



# RADIOWORLD

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## GBS Gathers Support for Geo-Targeting

But big groups caution the FCC that more real-world data is needed first.

### TECHNOLOGY

BY RANDY J. STINE

One of the topics for debate among technology leaders this spring — when they weren't talking about face masks or hurriedly setting up remote operations — has been whether the Federal Communications Commission should allow zoned programming for FM stations in the United States.

The National Association of Broadcasters gave qualified support to the general concept but voiced concerns over potential interference. Separately, four prominent radio groups told the FCC that much more real-world data is necessary before the commission should even proceed to a notice of proposed rulemaking.

One veteran industry observer said the concept if approved could spark a "booster boom," resulting in an increase in the number of booster facilities and modifications to existing boosters.

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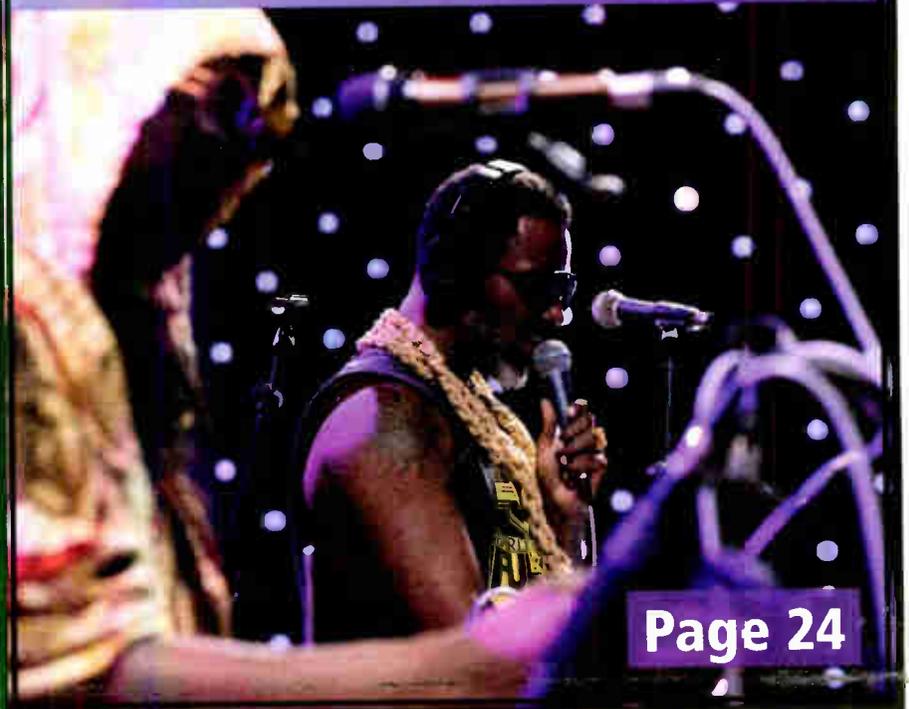
The signal of an FM booster is used to strengthen reception within a station's coverage contour on the same frequency as the primary station. Under current rules the booster must retransmit the same programming of the pri-

mary station.

Chicago-based GeoBroadcast Solutions, the company advocating the use of boosters to deploy geo-targeted content within specific parts of stations' over-the-air coverage areas, petitioned

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## Inside "Live at KEXP"



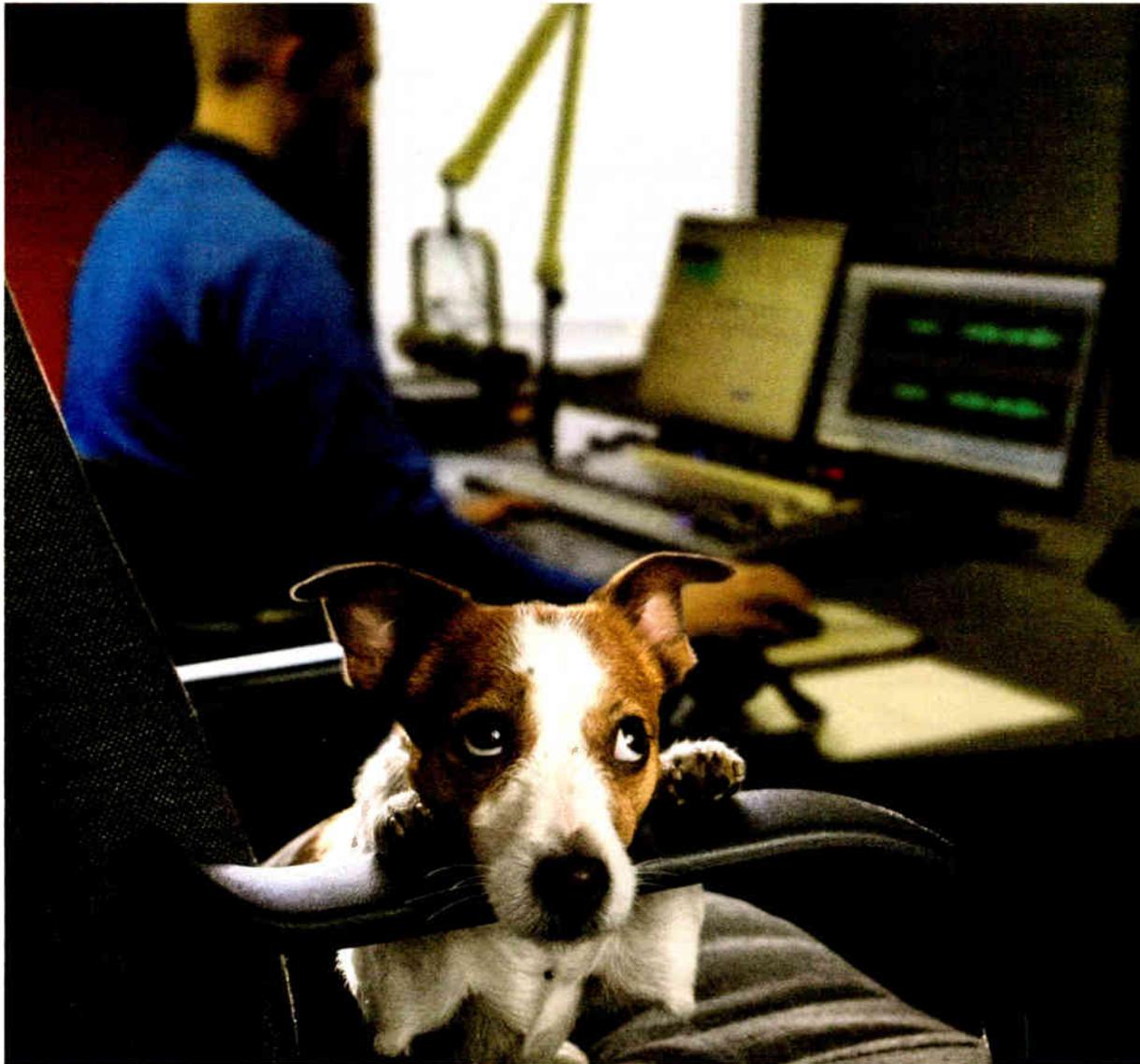
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# Infinite Insights Into Audio

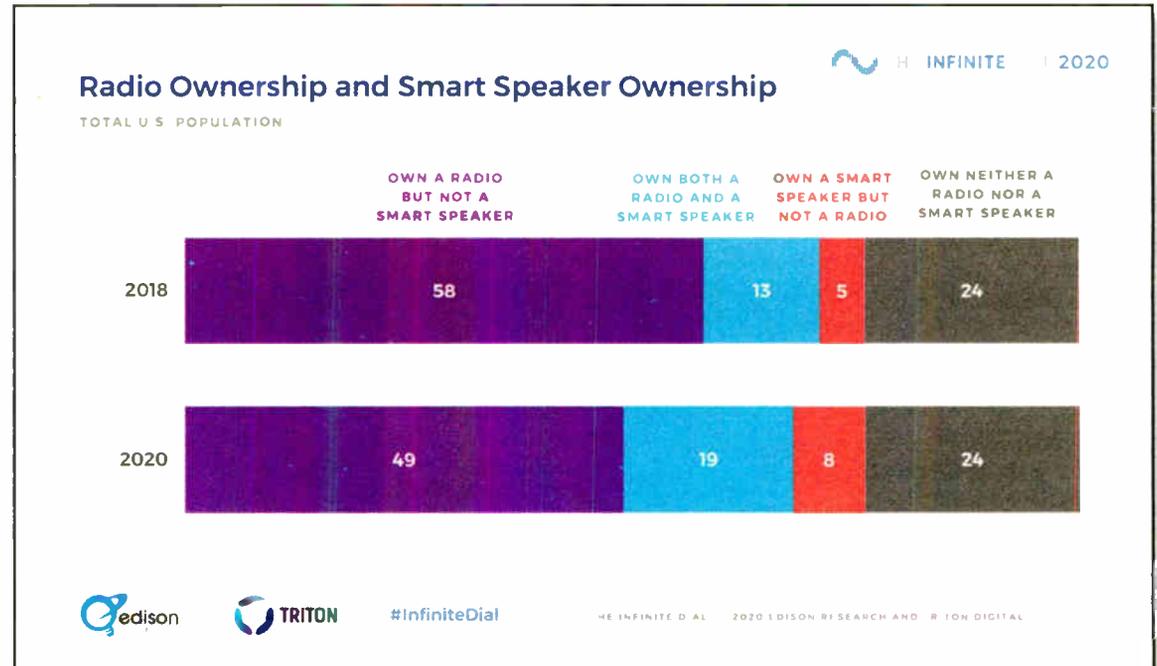
A small but growing percentage of Americans own a smart speaker but do not own a radio.

That's one of the insights to be culled from the Infinite Dial report that was released this spring by Edison Research and Triton Digital.

As show in the chart, the percentage of the population with a smart speaker and no radio grew

regularly, up significantly from 2019. Podcasts now reach over 100 million Americans every month and are attracting an increasingly diverse audience.

- Audio is growing in importance with 62% of Americans saying they have used some kind of voice assistance technology.



from 5 to 8 percent over two years. Another 24 percent own neither smart speaker nor radio, which held steady.

The Infinite Dial survey covers consumer usage of media and technology while tracking new media as they develop. It looks at digital audio and podcast consumption in addition to mobile, smart speaker and social media usage. The study of Americans age 12 and older uses a random probability telephone sample comprising both mobile phones and landlines.

Here are some of the findings:

- More than one-third of Americans age 12 and over (104 million) are consuming podcasts

- 18% of Americans age 18+ own a car with an in-dash information and entertainment system.
- In 2020, smart speaker households owned an average of 2.2 of the devices, up from an average of 1.7 just two years ago.
- 32% percent of those in the U.S. age 12-34 use Facebook most often, down from 58% five years ago. Twenty-seven percent of those in the U.S. age 12-34 use Instagram most often, up from 15% five years ago.

You can access the data and watch a webinar about it at <https://www.edisonresearch.com/the-infinite-dial-2020/>.

## Dennis Wharton Will Depart NAB

A Radio World tip of the hat goes to Dennis Wharton, who retires from the National Association of Broadcasters at the end of June.

As executive vice president of communications, Wharton is a 24-year NAB veteran and the longest-serving spokesman in the organization's history. He joined it in 1996 as vice president of media relations and in the intervening years has overseen departments that include Media Relations, Research and Public Service. Prior to NAB he had a 16-year journalism career in Ohio and as Washington bureau chief for Variety.

In the announcement, Wharton reflected that he has been "in the catbird seat for countless moments in broadcast history" including the launch of HDTV, radio performance royalty fights, "wardrobe malfunctions" and media consolidation battles. He expressed pride in the "unparalleled public service of local broadcast stations, which has been on prominent display during the COVID-19 crisis."

NAB will merge the association's Communications and Marketing Departments into a new Public Affairs Department that will be led by NAB's Michelle Lehman. She named Ann Marie Cumming, senior vice president of communications, to serve as the primary spokesperson of the organization.



# Collaboration Is at an All-Time High

A perspective on remote broadcasting from a college radio station manager

## COMMENTARY

BY JENNA MANGINO

*The author is station manager of KTSC(FM) Rev 89 at Colorado State University-Pueblo. While developing Radio World's new ebook "Broadcasting From Home, Around the Globe," we asked Mangino how she thinks radio operations in the industry will be permanently changed as a result of this health crisis.*

I think, going forward, people are realizing how much they can accomplish remotely. For some, the task may take two or three times longer, but as we continue to work remotely, I think it will eventually get easier.

I definitely see remote operations continuing for the future. Radio does not need a lot of space to function. The key to radio's success as a medium has always been based on our ability to adapt. This pandemic has only empha-

sized that feature. We can be nimble, figure out solutions on the fly, work on shoestring budgets, develop our own work-around solutions, and the audience

what is needed in order to keep air talent safe, so long as the mic, equipment and surfaces are disinfected properly and pop-filters are changed frequently.

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**The key to radio's success as a medium has always been based on our ability to adapt.**

---

has no idea (for the most part) of what it actually took to make the broadcast happen.

Radio is also able to socially distance successfully. For some local stations, the on-air talents have been reduced from a full roster of talent to one or two people working on air for a few hours each day, and then people outside the city track the remainder of the schedule. This is not a new idea; this has been happening in broadcasting for decades.

The confined studio is now exactly

Given the transitions of audio over IP, networking is becoming a vital part of day-to-day radio operations. The combination of a traditional broadcast engineer and computer information systems engineer has shown that radio can operate anywhere, as long as there is bandwidth available and the transmitter is running.

### MORE COLLABORATION

Doing shows remotely has never been easier. Hosting guests for public

affairs shows is easier to schedule as well considering they're working from home too, and they can adjust their schedule and call in from the comfort of their home.

Future studio designs could include the typical producer-studio separated by glass, but guests could be set up in the producer's studio so that they maintain social distancing and are protected by the glass window.

For sales, reporters and talent, they're showing that they can work remotely in the field or from home. As long as they have adequate equipment and bandwidth, they can meet with clients and close the sale from their home. Sources can be recorded on Zoom, many stations have audio/video sharing agreements so all stations get the same information. There's more collaboration between stations because everyone is facing furloughs and layoffs, and everyone in media knows what it's like, so information-sharing and collaboration is at an all-time high.

The most sobering wakeup call is that station owners are seeing their staff continue to produce excellent work, and ratings are increasing, as everyone is at home and remembering that radio is still free, doesn't require bandwidth (smart

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**THIS ISSUE**

MAY 27, 2020

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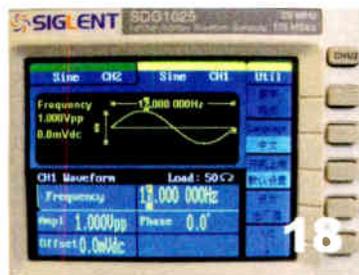


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speakers and streaming aside), and is local and reliable. As good as that sounds, it shows owners that if they can hire the right people who can do multiple jobs, the pressure will be on those fortunate enough to land a position in media to do more.

Open work areas are not needed in the future. The overhead of rent and utilities combined with the FCC eliminating the main studio rule will result in more and more employees being encouraged to work remotely. The small investment of

to create voice tracks, drop them into the system and have them inserted into the WO system instantly.

KTSC, a non-commercial student-operated 8,000-watt radio station, has been broadcasting since 1970, and will celebrate its 50th anniversary this fall. It is part of the media communication department at CSU Pueblo and "trains students to work in a pressurized, real-world environment to prepare them for a career in the industry."

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# New Master Antenna System Serves D.C.

Combined FM installation features a four-bay, three-around ERI panel

## PROJECT PROFILE

Washington, D.C., has a new master FM antenna system looking down on the city from high ground around the American University campus. In addition to a big new panel, the job added new antennas for two other stations. Radio World talked with Rob Bertrand, WAMU's senior director of technology, about the recently completed project.

**Radio World:** Where did this take place?

**Rob Bertrand:** The project took place on the 419-foot broadcast tower on the campus of American University in Wash-

**RW:** Describe the scope of the job.

**Bertrand:** The AU Tower has been the home to multiple FM stations since the 1960s. Additional stations were added in the 1970s and '80s, with a final station in the early '90s.

It is the primary broadcast home to WAMU, American University's NPR station; Hubbard's WTOP; Urban One's WMMJ; and Pacifica's WPFW.

WAMU and WETA also provide reciprocal aux sites for one another, so WETA has an aux presence on the tower. They had been sharing the WAMU backup antenna but will now be part of the combined antenna.

WAMU joined the WETA combined antenna in 2019 in preparation for this project. Finally, WPGC (Entercom) has

in the market. Because they've done so well, Urban One leadership was hesitant to join the new antenna system, though they opted to replace their 30-year-old antenna as part of this process.

**RW:** Why was the new system necessary?

**Bertrand:** When the current array of antennas on the tower-top pole were erected in the early 1990s, these were fundamentally different stations in terms of community impact. WAMU was a tiny bluegrass station, routinely ranking toward the bottom of the ratings in the market. The station that is WTOP(FM) today was WGMS, a classical station that held its own often around the #15 mark, but was hardly



Photos by Peggy Miles except as noted

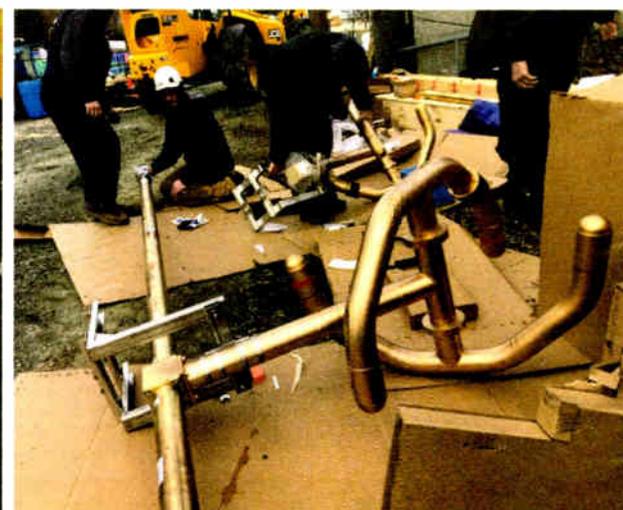
The new antenna systems atop the AU Tower serve six FM stations in the nation's capital.



WAMU Senior Director of Technology Rob Bertrand, center, stands with station Director of Engineering Andy Gunn and ERI President/CEO Tom Silliman.



The new panel system is maneuvered through campus.



Assembling the SHPX antenna for WPGC, to be mounted above the panel.

ington, D.C. I'll call this the "AU Tower."

**RW:** Make and model of the antenna systems?

**Bertrand:** The new panel antenna is a four-bay, three-around ERI Cogwheel antenna that serves WAMU, WTOP, WPFW and WETA. There is a new ERI SHPX Rototiller in place for WPGC and a new ERI LPX Rototiller for WMMJ. The combiner is all new; it was designed, built and installed by ERI.

maintained an aux presence on this tower since the early 1990s.

What is interesting about this group of stations is that WTOP and WPGC are both directional, which meant that not everyone could join the master system. However, ERI devised a method for WTOP to meet its required directional pattern into the left-hand circularly polarized input to the new antenna system, with the master combiner feeding the right-hand CP input.

WPGC is highly directional, as it's licensed to Prince George's County in Maryland. Its antenna was upgraded, but it remains separate from the directional system on a mast up above the new antenna.

WMMJ, a Class A station, has had such incredible ratings success from its standalone antenna. In fact, WTOP, WAMU and WMMJ often switch places in the ratings for the #1, #2 and #3 spots



Photo by Rob Bertrand

ERI field technicians assemble part of the four-station FM channel combiner. It feeds the master FM antenna, which includes dual inputs; one is nondirectional for WAMU, WETA, WPFW and to provide auxiliary facilities for WTOP(FM), the other input is directional and will be WTOP's licensed main antenna. The site also includes new antennas for WMMJ and WPGC.

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The tower before the new pole was installed.



Photo by Peggy Miles

at the time, which was next door to the studios, I had a hard time receiving the station. This is two miles from the tower at that spot, and the ability to receive the station varied widely from one day to the next. Far away from our six-bay antenna, the station performed well to the north; but close-in and to the south we did not do well.

Finally, American University decided that it was time to decide once and for all what to do with this unique non-core asset sitting on its campus. Should they keep it or sell it? And if they kept it, who should run it? We pitched the

idea of running it and performing this upgrade, with the goal of achieving full ROI in less than 10 years.

**RW:** How was the work managed?

**Bertrand:** WAMU led the project and managed it from concept to final construction. WTOP was a key partner and they were also an equal shareholder in financing the costs directly related to the antenna and its installation. It was unique that these two giant competitors worked so well together on this project, but from top management to the engineering teams, we all knew it was in our

mutual interest to build the best facility we could, together.

WAMU has ultimate ownership of the antenna, but WTOP is a major "shareholder" in the system because of their investment. The other antennas are owned by their respective stations and parent companies.

**RW:** What was the project budget?

**Bertrand:** The project in total cost \$2.8 million, excluding the rototiller antennas and their transmission lines. The project included a new shelter from VFP

(continued on page 8)

Work remotely,  
broadcast reliably.

Photo courtesy of Sean Caldwell

the powerhouse WTOP is today. WTOP and WAMU currently lead the market, locally and nationally, within commercial all-news and public radio, respectively. They are massive stations.

In the legacy build, rather than opt for a costly master antenna, WAMU was built as a six-bay on the tower-top pole. WGMS was a three-bay directional, interleaved with the top three bays of WAMU on one side of the pole. WMMJ's two bays straddled WAMU's bottom bay. WPGC towered above all of them with its own directional antenna.

It was a mess. It made sense in the early 1990s given the economic realities for all these stations, but as they evolved into market leaders, they were sorely in need of "getting out of each other's way" and an upgrade to an antenna system that would maximize audience for each station.

On top of that, these antennas were built on a "stepped" pole with the largest diameter at 16 inches OD and the narrowest at 6 inches. It was just a difficult situation.

Multiple driving measurement tests were performed over the years. We did one in 2017 with WTOP over the span of 900 miles of driving loops around the DC region. The test made clear what we had suspected: Each station was underperforming to the "opposite" side of the tower top pole — which was also the location of the adjacent antennas.

When I moved to the market in 2016 to join WAMU as its technology head, I was so surprised that at my apartment

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# MASTER FM

(continued from page 7)

beneath the tower to house the combiner system as well as massive reinforcement and reconstruction of the tower from top to bottom. It also included replacement of that stepped pole with a uniform-diameter pole with massively thick walls for stability. There were also additional costs local to individual stations related to these changes. All in it probably clocks in just north of \$3 million if you tally everyone's respective investments.

**RW:** What are the other critical components?

**Bertrand:** The system has a four-station combiner for WAMU, WPFW, WETA and a unique low-power non-directional aux for WTOP.

WTOP has the ability to broadcast at full power from its directional input to the system or at lower power via the combiner as a backup, in case anything happens to its directional infrastructure.

The system also includes the requisite bandpass filters for the non-combined stations as well as a versatile patch panel system for lockout/tagout and emergency operation.

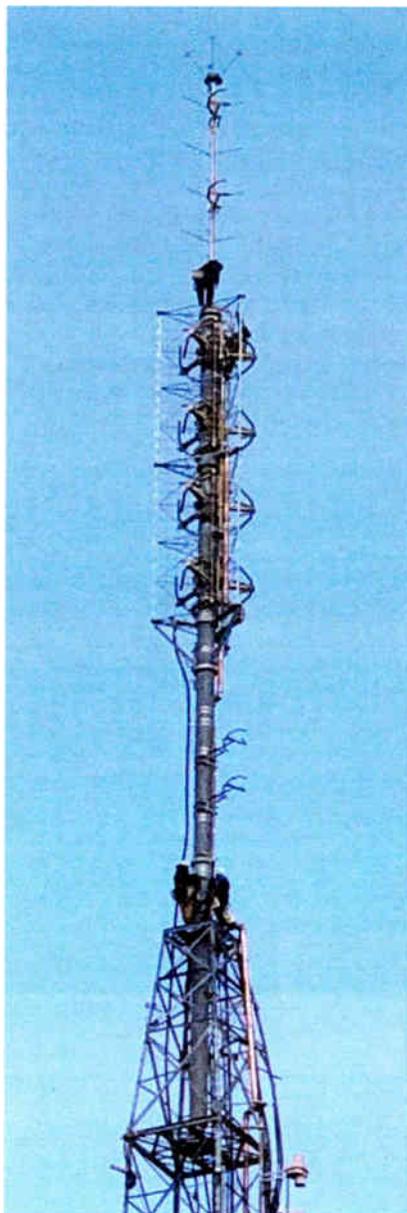
**RW:** What other key players were involved?

**Bertrand:** Vertical Technology Services of Hagerstown, Md., performed the tower structural modifications and removed the old tower-top mast and installed the new mast. They also installed the custom cogwheel antenna and support structure, as well as the two additional single-station rot-tiller antennas.

The structural engineer of record was Richard Dyer of Morris Ritchie Associates. James Ruedlinger, who heads the structural division for ERI, designed the tower modifications and the complex rigging plan. Bob Clinton of Cavell, Mertz & Associates was the FCC consulting engineer and contributed to our antenna design process, as well as handling the FCC applications for most of the stations.

The general contractor for ground support was Network Building & Construction services, who primarily supports cellular buildouts and was adept as a permit expeditor with the District of Columbia as well as supporting building the temporary roadway and ground support needed for the tower crew. Our new combiner shelter was designed and built by VFP shelters of Salem, Va. Paul Shulins and Dave Wing of Shulins Solutions did the installation of the Burk Arcturus system, which was engineered by Mark Raymond and Chuck Alexander of Burk Technology.

**RW:** What other technical aspects of



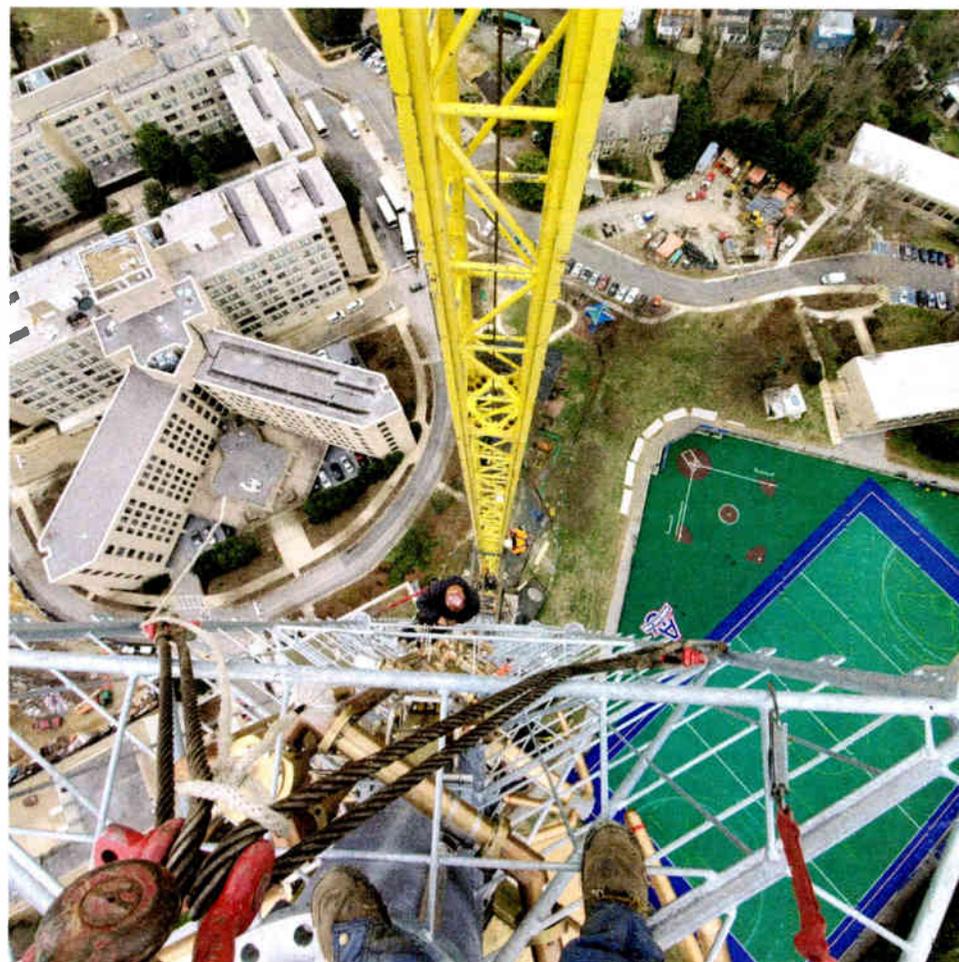
The tower with the new pole and antenna systems.

*the project will Radio World readers be interested to know about?*

**Bertrand:** We have installed the Burk Arcturus system to provide VSWR protection and full monitoring of the system, such as line pressures and temperatures. We were drawn to Arcturus because of our familiarity with the Burk ARC Plus platform and its hardware, as well as the promise of predictive analytics.

We're monitoring everything from VSWR at all the inputs and outputs of the system, line pressures, every dehydrator parameter including run-time of the redundant pair, line temperatures, to external temperatures and security parameters.

The goal is to be able to develop a complete picture of normal system operation across all seasons and be able to trend anomalies over time before they become major problems. The Arcturus also manages interlocks for the full facility and will automatically disable transmission based on which transmit-



A dizzying look down from 400+ feet.



Crew foreman Craig Fowler of Vertical Technology Solutions poses with the remains of the old tower pole that has just been extracted from the top of the tower.

ters are switched to which antennas, depending on where a VSWR condition is detected.

We welcome story suggestions about your own studio, RF or IT project. Email [radioworld@futurenet.com](mailto:radioworld@futurenet.com).

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# IP Studios for Managers

Or, what you need to know before you say "yes"

## COMMENTARY

BY CLARK NOVAK

*The author is Radio Marketing Specialist for Lawo AG.*

When broadcasters begin to discuss building studios using AoIP, the subject turns rather quickly to esoteric engineering topics like switch selection, console specifications and packet redundancy.

But for station managers, these fine details pale in comparison to a bigger question: namely, "Why should I approve this expense?" There are lots of answers to that question, but let's cut to the bottom-line: AoIP networks save money.

### THE BOTTOM LINE

New facilities built on an IP backbone cost less than traditional studios because they use the same inexpensive, off-the-shelf Ethernet switches as computer data networks. That means that the tech at the center of your facility is no longer proprietary: it's a commodity, with all the price advantages that implies.

It's also future-proof — computer networks are easily scalable and flexible: once audio is turned into data, it can be sent anywhere — across the building, or across the world. Lower cost and more flexibility are two big advantages that have made IP the standard for radio and TV stations across the globe.

Let's look at some of the specific ways

that choosing AoIP for your new studio will benefit your daily operations.

It bears repeating: studios that use AoIP infrastructure are money-savers.

How? First of all, the cost of wires and cables are dramatically reduced. In analog or older digital facilities, every audio signal had to travel over

its own pair of dedicated cables. By comparison, AoIP carries hundreds of bidirectional stereo channels on one Cat-6 Ethernet cable. And that Cat-6 can also carry data from your traffic and scheduling systems at the same time, further simplifying infrastructure and reducing cost.

Nearly all of today's radio equipment has an AoIP connection built in, which means one cable is all that's needed to connect a phone system, satellite receiver — even a transmitter! All of which translates into faster installation with lower costs.

### BENEFITS

AoIP networks also save thanks to their natural affinity with studio computers. Your mixing console can finally talk directly to the PCs used for recording, editing, production and playout — which means that the cost of expensive professional sound cards, line input cards and A-to-D converters is eliminated. Audio signals can also carry metadata for HD Radio and web-stream "now playing" info, or for visual radio channels.

Scalability is a big benefit of IP networks. If you've built studios before, you probably remember that as soon as they



RadioFR and La Télé produce programming in the all-IP-based radio and TV media house Mediaparc in Fribourg, Switzerland: SMPTE 2022-7 in an ST2110-40 environment — AES67 and Ravenna, 24 hours in live operation.

KISS FM, a popular radio station of Radio Africa Group in Nairobi, Kenya, operates with virtual radio IP technology.



Astro Radio's Vice President, Engineering and Technology Bala Murali in the HITZ on-air studio.

were finished, an unanticipated need popped up: a new station added to the mix, another production room needed, more capacity for syndicated programs.

In the old days this meant expensive cable bundles, patch bays and punch blocks; with AoIP, adding capacity is as simple as plugging new gear into the network switch. And since Ethernet switches are routers at heart, an IP studio network lets you immediately route audio from any studio to any other studio, instantly.

### AES67 provides a common tongue that IP products can speak regardless of the manufacturer.

You've probably noticed that TV is embracing IP in a big way. Television stations have been steadily moving to IP production infrastructures, which means an AoIP network in the radio suite can finally share audio seamlessly with the video facilities. Modern mixing engines used in today's radio consoles can easily extract audio from the SDI and MADI formats used by television, and radio content can be routed to TV master control in an instant.

#### WHAT'S AES67?

Today, most manufacturers' AoIP gear interconnects, but it wasn't always so. In the early days, every console maker used their own proprietary protocol — meaning you were locked into that vendor's "walled garden" of products. This didn't always sit well, and for a good reason: you should be able to choose the equipment that best suits your needs, without artificial limitations.

The AES67 AoIP standard, ratified by the industry's leading technology companies, is the answer. AES67 provides a common tongue that IP products can speak regardless of the manufacturer. Most companies have added it to their products, but not all. Before you sign on the dotted line, be sure that your AoIP equipment is 100% AES67-compliant.

#### CONCLUSION

If you're thinking about going IP, now is a great time. The document-



Astro Radio in Kuala Lumpur, Malaysia, uses IP-based radio tools: the control surface is software, driven by a multitouch interface on a high-resolution computer display. LITE channel host Soraya is pictured.

ed cost savings of this proven technology, coupled with ease of installation and maintenance, expansion-on-demand and the interoperability of AES67-compliant equipment makes AoIP ideal technology upon which to base modern radio studios — an investment that will continue paying off long into the future.

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Artist	Title	Time	Genre	Type
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70009	Subway	Spent	0:52	SR
10008	Subway	Efforts	0:22	SR
00066	South Great Heights	Postal Service	4:23	SR
00041	SummerTime Jingle	Jingle	0:28	SR
70001	Suchi	Spent	0:44	SR
90002	Suchi 2	Crashback Christmas Ball	4:28	SR

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## GEO-TARGETING

(continued from page 1)

the commission in March to consider the technical feasibility of its system, renewing an effort that goes back at least eight years. The commission then asked for industry comments about whether to take next steps.

GBS says its technology, marketed under the name ZoneCasting, would allow FM broadcasters to do “hyper-local programming, advertising and emergency alerting,” or what it calls geo-fencing audio delivery. The company asserts that radio is the only mass medium that cannot geo-target its content. It favors a “voluntary, market-driven” transition; and says its zoned coverage would not cause harmful interference to neighboring FM stations or to the primary station.

“The ongoing evolution of ZoneCasting and its ability to geo-target an analog or HD radio signal is made by arranging transmitters in a cluster to allow programming in the zoned area to break away from the main signal and transmit geo-targeted content,” the company states in its promotional material. “ZoneCasting works as a Single Frequency Network (SFN) deployed to boost the signal from the main transmitter to the booster nodes.”

Launching the technology would only require one change to a subsection of the rules on boosters, it wrote in its petition for rulemaking in March.

The proposed revision adds the following language: “The programming aired on the FM broadcast booster station must be ‘substantially similar’ to that aired by its primary station. For purposes of this section, ‘substantially similar’ means that the programming must be the same except for advertisements, promotions for upcoming programs and enhanced capabilities including hyper-localized content (e.g., geo-targeted weather, targeted emergency alerts and hyper-local news).” Such “fenced zones” could also be used for traffic information and second language programming, GBS has said.

GeoBroadcast supports its argument for using the geo-fencing audio technology by citing “interest and demand” by broadcasters and advertisers. It says research by BIA Advisory Services found that more than 90 percent of local retailers would spend more on broadcast radio advertising if zoned advertis-

ing were available. The study purports to show that “two-thirds of national advertisers indicated their interest in zoned broadcast coverage,” according to GeoBroadcast.

For precedent for its proposal, GeoBroadcast pointed to the FCC’s 2017 authorization to allow television broadcasters to use the Next Generation TV standard, also known as ATSC 3.0, which it said allowed for a higher level of service and benefits for consumers.

“Zoned broadcast coverage can be deployed without causing any interference concerns and without consumers having to buy any new equipment,” according to the filing, “since the signals can be received on existing radio receivers.” And when not operating in geo-targeting mode, the primary station’s signal is amplified, thus

**We are encouraged** by the amount of support we received from the broadcast industry, as well as the advertising and public safety sectors.

— *Bill Hieatt, CTO of GeoBroadcast Solutions*

improving the signal in the area covered by the boosters at all times, it said.

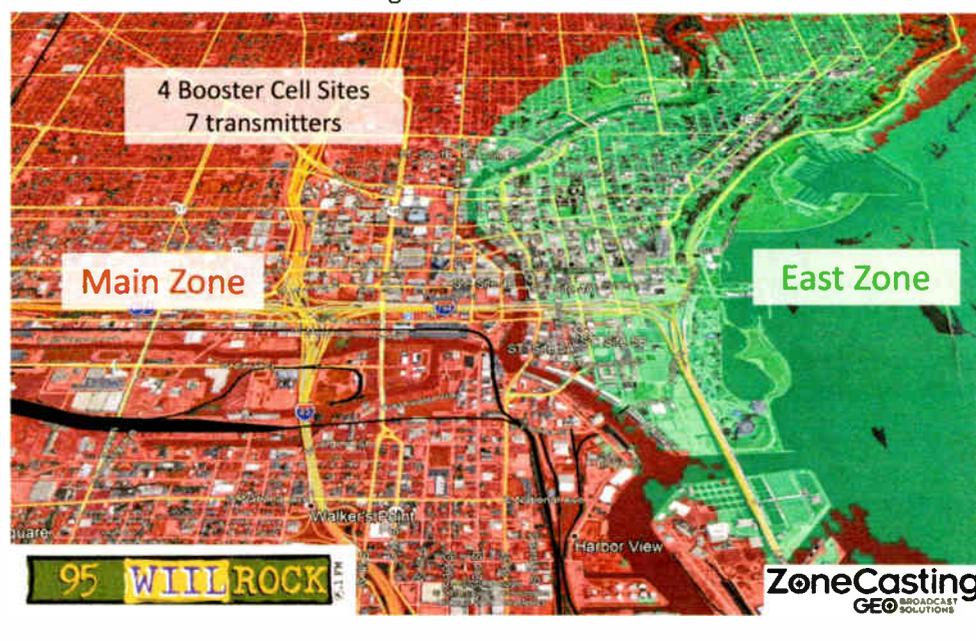
The company says it has studied zoned broadcast coverage for a decade. Indeed, the commission did issue a notice of proposed rulemaking regarding the company’s technology in 2012 and collected comments, but took no further action at that time.

Now it says its development work through simulations and modeling, as well as test work including a five-site network at Entercom’s KWFN in San Diego, demonstrate that the concept works. GeoBroadcast has used “extensive network design work at NPR Labs to identify the power and height for the ZoneCasting boosters under a variety of primary station types and terrain conditions,” according to its filing.

“Field tests have shown that deployment of ZoneCasting does not result in harmful interference within the SFN either between the primary station and boosters or among the booster cluster itself,” it said.

Bert Goldman, president of Goldman Engineering Management, wrote in the GBS filing that “the ZoneCasting technology that broadcasters could deploy

### WIIL Milwaukee ZoneCasting™ Test 2017



GeoBroadcast Solutions says it has performed three ZoneCasting tests under FCC experimental operation. For WIIL(FM) in Milwaukee the main zone is shown in red on the left and the increased zone is shown in green. GBS said this design is being used full-time in France.

tion for a level playing field in the broadcast industry and excitement for the ability to add localized weather and traffic, news, advertising, and emergency alerting during short parts of a broadcast hour, and the benefit it will offer listeners, small businesses and advertisers.”

Among those commenting in support, Sky Media LLC, licensee of KPKK(FM) in Amargosa Valley, Nev., wrote that it would “utilize zoned broadcast coverage to provide targeted emergency alerts, local news and public interest programming and localized advertisements responsive to the needs of small business.”

Another small broadcaster says the technology would bring numerous benefits to consumers. “Zoned coverage would make radio much more attractive to small businesses, who would be able to reach their targeted audiences more effectively and efficiently as well as local political candidates and local groups wishing to discuss localized issues affecting contiguous neighborhoods,” wrote Ashley Communications Inc., licensee of KLCY(FM) in Vernal, Utah.

The Multicultural Media, Telecom and Internet Council commented that “the ability to geo-target content on radio will be especially beneficial to minority broadcasters and their advertisers.”

Emmis Communications, which owns six FM and two AM radio stations, is in support, according to a letter to FCC Chairman Ajit Pai.

“From our company’s experience, this kind of geo-targeting could bring real benefits to the radio industry since it has the potential to address one drawback of

(continued on page 14)

does not raise any technical concerns” that should hold up commission action (see sidebar on page 14).

He told Radio World in an email the system uses the Synchrocast feature of GatesAir Intraplex codecs. “There is no other source that I know of which could supply that tight of a timing synchronization unless an RF STL link is used, but they typically use IP-based delivery,” Goldman wrote.

ZoneCasting currently works only with analog FM, but GeoBroadcast is working toward compatibility with digital radio systems, Goldman said.

The company’s ongoing testing “demonstrates the HD signal will work successfully with HD receivers in a ZoneCasting system,” according to a spokesman. “We are currently consulting with Xperi and infrastructure providers to ensure HD listeners will have a seamless listening experience.”

### SUPPORTIVE WORDS

GBS said the industry comments this spring demonstrated “general agreement” for innovative technologies and new paths for revenue. “Many of the detailed comments expressed antipa-



#MisheardLyrics

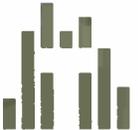
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World Radio History

## GEO-TARGETING

(continued from page 12)

the radio industry as it competes with other media: no ability to geo-target content and advertisements,” wrote Rick Cummings, director of programming for Emmis Communications.

Zoned advertising is a big part of the appeal here, and GBS noted support from advertising and marketing companies such as Ansira, Dentsu and MAGNA Global.

It also emphasizes the value in alerting. Craig Fugate, former director of the Federal Emergency Management Agency, told the FCC he believes geo-targeting is essential to allow regionalized alerts and warnings during times of emergency.

“In this era of hyper-local and targeted communications, radio has become the lone medium unable to reach its listeners on a granular basis. And, in fact, the value of geo-targeting through radio in times of local, regional, state, and federal emergencies is a paramount personal concern of mine,” wrote Fugate.

He continued, “Without a doubt, localized radio broadcast updates of today’s COVID-19 crisis would serve the public good by communicating public safety information pertinent to specific portions of the airwave’s audience. Consider the benefit of reaching a 25-mile portion of a radio signal about local test sites or shelters versus informing that same station’s 100-mile audience that do not need those specifics but require their own, zoned, details.”

### WORDS OF CAUTION

The National Association of Broadcasters supports giving FM broadcasters zoned broadcasting capabilities, but said the proposal is not entirely free of concerns.

The association noted its own previous opposition to the creation of a new Class C4 FM radio service due to an increased risk of interference to incumbent FM service — though in this case, it acknowledged, “any potential interference caused by using boosters to target content should only affect an FM station’s own service, and the decision whether to risk such self-interference would be purely voluntary,” NAB wrote.

It continued, “We also observe potential concerns that GBS’s system currently works only with analog FM service, which could undermine the continued expansion of digital audio broadcasting (DAB, also called HD Radio). There may be potential disruption to DAB in the targeted zones. This issue is not addressed in the petition.”

On balance, however, NAB favors the FCC granting the petition to move ahead to an NPRM.

GBS has, however, not yet made its case successfully to several of the coun-

try’s leading broadcasters.

iHeartCommunications, Entercom Communications, Cumulus Media and Beasley Media Group jointly told the FCC that “more real-world vetting” is needed before the commission moves ahead even to an NPRM. The language in its filing was much more cautionary.

“Technologies that are not yet widely proven which could cause interference to the primary signal, as well as confusion

believes there has only been one “real-world” experimental test of its current iteration.

They said that by moving to an NPRM, the FCC would essentially endorse ZoneCasting “without the need for implementors to report back to the commission on the benefits, problems and/or weaknesses of the system.” They asked the FCC to allow more experimental authorizations and reporting, as

**Automatically authorizing such an unproven technology ... is particularly premature given the proponent’s acknowledgment that listeners will experience some degree of “self-interference,” as the booster signal is handed off from the primary programming to the zone programming.**

— *Joint filing by iHeart, Cumulus, Entercom and Beasley*

among radio listeners as the primary signal is handed off to a localized signal, should not prematurely be adopted as a default standard without more real-world experience gathered with experimental authorizations,” they wrote.

“Automatically authorizing such an unproven technology ... is particularly premature given the proponent’s acknowledgment that listeners will experience some degree of ‘self-interference,’ as the booster signal is handed off from the primary programming to the zone programming,” they wrote.

They acknowledged that GBS referenced studies of its technology but

it has done for technologies like Single Sideband Suppressed Carrier Modulation, all-digital on AM, Modulation Dependent Carrier Level controls and HD Radio.

Others raising concern include REC Networks, a low-power FM advocate. It said the booster rule change could lead to an increased risk of interference within the FM band and possibly bring on a “booster-boom” in the United States.

“(REC) must disagree in part with petitioner’s claims that ZoneCasting does not raise technical or interference issues and has ‘no impact on other broadcasters.’ There could be situations where the

installation of an FM booster would create harmful interference to an LPFM station, mainly in cases where the full-service FM station was created or modified after the establishment date of the LPFM station,” wrote Michi Bradley, founder of REC Networks.

Commenting to Radio World about the general technical issues involved, Jim Stanley, president of Stanley Broadcast Engineering, said proper installation and maintenance of a station’s RF infrastructure will be critical to limiting self-interference when deploying such a system.

“Anytime multiple transmitters (boosters) are operated on the same frequency, synchronization is needed. This includes using GPS to phase lock the carriers and usually some type of audio delay in the input(s) of one or more transmitters.”

Stanley said, “When more than one transmitter is operated on the same frequency, with no geological terrain disruption between the two transmitter sites, there will be a certain amount of interference between the two signals where the contours meet. The degree of interference between multiple sites would vary depending on conditions. It is important that the booster sites be engineered and installed so that the booster coverage does not extend beyond the authorized 60 dBu contour of the primary facility.”

In a press release after the comment deadline, Bill Hieatt, CTO of GeoBroadcast Solutions, said, “The comments raised important issues for the industry as a whole and specific, instructive points on how our technology needs to address ideas and share knowledge to help it improve, as it has a chance to evolve in the marketplace.”

*Comment on this or any story. Email [radioworld@futurenet.com](mailto:radioworld@futurenet.com) with “Letter to the Editor” in the subject line.*

### MAKING IT WORK

Bert Goldman, president of Goldman Engineering Management, has been working with GeoBroadcast since 2015 to develop multi-transmitter booster systems known as MaxxCasting. He said ZoneCasting is based on that technology.

He told the FCC that MaxxCasting systems use boosters synchronized both with the main transmitter and with each other to produce seamless transitions between node areas. This, he said, improves coverage well beyond what would be possible with only the main transmitter by filling in low-signal areas within an FM station’s protected service contour. He said the system is used successfully in numerous markets including Boston, Chicago, Los Angeles and Seattle “and is expanding rapidly.” Users, he said, report “vastly improved” quality of service and Nielsen PPM decoding.

Goldman said MaxxCasting achieves interference-free signal improvement due to four techniques that essentially “trick” a receiver into acting as if it is hearing one station instead of two or more, which would result in distortion and interference.

These techniques are carrier synchronization, which Goldman said is now possible by using GPS-trained oscillators; pilot phase synchronization, also possible using GPS; the use of small cells or “nodes” with highly directional antennas to keep the real-time FM waveforms at the receiver to within two microseconds; and maintaining audio modulation of the main and booster carriers to identical waveforms with less than a 0.1 dB difference between the main transmitter and all nodes.

On those last two points, Goldman added that recent technical advances play an important part.

“The technology to so precisely control the timing of the audio waveform for both analog stations and stations operating with HD Radio has only been perfected recently. Accurate RF modeling and prediction, critical in optimizing performance, is accomplished with powerful software tools developed by the wireless industry for cellular communications. This allows Geo Broadcast to precisely tailor parameters to maximize coverage and eliminate interference.

“Modulation matching is also a recent development, made possible by digital composite and AES digital transmission, synchronization and high-speed data circuits.”



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World Radio History



# This Is the Time to Make Connections

Thoughts about local radio advertising during this or any business crisis

## PROMO POWER

Mark Lapidus



Should brands stop advertising during a pandemic? Can they afford not to?

One thing I've been wondering is how consumers have been feeling about advertising nowadays, with so many folks out of work, anxious about the future and suspicious or judgmental about a retailer's motives.

I headed to one of my go-to sources for marketing trends, eMarketer. For the uninitiated, eMarketer is a subscription-based service that aggregates research studies and presents its own take concerning trends.

In this case, eMarketer concluded that consumers didn't feel that brands should stop advertising during the pandemic. It stated that while "consumers don't expect brands to abandon advertising, brands should rethink their strategies. Campaigns that were planned pre-pandemic may no longer be appropriate as consumers clamor for information about how the crisis is being handled and how they can stay safe. That includes information about how brands are responding to COVID-19."

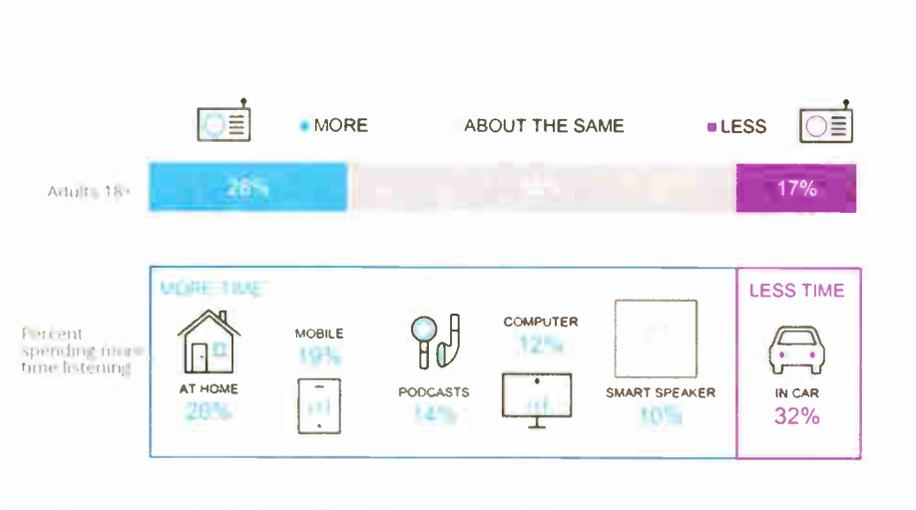
It doesn't take a research project to know that more people than ever were spending time watching television this spring; just look at Netflix's growth numbers. But what about listening to radio?

According to Nielsen, which researched the question in late March, eight in 10 people said they were spending the same or more time listening to radio as a result of circumstances surrounding the pandemic. "Sixty percent of American adults 18 and older hold radio in high regard and trust it to deliver timely information about the current COVID-19 outbreak."

Or, according to the Radio Advertising Bureau, "Radio is at its best when

### 8 IN 10 REPORT THE SAME OR MORE TIME WITH RADIO AS A RESULT OF COVID-19

Percent of responses to the question: "Because of the COVID-19 outbreak, do you find yourself listening to radio..."



Copyright: The Nielsen Co.

**A Nielsen study done as the coronavirus crisis was escalating in March found that 83% of consumers said they were listening to as much or more radio as they were before the pandemic.**

there's trouble, supplying vital information and entertainment."

#### MINDSET OF SUPPORT

Practically speaking, where does this leave local radio, for this crisis or the next one? The glass is most definitely half-full.

Listenership is healthy. Radio advertising still produces results and radio can make all the difference in delivering important local information and entertainment.

While there is no question that advertising will be soft until normalization, there are things to be done now that will benefit both your station and your business community.

Begin with the mindset of supporting your loyal clients and consider approaching the challenge differently than ever before.

During the Great Depression, my grandmother, who operated a clothing store in a small industrial Pennsylvania town, gave her customers credit when times were hard. Now, as opportunities to open retail expand, many businesses will be struggling to regain footing or even to survive. Your willingness to offer advertising credit for a few months could make a significant difference in generating revenue for local retail.

focuses on a campaign strategy, such as "Minneapolis Strong: We're In This Together."

Another approach might be to shift your attention more toward clients in the service and other industries, who are not reliant on foot traffic. Could you get set up to text coupons or special offers that are promoted on-air? Is there anything you can do to feature businesses that are reopening by using your social platforms or websites?

Naturally, the content of the advertising must reflect the current situation, so you must ensure that copy suitably addresses such topics as social distancing, safety, delivery, special hours of operation and other directives that are unique to the client.

#### WHO HAD THEIR BACK?

Working from my dining room table, it's easy for me to suggest a shift in sales strategy and to be generous with your advertising units. I'm aware that owners and groups will be concerned about setting precedents. However, this time will pass and when that happens, strong relationships will surely drive success.

These are unprecedented times.

**Radio is at its best when there's trouble, supplying vital information and entertainment.**

— Radio Advertising Bureau

Perhaps you could take one or two days of the week on which you air advertising "on credit" — say, a Sunday/Monday. First, as can be typical, some of the spots would be bonus ads for your best clients. Then, you would air a limited number of units-on-credit — in effect maximizing inventory on your bonus/credit days — for clients who will defer payment for sixty days. You can rotate these clients weekly for equitable distribution.

Could you consider scheduling a limited number of "on credit" remote broadcasts? Perhaps the retailer could compensate the talent with goods/trade, or the "remote" could simply be a phoner with one of your DJs interviewing that business owner about what's going on with their store or chain. Or you might creatively put several businesses together in a 30-second commercial that

Perhaps your team developed better ideas than my suggestions. I highly encourage serious discussion about how your station can help stimulate the local economy without destroying your own business, now or in the next business crisis. Letting staff go and totally automating is certainly the most direct approach in cutting expenses, but it does nothing to set stations up for the future. It breaks my heart that some will have no choice.

I will say that my grandmother's customers never forgot her generosity. Even when larger, name-brand stores with lower prices opened to compete against her, she never lost her loyal customer base. She made a solid community connection, the goal of radio stations everywhere. Especially nowadays.

Comment on this or any story. Email radioworld@futurenet.com with "Letter to the Editor" in the subject line.

### WE LOVE RADIO

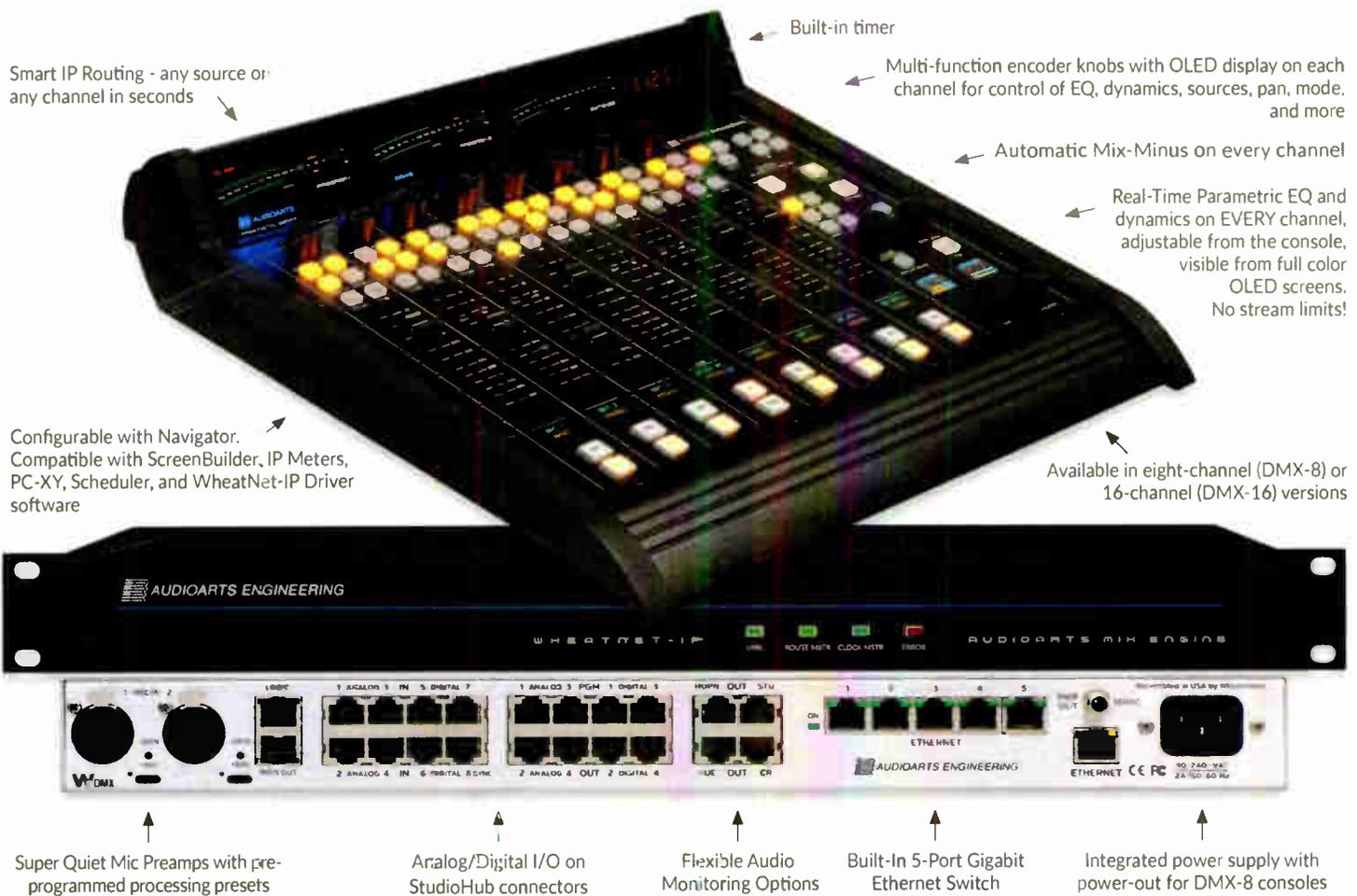
It touches us. It unites us.  
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# Use Privacy Slats to Deter Vandalism

Also, Rolf Taylor explains air filter MERV ratings

## WORKBENCH

by John Bisset

Email Workbench tips to johnbisset@gmail.com

It's hard to steal what one can't see. Broadcast engineer Ernie Nearman says chain link fence privacy slats, pictured in Fig. 1, provide inexpensive insurance.

The slats are available in a variety of lengths, up to 8 feet high. Find them at Lowes, Home Depot and online. Although green is pictured, the slats come in several colors.

The job of weaving the slats through your chain link fencing is a little time-consuming; consider it a chance to enjoy the great outdoors. The slats come packaged 78 to a bundle for around \$110.

If you're inclined to shop online, a company called Fencescreen.com has a much wider selection. They even offer faux hedge slats that consist of 3-mil PVC green pine needles which, at a distance, look like you have a hedge around your tower — a hedge topped with barbed wire!

Frank Hertel, like many engineers, owns the Siglent Model SDG 1075 Function Generator. It's a great tool. But Frank finds that from time to time it will glitch its settings when it's turned on. This doesn't happen often, but when it does, you can get lost in the menu tree. This is especially true when a menu changes to Chinese.

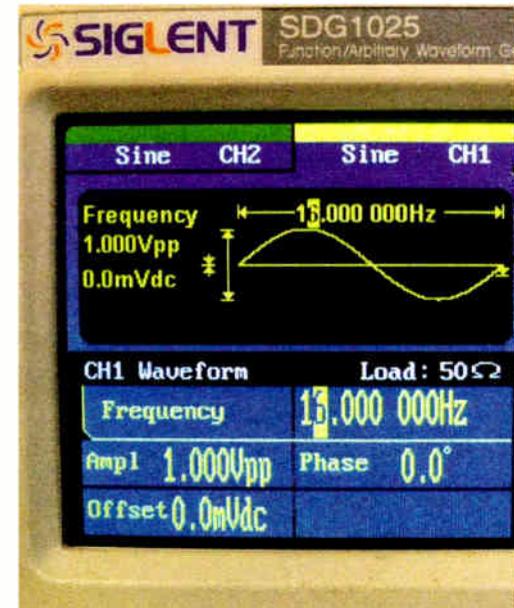
To help solve the problem, Frank generated a Utility settings flow chart, seen in Fig. 3. Most issues can be resolved from the Utility settings mode. The chart also helps navigate through numerous button pushes as you step through the menu. Of particular importance are the purple selections on the right; note the selection that chooses English. Owners of this instrument will want to copy this flow chart and keep it handy.

Frank also submitted a link to an interesting and useful product: the

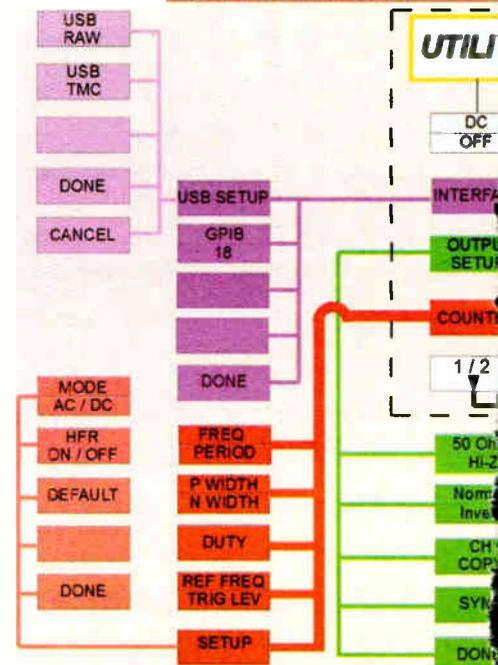
Reliance Products Collapsible Portable Toilet.

At one time, the FCC Rules and Regulations required that transmitter sites include restroom facilities! This goes back to the days when transmitter sites were manned 24/7.

Times have changed, and few sites provide such creature comfort when the need arises. This portable product can be left at a transmitter site, or stowed in a contract engineer's vehicle. The Reliance Products Collapsible Portable Toilet costs less than \$50 and is available from Amazon. It weighs only 5 pounds and folds down to 5 inches when



## SIGLENT SDG1025 FU



not needed. It has a 300-pound weight capacity.

On the Amazon site, enter the product name in the search block.

Rolf Taylor is an engineer with a multinational IT firm. He writes in to offer some tips on air filters and air conditioners.

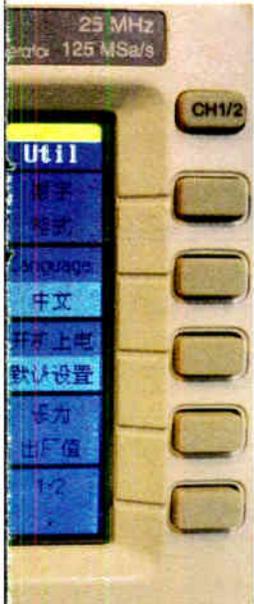
With respect to air filters, not only will dirt affect the heat transfer capabilities of the evaporator coils, that dirt also provides nutrients that encourage the growth of algae. As we've mentioned before, the algae can cause clogs and overflows of the condensate drain, leading to some of the worst HVAC problems — especially if a studio or transmitter is underneath.

More than **50%** of new vehicles ship with HD Radio technology



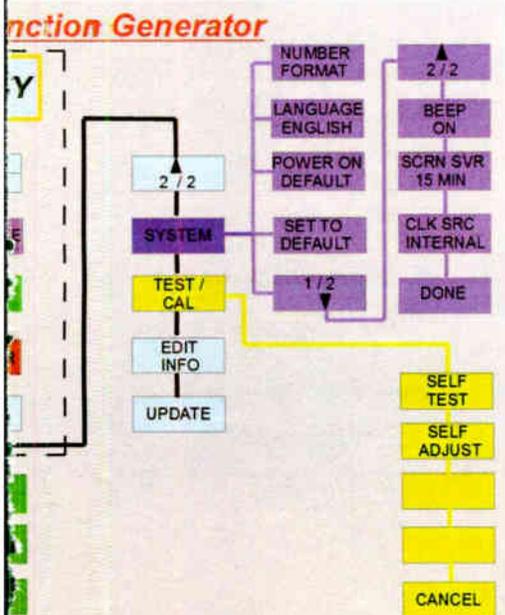
**NAUTEL HAS YOU COVERED**

nautel.com/HDradio 



**Fig 2 (left):** The Siglent Function Generator is a useful tool but may bring English-speaking engineers up short when it switches to Chinese, as at right.

**Fig 3 (below):** This flowchart, developed by engineering consultant Frank Hertel, will help owners of the Siglent Model 1025 navigate the menu.



At times, your "Selection" buttons will change to Chinese. When this happens this chart will help you reset the buttons to "English"

Periodic coil cleaning isn't a bad idea, and Rolf recommends that you perform that maintenance procedure when changing over to the high-efficiency filters. Get the gunk out, and keep it out! Drip pan tablets to prevent algae growth are available at the big box stores and are good insurance.

Finally, don't fall for the myths about the higher-efficiency filters creating an obstruction to air flow. Pleated filters have more surface area, which compensates for the increased air resistance the filter material causes.

One thing you will notice is that as the MERV filter rating goes up, there are more pleats to compensate. In fact, 3M high-end "purple" filters have less air resistance than their "red" filters,

due to considerably more pleats.

By the way, MERV stands for Minimum Efficiency Reporting Value. It ranges from 1 to 10, and is used to compare air filter efficiency. The higher the number, the fewer dust particles or dirt can pass through the filter.

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

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# Welcome to the D.J. Everett III Radio Room

Local broadcast company honors its late owner with a stunning on-site radio gallery



**HISTORY**

BY JAMES CARELESS

Many successful career people are grateful for mentoring they received on the way to the top. But few have honored a memory as passionately as has Beth Mann.

Ham Broadcasting is all about local. It owns five stations and markets itself as "western Kentucky's leader in marketing and promoting all types of businesses." It tells advertisers on its website, "We use a unique and powerful

combination of radio and new media platforms to grow all types and sizes of businesses and organizations. We are 100% locally owned, 100% locally operated, 100% locally oriented and 100% locally committed to help you grow your business."

Mann, its owner and general manager, wanted to commemorate the contributions of her predecessor D.J. Everett III. She did so by creating a Radio Room named for him at the WKDZ/WHVO studios in Cadiz, Ky. It opened to the public last October during the station's 10th annual Pink Out fundraiser for breast cancer research.

Everett worked as a broadcast journalist and TV general manager, as well as a radio owner. He was inducted into the University of Kentucky's Journalism Hall of Fame in 2012. He died in 2015 at the age of 67. "Under his leadership, WKDZ was recognized numerous times as one of the best radio stations

in the U.S. in its market size," according to the Times Leader newspaper in Princeton, Ky. "Everett was also known for his civic engagement and community involvement."

This Radio Room is a gallery and meeting space also dedicated to the physical history of radio in Cadiz locally and in the United States.

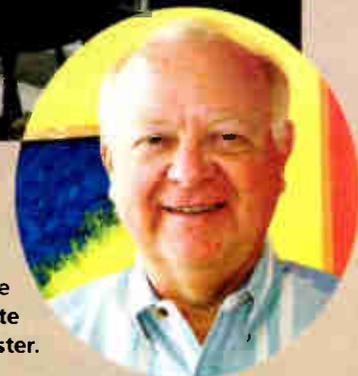
Among its highlights are an extensive, beautifully staged collection of antique radio receivers behind glass walls; the Legends Room, a replica 1966 radio production studio; and a public meeting space in the center of the facility.

The D.J. Everett III Radio Room covers 1,850 square feet, entered through a pair of custom-made doors adorned with door handles styled after the RCA 77-DX microphone.

"I started working with D.J. Everett when I was 17 years old, first in

*(continued on page 22)*

The room bears the name of the late broadcaster.



Beth Mann





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World Radio History

## FEATURES

### EVERETT

(continued from page 20)

television and then in radio here at Ham Broadcasting,” said Mann. “D.J. was a father and mentor to me, and when he passed away in 2015, he left me a number of vintage radios. I took over the company at that time — it had been part of his long-term plan for me to do so — and I wanted to find a way to honor his memory and showcase his collection. The D.J. Everett III Radio Room grew out of that.”

#### AN INSPIRED RADIO COLLECTION

The radios in the room cover from the earliest days of the medium up to the 1960s. Included in the displays are a 1919 Commerce Radiophone crystal set; a 1923 Atwater Kent “breadboard set,” so-called because the components are laid out on a flat piece of polished wood with no protective case; and a wonderful selection of 1930s-era “tombstone” and floor console radios from the Golden Age.

“We also have a 1943 metal-cased Echo-phone radio, which was used by the troops during World War II,” said Mann. “My favorite is the gorgeous dark green 1946 Bendix Caitlin, which came in a plastic case that would melt if the radio’s tubes got too hot.”

Also on display are photos, posters and other historical memorabilia. “We even have a diary donated by Annette Hargis, in which her great-grandmother Mrs. Wiley Stallons noted WKDZ’s first broadcast on April 8, 1966,” Mann said.

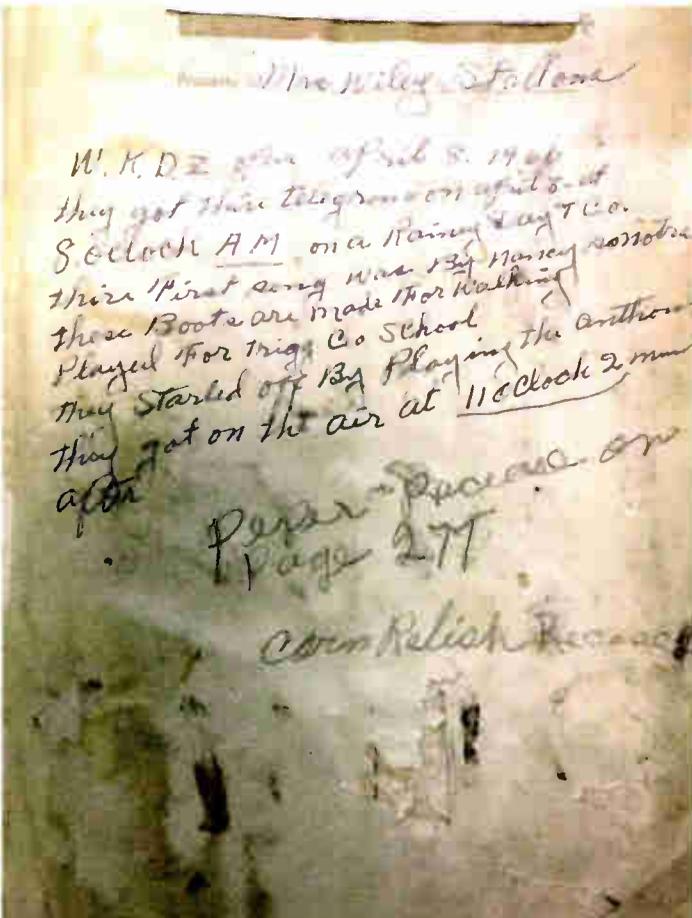
The Legends Room radio studio features 1966-era radio equipment that would be familiar to many broadcasting veterans, including a suspended RCA 77-DX microphone, a Gates



The entrance to the Radio Room with its microphone-styled door handles.

Producer dial-type control panel, a cart tape machine for commercials and idents, a rotary dial telephone and a Revox reel-to-reel machine of a kind this author used in his own early radio days.

“The Legends Room is decorated with photos of our staff back in 1966, plus photos that trace D.J. Everett’s distinguished broadcast career,” said Mann.



Annette Hargis contributed a diary in which her great-grandmother noted the day WKDZ went on the air. “We have a special place set aside in the D.J. Everett III Radio Room for this masterpiece,” Mann posted.



A display about radio during World War II includes ads from radio manufacturers explaining their work for the government making military radio equipment.



Samples of the radios on display.



Add the many tables and chairs available for community meetings, and one can see why the D.J. Everett III Radio Room has caught the imagination of Cadiz residents and radio fans in general.

"The overall reception to our project has been phenomenal," said Beth Mann. "It is

a chance for us to celebrate D.J.'s legacy, and also to show the world that local, community-centric radio is alive and well, and a career worth pursuing by young people."

People wanting to see this impressive installation can find out more under the Contact Us tab at [www.wkdzradio.com](http://www.wkdzradio.com).

## ABOUT WKDZ

Here's how the radio station describes itself on its website:

WKDZ-FM serves listeners in Western Kentucky and Tennessee. WKDZ-FM is licensed to Cadiz, Kentucky, and serves the Hopkinsville-Fort Campbell-Barkley/Kentucky Lakes region.

WKDZ-FM plays an awesome combination of traditional country, country classics, new country and remakes.

We are well-known nationwide and have won several awards for our local news and extensive weather coverage. WKDZ-FM provides more local news than any other radio or television station in our listening area. In fact, we are the only station in Western Kentucky that broadcasts a full one hour local newscast every weekday at noon and 5pm. Our commitment to news is phenomenal. When news or weather breaks out, we do not hesitate to break in. In fact, you can count on it!

WKDZ-FM is also known for extensive high school, college, and pro sports coverage. We broadcast Trigg County High School football and basketball, University of Kentucky football and basketball, Titans football, and all coaches' shows affiliated with the University of Kentucky and Titans.

WKDZ-FM broadcasts more than 75 local events a year and has won 3 Marconis (the top award given in the radio industry) for Small Market Station of the Year for community involvement.

WKDZ-FM is one of five radio stations locally owned and operated by Ham Broadcasting Co., Inc., Beth A. Mann, President. WHVO Oldies 1480, Oldies 96.5 FM, WKDZ(AM) 1110 and Oldies 100.9 FM are sister stations to WKDZ(FM).



A replica of a 1960s studio setup.



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# KEXP Podcast Blurs the Lines Between Live and Studio

Engineer Kevin Suggs records a live session for podcasts, radio broadcasts, streaming and more



Live sessions at Seattle's KEXP are captured for broadcast, podcasts, streaming and other formats.

Photos by Renata Steiner/Natawory Photography

## PODCASTING

BY JIM BEAUGEZ

*This story originally appeared in Podcast Pro, a free weekly newsletter about the production side of podcasting.*

ing. Sign up at [bit.ly/3bMAhog](http://bit.ly/3bMAhog).

Kevin Suggs arrived in Seattle just in time for the '90s grunge-era gold rush, when the city was bursting with bands looking to score a record deal. Spending a decade of 12-hour-plus days pushing faders at studios like Avast! Recording

Co. was the perfect training to head up audio engineering for the podcast series "Live on KEXP."

"Things just started to explode," Suggs says. "Even though I wasn't working with any huge Seattle bands, there were just so many bands and everybody was recording. It was a very

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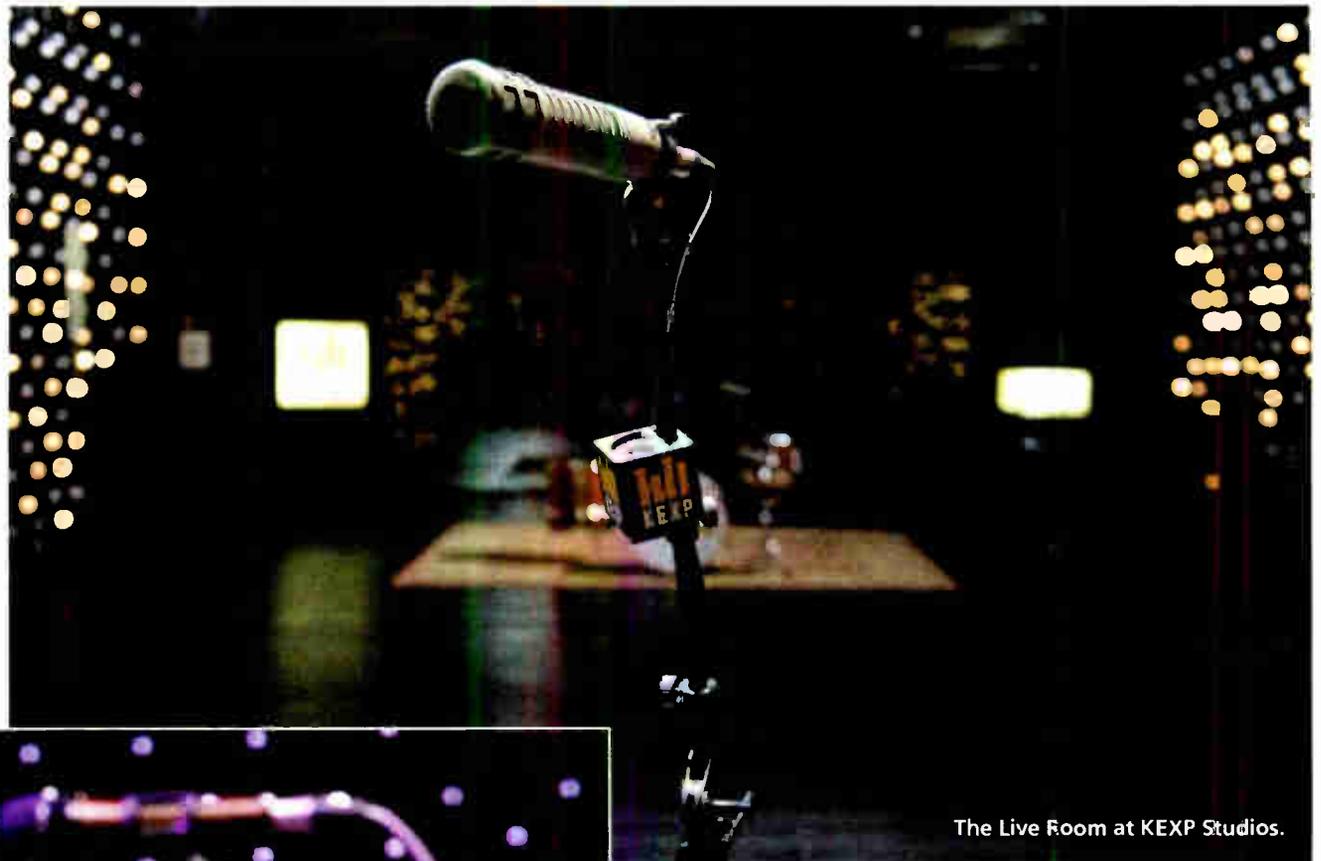
Troy Nelson, KEXP DJ and host of the "Live on KEXP" podcast.

vibrant time to be making music in this town. Everybody had a shot.”

As a freelance engineer and steel guitarist, Suggs racked up credits on albums by Death Cab for Cutie, The Shins and Brandi Carlile. By the time he arrived at KEXP(FM), a nonprofit arts organization known for curating adventurous music for its FM radio station and online properties, the audio crew was producing more than 100 live music sessions a year.

“Live on KEXP” — until recently known as “KEXP’s Live Performances” — is the latest evolution of a podcasting program that began in 2004, and a key arm of the organization’s multiplatform approach that includes broadcasting to the Seattle radio market and streaming to two million YouTube subscribers.

Every note of sound, though, begins with Suggs and the audio engineering team. Today, KEXP logs about 300 performances every year. To maintain efficiency and consistency, Suggs begins



The Live Room at KEXP Studios.

Photos by Benja Stenorth/Artery Photography



Hip-hop group Shabazz Palaces on stage at KEXP.

each session with a proven template based around workhorse mics like Shure SM57s and SM58s and a baseline of plug-ins and presets in Pro Tools.

“My mantra for these things is just simplicity,” says Suggs. “I’m not trying to recreate a band’s record or anything. I’m trying to capture what the band is giving.”

Until a few years ago, the engineers mixed the audio to two-track on an eight-bus digital Mackie board before sending it to Pro Tools. These days, they automate the mix through an Avid S6 Pro Tools control surface.

“It’s recording every move I make,” he says. “If I didn’t quite get that guitar solo up in time, I can make a marker. And then once we’re off the air, I can go back and I can fix that [for the podcast].”

Like any live recording situation, though, control is a relative concept. There’s only so much isolation you can do when a full band is playing together in a room. Suggs has a few tricks to help keep instruments in their own lanes, but sometimes he simply

*(continued on page 26)*

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# KEXP

(continued from page 25)

has to let it bleed.

"I always start my mixes with the vocal mics up because they're going to color everything," he notes. "It doesn't make a lot of sense to solo the kick drum, because as soon you push those vocal mics up, it's going to change that kick drum sound completely. It's just a matter of embracing the bleed, because you're going to get a lot of it."

That's what we usually use for mastering, so we can start fresh without any other compression."

When shelter-in-place orders came into play in March, the "Live on KEXP" team was already set up to have their engineers work remotely. Most, like Suggs, have studios in their homes, so they're able to mix and master sessions seamlessly.

Luckily, KEXP has enough sessions in the can to last well into the summer months. The only audio being record-

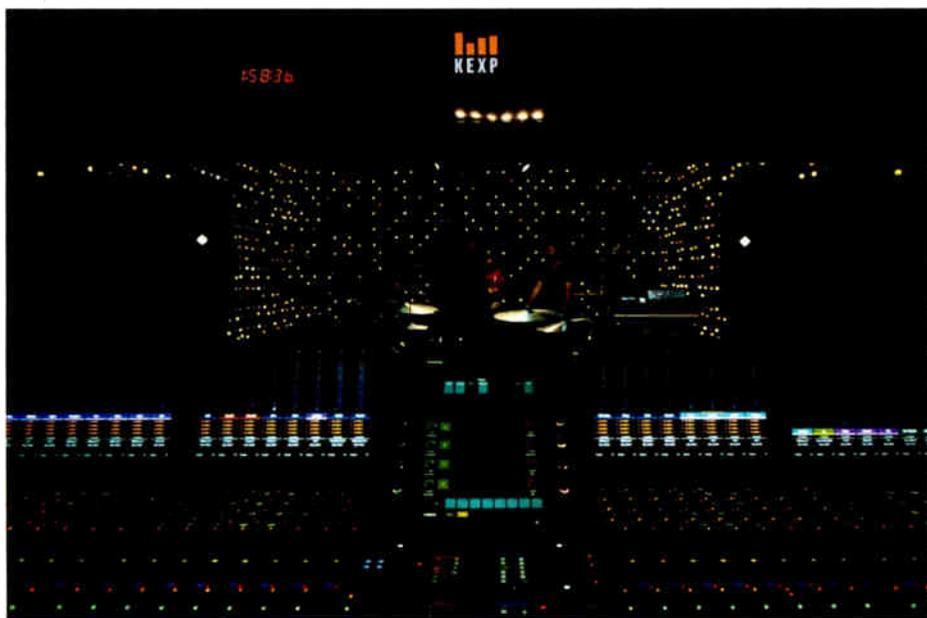


Photo by Renata Steiner/Netaworky Photography

The Avid S6 control surface captains the control room at KEXP Studios in Seattle.

Instead of setting up bands according to their stage plots, Suggs positions them in a circle, with everyone facing each other like in a rehearsal. In the absence of isolation barriers, this configuration cancels some of the interference between the vocal mic and drum mics.

Every session that ends up on the "Live on KEXP" podcast is first broadcast via radio to the Seattle area. With few exceptions, what ends up on YouTube and the podcast is exactly the same as what the radio listeners heard. The main difference between the broadcast and streaming audio is in the mastering stage.

"We hit the one that goes out on the air with a little more compression [from an LA-2A compressor], and then we do a raw track [for streaming] that has nothing on it and no compression.

**You still get that adrenaline rush. There's no net.**

— Kevin Suggs

ed at home for the "Live on KEXP" podcast is the voiceover by host Troy Nelson, who runs an AKG Perception 20 mic through a Universal Audio Arrow audio interface into Logic Pro X. Rest assured, Suggs and the audio engineering team will be ready to go as soon as they're able to get back to the studio.

"I really feed off of the vibe," he says. "There's really something about that live energy and the mix being a performance. At the same time as the band's performing, you're performing the mixing. You still get that adrenaline rush. There's no net."

## MARKETPLACE

**Hazard Relief:** V-Soft Communications says that RFHAZ 4 is a serious update of its longstanding RF hazard program.

It considers the FCC's five new categories for FM EPA antennas and it graphs multiple antennas on a given tower.

RFHAZ 4 also follows the FCC's current practice of graphically identifying the point of the highest power density at perpendicular distances from the tower. Also, RFHAZ 4 provides for graphical examination of multiple antennas at numerous RF density

scales from a minute observation with maximums not exceeding 50  $\mu\text{W}/\text{cm}^2$  centimeter to a maximum scale level of 3000  $\mu\text{W}/\text{cm}^2$ . The user can choose to display the graph as either "Power Density" or as a "Percent Maximum" of the FCC levels for controlled or uncontrolled areas.

For FM calculations, the user can select one of the five new antenna classifications, then, with the inputs of power and antenna height above ground, RFHAZ 4 uses the EPA studied antenna patterns to show power density. These vertical elevation patterns are included with the data files supplied with the program or the user type in and save a manufacturer's pattern from disk file. The user can select RF emissions calculations to consider the effect of a mix of array elements and element spacings (in wavelengths).

In addition to graphs, RFHAZ 4 will print a tabulation of both the vertical and horizontal power density levels and, when multiple antennas are used their sums in  $\mu\text{W}/\text{cm}^2$  from the tower to user's selected distances from the base will be shown. The program considers the impact of antenna arrays having from 1–16 bays as well as those with less than full-wave spacings.

RFHAZ 4 also handles LPTV and DTV duties.

Info: [www.v-soft.com](http://www.v-soft.com)

**Pint-Sized Recorder:** Lectrosonics has introduced its new MTCR — Miniature Time Code Recorder. Small enough to be hidden in garments, the MTCR can be placed on a subject to capture audio, synchronized with time-code, when using a wireless mic is not practical.

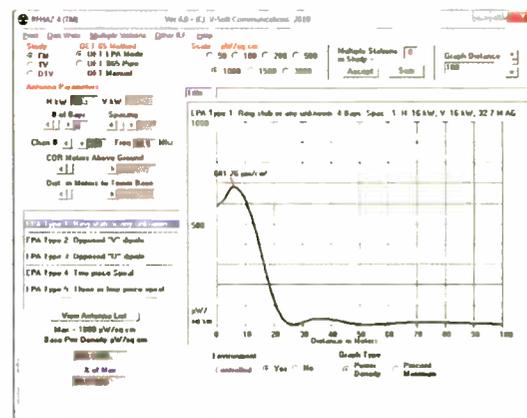
The MTCR, sized at 2.3 x 2.1 x 0.7 inches and weighing 2.5 oz., with battery, records in 24-bit/48 kHz digital onto a microSD card (HC type, Class 10) in the industry-standard BWAV (Broadcast Wave File) format. The unit can be jammed to external time code via the standard 5-pin Lemo connector. A headphone output jack allows for monitoring the signal input or listening to previously recorded files, but cannot be used to send live audio to another device while recording.

The input connector is a TASM jack that accepts any mic or line level signal and provides bias voltage to power electret lavalier microphones. The input connection and wiring are compatible with microphones prewired for use with Lectrosonics wireless transmitters with servo bias type inputs.

Setup and adjustment are made through an interface provided by the keypad and LCD. The housing is manufactured from aluminum alloy, then hard anodized. The MTCR runs for more than six hours on a single lithium AAA battery.

The MTCR, shipping now with an MSRP of \$990, comes with an M152/5P low-noise omnidirectional lavalier microphone, microSD memory card, belt clip, and AAA lithium battery.

Info: [www.lectrosonics.com](http://www.lectrosonics.com)



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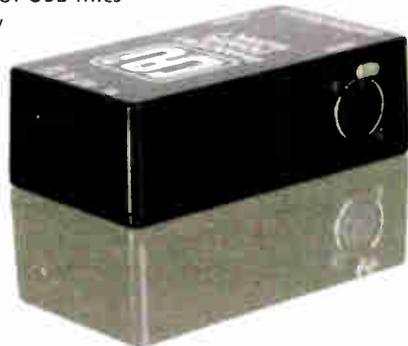


## MARKETPLACE

**Phantom Appears:** In these days of USB mics and microphones phantom powered by broadcast mixers, needing a separate phantom power supply may seem like a trip in the Wayback Machine.

But should an engineer find themselves in need, Countryman's Phantom Power Supply module provides low-noise, balanced phantom power.

Powered by 9 V batteries or wall wart, it offers 12V, 24V and 48V power anytime. The Phantom Power Supply comes in a rugged diecast aluminum box, ideal for rattling around in a kit for when needed.



Countryman Associates President Chris Countryman said, "Condenser microphones need rock solid power for maximum performance, particularly for low noise and high overload. Many mixers and audio inputs provide no phantom power, questionable power, or only provide it in switchable banks. We developed our Phantom Power Supply to deliver the cleanest power and the most options in the smallest possible size."

Info: <https://countryman.com>

**Processor Launch:** JT Communications gets serious in the broadcast processor market with the launch of the SEPsoniX FM broadcast processor.

Jim Trapani of JT Communications explained, "The SEPsoniX was designed to basically parallel the old Orban Optimod 8100 features, but with additional

features (like AGC, compression 'freeze' composite clipper, post processing output, FM signal generator). I was concerned that many broadcast processors have inherent delay; this delay prohibits air talent from hearing the processed audio. This is particularly important when air talent is live. Typically they like to hear the processed audio."

He adds, "It was not designed to compete with high-end processors with all the bells and whistles. It was designed for rapid setup, simple adjustments, and easy operation. This the word SEP (Simple Easy Processing) is what makes up the name SEPsoniX."



The 19-inch rackmount hardware box features dual-band stereo compression, compressor-derived AGC, compression "freeze," "ultrafast" per-emphasis high-frequency limiter, pilot level and phase controls, stereo generator with adjustable transient suppression (composite clipper), master composite output drive level, 6 pole 15 kHz low-pass and 19 kHz audio notch filtering and 50/60 Hz operation.

The company says that there should be no processing delay.

There's also an SCA/RDS input and a stream/processor output. There's also optional PLL programmable FM signal generator for local monitoring of processed audio.

The SEPsoniX has a microprocessor-free design with all adjustments made via front-panel controls. Price: \$1,049.95; with FM tuner — \$1,249.95.

Info: <http://sepsonix.jtcomms.com>

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Wanted: real plate reverb. abgrun@gmail.com.

### MICROPHONES/ HEADPHONES/ SPEAKERS/AMPS

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#### WANT TO BUY

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

WYBG 1050, Messina, NY, now off the air is selling: 250'

tower w/building on 4 acres; 12' satellite dish on concrete base; prices drastically slashed or make offer. 315-287-1753 or 315-528-6040

#### WANT TO BUY

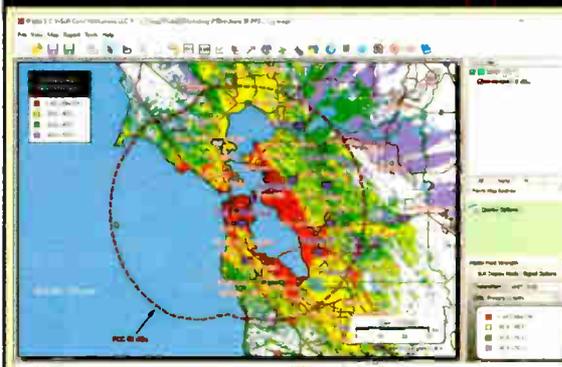
Wanted: ITC interconnect cables between ITC cart machine and record amp. Manual and idlers for Harris CB-1201 turntables. Don, k8drs1@gmail.com

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

I'm looking for KTIM, AM, FM radio shows from 1971-1988. The stations were located in San Rafael, Ca. Ron, 925-284-5428.

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### MISCELLANEOUS

#### WANT TO BUY

I'm looking for the Ed Brady radio show in which he did a tribute to Duke Ellington, the station was KNBR, I'd be willing to pay for a digital copy. Ron, 925-284-5428.

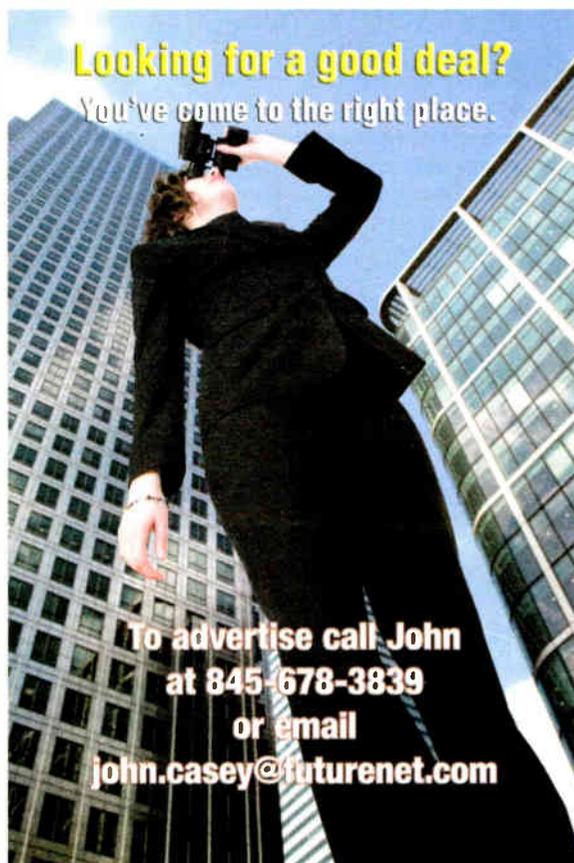
I'm looking for KFRC radio special of Elvis Presley which aired on January 8, 1978. I'd be willing to pay for a digital copy. Ron, 925-284-5428.

Looking for KSFY radio shows, Disco 104 FM, 1975-1978. R Tamm, 925-284-5428.

I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example news-cast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KZIA, KWBR, KSFY, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc, I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at [ronwtamm@yahoo.com](mailto:ronwtamm@yahoo.com).

Looking for a broadcast excerpt of a San Francisco Giant's taped off of KSFO radio from 1959, interviews with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a homerun by Willie Mays and Felipe Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or [ronwtamm@yahoo.com](mailto:ronwtamm@yahoo.com).

Looking for KFRC signoff radio broadcast from 1930 Andy Potter, running time is



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0:22 & also the KLX kitchen the program guest is Susanne Caygill, a discussion of women's affairs with a long promotion for Caygill's appearance at a local store. Anne Truax, Susanne Caygill, running time is 13:44. Ron, 925-284-5428 or email [ronwtamm@yahoo.com](mailto:ronwtamm@yahoo.com).

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Are you a small market station needing a good nuts & bolts engineer in the Los Angeles area? I will make your station shine! CET, fully FCC Licensed. Available for Full/Part-time/Contract work. Available immediately. Mitchell Rakoff, 909-446-6820, [mitchellrakoff@yahoo.com](mailto:mitchellrakoff@yahoo.com).

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#### WANT TO BUY

AM Stereo radio. Call 417-881-1846.

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READER'S FORUM

WAVEFORMS THAT LOOK LIKE BRICKS

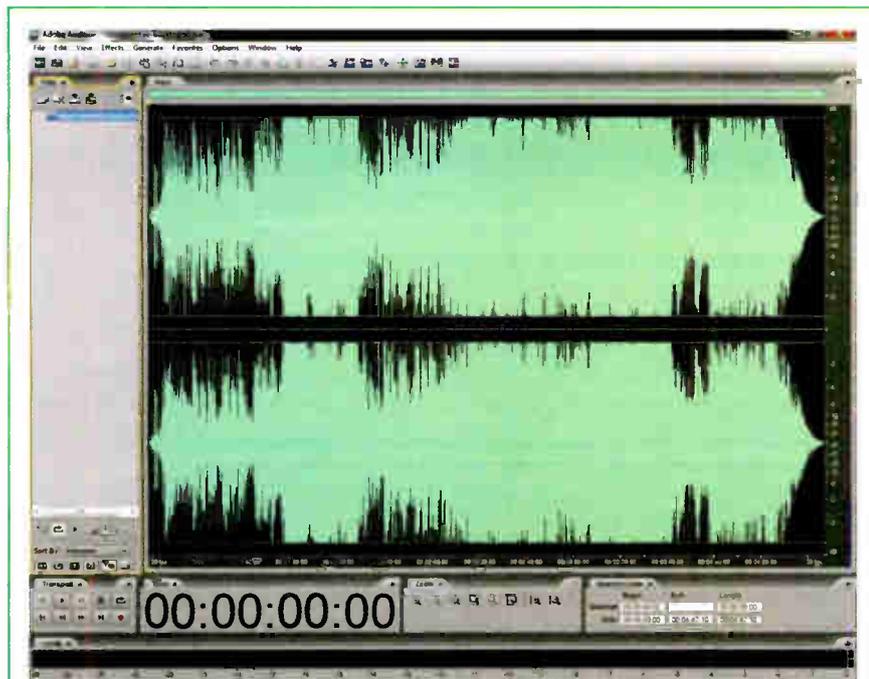
I found the article "A Quality Audio Crisis in the Music Industry" by Dan Slentz to be interesting and informative (Radio World, April 29). However, Dan's estimate of this being a decade-old problem is far off. Loud mastering of digital audio began as far back as the early to mid-1990s, becoming an industry standard around 1997 and only worsening since then.

Back in 2001, Bob Orban and Frank Foti joined forces to write an open letter to the music industry explaining why hyper-compressed audio was problematic for broadcasters. They even asked music producers to consider making radio-friendly versions with more dynamics specifically for broadcasters. Obviously it fell on deaf ears.

While Dan's comparison of the waveforms of old songs versus new ones illustrates the problem, he doesn't specifically mention the ultimate sin: the remastering of older music to make it as loud as newer music! Once consumers became accustomed to louder CDs, rereleases of old albums or greatest hits versions were often remastered to give them volume levels comparable to newer releases.

Shown here is a comparison of Tina Turner's "What's Love Got To Do With It" from a TM Century Golddisc, and then the same track from the 2008 Greatest Hits CD, "Tina!" The song was not all that dynamic to begin with, but now it is brutally brick-wall limited!

If your station plays older music, it wouldn't be surprising if many of these louder versions of tracks exist in your playout system. Even if the overall level has been lowered for headroom, this does nothing to eliminate the additional



COUNTRY MUSIC NOT IMMUNE

It's not just limited to rock music; country music is just as guilty. I've attached an unaltered Adobe Audition screen shot of the Reba McEntire song "Back to God" that my radio station received in the winter of 2017. If you think it looks bad, imagine what it sounded like when it hit my Optimod.

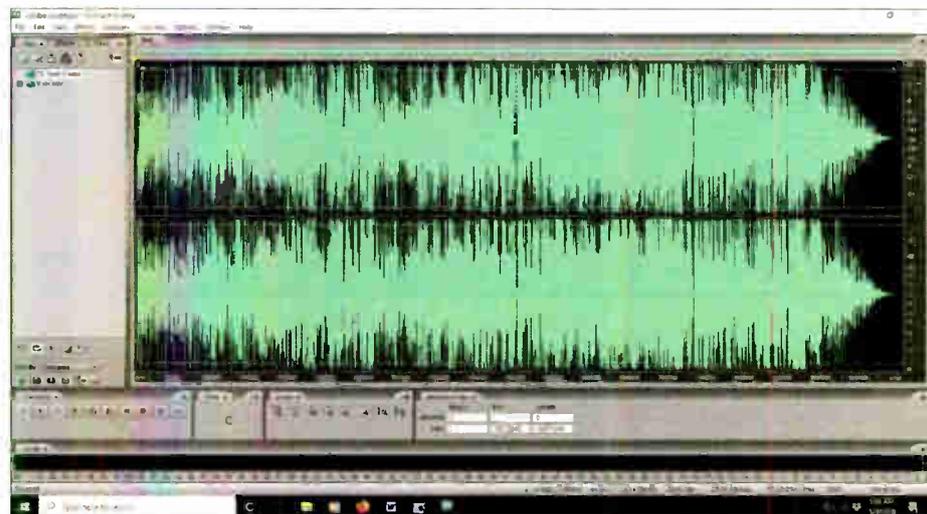
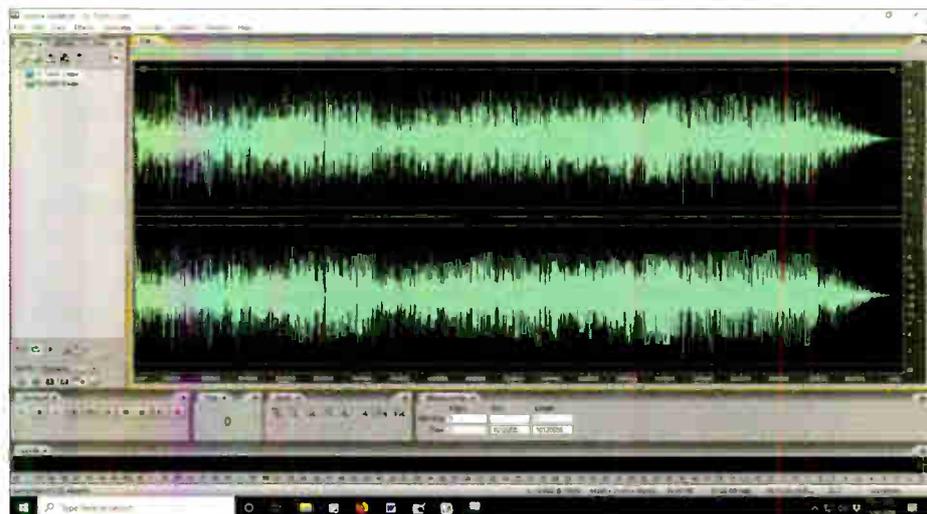
Through contacts I have in Nashville, I was able to track down the session producer, session engineer and the session mixer. They all agreed that it did not look like that when it left Starstruck Studios.

When brought to the record label's attention, their attitude was "So? We've had no other complaints."

I made it clear to the label that once it left the charts, it would also leave my playlist, never to be heard from again on my station. They remained indifferent. Not the least bit curious.

The public has been conditioned down to accept lower-quality products in our everyday life, including music. If nobody demands better, we will only get worse.

Scott Cason



Remastering at work: A comparison of two iterations of "What's Love Got To Do With It."

distortion and lack of dynamic impact of these versions. These are sometimes the versions that come with preloaded playout systems, and often the ones delivered by music providers.

Even if you are simply sourcing from commercial CDs, keep in mind that "Greatest Hits" collections and remasters made from the late 1990s into the 2000s tend to be the worst offenders. Even purchased downloads of older songs from iTunes and other sources can suffer from loud mastering (on top of potential data compression).

Bottom line: If you have an older song with a waveform that looks like a brick, get rid of it and replace it with an older, more dynamic version!

Our HD2 station runs a classic hits

format. Both the HD2 signal and the associated FM translator are running somewhat lighter audio processing, with a more open sound than is typical for the market, so avoiding tracks that are loudness-enhanced is even more important.

It's worth mentioning that Bob Orban has also authored "Maintaining Quality in the Radio Plant," a guide that is periodically updated to reflect changes in industry practices. The more recent versions of this guide stress the importance of sourcing music on a cut-by-cut basis, since the "newer is better" formula no longer applies.

Scott D. Swinamer  
WLTR(FM)HD  
Magic 101.7 & 102.5 The Vault  
Binghamton, NY



Write to RW

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

**READER'S FORUM****DE FOREST AND ARMSTRONG**

In response to John Schneider's article "Lee de Forest, Pioneer Broadcaster" in the April 15 edition of Radio World, I wanted to add some comments concerning de Forest's experimental broadcast station 6XC, which he operated in San Francisco in 1920.

He built this station after learning that the audion vacuum tube, which he first developed and used as a detector of radio signals, could also be used as a generator or "oscillator" of high-frequency radio signals, as well.

The man who discovered the principle of electronic "oscillation," or regeneration as it was originally named, was Major Edwin Howard Armstrong, who also created and first developed wide-band FM broadcasting, as well as the superhetrodyne radio receiver circuit.

Armstrong discovered the principle of regeneration in 1913, and later in that year, he applied for a U.S. patent on his findings. On Oct. 6, 1914, he was granted U.S. patent #1,113,149 for his discovery. This regenerative concept is the basis for all electronic vacuum tube oscillator circuits, which were originally used in all modern broadcast transmitters and receivers, including those later deployed by Lee de Forest in his broadcast station 6XC.

De Forest did not understand, and could not properly explain, just how his audion tube could be made to produce

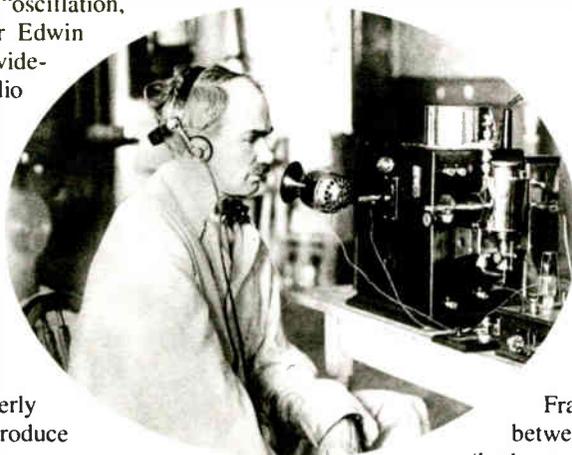
"oscillation" or regeneration until that concept was explained in great detail, by Major Armstrong, in the major's regeneration patent disclosure.

In his own autobiography "Father of Radio," written in 1950, de Forest wrote that he was "totally unaware of the fact, that in the little audion tube, which I was then using only as a radio detector, lay dormant the principle of oscillation, which had I but realized it, would have caused me to unceremoniously dump into the ash can, all of the fine arc mechanisms, which I had ever constructed."

I just wanted to say, that if it hadn't been for the work of Major Armstrong, Lee de Forest would most likely have never understood just how his audion tube produced radio oscillations, which allowed his broadcast station, 6XC, to function.

*Steve Hemphill*

*Licensee of Armstrong Memorial FM broadcast station WA2XMN and Board of Directors member, Armstrong Memorial Research Foundation*

**DE FOREST IN TOLEDO**

De Forest not only envisioned radio, he made it happen — and in Toledo, Ohio, in 1907.

If you are not from Toledo, this period in De Forest's life gets lost to time. As we all know, de Forest was a rolling stone. As one venture failed and investors got angry, he would move on to another city.

He met up with a railroad telegrapher by the name of Frank Butler, who assisted de Forest with radio experiments between the Ohio and Nicholas buildings in downtown Toledo (both are still standing). Butler was from Toledo and quit his job with the railroad to concentrate on experiments with de Forest full-time.

Toledo broadcaster Lou Hebert extensively researched Butler and wrote a piece about his adventures with Lee de Forest that you can read at <https://tinyurl.com/rw-butler>.

De Forest and Butler were responsible for the first "ship to shore" wireless coverage of the 1907 Yacht race on Lake Erie. News of the broadcast accomplishment was published in the August 1907 "Electrical World," which you can read at <http://earlyradiohistory.us/1907yht.htm>. The radio location is marked on the Ohio register of historic places at "Put in Bay."

Amazingly, the very de Forest "bulbs" employed to cover that event in 1907 are on display in the National Museum of the Great Lakes here in Toledo. You can see them by visiting the museum or take the virtual tour at [nmgl.org](http://nmgl.org).

De Forest, typically, left Toledo and moved on. But his 1907 efforts inspired many Toledoans to pursue early radio. Toledo had many early electronics sales businesses. Experimental amateur radio was taking place from both Waite and Scott high Schools and several radio broadcast stations went on the air.

One of those stations is still on the air, 1370 WSPD(AM) celebrates 100 years of broadcasting in April of 2021.

*Steve Pietras  
Toledo, Ohio*

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**USE WI-FI AND STREAMING**

Regarding "Check Out These Unexpected Uses for Unlicensed Broadcasting" ([radioworld.com](http://radioworld.com), keyword "unlicensed"):

In looking at the amazing list of new uses for unlicensed radio transmitters and knowing that some setups have been flaunting FCC rules, I suggest that radio is not the answer for these events.

They should all be using Wi-Fi and video streaming, either with a local server or with a paid version of Zoom. Folks can bring smartphones, tablet or laptop computers and be able to participate.

The least equipment is a laptop and one or more wireless router/access points and can be expanded with real cameras, DSLRs or video camcorders with HDMI outputs fed to a computer with HDMI to USB dongles or an HD video encoder that does WiFi and/or a small video switcher for multi-camera broadcast.

*Ira Wilner  
Chief Engineer*

*Monadnock Broadcasting Group  
Saga Communications  
Keene N.H.*

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