreens for audio control, internet access, video monitoring (most audio podcasts that are streamed live include video content, usually of the studio setting with hosts and guests), so it's not uncommon to have several video displays mounted around the host position. With automatic mic mixing, the host can concentrate on program content and interaction with guests, in studio or on the phone.

Touchscreens have made the modern broadcast/podcast and production studio very streamlined.

In the 1980s, it was rare to attend an NAB convention and not see at least one cart machine in every booth on the floor. Since computers took over most of the pre-recorded audio content, cart machines have become museum pieces. Mixing consoles for radio and television operations will one day follow suit and generally be replaced by computers and touchscreens.

Today only a handful of touchscreen-controlled pro-audio equipment manufacturers offer systems especially aimed at broadcast/podcast end-users, but I believe that will change, possibly as soon as this year's NAB Show in April.

*Steve Keating
Mission Sound & Video
Las Vegas*



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AOIP

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NIC and one CAT5e cable, directly into the AoIP system. No other hardware is required beyond an available port on a network switch. Once you make the switch to AoIP, you open up so many other doors.

Adding appliances like our PhoneBlade allow you to integrate your VoIP phone system into your AoIP system. Other AoIP appliances, like our StreamBlade, give you the codec and processing tools for managing multiple streams and still other appliances can extend AoIP beyond the studio so you can connect with other studios or remote locations.

Even if you can't jump into AoIP with both feet, taking these steps will give you some, and eventually, all the benefits of an AoIP facility.

Richard Maddox joined PR&E in 1993 as digital product specialist with later stints in the Engineering, Systems Design and Customer Service departments. When Wheatstone purchased PR&E assets, he joined Wheatstone to continue supporting legacy PR&E products. He supports Wheatstone-designed products from his location in Southern California.

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