



# RADIOWORLD

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## Pattiz: Podcasting's Inflection Point Is Yet to Come

Syndication innovator talks about PodcastOne and the intersection of the format and radio

BY PAUL McLANE

PodcastOne, founded in 2013, positions itself as "the leader in digital on-demand spoken word audio" and "one of the few pure plays" in the podcasting space. Its stable of talent includes Adam Carolla, Laura Ingraham, Shaquille O'Neal, Dan Patrick and numerous others, in a network of more than 200 shows.

The podcasting company was founded by Norm Pattiz, who was already a legend in radio and media circles for having created and led Westwood One. Radio World caught up with Pattiz recently to ask about the biggest challenges his company faces, where he sees PodcastOne going and how he feels podcasting has affected his former industry.

*Radio World: Podcasting has had a*

*remarkable arc in 15 years. Can you capture where you think the industry is in its life span?*

**Norm Pattiz:** The growth of PodcastOne is remarkably similar to the growth of Westwood One when I founded the company. We started off with a little bit; in the case of Westwood One, I think, we had \$150,000 worth of business. In the case of PodcastOne, we started out with a million-and-a-half dollars' worth of business, and today, we're well up into the tens of millions, which is where Westwood One was at a similar time. Then a few years later, Westwood had \$600 million worth of business, went public and wound up with a \$4 billion market cap.

I don't know whether I'll be around to see that because I'm considerably older; but that's where I think that PodcastOne is going, reflective of the overall growth of podcasting. And the similarities will be when PodcastOne hits the same inflection point that network and syndicated radio reached — when rather than evangelizing and building support, we become a part of the overall media mix.

*RW: So you're a believer that the growth*



*is yet to be fully realized.*

**Pattiz:** Oh, I don't see any cap on the growth, quite the opposite.

Let me say this first. I've been a cheerleader for radio for 45 years; I'm not changing now. But I think the fastest-growing segment of audio is going to be podcasting, because it's not limited to simply the formats that exist on radio; you don't have to find your radio station

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**CONTENT**

**Managing Director, Content** Paul J. McLane,  
 paul.mclane@futurenet.com, 703-852-4628

**Senior Content Producer — Technology** Brett Moss, brett.moss@futurenet.com

**Content Manager** Emily M. Reigart, emily.reigart@futurenet.com

**Technical Advisors** Thomas R. McGinley, Doug Irwin

**Technical Editor, RWEE** W.C. "Cris" Alexander

**Content Director — International** Marguerite Clark

**Contributors:** Susan Ashworth, Dave Beasing, John Bisset, James Careless, Ken Deusch, Mark Durenberger, Charles Fitch, Travis Gilmour, Donna Halper, Craig Johnston, Alan Jurison, Paul Kaminski, John Kean, Peter King, Larry Langford, Mark Lapidus, Jim Peck, Mark Persons, Stephen M. Poole, James O'Neal, Rich Rarey, Jeremy Ruck, John Schneider, Randy Stine, Tom Vernon, Jennifer Waits, Chris Wygal

**Production Managers** Caroline Freeland, Nicole Schilling

**Managing Design Director** Nicole Cobban

**Senior Design Director** Karen Lee

**ADVERTISING SALES**

**Senior Business Director & Publisher, Radio World**

John Casey, john.casey@futurenet.com, 212-378-0400 x512

**Publisher, Radio World International**

Raffaella Calabrese, raffaella.calabrese@futurenet.com, +39-320-891-1938

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**LICENSING/REPRINTS/PERMISSIONS**

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**Head of Print Licensing** Rachel Shaw [licensing@futurenet.com](mailto:licensing@futurenet.com)

**MANAGEMENT**

**Managing Director/Senior Vice President** Christine Shaw

**Chief Revenue Officer** Luke Edson

**Chief Marketing Officer** Wendy Lissau

**Head of Production US & UK** Mark Constance

**VP/Media Technology Group** Carmel King

**FUTURE US, INC.**

11 West 42nd Street, 15th Floor, New York, NY 10036



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 www.futureplc.com Tel +44 (0)1225 442 244

# FCC Finalizes Repack Cost “Catalog”

Document aims to help FM stations understand what is potentially reimbursable

BY SUSAN ASHWORTH

How much can I receive? And what’s covered? Those are questions that radio broadcasters affected by the TV band repack can get answered when it comes to being reimbursed by the federal government.

At its March meeting, the Federal Communications Commission said that FM broadcast stations, television translators and LPTVs are eligible for reimbursement if their facilities have been affected by a repacked television station, assuming the stations have been in operation for a stipulated amount of time. The commission finalized and released a catalog that details potentially reimbursable costs.

Earlier, Congress had appropriated \$1 billion in funding as part of the 2018 Reimbursement Expansion Act. Of the \$600 million available in fiscal 2018 and \$400 million in 2019, the REA stipulated that up to \$50 million be used to reimburse FM stations, and up to \$150 million for LPTVs and TV translators.

price ranges. These provide guidance only, the FCC clarified; they do not serve as price caps, and stations can submit additional cost justification documentation if needed, the commission said.

Earlier, NPR had expressed a concern that the draft version of the catalog limited the range of equipment and services that is potentially reimbursable.

“We reiterate that the cost catalog is a non-exhaustive list of equipment and services,” the FCC said in finalizing the catalog. “It is intended to serve as a reference guide that will add structure to the process of claiming reimbursement by identifying the types of equipment and services that are most commonly

**Catalog of Potential Expenses and Estimated Costs for LPTV Stations, FM Stations and Translators**

Rigging and Antenna Installation/Removal	Range of Estimated Costs (in dollars)
<b>Tower Rigging</b> - fees paid to tower crews to install/remove antennas and/or transmission line.	
Tower shorter than 500'	61,400 - 81,900
Towers between 500' and 1000'	102,500 - 205,000
Towers over 1000' or Complex tower (Candelabras, stacked antennas, terrain-constrained)	102,500 - 409,500
Helicopter installation/removal (for antennas on top of high-rise buildings, a complex tower, or tower that is terrain-constrained so that antennas can't be lifted using a gin pole or winches)	Variable
<b>Other Tower Expenses</b>	
Temporary Tower Rent	Variable
<b>E. PROFESSIONAL SERVICES</b>	
Stations without sufficient internal resources, either at the station itself or at an affiliated station or company, may have to obtain professional services from an outside vendor to complete the various aspects of the station's channel relocation.	
	Range of Estimated Costs (in dollars)
<b>RF Consulting Engineer Fees</b>	
Prepare Engineering Section of Construction Permit	1,025 - 3,070
Prepare Engineering Section of License to Cover	510 - 1,535
Prepare Engineering STA	510 - 2,050
Prepare Form 601	510 - 1,000
<b>Attorney Fees</b>	
Prepare and file Construction Permit	770 - 5,120
Prepare and file License to Cover	770 - 2,305
Prepare and file STA	770 - 3,585
Lease negotiation or other legal matters	2,255 - 4,095
<b>Other Professional Fees</b>	
Project Management, if needed (per hour)	51 - 154

A sample page from the FCC catalog

## Congress stipulated that up to \$50 million be used to reimburse FM stations.

To help broadcasters keep track of what is potentially reimbursable, the Incentive Auction Task Force at the FCC finalized its cost “catalog.” A draft had been circulated earlier. The catalog is a 20-page document that can be found at <https://docs.fcc.gov/public/attachments/DA-19-176A2.pdf>.

The FCC adopted rules to reimburse both hard and soft expenses for FM stations that must replace or modify equipment, as well as stations that must construct or upgrade auxiliary facilities in order to minimize disruption of service. “Hard” expenses include new equipment and tower rigging; “soft” include legal and engineering services.

The goal of the catalog is to give stations a list of ranges for use as estimates when they do not have vendor quotes and to help them establish acceptable

required to construct new broadcast facilities, as well as their price ranges.”

For equipment or services not listed in the catalog, the form provides flexibility for users to claim reimbursement for such reasonably incurred expenses.

The final version includes other changes, such as a modification requested by NPR that the initial price range proposed in the draft for “lease negotiations or other legal matters” for FM stations should be equivalent with the range for LPTV and translator stations.

The FCC also amended the catalog to add a line for FM stations looking to purchase a combined HD importer/exporter, a relatively new type of product that combines an HD Radio importer and exporter into one unit.

The commission also added a broader range of program management and consulting costs as part of the professional services category, since “local public radio stations are likely to need ‘legal, engineering and consulting services to assist with overall planning, determining the specific steps needed to minimize disruption, and procuring equipment, labor and services,’” the report said.

The FCC also updated the catalog amounts for filing fees associated with certain Media Bureau applications that FMs, LPTVs and translators may need to implement changes necessary to remain on the air during the repack.

# How Technology Helps Radio and Its Listeners

Technology is everywhere, RAB says, and audio tech is no exception

## COMMENTARY

*What are sales executives telling the advertising community about audio technology and how radio fits into it? This post from the Radio Advertising Bureau provides insight.*

Technology! It enables us to do things quickly and gives us capabilities to do stuff that we could never do before. Technology provides us with choice (arguably too much choice). It helps to save lives and exposes us to experiences and content never before dreamed possible. Technology gives us the ability to multi-task, makes us a smarter population, and it allows us to make informed decisions.

Technology is changing the game across all categories of business, making industry and local cities more productive and efficient while improving daily lives. Technology also risks making things more complicated and it is human impact that helps to simplify

various aspects of innovation.

Thanks to technology, the audio landscape continues to evolve and innovate in meaningful ways. Consumers are leaning in to audio and they are listening to radio across all platforms with mass- and niche-targeted content available across devices with a simple touch of a button, a turn of a dial or an audible cue.

Technology allows radio and its listeners to engage and interact in real time, allows brands to plan smarter campaigns, and realize specific and attributable results.

So what is technology enabling in audio and how can marketers leverage what's available today and prepare for tomorrow?

### VOICE

Radio is audio and audio is sound. Voice is sound and sound is audio. Voice — it is opinion, attitude, expression, a means to convey desires, answers and so much more.

The power of voice continues to rise



Getty Images/Westerndf1

with the insurgence and adoption of AI-based technology. Consumers simply use their voice to garner a desired response — no need for a keyboard, no need for a button, just the sound of their voice and the proper audible cue (or command).

Today, consumers' voices are louder

than brand voices, and radio stations and their partners have a tremendous opportunity to ensure they're delivering on the voice requests, desires and commands. Radio stations across the country are ensuring that listeners know how to ask a voice-activated device to play their favorite station or tune in to a specific radio broadcast. Radio is also the platform where brands have successfully established audio identities and driven calls to action.

Radio is the only mass-reaching, niche-delivering audio medium to establish sonic brands and audio cues. Not only are audio identities critical for brands in a voice-activated world, but according to a variety of studies outlined here (<http://tinyurl.com/rw-rab-sonic>), sonic branding connects our hearts and minds, familiar music cues generate memories, the speed of sound is faster than a visual and audio signatures have the ability to convey your brand's emotions.

### CONNECTED CAR

The automobile presents a highly unique experience in that drivers and passengers are extremely captive audiences, and an audience that now has the ability of choice — bringing their owned entertainment into the vehicle or make use of what is provided to them.

Radio is and always has been the

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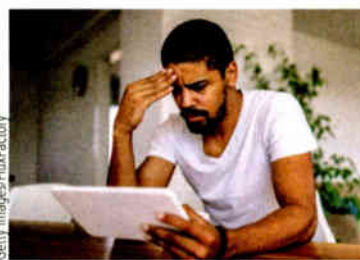
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foundation of infotainment in the vehicle and continues to capitalize on the rich opportunity to expand upon technological advancements for broadcast and compelling, original and local content that people want to listen to.

Radio's in-dash experience is changing — there are advancements in HD Radio allowing for a richer and more robust content experience. With voice controls, the driver can easily request where to tune in and the possibilities to act on advertising are becoming quite real. Imagine hearing an ad on the radio and using voice to tell your vehicle to drive you there, or hear an ad on the radio and ask for the information to be sent to your smartphone via SMS or text.

**MEASUREMENT**

Today, metrics and optimization opportunities that were previously only available in the digital space are available from radio broadcasters as well as a wide breadth of data and research partners who are proving not only radio's reach but also its ability to drive a return on specific ad spend.

The radio industry is making investments and adopting technology to continually improve audio products and the platforms for which they are consumed and transacted. For the consumer, radio is about being wherever and whenever the consumer wants it, and for advertisers it is about making it easier to plan, buy and utilize data.

Marc Pritchard, chief brand officer for Procter & Gamble, spoke with Jeff Schmidt, RAB's SVP professional development, at CES 2019 and confirmed that P&G is trying to leverage

technology and analyze and interpret data to constructively lead disruption. They are trying to eliminate the waste out of mass media to reach people on a one-to-one basis only when they want to be reached.

Pritchard shared that they are finding that radio is becoming far more data-driven, -analytics driven and -programmatically driven, which is enabling P&G brands to find ways to reach consumers in a far more effective way and on a real local scale as well.

**PODCASTING**

If you haven't experienced podcasts yet, take it from Conal Byrne, president of iHeartPodcast Network, who said, "The first time people discover podcasts, it's like peeking into a room that you didn't know was there, and it's like finding gold."

Podcasting has enabled radio to do what it does best: tell stories, share conversations, inform, educate and entertain in a longer format and on-demand with relevance across a variety of niche subject matter.

Growth of audience over the next couple of years is inevitable, and the benefit of a brand partnering with a radio broadcaster that operates in the podcasting space is the ability to also produce, distribute and promote podcast content on broadcast radio. It offers greater scale and a wider breadth of opportunities for both the advertiser and the podcast content.

**PROGRAMMATIC**

Programmatic capabilities, more specifically, enhanced targeting and automated/rep assisted planning and buying,

are key to enabling the broadcast radio industry and medium to grow and better serve advertising partners.

Platforms that include iHeartMedia's SmartAudio and Expressway by Katz, among others, now enable advertisers to connect to prime broadcast radio inventory swiftly and efficiently while creating smart, customized and targeted campaigns. And it's working.

**ALL ABOUT EXPERIENCES**

Last but not least, technology is enhancing radio's hardware — in addition to the smartphone, tablet, smart speaker or the Amazon Echo Spot (that looks like a clock radio), there are many companies building radios the way listeners want and need to use them.

ION Audio, for example, is all about experiences and enabling consumers to take sound wherever they go. They have built product designed for the DIYer, the swimmer (Wave Rider Max that can not only submerge in the water, but has cup-holders to hold your beer and lights to light up the pool at night) and the survivalist (a device that charges with a crank in the event of a power outage — every home in America should have this device!)

Indeed, technology is everywhere and audio tech is no exception, providing advertisers the opportunity to innovate, build brands and drive results.

*This commentary appeared in the Radio Advertising Bureau newsletter "Matter Of Fact." Sign up for it at [www.rab.com/whyradio](http://www.rab.com/whyradio).*

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## PATTIZ

(continued from page 1)

to listen to it; you can consume it anytime, anyplace, anywhere.

Programming in network and syndication, you'd [need] a certain amount of consumption that would be have to be relatively large. In the podcasting area, what you need are active and committed consumers and listeners.

This has been proven in the direct response market. But now brands are getting involved; where we used to be 90% direct response advertising when we started, we're now about 50/50 direct response to brand advertisers.

There are too many great selling points to overlook. The podcast listener is the most committed listener in the audio or video medium. A recent study showed a 61% conversion rate for podcast listeners to products that are host-read and advertised on podcasts. I mean, that's amazing.

**RW:** Yet I imagine there are perceptions about the market and the platform. If I'm a P&G or a Ford, I might sense that audio is hot, yet I might look at the total for podcasting and think there's so many different offerings, and it's not well developed in terms of audience measurement. ... What objections do you hear from those kind of advertisers?

**Pattiz:** I've never heard that kind of argument. I've certainly have heard questions relating to measurement, which is one of the reasons why at PodcastOne we spent a lot of money building a back end that can provide



Podcast host Todd Garner, right, with his debut episode's guest Adam Sandler.

loads, filter them and convert them in to filtered downloads. We can deliver really any way that an advertiser wants.

When you compare podcast measurement to syndication or network radio, there are some sources that people are more comfortable using for radio and for radio syndication; but they're phenomenally unsophisticated, and the word "estimate" is very much in view when those numbers are being supplied.

call-out research and the latest overnight ratings — it's endemic to media companies, whether they're digital or not, people are always questioning the research.

When I was working in the television business, every time we got a lousy book we would find a reason to discredit it; and every time we had a good book this was the most accurate survey that had been taken in the history of television! I don't see [measurement concerns] stunting the growth of podcasting in any way.

**RW:** What are other misperceptions among the advertising community or general public that you would like to see overcome?

**Pattiz:** The consuming public is just getting it. When you take a look at the number of people who have consumed podcasts — at one point when we started six years ago, it probably wasn't even 20%. Now it's either pushing or slightly over 50%. And when you take a look at the average time spent listening, it's way more than any competitive medium. Even Apple, with the limited research that they release on podcasting, last year said that the average time listening to a podcast was 48.3 minutes. And when you consider that some of the podcasts that they were measuring probably didn't even run that long, I think that's pretty outstanding.

If a buyer is buying a million viewers on television or a million listeners on radio or a million consumers through a podcast, podcasting should be worth more because those people had to per-

form a positive act to get there in the first place.

The biggest problem is educating advertising agencies and advertisers. They're not used to it. So we have to go out there and evangelize and then build demand. That's the stage we've been in.

It's not often somebody who tests the medium doesn't wind up using it more.

**RW:** Is there a difference between what makes good, compelling content in podcasting versus what makes good, compelling content for a Westwood One radio?

**Pattiz:** It's entirely different. All of the research shows with people who consume radio are not the same people who consume podcasts.

Now, that could change, with iHeart getting into the business and with Cumulus getting into the business. But they're learning very quickly — I could cite the iHeart deal with "How Stuff Works" — you can't just go in there and say you're the biggest because you're repurposing your radio shows. Nobody's gonna buy that. It's not true. They have now gone out to try and get podcast-specific programming. And if they, in fact, do promote across their radio, that could drive more consumption of radio listeners to podcasts. But right now, I haven't seen it happen.

Most radio companies, they're seeing people do well in podcasting such as ourselves and others, and they think, "Well, we should be able to do this, look at all of our content and look at all of our resources." Even though resources is probably not the best word to use for

(continued on page 8)

**I've been a cheerleader for radio for 45 years; I'm not changing now. But I think the fastest-growing segment of audio is going to be podcasting.**

audience measurement any way the advertiser wants it.

Whether it's the way they currently buy radio or television, using gross impressions, or going through the digital door and using uniques, we can pretty much supply that number; we can use the IAB standard. We're in a situation that as the marketplace remains in flux, we don't lose business because our platform doesn't deliver the metrics that the advertiser wants.

We do business with third-party suppliers. We can give them survey research through Edison; we can give them download research through Knox and Verizon, who measures raw down-

"Estimate" is what's used no matter what service you use: They're audience estimates. Though people talk about a universal measurement for podcasting, as long as there's so many companies using their own technology to count those numbers, I don't think we're close to that.

But then again, RADAR in network radio was never a very accurate way of measuring audience. Some of the surveys that are used when buying sports inventory or special events, sometimes those services do overnight ratings with about a hundred people. How accurate can that be?

Of course, people have [long] been complaining about survey research and

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World Radio History

## PATTIZ

(continued from page 6)

radio major companies these days.

They're learning. I see them making many of the same mistakes that we made when we first started. But we overcame them, and I'm sure they will too.

In terms of the competition, we've got 300 podcasts on our network. I could have 3,000 tomorrow. But since our programming is generally partnerships between the network and the producer — and of course, we produce a lot of our own stuff — I'm not interested in filling our network full of programs until everybody's making money.

**RW:** *These are remarkable times for people who believe in audio. For a radio broadcaster watching the development of podcasting, what do you think should be going through their mind about the relationship of the two?*

**Pattiz:** Radio broadcasters should pay a lot of attention. They certainly are corporately, and I think they are well down the ranks.

We have some repurposed radio programming on our network ... but the strength of podcasting is original content.

One case in point: We had the Laura Ingraham radio show for many years; I've had a relationship with Laura for 17 years going back to Westwood One. Now Laura is no longer doing a radio show, she is doing multiple podcasts during the week; and the size of her audience, after having been on only three weeks [as of early February] is four to five times the size of her audience in radio.

That's because the way that radio groups function right now is that the big ones control the major markets. If you're an independent, even if you're distributed by that radio network, all of those programming decisions are still made locally. In the case of Laura, she's been on for a very long time but was weak in the top 10.

Well, she's not weak in the top 10 anymore; and when she mentions her podcast on her Fox TV show and we start using all of our network programming to promote new shows, special events and what have you — because we have the

One step too much. And that'll be solved quickly. It shouldn't be more than "Hey, I wanna listen to Adam Carolla's program last Thursday."

**RW:** *It sounds like you definitely feel like we're nowhere near seeing the full story of podcasting written.*

**Pattiz:** Oh, no, not even close. When I left Westwood One, they asked me if I would form a consultancy or a boutique that would keep the talent that I had relationships with still in the Westwood One camp, and of course, I did that. When a mutual friend of mine introduced me to a young man named Kit Gray who was repping podcasts out of his apartment in Marina Del Rey with his dog, and I saw what he was doing on a very, very small scale, I thought, well, this is just the digital version of Westwood One, with so many advantages it's tough to count them all.

I had no desire to go back into business; I'd had a pretty successful business career. It certainly wasn't about the money. But the thing that was nice about the money was that I didn't need any partners, I could fund this myself. So we did, and it's just been a great ride ever since.

I think the entrance of PodcastOne was one of the inflection points that pointed out the ability that podcasters have to go to national advertisers if they have a variety of programs in their mix.

I couldn't go in and start evangelizing podcasting unless I had offerings in every category that was on iTunes. Otherwise, I'd be going in and saying podcasting was great, and somebody would ask me for something I didn't have. Before we hit the streets or went to Manhattan, we were making sure that we had program offerings in every category that an advertiser could want.

**RW:** *Anything else we should know?*

**Pattiz:** I still get asked to speak at a lot of radio functions. From the very beginning, I have said: What radio needs to do is embrace digital, whether it's podcasting or streaming or what have you. Because radio has had a history of growing every year, for a very long time, until recently.

I said that by adapting digital, as part of audio, part of radio, you're going to see your business start growing again. That pretty much fell on deaf ears at the highest level until a couple of years ago. Now we see radio companies getting involved. Most of them are dipping their toes.

Hubbard was the company that rec-

## LADYGANG PODCAST



A sample PodcastOne offering, "LadyGang," is described as "a celebrity-driven podcast from the minds and mouths of Keltie Knight, Jac Vanek and Becca Tobin where no subject is off limits. Inspired by their bottomless mimosa brunches, each week, a celebrity guest joins the girls for a raw, honest and hilarious look at what life is really like under the bright lights of Hollywood."

ognized the opportunity. The investment they made in the company could still be classified as dipping their toes [but] it was a larger investment than any radio company that I knew of had made in podcasting.

So we were encouraged then; we're encouraged now. I see that there's been press about Gimlet possibly getting bought by Spotify for \$230 million. Boy, do I hope that one closes! [Spotify announced the deal shortly after this interview.]

**RW:** *You put a lot of work in to get to this position.*

**Pattiz:** Yeah. And we're bigger!

A lot of deals that are being made involve bigger production guarantees, bigger fees to name talent. We haven't gotten caught up in that; we like the idea of partnerships. Even though we could make bigger guarantees, we think that the personalities that we're working with, if they're hugely successful in other mediums, that no matter what podcasting has to offer them it's probably going to be at the lower end of the priority list.

We like the idea of being partners with them so that they're as committed to the success of the podcast as we are; it's not just a big check that their agent brought them, and they're going to wind up having to cancel shows because they just got a movie or something.

All of that stuff will work itself out over time. But right now it's a very interesting and exciting medium. Over the next few years, more will be revealed.

For Norm Pattiz' views on the role of video in radio operations, see the Radio World eBook "Trends in Visual Radio 2019" at radioworld.com/ebooks.

## Now we see radio companies getting involved [in digital]. Most of them are dipping their toes.

In our partnership with Hubbard, which owns almost 31% of PodcastOne, we have been doing some work on the local level; and they've been supplying us with programming, both original podcasts and programming [from] very popular time periods on their stations.

The economic impact of being able to provide the kind of data, and the ability to digitally insert, and the kinds of things we've been able to do — being used by a major radio group has proven to be very valuable. Some of their podcasts develop audiences that are big enough to be packaged in with our biggest national programs. Others simply provide an on-demand audience that can be sold locally, along with the regular average quarter hour of the time period, to bring in new audience and new revenue for little or no cost.

right to promote in unsold inventory on every show that's on our network — that combination is a tough one to beat.

There will be more and more interaction between radio and podcasting. For the radio talent? Where radio and other big media companies paid little or no attention to podcasting, now if you go to work for them there's a high likelihood that your podcast rights will be part of your deal — even though they may never, ever do a podcast. But using the misconception that their popularity in radio is what's driving the interest of anybody wanting to put them in a podcast network, so that they can get a piece of the action. You see that everywhere. It's not unusual to see it creep into podcasting.

**RW:** *Do trends in consumer use of technology affect this? I'm thinking for instance about smart speakers and how dramatically that's come on in the last two years.*

**Pattiz:** Absolutely. Our programming is compatible with both the Apple speaker and the Android speaker. What you have to do is you have to identify the program, currently, by who distributes it. So you'd have to say "Go to PodcastOne. Go to Adam Carolla."





# Cover all Bases with ViA



Bill Eisenhamer, Chief Engineer (Left) with JR Rogers, Technical Director

**The Tieline ViA has been the backbone of the San Diego Padres road play-by-play live broadcasts.**

"The ViA comes with an SD card slot for recording, so no more worries trying to keep someone at the station focused on recording. The crew on the road takes care of that and records interviews for playback during their live show. Being self-contained makes the device more flexible for the real world."

The ViA is a winner for The Fan, and Entercom San Diego.

**Bill Eisenhamer**  
Chief Engineer, Entercom San Diego



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# Finding Radio's Balance in the Dashboard

Initiatives to help stations meet auto manufacturers' minimum requirements

## COMMENTARY

BY NICK PIGGOTT

*The author is project director for RadioDNS.*

**LONDON** — RadioDNS Hybrid Radio exists because we think that the best experience of radio in the car dashboard is enabled by combining broadcast and IP together into one hybrid technology. We have a number of initiatives to enable widespread implementation of hybrid radio using our open standards.

The radio industry is characterized by its diversity, from stations that struggle to stay on-air to well-resourced stations with lots of content distributed

approached daily by companies offering to “repackage” radio to give it that consistency by “backfilling” the capabilities gap. To a car manufacturer, “gate-keeping radio” is initially a good thing.

RadioDNS' technology standards prevent us from becoming an intermediary and no content flows through us. We sell nothing. We are a not-for-profit organization, governed by statutes and financed and run by our members. For broadcasters wanting to secure their place in the dashboard, supporting RadioDNS is the very lowest risk option.

But this fundamental “hands-off” approach to our technology design also



Nick Piggott

hybrid radio. We encourage manufacturers to use RadioDNS Certified solutions, which guarantees that “backfilling” is only used if a radio station isn't providing content using RadioDNS. Xperi's Connected Radio platform was the first to become certified.

“Project Logo” is our initiative to get every radio station to meet the automotive industry's basic expectations, and you'd gather

terms to be universally used, we needed input from broadcasters and manufacturers, and we had a consultation running until April 12.

### PARTNERS

In the United States, we are working with the National Association of Broadcasters, one of our founding members, to help every U.S. radio station provide RadioDNS Project Logo, either directly or by working with partners (listed at <https://radiodns.org/partners>).

The NAB has brought their member broadcasters and manufacturers like Audi together for discussions and to test implementations of RadioDNS in the North American market. Both



Audi development engineer Christian Winter explains the hybrid radio's functionality and the resulting advantages for the listener to Audi blog author Andreas Wittke.

over a diversity of platforms. There's no consistent quality of metadata, and this frustrates car manufacturers who get consistency from services like Spotify, Pandora or iHeartRadio.

### MEETING EXPECTATIONS

This diversity is our most complex challenge — both for RadioDNS as an organization and radio as an industry. Broadcasters are, rightly, anxious about a concentration of power to gatekeepers who can control metadata, potentially disintermediation and disconnecting them from their audiences.

But car manufacturers want to make sure that every station reaches certain minimum standards: a logo, a comprehensible station name, “now playing” information, album artwork. They are

means we can't fix up inferior radio station metadata. We have absolutely no way, either technically or within our structure, to do that. If you broke it, we can't fix it for you. When we meet automotive companies, they love that our standards will function for decades (much as RDS has), but don't like that we can't guarantee how many stations will provide quality content.

We have three initiatives to try and bridge this expectation gap without compromising our “no gatekeeper” approach to hybrid radio.

### THREE INITIATIVES

Our service provider certification program acknowledges that every automotive manufacturer will work with a third-party technology supplier to enable



Photos courtesy of Audi

correctly from the name, the first expectation is a correct logo for every station.

Alongside the technical standards for getting a logo (and other content) from a broadcaster to a car, we identified that broadcasters and manufacturers want a common understanding of how content will be presented to drivers. Putting that in place protects the people with good intentions, and makes it easier to penalize those people with bad intent.

Our “Standard Terms of Use” is a document that we would like every radio station and manufacturer to use. A radio station will offer their content using our Standard Terms, and an auto manufacturer can use the content if they know they follow the terms. RadioDNS won't be a party to the agreement, but we will keep a permanent reference version of it.

This approach is scalable, and avoids a concentration of power in one place. Each deal is effectively bilateral between the broadcaster and the manufacturer, but because it's the same deal — the exact same words — there's little legal effort involved with agreeing to it. The broadcaster can choose to control to whom they're providing data, and measure their usage.

For us to meet our ambition for the

RadioDNS and Audi were at this year's NAB Show demonstrating RadioDNS in the dashboard of real vehicles. In Europe, we have a similar working relationship with the European Broadcasting Union, who are helping their members launch RadioDNS hybrid radio with their RadioManager platform, which can also provide metadata for voice assistants in smart speakers and in the dashboard.

The EBU also hosted a very engaging RadioDNS/WorldDAB workshop, bringing together broadcasters and manufacturer to discuss their five most pressing issues in respect of radio in the car. In Australia we work with Commercial Radio Australia, and their RadioAPP platform now natively supports RadioDNS.

These partnership initiatives, as well as working directly with broadcasters, mean that RadioDNS is available for more than 80% of radio listening in many European countries, and is rising in North America and Australia.

Over time, we want more radio stations and service providers to use our standards to provide their content to the dashboard. Certification, Project Logo and the Standard Terms of Use are key parts of that ambition.

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# DelDOT Believes in the Power of Radio

WTMC anchors Delaware's statewide Travelers' Information Station network

**BY JAMES CARELESS**

Tune into Delaware's Travelers' Information Stations and eventually you will hear a recorded station identification: "This is WTMC-1380 AM, broadcasting from Delaware's 24-hour Transportation Management Center, providing the latest statewide traffic and transit information. This broadcast is also streamed on the internet at [www.delldot.gov](http://www.delldot.gov) and the DelDOT app."

Delaware's Department of Transportation has its own licensed Class B AM radio station, linked to 21 synchronized low-power TIS/HAR AM transmitters and antennas located across the state, with three more under construction; and it has just added an FM signal too.

WTMC — the call sign is for "Transportation Management Center" — covers over 90% of Delaware with constantly updated traffic, weather, and public safety information. It is licensed

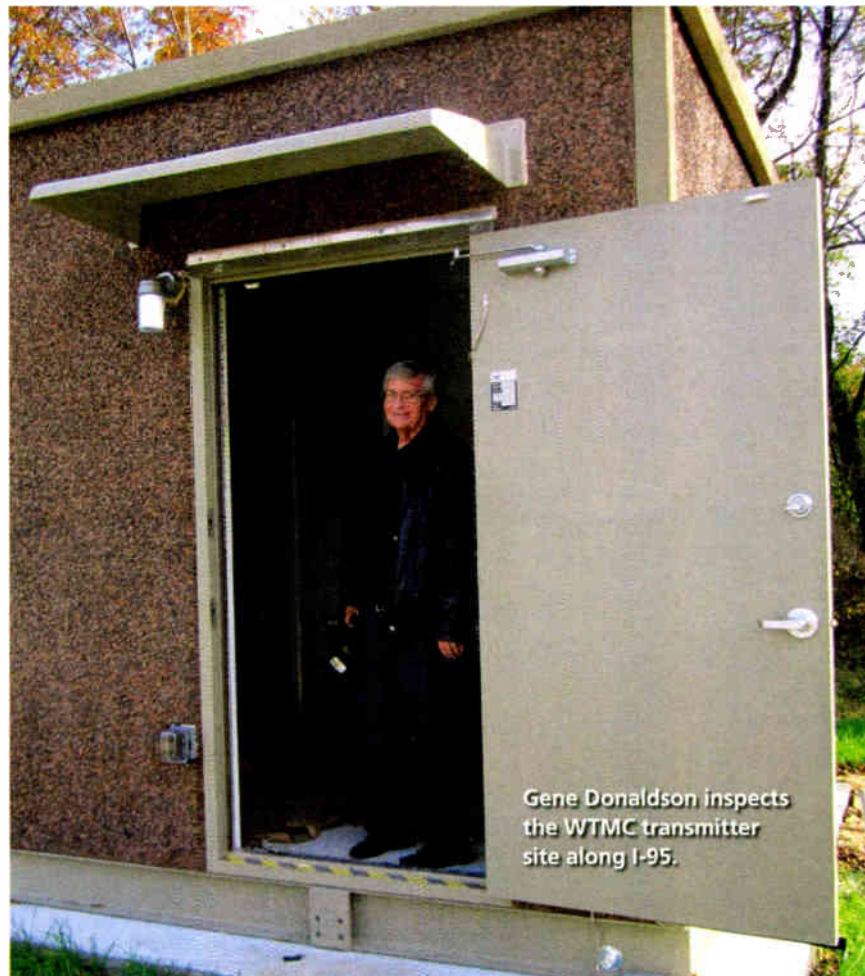
to Wilmington in the north end of the First State.

"We have anchored DelDOT's traffic information on WTMC because radio is the medium that keeps working when storms have knocked out cell service and the internet," said Gene Donaldson, DelDOT's TMC operations manager and the person in charge of the state's TIS service. "Everybody has an AM radio somewhere."

**FROM TOP 40 TO TRAFFIC**

Wilmington's WTMC is the descendant of WAMS, which went on the air in 1948 and was owned by the Wilmington Tri-State Broadcasting Company (later Rollins Broadcasting of Delaware), founded by John W. Rollins and his brother O. Wayne Rollins. According to FAA records, WAMS had a directional antenna system and daytime broadcast power of 1,000 watts courtesy of an

*(continued on page 14)*



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World Radio History

# TIS

(continued from page 12)

RCA BTA-1L transmitter.

Like many AM stations, WAMS went through many formats in its lifetime. By the time it signed off in 1986, WAMS was a top 40 music station (its call sign has been used elsewhere since). DelDOT acquired the AM license in 2000, reviving the station as WTMC-1380 with 24/7 recorded traffic and weather information.

Today, WTMC-1380 broadcasts at 250 watts during the day and 10 watts at night. "When we drop to 10 watts at night, we fill any gaps using TIS/HAR stations," said Donaldson.

WTMC is located at Delaware's Transportation Management Center southwest of Wilmington between highways I-95 and 295. This is where DelDOT staff record audio information into the station's playout server, using a microphone-equipped, soundproof cubicle in the TMC office complex. WTMC's nondirectional AM tower and transmitters are also located within the I-95 right of way at the I-295 merge south of Wilmington. (The old WAMS five-tower array was a few miles to the north and taken down for development in the 1980s.)

With the help of Information Station Specialists of Zeeland, Mich., which focuses on installing and servicing TIS/HAR stations, DelDOT erected low-power TIS/HAR stations to turn WTMC into a true statewide broadcaster, using TIS/HAR stations to serve south of Wilmington beyond WTMC's coverage contour.

"Delaware is the only jurisdiction where a DOT has purchased a commercial radio station license and then augmented it with multiple synchronous TIS/HAR stations to effectively cover a state," said Bill Baker, owner of Information Station Specialists.

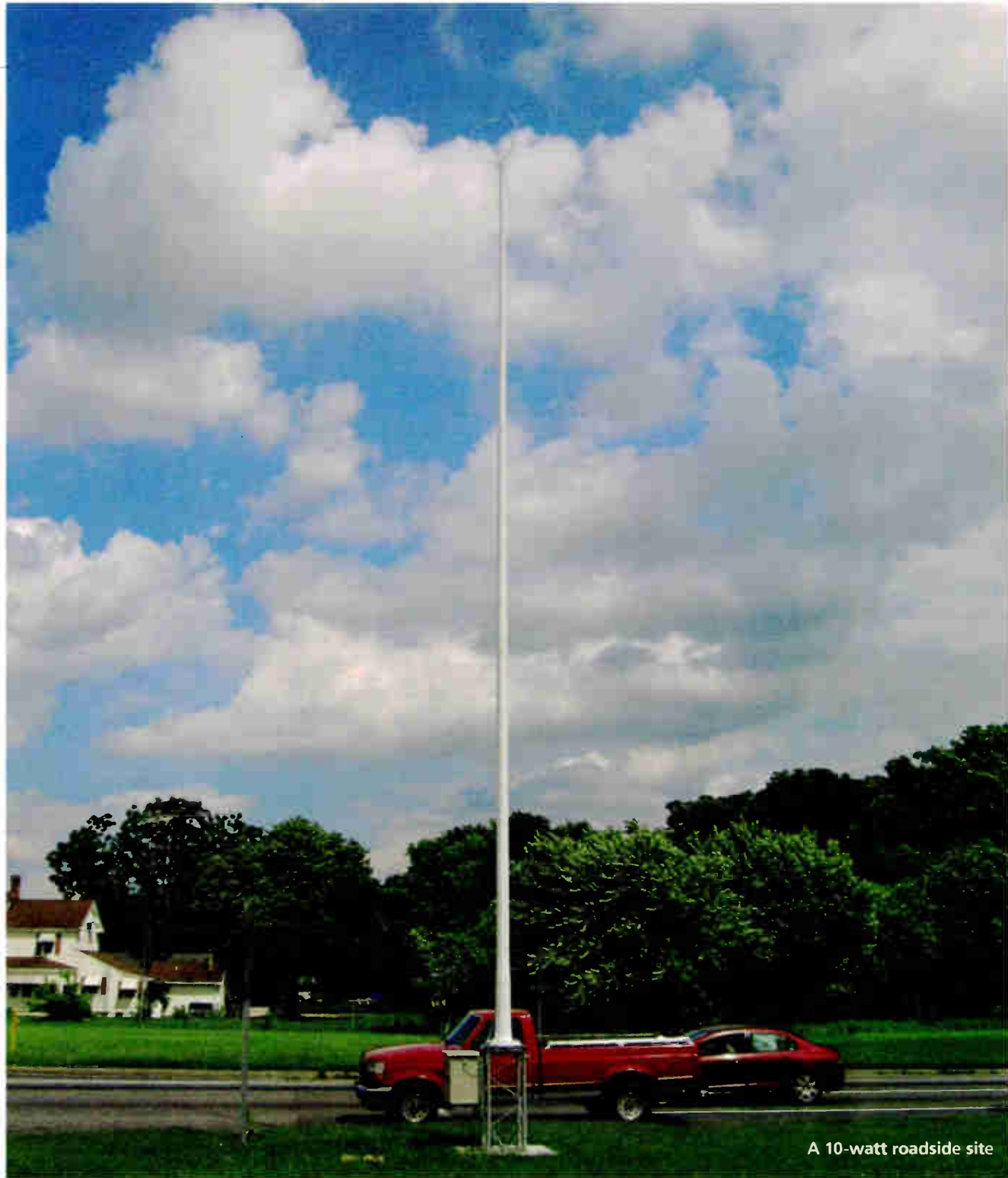
"It is also the largest operator of multiple synchronous TIS/HAR stations in America," he said, and the department is about to add more.

## NOT JUST RADIO

WTMC's pre-recorded reports can be heard online and via the DelDOT app (Apple and Android) because DelDOT wants to deliver traffic/transit, weather and emergency information via audio to listeners by all means possible.

"This is why our electronic highway signs are equipped with flashing beacons," said Donaldson. "When these beacons start flashing, drivers know it's time to tune into 1380 AM to get the latest breaking traffic/weather news — or to have someone call it up on the DelDOT smartphone app in the car."

And like many other, more traditional AM broadcasters, DelDOT has taken



A 10-watt roadside site

advantage of the recent FCC rule change and has added an FM translator, on 98.5 MHz.

Lee Afflerbach, co-owner of CTC Media Group, a professional engineering firm that has helped DelDOT build its TIS/HAR network, said, "It will target the highly travelled I-95, I-495 and I-295 corridor. The translator will include RDS digital service of DelDOT's web-based information resources. Also in the picture is an AM power increase with an added digital transmission component."

Analog AM radio remains at the heart of DelDOT's overall information delivery system. "When things start to fail in bad weather, you can count on AM radio to get through," Donaldson said. "This is why DelDOT still counts on AM radio today."

For more on U.S. traveler's stations, read "TIS Is a Stalwart of Our Radio Landscape" at [www.radioworld.com](http://www.radioworld.com), keyword TIS/HAR.

## WAMS TRIVIA

The manual for WAMS' original RCA BTA-1L 1,000-watt transmitter can be found online at <https://tinyurl.com/rw-wams-rca>.

"This transmitter will provide reliable, high-fidelity operation at any frequency between 540 and 1600 kc with negligible distortion and low carrier noise," said the BTA-1L manual. "It is very easily installed, requiring only the connection of external wiring and the bolting of cabinets together."

The original FCC card files for WAMS have been digitized, and can be read online at <https://tinyurl.com/rw-wams-cards>. Captured on old microfiche film, the cards have since been destroyed to save storage space. These cards run from WAMS' initial license approval in 1948 to its last license renewal in 1981.

A classic aircheck from the summer of 1976 can be heard on YouTube; search the site for "Bobby Dark 1976."



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# There's a Tank Circuit in a UPS?

And Dan Sletnz offers more ideas for nifty stuff that's cheap or free

## WORKBENCH

by John Bisset

Email Workbench tips to [johnpbisset@gmail.com](mailto:johnpbisset@gmail.com)

Our mention of the Ion Trap magnet (March 13 column) brought back some very old memories for a number of readers.

NHPR's Stephanie Donnell, WA1YKL, wrote that she had not even heard the term "picture tube" in many years. She also recalled a thing called a "purity ring," used on color picture tubes. And if you have a weak CRT, Stephanie still has a B&K CRT Rejuvenator.

Stephanie shared another story of interest about an old Ferrups UPS, on which the AC output had died. The only logged fault displayed was "Low AC Output." After checking for the usual things like fuses and signs of damage or burns, she called Eaton Tech Support, who recommended she check the tank cap.

It took Stephanie a second, but she quickly realized this was the large, nonpolarized electrolytic capacitor that made up a resonant "tank," along with the additional secondary winding on the AC power transformer. With the UPS switched off and unplugged and with the capacitor disconnected, Stephanie attempted to check the capacitor and saw that it was shorted. A quick inspection of the capacitor did not reveal



Fig. 1: Hold a business card along the top of this failed capacitor and you can see the slight bowing, indicating failure.

anything unusual, and there wasn't any leakage.

What she saw when setting the capacitor top on a flat surface was a very noticeable wobble. The top of the new replacement capacitor was very stable. Checking against a business card (see Fig. 1) revealed a subtle outward bulge in the otherwise flat surface.

While this was far less noticeable

than what has been seen with electrolytic capacitors when they have similarly failed, it provided further proof of the condition of the capacitor. A new 10 uF 660V capacitor was ordered from Eaton, installed and the UPS was back in operation.

This issue with the UPS brought back some of the things recalled about power supply regulators. The old UPS uses a

"ferro-resonant" or what is sometimes called a "constant voltage" transformer, kind of an ugly stepchild of power supplies. Their regulation is based on the resonance of an extra secondary winding in the transformer, and the capacitor that is connected to it. The capacitor and the extra secondary form a resonant tank circuit that works in conjunction with the AC Line frequency. Their efficiency is often quite low, compared to other power supply designs. But one advantage is that they are very simple.

Broadcast engineer and Radio World colleague Dan Sletnz has been surfing the web again and found more useful sites.

Formerly expensive Digital Audio Workstation Cakewalk software is now free. It's good for mixing music (CDs and albums), allowing you to compose, record and then edit material. Here's the site to visit: [www.bandlab.com/products/cakewalk](http://www.bandlab.com/products/cakewalk).

**Although your translator is licensed under Part 74, it is a Part 73 device!**

And here's a novel reason to become associated with an educational facility or nonprofit. AutoDesk, maker of AutoCAD drawing/drafting software, offers their full software suite to .edu organizations. This is not a "lite" version but the full-blown AutoCAD, and you can choose any version, including a network-applied version for educational nonprofits.

If you are associated with an .edu, check out this link: [www.autodesk.com/education/free-software/autocad](http://www.autodesk.com/education/free-software/autocad).

Dan also suggests Workbench readers take a look at Wireshark. It's said to be the world's most widely used network protocol analyzer.

Wireshark lets you see what's going on in your network at a microscopic level. Its feature set includes deep inspection of hundreds of protocols. Wireshark is multiplatform, running on Windows, MacOS and Linux, along with many other operating systems. Network data can be browsed using a GUI. Wireshark also provides VoIP analysis. A Wireshark user guide can be downloaded from the site: [www.wireshark.org](http://www.wireshark.org).

(continued on page 20)

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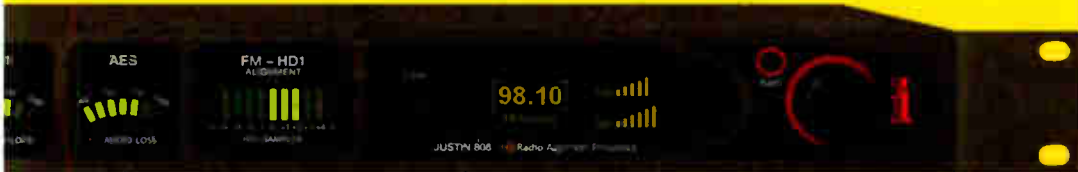


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# RE~~X~~THINK

## Radio

### Introducing The Über-Node.

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Power Core can handle up to 128 MADI channels, standard. 4 front-panel ports (two dual-redundant pairs) with SFP make it easy to bridge your AoIP and baseband digital signals.

Think Power Core looks awesome outside? That's nothing compared to the sheer processing might inside, with a 1920\*1920 routing matrix, 96 DSP channels and 80 summing buses. All your friends will be so envious.

Information please: high-resolution color display with rotary encoder provides easy front-panel access to network information and settings.

Power Core is 100% standards-compliant - because proprietary AoIP is so 2003. Up to 256 channels of true AES67 and RAVENNA streaming, on two front-panel Ethernet ports. Even complies with the ST2110-30 standard. Because you can't be too future-proof.

Power Core supplies 64 channels of GPIO via standard RAVENNA and open-source Ember+ protocols. Need physical connections? Use the front-panel interface. Highly logical.

The Lawo logo. Your assurance of meticulous engineering and premium components, uncompromisingly crafted to the highest German standards.



Power Core is the only broadcast AoIP node with ST2022-7 Seamless Protection Switching, giving you dual discrete links to your network core. Completely redundant, with automatic, inaudible switching. Now that's what we call peace of mind.

Connect your AES / EBU devices. Expansion card has 4 digital stereo inputs with broadcast-grade sample rate conversion, and 4 digital outputs.



Everybody's got a few analog sources. Line input & output cards with 4 stereo (8 mono) channels make connections a snap.

Lots of talking to do? 8x Mic/Line card with Phantom power does the trick.

Studio I/O card is perfect for on-air rooms. 2 Mic/Line inputs, 2 Line outs for speakers and 2 headphone feeds.

Got DANTE®? No problem. Power Core equipped with a DANTE expansion card gives you access to a whole world of pro-audio devices. Two mirrored ports with onboard SRC provide 64 channels of I/O.

If four front-panel MADI ports aren't enough, you can add more. Dual-port MADI expansion cards give you two SFP ports with 64 channels each.

Power Core is already the highest-capacity AoIP node + console engine in the world. 8 rear-channel expansion slots make it capable of even more.

Dual-redundant power, of course. Our hardened internal auto-switching power supply is backed up with an inlet for external power too.

Some say bigger is better. Respectfully, we disagree. Small is superior. As proof, we present Power Core: the modern, super-compact AoIP audio interface that packs hundreds of stereo channels into just 1RU. Handles AES67, MADI, analog, AES3 – even Dante®. You'd need 24 rack units of old-style nodes to equal all the I/O available in just one Power Core.

Impressive, yes? But audio I/O isn't the end of Power Core's capabilities. There's DSP; a lot of it — 96 channels of EQ, dynamics and mixing. AutoMix, too. Plus routing: 1,920 crosspoints, enough to switch an entire multi-station broadcast facility.

Power Core is flexible, too. Pair it with our award-winning Ruby radio console and it's the most powerful mixing engine ever. Put it in your rack room and presto! it's a high-density audio interface with built-in routing. Remote-control it with our VisTool GUI Builder software, and it's the heart of your TOC.

Power Core. The Über-Node has arrived.



With so much onboard I/O, Power Core is the perfect AoIP supernode. But thanks to all that DSP, it's also an incredibly powerful mixing engine for Lawo radio consoles. Pair it with our award-winning Ruby – the beautiful, powerful, intuitive surface your talent will be clamoring to get their hands on. Sizes from 4 to 60 faders.



Interested in a mixing solution with a virtual interface? Control your Power Core with Lawo VisTool. Create a custom “virtual console” with context-sensitive multi-touch controls – faders, meters, routing and DSP controls on-screen, right at your fingertips. Or use VisTool to complement your Ruby mixing console with a rich, graphical interface that can include social media, video feeds, peak meters and more.

# Commissioning Practices for AES67

First, map out an IP and stream multicast address plan

## AUDIOOVERIP

BY DOMINIC GIAMBO

*The author is senior development engineer at Wheatstone.*

AES67 has emerged as an important standard that will eventually find its way into every broadcast plan that includes audio. With AES67 being the audio transport standard defined by SMPTE 2110-30 and supported by major IP audio network systems, all that remains is for broadcasters to commission AES67 in their plants.

There are several key AES67 commissioning practices I've observed in the field and with a large, simulated studio network that included over a hundred AES67 compatible consoles, software applications, automation systems and controllers.

### MAPPING IT OUT

The first step in commissioning AES67 is to map out an IP and stream multicast address plan that assures every stream on every device will have a unique address available, keeping in mind that multicast traffic is not normally routed across subnets.

This is critical because the different devices in various AoIP networks can't "see" each other, and therefore it is entirely possible that they may be using address settings already in use elsewhere.

To make a stream multicast address plan, note all the different devices that will be in the system and how they allocate multicast stream addresses. Start with

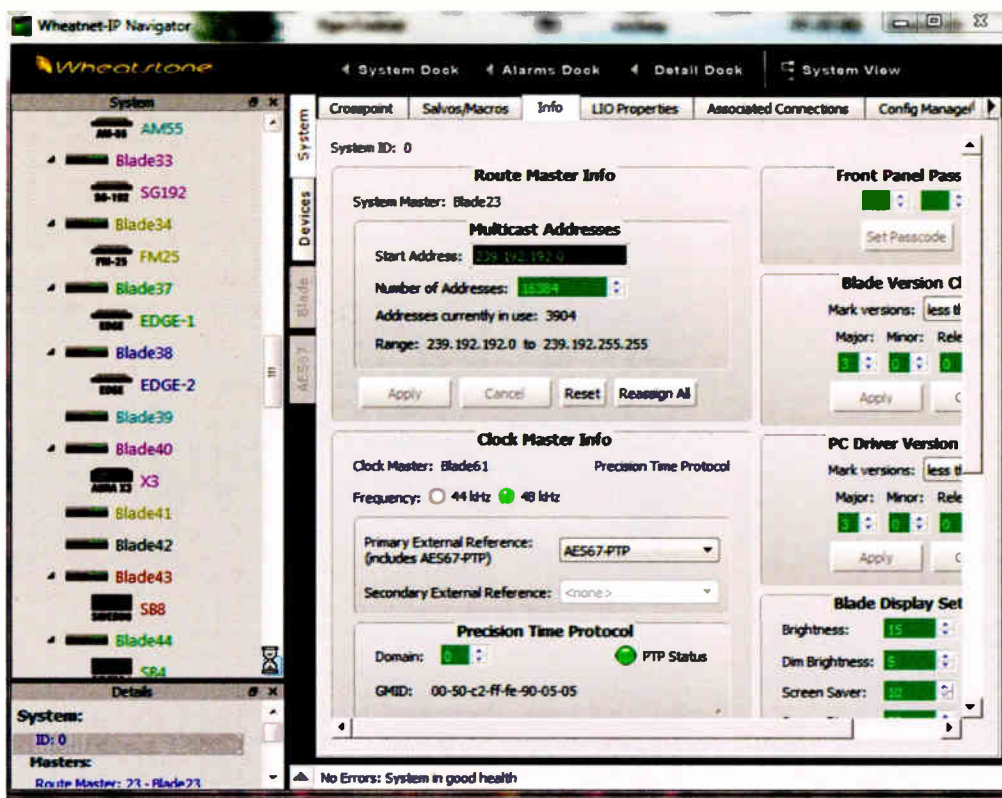
## WORKBENCH

(continued from page 16)

And Dan's latest find is the MixerFace R4, a portable two-mic (with phantom power) mixer and mobile recording interface, featuring high-quality mic preamps, High-Z (guitar) inputs and balanced outputs. Dan says that it would work great with a cell phone doing a call-in, or using Cleanfeed (<https://cleanfeed.net>). The device lets you record pro-quality audio on your smartphone. An internal long-lasting rechargeable battery makes it ideal for interviews or remotes "on the road."

It's manufactured by CEntrance, which has been around for two decades providing products primarily to the music/performing industry. The MixerFace R4 sells for between \$349 and \$599, depending on options. Here's the link for more information or to order: <https://centrance.com/mixerface>.

"Thumbs" Feebleman is the editor of the Munn-Reese Broadcast Engineering Consultants e-newsletter ([www.munn-reese.com](http://www.munn-reese.com)). In a recent



Once the PTPv2 clock is running, the system is licensed for AES67 and it's possible to begin connecting AES67 devices to the network. This screen opened in Navigator, the administration application for the WheatNet-IP audio network, shows the status of the PTPv2 master clock along with other key settings.

the devices that are least common or least flexible in specifying or changing multicast addresses and isolate them in an address range, well removed from what the majority of your devices will be.

Multicast addresses are in the form of 239.xxx.yyy.zzz. Each AoIP vendor has their own way of allocating

issue, Thumbs cautioned owners of new translator construction permits to read the CP thoroughly.

Many new CPs are conditioned with special requirements, like intermodulation and spectral measurements. You may also need to complete a partial proof on a nearby AM array.

Remember, your new translator is licensed under Part 74 of the FCC Rules and Regulations; however, at the very beginning of Part 74 is a paragraph that refers many requirements back to Part 73. Although your translator is licensed under Part 74, it is a Part 73 device!

Questions? Obtain more information by emailing [thumbs@munn-reese.com](mailto:thumbs@munn-reese.com). And if your new translator needs a coverage map, email Bruce Bellamy, [Bruce@munn-reese.com](mailto:Bruce@munn-reese.com).

*Radio World's popular Workbench column relies on your tips and ideas. You'll help fellow engineers and qualify for SBE recertification credit. Send tips and high-resolution photos to [johnpbisset@gmail.com](mailto:johnpbisset@gmail.com).*

*John Bisset has spent 49 years in the broadcasting industry and is still learning. He handles western U.S. radio sales for the Telos Alliance. He is SBE certified and is a past recipient of the SBE's Educator of the Year Award.*

addresses for each stream. WheatNet-IP does it automatically (although you can change the starting address and range, if needed), whereas Dante will let the user specify the xxx octet of the address but automatically generates the yyy and zzz.

Therefore, when adding two Dante devices to a WheatNet-IP system with 50 Blades, the Dante device streams would be given a multicast address of .192 for the second octet to produce a multicast address Dante auto-signs. Then, the WheatNet-IP devices can auto-generate multicast addresses starting lower (239.192.192.1) or higher (239.192.yyy.zzz+10), ensuring that there are no WheatNet-IP streams assigned the same multicast addresses.

It's important to go through the effort of creating a plan first, because as you add AES67 devices to the system, you will be doing a lot of hand entry and specifying stream addresses the devices are using to transmit on and which stream address devices are using to receive.

If you go through all this effort only to discover that some other device is using that same address, you will only have to start over. Having a multicast address plan in place will be useful later when routing AES67 streams in your network; it'll be referred to over and over again.

### PACKETS AND TIMING

It's also important that both systems are synchronized and use the same packet structure, which varies depending on devices and systems used in the network.

AES67 specifies the PTPv2 protocol to synchronize all the devices in the network, which is so precise that in the best circumstances (PTPv2 master clock synced to GPS for absolute timing reference and PTP aware switches used for reference signal distribution) timing accuracy of better than 1 microsecond can be achieved.

While this degree of timing accuracy is normally not required for a typical AoIP installation, we find that an ordinary crystal oscillator in a PC or I/O device is nowhere near this accurate and stable enough when used with a multiplicity of various devices. In most cases, a standalone PTPv2 master clock device works best to serve the role of timing generator to which all other devices slave their timing.

For packet structure, we suggest setting devices and system sample rates to 48 kHz as AES67 favors the 1 msec packet timing seen in all of the specifications, which equates to 48 samples left-right interleaved in a stereo stream.

If you are attending the NAB Show, hear more on these and other practices in my BEITC session, "Commissioning AES67 in Your Plant: Key Findings."

*Dominic Giambo has been involved in industry AES67 plugfests as the lead engineer responsible for AES67 implementation in the WheatNet-IP audio network.*

*Radio World welcomes proposals about best practices in AoIP as well as other technical topics. Email [radioworld@futurenet.com](mailto:radioworld@futurenet.com).*



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# Proper Grounding and Bonding Are Essential to Uptime

Get to know the helpful resources available from the Copper Development Association

BY THOMAS MCGINLEY

Grounding in the broadcast plant is a topic as old as the business itself. Protecting equipment and operations from potential damage caused by lightning is of vital importance when the use of proper and effective grounding methods are considered by working engineers.

As we all know, direct lightning strikes and their damaging effects cannot be completely controlled or totally eliminated; but we can do a lot to minimize potential damage by employing the best time-tested methods to achieve that goal.

The various “best practice methods” used over time have evolved and improved as more has been learned about what lightning energy is, as well as how and where it travels to release its payload. A single wire running to the power company’s 8-foot ground rod connected to their disconnect panel with #6 wire is hardly an adequate single-point ground reference for a broadcast studio or transmitter facility.

Implementing an effective grounding scheme need not be expensive and is not difficult if you know what to use and where to install it. If you haven’t thought about or reviewed this issue lately regarding your own facility, keep reading.

## EVERY SITE UNIQUE

The Copper Development Association is a not-for-profit trade organization representing the copper industry to promote research and education for industry and business in proper use and implementation of copper products including best practices for energy efficiency, power quality maintenance, wiring and grounding as well as NEC adherence.

Staff from the CDA have presented talks and seminars on grounding and other electrical matters many times at NAB Shows and Ennes workshops and have a paper titled “Proper Grounding and Bonding Are Essential to Uptime.”

Grounding and bonding, including



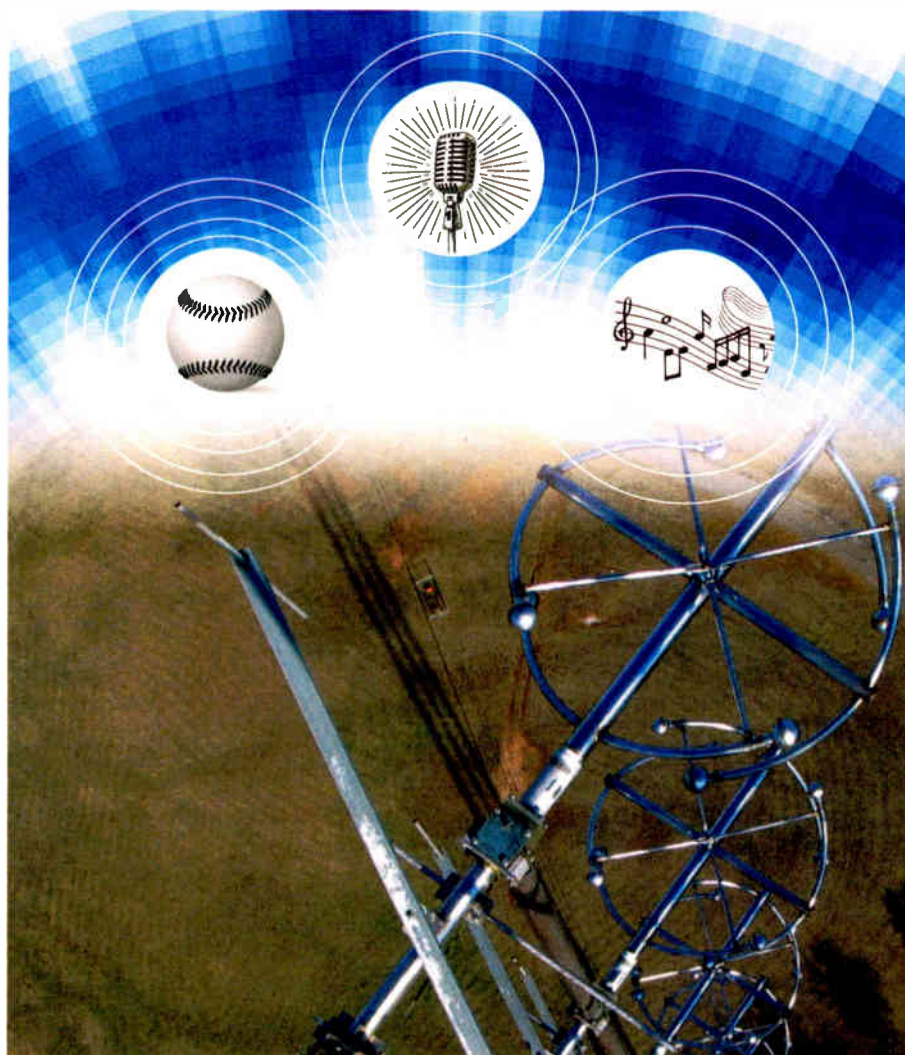
Courtesy Andrew Skandal

how equipment is connected, is fundamental to an electrical system. It’s like the importance of a building’s foundation. Proper grounding and bonding is cost-effective, often with paybacks under one year. But there is no single solution that applies to every facility.

Each site and design is unique. The

quality of local ground characteristics will vary. Rock piles and deep sand need a lot more grounding augmentation than sites surrounded by good topsoil. Proximity to a water source also is important.

Typically a single point of ground reference for a given facility is preferred, and that includes the power company’s



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disconnect panel ground reference. The use of multiple independent grounds can be disastrous since resistance and potential difference values between them invite additional lightning discharge conduits.

The primary goal of any grounding scheme is to minimize the resistance between the master ground reference and all of the facility's equipment, including transmitters, rack cabinets, cabling and transmission line shields and cable trays as well as connections to outside equipment over waveguide bridges at tower bases.

**The primary goal of any grounding scheme is to minimize the resistance between the master ground reference and all of the facility's equipment.**

However those connections should not be grounded to the tower(s) themselves. Towers should have their own ground system reference, including the guy wire anchors to isolate and prevent lightning energy strikes to the tower from reaching the tower base connections and traveling to the building.

**HOW MUCH IS ENOUGH?**

The question is often asked, "How much grounding is enough to be effective"?

The CDA case study cites 5 ohms or less from the ground reference to the surrounding ground as the IEEE suggested target value. Sensitive facilities, especially in high lightning zones, should strive for 1 ohm or even less if possible.

The other goal is to configure the grounding connections such that any incoming lightning-induced energy from the outside traveling the power lines or transmission cables will be shunted to ground before it can enter the building. Those ground connections need to be substantially low impedance so larger wire sizes and/or copper straps are recommended to handle larger currents.

All connections exposed to the outside elements should be exothermic or cad-welded. If mechanical connections are used, all-copper or stainless steel hardware should be used. All connections need to be inspected annually to verify they are still clean, tight and secure and

the bonding has not deteriorated.

Control, communications and low-voltage wiring needs to be routed away from the common facility "halo" ground wire runner as well as power and transmission lines that run to the outside so they cannot induce lightning energy that may enter the building along those conduits. The use of 4/0 stranded copper wire connecting equipment and transmission lines to wall-mounted copper grounding plates as well as wide copper strap running between cabinets along the floor typically is employed. Anything smaller is deemed inadequate for

most installations.

CDA has given presentations about facility case histories from Florida and New Jersey that had suffered extensive lightning damage before the recommended grounding methods were implemented. Pictures of before-and-after hardware environments illustrate how the additional grounding interconnections were best routed and installed.

While adhering to NEC standards for hardware installation guidance is recommended, some of the NEC codes will not always apply or adequately address specific site needs. CDA case

studies discuss such unique situations. For all facilities, grounding and wiring is usually cost-effective, especially during the construction phase of a facility. Lightning damage to equipment and resulting downtime are usually far more costly than corrections to the electrical installation.

The Copper Development Association's website, [www.copper.org](http://www.copper.org), has many articles and videos on wiring, research, case histories on grounding, connectability and a host of other topics. Most can be downloaded. CDA also offers free seminars to groups like SBE chapters.

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# WWTC Moves in With KKMS

Sharing AM towers makes sense for these stations



Fig. 1: The KKMS radio towers point north into the metro.

Photos by Mark Persons

## FACILITY PROJECT

BY MARK PERSONS

It is happening more and more, with property values going up: AM stations sharing transmitter sites with other stations for the benefit of both.

Case in point, Salem Media Group just combined two of its stations in the Twin Cities market of Minneapolis and St. Paul. Salem is a Christian programming-formatted network of 115 stations and has four signals in the Twin Cities.

The tower site for 1280 kHz WWTC was on the west side of the metro, combined with 1570 kHz KDIZ. Consulting engineer Carl T. "Tom" Jones of CT Jones in Springfield, Va., was hired for the project, and his study showed WWTC could increase from 5 kW day and night to 10 kW day and 15 kW night by moving to the south side of town.

Yes, that's right — they could have more power at night than day. That

helps overcome night interference!

### THE SITE

Fig. 1 shows towers at the 980 kHz KKMS site in Eagan, a south suburb of the Twin Cities. It was a prime candidate for diplexing two AM signals. All four towers are now used for both stations. No new towers were added and no changes were made.

Tower lighting power is via Austin brand isolation/lighting transformers, commonly called Austin Rings. Lighting chokes can change tower impedance a bit. Ring transformers don't have that problem.

All patterns point north-northeast. The study showed WWTC would lose a little coverage to the west, but would gain in high population areas. For perspective, most AM directional patterns in Minnesota point north with nulls to the east, south and west, protecting existing stations in the U.S.

This new site on the south side of the market makes a lot of sense.

### TIGHT SCHEDULE

Steve Smit, Salem engineer in the Twin Cities, was a busy man during this project.

First, there was a year of planning. Construction started in late summer of 2018, when there were 95-degree Fahrenheit days in September, followed by 40-degree weather two weeks later. This is Minnesota!

Steve had to manage this new work while doing all the necessary engineer duties required to keep four stations running.

### SLIP SLIDING

Trenches were dug to each of the four towers at a depth of 4-1/2 feet (See Fig. 2).

before final trench closure. The soil is a mixture of clay, field stone and sand that was very greasy and slippery after the rain.

What a mess. But they got it done.

### THE PHASOR

Kurt Gorman and crew at Phasetek Inc. of Quakertown, Pa., rebuilt a used phasor from Salem's 1300 kHz KKOL in Seattle. They were also able to reuse some parts from other Salem network



Fig. 2: Water half-filled trenches to the towers



Fig. 3: One of the three-bay tower cabinets

All was going well until 3 inches of rain drenched the site, causing trench bank cave-ins. The top layer of cushioning sand washed away in places. They had to dig to recover the transmission lines, sample lines, control lines and power cables by clearing away debris and rocks. Sand was then put in again

stations (see Fig. 3).

The antenna coupling unit/filter cabinets were new, but again benefited from some used components inside. Concrete pads were poured at each of the four towers to support the 4 ft. x 3 ft. x 12 ft. cabinets containing antenna

(continued on page 28)



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# MOVE

(continued from page 26)

coupling networks and filters for the two stations. Fences had to be rebuilt to accommodate the change.

Fig. 4 shows the newly constructed antenna coupling network for KKMS. You will note there is no RF contactor to change from day to night patterns. That station has just one pattern with the same 5 kW power for day and night. That is very convenient!

Fig. 5 is an antenna coupling network for WWTC. The center bay, of each 12-foot cabinet, is a combining network, which is seen in Fig. 6. All

nicely done.

## THE BUILDING

The station was built in the 1960s for one AM with the possibility of an FM in the future. All equipment was on the main level. No thought was given to expanding.

Fortunately, there is a basement, as is the custom in almost all Minnesota buildings. The basement area was rebuilt to accommodate two transmitters and the WWTC phasor system. Wiring had to be bored through cast concrete walls, and air conditioning was installed.

(continued on page 30)

Fig. 4: The KKMS antenna coupling network



Fig. 5: WWTC's coupling network

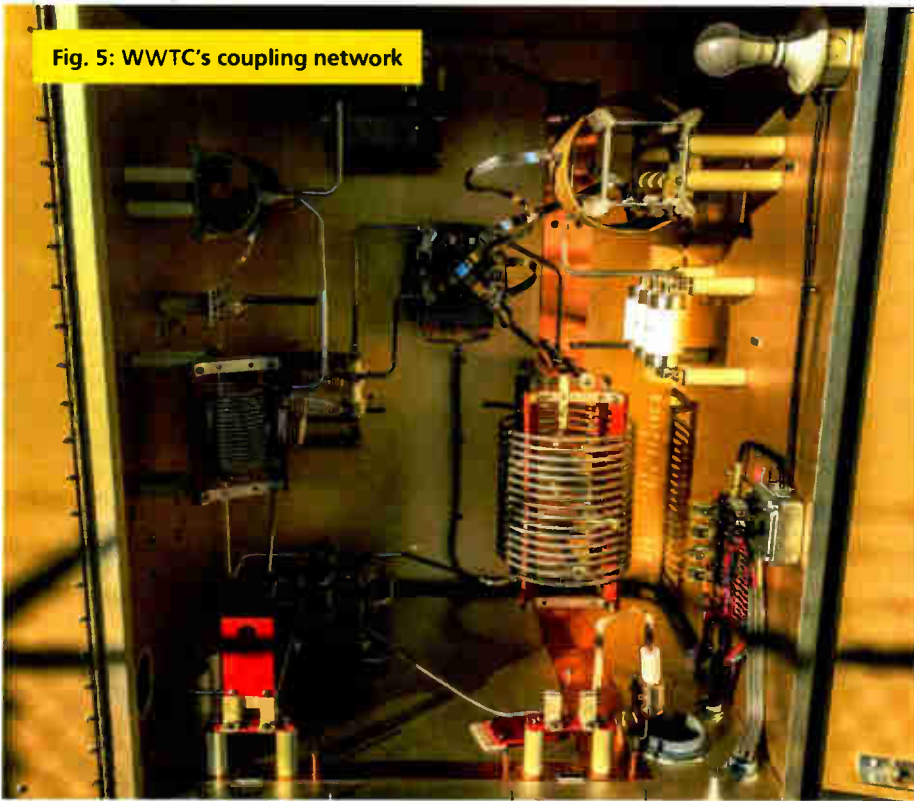
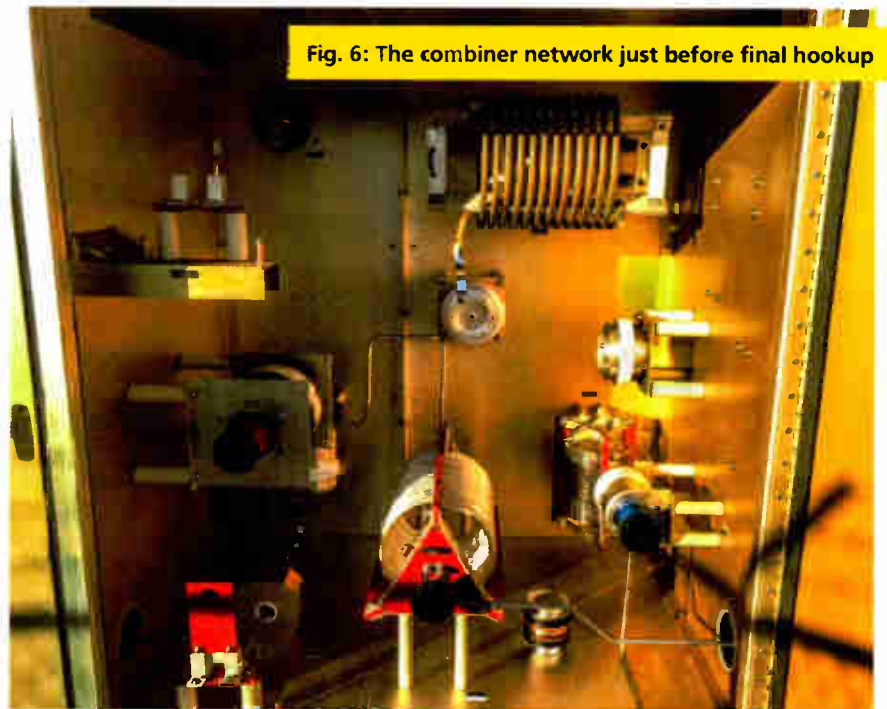


Fig. 6: The combiner network just before final hookup



Photos by Mark Persons

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## MOVE

(continued from page 28)

### THE TRANSMITTERS

A used Harris 3DX50 transmitter was brought in from KKOL in Seattle, then tuned to run on 1280 kHz at 10 kW day and 15 kW night. It is loafing along in this application. (Interestingly, Steve had helped install that transmitter back in 2005, when he worked in Seattle.)

This transmitter was built to run on 480 volt three-phase power, so new electrical service was added. The list of items to be completed went on and on.

Fig. 7 shows Steve Smit checking the WWTC common point impedance on the newly rebuilt and operational phasor. To his back is a Nautel ND-5 backup transmitter from WWTC's original transmitter site. There is also an equipment rack and the Harris 3DX50.

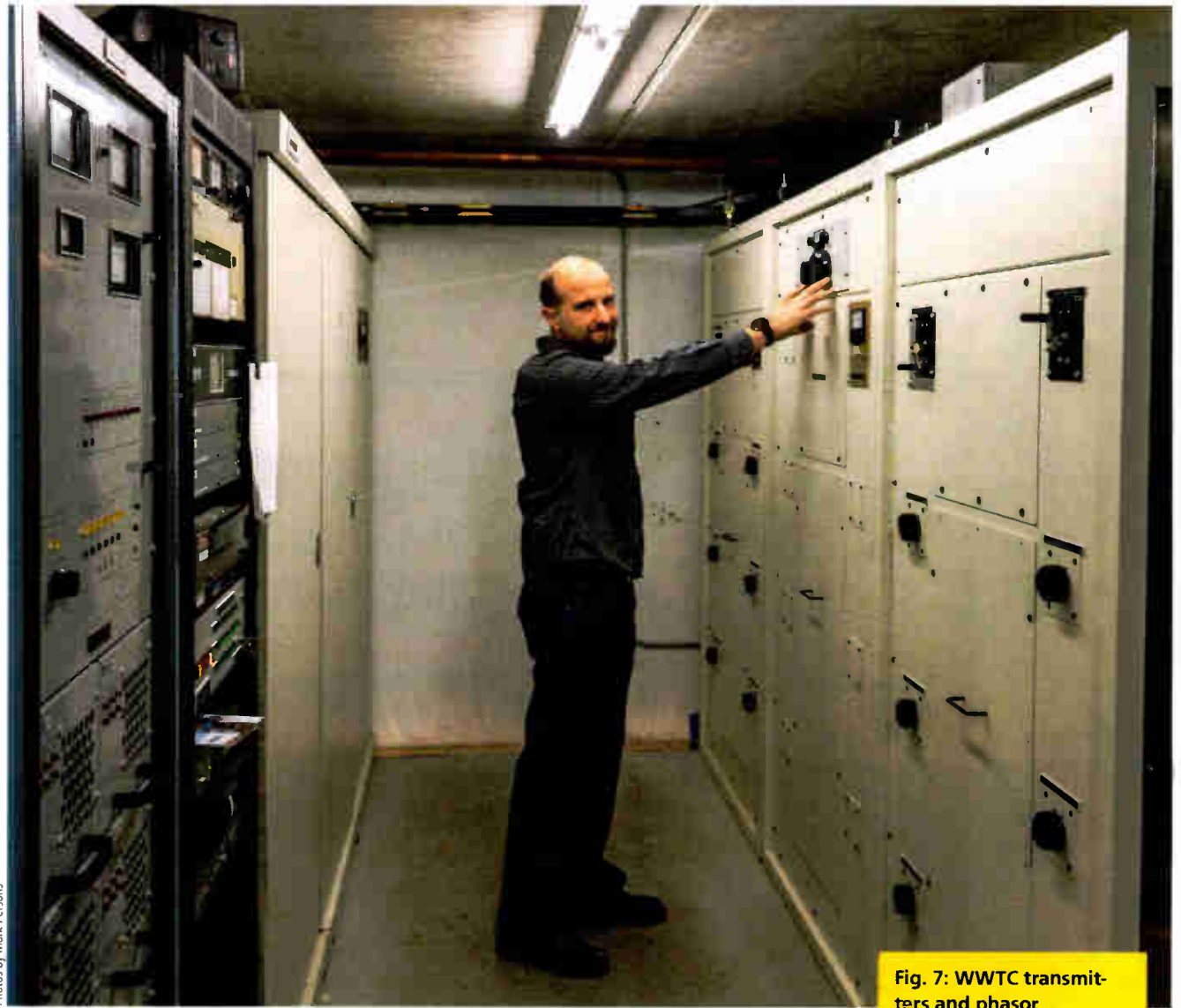
The KKMS transmitter and phasor room remained the same. In Fig. 8, Steve is checking readings at the phasor, with two Gates 5 transmitters as alternate mains. This is a good arrangement with two equally-capable transmitters that substitute for each other on a regular basis.

### MOM

RF Method of Moment proofs were performed several years ago by Tom Jones and this time were proofed by Kurt Gorman.

MOMs, as you know, avoid frequent monitor point measurements on the pat-

Photos by Mark Persons



**Fig. 7: WWTC transmitters and phasor**



**Fig. 8: The KKMS transmitter room**

tern for KKMS, along with day and night monitor point readings at WWTC. Of particular importance were monitor points on the somewhat restrictive WWTC night pattern. They had to be read during the day, resulting in some listener complaints.

Kurt Gorman filed the FCC paperwork. Approval was granted in early January 2019.

The stations are 100-percent operational, and the staff is happy to have this project completed. The timing was good. Temperatures dropped to 30

## Salem consolidated three transmitter sites down to just two, each with two stations.

degrees below zero (the actual temperature!) for several days later in January. You wouldn't want to work on an AM under those conditions!

### PROGRAMMING

The station's programming is not all automated or from a bird. About 25% of aired material is locally produced for the four Salem stations in the Twin Cities. They find it is important to be connected with listeners, via live talk, in the market.

### THREE IN ONE

KDIZ, the 1570 KHz non-directional station, moved from the west site, to KYCR's three-tower transmitter location in Golden Valley, Minn., in March 2019. (Salem owns that one too.)

This was just one more combining project for Steve Smit.

Michael Patton of Michael Patton & Associates in Baton Rouge, La., was hired to retune the 3DX50 transmitter for WWTC, as well as a Nautel ND-5 transmitter for KDIZ.

In the end, Salem consolidated three transmitter sites down to just two, each with two stations. The studios are all at the KKMS/WWTC site, where Steve's office is. Very convenient!

*Comment on this or any article. Write to [radioworld@futurenet.com](mailto:radioworld@futurenet.com). We're always looking for good facility project stories to share.*

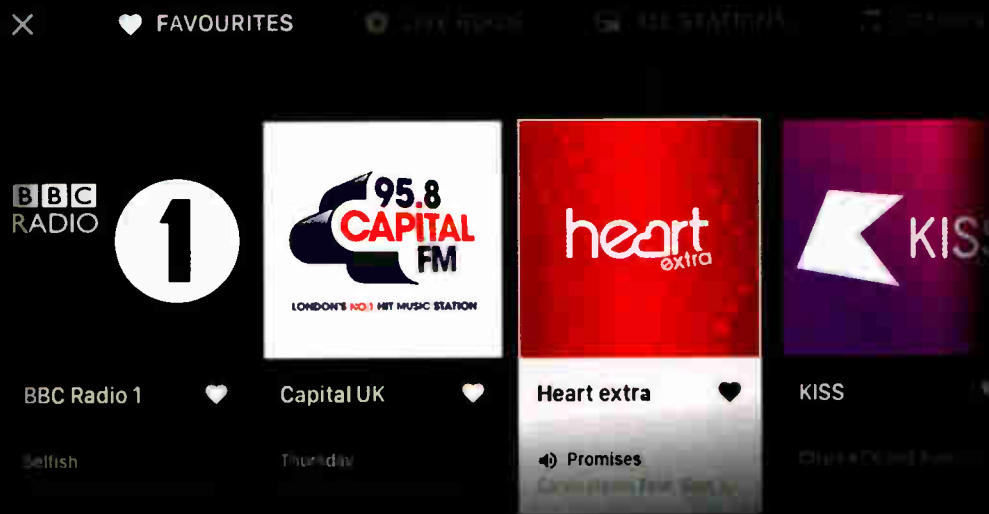
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# NPR's Sucherman Seeks Digital Partnerships

"A huge opportunity for us ... There is a great synergy between these platforms and public radio"

## NEWSMAKER

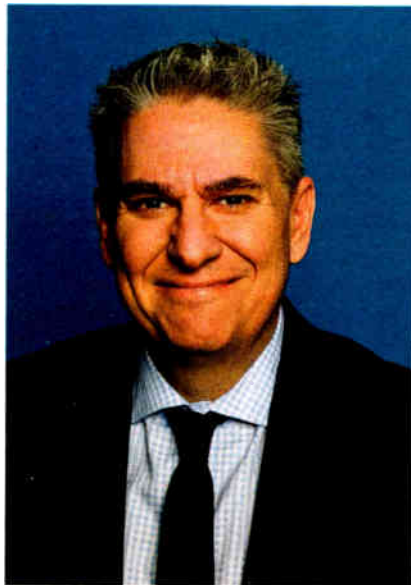
BY RANDY J. STINE

**WASHINGTON** — National Public Radio believes that growing relationships with tech companies like Google and Apple is key to its future digital success. At NPR, Joel Sucherman is point man for those budding partnerships.

Sucherman, vice president of new platform partnerships, is responsible for increasing the reach of NPR on emerging platforms while focusing on voice-activated devices. Promoted to the position in April by Chief Digital Officer Thomas Hjelm, Sucherman leads the media company's efforts to develop strategic partnerships with Apple, Google, Amazon, Samsung, Microsoft and other technology partners.

The rising popularity of personal assistants like Amazon Echo and Google Home is fueling the new audio renaissance and makes Sucherman's work critical, according to the organization.

Sucherman, 54, came to NPR after having founded the first streaming video group at USA Today; his radio roots date to his time as a Capitol Hill correspondent in Washington. Over the past 10 years he has helped shape NPR's digital strategy, including working with and guiding the team responsible for a digital portfolio that includes NPR.org, the NPR



Joel Sucherman. His email signature line ends with, "Tell your voice assistant to 'Play NPR,' or play your station by name."

and NPR One apps, and products delivering live and on-demand audio to the connected car and home, the company said.

NPR has put a lot of resources into the development of multiple digital platforms that stretch the network's digital fluency. The public broadcaster's efforts include a Public Radio Incubation Lab, consisting of product managers, designers and technologists who work four-month rotations

solving public radio's pressing digital challenges, according to a press release.

Sucherman, who regularly travels to Silicon Valley and Seattle to meet with technology companies, said a recent survey by NPR and Edison Research pegged the voice-activated smart-speaker market at 53 million people in the United States.

Radio World spoke with Sucherman about his vision of audio distribution and the challenges emerging technologies present to traditional radio broadcasters.

**Radio World:** Give us a summary of what you have worked on and your immediate focus these days.

**Joel Sucherman:** I came on board to work with member stations on improving digital acumen and reaching audiences in the digital space. First, it was building out a blog network of local blogs

to them. But so much radio listening is happening on these devices now that we see it as a huge opportunity for us. Right now, there is a great synergy between these platforms and public radio.

**RW:** When you talk about forming these partnerships, what do they typically look like?

**Sucherman:** Well, there is an exchange of value. I can't really get into specifics of our arrangements and agreements. It's not one-sided. We know full well the value of public radio and how many people are listening on various platforms. We know that right now we have over 2 million hours of listening to NPR programming per week on smart speakers. In fact, about 21% of all listening to public radio digital streams comes through smart speakers.

**Smart speakers** are what I call beautiful radios, and they are now in kitchens, living rooms, bedrooms and garages.

— Joel Sucherman

that were of critical importance. Then, I took over the product team, which manages NPR apps, the website, podcasts and social media. Then, it became clear that emerging platforms and, more specifically smart speakers, would become my primary focus.

Today, I manage relationships with the big tech companies to ensure we are where we want to be, so that listeners can find public radio no matter how they choose to tune in.

**RW:** You are heavily involved with NPR's growing presence on voice-activated platforms such as Amazon Alexa, Google Assistant, Apple's Siri, Samsung's Bixby and Microsoft Cortana. What makes voice-activated services so critical?

**Sucherman:** Within just four years of their introduction, 53 million Americans now have a smart speaker in their home. These are what I call beautiful radios, and they are now in kitchens, living rooms, bedrooms and garages. Our research shows that more than half of Americans that have a smart speaker have more than one. It's really phenomenal growth. Almost a third of folks that have them have three or more.

You always have to eye with some caution when someone else owns the platform, so to speak; then you are beholden

Companies like Amazon, Google and Apple are well aware of the power of NPR to drive those listening levels. They are happy to have us help people find value in these devices. This is kind of interesting. What we see time and time again is these companies take older technology and put it in or on new technology. We think it helps put more of a shine on our products.

Radio needs to make sure its content is available and easy to find on these appliances. Now we have started to experiment some with interactivity. Asking: How do we make the product more conversational? How do we begin to answer questions in that conversational tone?

We have 50 years of archives to dive into. That's a lot of content.

**RW:** And you envision adding an "ask NPR" element to your offerings?

**Sucherman:** Yes. So for example, take the day Tom Petty passed away. We maybe had a 30-second story about his death in the newscast. Then, say, maybe there was a seven-minute segment from "Morning Edition." Then somewhere, perhaps "Fresh Air" interviewed him in a longer 40-minute segment. So the challenge is to move people along from one place to the next and getting deeper into

(continued on page 34)

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## SUCHERMAN

(continued from page 32)

NPR content. But what are the magic words to get all of that accomplished?

Those are the sort of things we are working through. The goal is to get listeners to engage deeply.

**RW:** Take me inside NPR and how decisions are made about digital initiatives. What is the business planning process?

**Sucherman:** Producing great content is the recipe for success on all of our digital platforms. The business model of National Public Radio is to be sustainable in the digital world. Overall we won't have to completely reconfigure our business model if we continue to produce great content.

**RW:** Seems like the immersion of NPR's digital brands know no limits.

**Sucherman:** Oh, yes. We are talking about connected TVs and connected homes. We even have NPR updates in Samsung smart refrigerators. It's all about being able to meet listeners however they choose to tune in. We are even interested in the shared economy of Uber and Lyft and the opportunities there.

The podcast group here still rolls up to me on the product side. There is so much crossover between app platforms, podcast platforms and emerging platforms that it makes sense to do it that way.

Podcasting continues to grow for us. We now have better measurement of podcasting efforts with our new podcast measurement system called RAD [Remote Audio Data], which is being deployed. It shares listening metrics from podcast apps straight back to publishers. NPR One's Android app is configured to read RAD tags now, and iOS will do the same.

In-car is, of course, a major focus. All of this digital fluency is really a collaborative effort between the digital media group here, programming and the news division along with sponsorship.

**RW:** You work closely with the likes of Google and Apple. Those companies want to control the audio experience of users. How do you view those relationships?

**Sucherman:** There are a lot of ways to look at it and turn that question around. Here is an example of how we view it. About eight years ago, we began to focus on the connected car and how that would impact how people listen to "Morning Edition" and "All Things Considered." It became important that we focused on how things would look on what has become more like a tablet or a computer screen. Of course, each automaker had their own screen and vision of what things would look like.

So as it came to a duopoly, as it has



**NPR team members at work: Senior Interaction Designer Vince Farquharson, Senior Product Manager Emerging Platforms Ha-Hoa Hamano, and Software Engineers Kris Kagei and Kaivon Jones.**

today with Android Auto and Apple Carplay, we welcomed that consolidation. As an app developer and publisher it makes things so much easier to consolidate around just a couple of standards.

**RW:** With so much focus on voice assistants, has app development taken a backseat at NPR?

**Sucherman:** Good question. The NPR and NPR One apps are well established. With NPR One, we are beginning to personalize offerings and have it understand your listening habits, much like Pandora does on the music side. Maybe in the morning you want hard news, but then for the afternoon drive home you are interested in podcasts.

The number of NPR podcasts has increased significantly along with updates via Twitter.

[At this point in the interview, Sucherman's office smart speaker engages with Alexa, interrupting the conversation for a moment, which leads to laughter.]

Oh, sorry about that! Since we try to look at what the world might look like five or 10 years from now, we are trying to balance a lot of platforms. We try to think as much as possible about creating content that is flexible to fit whatever the platform might be.

**RW:** Any worries that autonomous vehicles will bring a more hostile environment for audio houses that produce content?

**Sucherman:** The focus on our in-car offering continues to expand. As a traditional radio company, we have to con-

sider what autonomous vehicles might bring to that space. I will say that in one sense, motion sickness might be our friend [chuckles], in that not everyone will want to watch video in a moving vehicle.

Autonomous is an on-going development and will be for years. It's very early. Public radio has been able to weather a number of challenges through the years with a focus on meeting the needs of listeners.

**RW:** What other trends are you focused on that might happen in the next five to ten years?

**Sucherman:** So as we think about voice assistants and smart speakers, we begin to think about a voice-first world. Voice-activated assistants such as Alexa, Assistant, Siri, Cortana and Bixby are going to be with us everywhere. Google and Amazon are talking about voice assistants that are with you all the time. On your phone, in your car and in your home. So all of your queries will become voice queries, no matter where you are. Making voice queries is so much quicker than typing things out.

We also think screen environments will still be very important in the voice space. Both Amazon and Google have spent a lot of time thinking about the screen and visual companion content. We hope to be part of those solutions to provide knowledge, entertainment and information.

**RW:** What is the next great partnership for NPR as you seek to engage with

other emerging technologies?

**Sucherman:** Our digital portfolio continues to expand. Things are moving so quickly, especially in the voice assistant space. We are growing. We already have one scrum team in place devoted to emerging platforms like voice assistants and will soon be spinning up a second soon. A team is generally made up of a product manager, voice experience designer, two software engineers, a quality assurance specialist and a "scrum master" or project manager.

It's a matter of trying to realize our ambitions in the space as they exist today.

And while Amazon and Google have certainly dominated the voice assistant space in this country to this point, Apple was really first out there with Siri, so I expect them to fight back and make more inroads. They launched a Homepod last year, and while it is a high-end speaker so it isn't competing with the Mini or the Dot, I expect them to be a player yet.

I see the way we think about voice assistants today changing. Right now, it is more of a fetch mentality. "I want this, so you are going to get it for me." It will become much more conversational in ways that is an always on experience. It will provide more nuanced meaning and better overall experiences for you.

The last thing I'll say is I believe privacy and security will become even a greater concern to people. Certainly, people have the right to feel safe and that they are bringing these devices into their home that the devices are good houseguests.

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# Create Shareable Radio, Not Bad Television

Your goal is to capture, share and celebrate the most emotional, exceptional audio content

## COMMENTARY

BY DAN McQUILLIN

*The author is managing director of Broadcast Bionics.*

A decade of helping some of the world's largest broadcasters visualize great radio has informed the following tips and tricks. They represent both the art and science of creating contagious content, distilled from the successes and failures of some of visualization's pioneers.

Radio visualization has a troubled history. From simple webcams in the studio to sophisticated multi-camera productions complete with music videos, its historic attempts involved considerable effort, disruption and investment, only to result in disappointing, often single-digit viewing figures, if anyone was watching at all. There were notable exceptions, but only a few.

The demand for watching long-form



live radio remains unproven. But visualization as part of social media strategy has transformed the returns of installing cameras in the studio. We encourage stations to think of visualization not in terms of producing bad television but making "shareable radio," helping transform the best radio content to become shareable, searchable and discoverable on the most powerful platforms on earth.

Radio has always painted better "pic-

tures" than television; but as far as social media is concerned, an actual picture or video is worth millions more clicks, likes and shares than a thousand spoken words. Using visualization, we have enabled radio content to reach millions more listeners, engage

love and react to. As we add cameras to capture and share those experiences, it is important not to sacrifice the intimacy, immediacy or simplicity of radio's workflow. Don't let visualization change your output; the great audio you already produce is what your audience desires. Video is just the carrier for that audio.

The good news is the same emotive and exceptional experiences and great storytelling that make fantastic radio also

**You will be amazed by what happens when you trust your own content and place it in your audience's hands.**

younger demographics and empower passionate audiences to share and discover amazing radio for themselves.

How you film, what you share and where you share it will make all the difference between a handful of views or millions of active engagements.

### DON'T BREAK RADIO

The golden rule for visualization is: Don't break radio. Radio already creates compelling content that our audiences

deliver the most engaging social content.

### CAPTURE EVERYTHING!

The advantage of using a system of installed cameras with automated switching is that it enables you to capture everything. While some highlights can be predicted, the biggest viral moments from the stations we work with have come from clips recorded when it was least expected.

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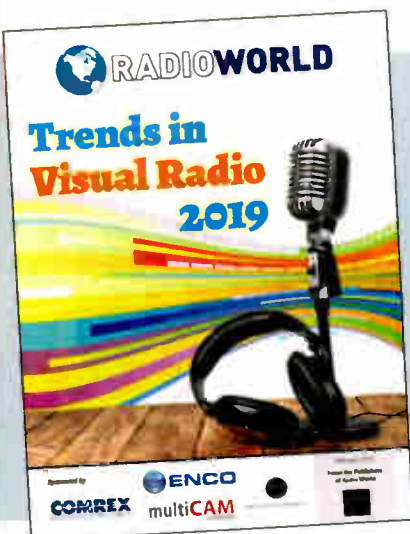
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This article is from Radio World's ebook "Trends in Transmitter Design." We've now published more than 50 ebooks on a wide range of topics that are of interest to the broadcast technologist or manager including AoIP, next-gen codecs, cloud technology, digital radio, RDS, DRM, translators and more. All are free to read. Find recent issues by clicking the ebooks section under the Resource Center tab at [radioworld.com](http://radioworld.com).

shows have exceptional moments that are invaluable when streamed on platforms such as YouTube live or Facebook Live.

As well reaching a topic-specific live audience, these streams have a distinctly positive effect on your page rank via the mysterious Facebook algorithm. Along with emotional video clips, the organic reactions and response to streaming content and video clips are recognized and rewarded with a far greater reach than the promotions, memes, click bait and listicles that too often dominate station pages.

moments are captured, they can be clipped and shared with remarkable results.

**SHARE THE EMOTIONAL**

Ultimately your listeners will not engage with your content or brand out of any innate desire to reward you. We are all now in the habit of sharing our emotions and experiences to reward and delight our friends.

Your audience wants to share the experiences and emotions from your best content. Visualization fits that content for the platforms that allow them to share it. If you make someone laugh, they want all their friends to laugh. If you make them cry, inspire awe or provoke anger, audiences will instinctively share these emotions and experiences with their friends, if we enable them to.

Though your audience is not rewarding your brand, the station should consider carefully the physical branding of the studio and invest in microphone windshields, onscreen logos and graphics to ensure wherever your stunning viral content ends up, you not only get the credit you deserve but enable ways for that new audience to connect back to the station.

**STREAM THE EXCEPTIONAL**

There are few radio shows that could command a large viewing audience in their entirety. But most

You will be amazed by what happens when you trust your own content and place it in your audience's hands.

**SEARCH AND SERENDIPITY**

Beyond social, the best visualized radio content can also now appear in response to Google and YouTube searches. From search, linking, recommendation and the serendipity of surfing, radio content is given a far wider reach and longer lifespan. Through transcription, radio doesn't just become searchable and linkable, but we are even seeing radio read first in muted timelines before the "listener" clicks to listen. There are challenges to fitting content to these platforms; but the rewards have proven exceptional to those willing to engage their audiences.

We have helped radio stations achieve millions of views from clips that consist largely of fat middle-aged men in large headphones, sitting in a room, talking to themselves. Clearly, it is not the power of the images that audiences are reacting to. Everything we help our clients achieve is first and foremost about capturing, sharing and celebrating the most emotional, exceptional and compelling audio content.

By fitting amazing audio to the platforms and habits of our audiences, visualization has finally shaken off its troubled past and become a critical part of radio's future.

# Survey Says ... Radio Is Still Going Strong, But Digital Is Moving Up

Does Techsurvey 2019 prove theories about smart speakers' and podcasting's impact on radio?

## LISTENER BEHAVIOR

BY EMILY M. REIGART

Jacobs Media has unpacked the results of its 15th annual Techsurvey, and the outcomes could be described as mixed for broadcast radio.

Essentially, the medium remains strong, yet digital competitors are making inroads with listeners — confirming some broadcasters' fears while, maybe, also offering a new way forward for radio stations.

Note that Jacobs Media polls commercial radio listeners in the U.S. and Canada for its Techsurvey, so the results should be read as measuring behavior among current radio listeners and not necessarily all consumers. Results were also collected online, which could favor those who are at least somewhat tech savvy.

The 2019 Media Media Pyramid shows that 95% of the 50,652 radio listeners surveyed indicated they watched TV/video content for at least one hour per day, followed by smartphone usage and AM/FM radio listening, both at 91%.

Only 65% of respondents indicated they use radio and music apps with that kind of regularity — but that number is much higher than the one-in-four who said they tune into satellite radio often. Time spent listening to smart speakers came in at 27%. Weekly podcast listening was reported by one-in-five respondents, and HD Radio was only cited by one out of every 10.

AM/FM radio's brand usage remains extremely high at 91% (again, perhaps not surprisingly when polling a group of radio listeners). But Pandora is not faring so well, sliding to 20% from last year's 25%. iHeartRadio is basically flat and lagging far behind the 42% of respondents who say they weekly tune to their home station's stream. However, iHeart continues to beat Spotify and TuneIn.

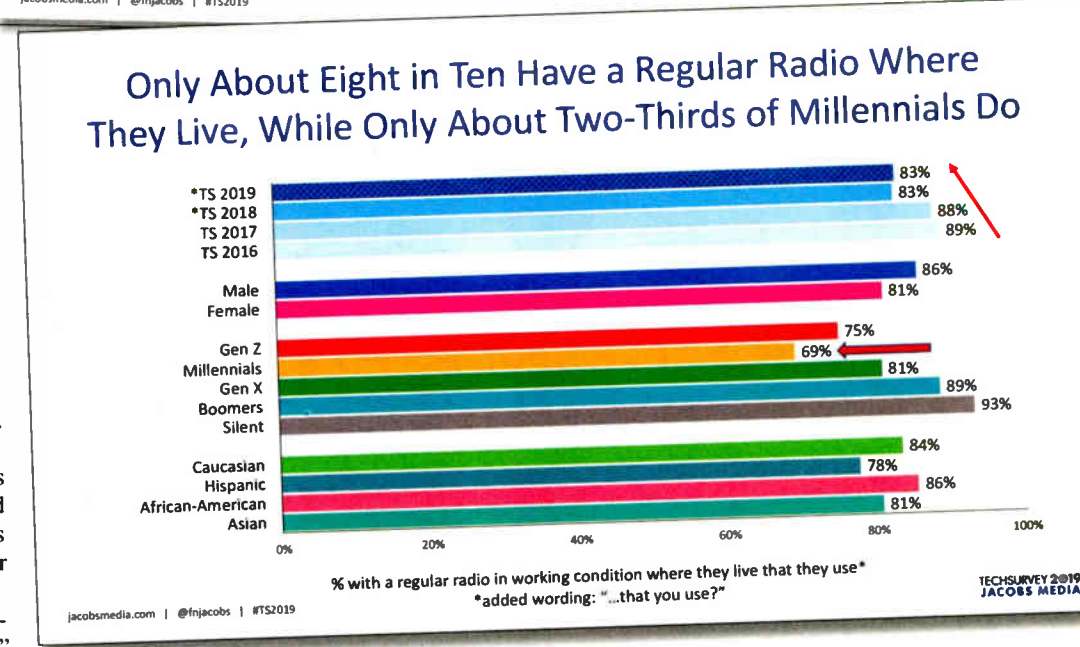
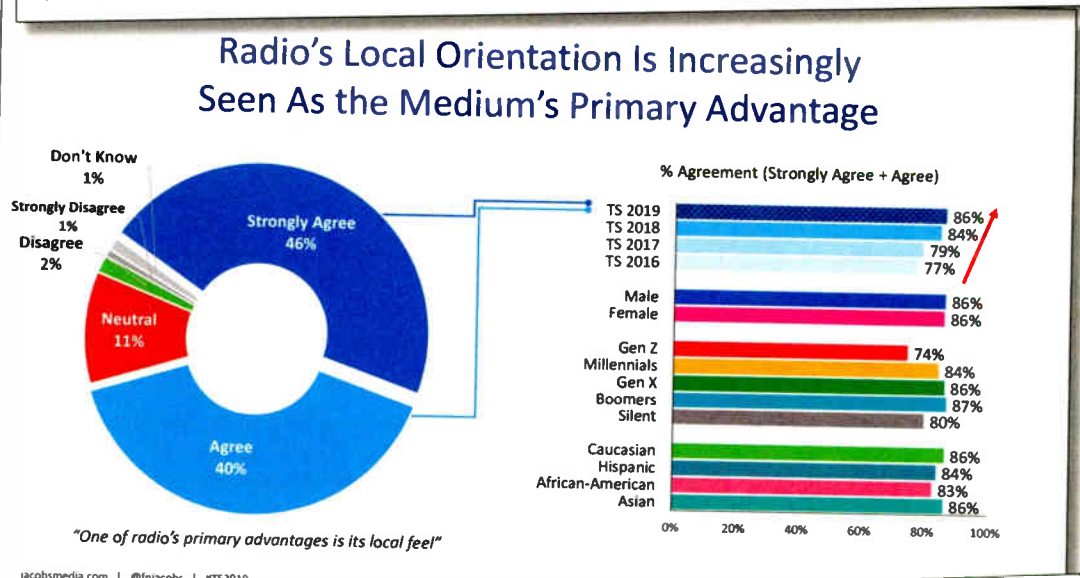
What is broadcast radio's enduring appeal in the world of audio? According to the survey, radio's very low price tag and ease of use are major factors for listeners — another reason for radio to fight for a prominent, accessible place in the connected car, since traditional radio receivers are becoming less commonplace in many homes.

In fact, 65% of radio listening is done via what Jacobs Media called "regular radios," but that drops a bit among Millennial respondents. As radios are on the decline, smart speakers continue their precipitous ascent. Smart speakers are now in the homes of one-third of respondents, up from 11% in 2017, and smart speaker owners are likely to own more than one such device, which further solidifies their ubiquity.

Localism is another quality cited by about nine-in-ten as a primary advantage for radio. Despite industry concerns that radio is increasingly homogenized, this number is actually way up from three years ago.

While the number of podcast listeners remains relatively small — and slightly down from last year — the time spent listening to podcasts is increasing for this segment of the population. In fact, 40% reported that they are listening to more podcasts/on-demand audio content this year than they did in 2018. Podcasts also continued to be most popular among Millennial males, compared to other demographics.

Review the full report online at <https://jacobsmedia.com/ts2019-results> or sign up for the "10 Key Takeaways from Techsurvey 2019" webinar, scheduled for April 15.



# Hearing It in the Air Tonight

Keeping the emotion in radio with Omnia.11

## USERREPORT

BY CLAY WALKER  
Program Director/Director of  
Digital Integration  
WPAW(FM) Entercom Greensboro/  
Winston-Salem/High Point

**GREENSBORO, N.C.** — One of the most powerful stories of music creation comes from 1981, when Phil Collins produced "In The Air Tonight." The song was assembled during a dark time in Collins' life, and he wasn't afraid to show his feelings.

If you remember, the song's foundation is an emotionless drum machine, and it's layered with movements of great intensity, crescendos and decrescendos, leading up to the song's climax and trademark drum solo. The emotions in each layered and reversed vocal, transient guitar riff, and synth is, to me, unlike any other song pressed to vinyl or compact disc.

For years however, I always thought this track sounded rough on FM radio. It seemed most stations had to dance the loudness dance and leave musicality and emotion leaning against the wall like an awkward seventh grader at his first dance.

That's one of the toughest parts about radio in general. It can be difficult to express emotion when we're told we have to be the loudest station on the dial — the station with the most bass, the station that doesn't come up for air because we're afraid someone's going to punch over to a competitor. And, Lord, have mercy if you're encoding for PPM.

But isn't music the ultimate expression of emotion? Lost love, party songs, pride about your home state (I'm looking at you, Skynyrd) — the list goes



on, but the common thread remains ... music is all about emotion!

Enter the Omnia.11 audio processor from Cornelius Gould and his merry band of processing gurus at the Telos Alliance. With the recent release of G.Force Version 3.5 software update, coupled with its optional Perfect Declipper software, there's no longer a tradeoff between loudness and musicality. I can push a station's Omnia.11 as hard as the market will tolerate, while at the same time allowing the processor to open up those transient details that come standard with "In The Air Tonight."

### A MATTER OF FEEL

Modern songs that have been mastered for smartphone consumption (translation: clipped to death) are given a breath of fresh air that's akin to

early compact disc technology with incredible dynamic range, but at the same time maintaining the competitive punch, with loudness that doesn't generate that ridiculous intermod distortion that traditional processing tends to generate. Sure, the .11 has been out for a number of years now — but I'm more than confident installing this processor in some of the most competitive stations in America.

Yes, the Omnia.11 can make your station loud — it's great at helping your station jump off the dial and makes you as competitive as you want. As a program director, however, the real under-the-hood elements don't matter as much as the results.

How does the listener feel when they hear the radio station? Are we taking them somewhere? Can they feel the

despair in Phil's heart when the first few beats of the drum machine arrive? Can they really feel the intensity of his pain when the infamous drum break finally kicks in? Are listeners hearing the subtle crackle and pops of a smoldering fire in Cam's "Burning House?" How do your listeners feel when the beat drops in Maren Morris' "The Middle?"

What makes the .11 my favorite tool in the processing arsenal is its unparal-

**It can be difficult to express emotion when we're told we have to be the loudest station on the dial.**

leled ability to handle both loudness and emotion. To me, it's akin to seeing HDTV for the first time. You'll hear songs that you've played countless times on the air come out of your speakers with an added dimension. I don't know how they do it, but it sure is cool.

The fact of the matter for me is that songs are like bookmarks in the chapters of our lives and we deserve the chance to treat them like it. The Omnia.11 audio processor from the Telos Alliance gives us a chance to turn our radio stations away from being hype machines to being what we truly were designed to become — emotional companions for our fantastic listeners.

For information, contact Cam Eicher at The Telos Alliance in Ohio at 1-216-241-7225 or visit [www.telosalliance.com](http://www.telosalliance.com).

### ABOUT BUYER'S GUIDE

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## TECHUPDATES

### DM BROADCAST VIBE PROVIDES FLEXIBILITY

DM Broadcast describes its Vibe audio processor with built-in MPX and RDS encoder as providing a flexible alternative for radio broadcasters.



The three- or six-band Vibe FM is fed by a wideband AGC, while DSP manages the audio processing and RDS/MPX encoding.

The system, which DM Broadcast says, gives radio stations a natural and clear sound, allows users to implement new functions and upgrades through software updates.

In addition, an optional Ethernet streaming card lets users play MP3/AAC+ streams and files. It forms a complete stream to the MPX and RDS receiver for use as a spare audio source or STL network. In this configuration, the audio signal coming from the network is processed by the DSP and converted to analog through the MPX output, thus creating an entirely digital processing chain.

For information, contact DM Broadcast in Italy at +39-051-817657 or visit [www.dmbroadcast.it](http://www.dmbroadcast.it).

### THIMEO UPGRADES STEREO TOOL 9.30

Thimeo Audio Technology highlights new features and improvements in Stereo Tool 9.30, the latest version of its FM, AM, HD, DAB+ and streaming audio processor.

MicroMPX, a codec to stream a composite FM signal including pilot and RDS over an IP connection at lower bitrates, is now built into Stereo Tool, making it possible to stream directly from Stereo Tool to the transmitter. At the transmitter site, the firm explains, all that is needed is a decoder that feeds the transmitter.

Also, the company has improved the FM final clipper to make it sound fuller, louder and more transparent.

The company says other improvements produce a more consistent and natural sound in the dynamics section; and for tracks that lack mid-bass, there's a new synthesizer that generates natural-sounding mid-bass to benefit listeners on small speakers.

Thimeo has added features to the RDS encoder, which now supports EON for large nationwide networks of FM stations, and ODA, used for example to send traffic information to navigation systems.

Also new, "The BIMP" is a built-in micro processor module that communicates with the rest of the processing to reduce total processing latency. Microphone and normal processing combined can be done in under 6 ms for the low-latency monitoring output.

For information, contact Thimeo Audio Technology in the Netherlands at [mail@thimeo.com](mailto:mail@thimeo.com) or visit [www.stereotool.com](http://www.stereotool.com).



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RADIO WORLD





# Hofstra Picks Wheatstone FM-55 Processor

Academic David takes on commercial NYC Goliaths

## USERREPORT

BY ANDY GLADDING  
Chief Engineer  
WRHU(FM)

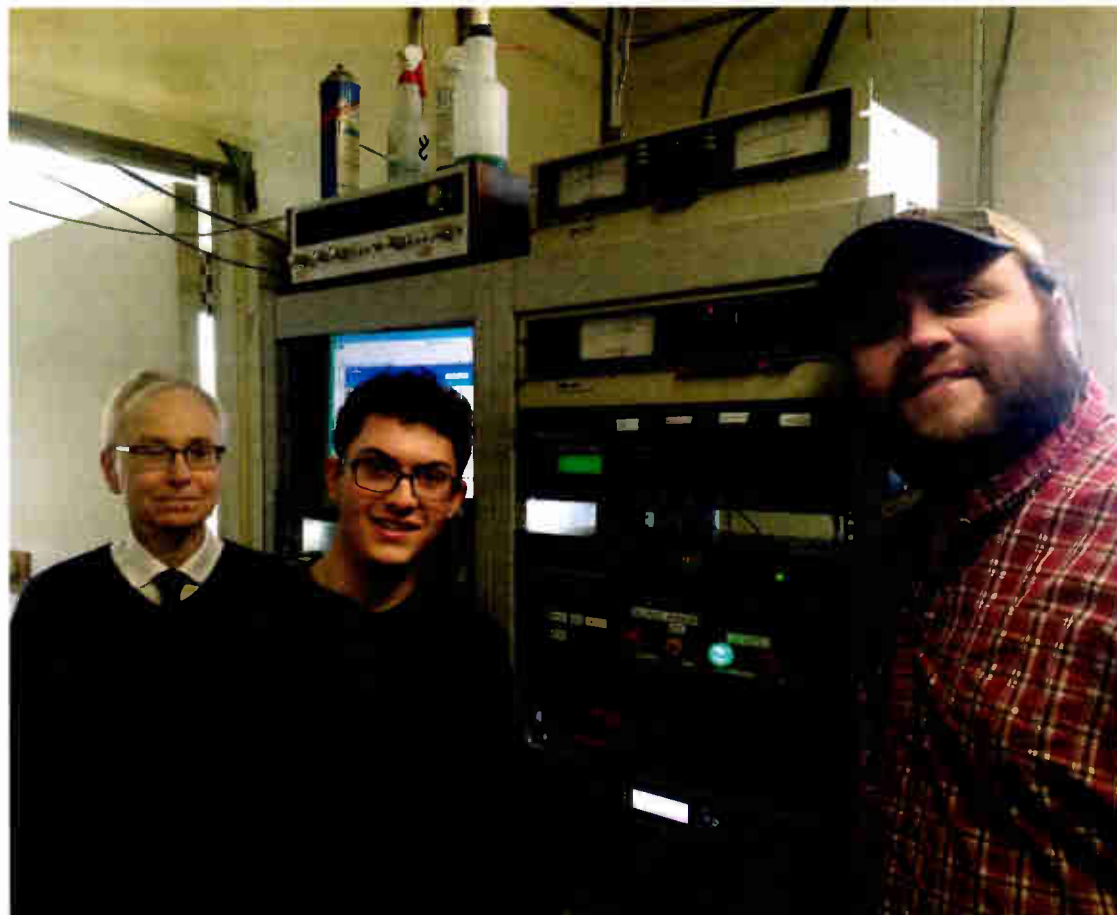
HEMPSTEAD, N.Y. — WRHU(FM)/88.7 MHz has been the voice of Hofstra University and the surrounding community for 60 years and is Long Island's oldest noncommercial radio station. As chief engineer of WRHU, it is my responsibility to make sure that our 430-watt FM signal remains technically competitive in the New York City market.

Tasked with upgrading our aging air chain and transmission paths, I needed to find a processing solution that was superior to our competitors and also cost-effective while being capable of handling a variety of formats and styles with minimal supervision. After doing much research, discovery and listening trials, I felt that the Wheatstone FM-55 was the best tool to accomplish our goals.

The FM-55 is an easy product to install and configure and has a powerful GUI that provides access to all the advanced machine functions. We have found these features to be essential to competing in the New York City market.

WRHU, part of Hofstra's Lawrence Herbert School of Communication, has a diverse staff of more than 230 students and community volunteers and is the only college station in the country contracted to produce, broadcast and distribute games for a national sports franchise, the New York Islanders. With the FM-55, our sound is now superior to our much larger peers in the NYC market and helps us maintain our edge and presence.

For information, contact Jay Tyler at Wheatstone in North Carolina at 1-252-638-7000 or visit [www.wheatstone.com](http://www.wheatstone.com).



From left, Hofstra University's Chief Video Engineer Joseph Valerio, WRHU Student Technical Engineer Jon Sanelli and WRHU Chief Engineer Andy Gladding

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## USERREPORT

BY JUDE DAWSON  
Senior Manager  
Broadcast Operations

**KUALA LUMPUR, MALAYSIA** — Astro Radio, a commercial radio network based in Malaysia and owned by Astro Holdings Bhd., has been revolutionizing radio in Malaysia since its launch in 1996 when we introduced format-specific programming, i.e., format radio, to our listeners.

We began operations with five FM radio stations, eight satellite radio stations with 25 regional commercial splits with the (then-revolutionary and now-legendary) Optimod-FM 8200 digital audio processor. Much has been said and written about this amazing piece of technology; it is sufficient for us to simply state it was the best decision we ever made to go with Orban.

The 8200 made our stations the consistently best-sounding radio network on the FM dial in Malaysia. We're pleased to say that even after 20 years in the transmission chain, the Optimod FM 8200 still performs better than any competitor's current products.

### GOOD PERFORMANCE

Today, Astro Radio operates 19 radio networks, which cater to a diverse range of musical tastes and demographics. Our stations broadcast to our listeners on three primary delivery platforms: FM, satellite radio and online.

Our flagship brands hitz, My, Lite, Mix, Era, Sinar, Melody, Raaga, Gegar, Zayan and goXUAN reach 16.2 million radio listeners, 17.5 million social media followers and 56.3 million on Facebook.

To deliver steady high-fidelity audio over these platforms, we deployed Orban's arsenal of digital audio processors with great success.

For FM broadcasts, we utilize the 8700i, 8600, 8500, 8500-FM and 5500



audio processors in tandem with the 5518 stereo encoders.

For satellite-radio audio processing we chose the 8685 (yes, the one that does surround sound). We also still use the 8200 to process audio for some of our satellite-radio stations!

To dominate and tame the online streaming platform, we use a combination of Optimod-PC 1211 cards as well as Optimod-PCn StreamS software.

**To deliver steady high-fidelity audio over these platforms, we deployed Orban's arsenal of digital audio processors.**

In total, we use 96 units of rack-mount Orban Optimods as well as 27 PC-based Opticodec cards across multiple locations in Malaysia to deliver the sweetest, cleanest, distortion-free and regulatory-compliant sounds. We're very pleased that our stations sound clean and loud but don't distort.

We have been able to achieve and maintain these high standards simply because of excellent technical support and sound product advice over the years from many of the experienced, talented and knowledgeable people at Orban.

Simply put, Orban's audio processor solutions just work beautifully for Astro Radio.

For information, contact Mike Pappas at Orban in New Jersey at 1-856-719-9900 or visit [www.orban.com](http://www.orban.com).

## TECHUPDATES

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DEVA Broadcast says its DB6400 offers advanced processing and a range of functionalities.

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In addition, it comes with a set of factory presets as well as several customizable user presets. It can be accessed, set up and controlled through the front panel, remotely via TCP/IP or by the web interface.

For information, contact DEVA Broadcast in Florida at 1-305-767-1207 or visit [www.devabroadcast.com](http://www.devabroadcast.com).

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I'm selling between 150 and 200 cassette tapes that consist of old-time radio shows, sports shows, some local New York radio talk shows, etc... Must take entire collection and the price is negotiable. Please call me for details and, my phone number is 925-284-5428.

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

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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 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.

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

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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 home-run 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.

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

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

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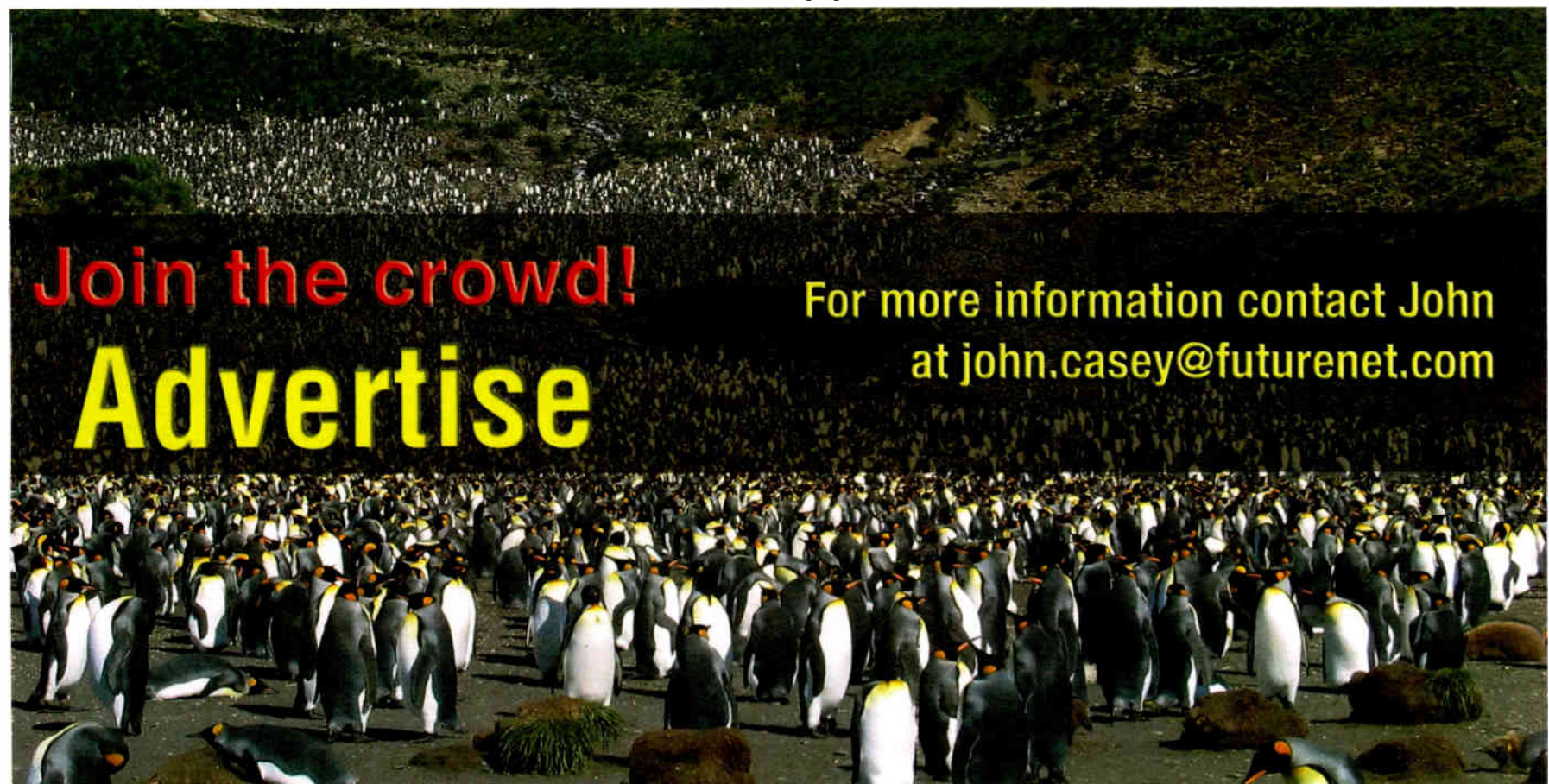
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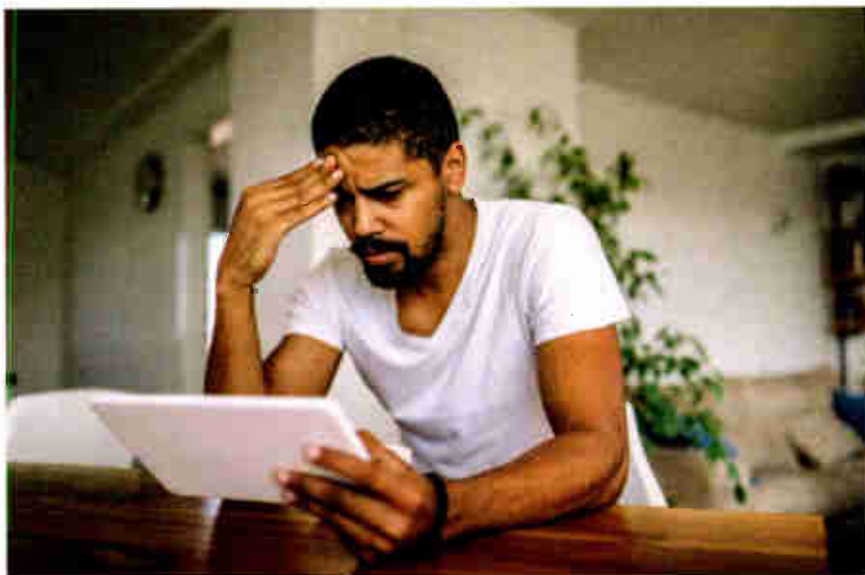
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# Community Broadcaster: Post-Mueller Report, It's Radio for the Save

Radio has been a necessary antidote to some of the mess we're offered on television and digital



Getty Images/FluxFactory

## COMMENTARY

BY ERNESTO AGUILAR

*The author is membership program director of the National Federation of Community Broadcasters. NFCB commentaries are featured regularly at [www.radioworld.com](http://www.radioworld.com).*

In the wake of the completion of Robert Mueller's report, much is being made of the outcome. More than 600 days and thousands of subpoenas later, we know little as of yet. That has not stopped the speculation.

One thing is clear: Radio in communities across America has been a necessary antidote to some of the mess we're offered on television and digital.

Although it is unlikely anti-Trump forces will get their wish and see President Trump impeached over alleged ties to Russian election meddling, they got much coverage of the story. Whether that coverage was a democratic imperative or just excessive remains to be seen. However, I do not believe anyone can argue it was especially smart or illuminating.

Reporting of the investigation was driven quite often by the 24-hour news cycle. Breathless cable channel pieces and roundtables from every angle squeezed the last ounce of drama, day and night. One network even logged

every single day the public awaited the report's completion, including graphics and dour voiceover on it being Day 400, or what have you. The apex of the frenzy may have been in January, when BuzzFeed doubled down on a story by a journalist accused of past plagiarism and shoddy reporting, in which Mueller's office took the extraordinary step of labeling false.

Seven in 10 Americans say they have news fatigue. Is there any wonder why?

As a former newspaper and radio journalist, I pondered the stories that were missed by the focus on one important, but heavily covered, story. Rather than scold the press for not putting more resources into this-story or that-story, though, I wondered how many journalists spent more time on Mueller reads than going into rural communities and communities of color to share the news we rarely hear. Awaiting and reacting to awaiting the Mueller report added up to hours and hours of news each day for a single story. And while television and digital media is a game of ad impressions, where Mueller stories generate clicks but human trafficking or the epidemic of intimate partner violence don't, omitting that reality and dressing up the focus to, frankly, "Because Trump," felt obscenely hollow.

With the findings done and no further criminal charges or other related activity on the horizon, today you do not need to look far to encounter vari-

ous news outlets and journalists defending this sort of reporting. Simply do a search for "news coverage mueller" and you'll be treated to a plethora of pundits defending the press. Yet, to quote the famous philosopher Jay-Z, men lie and women lie, but numbers don't. Television is down in audience. So is digital. Do you know what isn't?

Radio.

Chris Stigall argues conservative talk radio has been a corrective to liberal news coverage. While he's off — Pew is among many organizations to

something different.

Local radio offers connection to communities and greater context when Americans feel there's misinformation elsewhere. At a station like Colorado's KVNF, the award-winning Local Motion presents stories that reflect a community's diversity of views. Meanwhile, liberal radio talk show hosts like Thom Hartmann are the progressive counterparts of those Stigall champions. Like conservative talkers, such hosts seem unconvinced commercial media is getting the story right, and seek to go farther.

The result of all these fascinating radio departures is a more fully informed public, one that wants more nuance to its news. Radio has provided such richness for generations. Today is

Television is down in audience. So is digital. Do you know what isn't? Radio.

note the nation is skewing more politically liberal in the last 40 years, making the conservative Silent Majority implication a bit suspect — news fatigue and distrust of media are real. These facts are assuredly why there is such disintermediation today; new content providers and outlets are popping up every moment as audiences want a fresh perspective on an issue. When CNN's 14 thumbnail images screaming at each other and Fox News' talking heads feel tiresome, most people crave

a day we only reaffirm that commitment by demonstrating that appealing to minds over clicks makes and keeps us relevant for years to come.

To be clear, my media criticism is more about the model. Furthermore, it is based in a hope for renewed attention on public and community media, which provides an important context to the news. It's a context from which we can all benefit.

*Comment on this or any story. Write to [radioworld@futurenet.com](mailto:radioworld@futurenet.com).*

## READER'S FORUM

### HUGHES APPRECIATION

Thank you for writing about Cathy Hughes in the March 13 issue ("For Cathy Hughes, Information Is Power"), and I thank the NAB for inducting her into the Broadcasting Hall of Fame.

I am a female radio station owner, and I enjoyed the story and details about her tenacity and hard work so much.

Linda Hamlin Russin  
Owner  
Island 106.9 FM  
Key West, Fla.



**READER'S FORUM**

Mark Persons with the Dumont Telecruiser

**KBTV MEMORIES**

I was subtly surprised by a photo in the Feb. 1 issue in the article by Mark Persons, "Take a Step Back in Time in Kilgore, Texas."

It showed a very impressive Dumont Telecruiser bearing the call sign KBTV (KBTV Denver eventually became today's KUSA).

In my earlier days, late 1969 to 1970, I worked in engineering with the earlier call-signed KBTV Channel 9 television station in Denver, owned by Mullins Broadcasting. We never had such a nice remote vehicle.

Actually, we had an old truck that had been picked up and driven all the way from Washington, D.C., by our chief engineer shortly before I joined on with the station. Rumor had it that the vehicle had previously served as a milk or bread van, and it seemed to bear the traces of such a history.

When heading to a remote fully loaded with a complement of both vacuum tube and solid-state equipment, I will always remember how that old truck would float along, bearing the stress of much more weight than it was designed to carry. When stopping at an intersection, the truck would continue to rock back and forth until the springs and shock absorbers would finally get their act together and settle things down. Then it was off with a chug towards the next destination!

*Gregory Muir  
Principal Engineer  
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**ANOTHER PERSPECTIVE ON PRE-EMPHASIS**

I have just gone through Larry Langford's article, "Time for a New Curve" (Jan. 14, <https://tinyurl.com/ycmbok26>), and it is interesting. I have come across these issues with 75  $\mu$ S pre-emphasis, with experiments with my transmitter designs based around FPGA signal processing.

I have changed to using a 50  $\mu$ S pre-emphasis with 12.5 kHz cutoff frequency, and this has made a big difference with wideband AM stereo receivers. I plan to write a detailed article about how this all works. There is renewed interest in the rich sound of AM stereo, due to modern compressed audio that is used with HD Radio.

Doing my research into Dolby noise-reduction systems and how this could work with AM radio, I noticed that noise reduction needed extra headroom on tape to work (lower recording level). As for the NRSC curve being at 75  $\mu$ S, having the same issue where you need greater headroom to fit in the higher audio frequencies, making the transmission sound softer compared to other radio stations.

To minimize this I have gone with a 50  $\mu$ S pre-emphasis to provide room for a higher cutoff frequency of 12.5 kHz over what was used with 10 kHz. On an AMAX receiver there was next to no difference between 50 and 75  $\mu$ S, due to IF filtering having the biggest impact above 5 kHz.

From reading Mr. Langford's article, what I think is going on is that the pre-emphasis curve is acting more like group delay corrector for the narrow-band AM receivers, and this is where the brighter sound comes from. The test I would do is to compare this response on wideband AM stereo receiver, but I would not expect it to sound that good; it would have far too much in the higher audio frequencies.

As for the NRSC curve, I do not think much of it. I would like to go with the NRSC version B curve using a 50  $\mu$ S pre-emphasis for AM stereo transmissions [and] for mono and narrow-band IF stages, a standard type of group delay corrector configuration to address Mr. Langford's findings.

*Grant Taylor*

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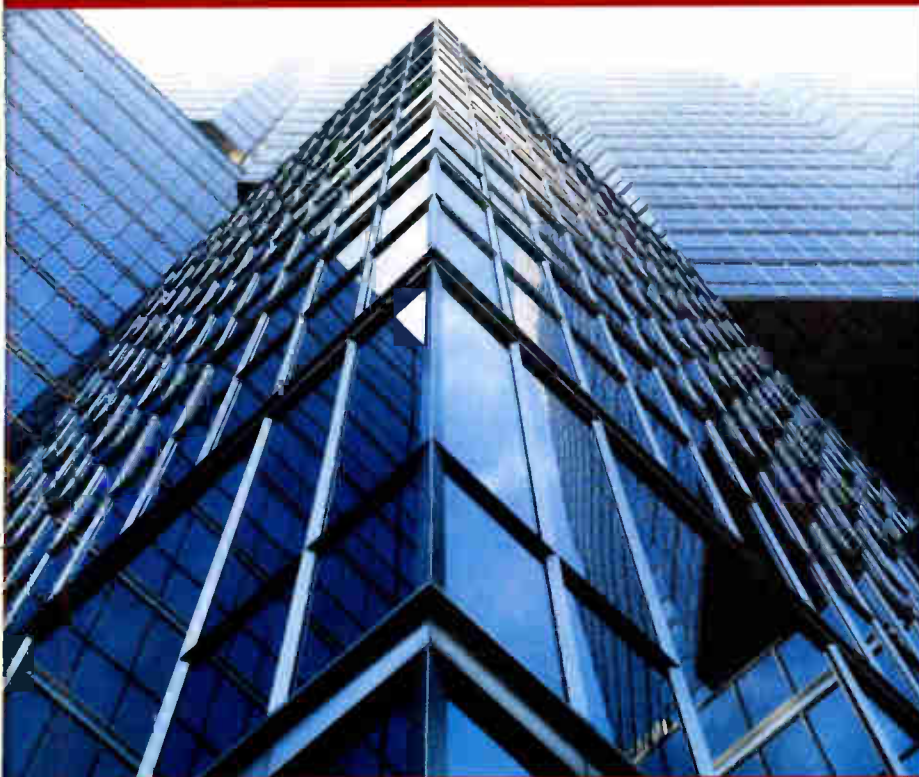
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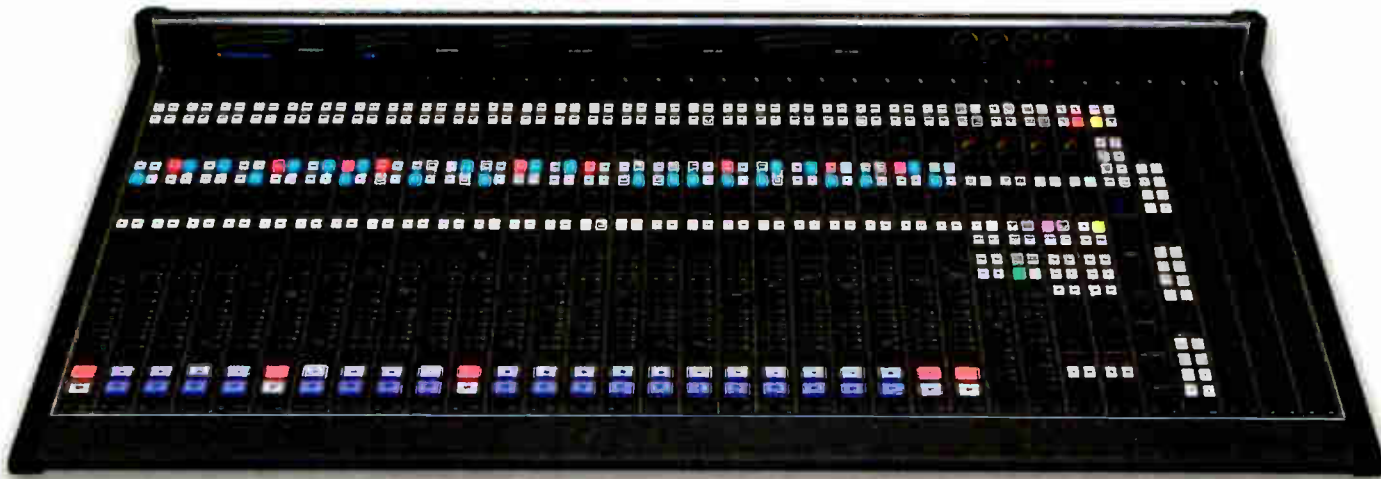
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