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Futuri seizes the AI moment

Daniel Anstandig talks about the implications of RadioGPT

An RF signature

Engineers found a surprise when they removed an old transmitter.

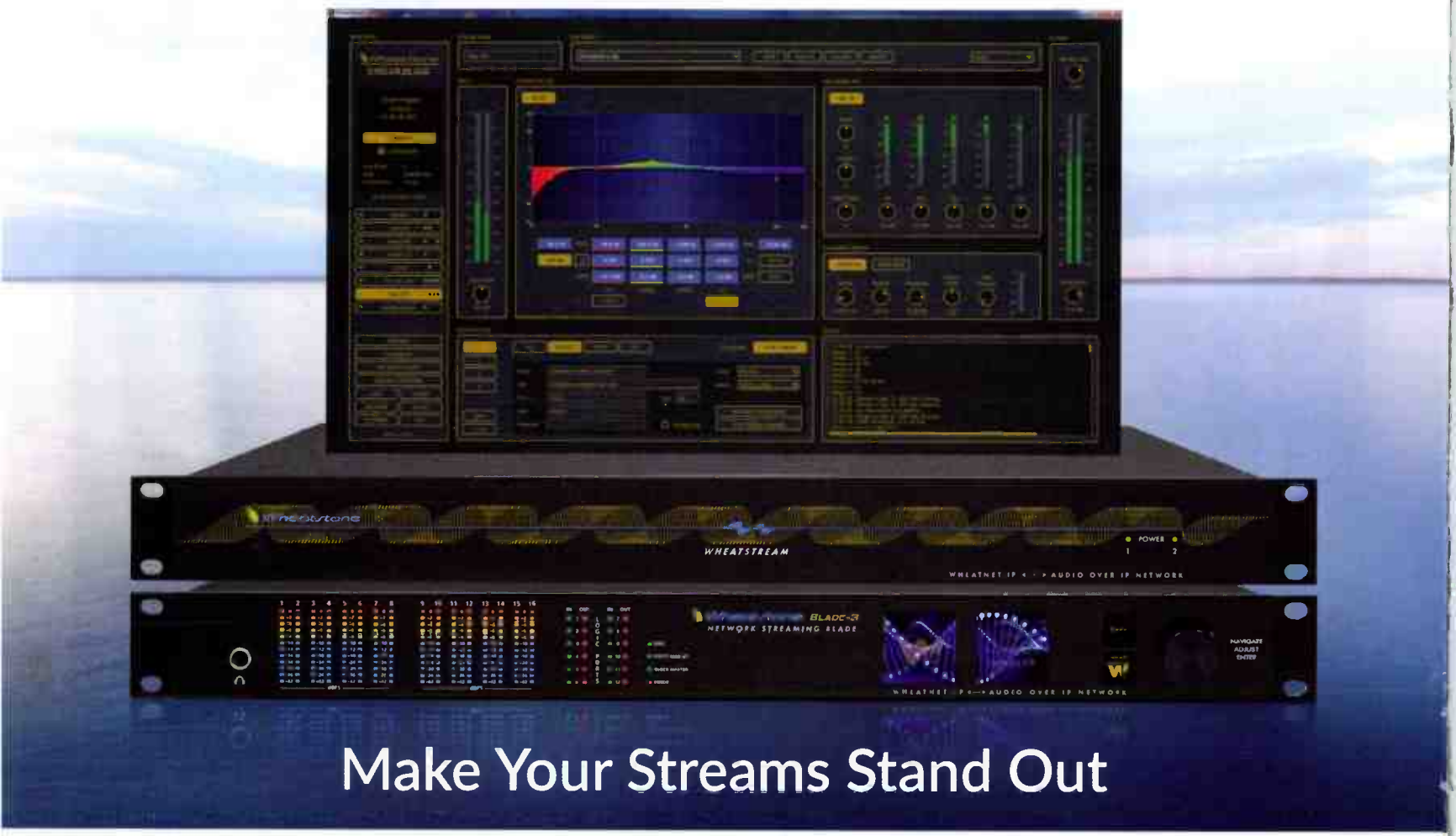
Keep your balance

Mark Persons offers tips for connecting analog audio sources.

Band on the run

Readers debate the precarious state of AM and what to do about it.

FUTURE



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Tips for your next STL

A new Radio World ebook provides practical insights

Paul McLane
Editor in Chief

When you're planning an STL, you have many options to consider these days, including 5G, fiber and Starlink satellite. Alex Hartman has a few words of caution though.

"They're offering a much more diverse selection of pathing between the studio and transmitter sites," he said.

"Importantly, though, they also put you in the hands of third parties — big cellular companies in particular — and at their whims of moving things around or causing unknown outages."

Hartman, a partner in Optimized Media Group, has done a great deal of STL work. He talked with me for our latest ebook, in which we discussed the many new types of "pipes" available.

"In many cases in rural areas, the towers are all linked by other backhaul means to the primary point-of-presence tower, where the large-capacity fiber lines are," he said. "So the diversity on the towers is actually not as diverse as one thinks. These towers can be 40 miles apart, end to end, all using the same fiber connection at the point-of-presence tower via licensed or unlicensed links to adjacent towers."

With fiber, as with telcos, you're at the vendor's whim and at risk from outages, upgrades and changes, Hartman said.

"Starlink is the newest player to the game, which literally opens up a whole new world of connectivity. Keep in mind that it's still growing and comes with those growing pains. But having low-latency high-speed data to mountaintops or very remote locations opens new possibilities," he said.

Alex Hartman

"Putting Starlink on BOTH sides of the link — at the studio and the transmitter site — is in essence a private network. It's using only the Starlink network, it never touches the ground-based public internet!"

Eventually, he said, Starlink will be another large-scale network — a global network — overlaid on the traditional

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ground-based system, with points-of-presence to get back to the ground. "But if you go terminal to terminal, you never need the wireline carrier part of the system!"

Again, though, there's a third party involved, so you're still at their whim. "And right now it uses CG-NAT, or Carrier Grade Network Address Translation, meaning that the IP space used cannot have ports opened, VPN hosts, etc. It does need an intermediary service to make IP connections. It was designed for consumption, not hosting."

Learn more from Alex Hartman and a half-dozen other STL veterans in the free ebook "STLs in the 21st Century," at *http://radioworld.com/ebooks*.

Newswatch

NEW NABA LEADER: Rebecca Hanson was named the new director-general of the North American Broadcasters Association. She'll succeed Michael McEwen, who will retire at the end of June.

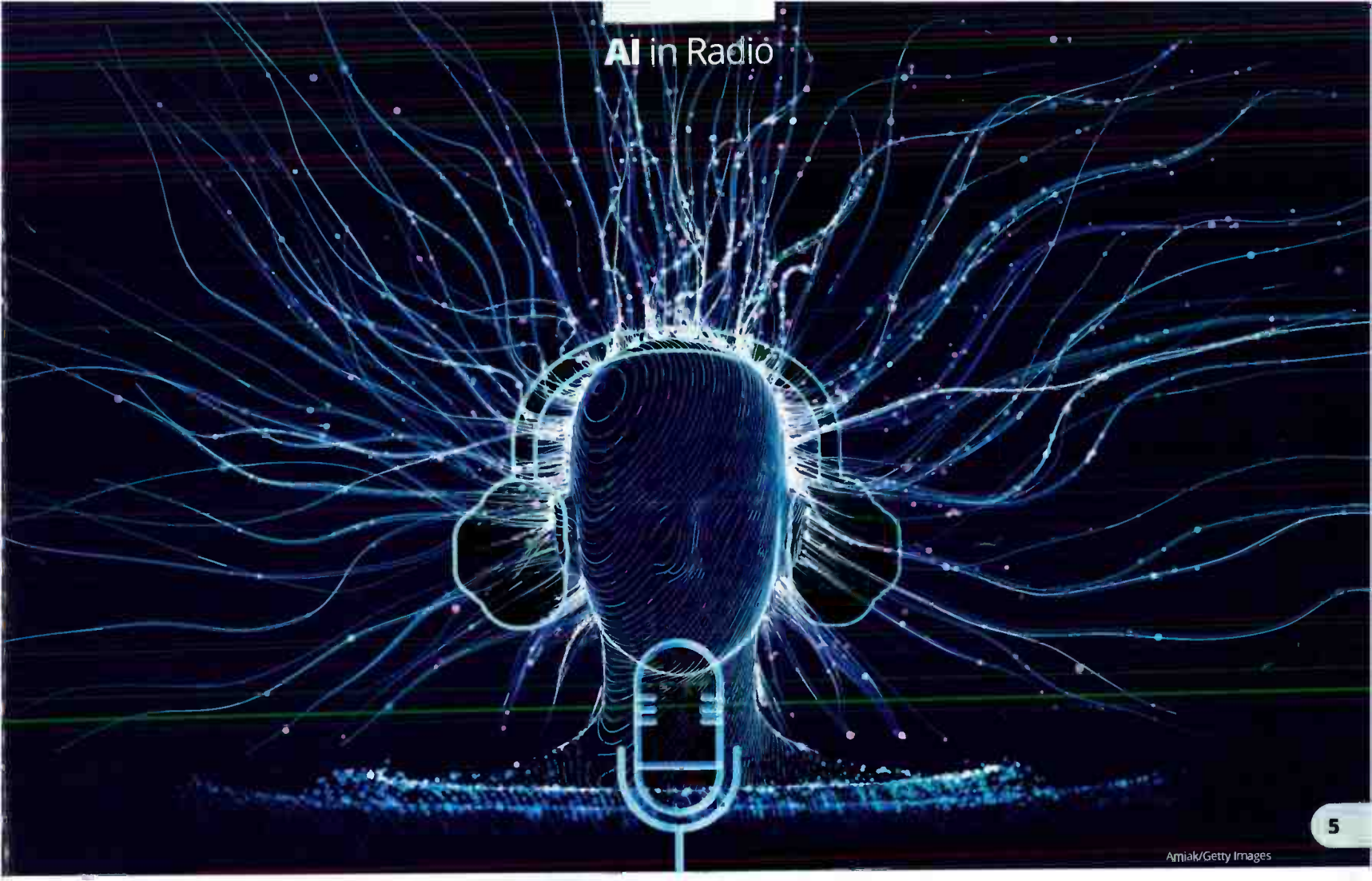
Hanson is a former SVP of policy and strategy at Sinclair Broadcast Group and former general counsel for HC2 Broadcasting. She was a member of an FCC spectrum task force on the National Broadband Plan and has also held roles at Sprint Nextel, XM Satellite Radio and Pillsbury Winthrop Shaw Pittman. She serves on the Maryland Public Broadcasting Commission and is the board of the NAB Leadership Foundation.

NABA said she will lead the group with "a strategy that includes resisting all forms of encroachment on broadcast spectrum, a continued commitment to broadcasting core values as a public good, and demonstrating other values that broadcasting offers in evolving communications."

WAHL LOSES LICENSE: The FCC will revoke the license of Roger Wahl, who owns an FM station in Pennsylvania southeast of Pittsburgh.

Wahl pleaded guilty in 2020 to several crimes including secretly taking nude photos of a woman and impersonating her online.

The license of WQZS, a Class A FM on 93.3 in Meyersdale, was to be revoked barring a reconsideration appeal. The FCC said Wahl lacks the character qualifications to remain a licensee.



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Writer

Randy J. Stine

Radio World's lead news contributor wrote about carmaker plans for AM radio in the March 29 issue.

Futuri grabs radio's attention with RadioGPT

Anstandig expects the tool to be on-air "at hundreds of stations" this year

Imagine a computer-generated voice created for radio that's barely discernible from human, that can do its own show prep, that is aware of hot topics being discussed on social media in your market, and that can work seven days a week without taking breaks. Too good to be true? Maybe not.

Futuri Media says the future of radio is here with the introduction of its AI bot RadioGPT. For many in radio it's surprising just how fast the future has arrived.

Interest in AI-based tools for broadcast radio is high, and with generative AI and synthetic voice technologies maturing quickly, the impact is likely to be disruptive, including the loss of on-air jobs.

Writing tools like ChatGPT already are being used for emails, commercial copywriting, social media posts and blog writing, according to industry sources.

ChatGPT is an AI-powered chat-bot introduced last fall by OpenAI; the acronym refers to generative pre-trained transformer technology. But Futuri is taking GPT further for broadcast with RadioGPT, which uses GPT-3 and GPT-4 to create what it calls the first fully AI-powered radio hosts.

The natural language processing software is quite a technical feat, according to the company. An AI jock can chat about weather and sports, tease the station's playlist of songs and perform numerous other tasks currently done by air talent.

Futuri says the synthetic voice software behind RadioGPT has been in development for three years. The platform can also write blogs and social media posts.

AI watchers (and listeners) say it is increasingly difficult to differentiate between what's organic or AI-created. Broad

industry discussion has focused on the many ways RadioGPT could be used by radio groups to become more efficient.

Beta test partners for RadioGPT include Alpha Media in the United States and Rogers Sports & Media in Canada, according to Futuri. The product — and it is, in the end, a product — was expected to be a buzz topic at the NAB Show this month.

Its launch comes at a time when radio broadcasters are looking for more efficiency and cost saving. Considering how challenging the economic climate is, generative AI is likely to be tempting to large radio broadcast groups such as iHeartMedia and Audacy that are heavily in debt and have gone through periods of downsizing.

Above
Daniel Anstandig

AI-driven radio

Daniel Anstandig, 39, is the founder and CEO of Futuri Media. According to Crain's Cleveland Business, "Anstandig started a radio broadcast program in his parents' basement at age 9 and sold a company to Microsoft at 17." It said he launched Futuri in 2009 with the help of Zapis Capital Group.

Futuri Media originally was known as Listener Driven Radio and offered a variety of media services under the LDR banner. The company is privately held and based in Cleveland; it also offers sales intelligence technology to broadcasters and digital publishers. It employs around 100 people, many of whom have backgrounds in computer and data science while others have experience in broadcast media.

> **"I do not believe people are going to be replaced by AI, but I do believe those people will be replaced by others who use AI."**

Anstandig declined to discuss specific potential clients for this story. But he expects RadioGPT "to be on the air at hundreds of radio stations by the end of this year." The tool, he said, is meant to enhance the sound of a station, not necessarily replace current DJs.

"The capabilities of AI are being used to change jobs in every industry. I do not believe people are going to be replaced by AI, but I do believe those people will be replaced by others who use AI. It could be what happens in broadcast. AI is going to create new opportunities and new jobs that right now are not even being considered," he said.

Reactions from air talent, Anstandig says, understandably has been mixed.

"Some are excited and intrigued by the technology, and others are fearful and see it as a threat. I get it. But I ask them not to jump to the worse possible conclusion. I see a future that depends on artificial intelligence to create content for radio broadcasters. People now expect content on demand. That's the role of RadioGPT."

The platform uses AI-generated voices combined with real-time intelligence about what is happening in a local market to create a localized personality. A predictive AI platform called TopicPulse monitors Facebook and Instagram and collects data from over 250,000 news sources, looking for local trends; then an AI voice creates local content.

Radio clients can choose from more than 100 synthetic or cloned voices; they can assign a voice a personality. They can use RadioGPT to create shows with one, two or three hosts, and program for individual dayparts. The tool can generate social posts and blogs related to the content on the air; it can create short videos on hot topics for social use. Its broadcast audio can then be published to podcasting platforms automatically if desired.

Said Anstandig: "This is way more than just text-to-speech."

"Live and local"

The RadioGPT process begins with Futuri's broadcast interface, Anstandig says, which is tied to a station's automation system.

"We see their program logs and the talk break commands. We use GPT-4 to create a conversational element that could be about what is currently trending, or local news or weather. Or a station promo or teasing another song, even plugging in a sponsor mention."

RadioGPT creates "dynamic and engaging voices," which are combined with Futuri's backend imaging and loaded to the station's automation.

"Using AI can really create a live and local broadcast. It can make those voicetracked shifts that much more engaging," Anstandig said, "and free up jocks to be out in the community meeting listeners."

Anstandig stressed the ability to create new voices or clone existing ones. "Imagine a radio station being able to extend the uniqueness of their existing personalities and have them do other dayparts and audio production while being freed up to handle other tasks."

The company estimates that 70% of air shifts in U.S. radio are voice-tracked or at least passively produced. Futuri sees that as an opportunity.

"Our research shows that seven out of 10 air shifts around the world are already unmanned with generic

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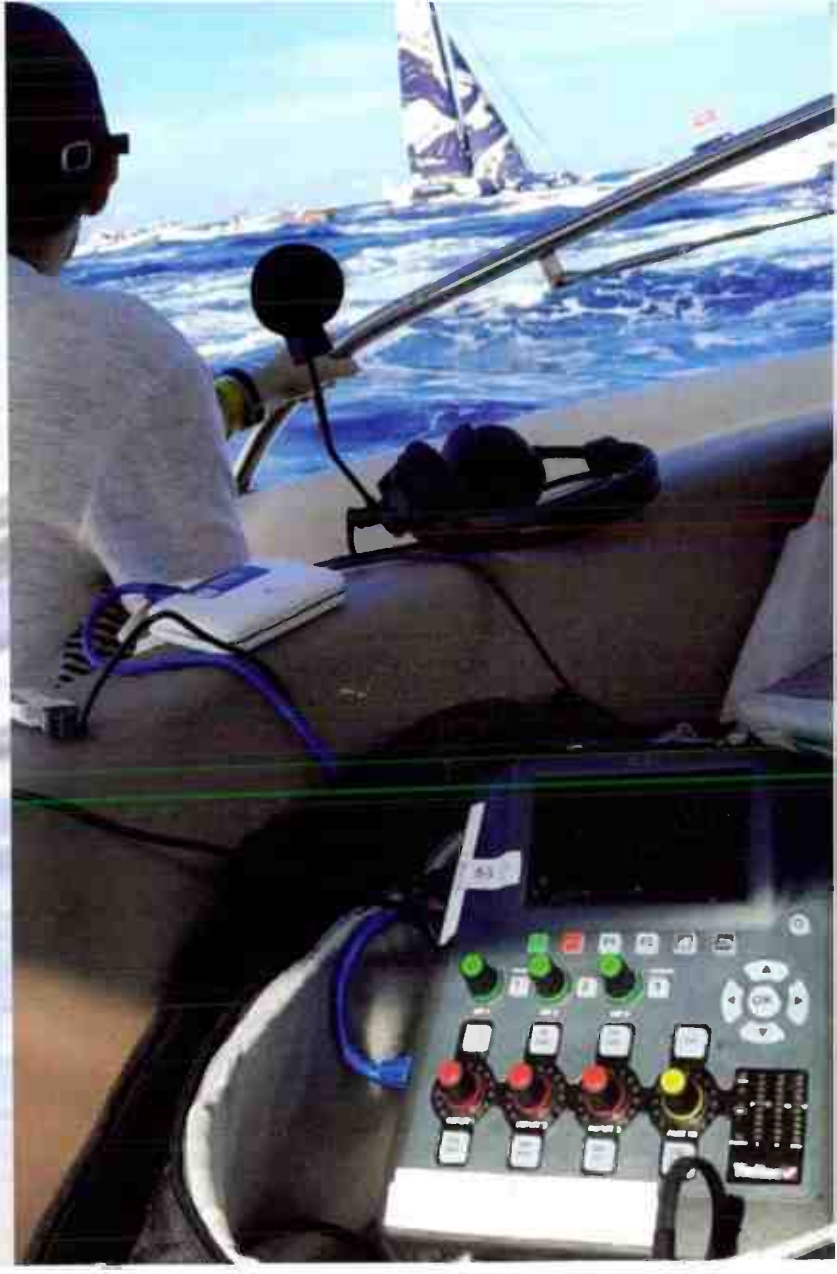

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production or voice tracking," Anstandig says. "What we're looking to do is augment a station's ability to fill its programming with more live and local content."

Auto industry analyst Roger Lanctot of TechInsights attended a presentation by Daniel Anstandig at Radiodays Europe in March. Lanctot marveled that RadioGPT can see what's in a station's music log and talk about those songs and artists; tease and promote content going into breaks; discuss the weather and traffic; take audio from listeners and incorporate their comments into the show; give away prizes; and riff on what's happening in a given market in real time.

"It isn't just that RadioGPT can do these things," Lanctot wrote in a blog post. "It's that RadioGPT can do these things well with appropriate emotional inflection and location appropriate accents. The 2013 movie 'Her' comes to mind."

He described the effect as eerie.

Above
Futuri says RadioGPT "could transform the broadcast industry, enabling companies to cut costs while determining some, if not all, of a radio station's content."

Keeping up with streamers

On the surface, the fact that RadioGPT describes this kind of radio as "live and local" seems counterintuitive or misleading. Yet Anstandig argues that Futuri's natural language processing software can deliver exactly that.

"It is live and local because the voicetrack is generated by AI in real time based on what is happening in a specific market. Let's be real. Many of those voicetracked shifts today on radio are far from live and local. Sometimes they are tracked from thousands of miles away and days ahead of time, literally.

"RadioGPT can create a jock, one with real emotion and personality, targeting a specific demographic that can do an even better job being live and local utilizing the technology," Anstandig said. "There will not be a need for just a jukebox radio station with sweepers ever again."

> **"It is live and local because the voicetrack is generated by AI in real time based on what is happening in a specific market."**

The upshot of RadioGPT, Anstandig says, is that it can create a truly synthetic voice or clone an air talent's voice so that it is remarkably close to the real thing. "Imagine freeing up a local talent to use the voice to create spec spots. The potential is really remarkable."

Ironically, streaming companies like Spotify now want to sound more like radio, Anstandig says, and make themselves more of a companion technology. The streaming service, which has long aimed for more in-car listening, released a new AI DJ that guides and personalizes a user's experience.

Anstandig says Apple and Amazon are developing their own version of AI jocks. "There are becoming AI-powered streaming services," he said. "That creates an urgent need in the radio industry to keep up."

Other technology companies, like Veritone and Super Hi-Fi, have developed synthetic voice and AI tools that mimic or create a radio listening experience. iHeartMedia is using Veritone products to translate podcasts into foreign languages, Radio World has reported. Adthos uses generative AI to create 100% automated audio ads.

"AI is being used in nearly every industry," Anstandig says. "AI was surely going to come to the broadcast industry. The convergence between tech and media is happening. AI can make completion of human tasks far more efficient, and it delivers insights that no human can replicate. It allows broadcasters to leverage their best talent and use AI as content creation and grow audiences. It is an AI powered tool that can help grow revenue."

"I love radio"

Anstandig, who describes himself as a tech futurist and has done radio on-air work himself, says he is passionate about radio and tech, and that Futuri created RadioGPT to save radio, not compete with it.

"I love radio and we are helping shape the future of broadcast media, which means finding ways for audience

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> **I just don't think radio stations have the ethical need to explain their production processes or the way that every minute of their content is created.**

and revenue growth for broadcast. Part of it is to implement AI personalities to make radio sound better. To have AI that can share news updates and current events relevant to an audience's interests and demographics is something special," he said.

"I do believe listeners favor live personalities. But at the end of the day, it's all about the value of the content. If the content is engaging and interesting and providing value, then the audience will continue to listen. So long as the synthetic voice is not so robotic that it becomes grating."

What about fears that AI can create misinformation from incorrect data, outputting bad results in what some call "AI hallucination"?

"We have a high level of assurance that RadioGPT has implemented more preventive filters and training compared to most broadcasters in their operational processes. RadioGPT obtains content from reliable and verified sources [via TopicPulse], which has a team of human moderators; and our AI is programmed to cross-check and reduce the occurrence of speculative or inaccurate content, sometimes referred to as hallucination.

"Additionally, RadioGPT automatically confirms that any generated content does not contain any offensive material."

Anstandig expects the broadcast industry will continue to debate the ethical implications of using AI bots as DJs, and whether and how to disclose it to a listening audience.

"I believe that transparency builds trust and eliminates confusion. For certain uses of AI, say in the medical or financial industries, it's particularly important to disclose the use of AI and the possible consequences. Yet in broadcast I don't think it is going to be as important for every single radio station to take the air time to qualify the use of AI for every voice on the air.

"I just don't think radio stations have the ethical need to explain their production processes or the way that every minute of their content is created."

Alpha

Futuri listed Alpha Media, which owns about 200 stations, as a beta partner in its March announcement. Executive VP of Content Phil Becker was quoted: "At Alpha Media, we always seek innovative ways to engage our audiences. That's why we're a part of Futuri's RadioGPT beta group. With RadioGPT's cutting-edge language and content technologies, we can deliver a real-time, hyper-localized, innovative audio experience. In fact, I have such faith in AI that I had it write this quote for me."

But it's not clear when the company might put RadioGPT on its airwaves. Becker responded to a Radio World query by email: "At this time, we are conceptualizing some use cases for RadioGPT. We haven't activated, used or shared with anyone our recommendations or findings."

Rogers Sports & Media did not reply to a Radio World request for comment.

Real People Talk About AI

Some recent comments about the use of generative AI tools in radio:

Gary O. Keener, Radio World reader — "After hearing the demo of RadioGPT on Futuri's site, I had an immediate flashback to Tom Petty's 2002 tune: 'There goes the last DJ who plays what he wants to play, and says what he wants to say ... there goes your freedom of choice, there goes the last human voice, there goes the last DJ.' I must have heard that in, oh, 2004 or so. Little did I know it would literally come true in my lifetime, including that human part!"

Fred Jacobs, Jacobs Media, about such tools in general — "[I]t all begs the question: What is the underlying motivation of this technology? At its core, if it's successful, what is the goal? To fool people, of course. ... There is no one who welcomes technology and innovation more than me. ... But a technology that is predicated on using AI to fool our listening audience requires thought, consideration and research."

Roger Lanctot, TechInsights — For me, RadioGPT's ability to conduct interviews and interact with listeners is the eeriest proposition of all. ... Combining the arrival of RadioGPT with the widening acceptance of natural language voice interfaces in cars makes this proposition seem inevitable. The challenge will be for broadcasters to rapidly come to terms with the ways that artificial intelligence can be used by humans to enhance the content delivery and marketing value proposition of radio. ... What is clear? RadioGPT is here, it's eerie, get used to it.

John Bisset
CPBE
The author is in his 33rd 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.

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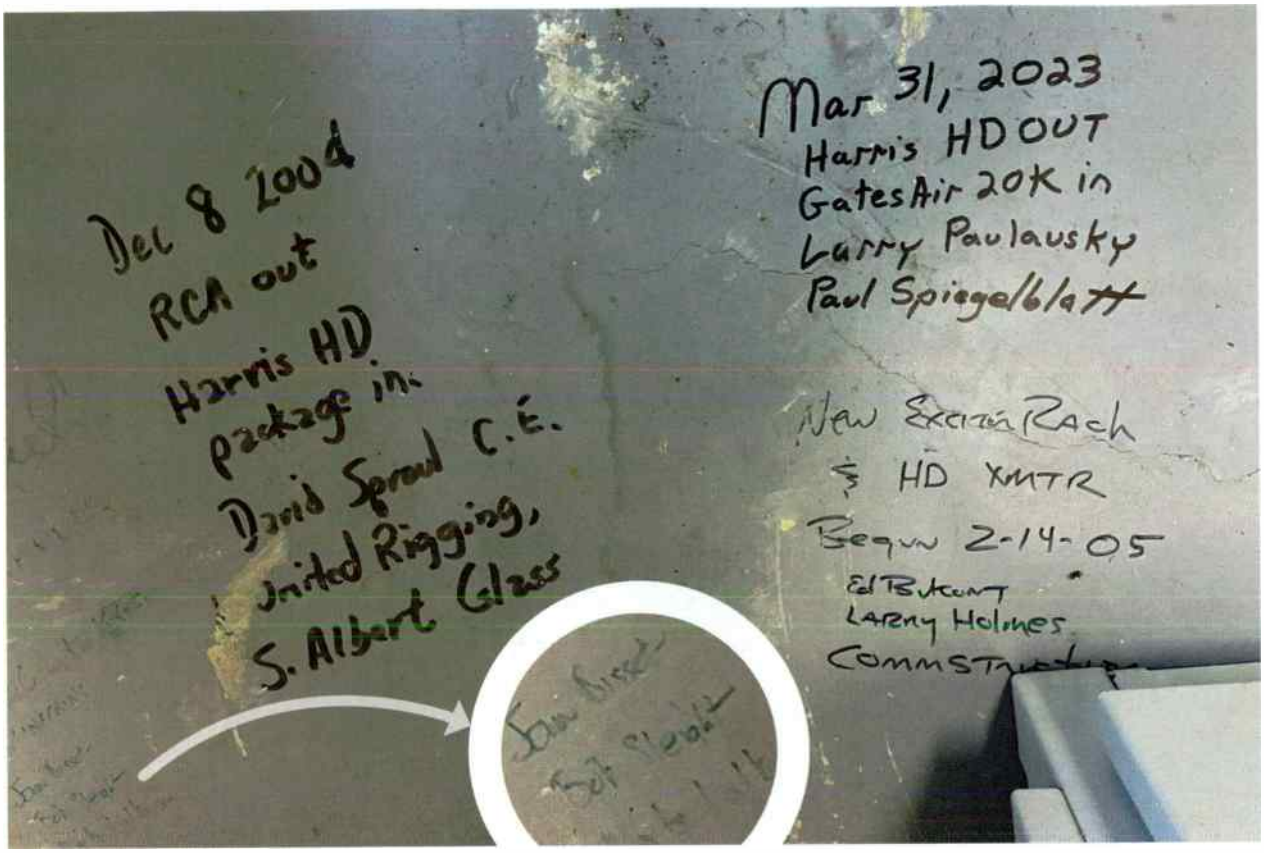
Workbench submissions are encouraged and qualify for SBE recertification credit. Email *johnpbisset@gmail.com.*



Above
Fig. 1: Create your own time capsule during your next transmitter install.

Engineers uncover a surprise UNDER the transmitter

And it delivers an unexpected memory jolt to your trusty Workbench author

Oct. 9, 1985 found me working as chief engineer of Washington's 105.9 KIX Country. We'd signed a lease as a tenant on a new tower about 15 miles closer to the city; the project involved moving an RCA-20E transmitter and installing an Alan Dick panel antenna.

The transmitter had to be craned through a window into its second-floor home, so it was critical to use a professional rigging and hauling company — in this case United Rigging of Beltsville, Md. We worked with the Metroplex DOE, the late Doug Holland, and his associate Scott Tanner.

Before setting the transmitter in place, I remember that Doug grabbed a Sharpie Permanent Marker and had each of us sign our names on the floor. This permanent record, including the signatures of my assistant Bob Sleight and maintenance engineer Marty Wilkerson, was entombed by the weight of that RCA and a later Harris transmitter, and pretty much forgotten.

Then on March 31 of this year, Cumulus Media Market Engineer Larry Paulausky and his assistant Paul Spiegelblatt coordinated the installation of a GatesAir 20 kW box. As the Harris transmitter was moved to make way for the GatesAir, Larry and Paul discovered not only our 1985 Sharpie names but those of the engineers who'd installed the Harris in 2004.

They added their own to this growing record and snapped the picture shown.

Dave Sproul, who was chief of the station when Cumulus entered the market, passed the picture along to me. These signatures show the progression of transmitters that have served 105.9 over the years. Down in the lower left of the photo, past the Dec. 8 entry, you can make out some of the faded writing from that first installation, approaching 40 years ago.

If you're planning a transmitter install, why not start your own time capsule using a Sharpie. Who knows who will find it?

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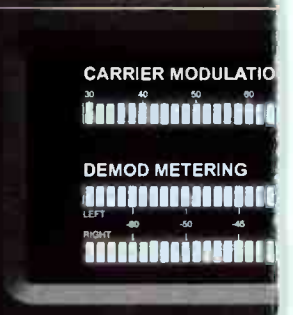

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Above & Right
Fig. 2: The burned interbay coupling box as the antenna is removed.

Fig. 3: The full extent of the damage can be seen.

Fig. 4: Dents and heat marks are noted on the transmission line.

Fig. 5: Was the hole from the burn? Or a bullet fired from a rifle below?

Fixing a hole

Texas-based Coast to Coast Tower Service offers a few pictures of their own, driving home a point that Sinclair Telecable Norfolk DOE Dave Morgan made here recently concerning tower maintenance.

Coast to Coast was called when this station was off the air. Inspection found several dents and burns in the antenna interbay transmission line. Fig. 2 shows the interbay coupling box as the antenna was being dismantled. Fig. 3 shows the same junction once removed. Fig. 4 shows dents and over-heating marks on the line.

The entire 12-bay antenna was disassembled and brought to the ground for inspection and repair. After it was checked out and cleaned and new replacement parts installed, the antenna was restored to service.

One curiosity was the hole shown in Fig. 5. Was it from the burn, or was it caused by a bullet that may have initiated this catastrophe?

Sone things periodic inspections can't prevent, but having a reputable tower company to service your transmission systems is good engineering practice. Coast to Coast Tower Service's site is *www.ctctower.com*, and they are available 24/7/365.

Old manuals, anyone?

Harold Hallikainen dropped us a note of thanks for the mentions of the Western Electric 111-C transformers. He says he solved a ground loop problem between a Moseley PCL-303C Composite STL and a Gates exciter using a 111-C.

If you've ever wondered about the specs of this transformer, Harold writes that composite stereo was passed through the transformer with great results — plus it got rid of the ground loop! He concludes that it truly was an amazing transformer. Engineers who have repurposed these gold nuggets will agree.

If you're not familiar with Harold's Broadcast History reference site, visit *https://bh.hallikainen.org/*. Its mission: saving history from the dumpster! Through the help of contributors, Harold has amassed an unbelievable library of broadcast equipment technical manuals and historical publications.

If you maintain older gear, bookmark the site. And if you discover old equipment manuals in your files, don't pitch them until you offer them to Harold.

Amateur radio enthusiasts will also want to visit Harold's site *https://w6iwi.org*.

"The mission of Harold Hallikainen's Broadcast History reference site is to save history from the dumpster!"

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Let's connect audio in a studio

There are no concrete answers that fit every analog audio situation

Writer

Mark Persons

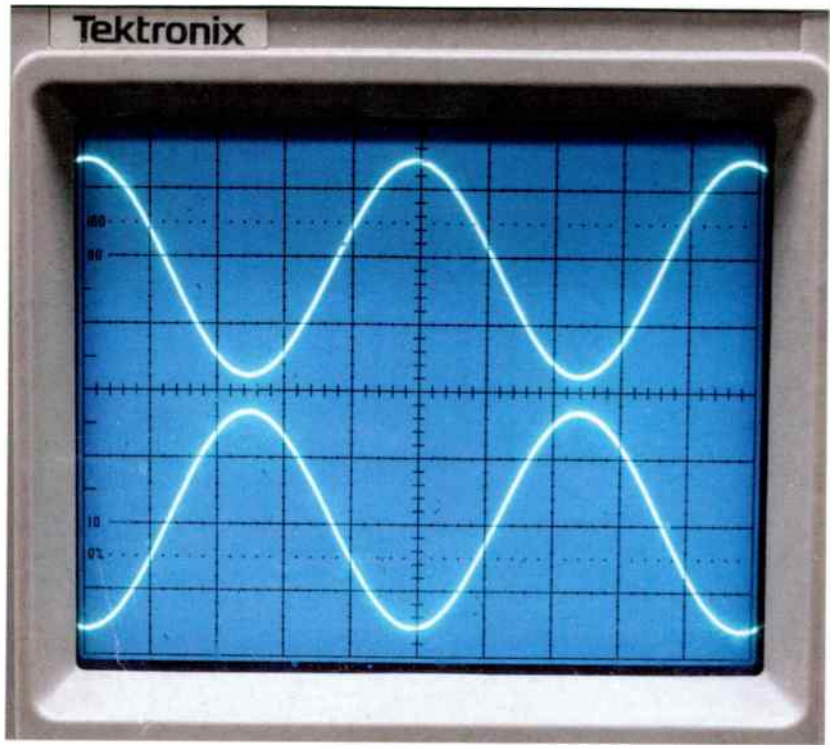
CPBE, CBNT, AMD

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.

In Part 1 of this series on audio fundamentals ("Let's Talk About Some Basics of Audio for Radio," *radioworld.com*, search Basics), we discussed audio problems and how to handle audio transformers.

Most of today's studios don't need transformers to couple audio from one place to another. Integrated circuits (ICs) with operational amplifiers made a huge improvement in audio quality starting in the early 1980s.

Our discussion today is mostly about analog audio, though some techniques apply when connecting analog audio to digital devices.



Right
Fig. 1: Active balanced + and – audio.

Below
Fig. 2: A balanced-to-balanced signal path.

Active balanced

Inexpensive ICs can send and receive audio on balanced lines. That means a pair of wires, isolated from ground, carrying analog audio. We call it "active balanced."

With balancing, each of the two wires has audio, but they are 180 degrees out of phase from each other. To keep things straight, we label one wire as "+" while the other is "–". This is important in stereo, where an accidental reverse of the wiring could cancel monaural material.

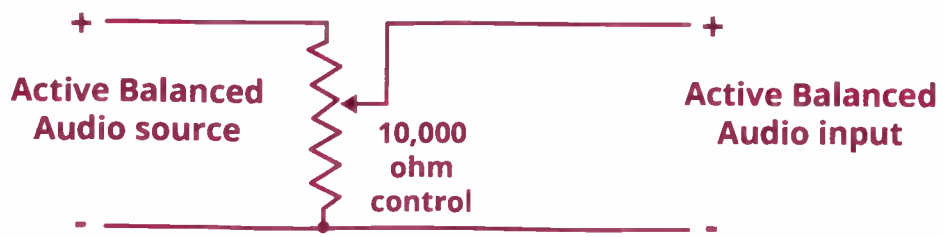
Fig. 1 shows a dual trace oscilloscope displaying a 1 kHz tone. The top trace shows the + wire while the bottom trace shows the – wire. One is going positive in audio voltage while the other is going negative. That doubles the voltage delivered and multiplies the power by four.

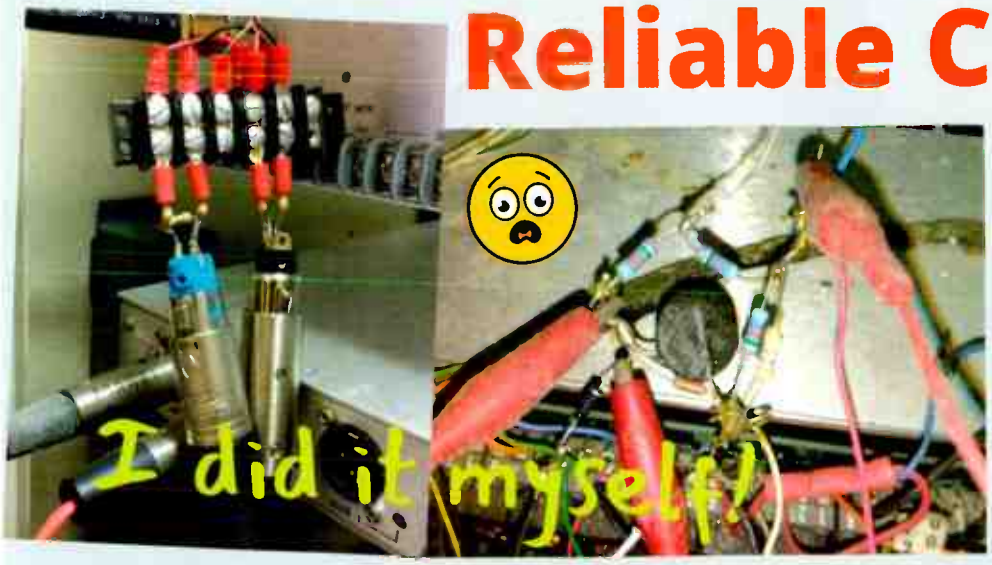
Power isn't a big concern because we are talking fractions of a watt, but it helps keep a high audio signal-to-noise ratio. We don't want to hear hum and noise in the background of the air product.

Fig. 2 shows an active balanced audio output driving an active balanced input. A typical source impedance is 50 to 600 ohms while the receiving end is typically 10,000 ohms. Audio is, in essence, sampled without loading down the source. Audio can be sent to multiple destinations in a building without degradation. Note there is no reference to ground. There doesn't need to be if all audio devices are grounded through their power cords.

Also shown is a 10,000-ohm variable resistor to adjust audio level. If adjusting is not necessary, remove the control and connect + to +. The diagram is for one audio channel. You'll want to do the same for the other channel to keep left and right stereo consistent.

Fig. 3 has an unbalanced audio device, such as a CD player that has a two-wire power cord. The audio cable will have a phono plug at the CD player. That audio cable shield needs to go to the (–) input on the console. You should also connect the shield to console case ground. Connecting a shield to only the audio console (–) input might be a bad idea. Static electricity on the CD player could damage the audio console's active balanced input amplifier. The





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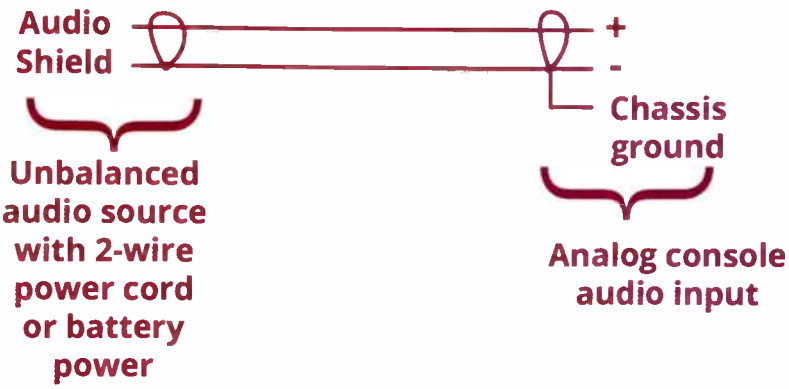


schematic diagram shows loops around the + audio wire. Those signify a cable shield around that conductor, as required when handling unbalanced audio.

Fig. 4 shows an older Arrakis analog audio console's input terminals. A #12 bare copper ground wire is held in place by solder lugs, which are screwed to the console's metal cabinet. Call it a "ground buss." The console did not come that way. I modified it to this configuration to keep the audio clean.

Note that cable shields tie or are soldered to the buss wire as opposed to connecting to the G (ground) input on the console's circuit card. The reasoning is that there could be some AC leakage current flowing through the shield that might add hum or noise to the console audio by way of the console's thin circuit board conductors leading to console ground.

Best to connect all shields to the metal console cabinet, as shown here. I worry a bit about putting a static electric shock into an audio console when an audio source is connected or disconnected from power. Connecting the shield to console case ground should keep this problem at bay.

The internal console electronics typically tie to the buss over at the output amplifier board with just one wire. It is a bad idea to run multiple grounds to multiple circuit cards. All console circuits need to seek ground at one point to keep audio clean.

Above
Fig. 3: An unbalanced source to a balanced audio console.

Below
Fig. 4: Audio connected to console inputs.

That is usually at the output card.

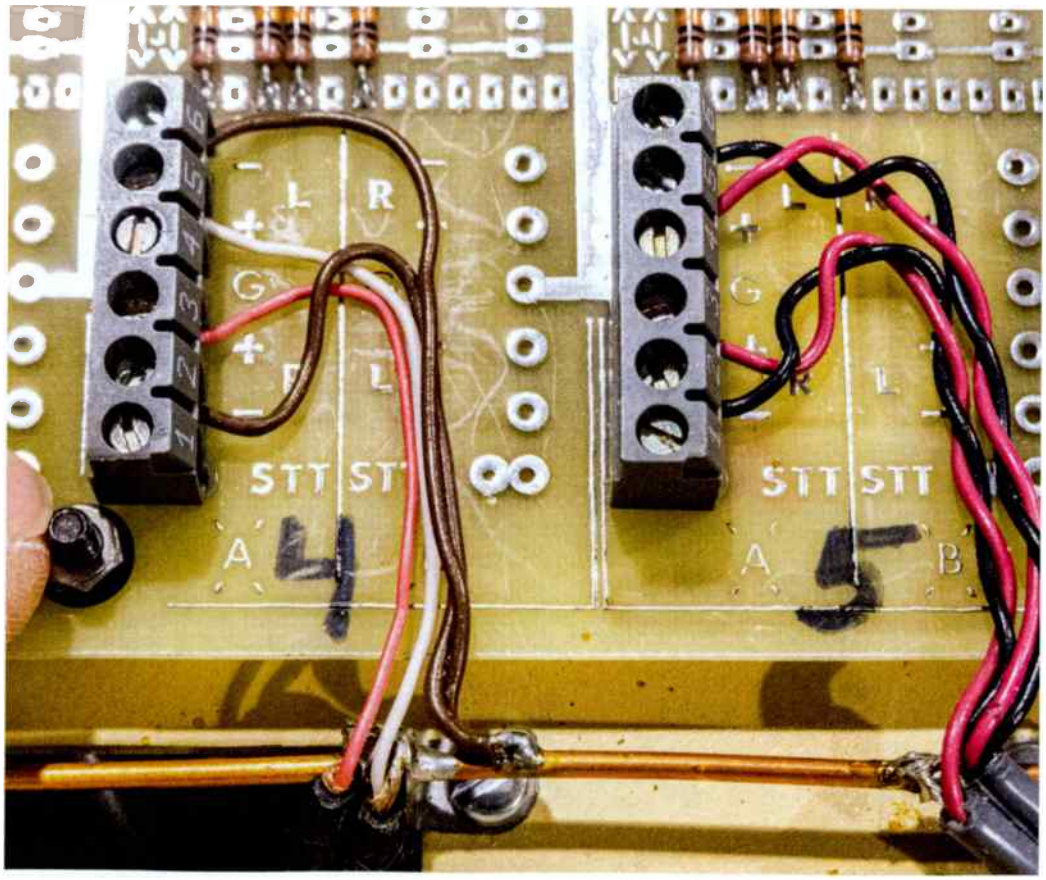
This console's #4 input has stereo unbalanced shielded cables from a CD player. They are the red and white wires going to the L+ and R+ inputs. Their shields go to the ground buss. The active balanced L– and R– inputs are tied to the ground buss via the brown wires. This is the best way to do it.

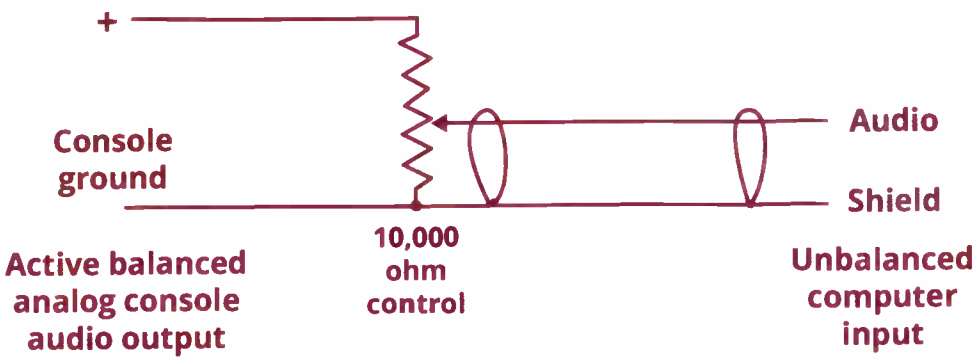
Console channel #5 is receiving audio from an active balanced source. The source cable shields are tied to the ground buss, not to the G as indicated earlier.

Feeding audio to an unbalanced device, such as a computer, has its challenges. See Fig. 5. Use either the + or – output of the audio console along with the buss ground, not the ground terminal on the console's output connector. As with the console's input, seeking ground through a circuit card trace can lead to adding noise to audio.

With console outputs ranging from 0 dBm to +4 dBm, there is likely more audio than needed when sending audio to a recording device. Fortunately, audio from just the + or – output of the console is 6 dB less than the total of + and –. This may still be too much for a recorder. Fig. 5 shows a 10,000-ohm variable resistor to set level.

Equipment with a three-wire power cord is already grounded





via the third pin on a power plug. This kind of situation is not always predictable. Start by using an audio cable shield to connect grounds at each of the two devices that have grounded power. Hum and noise might result. You'll likely wind up disconnecting the ground at one end. You might use a heavy wire to bond the console ground to the computer case. Use an audio transformer only if necessary.

Safety

An audio hum problem can be made to go away when a ground adapter is connected in series with a three-wire power plug, as seen in Fig. 6. It disconnects the ground conductor. This is a BAD choice for safety. The ground connection is there for a reason and should not be circumvented. Find another way to solve the problem. Active balanced audio works well in cases where both ends of the audio cable are active balanced.

Above
Fig. 5: Feeding audio to an unbalanced recorder.

Clean ground

Every studio facility should have a ground reference that is common to all studios in the building. A good way to do that is to establish a single-point ground in the engineering/equipment room. That should be a copper strap connected to an insulated #6 or better stranded cable that is run to the incoming electrical power panel with its associated ground rod or rods.

Heavy ground conductors should be run from the engineering/equipment room to each studio. Fig. 7 shows an RG-8 coaxial cable with the inside and outside conductors brought together at the end. It makes for an inexpensive low-resistance conductor that is insulated along the cable route because of its non-conductive jacket. You don't want the ground wire to

touch other grounds on the way. Accidental intermittent touching to electrical conduits, rebar in concrete, water pipes and whatever creates a difficult troubleshooting problem. Don't let an unreliable connection happen as it could play havoc with audio and control for years to come.

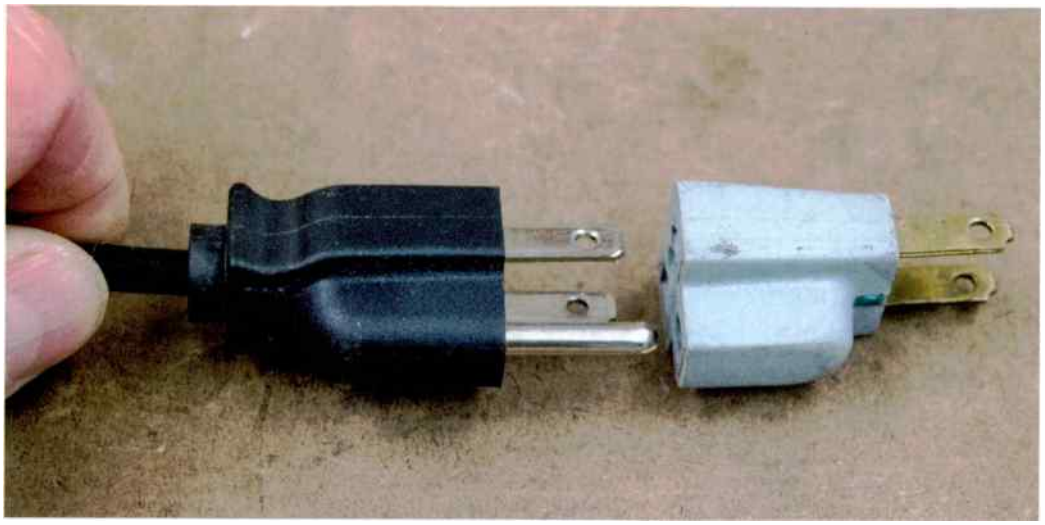
A single point ground is sometimes called a star ground, where the equipment room is the hub and studios are runs away from there. Every studio ground should be the other end of each RG-8 cable. Fig. 8 shows a 12-by-2-inch copper strap where studio devices connect. You could call this a mini-star hub leading to the equipment room.

Ground differences

Balanced audio can get into trouble if the ground on one audio device is more than a few volts different from the other. Audio could get noisy or distorted, or have hum. This should not be a problem when employing a star ground. I've seen it where the ground system is the last thought and must be put in later to solve problems. It sometimes confused or irritated people when I spent time carefully building a studio ground system before doing anything else. A good ground helps with lightning protection too.

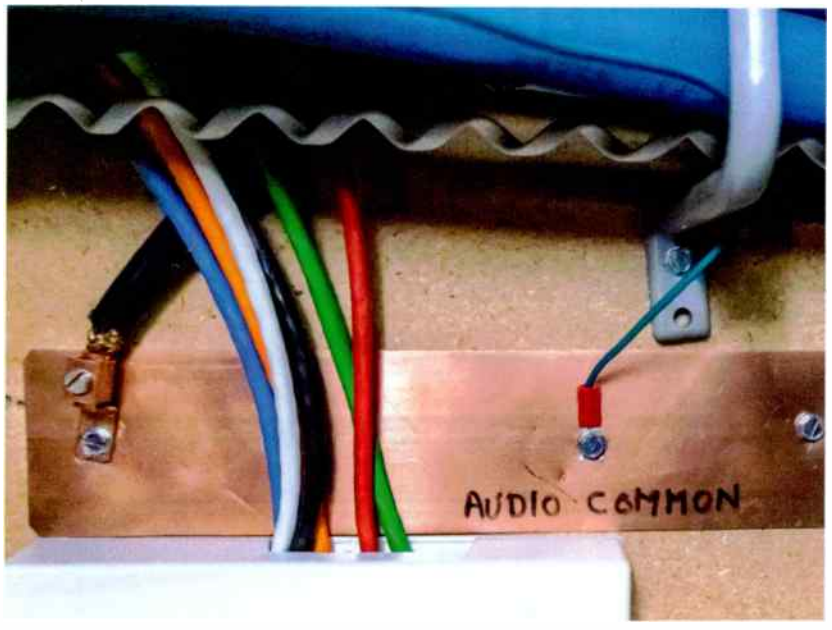
In summary there are no concrete answers that fit every analog audio situation. Some experimenting is required. Knowing the pitfalls should help you get to the right answer. Think through and understand audio in the facilities you work on. Radio depends on keeping listeners who enjoy the sound.

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



Above
Fig. 6: Don't use a ground cheater.

Right
Fig. 7: Ground connection in equipment room.



Below
Fig. 8: Ground connection in studio.

Omnia Forza Is Processing for Streaming

Telos Alliance has rolled out a software-based approach to processing that targets HD Radio, DAB and particularly streaming.

Omnia Forza was announced by Omnia founder Frank Foti and Product Manager Geoff Steadman.

Foti said in the announcement that the percentage of listeners using streaming and digital broadcast platforms is increasing, and that the tool is intended to help stations pay more attention to that content.

Features include Omnia presets

and a single-page user interface that uses "smart controls" to simplify access to multiple parameters. The company said this will help make the software useful to users who have less processing experience as well as audio veterans.

The company highlighted the software for fresh processing algorithms supporting its five-band design; Sensus codec conditioning for low-bitrate streams; and a LUFS target-driven ITU-R BS.1770 loudness controller useful to streaming audio applications.

Forza is available now as a software container and it will be a processing option in Z/IPStream X/2 and R/2 as part of a planned update to those products. A container-delivered FM version of Forza is in development.

Info: telosalliance.com

New Nautel Transmitters Have HD Radio Air Chain Inside

Nautel announced a new iteration of its flagship FM transmitter line. It said the GV 2 family is the first to integrate all HD Radio components inside the transmitter.

The hardware platform supports HD Radio with Xperi Gen4 Importer, Exporter and Exgine implementations for HD Radio encoding, station logo and Artist Experience.

"Omnia for Nautel covers all FM and HD Radio audio processing needs and provides Livewire AoIP inputs for all audio streams. No additional hardware is required."

It said the transmitter has new power supplies, solid-state storage, a new interface card and "dramatic" increases in computational capacity. It features a fresh iteration of Nautel's Advanced User Interface based on HTML5.

The transmitter incorporates a software-based air chain architecture discussed at last year's NAB Show, when Nautel demonstrated the air chain hosted in the AWS cloud. The software components can also be hosted on the HD MultiCast+ platform and natively within the GV 2 platform.

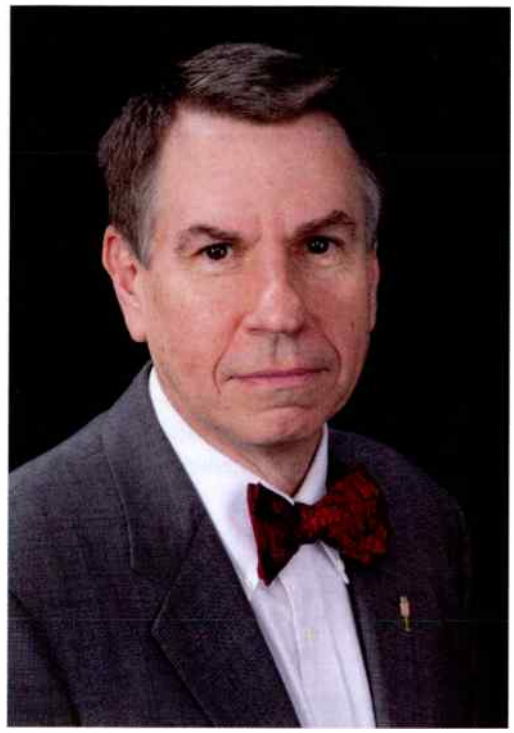
"A key component of the architecture is an air chain selector, which allows the GV 2 to select one of many air chain inputs (FM and all HD) and gracefully change from one feed to another, no matter whether the feed originates from the studio, the cloud or the internal platform," Nautel said, adding that FM/HD1 time alignment is assured through the blend lock function without the need of GPS.

CTO Philipp Schmid said FM stations operating digital modes or considering a shift to HD Radio will benefit from streamlined deployment and elimination of time-alignment tissues. "As long as there is an IP audio feed available at the transmitter site, operation is audio in and RF out," he was quoted saying.

Info: www.nautel.com

Don't ignore options to upgrade in class

Frank McCoy has a warning about a scenario that you could easily overlook



Frank McCoy recently retired from his role as chief engineer for the Salem Media properties in Chicago, legendary directional AM stations WIND and WYLL. He'd worked there since 2010, overseeing the technical assets of three transmitter sites and a studio complex. He also worked for ABC, Gannett, Skywave Inc., Capstar Broadcasting Partners and American Media Services. He does consulting work and is the managing member for an LLC that owns several FM translators.

Learn More

This interview appeared in the Radio World ebook "Maximizing RF Coverage." Find it at *radioworld.com/ebooks.*

Frank how can broadcasters maximize coverage of their FM over-the-air signals?

Frank McCoy: Coverage is basically limited by co-channel and first-adjacent-channel interference. FM HD is well into the guard band between co- and first-adjacent, more or less by design. An all-HD world might employ error correction-type schemes to sort out this kind of interference. Analog FM detectors of the discriminator kind just decode what they pick out of the air, so there's no fixing that.

On the other hand, the FM band interference rules for second- and third-adjacent channels are completely pointless. They came, in part I suppose, from similar rules for AM at the time. Early analog tuned FM receivers had AFC, a feedback-driven system for maintaining receiver tuning and compensating for drift. Strong adjacent-channel signals would capture the AFC and made listening to distant signals difficult. Plus in those days, FM meant "Forget Money," so there just wasn't that much demand for FM allocations. Aside from dividing the FM revenue pie — likely to be resisted by the incumbent players — there is no reason the number of FM outlets couldn't double using existing analog methodology. A ceramic 10.7 MHz IF filter costs a quarter. An FM receiver with a cascade of these will experience no ill effects from a strong signal 200 kHz (first adjacent) away. Contrast this with the inductor-capacitor IF "cans" of the era that included AFC. Radios are way better. Allocations should recognize the improvement.

What strategies are 21st century consulting engineers deploying to squeeze the most out of FCC allocations?

McCoy: Some clever ideas have gotten engineers and licensees in trouble. A Texas group advertised their signal for sale and included a coverage contour map that looked very asymmetric for what should have been an omnidirectional facility. Turns out they'd researched on the antenna range what distance the antenna needed to be from the tower in order to maximize the signal towards the population center. Their rim shot had some extra juice — nearly 6 dB worth if memory serves — in one direction. A competing broadcaster pointed this out to the FCC and included the sales literature with the description of the coverage and the "how it was done." The FCC staff put an end to that cleverness by imposing an overall power reduction, nixing the gain they'd created with exotic engineering.

When consultants look at a station's signal footprint today, what techniques are they using to improve it? What options might they recommend?

McCoy: Most licensees — and that includes most corporate group engineers — have little

understanding of the three-dimensional chess game that is allocations. The FCC has constrained much of this work with two rulemakings in the past decade.

The first was the change from notice, counterproposal and comment-type processes for significant changes, to the FM table of allocations. Now city changes and interrelated channel changes are handled as applications, entitled to first-come-first-served processing. While streamlining, this also limits most rearrangements to four or fewer participating stations.

The second significant change was the Rural Radio rulemaking that sought to limit moves of stations from outlying areas into more urbanized places. This had the effect of limiting new entrants and new voices in populous areas. The jury is still out on the public benefit of that one, but it was applauded by the community of existing broadcasters in those same larger markets.

One piece of advice, learned from heartbreaks I've personally witnessed and caused: If your FM station has an option to upgrade in class and you don't file it, perhaps because you don't really want to budget for the upgrade, or whatever reason, you are a prime target for those looking for upgrades for others. Nightmare scenario? Some other licensee, likely a smaller player in your market, forces a channel swap, then takes first your frequency and then the upgrade you dilly-dallied over. You get shifted somewhere else on the band. Talk about a business model disrupting experience!

But read your license. The FCC specifically excludes any exclusive right to operate on a particular frequency. There are people like me looking to claim spectrum for paying clients and all is fair within the FCC rules. You have been warned.

What about translator plays, rimshots and other time-tested techniques, what role do they play today?

McCoy: Translators simply prove that the interference rules are entirely overkill, based on receiver technology from 1960. Rim shots invariably are on second- or third-adjacent channels.

If the FCC is looking for a solution for AM broadcasters, whose spectrum is hopelessly polluted by uncontrolled switching power supplies and industrial-scale interference hash, rimshots are probably it. But not as they are now. Instead, subject to waivers of the kind afforded to translator moves where there is an AM primary station, move those rimshots into markets those same AMs now serve. Then sunset the AM licenses. Again, recognize that receivers are better for the 60 years of design progress.

Develop a first-party data strategy

You should already be working on mitigating the loss of third-party data revenue

When a research study from the National Association of Broadcasters says that broadcast stations could be losing over $2 billion over the next few years, I pay attention.

The NAB's PILOT innovation arm has released a report focused on what could happen to radio and television stations' digital bottom line once third-party cookies are totally phased out.

"The digital advertising industry is moving away from third-party cookies based on changing user expectations and global regulations," it states.

"This could create a $2.1 billion loss in annual digital revenue for the broadcast industry." It estimates that the average multi-station radio cluster could lose as much as $735,000 per year.

The objective of the "PILOT First-Party Data Direct-to-Consumer Accelerator" is to provide broadcasters with the expertise needed to construct a direct-to-consumer digital business without the use of the third-party cookies. (For background, see my column last summer, "Cookies Are Coming Off the Menu," at *radioworld.com*, search "Cookies Menu").

Radio has a leg up

The good news should be obvious, but it's easy to miss when one works in broadcasting.

Many digital-only businesses have limited access to consumers and are freaking out. Fortunately, radio has a huge, continuous, direct-to-consumer relationship that is neither controlled nor affected by cookies. How we utilize this huge broadcast asset to harness greater direct digital access is the $2 billion question of the day.

To simplify: What types of data collection can stations begin now that will enable us to be in the driver's seat when cookies are toast? And once your newly built data warehouse is collecting and arranging data, how does one monetize it?

The report speaks to the challenge: "A concise and easy method for passing first-party data and ad calls to the various delivery systems is lacking. Progress is being made in this regard, but not quickly enough for broadcasters who have data ready to feed into these systems," it states.

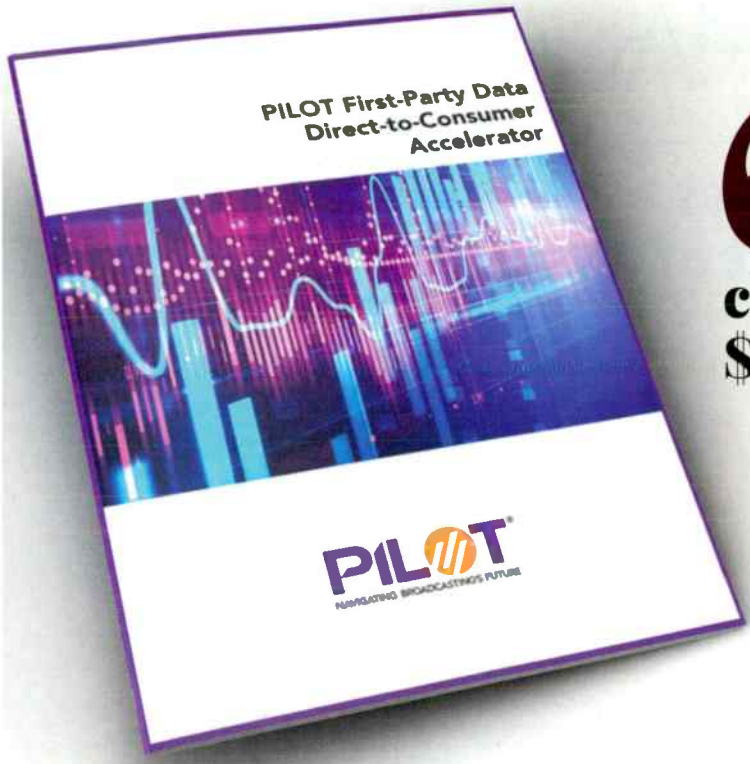
"Many broadcasters currently find this to be a laborious, multi-day

Mark Lapidus

is a veteran multi-platform media and marketing executive.

Comment

Got a suggestion for a future Mark Lapidus column? Tell us at *radioworld@futurenet.com*.



> **The report estimates that the average multi-station radio cluster could lose as much $735,000 per year.**

process to export data from their Customer Data Platforms (CDPs) and into the ad delivery platforms. Additionally, once a data transfer has occurred, it is not available for immediate use. As the time from when the data is collected or updated to when it is used to inform delivery passes by, the data can become stale and less valuable."

Now that you've got a sense of the scale of this issue, it's easy to understand why many of the major broadcast companies are attempting to come up with solutions together.

One thing I've enjoyed noting is that the major groups have started to hire digital expertise. That being said, it is important that individual clusters also hire at least one digital data guru to focus on data strategy application, which can translate into revenue generation.

If you find this subject intriguing, the PILOT report is worthy of your time and a good place to start. You'll find it at *nabpilot.org*. After digesting the info, you'll be ready to explore basics of the Google Privacy Sandbox, Publisher Provided Identifiers and Contextual Targeting.

The conclusion you will likely draw is simple: To participate in the ever-evolving media landscape, your digital future requires expertise!

BROADCAST EQUIPMENT EXCHANGE

TT/Getty Images

Above
Radio World readers have had a lot to say about the prognosis for AM radio.

Take Advantage of All-Digital AM

AM radio has seen many attempts to improve the service over the years. There was stereo AM, the NRSC-1 AM standard and then in-band on-channel analog/digital broadcast. IBOC suffered from the digital interfering with the analog of adjacent channels; in the end everyone shut down the digital and considered it a fail.

But in the meantime, for the last 10 years or so, car manufacturers have been providing radios with digital AM stereo capabilities. Sadly there's no mention, not even a hint, that these radios are digital AM capable. It was not until WWFD in Frederick started broadcasting digital-only that I was able to listen to and evaluate digital AM for myself.

It is surprisingly good. Audio quality is very good. The signal coverage appears to be close if not equal to the analog coverage. Most importantly there is no audible noise. And yes both of my cars — model years 2010 and 2012 —receive digital AM.

As I read and listen to the complaints about AM, I find it amazing that an existing technology that is mostly in place and available is being ignored.

Carmakers are not going to continue to support a technology that no one is using or cares about. AM stations clamored to add FM translators to improve the listening experience; yet most of those stations have a much greater signal coverage on AM, in many cases by hundreds of miles.

Not taking advantage of the technology available could be the beginning of the end for the AM band.

David Eltzroth
Elkridge, Md.

“As I read and listen to the complaints about AM, I find it amazing that an existing technology that is mostly in place and available is being ignored.”

Quick, Get Me an Ammeter

In his commentary about paid subscriptions (“A Threat Even Bigger Than No Car Radio,” Feb. 1 Issue), Jerry Del Colliano wrote: “Fact: Electromagnetic fields generated in non-gasoline engines make AM virtually unlistenable.”

Chrysler apparently found a way around this issue because my 2021 Pacifica EV has a radio that receives AM just fine. I can even do some DXing with it at night. If Chrysler can build a necessary filter, so could other automakers.

The article goes on to say that manufacturers claim AM radio drains the batteries of their electric vehicles. Really? Quick, get me an ammeter; I need to see for myself that the radio draws excessive current while tuned to 570 AM but not for 102.7 FM or "Willy's Roadhouse" on satellite radio.

C'mon, Radio World, why publish stuff like this? My grandmother told me that paper lies still while we write anything on it. Please don't make it yours.

Jeremy Burnham, WA6FEQ
SBE Life Certified CSRE

How to submit

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

No AM? No Thanks

The other day, I took my five-year-old Tesla Model S in because the front touchscreen computer was working sluggishly. They recommended an upgrade to a new computer that also contains a new "modern" media system. The way you get the upgrade is to pay $2,500.

I went home thinking that I had a pretty good solution. However upon further Google research, I found out the new package not only omitted AM radio, but FM radio as well. I decided to not "upgrade."

I think we need our broadcasters to tell Tesla (and any other manufacturer that removes a radio from their cars) what we think of this "solution." However, Tesla has dissolved its public relations department, so there may not be a road back.

Doug Vernier
V-Soft Communications
West Palm Beach, Fla.

Memories of Leonard Kahn

My memory was jogged big time when Brian Winnekins mentioned AM stereo ("Help Farm Radio Fight for Radio," Feb. 1 issue).

I remember when AM stereo had its start in the early '80s and its finish in the '90s, when the FCC made the Motorola C-Quam system the standard. I was the chief engineer of a major New York AM station at the time. We were purchased by Tichenor Media of Texas, which mandated that all its AM stations adopt the Motorola system. But before I could convert our station, we were sold again, to Command Broadcast Associates, and we never went AM stereo.

I will say that when you tuned into an AM stereo station you knew it. The sound was great.

I was a good friend of Leonard Kahn and it was generally accepted that his system was the superior of the two. Along with Herb Squire, chief engineer of WQXR(AM/FM), I accompanied Leonard to his patent infringement trial against Motorola in federal court in Uniondale, N.Y. This was a jury trial, with Leonard accusing Motorola of stealing his patent for AM stereo. Herb made a magnificent presentation to show that the Motorola system as it stood had very objectionable platform motion.

Leonard acted as his own lawyer while Motorola had a battery of lawyers. Some of Leonard's objections made the judge laugh. During a recess I told Leonard that the jury looked bored and was not getting it, but Leonard insisted they were. He lost the trial and this put him in the hospital.

In the meantime fewer and fewer AM stations were transmitting in stereo. I owned a vintage Lincoln Town Car that did have an AM stereo radio, which I enjoyed. But I don't see it ever returning.

I retired from Univision in 2021. I do believe that AM radio should remain in all new vehicles and that any kinks in electric vehicles can be worked out.

Richard Ross
New York

Put AI on the Case

The field of RFI filtering using AI is rapidly developing. See for example *https://ournetplace.com/rm-noise/*.

It may be possible to make AM radio usable in EVs someday by incorporating AI filtering code in the car radio firmware. This would be an inexpensive solution to the problem and make AM radio viable again in automobiles.

Rob Atkinson
St. Charles, Ill.

"I think we need our broadcasters to tell Tesla (and any other manufacturer that removes a radio from their cars) what we think of this 'solution.'"

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