



RADIO WORLD

NOVEMBER 25, 2020 | The News Source for Radio Managers and Engineers | \$5.00 | RADIOWORLD.COM

Online Resources Blossom at SBE

President Wayne Pecena talks about normalcy and change at the society

The Society of Broadcast Engineers has an incoming executive director, a new website and a pending new technical training program, among other notable changes.

Radio World's Paul McLane caught up with Wayne Pecena, recently elected to a second term as president of SBE, to ask him about its priorities in coming months.

The non-profit society is based in Indianapolis, Ind. Pecena is associate director of educational broadcast services at Texas A&M University, which operates the KAMU(FM/TV) public broadcast stations. Appropriately for an SBE leader, he has a lengthy string of certifications including CPBE, 8-VSB, AMD, DRB and CBNE.

Upon reelection, Pecena noted that the industry and broadcast engineers "have experienced change and chal-

lenge like never before. I want to ensure the society brings a sense of normalcy to our members." through its professional development continuing education, certification and frequency coordination programs.

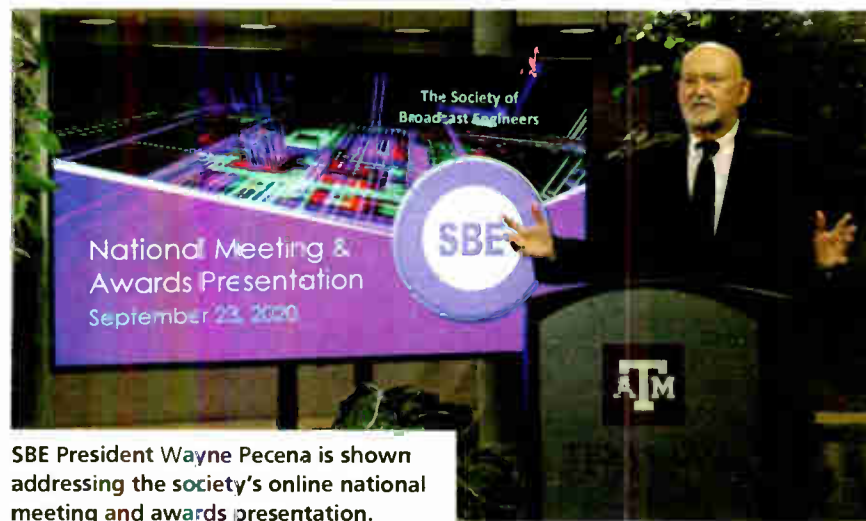
This conversation includes reference to the pending retirement of John Poray, SBE's first and only full-time executive director since 1992. James Ragsdale, a former finance executive at Anderson University in Indiana, will succeed Poray in January.

Radio World: This has been a year like no other. Has there been an effect on the society's activities?

Wayne Pecena: Certainly we have been impacted, while at the same time many things are normal.

The SBE office has remained open

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SBE President Wayne Pecena is shown addressing the society's online national meeting and awards presentation.

Courtesy Wayne Pecena

TPTP Will Support New Engineers

SBE effort aims to bring society's resources together to benefit new entrants more

BY BY PAUL McLANE

In January, the Society of Broadcast Engineers will launch a new Technical Professional Training Program.

Its purpose is to position people new to broadcast engineering for success by expanding their knowledge base.

Geary Morrill of Alpha Media chairs the society's Education Committee and is a member of the organization's exec-

utive board.

"What we're doing by offering TPTP," he said, "is providing means to deliver support to a new broadcast engineer, leveraging inherent strengths of current SBE initiatives — providing a step-by-step template that can be utilized by group owners, independent broadcasters, contract engineering firms, state associations ... basically

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11 West 42nd Street, 15th Floor, New York, NY 10036



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Persons: "I Never Had a Plan B"

Recipient of lifetime achievement award is a mentor and inveterate storyteller

NEWSMAKER

BY MARK PERSONS

Prior to this autumn, only nine people had received a lifetime achievement award from the Society of Broadcast Engineers.

Mark Persons is the 10th. The award was presented to Persons during an SBE online membership meeting and award ceremony. Radio World is proud that Mark is a longtime contributor and valued member of the RW family.

We asked him to share thoughts and memories of his career.

This story starts in the mid-1920s when my father, Charles B. Persons, became a radio broadcast engineer at age seventeen at WEBC Radio in Duluth, Minn. — the only station in town. It grew to become part of a seven-station network before he left to build our own WELY in Ely, Minnesota, in 1954.

It was a great time for me to learn electronics and Ohm's Law, turn knobs on the 250-watt AM transmitter and build Heathkit equipment at age seven. That station was later owned by well-known CBS journalist Charles Kuralt.

I became a radio amateur in 1963, the year before our family built and owned KVBR Radio in Brainerd, Minn. At age 17, it was a natural for me to wire the transmitter and studios with the latest innovation: cartridge tape decks.

There was never a question about my future. Broadcast engineering was not just a job, it was a lifestyle.

Three years later, I found little interest in college, which taught nothing about electronics. I enlisted in the U.S. Army and taught electronic repair at Fort Monmouth, N.J. Then it was off to Vietnam to do

high-tech electronic repair. The plan was to fulfill the obligation to our country so I could go back to broadcast engineering in 1969.

Work ramped up in the 1970s, when engineers were let go from radio stations because the FCC no longer required them. Soon I was a full-time independent radio broadcast engineer, building 12 new stations and repairing countless others. Good test equipment helped solve the problem of a noticeable hearing loss from my service in Vietnam.

"There was never a question about my future. Broadcast engineering was not just a job, it was a lifestyle."

TREAT IT LIKE YOUR OWN

Coming from a family ownership situation, I treated each station as if it were my own. The attachment was personal because the work was mostly for clients who believed in engineering. A message on our telephone recorder said, "I am out working on one of America's great radio stations."

My wife Paula came into the business full-time after working as a legal secretary. She has a keen sense of character and it paid off. Her job was to run the office, freeing me to go out in the field 60 hours a week at 40 or more clients.

Once I was almost hit head-on by a drunk driver at 2
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Mark Persons is shown receiving the SBE Lifetime Achievement Award virtually.

PERSONS

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a.m. but went in a ditch instead.

I never wanted to own a station. The challenge of installing, troubleshooting and repairing equipment was more than enough. It is a great feeling to get all electrons flowing in the same direction, so to speak.

Along the way, two engineers tried to get into our "territory" by promising lower prices. (They never asked; we might have given them a few stations.) In the end, the clients came back to us for dependable results.

We lost less than \$4,000 to bad debts over the years. I remember two times when a customer was slow to pay and then called looking to send me to a transmitter right away. Paula's response in one case was, "You are no longer a customer!" That day I drove right by his downed transmitter while coming back from another project and did not stop.

That dented our reputation a bit, but we stuck by our principles. As Paula said, "We are not a bank that loans money."

My first AM directional was a five-tower array in 1982 at Hibbing, Minn. It was built from parts, including a custom phasor controller. The phasor was, and still is, a room in a building with an eight-foot-high aluminum wall with inductors, capacitors and contactors on



In the field, at KLOH in 1988.

which introduced the "oldies" format in 1986. It placed second in the Arbitron after being on the air only six weeks.

SHARING KNOWLEDGE

Never satisfied, I modified equipment, then designed and built many electronic gadgets used in stations. That evolved into designing prod-

"I never wanted to own a station. The challenge of installing, troubleshooting and repairing equipment was more than enough."

the backside. Coupling units were built open-panel style at each tower.

The client liked this so much that he had me build a three-tower array in Cape Coral, Fla., and a three-tower in Carmel Valley, Calif. All 10 kW stations. He gave me the freedom to design and build what I thought was best for each job.

Then there were more than 40 C-Quam AM stereo installations. One of them was at the Cape Coral station,

ucts for manufacture such as the Programmer 3A Live Assist Program Controller and the Max-Tel Remote Broadcast Telephone, later updated to be the Max-Z and Z11.

I have always enjoyed telling stories. Approximately 188 of my articles have been published, mostly in Radio World. Then there is the popular Tech Tips section on my <http://mwpersons.com> website, where free answers are given to radio broadcast engineering problems.

We retired when I was 70 and mentored two engineers to take over the territory. There was no charge except for a few hours of classroom training to bring them up to speed on measuring AM impedance etc. Then the SBE mentor program added two mentees in other parts of the country. I also became a member of the National Radio Systems Committee's AM Improvement



Working Group.

It is volunteer work, and it feels good to continue to be a part of the broadcast industry that I grew up and prospered in.

The plan is to keep writing articles for Radio World in the quest of spreading knowledge to broadcast engineers everywhere. Radio has a great future and needs good engineers to keep it going.

Regarding the SBE Lifetime Achievement Award: I had no intention of seeking that or any other accolade. Life just worked out that way while keeping the "families" of stations the best they can be. Paula says she will bury me next to a transmitter when the time comes.

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

The SBE John H. Battison Award for Lifetime Achievement recognizes and pays tribute to individuals for their dedication, lifelong achievement and outstanding contribution to broadcast engineering, according to the society. Prior recipients are Benjamin Wolfe and James Wulliman (1995), Philo and Elma Farnsworth (1997), Morris Blum (1998), Richard Rudman (2002), Richard Burden (2005), John Battison (2006) and Terry Baun (2010). You can watch the replay of the membership meeting and awards ceremonies on the SBE YouTube channel.



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

TPTP

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any organization concerned with finding and developing our next generation of broadcast technical professionals."

Over the years, SBE has developed and delivered programs and support to those already employed in the profession. "Unfortunately, those not intimately involved in the technical side of our industry aren't truly aware of what and how we do this," he said.

"They are however acutely aware

there's less and less folks available to perform technical work critical to their enterprise, and that sources traditionally geared to prepare new techs — trade schools and electronic vocational training programs, and on-the-job learning opportunities — have either shrunk or disappeared completely."

SBE's leaders considered how to fill the gap.

"This was not just a technical issue. We would need to make everything user-friendly to both technical and non-technical folks, or it could never get off the ground," Morrill said.

COST AND BENEFITS

The cost for a person entering the program is \$475. What do they receive for this?

First, they'll be paired with a mentor, someone already in the technical side of the industry with a knowledge base and practical experience that will help to encourage and guide their learning process.

"In a group owner situation, this could be someone already in their employ at a market, regional or national level," Morrill said.

"It may be someone affiliated with

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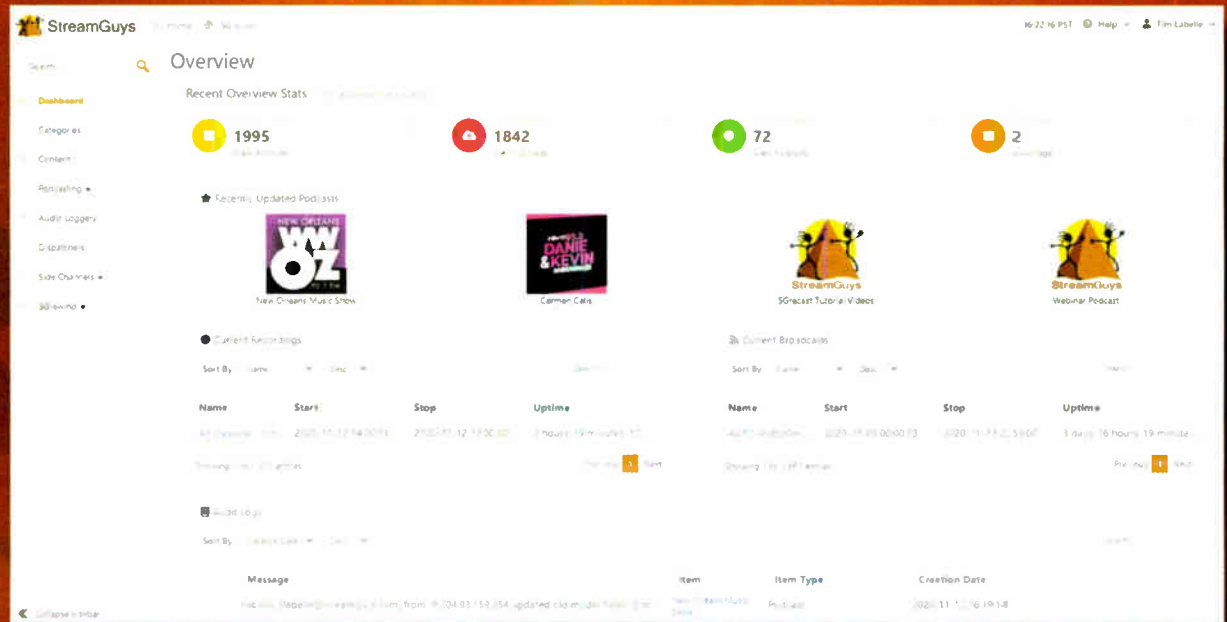
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SBE

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throughout the pandemic — granted, in a modified form, observing the restrictions placed by the state of Indiana and the city of Indianapolis. But the office is open and functioning, with all programs ongoing.

We'd been doing webinars for some time. Like a lot of organizations, we were already in that virtual environment, so it wasn't necessary to hurry and ramp up. But certainly we have increased that.

We have seen phenomenal engagement from our members in the webinars. As of last month we had twice as many participants as the year before, and we haven't gotten to the end of the year yet.

Obviously our in-person events have been canceled, whether it's an SBE-only event or related ones — the NAB Show being the biggie that a lot

of our in-person outreach is centered around.

Many of our local chapters have gone to a virtual meeting environment. That's a blessing and a curse, in some ways; everyone probably prefers that in-person fellowship and networking at a chapter meeting. But [we've seen] increased attendance in some larger areas where it's just not easy to get across town to a 7 p.m. chapter meeting; that travel can be significant.

I know I have enjoyed attending many local chapter meetings because of Zoom around the country.

RW: It seems like in the last year or two, there's been a real mushrooming of resources made available to your members.

Pecena: Since day one of the SBE, professional development, continuing education, has been a priority. And as technology changes rapidly it creates opportunity for further programs.

Even before the COVID pandemic, we had been aggressively ramping up, particularly, our webinar programs. Those have been most popular with our members. You can attend at a prescribed date and time for that live presentation,

but we see far more participation on-demand. Those are recorded and available to our members.

The feedback that we get from those programs is very positive.

RW: I understand you've got an updated IP networking series coming.

Pecena: That is just one of the webinars planned.

One of the things that we have seen, not just in IP networking, is a need for more in-depth content. There's a limit to what you can do in a webinar session, which we try to keep to an hour to an hour and 15 minutes.

So for many topics — beginning with our RF 101 series and advanced RF series, a lot of the IP content — we've gone to multiple-part webinars. There's an AoIP series that, gosh, I've lost count of the number of parts, six to seven, maybe even eight parts.

That's how we're addressing more advanced topics, to have enough time to address those topics but at the same time

"Jim was chosen unanimously by the committee. He did his homework on the SBE. He brought the best perspective of looking ahead."

TPTP

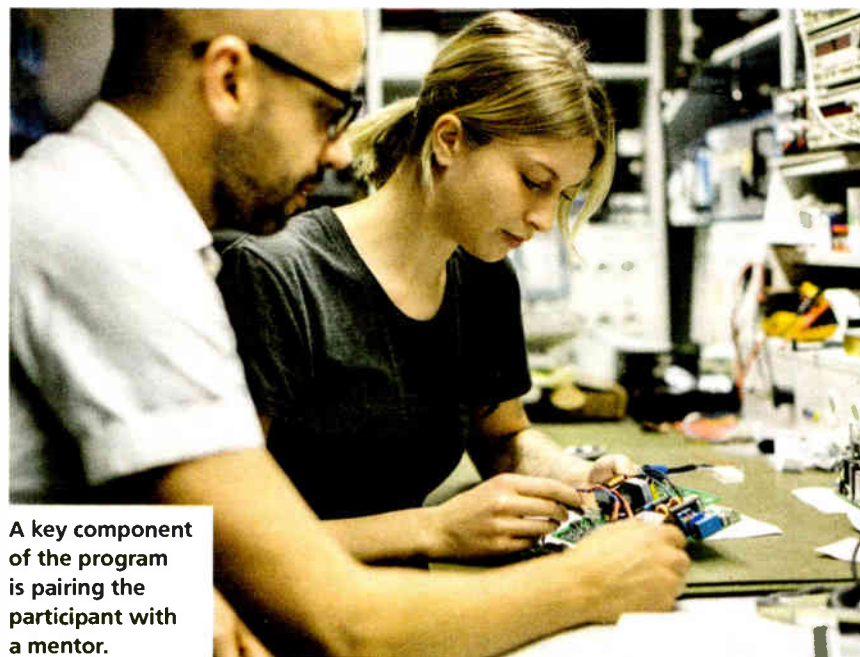
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another organization, like a state broadcasters' association, interested in supporting this effort for their membership. Or it could be a retired engineer looking to pay forward the support he or she received as a new entrant to our profession some time ago. The common denominator is a desire to see a new person succeed in their broadcast technology career."

Second, the mentor will collaborate with their mentee to determine their grasp of the disciplines and technologies needed for their role using existing and enhanced tools like SBE CertPreview.

"Armed with this evaluation, the mentors can direct a mentee's studies by curating the extensive archived SBE webinar series as well as new offerings that are always in development as technology evolves," he said.

"Included with enrollment in the program, the mentee receives SBE Member Plus level access to the entire educational webinar library of the society for a year, including all new webinars. Mentee learning is further supplemented



A key component of the program is pairing the participant with a mentor.

Getty Images/Hinterhaus Productions



remain with the employer making this investment, for a mutually agreeable period, or to reimburse the employer's hard cost if they should choose to withdraw. That way, both parties have a vested interest in the employee being successful, as they have 'skin in the game.'"

Morrill said the effort involves education, mentorship and certification that already exist in SBE offerings but brings them together in a "guided" system rather than offering things a la carte.

"This is a huge benefit to the intended users because we realize folks who aren't already technically proficient simply don't know what they don't know. And non-technical folks wanting to help don't either."

SBE will also provide support and training for volunteers to make their role effective and rewarding.

"A successful mentor doesn't need to be a professional educator ... just be willing to take an active interest in bringing this next generation along."

Details and registration information are expected to be announced after the New Year.

This is a huge benefit to the intended users because we realize folks who aren't already technically proficient simply don't know what they don't know.

— Geary Morrill

with a copy of the recently published 'SBE Engineering Handbook,' providing a written resource that can be used for both their studies and future reference."

Third, a natural byproduct of this effort will be preparation to write the Broadcast Technologist Certification exam for either AM/FM

or TV. That helps to demonstrate a mentee's mastery of electronic fundamentals and relevant FCC rules.

Morrill said SBE is encouraging employers to invest in participation by their new hires.

"In return, it's reasonable to ask for a commitment from the employee to



break them into manageable chunks of time. You could offer a full-day, eight-hour seminar, but there's not many broadcast engineers who have that kind of time to sit in front of the computer.

RW: *You have a pretty big change with John Poray retiring as executive director, and Jim Ragsdale coming in. How do you feel about John leaving?*

Pecena: Certainly his announcement was a surprise; at the same time it was not a surprise. From the board aspect, we knew that John was going to be retiring soon, but when that announcement came at the first of this year, it still was a shock now that we had a date in front of us.

John has been the face of SBE for 28 years. A lot of growth has occurred over that time, from the office staff that keeps everything running, to the number of programs that are offered. It's never enjoyable to lose someone with John's tenure and experience and of course his dedication to the society.

Early in his career, when he came to SBE, he thought he'd probably be at SBE for five years and then move on to the next step up. And here we are 28 years later and he's still with us.

We offer John sincere thanks and congratulations for his dedication to SBE and everything that he has done. I think it's safe to say there's not a program offered through SBE that does not have his personal touch on it in one way or the other. He's a very engaged leader.

I suppose if you're going to retire, there's probably a good time to do that: when things are pretty good. Yes, we have some challenges that the industry presents and the COVID situation has presented. But we have a society that is in sound financial shape. We have successful programs. We have a dedicated and supportive staff that takes care of all of that day-to-day stuff.

If you're going to say goodbye to 28 years, this is probably a good time to leave, at the top of things.

RW: *How did the search go and what struck you about Jim Ragsdale?*

Pecena: Our response from potential candidates was a little overwhelming; I personally had felt that if we got maybe 10 applications we're going to be good, and we had pushing 30. So then we had a different challenge in front of us. How do we weed through this?

We had a dedicated committee led by Joe Snelson, a former SBE president [who has experience in] the corporate environment. He did a really good job in leading that effort.

We boiled things down to three candidates and engaged in face-to-face interviews in Indianapolis. The three candidates were uniquely different but all viable for the position.

Jim was chosen unanimously by the committee. He did his homework on the SBE. He brought the best perspective of looking ahead. Granted, he was from outside the industry, but at the same time, he had ties to the broadcast industry through family members who were engaged in broadcasting for many years, and he brought solid financial management strengths, particularly in a nonprofit environment, as well as solid reference evaluations from previous roles.

Everyone felt he was that right fit for SBE.

RW: *What should we look for from SBE in coming months?*

Pecena: I think we step back and take a new breath and give Jim Ragsdale a time to get acclimated. We have several new programs that are launching. I don't want to remotely suggest we're just going to stop doing things; but give Jim an opportunity to get up to speed, making his own evaluations. He brings a solid financial background and [can make] his own assessments with that.

And this is strictly a personal feeling, but we probably need to revisit our strategic planning efforts. In our last event

about three years ago, we came up with a plan, and many of the aspects of that plan have been implemented. You've noticed the new website, for instance; the need for that was identified in that strategic plan.

What was also identified but frankly has not happened has been some of our expanded outreach activities engaging in other related organization's activities — whether it's a state broadcast conference or local chapter events. Of course with the COVID situation, that kind of stuff went away.

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SBE

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So I think once he gets a solid footing by mid year, we need to reevaluate our strategic plan. Not necessarily do it all over again, though maybe that's the best way to do it. In today's fast changing environment. I'm not sure doing strategic planning every five years is the right time. Maybe it should be shortened a little bit.

Our focus, I think, will continue to be on education certification, our frequency coordination activities that are going on. You don't necessarily hear a lot about frequency coordination, because it's going on in the background, but there's a lot of work that goes into that, particularly with the Department of Defense contract that SBE is involved in.

RW: The direction of membership trends is down over time.

Pecena: Yes it is down. That was a big focus of our last strategic planning effort — ways to increase that membership, and that was the basis of our outreach program.

We still need to focus on the increasing membership.

RW: We've seen a lot of attention in the national discussion over diversity, and

as we've reported, radio engineering in the United States certainly has not got a lot of racial diversity, or age diversity for that matter. What role, if any, does the SBE have in this discussion?

Pecena: That is an aspect that needs to be on our radar. I'll just say, it honestly has not been a dedicated focus. We have been focused more broadly on increasing our membership by providing desirable, needed services to our members regardless of race or demographic background. I think we have

RW: SBE has always kept a voice on Capitol Hill when there are technical issues being discussed. Are there things that SBE is following closely in Washington that we should know about?

Pecena: Certainly I think that "spectrum grabs" will continue, and we continue to comment.

When the December SBE Signal newsletter comes out, there'll be a piece that [SBE General Counsel] Chris Imlay wrote regarding some actions question-

RW: The 2021 calendar already looks different with no spring NAB Show. How are your events and meetings affected?

Pecena: Historically the SBE has two major in-person events a year, the first centered around the NAB in the spring, and then the national meeting, which occurs in the fall, typically in conjunction with a regional broadcasting event. This year it was to be Chapter 22's Broadcast and Technology Expo in Syracuse, N.Y.

With everything shuffling around and the NAB moving to an October show next year, it was not felt we could do both of those within three weeks; so the 2021 NAB will feature our traditional "NAB events" with that national meeting and awards presentation, which of course this year were done virtually.

It looks good on paper today. We'll see how things work out.

Everyone is hopeful that we can get back to some in-person events at some point. One of the things we're always excited to do is our regional Ennes workshops. Outside of one early this year, they were all canceled, so I'm hopeful that at some point in 2021, we can get back to those in-person regional Ennes workshops around the country. We have several chapters or state broadcast associations that are interested in that.

"We have seen phenomenal engagement from our members in the webinars. As of last month we had twice as many participants as the year before, and we haven't gotten to the end of the year yet."

some more fundamental things to work on before we dedicate our resources to a specific area. That's my personal feeling.

We are working too on revamping our international program, with a new committee chair who is going to take a look at that aspect; that brings more of an international perspective.

ing the ethics of broadcast engineers in general. I think he's done a really good job of responding to that.

We'll continue to do our best to help the FCC make good decisions. A lot of times decisions are made without the true technology impact [being considered]. We'll do our best to keep our opinions in front of those FCC staffers.

IBA Tackles Needs of Independent Stations

BY SUSAN ASHWORTH

There's a new organization focused on supporting the needs of independent radio owners.

The Independent Broadcasters Association started as brainchild of Ron Stone, who felt that existing broadcast associations give insufficient focus to the needs of companies that are not publicly held.

"Bigger companies have taken control of what is going on in our industry," said Stone, who is founder, president and executive director of IBA and the owner of 24-station Adams Radio Group.



"They've had control since consolidation in the '90s. And if you look at revenue, in 1996 we were something like a \$15 billion industry. This year, we're a \$10 billion industry. Compared to 1996 valuations, that's more like \$8 billion. So we've lost 50% of the revenue that we used to have. Half our revenue is gone.

"We can keep doing the same things and you can see what the next 10 years is going to look like," he said. "Or we can make a decision to bind together and find a path together."

The non-profit organization filed articles of incorporation in Minnesota in July. Stone said it has support from 1,200 dues-paying radio members. They pay \$600 per year or \$100 plus a daily barter commitment.

The association wants to provide operators with benefits that cannot be achieved alone.

In September IBA and Gen Media Partners formed IBA Radio Sales, a national sales rep team for IBA members. He plans educational webinars, conferences, access to group health insurance and admittance to jobs board. IBA also wants to roll out a news service for independent broadcasters.

"What we're trying to do is to have all independents of the IBA contribute stories and images and [make that news accessible so that] any member can use it."

IBA also has an association with accounting firm dk east associates, which will conduct a free financial



Ron Stone

analysis of members' operations. It's even exploring the possibility of creating its own app for car dashboards and its own real-time, app-based ratings service.

"I want to know that when our generation hands it over [to the next generation], it will be in good shape," Stone said. "But it takes every independent to make that happen."

The website is <http://iba.media>.

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Groups Will Model IT Like a CDN

Musing about the implications of virtualization on physical facilities

BY MICHAEL LECLAIR

One in a series of commentaries about how radio's technical infrastructure will look in the future.

Michael LeClair is chief engineer of WBUR Boston and former tech editor of RW Engineering Extra.

I recently moderated a roundtable interview with five leading technologists for the Radio World ebook "Virtualizing the Air Chain." We discussed whether the industry is ready for a fully virtual air chain, what kind of obstacles exist, and the implications for radio managers and their suppliers including a discussion of cap-ex vs. op-ex philosophies. You can read that very interesting discussion at radioworld.com/ebooks.

Radio World's Editor in Chief Paul McLane then posed a related question to me: "All this is happening in an industry that, at least in the United States, suddenly is not required to maintain a physical studio in every city of license," he asked.

"This combined with the possibilities in virtualization seems to open some pretty remarkable implications for what a studio air chain looks like in a few years. Am I right in thinking that this is an important angle to this story?"

I replied, and Paul asked me to share my thoughts with readers.

STRETCHING THE MEANING

Yes, there's an angle there; and the engineers in our ebook roundtable were clearly coming from groups that all would find that angle to their advantage.

But I note that satellite distribution already has consolidated the studio into one location if desired.

The removal of the main studio rule simply codifies the lack of having *any* presence in a particular market that is associated with their license, except the physical transmitter and their EAS monitoring.

Stations had already been stretching the meaning of the main studio rule for years of course, both in the commercial and NCE worlds. With music automa-

tion, we're already at the point where the studio portion of the radio station has been virtualized into computers and it happened a long time ago.

To take EMF and Cox as examples, they appear to be well along in building out the centralized "cloud" infrastructure, but not in the commonly understood sense of moving all their infrastructure into the hands of someone like Amazon, which handles web services for all kinds of web-based businesses

Neither appears to be enthused about the idea of moving their air chain content into a rented site with IT support, no matter how good it is. They are going to model their centralized IT operations like a content distribution site. They

EMF and Cox appear to be well along in building out the centralized "cloud" infrastructure, but not in the commonly understood sense.

may even purchase the support for it if the price is right (as in the concept of "hybrid cloud" that we discuss in the ebook).

But they don't seem on a track to ditch all their assets and rent them from suppliers whose primary expertise is web site hosting. For the multiple streams and formats they generate, it could all be done in one location and then spread out across the country to fill in at a selection of stations that works for them. Assembly of localized advertising could be done over the web from anywhere.

Much of what is streaming on the web has been shown to be aimed at listeners to legacy programming from radio stations. The volumes there are so large that most (if not all) large streamers have already moved to the model of renting out capacity from a CDN, a content distribution network. The station creates a stream they hand off to the CDN, and the CDN arranges the necessary parts and pieces like different versions of the stream (higher or lower bitrate), ad insertion and variable bandwidth upon demand to support a changing number of listeners. Individual stations don't really have to do much except hand off the content and that could be coming from or going to anywhere in the continental United States.

Creating live content would still

require a studio somewhere — I'm imagining a large and uninteresting warehouse somewhere in the Midwest with 40 voice booths, cranking out the announcer bits and producing local ads when needed. Add in music assembly by automation at the CDN and you are ready to build as many feeds as you need for the broadcast side, using a few successful templates as a start.

CLOUD THINKING

I would argue that we've already reached this model with existing distribution networks and there's really nothing new there.

The new part of the discussion is the idea of moving all the other aspects of

the air chain that might normally reside at a transmitter site into this common studio for assembly so that a single stream could be deployed to meet the unique characteristics of a particular station: HD, multicast variations, processing, PPM, RDS metadata, HD PAD and EAS insertion.

On the other hand, as Alan Jurison of iHeart said during our roundtable, this might be an attractive option to smaller broadcast groups or ones that serve low population areas that have limited local advertising revenue available.

In order to get 24/7 support they might want to build the automation and the rest of the chain in an actual cloud center, then ship it off to the transmitter. As Philipp Schmid of Nautel said: All you need is an Ethernet jack and you're all set.

But it's true that the pandemic has moved our entire industry into learning the techniques required to assemble a broadcast program largely, if not entirely, from home. These newly learned skills would be at the core of transitioning the industry further to a centralized data center model.

What do you think the radio air chain of the future looks like? Email radioworld@futurenet.com with "Letter to the Editor" in the subject field.



The commentary above was prompted by discussions of virtualization in a Radio World ebook that you can read at radioworld.com/ebooks.

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World Radio History

A Lineman's Tips to Ground an STL Pole

Also more about gas discharge tubes and metal oxide varistors

WORKBENCH

by John Bisset

Email Workbench tips to johnpbisset@gmail.com

Wayne Eckert is an engineer with the Rural Florida Communications Cooperative. He occasionally comments here in Workbench on electrical matters of interest to broadcast engineers.

He noted the article by Mark Persons in the Oct. 14 issue of Radio World detailing lightning damage at KRJM. For engineers who are interested, he points out that AT&T has a relevant document "Grounding and Bonding for Network Facilities" that can be downloaded free in PDF form at <https://tinyurl.com/rw-att-grounding>.

Wayne writes that while the document was created for central office grounding and bonding, it is now considered a company reference for all cell

sites as well. And many parts of it are applicable to broadcast sites, studios or any other facility where uptime is of high importance.

Wayne believes that if just some of the practices detailed in the AT&T document had been applied at KRJM, the damage suffered could have been greatly reduced.

One thing that caught Wayne's eye was it appears that the pole supporting the STL link lacked a down ground. Wayne bases this opinion on the damage to the pole and from what Wayne could see in the photograph.

A down ground is an old utility practice and is a simple lightning protection device. Normally before the pole is placed, a lineman will secure a #6 hard drawn copper conductor to the pole with fencing staples. This line will attach from the top of the pole to the "butt" or bottom of the pole, leaving 6 inches or so of it standing above the top and coil

The down conductor provides a bypass for the lightning's energy into the earth, sparing the pole from extensive damage.

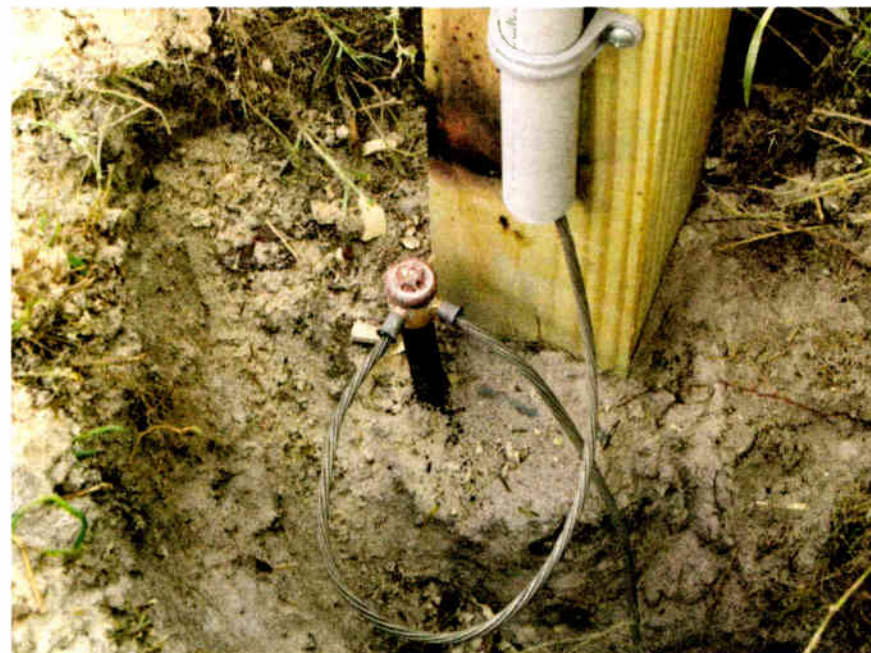


Fig. 2: Note how the ground cable sweeps in its connection to the buried ground rod. No sharp bends!



Fig. 1: The down conductor has been stapled to the 4-by-4 pole.

up a few feet of the cable on the butt.

The goal is to produce a grounding electrode on the butt of the pole, so when the pole is placed in the earth it will make good contact with the earth.

If the pole is already in place, you can add a down conductor by installing an 8-foot ground rod into the earth.

Note well: Before pounding anything into the earth, contact your state's one-

call utility notification center. All states have such centers and require by law that you call 48 to 72 hours before digging. In most states the number is 811.

A "locate" will be scheduled and done at no charge to determine if there are any underground utilities present. Keep in mind that though this service is free, it is not "next day," so plan your work, giving the "locates" folks plenty

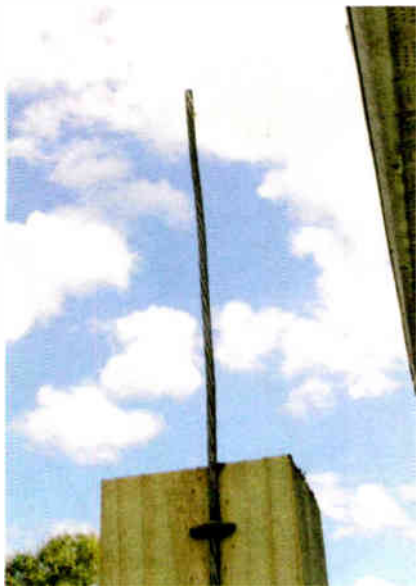


Fig. 3: A view at the top of the pole.

of time. Failing to notify them can get you killed should you drive the ground rod through an electrical cable or natural gas pipe. At the least, it can result in being sent a substantial bill from a utility should you damage something below grade.

The down conductor provides a bypass for the lightning's energy into the earth, sparing the pole from extensive damage. Keep in mind that all pole attachments shall be bonded to the down ground cable. It is required by code that you bond the grounding electrode to the building's grounding system using a direct buried #6 copper conductor, which prevents potential differences between grounds.

Wayne included several photographs that detail a down ground installed on a pressure treated 4-by-4 support pole. In Fig. 1, note how the down ground is stapled to the support post. Also note that the last 36 inches or so of the down ground cable is protected by a piece of PVC pipe secured to the post.

Since the size of the 4x4 is too small for a butt coil, a ground rod was used, shown in Fig. 2. In this photo, also note that all of the bends in the grounding conductors are sweeps (gentle curves, no sharp angles). This is very important as it minimizes the inductance in the grounding conductors.

Wayne writes that though lightning is direct current, it acts more like RF due to its extremely fast rise time, so inductance must be kept to a minimum.

Fig. 3 shows the top of the 4x4 pole with a pigtail, to which supporting structures like antennas or STL dishes can be bonded and grounded.

Robert LaJeunesse in Ann Arbor, Mich., holds an MSEE. He read with interest our discussions about gas discharge tubes and metal oxide varistors.

Bob points out that there are unique differences. The MOV clamps above its breakdown voltage while the GDT clamps below its breakdown voltage.

This may seem like a minor point but it has a major impact on the power dissipated by the clamping device, not to mention the pass-through energy.

With the GDT clamping lower, this device reduces the amount of energy that can pass into the subsequent protected circuitry; and the lower clamping voltage likely allows for more clamping current without over-dissipating. It also makes sense that both be used

together to protect a load. The MOV would absorb lower power surges but might allow the voltage to rise significantly above the MOV threshold on a higher current surge. The GDT can then kick in and clamp the voltage down, pushing more of the dissipated power back to the source — and source wiring — thus limiting the surge power that gets to the protected device.

Bob notes two PDF resources from Littelfuse to learn more. One is "Varistor Products Overview" at <https://tinyurl.com/rw-MOVs>. The other is a datasheet about its CG6 gas discharge tubes at

<https://tinyurl.com/rw--GDTs>. Note the double hyphens in the second URL.

John Bisset has spent more than 50 years in the broadcasting industry. With this column he begins his 31st year writing *Workbench*. He handles western U.S. radio sales for the Telos Alliance. John holds CPBE certification with the Society of Broadcast Engineers. He is also a past recipient of the SBE's Educator of the Year Award. *Workbench* submissions are encouraged, qualify for SBE Recertification and can be emailed to johnpbisset@gmail.com.

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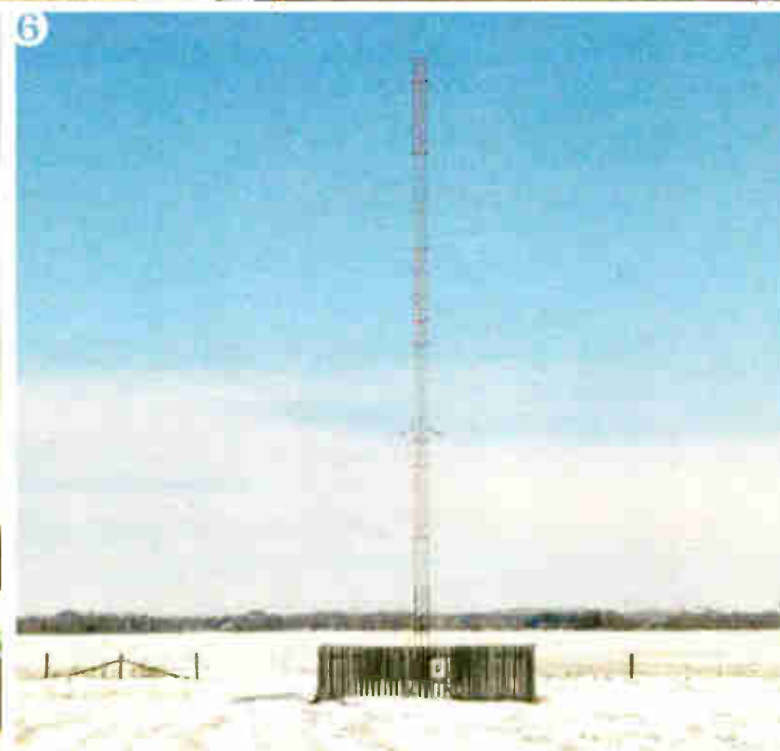
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CHU, Canada's Time Station



- ❶ The unassuming exterior of CHU in southwestern Ottawa, Canada.
- ❷ These transmitters are like silent sentinels that just happen to tell very good time.
- ❸ Generation and measurement of signals in the CHU control room.
- ❹ Faraday cage blocks unwanted electromagnetic fields.
- ❺ Atomic clocks inside the cage.
- ❻ One of CHU's three towers.

Shortwave signals are one way official time is disseminated across the country

BY JAMES CARELESS

It is nestled in a farmer's field in southwestern Ottawa, Canada, in a protected area known as the Greenbelt, surrounded by miles of sprawling suburbia.

It is CHU, Canada's own automated time station.

Operating from a 1940s-era transmitter building and three vertical antenna towers, CHU broadcasts automated voice time signals in both English and French 24/7.

Its broadcasts are transmitted on 3.33, 7.85 and 14.67 MHz, and are heard through central/eastern Canada and the eastern United States, plus many other areas of the planet on a regular basis.

After the move we got complaints from a person in New Zealand who said we were causing interference, so we cut our power to 5 kW peak.

— Bill Hoger

CHU's time service is operated by Canada's National Research Council, with the station being remotely controlled from the NRC's Montreal Road headquarters central Ottawa some 12 miles away. The time signals are based on CHU's trio of atomic clocks on-site, which are constantly checked against the atomic clocks at NRC headquarters.

"We are equipped with 1960s-era 10 kW transmitters that have been highly modified over the years," said Bill Hoger. He is the Research Council officer who maintains the unmanned station as part of his overall duties along with two other off-site technicians.

"Before we moved to 7.85 from 7.335 MHz in 2009 due to an ITU frequency reallocation, we ran 7.335 MHz at 10 kW, our highest output power at CHU," said Hoger. "But after the move we got complaints from a person in New Zealand who said we were causing interference, so we cut our power to 5 kW peak." (CHU's other transmissions run at lower powers.)

CHU was launched as experimental station 9CC at the Dominion Observatory in downtown Ottawa. Regular time broadcasts began using

the callsign VE9OB in 1929.

In 1938 it became CHU, and in 1947 the station was moved to its current flat rural site in a project to boost its transmitting power, enlarge its antenna farm and extend its reach.

The idea behind VE9OB/CHU was to provide accurate time-keeping information to people across Canada, especially those in rural and remote areas who

needed accurate time and didn't have local access to it. The country's vast spaces and its government's determination to bridge them is why it has been a pioneer in national microwave and satellite communications for decades.)

"Initially our service was just a constant frequency with patterns of Morse Code pulses in it to indicate the time," said Hoger. More Morse Code information such as station identification was added in the 1930s, with recorded voice time messages coming from a mechanical "speaking clock" starting

in 1952. This system used recorded time announcements on film whose playback was controlled remotely by the clocks. "We then went to digital playback in the 1990s," he said.

In its early days, CHU had personnel on site, but today the station runs itself with occasional human intervention. Still, it has a following: "We receive listener reports from around the world, and send out QSLs (reception report cards) on a regular basis," Hoger said. Meanwhile, the NRC keeps this 1940s-facility maintained and repaired.



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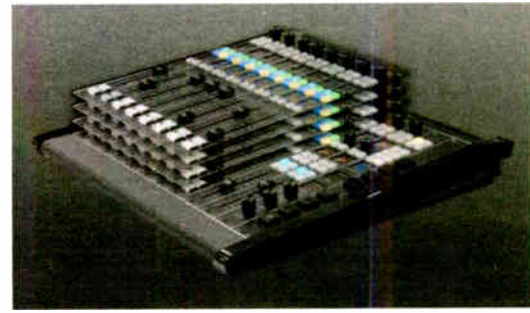
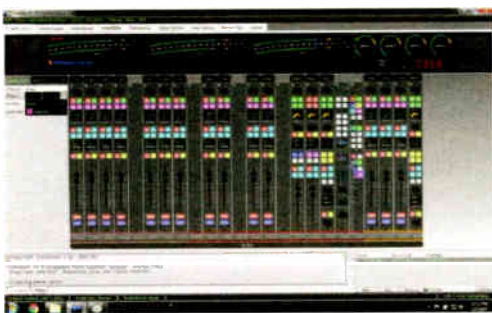
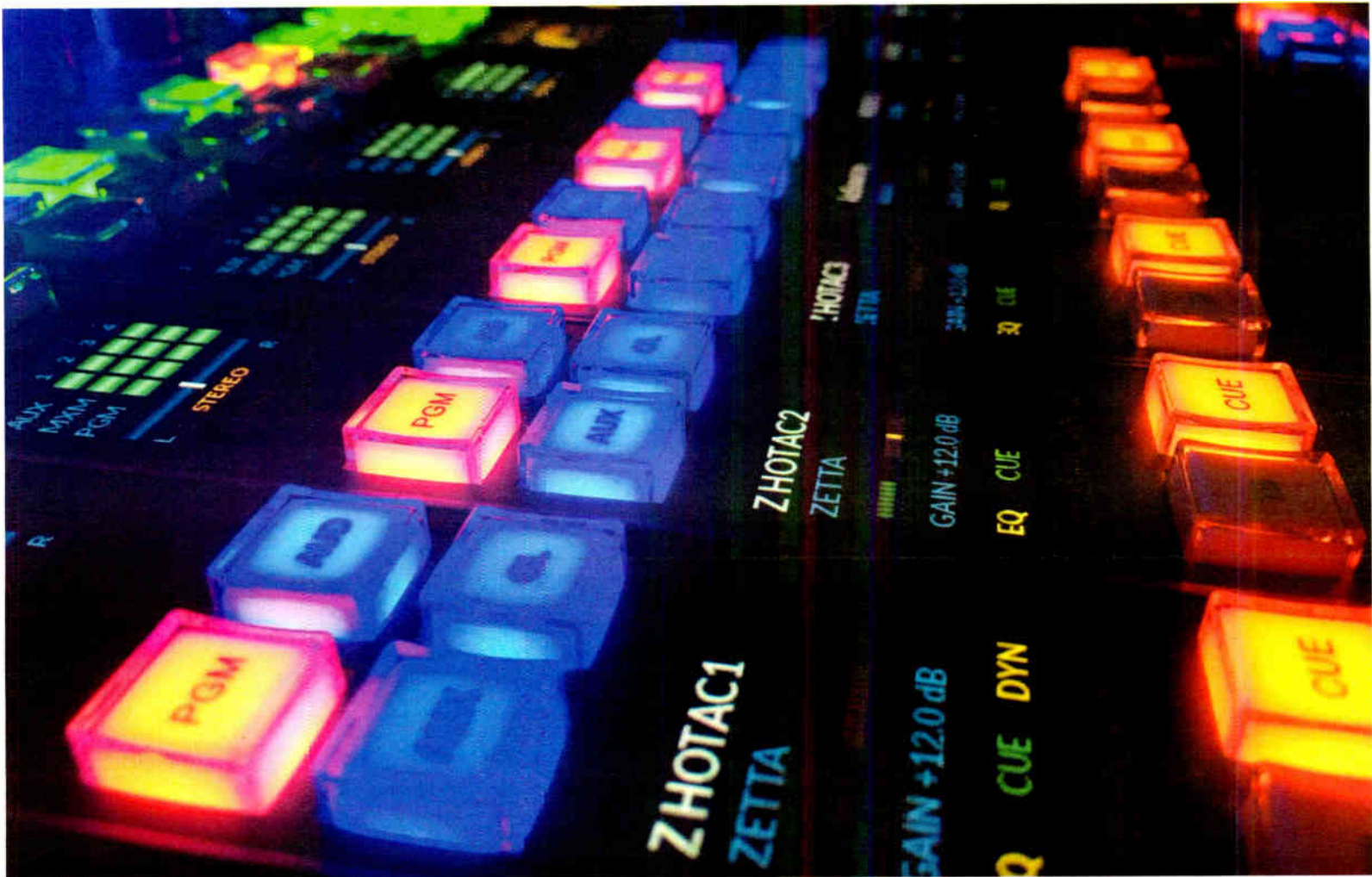


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Belizaire Reflects on Race, Success

Veteran engineer hopes to facilitate conversations about social inequities

BY RANDY J. STINE

One in a series of articles about the careers and experiences of Black engineers in radio broadcasting.

Rodney Belizaire has worked in engineering in New York City for 37 years, work that allowed him to travel to points across the globe as a specialist in remote radio engineering.

Belizaire is senior engineer in Media Operations Engineering at Disney Direct to Consumer International. He provides technical management for the New York radio stations of ESPN and tech support for ESPN's and DTCI's audio initiatives, which cross over into TV and video.

Radio World: *You started early in the field, showing notable initiative for a teen.*

Rodney Belizaire: When I was 13 years old, I gave myself a summer project of writing all of the CEs of all the major radio facilities I wanted to visit in New York.

I didn't realize until years later how seeing one African American engineer, the only one I saw in my visits, made an impact on me. In seeing him do his job running the board, I saw someone who looked like me. It was at that point I realize that my dream was possible.

I charted and planned my course from there.

RW: *Has the acceptance level as a Black man in radio engineering changed since then?*

Belizaire: I stand on the shoulders of mentors, colleagues and benefactors who paved the way for me throughout my career.

Due to the lack of diversity in broadcast engineering, there have been only a handful of those African Americans who I met coming up in the New York City community who were staff engineers, who by the way never even had aspirations to be more than that because they never felt the opportunities would come their way. Only one who was a CE, David Antoine, who I could look to for guidance and what I realized later was mentorship, on how to navigate the broadcast engineering field.

That said, there's no way I'm in this industry without being given the opportunities by non-African Americans to prove myself. I'd like to think that my work ethic, commitment to excellence and good fortune to have crossed paths with the right people at the right time have kept me in the industry all these years.

I'd like to think that due to the diverse racial makeup and melting pot that New York City is, that as time went on, being an African American in media in general wasn't like being a unicorn.

I've often wondered if I hadn't been born and raised in NYC whether I would've had the same opportunities. The cream of the crop in engineering talent works here, so I felt like I was playing catchup my whole career. I knew that I had to bring excellence to everything that I did every day.

There was also the silent but ever-present knowledge and burden that if I screwed up, I wouldn't only be seen as just a bad engineer but I could jeopardize things for anyone who looked like me moving forward. My goal was and is every day to break stereotypes and biases that non-African Americans have about people who look like me.



Rodney Belizaire

RW: *We've heard from other Black engineers about how they felt or were treated in certain employment circumstances. Have there been awkward situations?*

Belizaire: I've run out of fingers and toes to count how many times that vendors, industry colleagues, etc., who have met me for the first time after dealing with me by email or phone, can't even hide their shock that I am African American. Whatever they were or weren't expecting when they do finally meet me, I knew that it wasn't me.

At conventions, my attendee badge and the company I work for have opened many doors that I'm pretty sure would've otherwise been closed to me.

Most people tend to forget my skin color once they get to know me. I treat

people the way I'd like to be treated and have been fortunate to be treated extremely well for the most part.

I've definitely done remotes, worked on job sites or entered buildings where I've experienced the standard extra level of scrutiny and circumspection.

I've also been stopped by the police for driving while Black in the middle of the night, on the way to a morning show remote prep, and had to have a White colleague vouch for me before I could enter a work site, because it was impossible, in the gatekeeper's mind, that I was there to do what I said I was there to do, even if my name was on a list.

So sure, I've been made to feel like I don't belong; but I don't let that stop or define me. What defines me is that I'm there to do a job to the best of my ability and my employer's satisfaction.

RW: *What does it feel like to be in your shoes right now? What emotions do you have about the current social movement?*

Belizaire: Let's face it, most senior executives who run broadcast stations or operations don't live in areas where they see many people or interact socially with anyone who look like me. Once they leave work, they may never see another African American unless they are at work.

Whatever they may feel about African Americans, whether it's conscious or unconscious bias, they may not want to place anything as important as the technical reins, directly tied to their revenue, in the hands of someone who looks like me.

In general, every decision I make outside of my home is usually rooted in avoiding situations that could need or cause me to justify my existence based on someone else's bias, prejudice, stereotypes, etc.

Someone said to me after the George Floyd incident that racism never really went away. It was only dormant. That's a powerful statement inasmuch as even with the societal progress that's been

(continued on page 20)

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BELIZAIRE

(continued from page 18)

made, it may easily take a couple of more generations before enough biases have been put aside.

I'll admit that I was caught off guard and dismayed by the events that led to the powder keg and frustration of the national movement, because I mistakenly thought we were more evolved as a society.

That said, I and my family do our part to dispel stereotypes, defy negative

My goal was and is every day to break stereotypes and biases that non-African Americans have about people who look like me.

— Rodney Belizaire

expectations and do the best we can to be part of a society that changes for the better. And I do believe this will get better with the awareness brought on by the events that put a spotlight on biases and still-pervasive racism. I pray that the conversations that have begun will continue.

RW: What can broadcasters do to improve recruitment protocols in order to bring more diversity into the technical side of radio?

Belizaire: The issue isn't just recruitment. It's pay parity. And education about career options since most kids don't even see radio as a viable medium anymore.

I know that the SBE [Society of Broadcast Engineers] and others do their best to evangelize broadcast engineering, but broadcast engineering is seen as a dead end. I am guilty myself about not evangelizing for it, but the jobs are minimal, require a lot of work

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Hello From Venice

We asked Rodney Belizaire to share an interesting career project memory:

One of the pinnacles was helping the first ISDN remote originating from Venice, Italy.

In 1995 while being a staff engineer at WQXR-FM in New York, America's foremost and most listened to classical station, I was afforded the opportunity to be the remote engineer for week-long live broadcasts originating from Venice.

There were many challenges surrounding the use of an external Adtran NT-1. Outside of Italy or to non-visitors, it's not universally understood that Venice is many little islands that make up two larger sections separated by the Grand Canal, making up one larger island not on the Italian mainland. The Venetian telecom central office had never done or had an ISDN use request off the Italian mainland, so their telco central office wasn't even entirely equipped to accomplish what was needed.

Between my broken — really, nonexistent — Italian, a dedicated Italian telecom professional, our benefactor's political connections and clout and a miracle or two, we were able to become the first broadcasters to originate a live remote from Venice using ISDN in 15 kHz mono.

All the broadcasts were done from the Safe Venice Society's offices next to the Grand Canal, which provided great ambient sound and views for the host, who was giving play by play descriptions of the breathtaking views down the Canal and having the listeners view Venice from his mind's eye.

An attempt to originate a couple of the broadcasts from one of the hotels never happened because they could not move or provide ISDN in time to the second location. Whichever central office configurations that worked in the offices did not work at the hotel.

Imagine traversing the Venetian streets with a cart full of equipment on almost cobblestone-like streets, rushing to make it back to the offices in order to get the broadcasts on the air. I will never forget that.

due to reduced staffing and are thankful in any markets outside of the top 10.

I mentor younger folks, but I can't get them interested in engineering. The few I've tried to interest don't have the fire in the belly and aren't interested. There's a reason why most recruits are coming from IT, which works on the studio side of things. Who's teaching RF? Those are mostly contractor jobs now.

RW: On that topic, what would you say are the most important issues or trends in U.S. radio engineering?

Belizaire: Relevancy, adaptability and trendsetting. The issues loom larger than ever with the exponential changes in technology year over year, instead decade over decade.

How do engineers use technological trends to reach the audience wherever they are, using whatever methodologies are necessary? More than ever, the radio engineer needs to continually adapt to be media technologists, staying ahead of the curve through continual education.



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From the "Who's Buying What" page of the Radio World website:

Phillystran is highlighting the use of its products at a new two-tower AM installation in South Korea. Kintronic Labs Inc. installed two 210-foot towers for Far East Broadcasting Company (FEBC) to extend the reach of its Christian programming in the area.

Each uses four Phillystran HPTG cable guys with four guy levels on each tower.

Send info for our Who's Buying What column to radioworld@futurenet.com.



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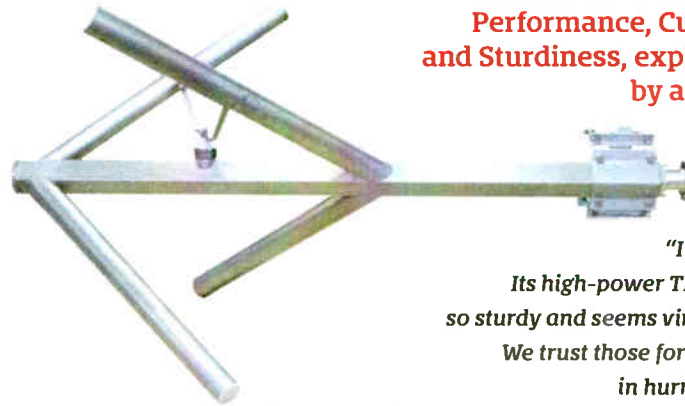
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1. Publication Title Radio World	2. Publication Number 3088	3. Issue Date 1/10/2020
4. Issue Frequency Bi-Weekly with additional issues in February, March, April, June, September, October, and December	5. Number of Issues Published Annually 30	6. Annual Subscription Price Requester
7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4) Future US Inc 11 West 42nd Street, 15th Floor New York, NY 10036-8002	Contact Person Cindy Cardinal Telephone 847 438-4577	
8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer) Future US Inc 11 West 42nd Street, 15th Floor New York, NY 10036-8002	Publisher (Name and complete mailing address) Carmel King 11 West 42nd Street, 15th Floor New York, NY 10036-8002	
9. Full Name and Complete Mailing Address of Publisher, Editor, and Managing Editor (do not leave blank) Publisher (Name and complete mailing address) Carmel King 11 West 42nd Street, 15th Floor New York, NY 10036-8002	Editor (Name and complete mailing address) Paul J. McLane 11 West 42nd Street, 15th Floor New York, NY 10036-8002	
Managing Editor (Name and complete mailing address) NONE		
10. (Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, give the names and addresses of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address.) Full Name Future US Inc (Future PLC) Complete Mailing Address 11 West 42nd Street, 15th Floor, New York, NY 10036-8002		
11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box. Full Name U Name Complete Mailing Address		
12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one) The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes: Q Has Not Changed During Preceding 12 Months C Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement)		

13. Publication Title Radio World	14. Issue Date for Circulation Data Below September 2, 2020		
15. Extent and Nature of Circulation	Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date	
a. Total Number of Copies (Net press run)	4981	4893	
b. Legitimate Paid and/or Requested Distribution (By Mail and Outside the Mail)			
(1) Outside-County Paid/Requested Mail Subscriptions Stated on PS Form 3541. Include direct written recipient, telemarketing and Internet requests from recipient, paid subscriptions including nominal rate subscriptions, employer requests, advertiser's proof copies and exchange copies.	302	4211	
(2) In-County Paid/Requested Mail Subscriptions Stated on PS Form 3541. Include direct written recipient, telemarketing, and Internet requests from recipient, paid subscriptions including nominal rate subscriptions, employer requests, advertiser's proof copies and exchange copies.			
(3) Counter Sales and Other Paid or Requested Distribution Outside USPS			
(4) Requested Copies Distributed by Other Mail Classes Through the USPS (e.g. First-Class Mail)	4		
c. Total Paid and/or Requested Circulation (Sum of 15c (1), (2), (3), and (4))	302	4211	
d. Non-Requested Distribution (By Mail and Outside the Mail)			
(1) Outside-County Non-Requested Copies Stated on PS Form 3541 (Include Sample copies, Requests Over 3 years old, Requests induced by a Premium, Bulk Sales and Requests including Association Requests, Names obtained from Business Directories, Lists, and other sources)	908	552	
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e. Total Non-Requested Distribution (Sum of 15d (1), (2), (3), and (4))	908	552	
f. Total Distribution (Sum of 15c and 15e)	4	4763	
g. Copies not Distributed	4	130	
h. Total (Sum of 15f and g)	4	4893	
i. Percent Paid and/or Requested Circulation (15c divided by 15f x 100)	4	81.3%	88.4%
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a. Requested and Paid Electronic Copies	4		
b. Total Requested and Paid Print Copies (Line 15c) + Requested/Paid Electronic Copies (Line 16a)	4		
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17. Publication of Statement of Ownership for a Requester Publication is required and will be printed in the November 25, 2020 issue of this publication.			
18. Signature and Title of Editor, Publisher, Business Manager, or Owner Carmel King VP, AV Technology Group	Date September 28, 2020		
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Z/IPStream R/2 Offers Power, Reliability

Telos streaming appliance was designed for broadcast streaming from the outset

BY DAVID BIALIK

NEW YORK — I am a systems engineering consultant and chair for the Audio Engineering Society's Technical Committee for Broadcast and Online Delivery.

Previously, I was director of stream operations for CBS Radio and then held the same position at Entercom. In these roles, I was responsible for setting up and maintaining over 300 streams.

Early on at CBS Radio, we were doing streams the same way as everyone else, with old PCs and without much priority. Eventually, management asked us to try to find a better solution to manage our streaming content.

We searched and spoke with a number of companies, but nobody could provide the exact solution that we were looking for. In 2014 I went to the AES convention in Los Angeles and after one session I got several members of

Telos Alliance together in the back of a conference room and explained how CBS needed a new solution for streaming.

At the end of the day, it turned out we had similar goals for a new streaming platform. I dubbed the meeting a success and came back to New York and worked with Telos' team over many months providing input and feedback on the project. After a little more than a year, the Telos Z/IPStream R/2 was born.

We started installing them in all the CBS stations. The rollout was a complete success and has continued to be for all the projects I have used the R/2 on since.

PROCESSING

R/2 comes with Omnia three-band processing "in the box," with optional Omnia.9 processing, allowing me to create unique and great-sounding individual presets for each stream.

Having the power of Omnia processing lets me tweak each one to sound amazing as well as staying within the specifications of AES TD-1004, the AES recommendation for the loudness of audio streaming and network file playback.

Remote operation is smooth as the design was always meant to be controlled and configured by a web GUI. With the Supermicro IPMI control port, the system can be cold-booted. As long

as the facility's firewall rules are configured for proper access, nobody has to be onsite.

The advent of smart speakers has caused unprecedented growth in stream listening. It is one of the fastest-adopted new technologies in our lifetimes. It has brought audio listening back into the home and is driving further expansion into mobile.

In my role chairing the Audio Engineering Society's Technical Committee for Broadcast and Online Delivery, we are looking into recommendations for stream loudness. We believe it is very important to set the stream content and any injected interstitial to a standard loudness. Not only





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Dave Bialik with several Telos Z/IPStreams in the rack.

are these jumps jarring, but forcing listeners to take action to adjust the volume level also opens the door for them to turn off the stream.

The Z/IPStream R/2 is the first streaming appliance to be designed from the ground up as a broadcast stream transmitter. With its built-in redundancy, it is truly the broadcaster's friend, and I have not worked with an engineer who has been unhappy with this product after I install it.

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

TECHUPDATES

INOVONICS UPGRADES SOFIA SITESTREAMER+ LINE

Inovonics has released new firmware for its Sofia line of SiteStreamer+ remote monitoring receivers. Models 565, 567 and 568 (pictured) are the recipients of the free upgrade.



New features include a more secure login for "casual" users that allows them to log in to the web interface, listen to the audio and view all parameters, but not to change anything. Doing this allows for nontechnical users to benefit from Sofia's diagnostic parameters such as the Listener Experience, Remote Audio Listening as well as verification of alarm conditions.

Inovonics describes this as a "Look but don't touch" setting allowing users to see readings and operate the units but not make any setting changes.

UDP streaming has been added as well, joining analog, AES3, AoIP (AES67) and Dante streaming options. UDP streaming is useful for using Sofia units in an audio logging situation. This stream can be sent to any number of recording software applications for proof of play as well as 24/7/365 logging.

For information, contact Inovonics in California at 1-831-458-0552 or visit www.inovonicsbroadcast.com.

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Comrex Opal Polishes Podcast Interviews

Learfield IMG College finds simplicity of operation and audio quality pleasing

RANDY WILLIAMS
Chief Engineer, Broadcast
Operations Division
Learfield IMG College

JEFFERSON CITY, Mo. — As the chief engineer of the Learfield IMG College broadcast operations division, my team and I spend our days assuring that all of our broadcast facilities, equipment, remote connections, satellite uplink and internet streaming systems are all operating correctly.

include doing this work for our podcast-creating networks as well.

Learfield started dabbling in the podcasting world a few years ago, and in the last two years we've gotten deeper into podcasting and Facebook Live streaming with many of the networks we work with. At this point, we're using the Comrex Opal for several podcasts.

For example, we use it for a weekly coach's interview podcast with Kansas State Network, North Carolina State



Wyatt Thompson, right, the voice of the Kansas State Wildcat Network, interviews Courtney Messingham, Kansas State football offensive coordinator.



One of the sports production studios at the Learfield IMG College broadcast operations facility in Jefferson City, Mo.

In addition to these tasks, also make sure that our remote crews have all of the equipment and cabling they need to do a complete broadcast. As time has gone on, my expertise has grown to

Wolfpack Network and the Wisconsin Badgers Network. Some Learfield IMG College sports networks use podcasting platforms to provide a weekly 10-minute insight into the coming week's foot-

We sent the link, the governor's team clicked it and connected to the Opal, and we connected our talent.

ball/basketball game, where the play-by-play hosts often interview an opposing team's coach.

We primarily use Opal to acquire audio from our play-by-play host talents, who are usually connecting from a home office or from the broadcast studio at their university. We also often use Opal's second connection to patch in either our coach, or an opposing coach that could be located states away.

We utilize Opal by sending a connection link to guests, who can then connect to it on a laptop or mobile phone with just a click. Because some of our recurring weekly podcasts are streamed live, we

use Opal in a live context as well.

When we think about doing an interview, whether with a governor or with talent or maybe even a sports icon, there is nothing better than using Opal to obtain a rich, full fidelity-high-quality audio feed.

We recently used Opal to do an interview on a COVID response with Kim Reynolds, the governor of Iowa. We sent the link, the governor's team clicked it and connected to the Opal, and we connected our talent. With no extra fuss, we did a three-way call and recorded it.

The audio sounded incredible — much better coming through the Opal

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Streaming Radio, Podcasting, Online Content Delivery

— than we would have had on a standard telephone coupler line.

In our experience, connecting talent and individuals with Opal is very simple. We've been able to use this platform across many talent levels — from folks that are not technically inclined all the way to people who are extremely tech-savvy. We're able to walk most people through it, and once they do it the first time, they're like "Wow, that was really easy." And to me, that's the beauty of this system. We send you a link, you get it on your laptop or on your smartphone, you press the button and talk into it, and you're basically done.

Comrex Opal is a fantastic solution. We've found multiple uses for it: everything from doing a podcast to a phone interview or a three-way call. It's affordable, and the audio quality sounds like everybody is sitting in the same studio. For anyone in the broadcasting world who wants to put up a high-quality audio stream or audio feed, there's no comparison to anything else in the market. Opal sounds 150% better than just a standard phone call.

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

TECHUPDATES

STREAMS UPDATES PROFESSIONAL STREAMING AUDIO ENCODERS

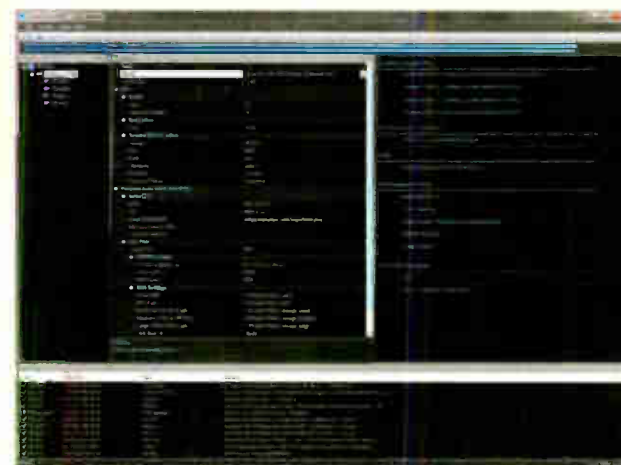
StreamS released major updates to its live audio streaming encoders. These include fully compliant CMAF HLS and DASH technology for low-latency, adaptive-bitrate HTTP Live Streaming (HLS)/Dynamic Adaptive Streaming HTTP (DASH).

According to StreamS this upgrade supplies a standards-based streaming solution that is reliable, scales to rapidly growing large audiences and reaches more modern devices.

CMAF HLS is the same technology that is fueling the "cord-cutting" that video content providers enjoy for OTT and other direct-to-consumer (DTC) services. It notes that by leveraging the standardized container of the Common Media Application Format (CMAF), content providers can reach a broader diversity of devices with a single file set, which results in more efficient content delivery, and reduced streaming costs, and increased audience.

StreamS says these same benefits are made available to audio content providers, including DTC services and radio broadcasters looking to expand their streaming presence and overall coverage. Using CMAF HLS, these customers can scale with greater strength and cost-efficiency than with older-generation streaming protocols.

Also they can leverage high-efficiency codecs such as xHE-AAC and the broader AAC family to cover a range of

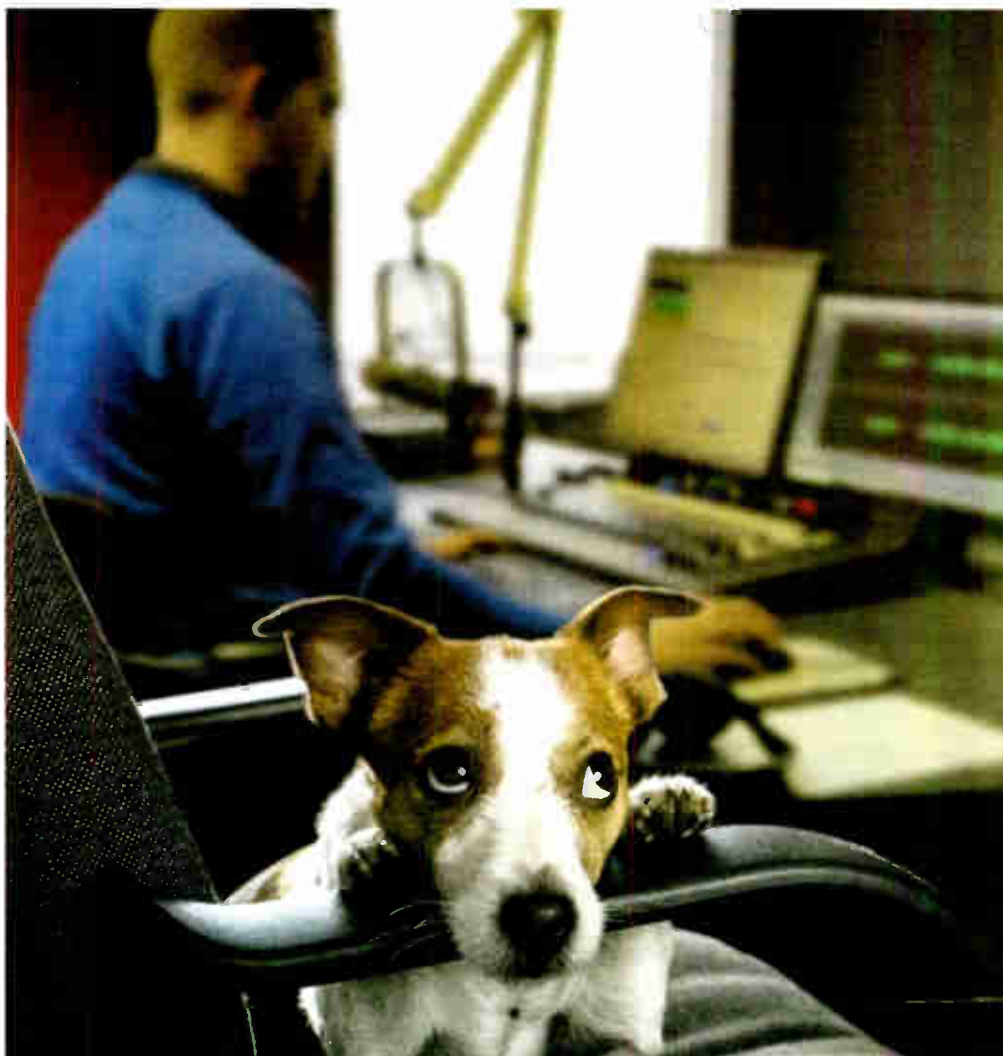


applications from high-quality voice to 7.1 surround.

For TrueHD streaming, ALAC and FLAC lossless codecs are now available for greater audio fidelity. The ability to stream real-time extensible metadata alongside pristine audio with ad insertion adds value for content providers and audiences.

The company says audiences are using expensive mobile streaming devices, computers and automotive digital dashboards to consume streaming media, and expect these systems to work with the advanced features they have to offer. StreamS Encoders support that listener experience.

For information, contact StreamIndex in Texas at 1-940-206-7702 or www.streamingindex.com.



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StreamGuys Assures Streaming Uptime for ARN

ARN finds migration a relief from infrastructure maintenance headaches

BY JOE SEXTON

Technology Director

Australia Radio Network/ARN

MELBOURNE, VICTORIA — ARN (Australian Radio Network) is one of the country's leading broadcast and on-demand audio companies. "Defining Audio" with ownership or investments in 12 radio stations nationwide plus digital entertainment platform iHeartRadio and Australia's number one podcast publisher, the iHeartPodcast Network.

We have a long history of providing our audience with the latest in streaming technology and were the first broadcaster in Australia to offer clients and listeners dynamic addressable content and interactive inventory.

To accommodate evolving technology, we have worked with several major streaming and cloud vendors. While we learned a lot in the process, the most obvious lesson was the challenge of managing a public-facing production platform. It's not as simple as "set it and forget it." The server farm required constant maintenance, which is time-consuming — particularly when dealing with multiple vendors.

Two years ago, we made the strategic decision to migrate our services to a hybrid hosting environment. We considered moving our streaming infrastructure to our private cloud, but we wanted to explore using a managed service that had experience with dynamic audio.

Our first goal for the transition was to simplify our streaming infrastructure to prepare for the future. We had multiple vendors and legacy systems supporting our live streams, making the existing infrastructure complicated and too difficult to scale. We also needed to increase our streaming capacity to accommodate an expanding number of audio channels and ensure suitable headroom for forecasted streaming listener growth.

Finally, we wanted to improve our reporting and analytics, as our management, commercial and content teams had no visibility of real-time or

historical data.

NZME, our iHeartRadio partners in New Zealand, had transitioned to a managed service a year before us and selected StreamGuys as their provider. After speaking with multiple potential vendors, it was obvious there was a certain "peace of mind" and assurance that StreamGuys' leadership brought

SEAMLESS MIGRATION

We commenced the migration of our streams to StreamGuys in March 2020. Their team was professional throughout the onboarding and user migration process. It is honestly the first time I've migrated so many streaming services with no noise. The "lift-and-shift" was seamless — and this was during the early months of



Joe Sexton. The StreamGuys GUI is on the computer to his left.

to the conversation.

StreamGuys also works closely with the AdWizz platform that we use for ad replacement and monetization, and their proposal provided the headroom we wanted for growth and a clear migration plan.

COVID-19 when everything else was difficult.

StreamGuys now manage live streaming with midstream ad replacement for ARN's iconic Australian brands KIIS, Pure Gold and The Edge, which are all integrated into the iHeart-

Radio Platform. StreamGuys handles our full audio payload, including radio simulcasts, DAB+ simulcasts, iHeart-Radio stations and our expanding array of audio partnerships. StreamGuys hosts our audio streams through their Australian data center and is giving 100% uptime to our listeners.

StreamGuys' SaaS suite provides flexible tools to help us monitor our operations. SGmetadata monitors what we are encoding from the studio complex to ensure that ad break replacement is being properly triggered. StreamGuys also created custom alerts in their SGalerts monitoring system that notify us of changes to our load balancing or other outages in our systems.

Our migration turned out to be perfect timing. During the pandemic, we have seen a significant increase in streaming traffic across all ARN and iHeartRadio audiences. In a relatively short time, StreamGuys have delivered multiple significant benefits — doubling our streaming capacity, adding new commercial inventory opportunities and overcoming our data visualization issues.

The operational stress of managing the server farms and day-to-day operation ourselves is not missed, and StreamGuys have proven to be a valuable technology partner. In many ways it's like they have joined the ARN technology team.

For information, contact StreamGuys in California at 1-707-667-9479 or visit www.streamguys.com.

TECHUPDATES

TIELINE VIA ADDS LIVE REMOTES AND PODCASTING

The Tieline ViA now delivers voice tracking, FTP and podcasting capability directly from the codec in the field. As a result, the company says, the codec, which offers live streaming with recording and playback capability, doubles as an integrated podcast production studio.

The ability to record a full show as a podcast is now critical, especially with new broadcast workflows being implemented during the pandemic.

With the Tieline ViA, users can simultaneously record and playback audio files, so users can create a podcast on the go while live at home or a remote site, or record a post-game show, including post-game interviews and sponsors' messages, all without entering the studio.

With the ViA, a second and third announcer can dial in using another codec or SIP device and go live, and at the same time be recorded as a podcast.

For example, before a live event, a user could prerecord music and sponsors' messages onto an SD card and insert this in the ViA.

At the remote site they'd prerecord interviews onto the codec and then go live and simultaneously record the output feed onto the ViA's SD card to create the podcast recording. Input sources can be selected or deselected as required.

During the recording the user inserts live content and integrate inbound callers, prerecorded interviews, music and ads. At the end of the broadcast they'd navigate to the FTP upload page and tap "Send" to upload the file.

For information, contact Tieline in Indiana at 1-317-845-8000. For international sales contact Tieline in Western Australia at 61-8-9413-2000 or visit www.tieline.com.



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TECHUPDATES WHEATSTONE STREAMBLADE PROCESSES STREAMS

Wheatstone says its StreamBlade addresses the unique challenges of processing and managing multiple program streams.

As a WheatNet-IP audio network appliance, StreamBlade accepts eight input streams of native WheatNet-IP audio directly from a soundcard or AoIP driver as well as RTP sources, each capable of four outputs for a total of 32 total output streams.

It includes selectable encoders targeting high to low bitrates for reaching a range of end-user devices and players, and has a five-band intelligent AGC and dual-band limiter designed to optimize the performance of encoded audio content.

StreamBlade is cloud-ready and compatible with standard CDN and streaming platforms, with support for HLS, Icecast, RTMP and RTP streaming protocols. Its Lua transformation filters adapt metadata input from automation systems into any required output format for transmission to the CDN server.

It also provides local I/O connectivity for audio network applications other than WheatNet-IP, as well as analog and AES67 input.



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

TECHUPDATES RME UPGRADES THE BABYFACE AUDIO INTERFACE

The new RME Babyface Pro FS is an update to the Babyface Pro USB audio interface.

Debuted in January, it features RME's SteadyClock FS technology, which the company says brings self-jitter to new lows and provides podcasters and live recording engineers with high-quality audio.

The analog to digital conversion allows users to hear their mix exactly as it is. Two new headphone outputs, offering TRS and mini-jack sockets in parallel, feature separate driver stages to match low- and high-impedance headphones.

The Babyface Pro FS comes with both USB-2 and USB-C cables, compatible with all computer types.

RME says the system is easy to use for podcasters who lack audio expertise, and that it helps solve problems that podcasters face every day such as struggles with mix-minus setups when interviewing via Skype.

For information, contact Synthax/RME in Florida 1-754-206-4220 or visit <http://rme-usa.com>.



TECHUPDATES STREAMINGPIX IS TURNKEY VISUAL STREAMING

Broadcast Pix says that its StreamingPix offering provides a live production and streaming solution that is simple to use and won't break the bank.

It comes with remote controlled RoboPix PTZ camera, a Lenovo Tiny server, a high-quality LAV microphone, SDI, HDMI, IP and NDI inputs and an IP switch.

Its video clip library and graphic templates help users create compelling content. A user-friendly interface features automated macros to simplify common tasks such as recalling clips, graphics and titles, as well as camera moves, into single-button pushes enabling users to focus on their shows.

Users can record and stream to popular streaming and video conferencing services such as Facebook Live, YouTube Live, IBM Cloud, Livestream, Zoom, Skype and GoToMeeting. They can grow the online

audience by multicasting a stream to up to five destinations simultaneously, using the 30-day free membership to Switchboard live, that's included.

Integration with the Castus Stream platform provides a plug-and-play approach to integrating social media feeds without dealing with firewall configurations or port forwarding. StreamingPix users can stream to and from Zoom and Skype to bring in co-host and guest from different locations for a podcast.

For information, contact BroadcastPix in Massachusetts at 1-978-600-1100 or visit at www.broadcastpix.com.



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Wanted: ITC interconnect cables between ITC cart machine and record amp. Manual and idlers for Harris CB-1201 turntables. Don, k8drs1@gmail.com

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

HEADPHONES/ SPEAKERS/AMPS

WANT TO SELL

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

WANT TO BUY

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

MISCELLANEOUS

WANT TO SELL

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

RECEIVERS/ TRANSCIVERS

WANT TO SELL

Professional grade SCA demod module, \$25.00. Contact David davidwj3089@gmail.com

WANT TO BUY

AM Stereo radio. Call 417-619-2467.

RECORDING & PLAYBACK HARDWARE

WANT TO BUY

1960s-vintage MacKenzie Repeater machines, magazines, spare parts and manuals, complete or "parts" machines considered, James, 870-777-4653.

RF CONNECTORS

WANT TO SELL

RF CONNECTORS & GADGETS - Parts, Products & More! www.W5SWL.com

TAX DEDUCTIBLE EQUIPMENT

Donate your broadcast facility; IRS approved 501(c)(3) non-profit charitable organization. Fair market value. License (AM/

FM/FV), land, building, tower, equipment, etc. The Augustus Foundation, Inc., 2902 Main Street, La Marque, Texas 77568. (409) 359-3435. Contact Dr. M. Augustus

TRANSMITTERS/ EXCITERS/ TRANSLATORS

WANT TO SELL

BE-25T 25KW FM transmitter 2007 frequency agile tube transmitter in good working condition on 90.7 (all its life) when pulled from service. Approx. 6 mos. on rebuilt tube and a newly rebuilt fan motor, also spare optical modules, manuals and maintenance logbook. \$17,500/OBO. As-is, where-is: Hayward, CA, Jeff Cotton, 530-279-6262 or info@kdup.org.

MISCELLANEOUS

WANT TO BUY

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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A History of Innovation, a Future of Growth

Personal, local and immersive — I see that as the future of HD Radio

BY ASHRUF EL-DINARIY

The author is SVP, Engineering — Digital Platforms at Xperi Corp.

A hundred years later, reports of the demise of radio continue to be greatly exaggerated. Again.

In fact, it seems that the very idea of radio has been waved away as a second-hand thought only for it to show its deep value — time after time. Even today, as the media splinters and morphs into the many ways people engage with content, radio is here, valued and appreciated — and continuing to rank above all other channels in consumption.

on the digital screen, with multi-casting opportunities.

This would prove to be a more engaging way for this increasingly digitally oriented audience to experience the local and personal content that broadcasters had spent years nurturing.

It sounds easy, but being the first to do something is always a risky, uphill endeavor. And while the story of HD Radio has always been about technical invention, the most critical part of that story is how it brought receiver-makers and broadcasters together.

It's fair to say, in fact, that the HD Radio journey started as a classic Catch-22: the receiver-makers would not invest

measuring reception and performance for days on end. Home products took the same journey: the Boston Acoustics Receptor Radio HD went through hundreds of hours of testing and validation.

At first, those units were expensive. But the economic tipping point came when Visteon signed with BMW AG to put HD Radio in 2006 model-year cars — that was the key that started the engine for HD Radio.

Today there are 42 car manufacturers and 290 models available with HD Radio. The Catch-22 has been solved, with each side of the ecosystem having exactly what they need: the audience and the technology to serve up a premium experience, where and how consumers want it. According to the recent Techsurvey 2020 by Jacobs Media, 69% of listeners surveyed said that the main reason they listen to radio is that it's easiest to listen to in the car.

can now access multicast HD2-HD3 audio programs and have a visual experience with album images

It has been quite a journey, one in which the immutable law of consumer value has ruled. Costs have decreased and the accessibility of HD receivers



Ashruf El-Dinary

INNOVATION EVOLVES

Over the past 20 years, we've worked with our partners to develop thousands of different radio models for car, home, portable and phone. To date, we have tested almost 4,000 radio models through our 80+ point product certification program.

What began with 12 people working on our vision for HD Radio, continues

has increased. Quality has improved thanks to a worldwide production ecosystem with established relationships with over 50 manufacturing partners across the world.

The important thing, though, is content. That's why radio is a sustainable platform. It's something we're very proud to be a part of, this innovative power to deliver personal options to consumers. The Jacobs' Media Techsurvey makes it clear: Six in 10 say that personalities are the main reason they listen — and close to 90% agreed that one of radio's primary advantages was its local content.

Personal. Local. And immersive. I see that as the future of HD Radio.

As we get set for the next 100 years, there are three things that will power the growth of HD Radio — and radio in general.

The first is humility. Learning from our experience informs the growth of the future, especially in terms of HD.

The second is momentum, because as HD grows, all connected industries gain velocity and opportunities to create more interactive and personal radio experiences.

And finally, it's to remain fearless in our innovation journey, and to be relentless in bringing new ideas and features to the market. That's how we deliver on the promise of a better experience for listeners — and that's why we'll be here 100 years from now.



Courtesy of Cutchfield.com

We've worked with our partners to develop thousands of different radio models for car, home, portable and phone. To date, we have tested almost 4,000 radio models through our 80+ point product certification program.

Radio has survived and thrived thanks to continuous innovation, along with the dogged work of achieving scale and adoption of those innovations. Those who have made radio their careers have focused on delivering what consumers want by coming together to innovate across content and technology.

For example, in the early days of FM radio that meant that stations launched FM broadcasts without receivers in the market, driving the adoption of an improved sound experience that increased the value of their content.

MAKING RADIO COMPETITIVE

In a way, the idea of HD Radio began, over 20 years ago, much like those FM radio days. Broadcasters were seeing competition for their products and services — from satellite radio, iPods and MP3s. The vision was to develop a digital solution that would allow broadcasters to be competitive, by improving quality and enriching the overall content experience. It was "CD-quality sound, no hiss or fuss" with the name of the song showing up

in a new product if no one was transmitting; broadcasters would not transmit if there were no receivers in the market to pick up their signal.

Fortunately, precedent had already been set when Westinghouse created broadcast content for their early wireless receivers. The first commercial broadcast in the U.S., aired on KDKA on Nov. 2, 1920, announced the winner of the Harding-Cox presidential race. More importantly it announced commercial radio — and changed the world.

GLORY DAYS OF RECEIVERS

The first commercial automotive HD receiver was the Kenwood KTC-HR100 HD Radio tuner; it was a dealer-installed aftermarket item. The black box went into the vehicle's trunk and the HD Radio function was completely separate from the main radio headunit.

We spent thousands of hours developing and testing it, including having groups from Japan and the U.S. drive around,



Courtesy of Cutchfield.com

The first commercial automotive HD receiver was the Kenwood KTC-HR100 HD Radio tuner; it was a dealer-installed aftermarket item.

with hundreds of experts in technology development and systems engineering. All told, thousands of people around the world are involved in the development, production and sale of HD Radio.

And those new receiver products have innovated to transform radio listening into a much richer experience compared to the first HD Radio receivers launched 16 years ago. Consumers

Making PPM Encoding Easier

How Orban's XPN-AM processor came to have PPM encoding built in

BY MIKE PAPPAS

The author is vice president, business development, for Orban Labs.

A long time ago, on a planet far away in a different galaxy and another lifetime, there were Arbitron (now Nielsen) paper diaries. These were manually filled out by "listeners" to indicate which radio station(s) they listened to and for how long.

Technology marched on, and in the age of PCs and smartphones, the thought of filling out diaries manually felt like using stone tablets and chisels. So Arbitron designed a system to encode a radio station's audio with a series of low-level tones that a device called a Personal People Meter would hear and log. All that Arbitron "listeners" would have to do was carry the PPM device and, at the end of the day, put it into its charger, which would transmit the listening data back to Arbitron for processing. Brilliant!

Arbitron built the encoders, which resided in the station's audio chain. The encoder looked at the audio and, if there was sufficient audio, generated the tones that the PPM device heard.

easier for stations. Also, there might be the ability to place the encoder in places that weren't practical with an external encoder.

Nielsen assembled a team that developed a PPM encoding Software Development Kit (SDK) for both X86 and ARM solutions, and worked extensively with processor manufacturers on implementation.

Timing worked out well for us at Orban as we had engineering resources that had become available right at the time the SDK was ready, and our new XPN-AM platform was an ideal candidate for the X86 implementation.

Bob Orban and the engineering team looked at where the best location in the processing chain should be for the encoder, taking into account the need to support both analog AM and HD Radio, and potentially all-digital AM, along with streaming or an FM translator.

This resulted in using two encoder instances, one for analog and the other for all other digital services. Within 90 days we had a stable XPN-AM build with integrated PPM encoders.

Once the encoders were implemented in our XPN-AM software, a stringent testing process was done with hundreds of audio test files being processed and checked by Nielsen.



Jason Ornellas, Bonneville's regional director of engineering for the West Region, is shown at KHTK(AM) Sacramento with the XPN-AM processor.

Processing manufacturers took a look at how they might be able to work with the encoder, and many provided an "encoder loop" that let the station put the encoder in between portions of the processor processing chain.

In many processors the "encoder loop" was placed after the input AGC and before the multi-band processing. This fed the encoder with more uniform audio levels and could potentially improve the encoder's ability to encode the audio.

TAKE IT ON-BOARD

A decade later, in the era of AI and really smart phones, Nielsen, along with the NAB, approached processing manufacturers to see if they were interested in having the PPM encoding done in the audio processor.

This would eliminate the external encoding hardware plus the processor encoding loop and make life

After the test files hit 100% approval, the next phase was beta on-air testing. These test sites had to have sufficient audience to generate enough testing granularity to assure valid results. Also, station management had to buy into the tests, the testing had to be coordinated with a Nielsen rating "book" period.

THE BETA PROCESS

I hit the road and installed all of the XPN-AM PPM beta test units at KHTK in Sacramento, KSL in Salt Lake City, KKYX in San Antonio and WSB in Atlanta.

Setup included adjusting proper modulation levels, checking HD Radio blend and diversity delay settings for KHTK and KSL along with doing drive listening in everything from vehicles ranging from a Mercedes Benz (borrowed from the morning drive host) to Jeeps, pickups and everything in between.

"Golden Ear" listeners, GMs and PDs were all



In-car testing at KHTK.

Timing worked out well for us at Orban as we had engineering resources that had become available right at the time the SDK was ready, and our new XPN-AM platform was an ideal candidate for the X86 implementation.

polled and processor settings such as EQ and density were tweaked as desired by each of the stations.

We also did some experimenting with MDCL (since we could). At KSL we increased the amount of MDCL from 3 dB to 5 dB AMC without impacting fringe coverage because of the higher modulation density. It was interesting to see the forward power running about 17 kW with a 50 kW setpoint. The DOE said that would pay for the processor in power savings alone.

The critical part of the project — the PPM encoding — was thoroughly tested. We were able to confirm with Nielsen that the correct IDs were being encoded. This included separate testing for stations that were running AM HD Radio.

Beta testing went live on Oct. 8 without any issues, and the feedback from both the stations and Nielsen has been highly positive, so much so that we have decided to provide PPM encoding at no extra charge in our XPN-AM starting immediately.

Orban's engineers always enjoy a good challenge — in this case, producing viable internal PPM encoding in record time — and as usual they delivered, thanks to Bob and his team.

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