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RNZ reinvests in SW

The overseas shortwave service of Radio New Zealand installs a 100 kW analog/DRM transmitter.

ENCO.com

SBE adds a CPT

The society has introduced an entry-level category called Certified Production Technologist.

FCC hears about "EAS at the Edge"

Three tech companies explained their concept to the commission.

Buyer's Guide

Eight notable products in the category of antennas, RF support and power protection.

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Welcome, Nick

Tis the season to welcome a new editorial colleague

Paul McLane
Editor in Chief

I'm pleased to welcome Nick Langan to the editorial staff of Radio World. He joins us as a content producer, writing and editing content for our website, daily Radio World SmartBrief e-newsletter and print publication. You may recognize his byline from articles he has written as a freelancer since 2022.

Nick is founder and principal developer of RadioLand, a mobile app for iOS and Android that uses a device's location to identify which FM stations are available based on measurable field strength value, for use in any location in North America or the Caribbean.

He has been operations manager for WXVU at Villanova University in Pennsylvania, where he has also taught podcast courses and platform-based computing. He holds a master of science degree in software engineering and a bachelor of science in information systems with a minor in communication.

Nick is passionate about radio and has enjoyed writing about its technology trends since joining our contributor community two years ago. He will work closely with me and Elle Kehres, our assistant editor and editor of the daily newsletter. His mix of interests and expertise will help us make our content better. He also loves smooth jazz and is in the process of writing a book about that radio format, focusing on the years 1987–2011.

You can email Nick at *nicholas.langan@futurenet.com*. And if you're not already receiving the free daily e-newsletter, click the Subscribe tab at *http://radioworld.com*.

On another note, I want to correct a statement we made in the Nov. 6 issue.

Our article about Jim Dalke stated that he was the first person to be named SBE's Engineer of the Year twice. That is not the case. Leonard Charles was honored in 1995 and 1997, while Clay Freinwald received the honor in 1996 and 1999.

And finally, allow me to make a plug for two of our most recent Radio World ebooks.

"Recipes for Visual Display" provides ways to make your stations more competitive and engaging on the car dashboard, with a particular focus on broadcasters in North America. We explored the key metadata platforms that engineers and managers should be familiar with, and discussed best practices.

The ebook provides many photos of how radio stations show up in all kinds of cars.

And we also released "What to Know About FM Translators," the title of which is self-explanatory. We saw strong interest in that one as soon as it was released.

You can find those free ebooks and many others at *radioworld.com/ebooks*.

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Sage Alerting Discontinues ENDEC EAS Box

Sage Alerting Systems will no longer manufacture its Sage Digital ENDEC EAS encoder.

The company said it has no current plans to manufacture new EAS encoding hardware going forward. The Model 3644 encoder has been in production since 2008.

President Harold Price says it has plenty of parts on hand to continue to repair the encoders and honor existing warranties.

The model has been popular, but "EAS has always been an odd niche business with a very bursty sales rate," Price said of the ENDEC's sales.

But he said that enough time has passed where it is more difficult to acquire parts to produce new inventory. With added uncertainty as far as the FCC's consideration of a software-based EAS infrastructure, Price is hesitant to commit to a new hardware release timeline.

"Existing stations are happy with the equipment that they have for EAS and it's built to last," Price told Radio World.

Sage plans a free maintenance release for minor bugs and to enable the Missing or Endangered Persons (MEP) *alert code,* sometime around the beginning of the new year.

Price pointed to Sage's history of backward compatibility of the ENDEC's firmware to avoid having broadcasters make wholesale changes as far as their EAS alerting equipment is concerned, including through the use of EAS and WEA alert templates.

"Anytime you make a change, you have to consider the existing user base and not make decisions arbitrarily," Price said.

He said Sage will continue to provide user support via its usual protocol of email and phone calls.

Progressive Concepts Buys Norwalk Electronics

Progressive Concepts has acquired Norwalk Electronics from its founder Donald Casavecchia Jr.

"Norwalk Electronics is best known for manufacturing the NWE34 Dominator FM Antenna," Progressive owner Eric Hoppe said.

"The Dominator Antenna is available in 250 Watts, 1 kW and 3 kW models, all providing +3 dB gain in a single-bay, design with low angle of radiation, making them very popular amongst FM broadcasters."

Progressive will manufacture the antennas at its Illinois factory.

Casavecchia wrote in a statement that he was retiring after 28 years. The terms of the cash sale were not disclosed. The acquisition involved products and intellectual property.

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MADE IN THE USA

RNZ deploys new shortwave transmitter

Ampegon 100 kW model supports both DRM and analog operation

Writer

James Careless

The longtime Radio World contributor wrote here recently about the production work at "Wait Wait ... Don't Tell Me."

On Aug. 1, RNZ Pacific — the international service of New Zealand's public media organization RNZ — did something rather unusual by current international broadcasting standards.

Rather than take a shortwave transmitter offline to shut down a service, RNZ Pacific replaced it with a new 100 kW Ampegon TSW-2100 transmitter. As Radio World's Carter Ross reported at the time, "The new transmitter replaces the 33-year-old RNZ Pacific 'Transmitter 1' installed in 1989 at Rangitaiki, near Taupō in central North Island. Part of a project to improve RNZ Pacific's capabilities, the new transmitter supports both DRM digital and analog operation." The estimated cost to the government was $2.4 million (U.S.)

Commissioning of the transmitter was officiated by the country's minister of foreign affairs at RNZ House in Wellington.

Why did RNZ Pacific take this step? We asked Chief Technology Officer Mark Bullen and Transmission Manager Steve White.

Chartered service

It may seem an overstatement to characterize RNZ Pacific's installation of a new radio transmitter as a life-or-death decision. But for those in the region who rely on its broadcasts during natural disasters — particularly on small islands with weak broadcast resources of their own — RNZ Pacific is an information lifeline.

This has been especially true since 2017, when Australia cut the last of its international shortwave services to save money.

Fortunately for RNZ Pacific's far-flung audience, this broadcaster's shortwave service appears to be safe for the foreseeable future.

"RNZ, under its charter, must 'include an international service to the South Pacific in both English and Pacific languages,'" said Bullen.

As a result, RNZ has been delivering shortwave broadcasts into the South Pacific region from the Rangitaiki transmitter site since 1990. "Prior to that the service was transmitted from our Titahi Bay site in Wellington, which opened on Monday Sept. 25, 1948," he said.

To abide by its charter, RNZ Pacific works with media partners across the Pacific to support the reception and rebroadcasting of its content in 22 nations.

As well, "as part of our lifeline utility role in New Zealand Aotearoa [the Māori-language name for New Zealand], we take on the role of ensuring that we can broadcast lifesaving information to the Pacific region," said Bullen. "Being able to deliver from outside the region ensures that it can be resilient, regardless of the event impacting the Pacific, whether it be cyclones or other causes resulting in loss of infrastructure. Since the other nearby

Below
A drone view of the RNZ Pacific shortwave site at Rangitaiki, New Zealand. (Photo courtesy Radio New Zealand.)

shortwave service from Australia ended in 2017, this has reinforced our role as a shortwave service provider in the region."

RNZ Pacific's decision to include Digital Radio Mondiale capability in its new shortwave transmitter was designed to do more than deliver content to consumer DRM receivers.

"We have media partners that choose to rebroadcast our DRM service within their countries," Bullen said. "Unlike analog SW, DRM delivers high-quality digital audio that is suitable for rebroadcasting. Thankfully, our existing Thales shortwave 100 kW transmitter also can deliver both analog and/DRM services. So this gives us flexibility and resilience across RNZ Pacific's two transmitters to simulcast if required or to perform maintenance on one of our transmitters."

RNZ Pacific chose the Ampegon 100 kW transmitter after a request for proposals process. "There were two key high-level reasons: commercial viability, and ongoing support and maintenance." Another transmitter that was considered would have required structural changes to the transmission building.

"Working with Ampegon allowed us to leverage our long working history and support along with the ability to share spares and tubes between the new and old transmitters."

Above
Steve White with the previous transmitter.

Smooth transition

RNZ Pacific's new Ampegon shortwave transmitter provides the same transmission power as the 1989 Thomson 100 kW analog-only transmitter that it replaced. Listeners are not likely to notice much difference, unless, of course, they are tuning in using DRM digital radios.

"The coverage is unchanged, as there have not been any modifications or additions to the antenna system," said Steve White.

Below
The new Ampegon system in place.

"The gains for RNZ Pacific lie in ensuring that the service is reliable going forward and that we now have redundancy for our DRM service," Bullen said.

Installing and commissioning the transmitter was a relatively smooth process, but some work still had to be done. Specifically, a site control system installed in 2005 was upgraded to interface to the new transmitter and the opportunity was taken to upgrade hardware and software to current versions. The audio distribution system was upgraded to a fully digital system, greatly improving operational flexibility.

Although the Ampegon was essentially a swap-out for the Thomson it replaced, the new transmitter is more efficient. "It also has the AMC analog modulation system, which results in further significant savings on power consumption along with much reduced stress on the transmitter," said White.

Solid performance

The new transmitter is performing as specified. "Now that we have two fully operational transmitters again, we broadcast in analog mode using the second transmitter during our DRM broadcasts so that all listeners can receive the service," White said.

The old Thomson transmitter has been dismantled, with useful parts recovered for spares. "Parts of the transmitter were also sent to our Titahi Bay transmitter site in Wellington, where they will be put on display next to one of the original 1948 shortwave transmitters," said White.

The new transmitter appears to be delivering the kind of international reach that the broadcaster was looking for, based on reception reports that listeners send to RNZ Pacific daily as well as data from its own monitoring receivers in the Pacific region.

"We saw recently that the signal had been picked up by a pocket radio in Plymouth, Minnesota — some 13,000 kilometers [about 8,000 miles] away from the Rangitaiki site," White said.

"This suggests that the new transmitter is operating well."

Back in BLACK

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Writer
Paul McLane
Editor in Chief

FCC preps some housekeeping in its rules

A 47-page draft NPRM contains numerous proposed changes

With Jessica Rosenworcel a lame duck as chairwoman of the FCC, no major policy decisions or regulatory changes are expected until Donald Trump returns to the White House, Rosenworcel departs and Brendan Carr takes the chair.

However the commission is not entirely idle. At its Dec. 11 meeting it was expected to start a housekeeping process aimed at updating certain rules for radio and television stations. In advance of that vote, it released a draft of the notice of proposed rulemaking.

It contains numerous proposals that the FCC says are intended to better reflect its application processing requirements; clarify ambiguity; and remove references to outdated procedures and filing systems.

Of most interest to radio stations, the NPRM proposes to:

- Update the rules for AM station power increases to eliminate a requirement that stations request at least a 20% increase in nominal power. The commission explains in the draft that current language dates to 1985, when new international agreements took effect. The FCC was worried at the time about the potential administrative impact of a large number of expected applications, so it determined that any application for power increase not involving a change in site must propose at least a 20% increase in nominal power; it thought that increases of less than that were not likely to provide much benefit. Now the FCC thinks eliminating the restriction will provide AM stations greater flexibility and new opportunities to optimize operations.
- Update language describing procedures for authorizing certain AM Class D daytime-only stations to operate unlimited-time. Some language was not updated when stations were reclassified in 1991.
- Codify an interpretation of the rules that when LPFM minor modification applications are received on the same day, they will be treated as simultaneously filed.
- Codify the interpretation of the term "authorized" station in the LPFM minimum distance separation rules as including construction permittees in addition to licensees. The draft states that an absence of a definition in the rules may have the unintended effect of causing confusion in the LPFM application process.
- Identify which applications an LPFM applicant must protect when submitting an application in a filing window for a new CP or modification of an existing authorization. LPFM applicants would have to protect FM, LPFM and FM translator applications submitted prior to a public notice that announced procedures for an LPFM filing window. This proposed change would mean that a public notice that simply announces dates for a filing window will not terminate protection requirements for prior-filed applications. Only a detailed public notice setting out procedures for the window would terminate the need to protect prior-filed applications.
- Remove language stating that an initial special temporary authorization to address technical or equipment problems may only be granted for 90 days with a limited number of 90-day extensions, rather than the full 180-day period permitted for STAs for other reasons. The FCC engineering staff has found that technical or equipment malfunctions frequently take more than 90 days to resolve. "Finding replacement parts to keep highly specialized broadcast equipment functioning may involve protracted search efforts and lengthy shipment times. In practice, requiring an update every 90 days typically results in the licensee raising the same issues and repeating the identical request

from the original STA filing. The frequent filings also place an extra burden on licensees."

The draft lists other desired changes in the rules. It proposes to:

- Replace references to the legacy Consolidated Database System electronic filing system with references to the Licensing and Management System. As of October 2023, the bureau no longer updates CDBS, and the FCC expects to decommission it soon.
- Update references to applications. In the CDBS, applications had separate form numbers such as FCC Form 301, but in LMS, applications use FCC Form 2100 with a separate schedule number.
- Make minor editorial tweaks to terminology referring to tables that govern FM and TV allotments.
- Eliminate language concerning a cap on the number of applications an applicant could submit in the 2021 NCE FM filing window.
- Update the commission's incentive auction rules to remove obsolete language.
- Codify the existing interpretation of the Signature Rule that "directors" of corporations may sign broadcast applications, and modify the rule to expand the definition of who may sign an application on behalf of a corporation, partnership and unincorporated association, to include a "duly authorized employee." The primary goal of the Signature Rule is to provide "assurance that the applicant has personally reviewed the application and can be held responsible for the truthfulness and accuracy of the application." The draft says the FCC has found that the rule, which does not permit a corporation to designate an authorized employee to sign applications or amendments, leads to numerous application dismissals of otherwise qualified applicants.
- Codify the practice concerning when applicants for new NCE FM, NCE TV or LPFM construction permits must give local public notice of their applications.
- Remove obsolete application processing language.
- Consolidate the rules for petitions to deny under a single rule section.
- Revise the informal objection rule to require that informal objections and responsive pleadings be served upon the relevant applicant or objector. It would also limit the type of responsive pleadings that may be filed, and impose filing deadlines for responsive pleadings that align with the limitations set for responsive pleadings to petitions to deny.

Whew!

You can read the draft NPRM at *https://tinyurl.com/rw-rules-2*.

John Bisset
CPBE

The author is in his 34th year of writing Workbench. He handles western U.S. radio sales for the Telos Alliance and is a past recipient of the SBE's Educator of the Year Award.

Send your tips

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

Brighten your studio with LEDs

These arrays can freshen the room and save money too

Readers have commented that many stations are upgrading or freshening their studios in the waning days of 2024. For many, this means clearing out everything, including old ceiling fluorescent or track lighting.

General contractors are specifying modern-looking LED arrays that are low in profile yet brighten a studio. Two such examples are seen here. The first photo is from WOW Radio in Connecticut, the second is at iHeart studios in Miami. An LED array bathes the studio in light, which is pleasing and also useful for visual radio applications.

If you haven't made the conversion in your studios, consider it. Even converting to LED incandescent replacement bulbs will amaze you and save you money in electric costs. The bulbs also reduce the amount of fixture heat. If you've made the switch, send me an email to tell me about it, and include a picture.

Frank's Ticking Stick

Consultant Frank Hertel, principal at Newman-Kees RF Measurement & Engineering, writes that broadcast engineers often are required to "fit" material into odd-

Above
LED light ceiling array in the WOW studio.

Right
LED lighting array in the iHeartMedia studios in Miami.

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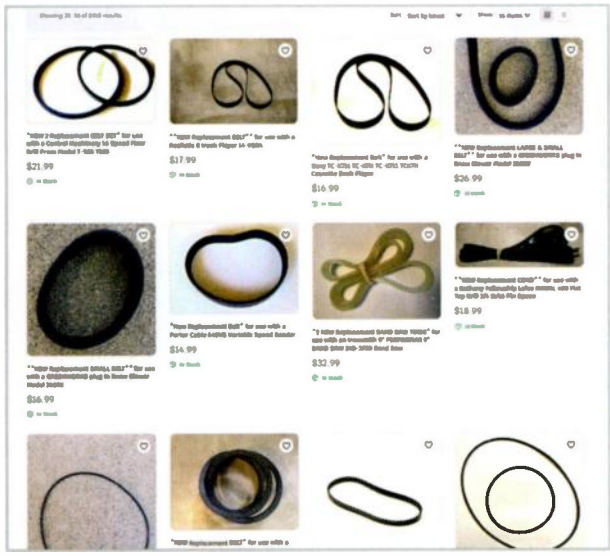

Left
At West Coast Belts, you can "search thousands of belts in record time."

Right
The Wireless Micro from Røde.

shaped spaces, as when installing tile or carpet in the studio or filling an odd-shaped hole with ceiling tile.

Rather than "estimate" your cut, visit YouTube to learn how to use a Ticking Stick to improve accuracy.

This old carpenter's trick apparently originated with shipbuilders, who had to deal with many unusual angles. You don't buy a Ticking Stick, you make one. Search YouTube for "Ticking Stick" or "Tick Stick" to find videos about how this tool can be adapted for replacing an odd-shaped piece of tile, soundproofing foam or carpet. (The YouTube channel called See Jane Drill has one, for example.)

Frank also shared a useful site for engineers restoring old cassette or reel-to-reel machines that need new drive belts.

Recently, he was repairing a Tascam 22-2 two-track stereo machine. When he got it open, he found that the drive belt had turned to a black rubbery goo. Frank warns that if you encounter this, make sure you wear rubber gloves because the gunky paste will stain your hands. Isopropyl alcohol is the best solvent for cleaning up such messes.

For the replacement drive belts, try *www.westcoastbelts.com*. The company has thousands of belts in stock from $14 to $30. A small price to pay to restore a machine. They even have a 30-day return policy.

Perusing the list, we find belts for many types of equipment — including a Magnavox 8-track tape player as well as various brands of meat slicers! The company can also manufacture custom belts if needed.

This is a good site to bookmark if you maintain legacy consumer or broadcast devices that use drive belts.

Below
A screwdriver tip and multiple wrench sockets make the Lectrosonics StandWrench a nice addition to any toolbox.

Wireless mic for your phone

Frequent Radio World contributor Dan Slentz points out that although cameras in most smartphones are amazing, their built-in microphones often are not.

Røde has introduced the Wireless Micro to help. You simply clip the mic onto your lapel and insert the Micro receiver into your phone. The system consists of two mic transmitters and a dual receiver, so you can record two people at one time — great for interviews.

There are two versions, one with a Lightning connector for earlier iPhones, and a USB-C version for newer iPhones and Android devices. A Gain Assist feature keeps levels in check, and it comes with a built-in windscreen.

The transmitters will run for seven hours on a charge; that's a lot of recording for under $150.

They're available from Røde dealers. You can watch a short video about it on YouTube; search "Røde Wireless Micro: Features and Specifications."

Worldwide resource

Broadcast equipment distributor Broadcast Supply Worldwide has released its annual equipment catalog. It describes pretty much everything used in a radio or television broadcast facility and is available at no charge. Request your copy by sending an email with your station information and mailing address to *sales@bswusa.com*. Please let them know you heard about the catalog from Radio World's Workbench.

Specialty tool

The StandWrench from Lectrosonics is a multi-tool for the performance industry. It can tighten loose music or copy stands, and the variety of wrench opening sizes make it useful for light-duty tightening. The tool is laser-cut from 14-gauge stainless steel, with a nearly flat profile. It has six hex sockets and a large flat-blade screwdriver tip.

Its compact size makes it suitable for any toolbox.

SBE Adds "Certified Production Technologist" Level

The Society of Broadcast Engineers has added an entry-level certification category called Certified Production Technologist or CPT.

"While the Core Four levels — CBT, CBRE/CBTE, CSRE/CSTE, CPBE — are the foundation of the program, advances in technology have spurred the need for other relevant skills to be evaluated," the organization said in its announcement.

"Examples of this include the Certified Broadcast Networking Technologist (2001) and Certified Broadcast Networking Engineer (2012), the specialist certifications (8-VSB, AMD, ATSC3 and DRB), and the Certified Audio Engineer and Certified Video Engineer."

It said CEA and CEV were created for people who perform the functions of a CBRE or CBTE but don't work with RF or regulatory issues; that includes broadcast facility production personnel but also those working in production houses and live venues and now people who work for streaming services.

"The candidate for Certified Audio Engineer (CEA) or Certified Video Engineer (CEV) must have five years of suitable experience in audio/video engineering or related technology," it noted. "The Audio/Video Engineer multiple choice examination consists of questions on operating practices, problems, theory, safety and basic electronics."

But Certification Committee Chair Ralph Hogan said CEA and CEV were created more than 20 years ago and that SBE realized that it needed an entry-level certification covering the same skills but without a career service requirement, given the proliferation of streaming services and the increase in media facilities not directly involved in broadcast distribution.

"Like the CEA and CEV, there are no RF or FCC questions on the exam," he said.

Noting that the Certified Broadcast Technologist (CBT) is actually two certifications that use the same name, focusing on either radio or television, SBE said the Certified Production Technologist (CPT) will do the same.

"It will be identified with one name, but it has two tracks: audio or video. Again, no experience is required as it is an entry-level certification."

The CPT exam will consist of 50 multiple-choice questions in an open-book format that allows personal notes and internet access. "It's important to know the technology, but just as important to know where to find a solution when it's needed," SBE explained.

The exam question pool is being finalized and a CertPreview sample test is in the works. Applications can be made through the SBE website.

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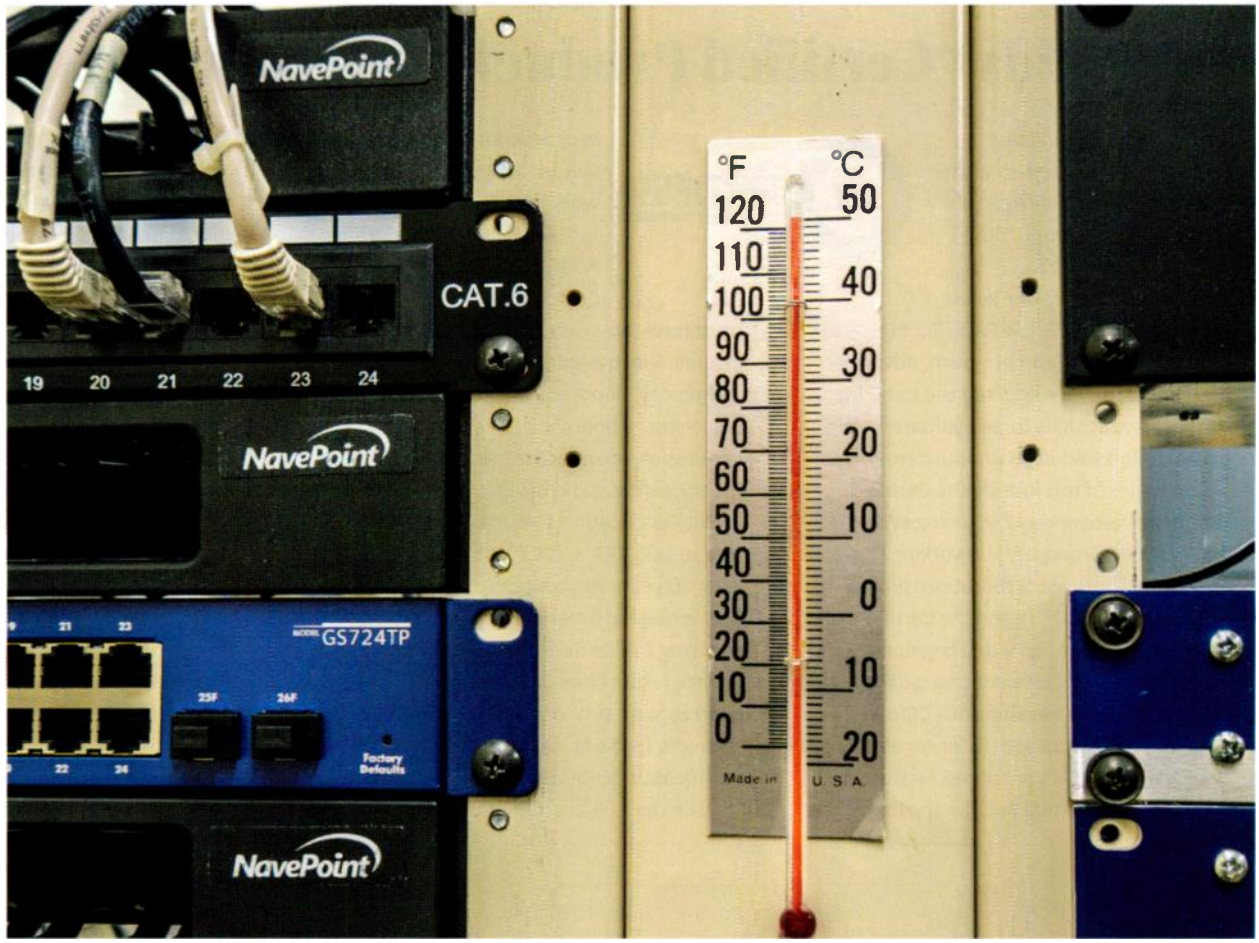
Writer

Mark Persons

CPBE, CBNT, AMD

The author is retired after more than 60 years in radio broadcast engineering. He is a Life Member of the Society of Broadcast Engineers and recipient of its John H. Battison Award for Lifetime Achievement.



Above
Fig. 1: Not the indoor temperature you want to see when you arrive at your site.

Your site still needs the human touch

Things can really go wrong when no one is paying attention

Multiple contractors may have responsibilities at a transmitter site without any of them ever considering the overall well-being of that site. Consider the following real-life examples.

Transmitter upgrade

Two new 30 kW solid-state FM transmitters were to be installed at a combined FM site. The heating and cooling contractor installed two new expensive air-conditioning systems and turned off the original fan ventilation system because who would ever use that again?

A broadcast contractor then came in to install the transmitters along with a new remote-control system. All appeared to be working properly.

Yet the IT department of the station group had not yet opened a digital port for the remote to allow outgoing alarm messages. An over-temperature condition could have been read at the studio during regular checks, but who looks at that while taking transmitter readings?

But the site is also home to an amateur radio repeater system, and when a ham operator visited on a summer day, he found the temperature in the building was a whopping 120 degrees or more, as you can see above.

He immediately informed management. There was no station engineer, so the station called the air handling contractor to remedy the problem.

It turned out that pollen had plugged the air-conditioning condenser coils. This meant an expensive service bill for something that could have and should have been looked after by someone doing regular maintenance visits.

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Above
Fig. 2: Thanks to vandals, mice now can get into this transmitter building.

The fan cooling system could have been left in place to take over at 90 degrees when the new air handling equipment developed troubles. You can never have too many backups.

Electrical panels

It takes a human to do regular checks to monitor the overall health of a facility.

During such visits, put your palm on the fuse and circuit breaker enclosures; you may detect early signs of a problem. I found hot ones several times over the years. A look inside will reveal the story. A call to an electrician can resolve the problem before you have a complete failure.

Watching after it

There is always something. Vandals break things (Fig. 2), mice get in, motor bearings squeak when they need replacement, people dump trash at a site, there are break-ins, tower fences might need repair, there might be roof leaks and trees can fall on the road or even on guy lines.

In one instance, a local contractor was hired to clear brush and small trees from inside the tower fences of an AM directional site. There was no one at the station to supervise the work or shut down the transmitter to make it RF safe for workers.

In the process, one of the half-inch antenna monitor sample lines accidentally was cut, which was not reported. Antenna monitor readings that night showed a problem. A consultant was called in from out of town to troubleshoot and ultimately splice the monitor line. In the end it cost a lot of money because no one from the station had been overseeing the work.

Power generators

Backup power generators are notorious for providing homes for mice that like to chew through wires. Perform a visual inspection once a month. It only takes a moment, assuming you visit the site in the first place.

You may be tempted to test your generators for just a few seconds (Fig. 3), to confirm that the engine will start. But will it produce power? Will it overheat after the engine has been running for awhile due to lack of sufficient coolant?

In many cases, backup power generators are programmed to test themselves weekly. That's well and good, but what if there's a problem? Will anyone know?

I recommend that every backup power generator be tested in person for at least 20 minutes once a month, powering the studio or transmitter site it serves. You will

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detect any problems in the system immediately. After all, it needs to work when there is a real power failure.

STLs

Contractors look at their job with a narrow focus and usually won't see or choose to ignore anything else. It is "not their problem."

At one AM site, I found that a contractor had come in to update an STL system with new equipment. The STL system was running fine, but the contractor had not checked the audio level going into the audio processor or the transmitter modulation, which was only 40% when he left. Lacking a modulation monitor, the installer should have used an oscilloscope to check modulation. It wasn't in the description of the work to be done.

Transmitter sites

At another site we found that the solid-state 1 kW AM transmitter had been damaged because of a roof leak and had to be sent back to the factory for an expensive repair. Water had come in only a drop at a time, but a month or so of that water torture was too much for the transmitter. No one knew there was a problem until the transmitter failed.

I recall when a contractor was hired to install a new tube in an FM transmitter. He adjusted the filament voltage to the required 5.0 volts. No one at the station knew to turn the filament voltage down a bit after the recommended 200 hours of break-in operation. In the end the tube experienced half of the life that it would have if the filament voltage had been turned down 10% or so.

Above
Fig. 3: A generator plant under test.

Once I visited a site and found not one but two surge protectors that had been delivered with the new transmitters but not been installed by the contract

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engineer because it was electrician's work (Fig. 4). Yet no one had called an electrician.

Right
Fig. 4: It can't protect equipment from surges if it has never been installed.

Remote readings

There was the announcer who didn't bother to take readings on an AM directional, he just wrote down what they were supposed to be. No one complained. Finally the manager noticed the station had very good coverage at night. A check revealed that the station was in its day pattern at night — and likely had been for months.

Then there was the AM transmitter site where the main and auxiliary transmitters were fed by separate audio processors. When the main transmitter failed, the auxiliary was brought online, but there was no audio. Yes, one audio processor had failed, but no one had done regular testing to confirm that the auxiliary was working.

Such problems aren't new.

Back in the days of Sine Systems dial-up remote-controls, the studio operators at one station took transmitter readings by phone. They logged that the temperature in the building kept going up and up and up. Ultimately the transmitter failed. The operators had dutifully taken the readings but didn't understand or give thought to what they meant. That's when I started programming remote controls to call out when an over-temperature condition existed.

Radio stations today are designed and computers are programmed to run facilities as autonomous machines. However, it takes a human to look after facilities in ways a computer can't.

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

Mark Persons, WØMH, is an SBE Certified Professional Broadcast Engineer and is now retired, but still mentoring five radio broadcast engineers. He and his wife Paula were inducted into the Minnesota Broadcasters Hall of Fame after 44 years in business. His website is www.mwpersons.com.

> **"It takes a human to look after facilities in ways a computer can't."**

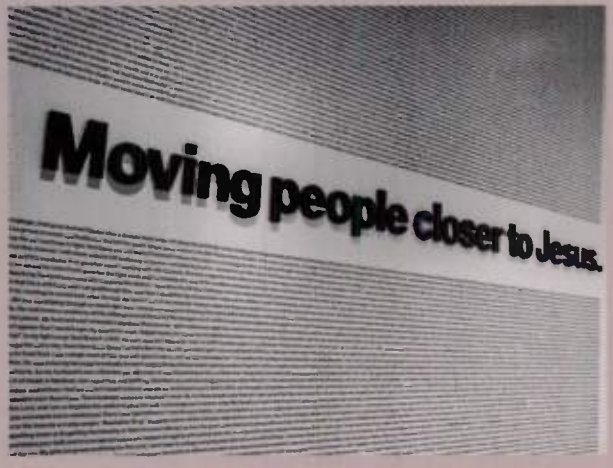
EMF Opens Its New Home

On Dec. 3, Educational Media Foundation opened its new headquarters near Nashville. EMF is the parent of K-Love and Air1, the largest Christian music radio networks in the U.S. The nonprofit organization began constructing its global headquarters in Franklin, Tenn., in 2022, after it announced it was relocating from Rocklin, Calif.

The ribbon-cutting event drew a crowd of nearly 500 and featured artists Steven Curtis Chapman and Jon Reddick.

The 166,000-square-foot facility features 10 studios for live broadcasts and podcasts. There is also space for the operation of K-Love Books, K-Love Live Events and K-Love on Demand, EMF's video streaming platform.

"The building also houses several capture spaces where artists and other leaders in the Christian space can create media content," read the release. "The auditorium, the K-Love Center, is a state-of-the-art live event space where tour rehearsals, concerts and events can be held in support of industry and other community needs."



Look for a feature about the studios in an upcoming Radio World ebook.

— Elle Kehres

Translators are great ...

... but don't let your hopes get out of hand

A new Radio World ebook explores "What to Know About FM Translators." This is an excerpt.

Bob Clinton is a senior engineer with Cavell Mertz & Associates.

Above
Bob Clinton working in the field with drone measurements.

How has the role of translators evolved?

Bob Clinton: Historically the idea of a fill-in translator has been to improve coverage in specific areas where a station's signal tends to be weak or terrain-limited.

In the 1980s and '90s, in the eastern part of the country, translators were primarily noncommercial educators looking to extend coverage outside of the normal 60 dBu contour, while in the mountainous west, they were used to solve terrain problems, because even if you put up a big 50 or 100 kW station, the terrain there would kill you.

Then AM revitalization came along.

It expanded the number of translators significantly. And we saw the impact of HD Radio, where a translator could rebroadcast an HD multi-channel, carrying that as a fresh signal on a different frequency.

Clinton: Yes. Sometimes these days it even feels like some broadcasters want a translator even if they don't really have a business need for it. Interest has been almost on the order of a fad that many get into for fear of missing out.

We've got an awful lot of translators on the FM band now. What kind of projects are you active in?

Clinton: Most of my recent work has been on the consulting side, where we help people apply for or modify the translators. New translators require a filing window, which the FCC will announce only in a fairly long while. There is no schedule, and it can take several years for them to propose another round. Anyone interested in a translator right now would have to find an existing one to repurpose.

A lot of translators for AM stations are not allowed to be sold unless you take the AM with you; the translator has to stay with the parent station. But there are plenty of translators that can be sold or change ownership.

Much of our work lately has been with fill-in translators, where a station wants a stronger signal in a community.

If you're going to purchase a translator and move it, the change must qualify under the minor modification rules. Minor mods can be done essentially at any time, unless a filing freeze has been instituted.

It could be a channel change to a first-, second- or third-adjacent channel, or to the IF, which is 53 or 54 channels away. Or it could be a physical move of a short distance. The move normally requires that you have contour overlap — whatever you propose must have a certain amount of 60 dBu contour overlap with the existing license. It's not difficult to demonstrate this; but it depends on how big your license is. If it's for five watts, you're not going to be able to move very far with the new one, whatever you propose.

But a neat thing about translators is that if you can demonstrate that you're receiving a significant amount of interference from an existing facility, you can change to pretty much any channel in your same band, whether you're in the educator band or the commercial band.

Do many projects involve the sale of a translator to an owner who wants to rebroadcast a different station?

Clinton: Some, but most already have a translator and are unhappy with the coverage.

But keep in mind that a translator is a translator; it's usually not going to deliver anywhere near as much coverage as a Class A station.

Some clients are just getting clobbered by incoming interference, and we can make a channel change to improve that; but there are parts of the country, like North Carolina, California and parts of Texas, that are so densely populated with FM stations and translators that finding an alternate channel is almost impossible.

Read this interview and others in the new ebook at http://radioworld.com/ebooks.

About Buyer's Guide
This section appears in every other issue, focusing on a particular category of products or services, which is listed above. It is intended to help buyers know what's on the market and gain insight into how their peers are using such products.

Maine Public Radio expands service with Dielectric

Network expands from 14 to 21 FM frequencies

Synonymous with public media to state residents since 1992, Maine Public embraces new opportunities to bring its radio, TV, educational and web services to larger audiences.

That will soon ring authentic to Maine Public's radio listeners as the network prepares to expand from 14 to 21 FM frequencies, an impressive 50 percent growth.

With most stations coming to air in 2025, the busy engineering team is moving toward final preparation. Naturally that means RF is on the mind, from finalizing transmitter and filter/combiner installs within shelters to mounting new antennas.

Maine is a deceptively large state to the unfamiliar. The seven new sites will strengthen over-the-air coverage for many rural populations, some of whom will receive NPR FM signals for the first time. That's especially true in the wide-open country west and north of Bangor, all the way to the Canadian state line.

The engineering team recently finalized the installation of Dielectric DCR-M ring antennas at its two northernmost sites in Mars Hall and Fort Kent.

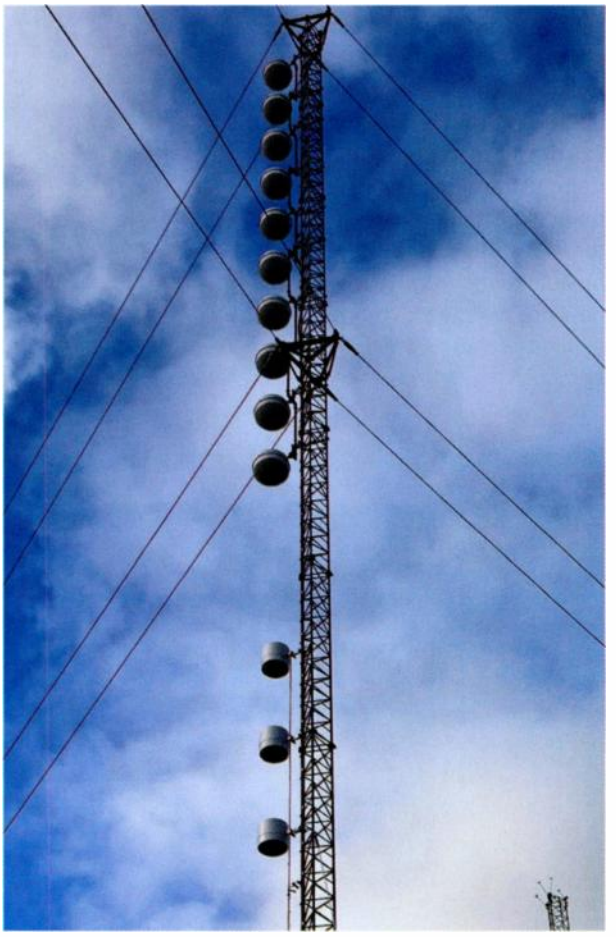
While Maine Public Radio FM service has been available on WMEM(FM) and WMEF(FM) for years, classical music fans in these markets were long in the dark. The network also took the opportunity to install a new DCR-H ring antenna on the Mars Hill tower to improve performance for the WMEM Maine Public Radio service, replacing a decades-old Dielectric panel antenna that was nearing end of life.

A longtime Dielectric customer, Maine Public CTO Jeff Mahaney chose the manufacturer to supply antennas for the seven new frequencies upon FCC approval.

"We're putting these antennas up today, and 30 years from now someone else will replace them with the next generation," said Mahaney. "We never anticipate having issues with a Dielectric antenna." He described the quality of work and materials as exceptional and said they're built for harsh environments.

Mahaney says the ring-style design brings important benefits to smaller towers often favored in rural regions.

"These are smaller antennas that reduce the weight and wind load on towers that aren't built to withstand the characteristics of much-heavier panels. Ring-style antennas radiate a very consistent omnidirectional pattern, which improves FM coverage. They also provide greater flexibility to specify wavelength spacings, which helps properly size the antenna for each configuration."



Right
These antennas serve WMEM, top, and WFAS.

More Info
www.dielectric.com

Mahaney said Dielectric added radomes to the antennas for optimized protection from ice and other elements. Along with the antennas, WMEM installed a Dielectric filter for the Mars Hill system while a Dielectric combiner is ready for service in Fort Kent.

Jeff Mahaney can be reached at *JMahaney@mainepublic.org*. Visit Dielectric's website at *www.dielectric.com*.

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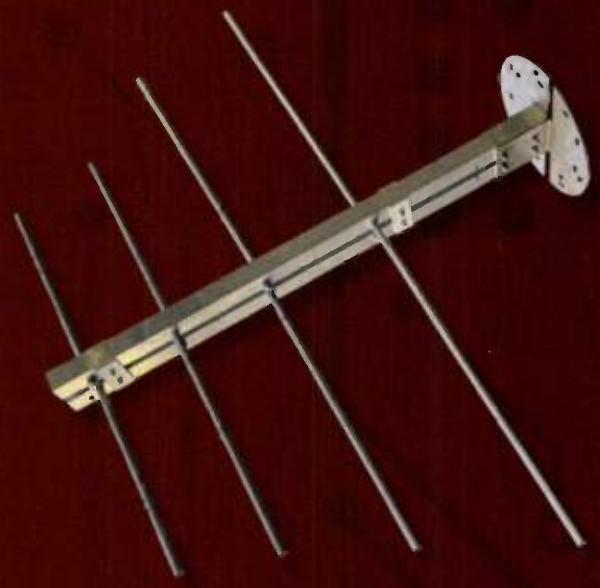

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Shilvey Labs' NEW FM6026 Log Periodic Antenna

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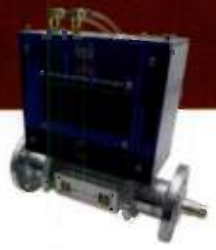

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Tech Update

A Lower-Cost **PowerClamp** for Solid-State Transmitters

The Sine Control Technology PowerClamp HP200-1-TX Surge Protective Device is intended for broadcast transmitter sites, network studio complexes and other mission-critical installations.

The company notes that "surge protective device" is the new term for a transient voltage surge suppressor or TVSS.

"The PowerClamp HP200-1-TX is ideal for solid-state transmitters that use switching power supplies, as they are especially vulnerable to powerline disturbances," it states.

PowerClamp SPDs use a hybrid of multiple technologies to reduce the amplitude of AC spikes and surges that can damage these switching supplies.

"The unit's 'clamping level' performance is exceptional, reducing surges and spikes to within just a few volts of the sinewave peak." The PowerClamp HP200-1-TX is rated at 200,000 surge-amps per phase.

The HP200-1-TX is for single/split-phase 120/240 volt power. Other Series 200 models are available for three-phase Wye electrical service from 120 to 480 volts. LEDs monitor the unit's fuses, with Remote Status Monitoring optionally available.

"Load matching is not required. There is no insertion loss or risk of power cutoff. In the unlikely event of an overload, the PowerClamp's internal fuse will open, but power to the transmitter will remain on," the company said.

"All Series 200 SPDs have more surge-amp capacity than previous PowerClamp units, but cost less due to newer production technology. Units are generally in stock for immediate delivery."

Info: *https://henryeng.com/powerclamp/*

Tech Update

Shively Introduces Log-Periodic Antenna

Shively Labs, part of American Amplifier Technologies, has introduced a log-periodic antenna for professional broadcast applications.

It said the FM 6026 combines high performance with compact efficiency. "Measuring just 4 feet in length, the FM 6026 features a four-element configuration that delivers the same directional broadcasting and receiving capabilities typically seen in much larger antennas," the company said.

"Its compact size, nearly half the length of traditional eight-element designs, makes it an excellent choice for installations where space is limited."

It said the antenna provides durability and strength, with a rugged frame and available radomes for additional protection against the elements.

"The FM 6026 offers exceptional broadband performance, achieving a 1.08 VSWR or better across the full FM frequency range from 88 to 108 MHz. This ensures consistent signal quality and bandwidth, making it a dependable choice for broadcasters requiring stable, high-quality transmissions."

Info: *www.americanamptech.com*

Tech Update

ERI Offers Medium-Power FM Bandpass Filter

Electronics Research Inc. is highlighting the new 940 Series FM Bandpass Filter. It describes it as a compact filter with innovative form factor and construction, promising "the smallest available footprint FM bandpass filter capable of handling up to 5 kW average power."

The filter is a four-section single-cabinet design with footprint of less than 18 by 21 inches. It includes Invar and bellows temperature compensation technology used in other models of ERI medium- and high-power FM filter products.

"The filter contains a cross-coupling standard for additional isolation in combiner systems with closely spaced frequencies," ERI said.

It is rated to handle up to 3 kW (depending on tuning) at the output after insertion losses, convection-cooled. That rating is increased to 5 kW with a forced air cooling fan.

The filter includes 1-5/8-inch unflanged input and output connections; an EIA flanged version is available optionally.

The filter can be used for intermodulation product suppression or configured as an FM channel combiner. A constant impedance configuration, also compact, is available.

Pictured is a 940 Series FM channel combiner for the expansion of a master FM antenna and combiner system owned by DMS Broadcasting in the Cayman Islands. The current system combines three FM stations into an eight-bay Axiom Master FM Antenna; the expansion adds five more for a total of eight full-service FMs. The expansion includes an ERI Model 935 constant impedance combiner module and four FI940 constant impedance FM combiner modules. Total combined power output after the modifications will be nearly 18 kilowatts.

Info: *www.eriinc.com*

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Tech Update

A Zyclone Blows In

Progressive Concepts says its Zyclone Broadband Circularly Polarized FM Broadcast Antenna is constructed of high-grade stainless steel and Teflon.

"This brand-new series has a very flat frequency response across the entire FM band from 88 to 108 MHz, no tuning required," the company says.

Available in one-, two- and four-bay models, Zyclone is a 50-ohm antenna that handles up 2 kW on a single bay or up to 4 kW with multiple bays and optional 7/8-inch EIA flange. The company says typical VSWR is less than 1.2:1 across the entire FM band.

Prices range from $799.95 to $3,699.

Info: *https://progressive-concepts.com*

Tech Update

Bext TFLHOP Handles 5 kW Per Bay

The TFLHOP is a new antenna from Bext Corp., a horizontally polarized model with an omnidirectional pattern, constructed from stainless steel that can be finely tuned to ensure a low VSWR within the 88–108 MHz FM band.

"With a robust power input of up to 5 kW per bay, the TFLHOP can be seamlessly configured into a 12-bay array, capable of handling a total power output of up to 60 kW," the company says.

The TFLHOP can include an optional mini radome to provide an additional layer of protection, designed to shield the feed point from the effects of harsh icy conditions, assuring consistently stable VSWR and optimal performance.

In an effort to address rising freight costs, Bext said its antenna arrays are designed for compact shipping, enhancing ease and installation and significantly reducing shipping expenses.

Bext calls this model suitable for stations seeking a cost-effective solution without compromising on quality. The company offers null fill, beam tilt and customized wave spacing at no additional cost.

Info: *www.bext.com*

Tech Update

OMB Supports Tronica in Botswana

OMB offers solutions for FM and DAB+ among other applications. Radio broadcast products include transmitters, amplifiers, antennas, IP links and STL equipment.

The company supports turnkey and custom projects. A recent example is a system created for communications and technology company Tronica Ltd. in Botswana.

It's an integrated dual-channel FM system to support rural areas that lack FM coverage. Each system incorporates dual satellite receivers, dual FM transmitters, an integrated dual-channel diplexer, satellite receive antennas and an FM transmission antenna array tailored for the desired coverage at each destination. The systems are packaged in outdoor cabinets for quick installation and commissioning without specialized equipment.

Info: *https://omb.com/*

Tech Update

Maintain Operations With a Temporary **AM Antenna**

"Quickly reestablishing an AM signal when a tower goes down or a broadcast site is lost once required the reinvention of the wheel; now it's something a broadcast engineer can take in stride," states Information Station Specialists.

The company has introduced a trio of lightweight whip antennas, groundplanes and accessories that make a temporary setup straightforward. Varying in price, efficiency and power capability, the ANXX, AN2X and HPR.0990 whips can work in association with an existing broadcast transmitter, or can be provided with a temporary low-power transmitter, to get a station back on air from a flat-roofed building or a simple support pole.

The company keeps a stock of most antennas and low-power transmitters on common frequencies for quick shipment in the United States on 24-hour notice. Available accessories include masts, stands, mounts, matchers and cables.

Info: *http://theradiosource.com*

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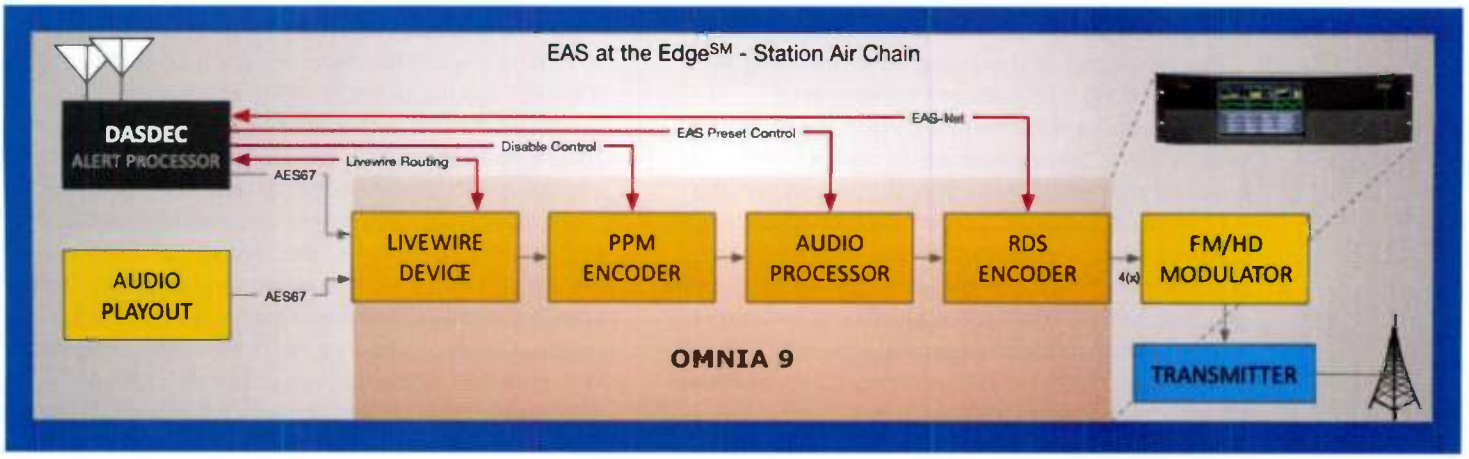

FCC hears about "EAS at the Edge"

Three technology companies discussed their concept with commission staff

If the FCC is going to allow radio broadcasters to adopt software-based EAS infrastructure, it should weigh the challenges of virtualization and consider how potential solutions might work together to meet them within the current regulatory framework.

That was the message from representatives of Digital Alert Systems, Telos Alliance and Nautel, who met in a video conference in October with nine staff members of the commission's Public Safety and Homeland Security Bureau.

What follows is a summary of the presentation, submitted to the FCC as an ex parte filing. It was written by Edward Czarnecki, vice president, global and government affairs for Digital Alert Systems and has been edited for space.

You can view slides that accompanied this presentation at https://tinyurl.com/rw-edge.

The purpose of the meeting was to provide the FCC with a full understanding of a solution supporting EAS in audio-over-IP (AoIP) and virtualized environments currently deployed at several broadcast radio stations. ...

The meeting began with an overview of issues faced by various radio stations adopting audio-over-IP and virtual architectures that do not readily integrate with certain legacy approaches.

The three companies meeting with the FCC combined their resources to craft an approach to address the AoIP and virtualization challenge for EAS. We also noted that many radio participants may not be aware of similar integrations already accomplished within the video services sectors — cable, IPTV, and broadcast TV — over the past decade to support EAS in IP and virtual environments.

While noting that virtualization brings new possibilities that might provide cost savings and new types of functionalities, we outlined various limitations of virtualization — as acknowledged by industry experts — that some forms of virtualization can be problematic considering a range of regulatory, policy, security and operational factors.

We explained how some of the broadcast industry's leading manufacturers have collaborated to develop and field a solution to enable EAS in a virtualized environment. This approach — called "EAS-at-the-Edge" — involves a hybrid combination of EAS device at operator site, virtualized systems for radio station operations, and virtualized services for system monitoring, management, reporting and software updating.

Conventional EAS processing at a radio station essentially consists of switching baseband audio, which is insufficient for the IP requirements of an AoIP or virtualized system. In the hybrid virtualized EAS-at-the-Edge environment, the DASDEC addresses this obstacle by communicating via IP (AES-67 plus routing/control protocols) to enable EAS insertion into the modern AoIP air chain. Hybrid virtualization combines IP-enabled EAS appliance and software virtualization to simplify EAS from reception to playback.

This approach yields an elegant architecture by essentially reducing the radio station footprint to two devices. With this currently deployable architecture, our hope is this approach simplifies issues for broadcasters in terms of cost, complexity and FCC compliance.

We illustrated how virtualized radio station solutions already provided by Telos Alliance (the Omnia.9) and Nautel (the GV2) were able to fully interface with the DASDEC EAS system, using a combination of Livewire for AoIP support and EAS-net for additional signaling functions. We showed how, as in the case of Nautel, this combination of resources reduces virtualized broadcast station to an elegant two-unit approach — the DASDEC for comprehensive emergency alert

Above
An example from the presentation showing integration in an Omnia.9 processor.

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management plus the GV2 to accommodate every function from audio playout, PPM encoding, audio processing, RDS encoding, FM/HD modulation and transmission.

Our joint stance is that the hybrid virtual approach would be secure and afford a greater deal of resilience in the broadcast architecture. In response to questions from the FCC regarding scenarios of internet unavailability and system survivability, we provided detailed responses stressing the flexibility and survivability of this architecture. The example of one client was provided, where they intend to run processing and insertion at the network operations center (NOC) but are also implementing redundancy at the edge (the transmission points) if contact with the NOC was lost.

Simplified station architectures were examined via two leading virtual air chains (the examples of the Telos Omnia.9 and Nautel GV2). One objective of this approach is to provide autonomous continuity of operations at the local station or local transmission site. Regardless of a particular air chain configuration, there would be survivability and ability to inject the EAS message into the transmitter regardless of disruption in other areas of the air chain.

A range of security considerations were discussed, including a broadcast station's overall security posture and component-level security. We addressed questions from the FCC participants around security at a radio station's studio and transmitter, and between the studio and the transmitter.

The meeting highlighted how this particular approach enables EAS in virtual and AoIP air chains, with full compliance with existing regulatory and operational requirements, including FCC Part 11 and Part 15 rules, government equipment type approval, and FEMA IPAWS conformity testing.

Our strong recommendation was that no solution should be contemplated by an EAS participant or the government without fully meeting those existing interagency requirements.

It was noted that this approach has already received significant industry recognition, including the 2024 Technology Award from the Society of Broadcast Engineers, and a Radio World "Best of Show" Award.

"Some forms of virtualization can be problematic considering a range of regulatory, policy, security and operational factors."

We observed that, as published in trade press and stated by FEMA officials, FEMA IPAWS prefers "full compliance with FCC rules" and has stated "IPAWS does not endorse any specific product but enthusiastically welcomes discussion about innovative solutions that can enhance the timely and effective distribution of alerts to the public."

Virtualized EAS device administration was presented in the form of Digital Alert Systems' HALO system that monitors and manages all EAS devices in an enterprise environment. With fully virtualized EAS device administration, HALO provides remote enterprise monitoring, health status and configuration management of EAS devices, with provisions for remote delivery of software updates and security patches. Currently deployed at major broadcast and cable TV operations, HALO can also provide the remote monitoring, management and updating capabilities being sought by the broadcast radio industry. In response to a question from the FCC regarding virtualized EAS software and HALO, we clarified that HALO remote enterprise management applies to EAS in either a physical or virtual (VM) environment.

Regarding accessibility, we detailed information on how we have utilized this EAS-at-the-Edge to successfully broadcast visual alerts in HD Radio, incorporating symbology to visually indicate the presence and type of alerts on enabled radio receivers. We suggested this approach would further the commission's objectives of making emergency alerts more accessible including to those with limited English proficiency. Responding to FCC questions, we clarified that the symbology was included in the HD Radio data (program art) transmission sent from the station and received on conventional HD Radio receivers. Whether via symbology in HD Radio, or RDS, our approach can enable persistence in the display of alerts during the active time of an emergency event, even after the EAS message itself has been played. This approach is compatible with millions of HD Radios currently used in the U.S. today, without any change required by the consumer or HD Radio manufacturer.

Concluding the meeting, we recapped how this industry-proven approach yields reduced security and operational risks while maintaining regulatory and operational compliance. This standards-based approach combines simplicity, reliability and high availability in an architecture that is being deployed today.

We also noted our hope for continued discussion between industry participants, hopefully leading to a consensus on optimal paths forward given operational, regulatory, and technical realities. ...

Digital Alert Systems, Nautel and Telos Alliance thank the commission for its efforts to maintain a resilient and secure national Emergency Alert System. Our companies are mutually committed to the development and deployment of broadcast systems that will achieve the objectives of a secure, reliable and robust public warning architecture in ways that will be compliance with government requirements.

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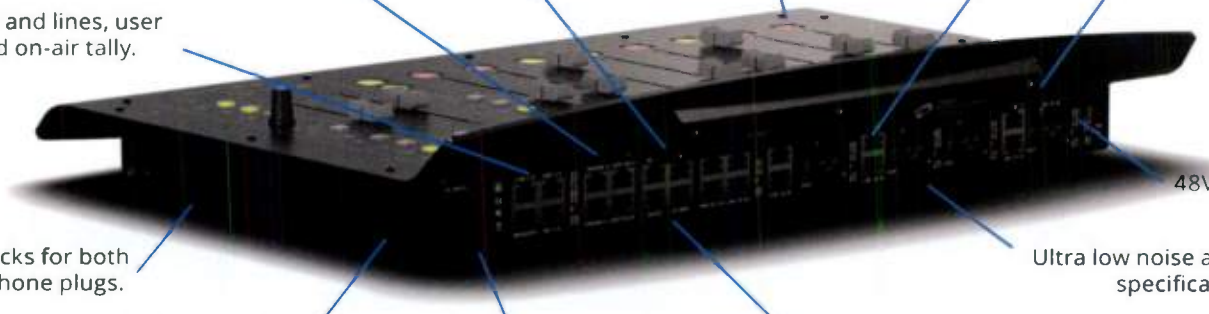

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