

# RADIOWORLD

Your guide to radio technology

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FUTURE



## “Tech Thursday” appeals to students

Hofstra station WRHU has success with a broadcast ops and engineering training series.

### The NAB Show returns

Here's a peek at the business and management sessions.

### Radio tech rules

What you need to know about the FCC's new changes.

### Buyer's Guide

New transmitter offerings from Nautel, Ecteso, GatesAir, BE, ISS and Rohde & Schwarz.



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# Station hacks

## How to survive in a small market



Paul McLane  
Editor in chief

Kevin Thomas is the owner of WDKC(FM) "KC101 FM" in Pennsylvania's Tioga County, a station where radio spots cost only a few dollars and the biggest

community in the coverage area only has a few thousand residents.

He'd like Radio World to share more tricks and "hacks" to help broadcasters in tiny markets.

"All small-market stations have unique inventions," he said, and cited

a few of his own.

"For example I have learned that if you offer a gas station \$100 of free ads to ask every customer what station they're listening to, you'll get a sample size of more than 500 and a gas station owner who is not only going to run ads on your station but who understands that your audience is their customer."

WDKC also started bringing a portable MP3 recorder to its events and offering a free T-shirt to anyone who voices a listener liner. It now has a library of more than 400 local listeners on the station voicing liners.

"We also just started a new program where we interview the oldest residents of our county each Saturday morning about life in the 1930s and '40s. I wish that I had thought of it years ago." WDKC can even operate its on-air equipment on golf cart batteries in a power outage if necessary.

"Maybe do a series of articles, each featuring a small-market station and their favorite hacks to survive in this world — like how to know when to raise your rates or how to price 60-second ads versus :30s. Where to find voice track talent and how to train them (we work with our local theater group). An introduction to mic processing, or comparing studio consoles that cost under \$1,000."

Let's help Kevin. What tips or hacks have you used to succeed as a small-market broadcaster? Email [radioworld@futurenet.com](mailto:radioworld@futurenet.com) with "Station Hacks" in the subject line.



Shown Kevin Thomas, WDKC(FM)

## THIS ISSUE

### NEWS

**3** From the Editor

**4** Newswatch

**5** NAB Show: Third time the charm

### FEATURES

**14** Workbench: Repairing an ice-damaged antenna

**18** Forest fee would hurt broadcasters, NAB says

**22** "Tech Thursdays" draw student interest

**35** Marketplace

### BUYER'S GUIDE

**28** A new architecture for FM and HD Radio

**30** KCON extends audience reach with GatesAir

**34** WSHR installs Egreso FM 5 kW transmitter

**35** 32 racks for all to see

### OPINION

**29** Reader's Forum



### On the cover

Cameron Keough of Hofstra University demonstrates a service technique to students. See page 22.

## John Warner Remembered

Retired engineer John Warner died in February at age 73. He was known as an expert in AM radio for his work with companies like Jacor Communications and Clear Channel Communications, later iHeartMedia.

Jeff Littlejohn, executive vice president, engineering and systems for iHeartMedia Technology Operations, said, "I never saw a problem that John could not beat. John loved to teach others about his craft, so any engineer that was eager to learn would have John as a willing teacher."

Warner lived on a farm as a child and became interested in antennas so that he could pick up various kinds of radio signals. His first job in radio was at WBAL in Baltimore in 1979, a 50 kW clear-channel AM on 1090 kHz with a high-power directional array. Warner credited engineers Harrison Brooks and Ron Rackley as important influences.

He came to Clear Channel when Jacor was acquired in 1999. Among his duties, he was responsible for overseeing design and construction of new AM facilities and maintenance and refurbishing of existing AM stations.



John Warner, second from left, is shown at the 2010 Radio Show convention with colleagues Richard Mertz, Ben Dawson, Ron Rackley and Tom Jones.

During his career Warner spoke at the NAB Show's AM Boot Camp and was a member of the Association of Federal Communications Consulting Engineers.

"He thoroughly enjoyed his work and it gave him great purpose in life," daughter Jenn told RW. "He loved imparting his wisdom and experience with others and formed friendships with others in the business through collaboration."

Read our 2010 profile of John Warner at <https://tinyurl.com/rw-warner>.

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VIEW OF MAIN LOBBY FROM CONVENTION CENTER DRIVE

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**Writer**  
Paul  
McLane  
Editor in Chief

# NAB Show: Third time's the charm

Here are some of the business and management themes of the convention

**A**fter postponements and cancellations that wiped out the 2020 and 2021 conventions, the NAB Show is set to return IRL — in real life.

This story provides a sampling of themes and sessions about broadcast business and management. Next issue we'll preview the technical conference and provide a radio exhibitor list.

Content at the April show will be arranged across four verticals: Create, Connect, Capitalize and Intelligent Content. The first three align with broadcasting's content "life cycle."

"This reimagining of the NAB Show experience is designed to better curate the attendee journey. In addition to making information more relevant and easier for you to consume, the new 2022 NAB Show model will enable closer connections to the people and solutions involved in modern media workflows," the association states on its website.

"As you take in Create, for example, you'll see that the focus is no longer on broadcast, cinema or radio — nor on podcasts, webcasting or any other narrow category. Create will be the home of creation, a single place you

can find all the tools you need to do your work, whether you're a broadcaster, videographer, streamer or other industry professional. If you're more focused on content distribution and delivery, you'll find those tools in Connect. And if content monetization is your thing, you'll discover applicable tools and workflows in Capitalize."

Nevertheless, most of the radio business and management sessions will be found under Capitalize, while radio tech and engineering will be in Connect, and most podcasting content in Create.

"Intelligent Content" is a new showcase that explores "the transformative impact of data, artificial intelligence and automation on the media and entertainment industry."

## A new look

This will be the first NAB Show since the new West Hall of the Las Vegas Convention Center opened.

"Those returning to the LVCC for the 2022 NAB Show will find some big changes — some REALLY big changes — in store," wrote Dave Arland, executive director of the Indiana Broadcasters Association in RW's sister publication TVTech.

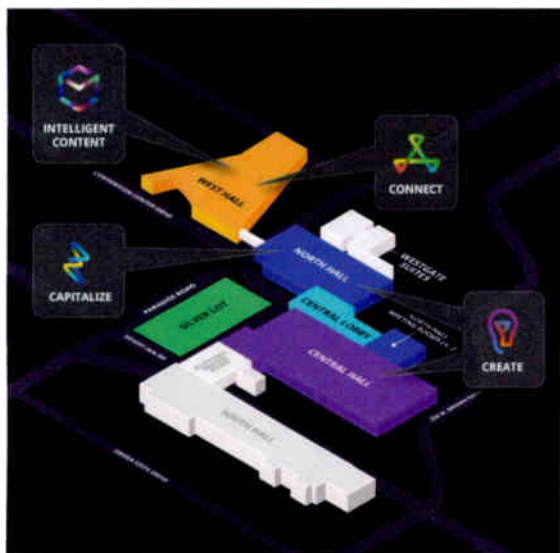
**Right**  
Bob Pittman, top,  
and David Field



## Show Dates

Saturday  
April 23 to  
Wednesday  
April 27,  
Welcome  
Session  
Monday  
morning





Above Content will be arranged across four verticals that are also reflected in the layout of the exhibit floor.

both a pedestrian walkway and a space-age underground transportation network.”

The NAB Show will use the West, North and Central Halls.

This also will be the first time exhibits open on Sunday and close on Wednesday.

The Bellagio Resort & Casino is designed as radio’s hotel for the show.

## Day by day

Sessions will be spread around several locations including the Main Stage in the North Hall, conference rooms, exhibit floor presentation areas, the NAB Member Lounge and the Networking Lounge.

Here’s a sampler of radio highlights for each day.

- The “Small and Medium Market Radio Forum” gets things going for radio managers on Saturday afternoon. It features a forum covering issues chosen for their impact on smaller radio members of the association. The closing reception is a networking opportunity. RSVPs are required to [membership@nab.org](mailto:membership@nab.org).
- A Sunday afternoon highlight is the NAB Achievement in Broadcasting Awards on the Main Stage. This event will honor recipients for both 2021 and 2022. “All Things Considered,” the flagship news program of NPR, will be inducted into the NAB Broadcasting Hall of Fame as the 2021 radio recipient. The 2022 radio inductee is syndicated talk show host Jim Bohannon. Jeremy Sinon, vice president of digital strategy for Hubbard Radio, will receive the 2022 Digital Leadership Award. It honors a person who “has had a significant role in transforming a traditional broadcast business to succeed on digital media platforms in a measurable way.”

- Sunday radio-related sessions also include insights on dashboard

technologies and initiatives that radio companies are deploying beyond their terrestrial signals. NAB holds its first diversity symposium. And Audacy’s Tim Clarke is featured in a Q&A about digital content strategies.

- Curtis LeGeyt will give his first “state of the broadcast industry” speech as president/CEO of the NAB on Monday morning, the official show welcome. NAB will also present its Distinguished Service Award to LeGeyt’s NAB predecessor Gordon Smith, who stepped down this winter. And Caroline Beasley receives the 2021 National Radio Award.
- A radio headliner event is “Transforming Radio in the Audio Renaissance,” Monday afternoon, featuring David Field, chairman, president and CEO of Audacy, formerly called Entercom, and Bob Pittman, chairman and CEO of iHeartMedia. They’ll engage in a conversation with Curtis LeGeyt about the evolution of radio and how these companies are building “diversified asset portfolios.”
- Monday’s radio/audio session themes also include protecting your content and battling inauthentic content across platforms; a media ownership discussion; and audience measurement for audio.
- Tuesday morning sees the presentations of the Crystal Radio Awards, which salute excellence in community service by radio stations. And radio session topics that day include a small- and medium-market radio idea exchange; a look at how to create business partnerships to expand revenue opportunities; and how leaders are embracing change.
- Midday Tuesday, Radio World Editor in Chief Paul McLane moderates “2022 and Beyond — Hybrid Station Operations,” discussing workflow solutions that have emerged since the pandemic upset standing assumptions. Guests include George Molnar and Brian Olinger, the senior director of technology and the technology manager, respectively, of WTOP and Federal News Network in Washington; Lamar Smith, vice president, engineering at Beasley Media Group; and Sarah Foss, CIO of Audacy.
- Wednesday features a closing keynote on the Main Stage featuring “Freakonomics” co-authors Stephen Dubner and Dr. Steven Levitt. Conference sessions include discussions of regulatory issues, local sales strategies, research, diversity and the metaverse.

And remember to check out the Las Vegas Convention Center Loop, created by Elon Musk’s Boring Company as the beginning of an ambitious underground travel network. It connects the new West Hall with the existing campus, using three passenger stations. 

## Exhibit Schedule

Sunday	10-6
Monday	9-6
Tuesday	9-6
Wednesday	9-2

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# KSL invests in podcasting success

Worsley: "Whether terrestrial or in a podcast, those are ALL your listeners"

**P**odcasting is now a crucial part of the business plan for many big media companies, but what about smaller ones?

"It can be daunting to dive into podcasting if a station doesn't have extra resources in producers or talent," said Sheryl Worsley,

vice president of podcasting for Bonneville International, KSL Podcasts.

"I would suggest managers in this position start small and use on-air hosts and producers who are hopefully motivated and energized about doing something only on digital. Ask your talk hosts to do a podcast segment and use their on-air show to push to the 'extra' interview and grow the podcast audience.

"If your station has a newsroom, is there a topic you can expand on in a weekly podcast? You might be able to use more of the interviews you are already recording on that topic for daily newscasts and present as a podcast with much more depth than your format has time for on-air. It will still require production and some writing, but it is a good start in using staff you already have."

At the NAB Show, Worsley will co-host the session "A Local TV and Radio Station Guide to Podcasting Success" on Monday April 25.

She encourages companies starting out to hire people who are passionate about it, and then stick with it over long periods of sustained effort. She said KSL started small six or seven years ago, mostly time-shifting some of its shows.

"In 2016 we started looking at the cold case disappearance of a woman named Susan Powell and the vast amounts of case files already released by police," Worsley said.

"It became clear as radio news reporter/producer Dave Cawley found new information while digging in the



**Above**  
Sheryl Worsley, center, works with Producer Keira Farrimond and "COLD" host Dave reviewing maps relevant to the Susan Powell case.

materials that we'd need to do some extra reporting. We started to carve out extra time away from his producing duties for the next year. We eventually concluded the best way to tell the story was going to be in a long-form narrative podcast, and that Dave needed to work it as his sole responsibility in order to make meaningful headway."

It took another year of full-time effort to complete the investigation. The show launched in late 2018 and has garnered more than 58 million downloads in two seasons.

At the conclusion of Season 1, KSL presented a live event, which nearly sold out. Now it has expanded the team and will be announcing more narrative podcasts. It currently produces or distributes 27 digital originals, including several from partners outside our organization.

"Both podcasts and radio shows are intimate and can drive a strong loyalty and listenership," Worsley said. "In my experience, a loyal podcasting audience drives more passion in both listening and in response to advertising and the research backs that up. However, that motivated podcast audience is more commonly small compared to the massive, if less passionate audience radio has enjoyed over the years."

She said it's good that spoken word listening is up so strongly, especially among younger people. Most of that is due to podcasts though, and she expects radio's traditional dominance to erode dramatically as time passes.

"Radio stations need to amplify their podcast game well beyond making on-air shows available for consumption by download or streaming later. It's absolutely necessary to expand what you are doing beyond terrestrial to ensure a station has robust listening in the future, whether that be over the airwaves or in downloads or streaming. The upside? Whether terrestrial or in a podcast, those are ALL your listeners." 🎧

**“ Worsley encourages companies starting out in podcasting to hire people who are passionate about it, and then stick with it over long periods of sustained effort. ”**



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World Radio History

Writer  
Paul  
McLane  
Editor in Chief

# FCC finalizes changes to radio tech rules

Class D NCE stations may be able to increase power and coverage

**T**he Federal Communications Commission in February finalized a series of changes to its technical rules covering U.S. broadcast radio.

Many of the changes are bureaucratic — cleaning up wording and inconsistencies. But some have meat. For instance some Class


D NCE stations may now be able to increase power and coverage and enjoy more flexibility in site selection.

It released its report and order that eliminates or amends rules that it says were outdated or unnecessary. The changes “better reflect current developments in the radio industry and ensure that our technical rules are accurate, up to date and consistent,” it wrote.

“In so doing, we increase transparency and certainty for broadcasters while eliminating unnecessary regulatory burdens.”

The commission adopted almost all of the proposals set out earlier except that it kept its “proximate interference” rule.

Here is what it did:

 The FCC removed the maximum rated transmitter power limit for AM stations, saying it had received no opposition.

“[A]n equipment limitation on transmitter power is outdated and unnecessary given our current reliance on actual operating antenna input power as the most accurate and effective means of ensuring that AM stations adhere to their authorized power limits.”



Saul Loeb/AFP via Getty Images

It said elimination of this restriction will allow AM stations of any class to use transmitters of any rated power, “benefiting the AM service by broadening the market of transmitters available to stations, enhancing the secondary market for AM transmitters and reducing the number of transmitters that need to be disposed of.”

 It eliminated an inconsistency between sections of the rules involving NCE FM community of license coverage.

Two sections currently state that NCE stations must demonstrate that they cover “at least a portion of the community of license” when submitting certain types of applications. But another section established the current standard that NCE stations must cover 50% of their community of license or 50% of the population in their community with a 60 dBu signal strength predicted contour.

The old language was changed to conform to the current standard.

**“ The commission updated signal strength contour overlap requirements for NCE FM Class D stations to harmonize with the rules for other NCE FM classes. ”**

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World Radio History

 It updated signal strength contour overlap requirements for NCE FM Class D stations to harmonize with a less restrictive section of the rules that applies to other NCE FM classes.

"We agree ... that there is no reason to continue treating Class D stations differently in this context." When it updated these rules in 2000, it deferred including Class D NCE stations to accommodate the establishment of the low-power FM service.

"Because the LPFM service is now mature, it is appropriate to extend the general contour overlap limits to Class D NCE stations. We anticipate that the less preclusive requirement will create opportunities for NCE stations to increase power and coverage, as well as provide them with greater site selection flexibility."

 It eliminated four obsolete provisions that require radio stations operating in the 76–100 MHz band to protect grandfathered common carrier services in Alaska. "Our licensing databases indicate that there are no common carrier services remaining in this band in Alaska."

 It tweaked the definition of "AM fill-in area" in one part of the rules to conform to a later definition, which states that the "coverage contour of an FM translator rebroadcasting an AM radio broadcast station as its primary station must be contained within the *greater* of either the 2 mV/m daytime contour of the AM station or a 25-mile (40 km) radius centered at the AM transmitter site."

Currently, one section refers to the *lesser* of these two distances. The NAB said the current wording "may inadvertently prevent many AM stations from operating FM translators within their 2 mV/m contour." The FCC agreed, so the relevant section now defines an AM fill-in area as: "The area within the greater of the 2 mV/m daytime contour of the AM radio broadcast station being rebroadcast or a 25-mile (40 km) radius centered at the AM transmitter site."

 Finally, the commission adopted several changes that relate to coordination with Canada and Mexico.


It updated a rule that contains minimum distance separations between U.S. and Mexican or Canadian FM stations, to reflect treaty requirements. The FCC noted that the NAB was concerned that the updated requirements

appear to impose greater minimum distance separations on Class A FM stations than is currently provided for in the rules, so NAB asked the FCC to confer "grandfathered short-spacing" status on existing U.S. stations; but the FCC said such "grandfathering" is not necessary.

It also updated the rules regarding stations near the Mexican border. At NAB's suggestion, it clarified that, for the purposes of a table associated with the relevant rule, U.S. Class C0 assignments or allotments are considered Class C.


It adopted an NAB suggestion about how distances are calculated for the border agreements. It also updated the rules to eliminate inconsistent language and reflect current treaty requirements applicable to FM translators.

**“ We anticipate that the less preclusive requirement will create opportunities for NCE stations to increase power and coverage, as well as provide them with greater site selection flexibility. ”**

 But the FCC did not adopt a proposal to eliminate the requirement that applications proposing use of FM transmitting antennas within 60 meters of other FM or TV broadcast antennas must include a showing as to the expected effect.

The National Association of Broadcasters had objected, saying this would weaken the FCC's "newcomer policy," under which a party

constructing a new or modified facility is responsible for eliminating objectionable interference to existing stations.

The commission noted that in the FM service, it has rarely if ever expressly relied on the rules as a means of implementing the "newcomer policy," but it concluded that the rule provides useful guidance for broadcasters. "We do not wish to introduce uncertainty or ambiguity into situations where it does not currently exist." 



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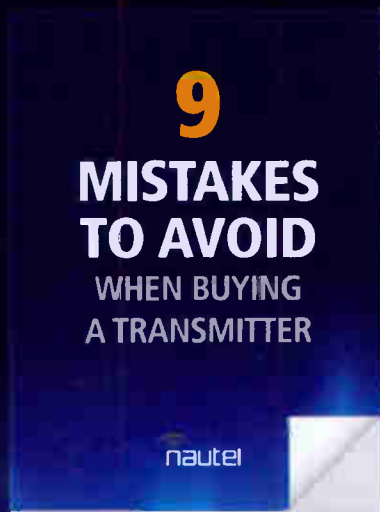
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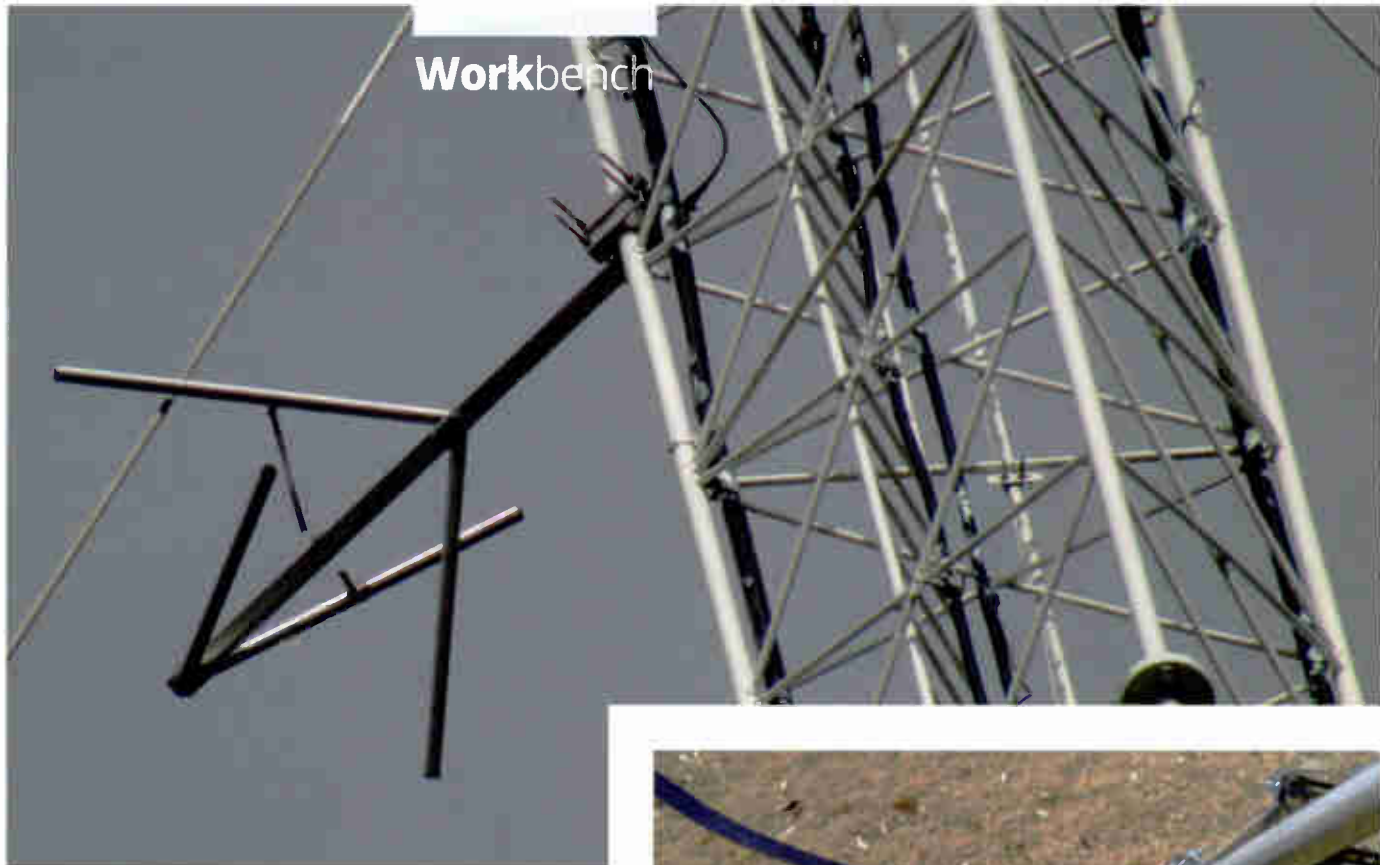




**John Bisset**

**CPBE**

With more than 50 years in broadcasting, the author is in his 31st year writing Workbench. He handles western U.S. radio sales for the Telos Alliance and is a past recipient of the SBE's Educator of the Year Award.



# Repairing an ice-damaged antenna

## Steel washer beefs up connection

If you're evaluating low-power FM antennas, consultant Frank Hertel discourages the use of models that have "flat strap stingers," the stainless-steel metal straps that run from the feed point to the individual radiating elements. He says this is a concern particularly in an icy winter environment. One of Frank's clients had the dilemma pictured in the top photo. following an ice and wind storm. Note the broken strap.

The problem presented as high VSWR. The antenna was 400 feet up the tower (which meant an \$800 climbing fee at \$2 per foot, even before any work is done). Evaluation of a different bay also showed the strap pulling free from the feed point because there was no flat washer.

A different model that Frank has seen uses round stock with flattened ends for the feeder elements. He finds that design to be more robust and not subject to flapping around in the wind.

The third photo shows Frank's suggested fix for the broken strap: a stainless steel "fender" washer drilled using a Dremel



### Send your stories

Workbench submissions are encouraged and qualify for SBE recertification credit. Email [johnpbisset@gmail.com](mailto:johnpbisset@gmail.com).

**Above**

A combination of wind and falling ice broke the feeder straps on this LPFM antenna bay.

**Middle**

On another bay, the feeder straps pulled free from the bolt.

**Bottom**

A suggested fix involves a stainless steel washer.

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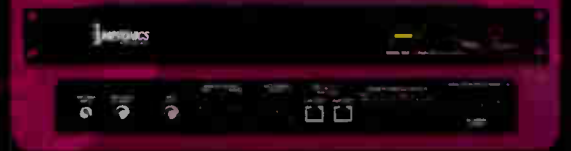
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- ▶ Monitor off-air analog FM and HD Radio signals (HD1-HD8) on the Front Panel Touch Display and via the Web from anywhere in the world. The 3U package features a 9-inch hi-res graphic touch screen display, wide-range LED level meters with rear-panel tallies.
- ▶ The 551 collects histograms of signal parameters and displays HD Radio™ album artwork, station logos and similar visuals on the front panel display and remote Web interface.
- ▶ Front-panel alarms and/or rear-panel 'tallies' indicate Audio Loss, Low Signal, RDS Errors, HD Loss, HD Power, FM/HD1 Alignment, HD Artist Experience, and many others.
- ▶ Spectrum graphs include RF Baseband, MPX and Left/Right Audio. O-Scope views for MPX, Pilot, RDS and all Audio Channels.
- ▶ Measures real-time audio diversity delay between the FM and HD1 broadcast.
- ▶ Fulltime off-air program audio is available simultaneously as L/R-analog, AES3-digital and Dante®-based AES67 AoIP streaming, all with adjustable levels, plus a multi-listener Internet IP stream and front-panel headphone jack.

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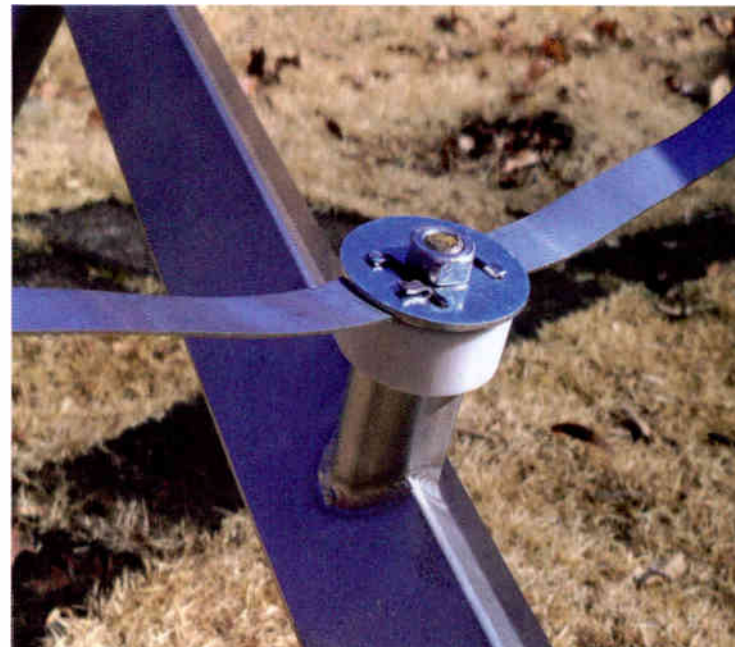


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**Above**  
Route the strap through the slots in the washer.

**Right**  
When you tighten down the nut, the straps are sandwiched between the base washer and the top washer.

or similar brand tool to provide slots wide enough to secure the strap when it is tightened. Fig. 4 shows how the strap can be routed through the slots, then sandwiched between the base washer and the top fender washer as in Fig. 5.

Frank qualifies this "flat strap stinger" design as a "fair weather" model.

## Undesirable DXing

I turned on the radio here in South Carolina the other day and a new FM station appeared clear as day, wiping out my local broadcaster. After listening for a couple minutes, I realized the signal was coming from Florida.

Tropospheric ducting occurs when a temperature inversion in the lowest layer of the atmosphere permits FM and TV signals to travel much farther than normal.

Hot, muggy summertime weather usually increases the ducting. But the effect can happen any time of the year, as I found out.

What drives PDs and engineers crazy is that the ducting effect can occur for hours or even days — and there's no solution.

Share your own experiences of this phenomenon.

## Programming insights

A good many readers of Workbench are current or former jocks, programmers or operations directors. Even for those who haven't programmed a station, discovering new ways to gain listenership can be a fascinating study.

Programming consultant Gary Berkowitz knows adult contemporary music. He's been a major-market air

talent, programmer and consultant. (Like me, Gary is also a jingle nut. Google his interview with Jon Wolfert of JAM Productions on YouTube.)

As a service to the industry, Gary publishes AC Programming Today, a periodic e-newsletter that's free upon request. The most recent issue discusses cumulative audience — universally called *cume* — and TSL, or time spent listening.

Gary explains you can't have TSL without *cume*. It's a quarter-hour game, and the station with the most quarter-hours is the winner. Holding the audience for at least five minutes in a quarter hour is the goal. Fascinating, even for engineers.

Even if your format is something other than AC, you'll find Gary's newsletter informative. Sign up for your newsletter at <https://garyberk.com/newsletter>.

You'll blow the minds of your GM and PD at the next managers meeting when you start talking about *cume* and TSL instead of chips and modules.

## Hey, sunny ...

When Frank Hertel sent his antenna fix discussed at the beginning of this column, he included a note about increased sunspot activity.

Sunspots are bursts of electrically charged energy that can interfere with other electromagnetic waves. Pops or bursts of noise or hissing are common to sunspot activity.

Frank noted that we are three years from the next peak of sunspot activity in 2025. The sun activity then will yield increased sessions of interference on a daily basis, but there are estimates that there's potential for more interference than normal this year, too.

Typical interference begins in late spring and runs through early December. It can also affect satellite reception. It's wise to be aware of this phenomenon. 📡

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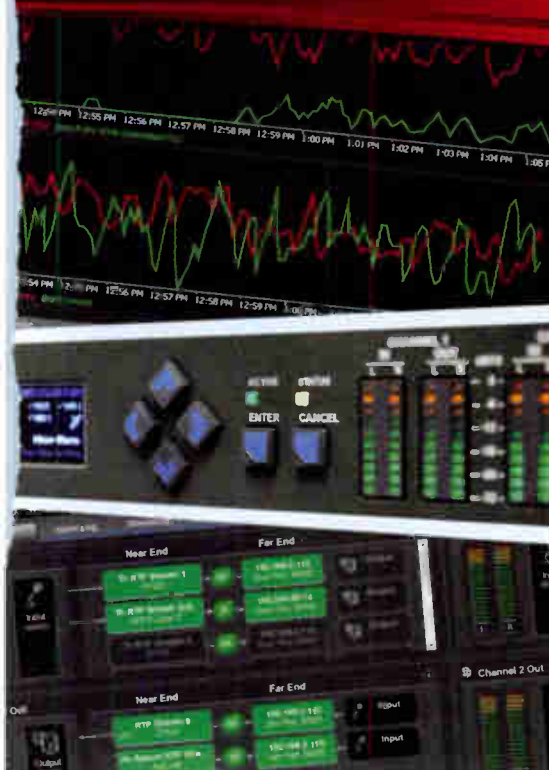
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## Forest Fee Would Hurt Broadcasters, NAB Says

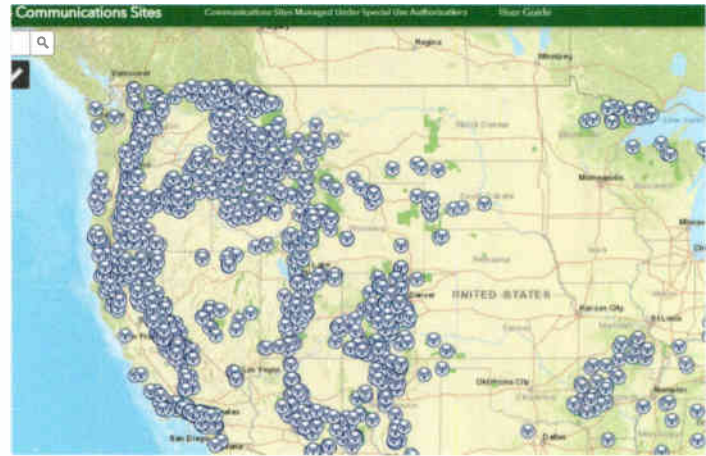
A proposal from the U.S. Forest Service could cost some broadcasters a new \$1,400 annual fee. The NAB is pushing back.

The Forest Service regularly authorizes communications uses on National Forest System lands with a lease or permit. Some broadcasters use the program to site their facilities. But the service now wants to assess the fee to cover costs of administering the system.

"NAB believes the Forest Service's current proposal is unlawful, inequitable and undermines the public interest," the association told the FCC in February.

It wrote: "Citing the 'need for wireless connectivity for teleworking, tele-education, telehealth and telemedicine,' and the need for the Forest Service to 'do its part by ensuring it has the necessary staff and expertise to administer its communications use program,' the proposed rule seeks to collect an additional 'annual programmatic administrative fee of \$1,400 per communications use authorization for wireless uses such as television and radio broadcasting, cellular telephone and microwave' to cover the costs of administering the Forest Service's communications use program."

The association said the proposal would increase the liability for existing broadcast uses serving smaller communities by nearly eight-fold in some cases, threatening their viability and potentially resulting in the loss of essential broadcast services in rural and remote areas.



U.S. Forest Service communications sites, shown in the agency's GIS tool.

NAB said the change would "drastically" increase the fees broadcasters serving rural populations pay for communications use.

It noted that while some "full-power" broadcasters successfully serve large populations from sites on Forest Service lands such as Mt. Wilson near Los Angeles and Sandia Crest near Albuquerque, other lower-power (but still primary) broadcast stations, often family-run or non-profit, are licensed to serve small communities from Forest Service sites.

NAB suggested that the Forest Service consider alternative approaches; but if not, it should provide a phase-in period of at least five years.

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Writer



Andy Gladding

The author is chief engineer of WRHU and also of Salem Media of NY.

# “Tech Thursdays” draw student interest

Sessions develop expertise in broadcast operations and engineering

**B**roadcast engineering has always been a unique corner of the radio and television industry. Engineers have to possess a wide variety of skillsets to keep their facilities running consistently and reliably, minimizing studio downtime and off-air events while also working with limited budgets and staff. It is a challenging position that is little understood outside of the business.

As broadcast technology and methodology has evolved, supporting it has become very complex. An engineer for a radio group must be competent in RF transmission systems, content delivery, advanced IT and networking, machine repair and other related areas of technical expertise that are required to support a 24/7 broadcast operation.

For smaller organizations, this role is often expanded to include facilities management, logistics and building and vehicular maintenance as well.

With the rise of social media and OTT content, the position now requires an understanding of video technology, asset management and even camera systems, as almost all radio groups are looking to create and distribute video to supplement their traditional terrestrial

offerings. As a result, broadcast engineers often function as a one-man band, simultaneously managing, developing and troubleshooting a variety of systems.

It is well known that the widespread consolidation of radio and television groups over the past 30 years eliminated a significant number of jobs in the industry. Technological advancement in broadcast automation means smaller radio groups in suburban markets no longer need to maintain a staffed 24/7 operation or have a chief engineer on staff. This eliminates the opportunity for high school and college students to “hang” at the local station, learning valuable skills and receiving mentorship from the senior station engineers.

In essence, major-market radio and TV has lost its “farm team,” which very often prepared personnel for opportunities in larger markets.

At the same time, digital giants like Amazon, Netflix and Hulu have lured a large chunk of engineering talent away from traditional radio and television organizations. Higher starting salaries, opportunities for growth, stock options and flexible work schedules have caught the interest of the usual “techie” grads who might previously have been enticed by terrestrial broadcasting.

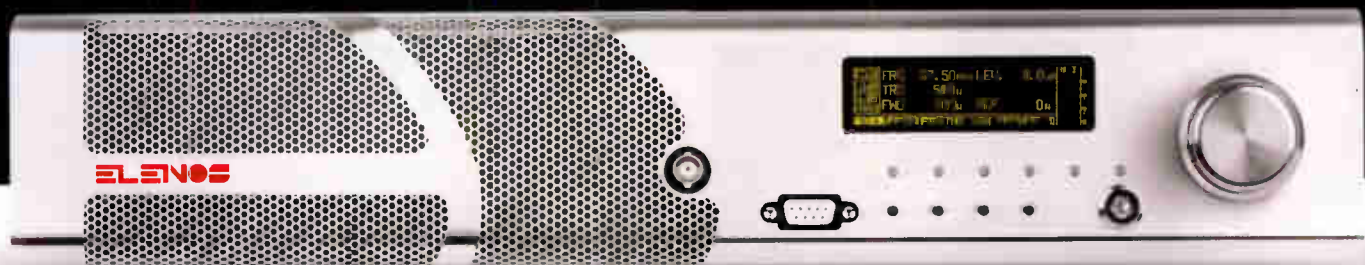
**Above**  
Students install new EAS equipment in WRHU studio south.

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As a result, the broadcast industry is finding itself with a shortage of engineering personnel, especially as older, experienced engineers are retiring or shifting into other, more profitable areas of media.

COVID-19 and the current employee shortage have only accelerated this shift. Major markets such as New York, Los Angeles, Chicago and Miami, once considered destinations for personnel, are all struggling to find support. Smaller markets often have only one or two local engineering resources to pick from in the region, leading to lengthy repair cycles, delayed studio builds, extended periods of dead air and unmanaged or unnoticed critical engineering issues. These problems often spiral into major financial and logistical headaches for owners and operators.

### Real-world issues

As the chief engineer of Salem Media of New York, I see firsthand how these changes are affecting our local cluster.

In addition to acting as an origination point for Salem Radio Networks' nationally syndicated "The Mike Gallagher Show," AM 970's "The Joe Piscopo Show" and the "Kevin McCullough Radio" program, our cluster generates many hours of weekly local programming, both audio and video. Audio and video content now comes from inside and outside the studio and has to be meshed together to form a high-level product, distributed both locally and nationally.

“ At WRHU and the Herbert School, we have realized that Broadcast Operations and Engineering is an area of the business that is experiencing a major demand for employees and contains tremendous opportunity for growth. ”

What used to be mostly centralized audio originating locally from a studio complex has become an audio and video octopus of sorts, with content coming in and out of the station 24/7, in various stages of process and production.

Luckily, the seasoned Salem team makes this entire process transparent to the listener and handles it with great

# Next Generation Monitoring



## Audio Sentinel® + Web/RJ Web-based Dual Channel Stereo Silence Sensor

The Audio Sentinel® + Web/RJ is Broadcast Tools' next-generation web-enabled two channel stereo silence and phase monitor with an integrated, transparent, 2x1 switcher. It is designed to monitor two analog audio sources, one primary, the other back-up. When silent and/or out-of-phase audio is detected on the primary input it can automatically switch to the back-up input via mechani-

cal latching relays. It includes a browser-based HTML5 web interface and supports SSL/TLS email (Gmail, etc.), SMS-email notification, as well as SNMP. Its audio I/O features both pluggable screw terminal-blocks and standard RJ45 audio jacks wired in parallel for ease of wiring.



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efficiency. But at its core, it is extremely complex and requires training, talent and infrastructure to execute properly.

While there are many open engineering positions nationwide, it remains a major challenge to generate interest in broadcast engineering among young, smart technical folks, especially college grads majoring in television and radio.

Most college students don't consider broadcast engineering as a career. The consuming nature of the job and the lack of a comprehensive vocational training program, along with exposure to large amounts of company IP and proprietary procedure, relegate it to a small, shrouded and often mystical area of the industry. Indeed, I've worked with many organizations that often refer to broadcast engineering as a "dark art," due to the complexity of the work and the difficulty of finding qualified personnel. All of these factors make recruitment, performance and sustainability very difficult in almost all media markets.

But take heart. There is a solution.

### Magical space

In addition to my responsibilities at Salem Media of NY, I am the chief engineer for Hofstra University's radio station WRHU. Serving Nassau County and the New York city metro DMA since the 1950s, WRHU is no stranger to the broadcast industry, receiving three NAB Marconi Awards



in the past six years, as well as multiple accolades for its service and commitment to educational broadcasting.

The station is part of the much larger Lawrence Herbert School of Communication (LHSC), which is a full-service institution, providing students training in Journalism, Media Studies, Public Relations, Audio-Radio, Television and Film.

As a student at the university back in the early 2000s, I was lucky enough to have the chance to hang out with the college station's former Chief Engineers Joe Derosa and Marc Weiner. The WRHU engineering shift was always on Thursday nights, and the windowless, heavy wooden door

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# Next-Generation Engineering



**Above**  
Lawrence  
Herbert School of  
Communication  
Chief Video  
Engineer Cameron  
Keough shows  
WRHU "Tech  
Thursday"  
students how to  
solder connectors  
onto new Yellotec  
mic arms.

to the technical office led to a magical space filled with rack-mounted hardware, blinking lights, bouncing meters and other fascinating technology unlike anything a young tech geek such as myself had ever seen.

Joe and Marc were experts in the field and never minded taking the time to speak with us students about broadcast engineering, science, math, astronomy or anything else that we were interested in or wanted to explore. The topics would range from string theory to the string cheese, and there was always a solution or answer to the questions presented. The sessions were informative, inspiring and informal, outside of the normal framework of the university academic structure, which made it all the more intriguing and engaging.

I'm sure this kind of experience is familiar to many other engineering folks who may be reading this. Many radio chief engineers traditionally get their initial exposure to the craft from older, more seasoned technical folks, either at college radio stations, small market clusters, ham clubs or engineering society meetups.

Mentorship and presentation, specifically at the university level, has always been powerful way to get students excited about career opportunities of which they may have otherwise been unaware. This kind of pre-professional development and exposure is one of the many benefits of a well put together school of communication and active local professional community.

At WRHU and the Herbert School, we have realized that Broadcast Operations and Engineering is an area of the business that is experiencing a major demand for employees and contains tremendous opportunity for growth.

Over the last few years, my colleagues at the radio station and university have grown the size and scope of our regular Thursday night engineering sessions to respond to this need. "Tech Thursdays" has now become a destination for LHSC students interested in learning about all areas of BO&E.

Our sessions have ranged from training workshops that teach basic skills such as soldering and cable termination to broadcast hardware troubleshooting, systems design and transmission systems construction. Tech Thursdays also often features guest speakers and panels lead by industry experts.

Recent presentations included a deep dive into AM and FM transmission lead by MediaCo CTO Alex Roman and West Coast radio engineering and operational procedures presented by Salem Media of San Diego's Chief Engineer Darnell Forde.

WRHU and LHSC student managers are also instrumental in the process, often leading discussions and training. Student technical engineers Ed Mabeza and Shayna Sengstock often come up with topics for discovery and have made themselves available for mentorship and guidance to younger students looking to get involved and grow.

Sengstock became interested primarily because of the Thursday night sessions, which she found out about via word of mouth. "I started fixing broken stuff at WRHU and found out I really enjoyed it. This led me to apply for the station student technical director position."

They also plan to pursue careers in engineering. Mabeza recently concluded an internship program with WABC(TV)'s Engineering Department and is now working in an engineering capacity at Northwell Health. Sengstock works part-time for Connoisseur Media's Long Island radio cluster and is looking to take on junior engineering duties at the company. She eventually wants to be a chief engineer for a major-market music station, like NYC Top 40 powerhouse Z-100.

In addition to our station technical workshops, students at the Lawrence Herbert School of Communication are actively trying to charter a Society of Broadcast Engineers student chapter on campus.

The station and the school are enthusiastic about it, and feel that the students could benefit tremendously working with the engineers and professional members of SBE-15, the New York chapter of the organization. Student membership in the SBE would provide station members greater opportunities for technical training via the SBE's vast educational programs as well as professional certifications that are often looked for by hiring managers.

Ultimately, a major priority of the Herbert School and Radio Hofstra University is to help prepare a new generation of storytellers in the media industry, including the next generation of broadcast engineers to fill some of the personnel gaps that now exist in the media business. This is a mission that is important to Hofstra staff, administrators, faculty and students as they recognize a tremendous opportunity within the business for personal growth and professional success. The school and station are excited to use their facilities, staff and resources to help build a better future for the students.

As the classic saying in broadcasting goes, "Stay tuned, there's much more to come." 📻

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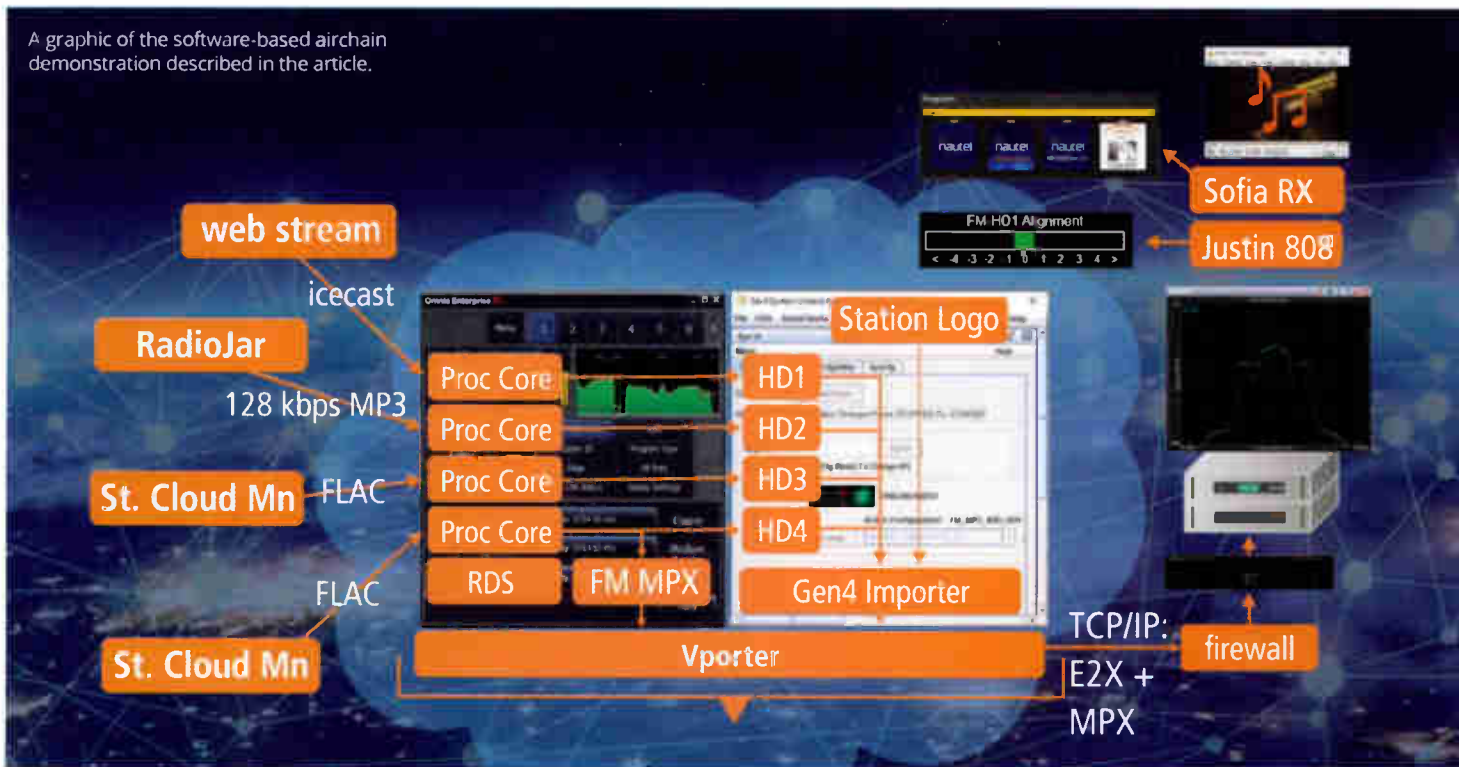


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# BUYER'S GUIDE

Transmitters

A graphic of the software-based airchain demonstration described in the article.



28

## About Buyer's Guide

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

# A new architecture for FM and HD Radio

"Nautel is fully invested in this disruptive vision"

In 2020 Nautel participated in a demonstration that described a new approach to HD Radio time alignment. We asked Chief Technology Officer Philipp Schmid for an update.

**RW** First let's summarize what was demo'd. **Philipp Schmid:** In response to industry

demand, Nautel, in cooperation with Telos Alliance, demonstrated a new FM+HD Radio transport

architecture based on established standards that allows a broadcast transmitter to simply connect to an IP address for all its audio and data content for both FM and HD Radio including all subchannels and data services.

This approach greatly simplifies

today's HD Radio installations consisting of many fixed-purpose boxes (and ensuing rat's nest of cables) at the transmitter site.

Now we can relocate major broadcast functions like audio processing such as the Omnia Enterprise 9s and audio encoding as in Xperi Gen4 into pure software components that can be centrally managed. Software components can also easily be duplicated for maintenance and redundancy purposes.

We demonstrated how we cloned several instances of the HD Radio air chain in Amazon Web Services and distributed them across data centers across the globe. We demonstrated a Nautel VS transmitter switching between the cloned air chains on simulated air chain failure conditions with minimal interruption to the overall broadcast signal.

The final standby air chain was running on our HD

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## Buyer's Guide

MultiCast+ platform running beside the transmitter, demonstrating continued broadcast under complete STL failure conditions.

**RW** The implications for how digital radio air chains are constructed include software-based premise server and cloud-based management?

**Schmid:** Yes, the ultimate centralized location is the cloud, no matter if it's a corporately managed data center or third-party service provider like AWS, Microsoft Azure or others. Smaller broadcasters can also benefit from shared centralization through simplified management and access to a pool of technical experts.

With the right transmitter, upgrading to HD Radio broadcasting will be so simple and cost-effective that any broadcasters can easily convert to HD Radio, even only for a limited time, should they see an opportunity to lease an HD Radio sub-channel or host a data service on their licensed frequency.

**RW** Can you expand on the implications? **Schmid:** The ability to clone a software-based air chain is disruptive.

Where fixed-purpose boxes require down time for repair or firmware updates, a broadcaster can apply new software updates and features by cloning a new standby air chain, updating, then testing the final on-air product using a spare transmitter, and then switching over before retiring the old air chain.

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greatly improved; should your air chain become compromised, fix the attack vector, ditch the compromised air chain, revert to the last safe restore point.

Fixed-purpose boxes cannot be easily replicated and are no safer. In fact, malicious actors can hide in embedded systems without your knowledge. Our solution is incorporating state-of-the-art

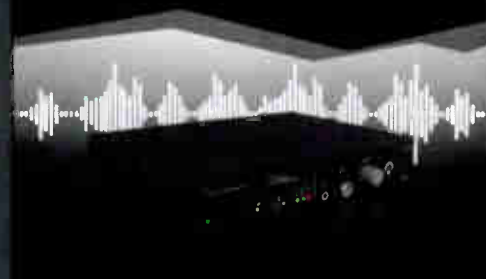
encryption and authentication to guarantee an uncompromised encoder to transmitter connection even across the public internet.

**RW** What new products does Nautel offer that build on these concepts?

**Schmid:** Nautel is fully invested in this disruptive vision. We are aligning our existing transmitter portfolio to this new architecture and will back-port it to already shipped Nautel transmitters ready to convert to HD Radio tomorrow. As we head towards the NAB Show we'll be adding Telos Alliance Omnia software audio processing options to the HD MultiCast+, our current software-based importer/exporter, which is already unique in the industry by way of its optional hardware-based audio processing. This is a first step towards the larger vision.

Please attend our Broadcast Engineering and IT Conference presentation for an in-depth look to fully understand the possibilities of this novel approach. It's called "A Cloud-Capable Synchronized Transport Architecture for FM and HD Radio Broadcasting," on April 26 at 12:55 p.m. 📍

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## Tech Update

### BE STXe-3 Serves WGEL(FM)

WGEL(FM) in Greenville, Ill., serves Bond County and its neighboring communities with news about Greenville, sports and "the best country music in the country."

The station recently purchased a Broadcast Electronics STXe-3 transmitter. Tom Kennedy, shown, is the general manager.

The STXe-3 is part of a series of new BE products that includes power levels of 2 to 6 kW.

"The benefits of the new series compared to the previous LP range is that they are more compact, higher efficiency and cost less," BE states.

Features include two hot-pluggable power supplies that are accessible from the front and IP connectivity with an extensive but easy to use graphical user interface. The transmitter is HD Radio-compatible.

With IP connectivity at the transmitter site, the STXe-3 will provide all important transmitter



operating conditions and control options from a laptop, tablet or smartphone. Three levels of security control are available, from "view only" to "complete control," ensuring secure access for the correct personnel.

BE cites specs of 70 dB SNR and 85 dB or better harmonic and spurious rejection. The transmitter is four rack units high and weighs less than 60 pounds.

Info: [bdcast.com](http://bdcast.com) or call (217)-224-9600.

30

## Tech Update

### R&S Highlights Efficiency and Reliability

Rohde & Schwarz says the THR9 high-power radio transmitter family helps today's radio network operators, who face major challenges.

"On the one hand they need to reliably operate transmitters while labor and energy costs are continuously increasing. On the other hand operational budgets are limited and tend to decrease every year."

The manufacturer says broadcasters can respond by reducing energy costs and maximizing the operational efficiency of terrestrial broadcast networks.

It says the R&S THR9 line supports this strategy with a maintenance-free liquid-cooled design. Energy consumption is minimized thanks to efficiency of 75%. The transmitter's design reduces heat dissipation into the room, which also helps limit cooling costs and reduces environmental carbon emissions.

"Another benefit arises from the amplifiers being encapsulated fan-less units and thus being completely independent of ambient conditions," Rohde & Schwarz states. "That ensures an unparalleled operational reliability and efficiency."

Models for FM analog are available with output power of 5, 10, 15, 20, 30, 40, 60 and 80 kW.

Power levels for HD Radio vary based on injection level but range from 3.0 to 76 kW.

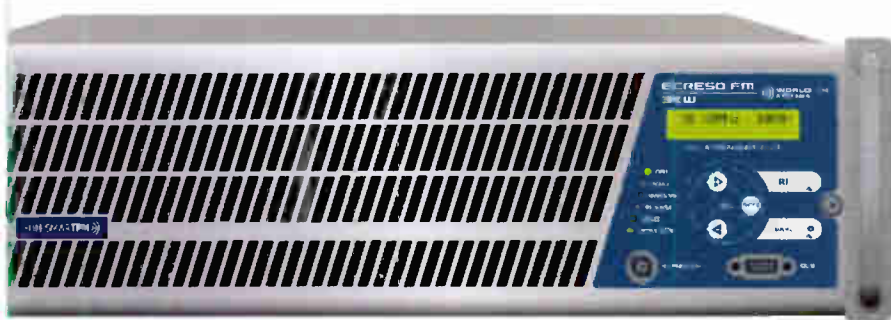
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# KCON extends audience reach with GatesAir

A new FAX15 serves East Arkansas Broadcasters at this station in Vilonia

**E**ast Arkansas Broadcasters, which owns and operates 33 full-power stations in its namesake state, recently ordered GatesAir Flexiva FAX air-cooled transmitters for three FM stations. The first of these has now gone on the air at KCON(FM).

Licensed to Vilonia, the family-owned broadcaster recently acquired the 25,000-watt Class C3 station to better serve the busy Conway and Little Rock markets. The purchase came with old, dilapidated equipment, requiring a complete rebuild of the transmission facility.

"The station was barely on the air," said Palmer Johnson, who managed the rebuild on behalf East Arkansas Broadcasters.

"We use GatesAir almost exclusively, so we quickly ordered a FAX15 15 kW transmitter. We require about 9 kW of analog for our TPO. That got us up to full power within three days, and leaves room for digital when we add HD Radio service."

**“The new unit takes half the room of the old one, returning space for maintenance.”**

Johnson updated the electrical and grounded the facility prior to the single-cabinet transmitter's arrival. The FAX15 takes up half the space of the old 10 kW transmitter, returning valuable space for maintenance. However, Johnson anticipates minimal work, saying that the transmitter is among the simplest he has installed.

"It was as simple as connecting the RF plumbing, the AC and the audio," he said. "The design is labor-friendly, and I really like the AC distribution connection and layout. I have a 25 kW FAX in service at another station, and I just clean the filters once a month. We have never had off-air problems with any of our FAX transmitters."

Johnson adds that remote monitoring is easy through the FAX15's web interface; he monitors the health and



## More Info

Find contact channels for GatesAir at [gatesair.com/contact](http://gatesair.com/contact).

status of KCON and four other FAX transmitters from his Jonesboro office.

Company owner Bobby Caldwell said the project delivered improvements in sound and coverage. "We can get the signal into Little Rock now, as well as Bald Knob, Heber Springs, Morillton, even Fairfield Bay and all the way to Searcy. That opens up some very nice new business opportunities for our sales team."



## Tech Update

### ISS TR6000 Transmitter Is "AMReady"

Information Station Specialists says that for more than two decades the TR6000 10-Watt AM Transmitter has been a workhorse, performing yeoman's service for

Travelers Information Stations covered by Part 90 and college broadcasters using Part 15.

With increased demand for a low-power unit to maintain licensed AM service, the manufacturer is making a special version, the TR6000 Model 15.73, tailored to the needs of the AM broadcasters in the United States, currently at a discounted price of \$2,246, which is 25% off.

The company says the popularity of the TR6000 Transmitter stems from its single-board, slim 1RU design with intuitive end-on controls and LED metering. It can operate on 120VAC or 24VDC and requires less than 40 watts of power, allowing it to run from a solar source and/or operate efficiently from a battery bank.

ISS cites its tough design that can withstand the rigors of unheated/



uncooled traffic cabinets and often-compromised antenna systems along the nation's interstate highways.

The standard 600-ohm, balanced audio input and 50-ohm, RF output have proven popular with engineers for simple integration into existing systems.

The TR6000 Transmitter is part of a line of "AMReady" products designed for temporary/auxiliary applications, which includes quick set-up groundplanes, antennas, matching units and accessories. The company also rents temporary solutions.

Info: email [bill@theradiosource.com](mailto:bill@theradiosource.com) or call (616) 772-2300 x102.



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# WSHR installs Ecreso FM 5 kW transmitter

NCE station cites improved signal quality and coverage

**W**

SHR(FM) on Long Island in New York recently deployed a new 5 kilowatt transmitter manufactured by Ecreso, part of WorldCast Systems.

The noncommercial educational station is licensed to Sachem Public Schools in Lake Ronkonkoma and is operated largely by students. It takes a professional approach and broadcasts a CHR format.

Around 2020, Sachem began an RFQ process for a new 5 kilowatt transmitter. WSHR General Manager and Chief Broadcast Engineer Mark Laura said he wanted a transmitter that could operate in a somewhat harsh environment and offered good redundancy, preferably with a good built-in audio processor too.

"Our station is in a very competitive market and it's a very important asset to our school district," he said.

He had seen the Ecreso 10 kW FM transmitters at an NAB Show. "I liked the amplifiers' clean, planar design and the hot-swappable components for easy maintenance. You could see the quality in the circuit design and the transmitter's overall construction."

He settled on the Ecreso 5 kW Full Redundancy version for WSHR's transmitter project, with dual exciters and extra power supplies maximize uptime.

The transmitter was delivered before the new building was ready, and a replacement power input panel was shipped to accommodate the 208V three phase at the site (European 3 phase is 380V).

WorldCast Systems' Tony Peterle joined Mark Laura and his team in November 2021 to assist with the installation. They swapped out the power panel and connected it to the mains in about 40 minutes. Total installation time was about one hour.

Laura says the students, community residence, school administration and board members have noticed improved



**More Info**  
Contact channels for WorldCast Systems can be found at [www.worldcastsystems.com/en](http://www.worldcastsystems.com/en)

signal quality and coverage. "We had a few storms and some fluctuation in power due to high winds but the transmitter handled everything like a champ. I was very happy (and relieved) to see how well our Ecreso transmitter functioned."

The transmitter is much more energy efficient than their old one, he said. Sachem may choose to test the Ecreso Smart FM technology for additional savings on power costs.

Laura also appreciates the built-in audio processing and RDS encoder, and said the embedded website makes it easy to control from his office on the other side of campus.

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# 32 racks for all to see

Audacy's Miami cluster lets visitors see right into the TOC



To conclude our Buyer's Guide section we thought we'd give you a peek at the Technical Operations Center in the new broadcast facility of Audacy Miami.

This photo appeared in the Radio World ebook "Spectacular Radio Studios," which you can read at [radioworld.com/ebooks](http://radioworld.com/ebooks).

The new facility is approximately 30,000 square feet and houses 14 state-of-the-art studios serving seven radio stations, as well as a 12,000-square-foot live performance venue. Edward Huerta is Audacy Miami's director of technical operations.

The TOC features 32 10-foot racks with floor-to-ceiling windows that showcase the core to every visitor who walks in the lobby. 📺

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## “Right On, Larry!”

In his article about AM quality, Larry Langford had me giving him fist pumps and yelling “Right on, Larry!” As a big fan of AM who has served in senior engineering and marketing posts for three radio manufacturers over the years, I offer some insights into the lagged response to the “new” 30-year-old NRSC standards for AM radios:

**Marketing:** Predicting acceptance for any “new and improved” product is very risky for the pioneers. Is there a driving force for the new product? A wrong decision can bankrupt. Radio makers watched the rise of FM throughout the 1960s. With the availability of FM car converters and AM/FM table radios, listeners welcomed static-free reception and extended fidelity of FM, and they turned away from AM. Many AMs switched to voice programming of news, talk and sports, or went dark for lack of revenue. AM stereo came along right after the music horse escaped the barn. Don’t need stereo HiFi for voice. That was a

cautionary tale for radio manufacturers. Why make a high-quality AM radio if consumers are turning away from it?

**Cost:** Modern radios aren’t the venerable All American Five hand-wired sets of the 1950s. They’re based on ASICs combining RF-through-audio functions for OTA terrestrial and satellite reception, including display, audio EQ, analog and digital flavors, internet connectivity and sometimes other non-radio dashboard functions. These are seriously complicated chips costing millions to design and develop, debug, redesign and manufacture in forecast quantity. There’s serious financial risk involved. Given the tremendous investment in these chips, chip designers are reluctant to invest in improving the AM corner of the ASIC real estate. AM performance in new cars is notoriously bad. Some engineers have deduced the AM function is a jam-fit into the FM demodulator, leaving AM a bastard stepchild. Then there was AM IBOC, another listener, investment and regulatory disaster. Time will tell whether digital AM ever comes to fruition or also flops for lack of consumer interest.

**Sabotage:** Can’t name names here, but “reliable sources” over the years report heavy lobbying efforts by the satellite and internet streaming interests to the car and car radio manufacturers to downgrade terrestrial AM and FM radio quality in favor of satellite and internet reception. Money talks; they seemed to have listened.

Will we ever see NRSC audio response from consumer radios? Possibly, if there is a renaissance of interest in

## Road to obsolescence

Regarding Larry Langford’s commentary in the Jan. 5 issue, “Time to Come Clean on AM Quality”:

So I’m not the only one wondering. Larry’s questions regarding AM quality have been rolling around in my head since 1973 when I bought my first new car. It had an AM/FM tuner, and my AM station sounded horrible. I took the car to the dealer, they replaced the tuner and it still sounded terrible. A year later a purchase of the same model with an AM-only tuner, and it sounded pretty good.

Fast forward to 1984 when my wife buys a Jeep with an AM stereo radio. The audio was awful until it got a stereo signal and the bandwidth strangely improved. My father-in-law’s Oldsmobile had an AM stereo tuner that when receiving AM stereo sounded as good as FM.

We’ve been whining about AM’s decline and yet haven’t fixed the reasons. Even Larry has adapted an FM translator to put a Band-Aid on his AM’s problems.

There’s enough technology to cure 99% of AM’s problems but no one has given manufacturers a reason to do so. Broadcast radio seems to be on a path to making its existence obsolete until someone steps up to address and cure its problems.

Larry’s questions and the answers would be a great start. Then we can go after the commercial load.

Dave Mason |

the AM broadcasting service in the U.S. That will take a reinvention of live-and-local programming to deserve audience attention and rebuild AM's popularity for new generations of listeners. Stay tuned.

*James B. Potter  
Radio Engineer  
Kimberling City, Mo.*

## It's not the radios

Larry Langford asks why, since we now have the NRSC standard that allows for wide-bandwidth FM, do we have manufacturers continuing to make radios with severely restricted bandwidth.

The answer is simple, sad and depressing. In many if not most areas, the noise floor on the AM band is so high that bandwidth restriction is necessary to make stations listenable.

I have an AA5 radio in my office with the wide response that was typical of radios in the 1950s, and I can receive nothing but trash across the band in either day or night. If I take that same radio home to a more rural location, I can hear AM stations clearly and cleanly from Cuba to Toronto.

Where is the noise from? Everything with a cheaply made switching supply in it, which comes down to nearly every electronic device. Until the FCC starts enforcing Part 15 regulations, and until there are tighter regulations on noise applied by consumer devices to the power line, the AM band is going to be a mess.

It's not the broadcasters, it's not the radios. It's every cellphone charger, every LED light, every laptop power supply that will doom AM.

*Scott Dorsey*

## Strong words for hams

This is in response to the article by Mark Persons "Alike, But Not Alike: Broadcast vs. Ham Radio."

Broadcast radio serves the public while 99% of hams serve themselves. Listen to the many frequencies quoted in the article. It's rare hams do anything but cackle by participating in contests where they exchange either useless or false information.

Most do not own generators, unlike broadcast radio stations; thus in storms they are absent, although they are good at buying yellow vests and interfering with emergency



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workers. Profanity on ham frequencies is banned yet heard frequently.

The word hobby is not to be found in FCC amateur radio regulations. Hams are granted a license for public service, which most never do. The commission expects hams to experiment to advance the state of the art, which they did 50 years ago. Nothing hams have done in the last 50 years advanced anything that other hams would benefit from.

One thing hams have over broadcast engineers is that, as pathetic as the amateur radio exams are — five-year-olds have passed them — at least the FCC does test hams, while the First Class Radio Telephone exam is long gone. (Actually the FCC doesn't test hams, it allows hams to implement the tests — the fox guarding the hen house?)

Experience in ham radio was an asset to broadcast engineers as late as the 1960s. Experience as a broadcast engineer may yet be an asset to a ham, because to be a broadcast engineer you actually have to know something.

*Burt Fisher, K1OIK  
Former chief engineer*

## We'll get back to you

Certain bits of advice have become even more important given the economic upheavals of the past two years. One is to check all aspects of any product before making a purchase.

In the case of broadcasters, that means not only hardware and software, but perhaps more important than ever, product support as well.

I recently had to contact a major supplier of transmitters about an issue at a site where I am a contract engineer. I called but was told that no one would talk to me; I would have to send an e-mail, to which they would reply in the next three days.

I certainly was relieved I was not the person responsible for choosing this product.

Here's the friendly reminder: Before recommending or purchasing critical equipment, take the time to call the company's product support line outside business hours and see if you can reach anyone for the support you might need. If not, find another product.

There's no need to add to sleepless nights by finding out the hard way that a product you recommended and are supposed to be supporting is not backed by the company that sold it to you.

There are many equipment companies that provide very good support. They meet and exceed their customer's expectations. A little research and a phone call or two is time very well spent.

*Michael Baldauf  
Rye, Colo.*

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