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Photo by James O'Neal

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Holding our own ...

... or treading water?

Paul McLane
Editor in Chief

Personalities truly matter for retaining listeners. ... Lack of music choice is driving some listeners away. ... Smart speaker ownership has stalled. ... Localism really makes a difference.

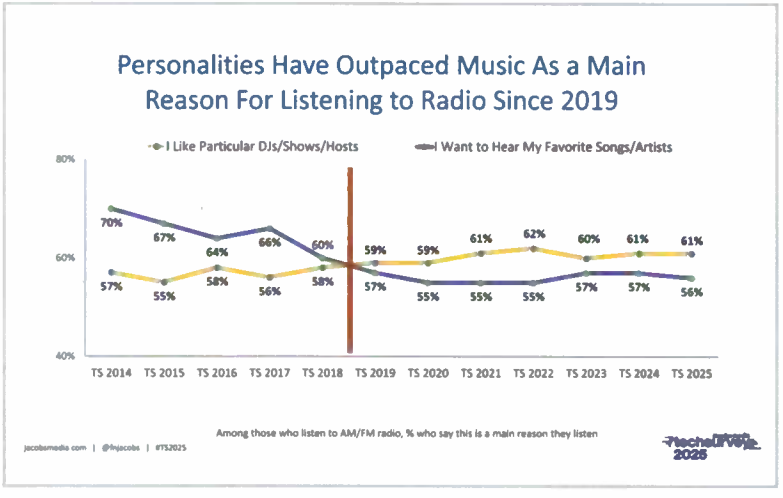
These are among the findings of the 2025 Techsurvey from Jacobs Media, which was released this spring. This is the 21st year that the consulting firm has produced studies about the opinions of core listeners to commercial stations in the United States and Canada.

"During that time, much has changed in the world of media and technology," Jacobs states. "From the rise of the smartphone, social media, smart speakers and podcasts to new technologies like AI, we continue to track what radio listeners are doing when they're not listening to the radio."

The findings are based on replies from approximately 24,500 listeners to 500 radio stations. Most respondents are members of station databases — this is a survey of people who presumably are inclined to be connected to radio, rather than of the general population, and the average respondent age is up to 58, which must be kept in mind while interpreting results in an industry that loves the 25–54 demo.

But even among this cadre of presumably loyal respondents, Jacobs found that broadcast radio in North America is treading water. "It is aging, and while some vital signs are OK, others show erosion."

The study reinforced that "being local" is a perceived asset, not just a slogan, and that localism has become even more important to listeners since the pandemic. And for seven years running, personalities surpass music as a main driver of broadcast radio listening as shown in the accompanying slide.



The survey found that one in 10 respondents are listening less, which Jacobs said is due to a combination of digital choice, COVID lag and "unforced content errors." Meanwhile radio's digital transformation continues but has slowed and become more incremental.

THIS ISSUE

On the cover
National VOA Museum of Broadcasting President Jay Adrick with a restored shortwave transmitter.

More Info
You can download a presentation and watch a webinar about the findings at *https://jacobsmedia.com/*.

"It's still about 'meeting the audience where they are," Jacobs found. "New paths include newsletters, smart TVs and short videos."

Mobile is like "connective tissue," it is everywhere. Podcasting is becoming a mainstream medium. Social media is more important than ever as a news source and for influencing purchasing decisions.

And as for the automobile, this cadre of listeners appreciates the ease of listening to radio in the vehicle; and yet the better equipped a car is with dashboard technology, the more radio listening is challenged, even for this group.

A few additional specific findings:

- AM/FM listening is lowest among the youngest generations; but even for Gen Z, 84% of respondents listen to radio (on any device) at least an hour each weekday. Again, the survey starts with a population of people inclined to like radio, but still this feels like an encouraging number.

- Among those who listen to radio, 66% said the main reason is because it's easy to listen to in the car. The second most popular reason was "because it's free," followed by DJs, hosts and shows. Reasons like traffic, weather and sports were far down the list.

- Turnover in personalities is a growing reason for listening less.

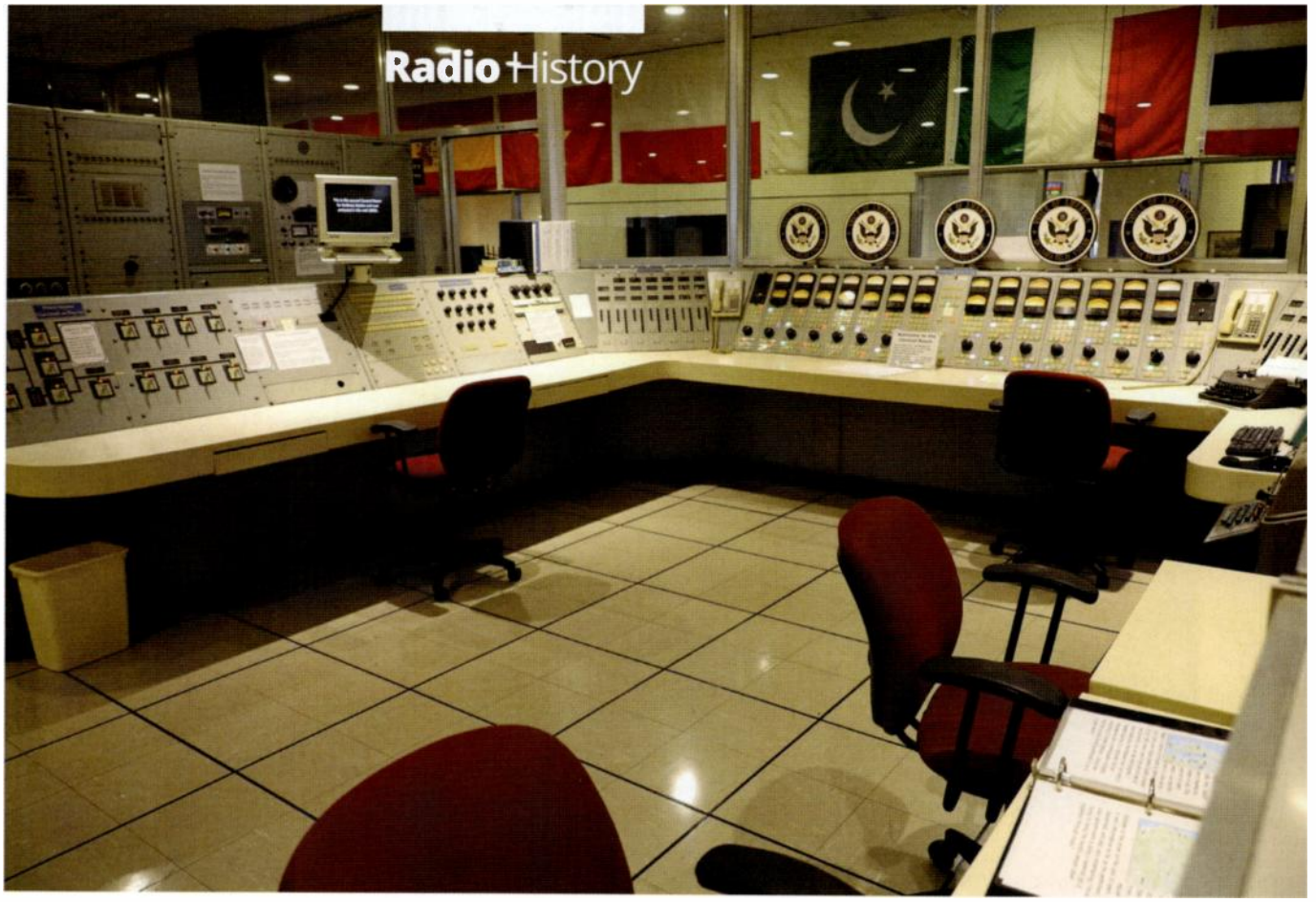
- Among listeners who said they've listened less in the past year, non-radio audio options are the big reason among the youngest demographics.

- Even among this presumably friendly pool of respondents with an average age in their late 50s, only three in four have a radio at home that they use. Millennials are least likely to have one.

- Though past rapid growth in smart speaker ownership has stalled, smart speakers and mobile have become more important for radio listening as "regular" radios disappear.

- One in three smart TV owners listen to audio on their TV at least occasionally.

It seems clear to me from looking over the findings that in our increasingly challenged environment, it's more important than ever for radio managers to embrace their remaining differentiators: strong personalities and a sense of local connection. The more radio departs from those strengths, the faster it will lose listeners to other options.



Writer

James E. O'Neal

The author is a longtime contributor to Radio World and former technology editor of TV Tech.

Learn More
https://voamuseum.org/

National VOA Museum celebrates makeover

Broadcasting's history comes alive in newly renovated facility

The National Voice of America Museum of Broadcasting has been around for more than 20 years, but a project supported by a $500,000+ grant has transformed its World War II-vintage building — the former VOA Bethany "relay station" transmitting plant — into a world-class repository of communications history and knowledge.

The 30,000-square-foot, two-story building was deeded over to the township of West Chester, Ohio, following the VOA's closing of the station in 1994. Little of it would be recognizable to those present when transmissions began in late 1943.

The facility was constructed by the Crosley Broadcasting Corporation under a contract from the Office of War Information as part of the initial VOA initiative to disseminate accurate reporting of wartime news to Axis nations. It had languished and fallen into disrepair following its abandonment by the VOA. The infusion of funding now allows artifacts to be better displayed, as well as making the facility more accessible (and comfortable) for visitors.

Above
A very visible VOA "left-behind" is the station's large control room, where programming from the organization's studios was monitored and routed to an array of shortwave transmitters.

The largest item on display is a 1960s-vintage 250,000-Watt 821A Collins shortwave transmitter that was "abandoned in place" when the GSA ceded building and grounds ownership to the local government.

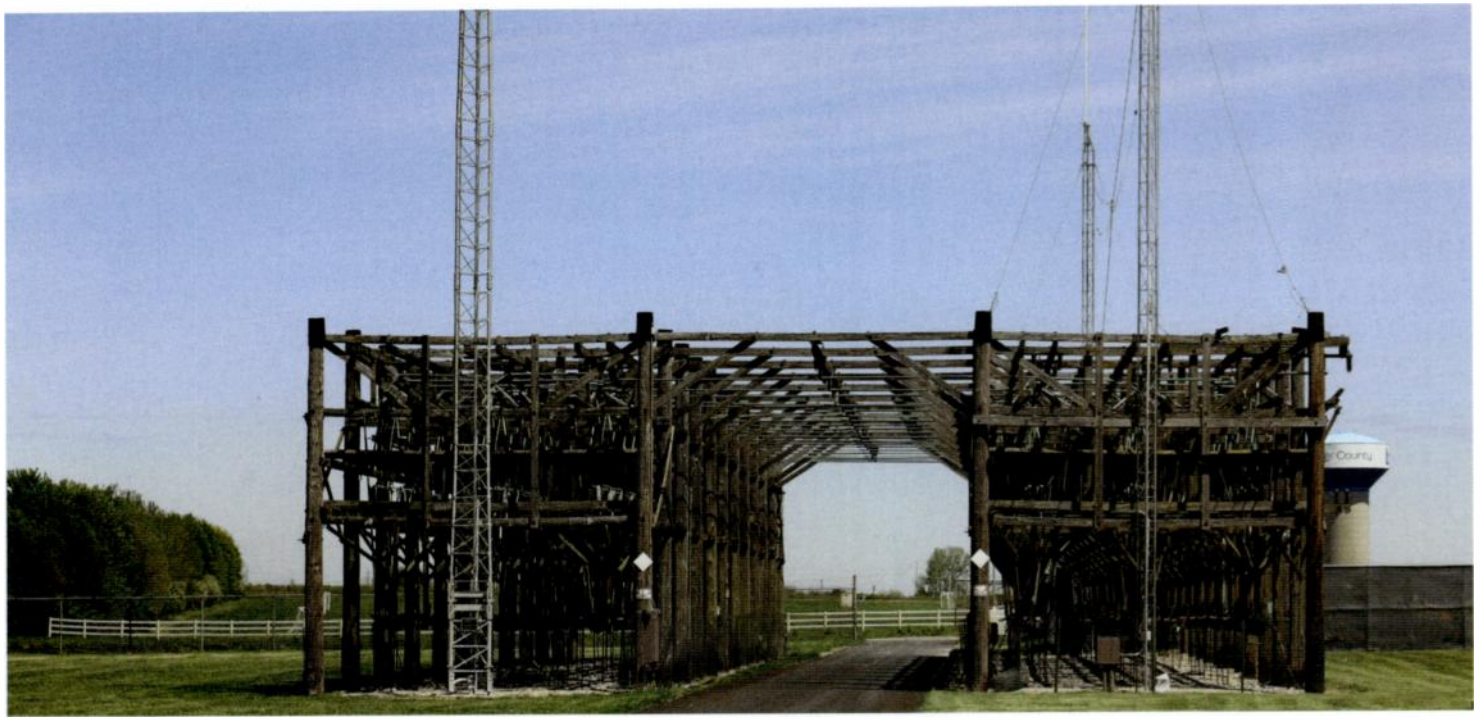
The giant transmitter has been extensively labeled to allow visitors to better understand what they are viewing. And while the government did remove the antennas and masts, museum volunteers have constructed scale models to illustrate how the site once appeared.

Another visible former VOA item is the large control room where switching and monitoring operations took place.

Telling the story

The facility is anchored by VOA artifacts and exhibits, but Jay Adrick, president of the museum board, is quick to remind visitors that from the 1920s onward, Cincinnati, just south of the Bethany site, was a broadcast industry "hub." This heritage is reflected in exhibits.

"In addition to Crosley's massive manufacturing and broadcasting operations, Cincinnati was home to the Kodel Radio Corporation, the original owner of station



Above
This manually operated crossbar switcher was part of the original wartime VOA operation and was still in use when the station went dark in 1994. It switched RF from the big transmitters to multiple antennas on the campus.

Right
While the exterior of the 30,000-square-foot former VOA "Bethany" transmitting facility appears much as it did in 1943, the interior has been transformed into a world-class museum of broadcasting history.

WKRC," said Adrick. Other radio receiver and equipment manufacturers calling Cincinnati home include the Midwest Radio Corporation, which sold their products directly to consumers."

"There were about 40 radio and radio parts manufacturers in the Cincinnati area," added Lee Hitte, a museum curator and docent. "This was the 'Silicon Valley' of its day. It was the center of broadcasting, the center of radio, and the center of the technology at the time."

Crosley's flagship WLW once had the distinction of being the most powerful radio station in the country, operating with 500,000 Watts during the 1930s, and referring to itself as "The Nation's Station." To provide programming, Crosley amassed an impressive group of entertainers and personalities, many of whom would become nationally famous. Museum visitors have the opportunity to experience some of this broadcasting history through exhibits featuring profiles of several of the on-air performers.

While the 1/4-megawatt Collins rig is the largest such item in the collection, it is by no means the only transmitter. Volunteers have restored to like-new condition an early 70-kW shortwave transmitter built and used by Crosley. Other artifacts include a massive 100-kW water-cooled triode, one of 22 used to power the WLW 500-kW rig.

Transmissions live on

Although the VOA's Bethany facility transmissions ended more than three decades ago, the facility still sports transmitting antennas and operational HF gear in the form of a large amateur radio operation. WC8VOA features four operating positions and is operated by the West Chester Amateur Radio Association, a division of the museum.

In addition to the array of modern amateur radio equipment used by the station, the museum features a comprehensive collection of vintage ham gear from many U.S. manufacturers, including Ohio-based R.L. Drake.

In addition to broadcasting and manufacturing radio receivers, the Crosley organization diversified into the production of numerous non-radio products, including the first refrigerator to feature shelves on the inside of the door (the "Shelvador"), a device marketed to stimulate hair growth (the"Xervac"), a refrigerator for use in areas without electricity (the "IcyBall"), small automobiles and even a line of kitchen cabinetry. Carefully restored and documented examples of all are on exhibit.

In addition to the visual "candy" on display, the museum features a hands-on gallery, the "Foley Pit," where visitors are encouraged to try their hand at creating the sound

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effects such a wind noises, hoofbeats and thunder that played a big part on setting the stage for radio dramas. The museum also features a "timeline" gallery depicting scientific discoveries that led to radio's development.

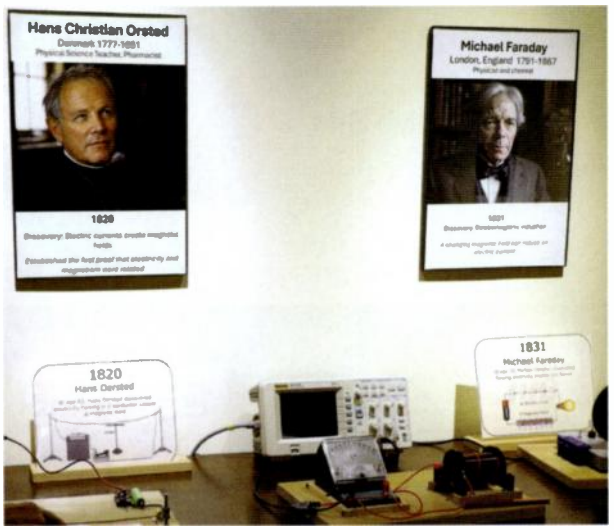
Above
The museum also features an extensive collection of Crosley's non-broadcast products, such as the first refrigerator with door-mounted shelves, the "Shelvador," and a refrigerating device that worked without electricity, the "Icyball."

The makeover itself

Adrick and Jack Dominic, the museum's executive director, said that when the building was deeded over, it had some serious deficiencies for museum purposes.

"One of the big issues was that there was no heating system," said Adrick, explaining that this had not been a problem in the operation's former life, with big transmitters running round the clock and giving off plenty of waste heat.

The Americans With Disabilities Act did not come about until 1990, so accessibility was another issue that had to be addressed. A new entrance was created so visitors can enter without navigating the steep stairs.



Left
A STEM gallery illustrates the development of radio technology, from experiments with magnetism and electricity through the production of RF energy and broadcasting. The museum also offers a Foley gallery where visitors can create sound effects.

And What About Those Cuts?

The museum is a non-profit and not part of Voice of America itself. It does not receive federal funding, so recent actions by the Trump administration to close or dramatically shrink VOA and other U.S. international broadcast operations do not touch it directly.

"Any decision in Washington regarding VOA will not affect operation of the museum," said Executive Director Jack Dominic in a video on the museum website.

He said that in some countries, VOA has been "the only non-censored window on the world," as becomes clear from the comments of foreign visitors who listened to the Voice of America.

"It is not uncommon to see these people break out in tears as they remember how significant the broadcasts were, and how the broadcasts contributed to their ability to hear factual and truthful information. ... The museum will continue to be a place where the Voice of America is celebrated as one of the most effective uses of broadcasting."

Funding from an Ohio state grant and a private donor enabled these and a number of other beneficial modifications and additions to be made to the 80-year-old building.

"The former east side garage has been turned into a conference center and a food preparation facility added," said Adrick.

Even with the upgrades and improvements, the museum is still a "work in progress," with plans underway for expansion of the existing STEM gallery, additions to the Media Heritage highlighting Cincinnati-area radio and television personalities and performers, and a new exhibit focusing on broadcast news.

"This will be the history of television news as it relates to this region," said Adrick. "We have four TV stations that are generating newscasts, but the first, WLWT, began their newscasts in 1948. A lot of technology and early firsts occurred in this market. Crosley built COMEX [the Communications Exchange building] as a news center for both radio and television, and had the first weather radar in the country, outside of the National Weather Service. So, we'll be developing a rather detailed exhibit around that theme."

The National Voice of America Museum of Broadcasting is at 8070 Tylersville Rd. in Chester, Ohio, easily accessible from both I-71 and I-75. The museum is open to visitors from noon until 4 p.m. on Saturdays and Sundays.

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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.

Bryan Steffy/Getty Images

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

It's important to stay grounded at work

Consider using a portable GFCI

Robert Brown, CBRE, writes from California to remind us that a lot of broadcast engineers and technicians visit transmitter sites by themselves and work alone.

A DOE told me early in my career: "No radio or TV station is worth dying for." Your most important job is to work safety and return to your family at the end of the day.

With that in mind, be aware that many convenience outlets are not supplied with a ground fault circuit interrupter or GFCI.

This topic is addressed in the "NFPA 70 E Standard for Electrical Safety in the Workplace," published by the National Fire Protection Association. It tells us that indoors or outdoors, GFCI protection should be provided when an employee is operating or using cord sets (extension cords) or cord and plug connected equipment supplied by 125 volt, 15, 20 and 30 amp circuits.

If such protection is not installed at the site, you can use a portable GFCI unit, many of which are sold online for under $50 by companies like Grainger, McMaster-Carr and other vendors.

Fuses and circuit breakers protect wiring and equipment, but a GFCI protects people. Current flowing across the heart and lungs is most dangerous (think about where you put your hands) with 30 mA to 40 mA considered to be the fatal range for most adults. This is far below where a 15 Amp circuit breaker would trip, but "A" style GFCIs will trip at 6 mA.

Inside a GFCI is a coil of wire that has both the hot and neutral running through the center of the core. In normal operation, the current goes out to the load and returns to the panel on the neutral, and the two magnetic fields cancel each other out.

But in a dangerous condition, the current goes out through the hot and does not come back on the neutral. The magnetic field produces a current in the coil of wire that trips the device and disconnects power from the circuit.

So Robert cautions that if you are using corded tools and equipment such as fans for

Above
If someone has cut off this ground plug, don't use the cord!

Right
A portable GFCI assembly. This Electriduct model is suitable for outdoor use and is available in versions with longer cords.

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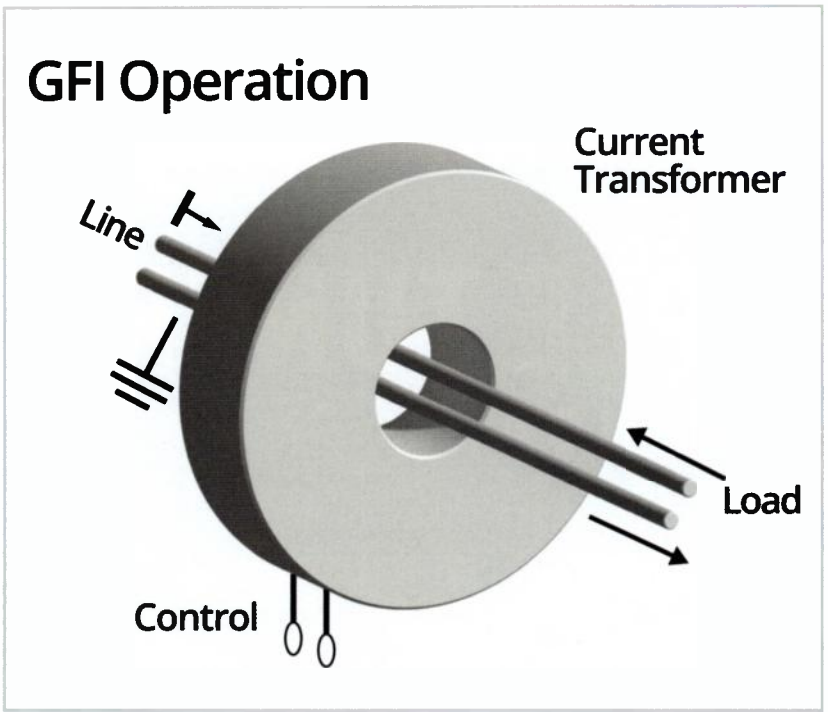


ventilation, tools or light carts, please inspect your cords for abrasions. And if the ground plug is missing, repair or replace it so at the end of the day you can return home safely to your family.

Above
How a GFCI works.

Below
CopperWatcher is intended to persuade a would-be thief to flee as early in the process as possible.

Hidden gem

Dale "Squeak" Porrray, AD7K, is a retired ham who spent his working days selling amateur radio gear and is always looking for good deals. He wants to let readers know that the HanRongDa HRD-757 radio, often sold for around $86, was selling for quite a bit less recently at Ali Express.

He adds that there once was a store called Radio World in Boulder City, Colo., that catered to radio amateurs. Unfortunately, it closed when the owner retired.

A TIP we've all experienced

Reading the April 23 Workbench column, retired broadcast engineer Brian Lee was reminded of a term he coined to describe a common equipment failure: T.I.P., or "technician-influenced problem."

In far too many cases the "problem" could be traced to the technician, like the person who forgot to plug something in or turn the equipment back on. Yes we've all been there.

Brian describes himself as an old analog engineer from way back, working with Broadcast Electronics Control 16 automation, ITC triple-decker cart machines, the first version of BE AudioVault, and the Harris SX-1 and SX-1A AM transmitters. You get the picture. All great memories.

What TIPs can you remember?

CopperWatcher

Sometimes it seems that copper theft has reached epidemic levels. Broadcast engineers should know that many insurance companies are mitigating their own risk by discontinuing coverage for vandalism, or they may require a separate rider to cover copper theft. Check your coverage.

Surprisingly, it may not be the copper strap that's at risk these days, it's your air conditioner condenser unit. Thieves can get much more money for an entire compressor assembly than a few feet of strap.

This is where a product called CopperWatcher comes in. It supervises power and refrigerant pressure to your A/C.

"When power is shut off or copper tubes are cut, the CopperWatcher sends a signal to the existing burglar alarm system," according to its website.

"The burglar alarm systems loud siren sounds drawing attention to the would-be thieves. CopperWatcher is intelligent enough to tell the difference between a purposeful shutdown and a local power outage, and will not send a false alarm to the security panel, saving you a possible fine with your local authorities and the nuisance the audible alarm will cause."

The Texas-based company provides an informative website at *www.copperwatcher.com*. The online store offers a variety of packages for around $500.

About those series and parallel circuits

Resistors, capacitors and inductors are easy once you understand the basics

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.

Situation: You're an IT person new to radio broadcast engineering and are given the keys to an AM transmitter site. The manager says to go out and get familiar with the equipment.

The site reminds you of a Frankenstein movie, especially when looking into a phasor cabinet or an antenna coupling network at the base of a tower. There are huge metal coils and fist-size blocks of black or white mystery parts that have no relation to the IT profession you trained for, as in the photo at right and Fig. 1 on the next page.

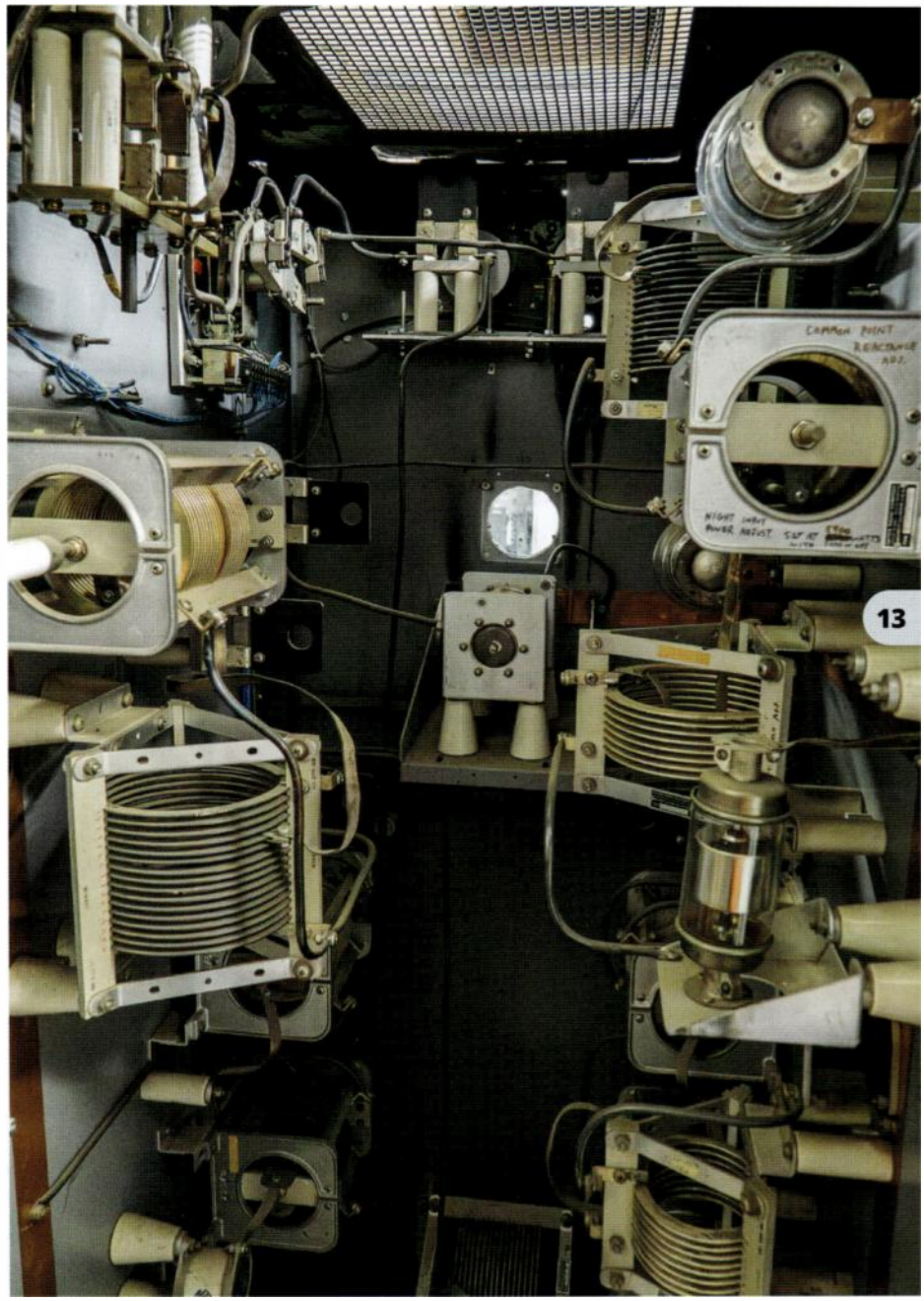
But what does all this mean?

Large RF capacitors are used in AM antenna phasors, antenna coupling units, filters and in transmitters. Troubleshooting can be easy half of the time, as in Fig. 2, where a capacitor has overheated, maybe even caught fire and smoke leaked out, as we say. This G2 series capacitor is an older version of the 292 black capacitor shown in Fig. 1.

A failed .001 mfd capacitor (Fig. 3) can be replaced by two .002 mfd capacitors connected in series. If the .001 was rated at 10 amperes of RF current, the .002 capacitors must be able to handle 10 amperes each. If the .001 capacitor was rated at 10 KV, the .002 capacitors only need to be able to handle 5 KV because each is seeing half of the circuit voltage.

You can also replace one capacitor by putting two capacitors in parallel as shown in Fig. 4. In this case, a .0015 mfd capacitor can be replaced by a .001 mfd and a .0005 mfd in parallel. Each must withstand the circuit voltage that the original .0015 did, but the RF current is divided between the two. The .001 mfd will handle two-thirds of the RF current in amperes. The .0005 capacitor will be required to handle one-third. That is because .001 has electrically half of the RF reactance that the .0005 has.

On the practical side, no two capacitors are identical. You might find a small tuning difference, even when replacing a single capacitor with a factory new one.



Right
AM directional antenna phasor.

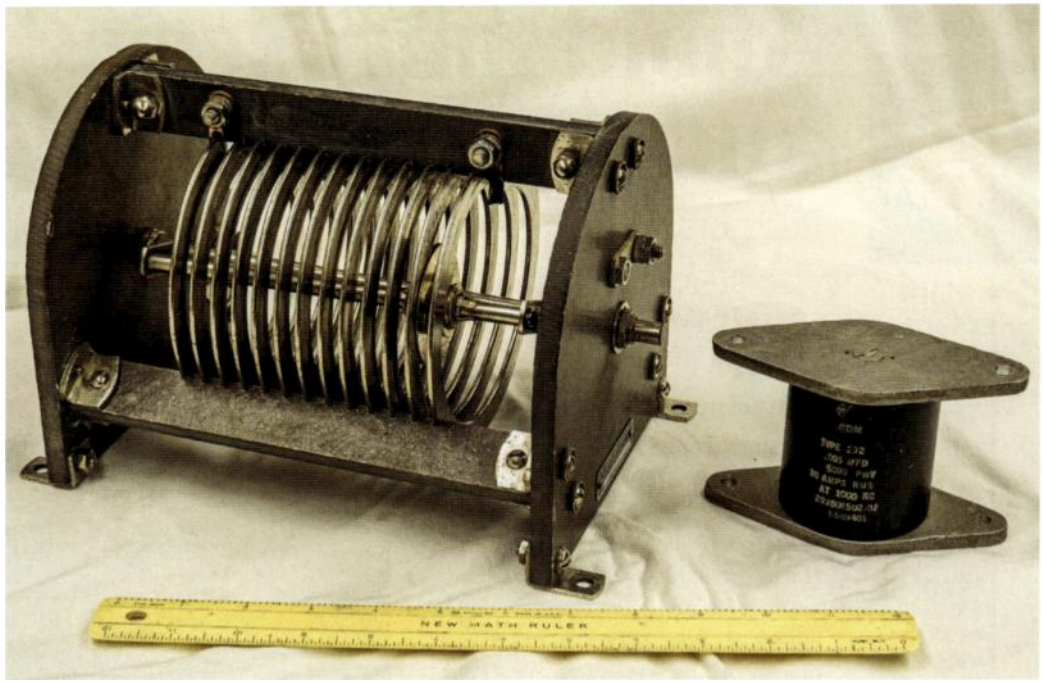
Let's look at the reason a capacitor in the AM example might have failed. Maybe it was lightning damage. If so, were the arc gaps set properly? I discussed these in a 2017 Radio World article (at *http://radioworld.com* type "understanding arc gaps" in the search field).

Assuming the arc gaps are doing their job, you should investigate the circuit design. It might take a consultant to figure it out. For sure you will want a consultant if the same capacitor fails twice.

RF resistance in capacitors is termed as capacitive reactance and it changes with frequency. The reactance of a capacitor will be less at higher frequencies. For example, a .001 mfd (1000 picofarad) capacitor is 159 ohms at 1000 kHz, the middle of the AM broadcast band. It is 106 ohms at 1500 kHz and 294 ohms at 540 kHz. You can measure the microfarad value with some multimeters, but not the reactance.

Similarly, a 10 uhy (microhenry) coil AKA inductor will have 63 ohms of inductive reactance at 1000 kHz. At 540 kHz it is 34 ohms, then at 1500 kHz it is 94 ohms. As you can see, the inductive reactance increases with frequency, just the opposite of capacitive reactance.

Connecting two coils/inductors in series gives you a larger inductor, just add the two inductance values

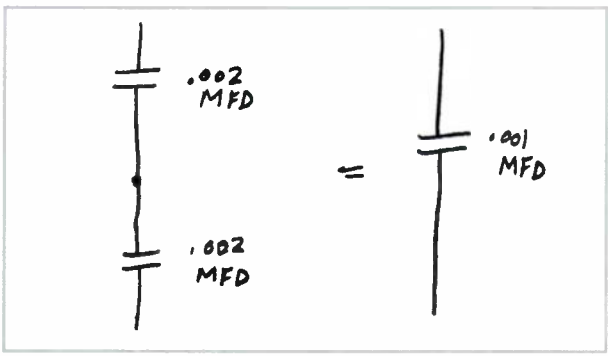


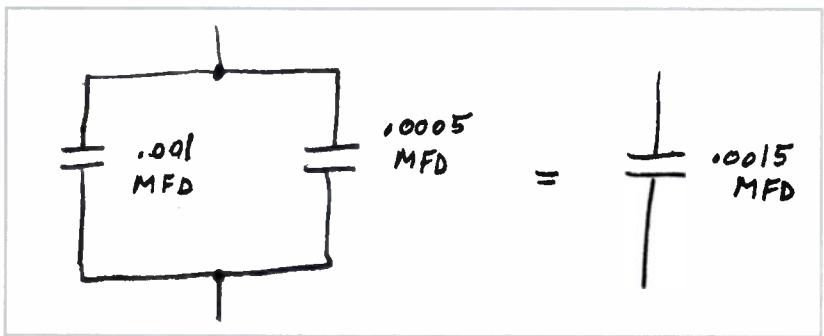
Above
Fig. 1: An 11 uhy-20 ampere variable inductor and a 292 series mica capacitor.

Right
Fig. 2: A failed mica capacitor.

Left
Fig. 3: Capacitors in series.

Below
Fig. 4: Capacitors in parallel.





together. There is no practical use for paralleling inductors that I can think of.

These similarities and differences make it possible to design broadband RF networks and very narrow circuits for filters.

In the past I calculated ohms of capacitive or inductive reactance on paper. Now a Google search will bring me to a calculator to find the value either going from capacitance or inductance to reactance or in reverse. Easy enough.

Let's look at resistance in a resistor. For all practical purposes it doesn't change with frequency. (Fig. 5.) Say you need a 5000 ohm/2-watt resistor to replace a failed one and you need it now! Well, a pair of 10,000 ohm/1-watt

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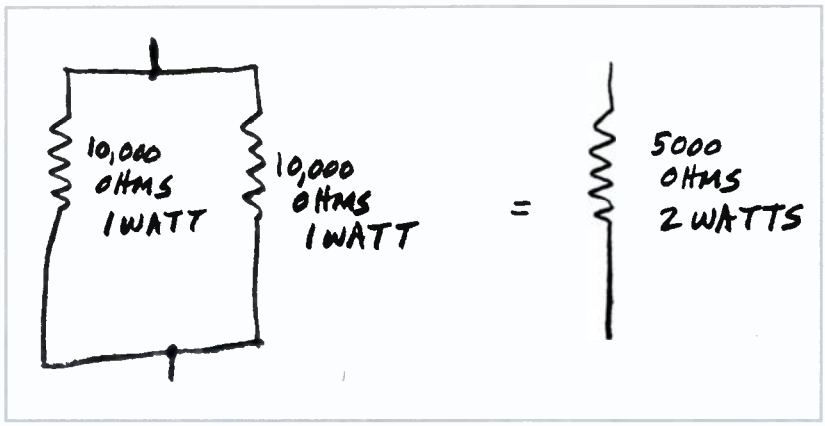
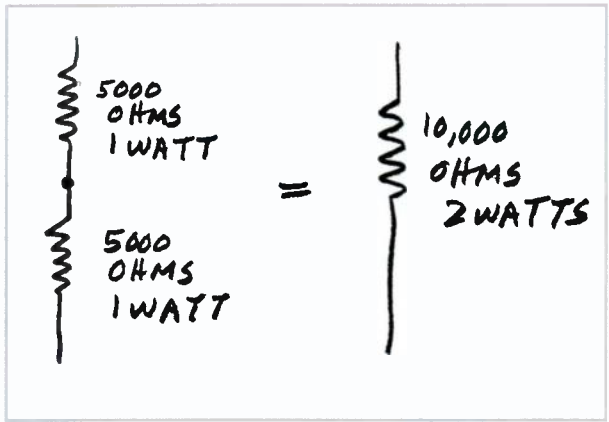
*get 2 additional mic channels with the purchase of the ARC-MIC-PRE.

ARRAKIS SYSTEMS

arrakis-systems.com





resistors in parallel will be an exact electrical equivalent, even if they look a little different.

The same applies to resistors in series (Fig. 6).Two 5000-ohm resistors, wired in series, become a 10,000-ohm resistor. If each of the 5000-ohm resistors is rated at 1 watt, the total is 2 watts over the 10,000 ohms.

Prove it for yourself using a multimeter on spare resistors to get a feel for how this works before you must put it into practice. I carry an assortment of resistors in my tool kit to take care of situations like this without resorting to ordering a replacement component that could take days to get. Remember, Radio Shack is no longer just down the street! It might be a temporary cure until an exact replacement arrives. Then, do the right thing. Take the time to make it look like factory original.

Back at the studio, let's say you want to create an audio attenuator to bring down an audio level that is too high for the equipment it is feeding. Possibly it is an old analog news or production studio console that might feed into an audio switcher.

If the console has a +8 dBm output, its peak audio level is +28 dBm at clipping and likely 10 dB or more above clipping on the audio switcher. Audio peak distortion happens. Ouch!

I described this in a 2023 Radio World article, "Let's Talk About Some Basics of Audio for Radio," which you can find by scrolling at *www.radioworld.com/author/markpersons*.

As mentioned then, a 600-ohm terminating resistor will likely be required if the console has an audio output transformer. That will keep the frequency response in factory specification. Then an audio attenuator or two can be used to reduce the level to something acceptable for some equipment. A simple series resistor circuit should suffice. Fig. 7 is a classic voltage divider. The output voltage will be at half of the input voltage, which is 6 dB lower than the input.

Left
Fig. 5: Resistors in parallel.

Right
Fig. 6: Resistors in series.

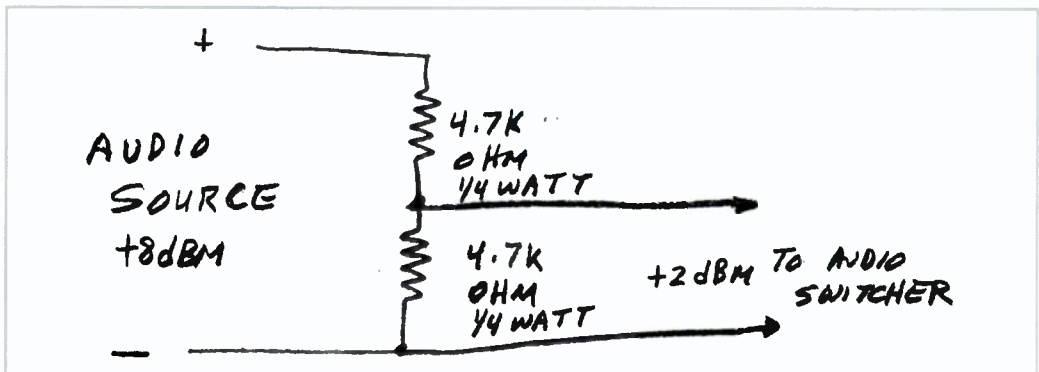
Below
Fig. 7: Voltage divider.

In summary, resistors, capacitors and inductors are easy once you understand the basics. Now you can go out into the radio broadcast world with more confidence to diagnose and solve engineering problems.

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

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

> **In the past I calculated ohms of capacitive or inductive reactance on paper. Now a Google search will bring me to a calculator.**



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The cloud supports comprehensive radio migrations

"The cloud is central to many operations ... This is not a future prospect, but a current reality"

Writer
Paul McLane
Editor in Chief

A new Radio World ebook explores how radio is adopting cloud technologies. Christopher Bell is a strategy and business development leader at Amazon Web Services. This is an excerpt from the ebook.

To what extent has cloud-based content creation and delivery been deployed by radio organizations?

Christopher Bell: Globally, we're moving from the early adoption of cloud solutions for broadcast and streaming radio into the planning and execution of comprehensive migrations for essential operations.

The need to define a "station of the future" is a common refrain, and cloud-based, centrally managed solutions are enabling networks to meet those goals. Many are leveraging services like Amazon Simple Storage Service for storing content and archives, AWS Lambda for highly scalable serverless audio processing on-demand, and Amazon Bedrock for access to a wide selection of Generative AI foundation models for different use cases.

Most important: The cloud is central to many station and network operations today. This is not a future prospect, but a current reality. A good opportunity to see this in action was the live cloud-based radio instance AWS operated at the NAB Show with partner Radio.Cloud as shown in the AWS booth. A walk-through of that configuration is available at *https://aws.amazon.com/media/nab25-demos/#Radio_and_podcasts*.

What are the primary drivers you're seeing for stations and networks adopting cloud solutions?

Bell: Faster access to innovation, system resilience, security and cost efficiencies are all drivers of adopting cloud radio solutions. As network operators face the prospect of upgrading and replacing often heterogenous on-premises solutions at multiple station locations, cloud alternatives allow for standardization on solutions that allow staff to focus on programming and content instead of server maintenance, security patching, data and content security, and other undifferentiated heavy lifting.

Can you expand on the key advantages of such solutions compared to traditional on-premises systems?

Bell: Radio broadcasters can focus more on content and programming, supporting their advertisers with modern monetization strategies, and attract operations talent from a larger pool of skilled engineers when they adopt cloud solutions. Network operators can better share cloud-based content and data across stations and can more easily find and use content from past productions when it's contained in unified archives and tagged consistently by automated processing that's easy to deploy in the cloud.

What emerging technologies or trends do you see having the biggest impact on the radio industry in the coming years?

Bell: Two AWS features that have accelerated the growth of radio- and audio-focused solut ons are the options for use-case specific AI foundational model adoption and highly scalable and cost-efficient serverless tools for data and content processing. We have multiple partners leveraging the Amazon Bedrock Generative AI managed service to access different foundation models matched to specific use cases like summarization, metadata generation, script writing, story selection and more. When preparing drop-in audio like weather and traffic updates at fixed schedule times, operators used to have to have processing capacity ready for those highly spiky workloads even though it mostly sat idle each hour. Now, with serverless architectures built with Amazon Eventbridge and AWS Lambda, operators have access to immediate scale capacity at much lower cost and higher reliabil ty.

Below
Read the full interview at *http://radioworld.com/ebooks*.


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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.

WVIA-FM picks Telos for AoIP upgrade

NPR affiliate uses Quasar console for an uncomplicated user experience

Right
Author Mark Ruddy in the studio.

> **"WVIA Radio is a public radio station affiliated with NPR that serves northeastern and central Pennsylvania through five transmitters and 10 translators."**

In 2023, we started the process of looking for a replacement for our radio infrastructure, moving away from our 18-year-old audio routing console system and modernizing to audio over IP. We did detailed research on the different variations of audio over IP and the manufacturers who make the equipment, and we ended up deciding to build a Livewire AoIP network due to its ease of functionality and because the gear we had acquired was already Livewire-ready. This meant that we were now focused on choosing an Axia mixing console.

WVIA Radio is a public radio station affiliated with NPR that serves northeastern and central Pennsylvania through five transmitters and 10 translators. In addition to having local news hosts, we air blocks of classical and contemporary programming with operators in the studio. Although there are some great virtual consoles on the market today, we needed to stick with a traditional broadcast console.

There were a few requirements for a new console: It had to be operator-friendly; it needed to be integrated as much as possible with WideOrbit Automation for Radio; and it needed to look impressive, because our radio studio is on the station tour route. Through input from Telos Alliance and current customers, WideOrbit and other radio engineers in our market, I realized that the Axia Quasar was going to provide everything that we needed.

Quasar goes into a lot of detail with settings and parameters, and it is very flexible from an engineering and configuration standpoint. But what the normal day-to-day operator experiences is a result of those settings and the console is not at all complicated. They can host their show with a sense of familiarity and the Quasar can be set up so that it's difficult to accidentally change critical settings.

Finally, I am impressed with the Axia Quasar Engine that is needed for the console. In addition to the various console audio outputs, we are utilizing several of the Quasar's built-in virtual mixers (or V-Mix) to be able to control feeds for different air paths and our HD Radio subchannels.

Even though it is new to us, Quasar is doing a heavy lift, and I believe it will serve our station well for many years to come.

More Info
www.telosalliance.com

Tech Update

AEQ Releases New Compact Audio Console

AEQ has expanded its range of digital audio consoles with Capitol IP Plus, calling it a solution for radio studios, mobile units and broadcast environments that need high performance in a compact format.

Available in 10 fader versions, Capitol IP Plus is designed for 48 kHz/24-bit digital processing. Each channel features dynamics control, equalization, automatic mixing (Automix), N-1 return management and an integrated routing matrix.

"Its main strength lies in its IP connectivity," the company states. "Based on Dante/AES67 technology, it provides up to 32 AoIP inputs and 32 AoIP outputs, enabling seamless integration with audio over IP networks, IP codecs, automation systems and intercom platforms." It also includes analog, AES/EBU digital and USB I/O for local sources, plus Bluetooth connectivity for cellphones.

The console can be operated locally or remotely over IP networks, making it suitable for distributed operations or remote production workflows. "Its ergonomic surface, color TFT displays and rugged chassis make it ideal for both fixed installations and mobile setup," AEQ says.

Info: https://aeq.eu

Quebec college program uses Calrec for AES67 upgrade

Cégep de Jonquière's four studios and 18 recording booths get Type R mixers

Cégep de Jonquière public college in Saguenay, Quebec, has installed 22 Calrec Audio Type R modular mixing systems as part of an upgrade to its AES67 IP infrastructure.

The school's media communication program was the beneficiary of the installation. It operates a student-run streaming radio station known as CJEP, which has approximately 25 hosts.

Calrec Canadian partner True North A.V. supplied the systems and collaborated with integrator Applied Electronics for the setup. The college received the Type R mixing environments in the school's four on-air broadcast studios and its 18 individual recording booths.

"The School of Art and Media Technology at Cégep de Jonquière is the only public school in Quebec that offers this kind of professional training and immersion," said Alexandre Morin, its technology and project manager, in a release.

More Info
https://calrec.com

Morin continued: "An AES67 IP radio network gives us much more flexibility and reliability. It enables us to share every source destination or every studio/booth without using DAs or physical patch cords, and it means we could remove a lot of technical equipment from our Central Equipment Room."

The college uses Type R's flexible large soft panel with the Calrec Assist application in its recording booths, while physical Type R fader modules are used in its studio environments. Morin said Type R also makes it easier for the school's technical staff to do maintenance and troubleshoot tasks.

Cégep de Jonquière has approximately 2,500 students enrolled. Established in 1967, the college stated that its media program maintains partnerships with institutions in Europe and Africa as well as with Canadian media organizations. In addition to the media communication program, it also offers a television production program.

Tech Update

Radio Dhoom gets upgrade with **AxelTech**

AxelTech, Digigram Asia and Airwaves Systems executed what they call a "transformative" installation for Radio Dhoom, tailored for the Indian market.

This project involved the integration of the Oxygen 2000 console into Radio Dhoom's main studio, replacing outdated mixing equipment. AxelTech said the decision to upgrade was driven by a need for a modern solution that could accommodate contemporary broadcasting technologies. The installation has streamlined studio operations.

It said the Oxygen 2000 comes with an intuitive user interface to reduce operational errors, an "Oxygen Remoter" feature that allows remote access, and improvements to audio fidelity.

Info: www.axeltechnology.com

Tech Update

Arrakis Highlights H-Series "Hybrids"

Arrakis Systems says its new H-Series consoles are hybrids that employ both analog and digital technologies to offer flexible configurations for studios of all sizes.

The H10, H10-Lite and H15 models blend analog mixing and digital control and feature balanced RJ-45 and unbalanced RCA inputs, integrated mic preamps, USB, Bluetooth and software-based remote control tailored for professional environments.

The H10 is a 10-channel analog mixer. It includes two built-in mic preamps (expandable to four via the optional ARC-MIC-PRE), seven stereo line inputs, one USB channel, one phone mix channel and one Bluetooth channel. Users can choose backlit analog or LED VU meters.

Front-panel switches are LED-lit, and each fader is dust-covered conductive plastic for long life. USB on Channel 9 serves as a built-in sound card, enabling computer play/record. The phone mix offers mix-minus. Bluetooth streams mobile audio to air.

The H10-Lite retains the H10's analog features, 10 channels, dual mic preamps, seven stereo lines, USB, phone and Bluetooth, but omits the controller hardware and H-Series Controller software. "It is upgradeable so studios can add software control later, making the H10-Lite ideal for cost-sensitive environments seeking proven analog performance without sacrificing fidelity," it stated.

The H15 expands on this with 15 channels, five assignable mic preamps, seven stereo line channels, two phone mix channels, a USB channel and a Bluetooth channel. The company said XLR mic inputs offer switchable phantom power (48 VDC optional), and DIP switches allow mic/line assignment. "Balanced RJ45 I/O enhances signal integrity in high-RF environments," said Arrakis.

The H10 and H15 consoles are software-controllable via the H-Series Controller, offering remote on/off switching, custom presets, logic control, pre-fader level adjustment, remote metering and an up/down timer. In the event of power loss, previous settings are restored.

Info: www.arrakis-systems.com

A split-frame LXE for Dublin's Sunshine

The music station uses a Wheatstone AoIP console to streamline workflows

Sunshine 106.8 consistently ranks as Dublin's #1 easy listening music stations for listeners 35 and older. The commercial station serving Dublin proper is a local fixture, drawing from a multi-decade music library and airing talk segments plus the occasional sports update, traffic report, weather forecast and a smattering of national and international news.

All of that, and more, is now managed through a split-frame LXE console connected via AoIP to a studio WheatNet IP audio network.

Sean Ashmore, CEO of Sunshine 106.8, said, "We really liked the look of the Wheatstone LXE and how it would integrate seamlessly into our preferred workflow."

The LXE console provides scriptable soft controls, one-touch event recall and status-at-a-glance. It is configurable as a split-frame recessed into the furniture, providing users with everything they need at hand.

As an AoIP console, LXE modules are grouped into bays, which can be located in the same studio or a nearby studio and connected to the Ethernet switch using standard CAT cables. Sunshine 106.8 chose a split-frame configuration with controls left and right of an open workspace in the center for a more ergonomically appealing workspace.

More Info
https://wheatstone.com

LXE also can be configured as a single frame tabletop or recessed unit with or without meter bridge.

> **Adding to its flexibility are scripted OLED displays on each module that dynamically change at the press of a button or turn of a knob.**

Any of 25-plus functions can be assigned to just about any knob, button or fader on the LXE using a drag/drop/script GUI. Adding to its flexibility are scripted OLED displays on each module that dynamically change at the press of a button or turn of a knob to give pertinent information for the task at hand — or multiple tasks at hand.

"The ability to easily use the studio for pre-recorded segments whilst it was live on-air was a real attraction," said Ashmore.

"We also liked [that it was] AoIP and the elimination of sound cards from our playout system," he added, noting that key functions of the station's automation are integrated into the LXE console for routing and switching on or off sources, for example.

Tech Update

MiniPod Maxx Is a New Problem-Solver

Henry Engineering's MiniPod Maxx is a new version of the original MiniPod, which the company said was the industry's first "daisy-chainable" headphone system.

This new Maxx version, which retails for $195, produces 400% of the output level of the original, providing extended headroom. "The new design eliminates all electrolytic capacitors in the audio path for exceptional transient response, solid bass and ultra-low distortion," states Henry Engineering in a press release.

This problem-solver is suitable for studios with multiple talent mics. Several MiniPod Maxx units can be "daisy-chained" with Cat-5 cabling, so each announcer has their own headphone jack and volume control.

Only one unit needs to be connected to the console for all announcers to get headphone audio via the Cat-5 chain of units. "This approach eliminates the need for DAs and separate power supplies," Henry said.

Each MiniPod Maxx is a separate headphone amplifier, so any combination of headphone types can be used without interaction between units. The Maxx is compatible with the original MiniPod and all Henry Engineering "Pod" products. It's the same size as the original MiniPod and can be mounted to a tabletop or to the underside of a counter.

Info: https://henryeng.com

Tech Update

Lawo's crystal Clear Streamlines Virtual Workflows

Lawo's crystal Clear is a touchscreen-operated, software-based radio mixing interface for use with the Lawo Power Core modular I/O and DSP engine.

Running on standard Windows PCs, crystal Clear provides a virtualized control surface, supporting fixed broadcast installations as well as remote production workflows.

It is available under two Power Core license models: Console Compact (two to 14 faders) for small self-op or mobile studios, and Console MAX for up to four independent mixing surfaces. Lawo said crystal Clear offers scalable flexibility. Additional I/O such as mic and headphone signals can be integrated via a Lawo AIOX extender.

With one interface, crystal Clear consolidates playout, routing and control tasks. It employs open-standard APIs (HTML, Ember+) for native control of external systems including codecs, telephone hybrids, playout and automation software, audio editors, video sources and social media platforms.

The system offers two user modes: a simplified Self-Op view for non-technical users and a Broadcast Engineer view for advanced control.

"An Automation Assistant mode supports routine mix automation, enabling hosts to focus on content creation," Lawo states. "Assistive features include automatic mic gain, fade in/out and AutoMix groups for hands-free audio management."

Info: www.lawo.com

Tech Update

Rave! Offers Pro Performance, Compact Footprint

Angry Audio says its Rave! Radio Mixing Console packs professional-grade performance into a compact footprint.

Though sized for small studios, it promises features typically found in larger consoles, like DA outputs for both Program and Audition, plus two dedicated mix-minus outputs.

"The console offers eight stereo-capable input channels, with four equipped with discrete class-A microphone preamps," the company said.

Its preamps have "massive" gain for the weakest mics and a noise figure only 1 dB above the theoretical minimum. (The company writes: "Recording studios are envious.")

Mic gain is adjustable via rear-panel controls, and unused mic inputs don't lock out the line path; every channel remains fully usable, whether configured for mic or line.

Audio specs include more than 20 dB of headroom, dynamic range of 108 dB, and THD (typical) under 0.0007%. Crosstalk and stereo separation exceed 75 dB at 10 kHz.

The console has smooth, long-life faders, Burr-Brown op amps, and avionics-grade illuminated switches. They are housed in a steel chassis with a laser-engraved, anodized aluminum surface.

Flexible monitoring and talkback features include headphone outputs with both 1/4-inch and 1/8-inch jacks, a guest feed that powers a daisy-chain of external headphone amps, split cue for headphone monitoring, and dual LED meters for Program and Audition.

The external power supply is fanless, housed in a steel enclosure, and designed to keep heat and noise out of the console.

Rave! is priced at $2,199. A StudioHub cable kit is available for $499 to speed installation.

Info: *angryaudio.com*

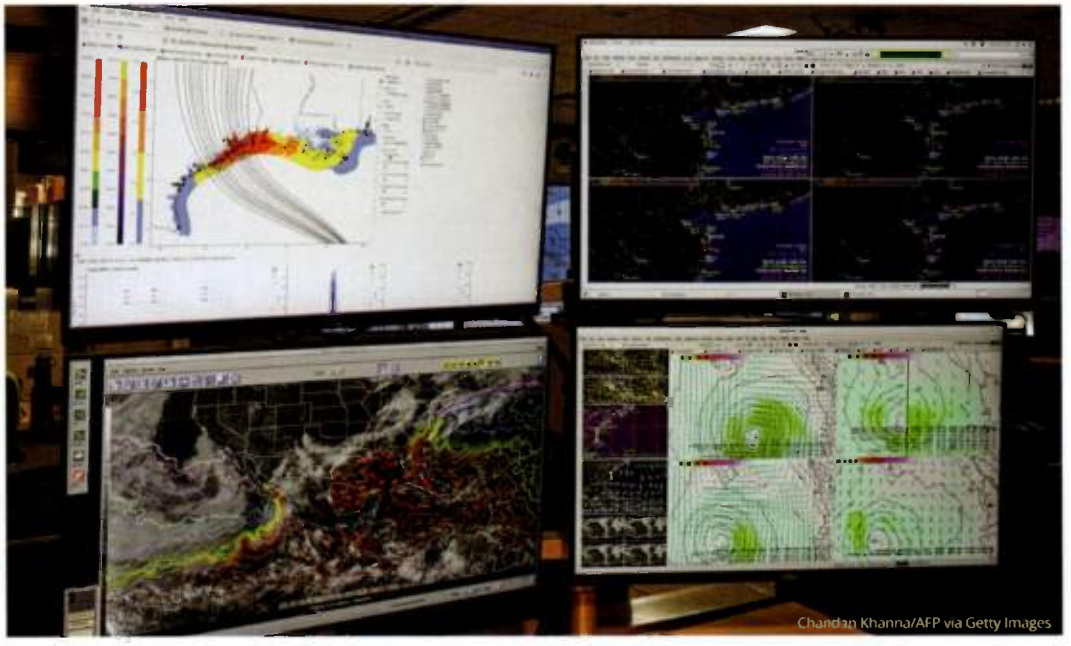
BROADCAST EQUIPMENT EXCHANGE

BROADCAST EQUIPMENT EXCHANGE

It's hurricane season again in the United States

These 10 steps, courtesy of the NAB, can help you be ready

In 2018 the National Association of Broadcasters published a guide to help broadcasters prepare their facilities and operations so they can stay on the air during disasters such as hurricanes. Larry Wilkins, director of engineering services for the Alabama Broadcasters Association, recently reshared those tips, lightly edited:


Chandan Khanna/AFP via Getty Images

Above
Monitors display hurricane models during a news conference in May at the National Oceanic and Atmospheric Administration's National Hurricane Center in Miami.

Radio and television stations play a unique role as first informers during disasters, providing breaking news alerts and round-the-clock reporting to keep their communities safe before, during and after. It is critical that broadcasters plan ahead to safeguard their facilities and staff in case of an emergency.

STEP 1: Prepare a Disaster Recovery Plan

Convene a cross-section of staff. Engineers should identify operational and technical risks. Your news team should plan for continuous coverage and remotes. The GM will oversee staff safety, training and communications, while station ownership should champion a commitment to planning.

The plan must address certain factors across natural and man-made scenarios. This includes risk assessment; critical equipment, systems and services; staff roles and duties; external and internal communications; staff training and safety; providing emergency news to all segments of your audience; and periodically reviewing, distributing and testing your plan.

STEP 2: Review Your Risks

What are the most likely emergencies that could impact your station?

Are you in a flood zone? Research the high-water marks in your area, and don't forget about nearby dams that could break.

If hurricanes or tornados are common, prepare your facility for high winds and extreme rain. Check for nearby tall trees or rock formations that could cause damage.

What's at Risk?

- People — Your staff is a station's most important asset. Make a plan that keeps your staff and their families safe during emergencies.
- Facility — Review the security, reliability and redundancy of your tower, antenna, transmitter, microwave and STLs and any other system needed to stay on the air.
- Supply chain — Make sure your station is prepared for power failures and equipment breakdowns.
- News delivery — Plan for alternative methods of reporting and distributing programming.

STEP 3: Engage Station Leadership

Ownership and management set the priorities of a station. Their commitment lets staff know that devoting time and money to disaster planning is valued. Leadership can also provide a holistic view of a station's many functions, identifying connections among departments that may be vulnerable. Station leadership can also address other important risks like damage to a station's image or reputation.

STEP 4: Expect the Unexpected

Focus on single points of failure that could knock your station off the air. Ask yourself:

The studio must be evacuated. Can you broadcast from another location? How will you get there? How long will it

How to submit
Radio World welcomes comment on all relevant topics. Email *radioworld@futurenet.com* with "Letter to the Editor" in the subject field.

take to restart operations? Can you originate programming from there?

Do you have a backup tower or auxiliary transmitter, or another way to broadcast?

Microwave, fiber or STL links are lost. Can you receive or deliver content another way?

Phone or internet access go down. Do you have a plan for communicating with staff, local public safety and clients?

Electricity is lost or equipment breaks. Do you have a backup generator and a fuel contract to keep it running, for both the studio and transmitter?

Have you made arrangements with vendors and contract engineers for a first right to obtain goods or services?

Your server is corrupted. Do you have backup files off-site?

STEP 5: Programming Continuity

Broadcasting is never more important than during an emergency. Make sure you can deliver the news even if your station goes down. Have a plan in place to carry programming from a network or other local station or simulcast on another station. Make plans to stream your programming even if OTA is down.

STEP 6: Simple Fixes Make a Difference

- Use glass with a high safety rating in windows and doors.
- Tether equipment racks securely.
- Use safety chains to secure heavy objects like speakers, monitors and lights.
- Anchor computer monitors to desktops.
- Bolt critical workstations to the floor or walls.
- Keep cars and remote equipment in multiple locations.
- Secure your facility: surveillance cameras, door entry keys and locks, fencing, perimeter security and reception security.
- Maintain backup data and records off-site.
- Schedule routine maintenance of all systems and equipment.

STEP 7: Staff Safety and Communications

- Identify and mark locations in the facility for shelter-in-place.
- Store essential supplies: food, water, batteries, bedding, battery-powered radio, NOAA radio, flashlights, first aid kid, dust and filter masks, sanitation needs, tools, plastic sheeting and duct tape. Make sure at least one employee is trained in first aid.
- Encourage staff to keep a "go kit" at work for clothing, medications and toiletries.
- In case of evacuation, make a plan for communication with staff, including a process for checking in.
- Keep contact information on hand for local public safety and emergency management agencies, as well as clients and vendors.
- Keep important documents in a portable waterproof, fireproof safe, including building plans, insurance policies, employee information and bank account records.

STEP 8: Training

Periodically train your staff on the disaster recovery plan. Use a quiz or other exercise designed to make sure everyone knows their role. Certain staff may be unavailable when disaster strikes, so cross-training is essential:

- Train back-office staff and management for on-air and production operations like call screening, board operations, field producing, reporting and emergency announcement processing.
- Train board operators to make simple technical repairs.
- Make sure multiple employees know how to process emergency alert system messages.

STEP 9: Test the Plan

Drill various scenarios:

Loss of master control operations:

- Switch to newsroom or production studio
- Use remote vehicle to provide on-air programming
- Imminent threat to station facility

Evacuation and meet-up site

- Move operations to another site or remote vehicle
- Maintain communications among staff
- Safe shelter-in-place location

Transmitter failure:

- Switch to backup antenna
- Simulcast on another station

Server failure:

- Auto backup material
- Switch to alternate server and file recovery steps

STEP 10: Insurance

Explore the various kinds of insurance that may help you recover from a disaster.

- Property insurance may compensate for building damage, internal water damage, electrical malfunctions and theft.
- Flood insurance availability may depend on your location. Internal flooding caused by broken pipes, leaking roofs and accidental spills is likely covered by property insurance.
- Loss of income or business interruption insurance may cover temporary needs like renting equipment to continue broadcasting and security personnel.
- Marine insurance is used to underwrite broadcast equipment like towers, transmission lines, transmitters, STLs and remote equipment.
- Cybersecurity insurance can help cover losses related to cyber disruptions of service.

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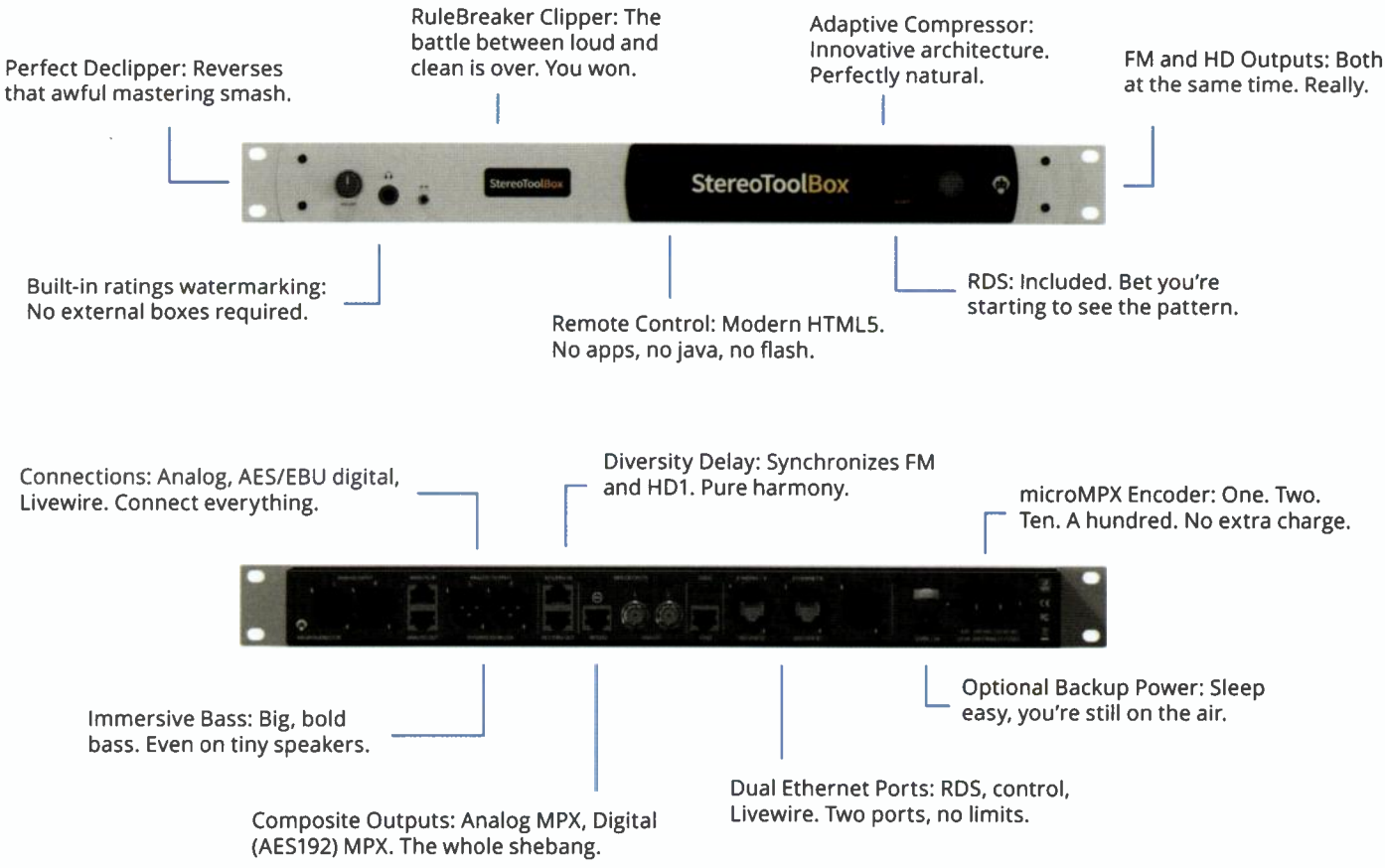
Remember when radio was fun? When beating the competition wasn't just a numbers game—it was a sound game. When tweaking your processing chain felt like tuning a race car. When you'd lean back, listen, and feel that rush—knowing your station sounded bigger, cleaner, louder than anyone else on the dial.

We remember, and we're here to bring that feeling back. StereoToolBox isn't just another processor—it's the one you've been waiting for. The one that makes radio exciting again. The one that crushes those $10K+ processors—for less than half the price. The one that puts the power back in your hands. No upcharges. No missing features. No shenanigans.

Put it on your station, and you won't just be in the race—you'll own the dial. Or, sure... blow $10K on their best and still get beat. Go budget and enjoy the sweet sound of compromise. Or get StereoToolBox and have it all. Your call.



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