RADIOWORLD

Technology & news for radio decision makers

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Dashboard tactitional

Fred Jacobs on making the most of that precious automotive real estate.

Best of Show at IBC

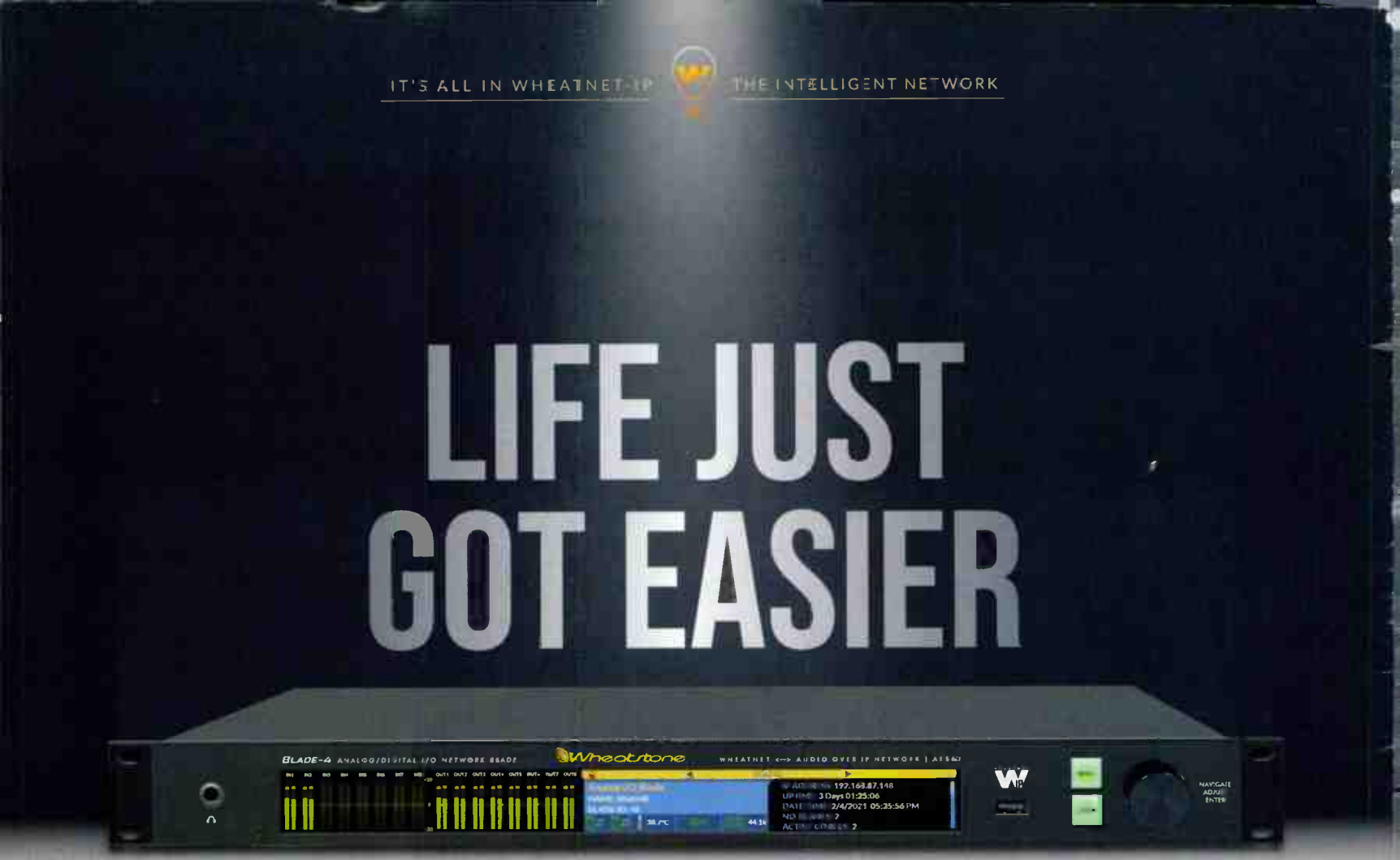
Find out who took home the hardware.

Audio fundamentals

Mark Persons on what to know about three-terminal voltage regulators.

What next at the FCC?

With all five seats now filled again, which issues should we expect the chairwoman to push?



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It's all about the data

Tremendous insights are available if you know where to look

Paul McLane
Editor in Chief

Consultant Mike McVay says data and analytics tools for radio managers are crucial in today's media environment.

"The competition is greater today than at any time prior, and it will only become greater," he told me.

We spoke as I was preparing the Radio World ebook "Actionable Business Intelligence," which you can read for free online.

"Radio feels ubiquitous because it's available on a phone, on a smart speaker, on a laptop, in your car and over the air," he continued.

"But it doesn't mean that we're only competing with radio. And it's not just streaming that radio competes with. I can pick up Netflix on my phone. I have YouTube, which gives me everything I want and it gives me the NFL, with pictures.

"So you have to know where your audience is, what they do with their lives and how much discretionary time they have to listen to what it is you have to present to them."

There are countless sources of data-rich information available to radio managers. In the ebook I discuss some of the most important ones like the Edison Research "Share of Ear" report, Media Monitors, Triton Digital streaming data, Scarborough from Nielsen and Miller Kaplan.

Find out what I learned from experts like McVay, Pierre Bouvard of Cumulus/Westwood One and Seth Resler of Jacobs Media, as well as Lee Perryman of RadioAlabama, who talked to me specifically about how he uses the broadcast dashboard of DTS AutoStage. Find the ebook at *http://radioworld.com/ebooks.*

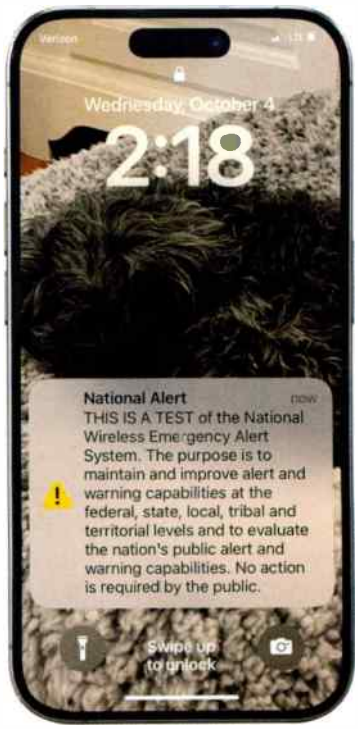
THIS ISSUE

NEWS

FEATURES

OPINION

FCC Tweaks WEA and Explores Alternative Delivery



Chairwoman Jessica Rosenworcel has announced an initiative intended to help the public receive Wireless Emergency Alerts when cell towers are disabled during disasters.

"The commission is seeking partners to test the viability of delivering Wireless Emergency Alerts through the use of complementary technologies that can help fill in wireless coverage gaps, such as satellite service," her office announced.

The notice reiterates that the loss of cell towers creates "dead spots" in phone coverage, which could deprive people from receiving lifesaving warnings. Just one example: In Hawaii, the communities of Kapalua, Napili-Honokowai, Kaanapali, Lahaina, Launiupoko and Olowalu are served by 21 cell sites, but on Aug. 12 during the recent wildfires, all 21 were out of service.

The FCC expects to hear proposals for satellite technologies; high-altitude platform systems that use balloons or drones; and technologies that enable device-to-device communication. It wants to begin testing next spring.

The accompanying image shows the receipt of the recent national WEA test on an iPhone.

Also in October, the commission unanimously adopted rules to improve Wireless Emergency Alerts by making the messages available in additional languages including American Sign Language.

At present, WEA messages are available only in English or Spanish. Now wireless providers that participate in WEA must support messages in the 13 most commonly spoken languages in the U.S., as well as English and ASL.

Providers will enable devices to display message templates that will be pre-installed and stored on the device.

The order also requires participating wireless providers to support the inclusion of maps in WEA messages that show the recipient's location relative to where the emergency is occurring.

The order also establishes a database to provide the public with information on WEA availability.

And it enables alerting authorities to send two local WEA tests per year that the public receives by default.

Writer

Randy J. Stine

Radio World's lead news contributor interviewed Commissioner Nathan Simington in the Jan. 19 issue.

Rosenworcel ready to hit fast-forward

Beyond Title II and net neutrality, which issues will she prioritize now?

Chairwoman Jessica Rosenworcel appears poised to push certain priorities now that the FCC has a Democratic majority. But will the protracted standstill on a number of broadcast matters come to an end?

Right
FCC Chairwoman Jessica Rosenworcel used an appearance at the National Press Club to propose the return of a net neutrality policy.

In October the commission started a process to reestablish the FCC's oversight over broadband and restore nationwide net neutrality rules. But those who watch the commission closely have many other issues of interest.

National Association of Broadcasters President/CEO Curtis LeGeyt says the FCC must address critical matters affecting broadcasters. He laid out the association's hopes in a blog post.

"First, broadcasters desperately need the FCC to modernize broadcast ownership rules dating back decades," he wrote. They need more scale to compete, and that requires further deregulation in his view.

"In today's world we face competition from pay-TV operators, satellite radio, streaming services and digital platforms operated by tech giants with market caps in the hundreds of billions (if not trillions) of dollars. These competitors have no obligations or incentive to provide the local news, weather, sports, public affairs and emergency information that broadcasters provide for free to the public every day," LeGeyt said.

"Yet broadcasters alone operate under regulatory constraints that incorrectly presume we compete only with one another for audience and advertising dollars."

The NAB took the FCC to court last spring over its failure to complete its 2018 quadrennial review of media ownership rules, accusing it of "a perpetual slow roll." Among other things the NAB favors abolishing caps on AM station ownership and raising those for FM. In September a federal appeals court gave the FCC 90 days to complete the review or justify why the NAB petition should not be granted.

LeGeyt also hopes the FCC will provide certainty that its merger review process will produce up-or-down votes in a timely fashion. "Unfortunately, opaque and shifting guidelines about broadcaster transactions can deter potential buyers from investing in new and established entrants."

Meanwhile the Multicultural Media, Telecom & Internet Council cheered Gomez's Senate confirmation. The organization hopes for action on the push by GeoBroadcast Solutions to allow stations to use FM boosters for geotargeting of very localized programming for a few minutes per hour. MMTC is in favor but the ZoneCasting concept has been opposed by some broadcast companies.

The FCC also may eliminate Channel 6 distance separation rules for noncommercial FMs, LPFMs and FM translators at the lower end of the FM band, according to Washington attorneys. Previously the commission

> **"It could be déjà vu all over again, to quote Yogi Berra, with rules adopted during one administration being reversed in the next administration."**

Right With Commissioner Anna Gomez sworn in, the FCC has its first Democratic majority since Barack Obama left office.

tentatively ruled that this would be feasible once the digital TV conversion ended.

David Oxenford, who practices in legal and regulatory affairs at Wilkinson Barker Knauer, also recently blogged about the FCC's further consideration of expanded Emergency Alert System certification and additional public file obligations.

Pragmatic effect

Melodie Virtue, principal with Foster Garvey PC, said, "Without a fifth Democratic commissioner, the chair likely advanced items only where she had consensus. That meant that all of the potentially controversial items have been on hold," including the contentious reinstatement of Title II broadband authority.

Does a Democratic majority mean the commission will produce a left-leaning outcome on ownership rules?

"It's hard to say where they will come down on the competition vs. diversity debate given the changes in the media marketplace," Virtue said.

"It could be déjà vu all over again, to quote Yogi Berra, with rules adopted during one administration being reversed in the next administration."

A long-pending issue surrounding EEO demographic reporting will likely be under discussion, Virtue said.

"It could mean additional reporting requirements by bringing back the old grid form 395-B on the makeup of a station's workface by gender, race, ethnicity and job category. The form has been suspended for 20 years, but the report may come back. And the question raised back then was whether those reports should be made public."

The practice was put on hold in 2004 when agency lawyers raised constitutionality concerns for quizzing broadcasters about the race and gender of their workers.

Scott Flick, partner at Pillsbury Winthrop Shaw Pittman LLP, said, "The recent history has been that the Republicans have generally focused on how to make broadcasting a more viable competitor to the Googles and Facebooks of the world, whereas Democratic administrations have tended to view broadcasting as a walled garden in which broadcasters compete only among themselves and therefore are largely immune to other market pressures."

That difference in philosophy often leads Democratic administrations to impose more operating restrictions and reporting expenses on broadcasters, resulting in a more densely regulated environment, Flick said. It can show up in the form of more restrictive ownership rules, annual employment reports, required cybersecurity plans and more enforcement actions.

"Though people tend to focus on the big policy matters, the more pragmatic effect of having five commissioners is likely to be a flurry of significant fines. This is because the FCC's rules limit the maximum fine that may be issued by, for example, the Media Bureau to $20,000," he said.

"In cases where there was a 2–2 split among the commissioners on whether a particular fine was appropriate, having a fifth commissioner now opens the door for fines much larger than $20,000. While you would like to think it would be a non-partisan question, that is often not the case."

But clearly Rosenworcel now has a greater ability to flex her policy muscles and lead a majority vote to push through initiatives.

Frank Montero, co-managing partner at Fletcher, Heald & Hildreth, said, "I agree that it's entirely possible that she was shelving some of those initiatives because she wanted to wait until she had the three votes to pass them over the two Republican dissenting votes. But I think also important is that this now provides the chairwoman with the opportunity to craft and implement a more lasting legacy for herself through the passage of more-impactful regulatory changes."

> **"Though people tend to focus on the big policy matters, the more pragmatic effect of having five commissioners is likely to be a flurry of significant fines."**

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> Dan Israel, Executive Producer & Co-host, Chiefs Radio Network

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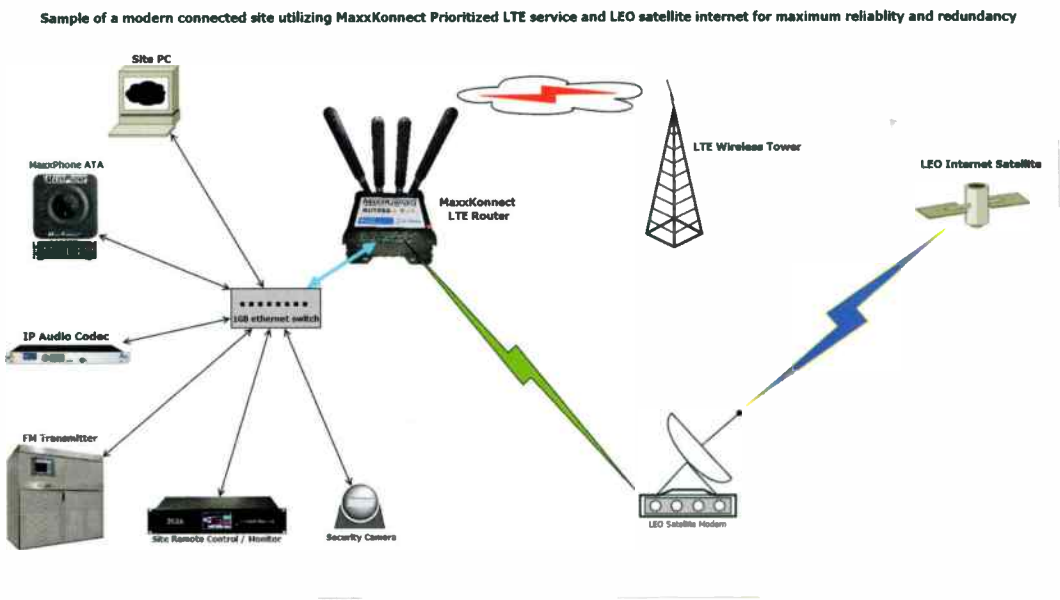
Josh Bohn preaches the religion of backups

You might think you have full redundancy, but take a closer look

Josh Bohn is president and CEO of The MaxxKonnect Group. One of its products is MaxxKonnect Wireless, a prioritized, high-speed LTE internet service for broadcast applications.

This is an excerpt of our interview with him in "STLs in the 21st Century," a free ebook at *radioworld.com/ebooks*.



Above
Bohn preaches redundancy. This graphic is an example of a modern connected site using MaxxKonnect prioritized LTE service and LEO satellite internet. Other options might include 950 MHz point-to-point or a wireline service.

Do you have STL words of wisdom?

Bohn: I'm a huge advocate of backups. I got a call an hour ago from a station in Tennessee, a community college that's talking to us about moving to a tower about 10 miles away. I asked what they use now for STL, and he said it's point-to-point 950 microwave, analog composite. But the electric co-op that's building the new tower is putting in fiber in so they're going to go on that.

But what are they going to do when the North American Fiber-Seeking Backhoe comes and takes them off the air for two days? If you're going to do fiber with point-to-point IP, even over the internet, your codec will have the ability to fail over. So whether we put a MaxxKonnect cellular modem or point-to-point IP radios, or if we can get a 950 shot we can relicense their current STL and just put in a composite switch, you've got to have a backup.

People hear "fiber" and think all their problems are solved. Yes, fiber is super reliable — until it's not. If it's buried, you have to worry about "backhoe fade," though that's maybe the only major thing. But if it's aerial fiber? A drunk driver, an ice storm, a windstorm, almost anything external can destroy it. If a pole falls, it's going to shred whatever's connected to it, which includes your fiber. And that's a significant amount of downtime.

We have a client site with MaxxKonnect. They had fiber running into their building. But a housing development is going up across the road, and a plumbing crew came in. They didn't call 811 first, and they cut through the entire bundle. That station had a T1 backup, but the fiber and the T1 run through the same conduit. So in one scoop, all connectivity for that site went down. They were off the air, in a big market in Ohio.

But their chief was smart, he also had Comrex BRIC-Links hanging on MaxxKonnect. So they were only down for the amount of time it took him to drive out, unplug the audio out of the out of the T1 codec, move it over and plug it into the output of those BRIC-Links, and boom, they were back up.

They ran on that for four days and ultimately ended up ditching the T1 and just switching over and using MaxxKonnect and BRIC-Links as their backup.

So figure out two ways to get program audio there. I don't care if you string a piece of wire a quarter mile down the road (though if you do that, put transformers on each end!).

If you're doing IP, consider your studio too. You may have three backup connections at the tower site, you may have an LTE modem, DSL and an internet fiber connection, but you have only 10 Gig fiber at the studio. Why is fiber at the studio good enough while fiber at the transmitter needs backups? People get a false sense of security because the studios are in a town and they think the infrastructure is more stable there. But there's just as much of a chance for your IP delivery system to get knocked out in an urbanized area than out the transmitter.

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John Bisset
CPBE
The author is in his 33rd year of writing Workbench. He handles western U.S. radio sales for the Telos Alliance and is a past recipient of the SBE's Educator of the Year Award.

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

Above
Marcos O'Roarke in one of his YouTube videos. Here he's showing a label maker, which as Workbench readers know can be very helpful in engineering work.

From SoCal to Denver, his videos educate

Also, an inexpensive way to decode for EAS reception

Marcos O'Roarke, senior engineer at Linkup Communications in Denver, is also the "Southern California Broadcast Engineer," posting neat engineering videos on YouTube.

With the holidays right around the corner, Marcos did a brief video describing some of the tools that make his life easier. It might give you some gift-giving ideas. At YouTube, search for "The Essential Tools Every Engineer Needs."

Marcos has a good number of non-engineers viewing, too. His adventures around broadcast facilities offer a peek behind the curtain for PDs and GMs who wonder, "Just what does that engineer do?"

Kevin gives us the Raspberry

Kevin Trueblood is president of KTrue Media Services, which provides technical solutions for broadcast, digital and IT needs and is based in Fort Myers, Fla. His website is *www.ktruemediaservices.com*. He does his contract work in addition to his full-time job as associate general manager for WGCU Public Media.

Kevin was pleased that we mentioned the SSH No Ports service recently. He lets us know that a similar service is available — for free — from Cloudflare, called reverse proxy.

Kevin has one at a client's transmitter site; it lets him access the local security cameras and transmitter remote control. Much like SSH No Ports, traffic is managed through an inexpensive Raspberry Pi. Kevin can access the devices through any web browser. No ports are open on the firewall and no VPN is required.

It is a useful and inexpensive solution that can secure your devices while making them accessible.

More Saigon memories

Burt Fisher saw the photos we've published showing equipment on display at Independence Palace in Ho Chi Minh City, aka Saigon.

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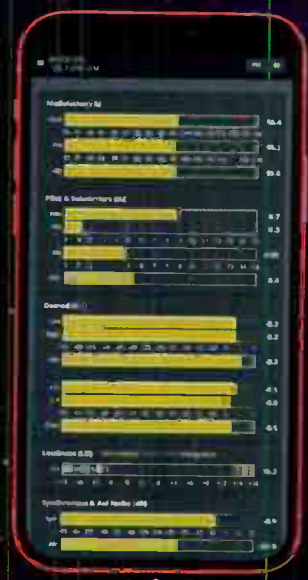

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Bert himself visited in 2012 and shares two more photos from that visit, and we share them here. If you've come across interesting broadcast equipment on your travels, take pix and send them my way.

Inexpensive EAS receiver solution

Ron Schacht writes in to note that since Dayton has gone away, people are having issues finding receivers suitable to decode AM or FM stations for EAS reception.

You can buy high-quality tuners but that's serious overkill for this application. You can solder wires across a portable radio or table radio, if you can find one, but there is a problem to this approach too. If you are at a distance from your assigned monitor station, you cannot put an external antenna on most consumer radios.

Ron's answer is to pick up a couple of really cheap automobile radios.

Discount stores and online sources like Amazon sell plain ol' AM/FM radios for $30 or less. They have pretty good sensitivity on both bands and provide an external antenna connection. The ones Ron has found have been rock-solid for staying on frequency.

Ron has mounted a couple on a rack panel and installed it in his rack out of sight. The audio required to drive an EAS decoder is so low that the radio volume is kept down to the point where a 500 mA 12 volt wall wart will run the radio. Make sure you get a regulated wall wart just for adequate filtering.

Now, Ron cautions that some radios won't allow you to ground one of the speaker wires. In such a case, you can use a 70 volt speaker transformer between the radio and the EAS input. You might also need to put a resistive pad between the 70 volt line out and the EAS decoder in. On radios where one side of the speaker can be grounded, you can run the audio right into the EAS box.

Many radios now have two separate power feeds; one powers the radio and the other powers the frequency memory. Ron has used blocking diodes on the memory wire to feed the same 12 volts that runs the radio to the memory. He then adds a 9 volt battery to the memory line, so if the AC power fails, the battery will hold the frequency in the memory.

This solution has saved some money in the engineering budget and provided reliable EAS reception.

Above
A Gates transmitter in the basement of the Saigon Palace.

Right
More transmission gear at the palace.

Left
3M 1267 Ultra-Conductive Embossed Foil is an example of the tapes that you can find on the Grainger website in various lengths and widths.

Sticky solution to shielding

Our engineering colleague Dan Slentz was asked by a friend to help him find conductive tape. Dan suggested *www.grainger.com*. Search for "copper tape" or "conducting electrical tape" and you will find rolls as well as squares or strips of the material, which can be helpful when shielding.

Best of Show at IBC

We are pleased to feature recipients of the Radio World Best of Show Award at the 2024 IBC Show in Amsterdam. The awards recognize excellent broadcast products and solutions on display at the show. Our sister Future brands TVBEurope, TV Tech and Installation also presented awards.

Broadcast Bionics
VirtualRack

VirtualRack is a hardware appliance and browser interface that helps engineers deploy containerized broadcast products rapidly and confidently, without needing advanced IT skills. Once a VirtualRack appliance is installed on your network, products can be selected from the built-in library without using a line of code.
The library includes a number of products from Telos Alliance, Sound4, 2wcom, Xperi and Wide Orbit.
Dan McQuillen is with Radio World's Raffaella Calabrese.

Xperi
DTS AutoStage Broadcaster Portal

The Broadcaster Portal of the DTS AutoStage platform provides important new data points to radio managers to help them make better decisions and compete in the world of "big data." Tools include listener "heat maps," daypart insights and station coverage as revealed by vehicle location trends.
Joe D'Angelo, right, accepted from RW's John Casey.

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Radio World's Carmel King makes the presentation to Gary Luhrman.

GatesAir
Intraplex IP Link 100n with MicroMPX

This hardware codec is the next generation of AoIP from GatesAir. It is a full-duplex single stereo-channel codec for simultaneous reception and transmission of audio over IP streams in STL, STS and other networking applications for radio and streaming services.

Kevin Haider accepts the award from Carmel King.

Omnia
Forza

Omnia is taking a new approach to multiband audio processing with Forza software, a stereo processor optimized for HD, DAB and streaming audio applications. It promises to "breathe new life into traditional five-band processor designs," for a consistent and polished audio signature without sounding overly processed.

Max Pandini and Frank Foti enjoy an Amsterdam moment.

NeoGroupe
NeoSIP

NeoGroupe took its NeoScreener product and added the capability to handle phone lines and codecs, making it an all-in-one software solution for managing calls and contributions at once. NeoSIP is a software-based telephony system to replace your hybrid and codec setups, allowing you to manage all contributions in one interface.

With Raffaella Calabrese are Philippe Halin, Damien Grelet and Raphaël Cote.

Jutel
RadioMan Clipper

This tool for journalists is a web audio production platform that supports mobile app environments, virtual browser-based production and media asset management in the cloud. It is intended to replace separate tools for recording, mobile audio editing, metadata generation, audio transfer, remote media asset management and multitrack audio editing.

Raffaella presents to Olli-Pekka Lukkarinen and Juuso Taipale.

Best of Show

RFE Broadcast
HPA3000 FM Amplifier

From RFE in Italy comes the HPA3000, a 3.3 kW FM amplifier that occupies only four rack units and features overall efficiency of more than 75%. It consists of three 1.1 kW RF modules and three power supplies, as well as a large LCD color display, touch panel and remote control from the web.
Sara De Sensi, Elena Ditadi and Michele Sacco are with Raffaella Calabrese.

Telos Alliance
Z/IPStream X/20 and R/20

Z/IPStream X/20 is an all-in-one streaming audio software encoding and processing platform for Windows PCs and servers, while Z/IPStream R/20 is a dedicated 1RU streaming and processing hardware appliance with AES/EBU, Livewire and AES67 I/O. The next generation of streaming tools from Telos.
Torsten Berselis, Scott Stiefel and Marty Sacks are shown.

Wheatstone
Layers Stream on AWS

Wheatstone offered a demo of its new Layers Stream software running on Amazon Web Services. Layers Stream features stream provisioning, audio processing and metadata software running on an on-prem server or public cloud, with easy setup and control through a browser interface. Layers is part of the WheatNet IP audio network environment.
In the booth are Danny Teunissen, Jay Tyler and Darrin Paley.

Telos Alliance
Axia Altus

"What happens," asks Telos, "when you move the console out of the studio into a virtualized environment? A world of new possibilities emerges." The Axia Altus is a software-based audio mixer that brings the power and features of a traditional console to desktop and laptop computers, tablets and smartphones running a web browser.
Derek Pilkington and Peter Passian accept for Telos.

Telsat
Broadcast Smart Platform

This is a complete portable broadcasting package deployed in a single small, mast-mounted weatherproof enclosure. It offers flexible, customizable architecture to meet regulations in various countries for radio or TV. It can be powered with solar or wind energy and can be used to cover large critical areas with a cell-based network model using low-power transmitters.
Paolo Marantonio is with Raffaella.

WorldCast Systems
Audemat MC6

The Audemat MC6 is a comprehensive and versatile test and measurement platform for DAB and FM broadcast applications. It builds on the foundation of the Audemat FM MC5 for FM measurement and the company's DAB Probe for QoS/QoE monitoring.
Christophe Poulain is with Raff in the WorldCast booth.

What to know about three-terminal voltage regulators

They've been a building block of nearly all electronic circuits since the 1970s

Writer

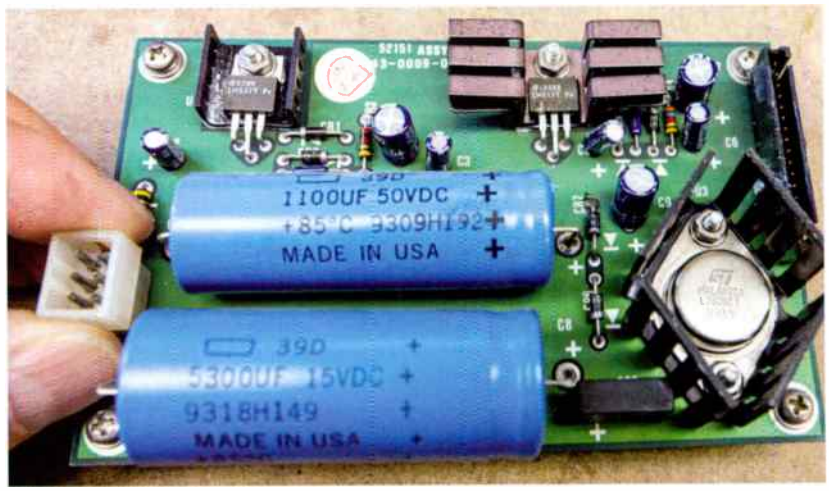
Mark Persons

WØMH, CPBE, CBNT, AMD

The author is an SBE Life Member, now retired after more than 60 years in broadcast engineering. He started turning the dials of transmitters at age 11 and stays active by mentoring. His website is *www.mwpersons.com*.

Whether you're aware of it or not, three-terminal voltage regulators automatically adjust power supply voltages in everything from audio consoles to distribution amplifiers to audio processing to STLs to FM exciters to transmitters and to modulation monitors. A circuit designer's first choice is a single regulator device that can replace a circuit card full of parts that were typical in past designs.

It is true that broadcasting has entered a digital world. Voltage regulators designed into equipment today sometimes use switching technology. They are a bit more complicated in the process of becoming more efficient, but most of the gear in use today employs traditional three-terminal regulators.



Top
Fig. 1: Three examples of voltage regulators.

Bottom
Fig. 2: Power supply board with three regulators.

What are they?

Three-terminal voltage regulators physically look like a power transistor and act as an automatic variable resistor to bring a supply voltage down to a desired voltage for circuits they power.

Typically, they have 17 transistors in a small package that are a simple answer to get a reliable fixed voltage from power sources that are subject to power bumps, sags and power supply ripple. They might take 24 volts in and regulate it down to 15 volts. That output voltage stays constant with a tight tolerance so the important circuits in electronic devices are not hampered by power fluctuations.

They are analog "series" devices that get warm, as any resistor would, while reducing voltage to a desired value. Ohm's law: 14 volts in and 5 volts out is a 9 volt drop. If the circuit draws 0.5 amperes, that results in 4.5 watts of heat; hence the regulator needs to be connected to a heat sink.

Fig. 1 shows three regulators, each with three connections, hence the name three-terminal regulators. The ones in larger cases can dissipate more heat. There are other variants, but the one on the left is the most common.

Important information is found in the part numbers. LM340T5 is also known as a 7805, which is a five-volt positive voltage regulator. A 7812 is 12 volts and a 7912 is a 12-volt regulator for negative power supplies. Some are adjustable with a few external components. (Stick with me as there are some important nuggets of information that could make your life easier.)

Fig. 2 is a power supply card in a 1990s vintage Continental 802B FM Exciter. As you can see, there are three regulators. One supplies +22 VDC, another -22 VDC and the larger one provides +5 VDC. They are everywhere;

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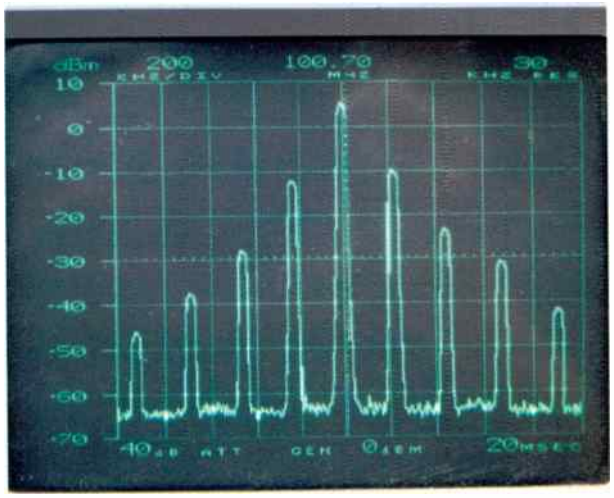
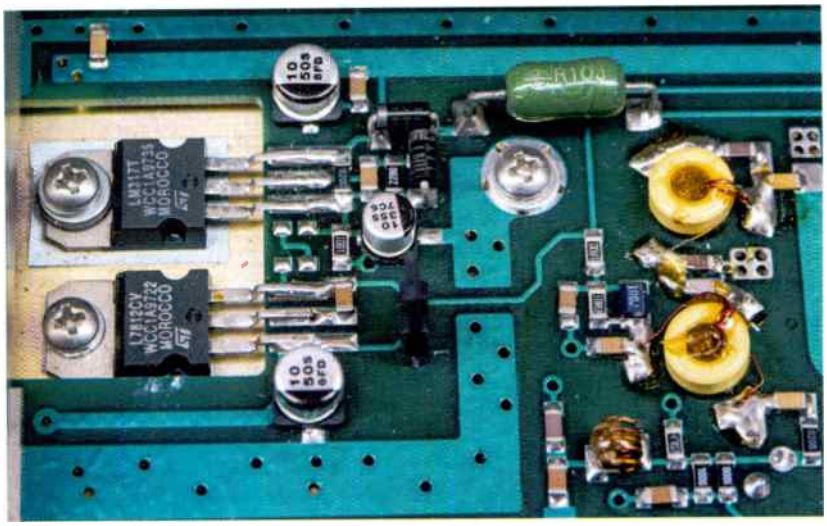
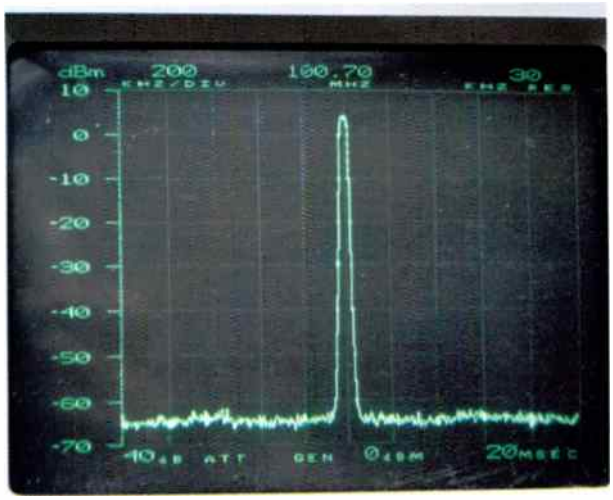




> **Replacing one small capacitor saved a $5,000 expense for a new FM exciter, not to mention the hassle of recycling.**



Above left
Fig. 3: Before troubleshooting.

Above right
Fig. 4: RF amplifier board with two regulators.

Right
Fig. 5: Success!

this exciter has no fewer than eight of these inexpensive, hard-working circuits.

Things can go wrong

Three-terminal voltage regulators are high-gain devices to keep up with fluctuating input voltages and circuit loads. With high gain comes the possibility of breaking into oscillation and making their own high -requency alternating current. They will sometimes start oscillating at a couple hundred kilohertz. The regulator will continue to put out its rated voltage, but with an additional 200 kHz or so of unwanted garbage. An oscilloscope will show that. Ouch, the circuits they feed don't like that. An audio circuit might have a lot of hiss or distortion in it. A green light glowing on the power supply does not indicate all is well. It just shows that voltage is present, regardless of its purity, or lack thereof.

Fig. 3 is a spectrum analyzer view of the RF output of the same Continental exciter, which came out of a Continental 816 FM Transmitter. Yes, it is on the intended 100.7 MHz, but it is also on FM frequencies at about 210 kHz intervals up and down the dial. Now we are taking interference to other stations!

This problem turned out to be a regulator on the exciter's RF power amplifier board. All was well in the exciter until the RF got to that point. Then the signal was "modulated" by 210 kHz from a regulator gone wild. The culprit turned out to be a 10 mfd electrolytic capacitor that failed by going open. Electrolytic capacitors have a limited lifespan, especially when they are in a hot environment and as years go by.

Fig. 4 shows capacitors associated with two regulators in that module. Fig. 5 shows the result when just that one capacitor was replaced. The unwanted signal spurs were gone and just the intended signal on 100.7 MHz came through. In a case like this, I recommend you replace ALL the electrolytic capacitors in that module as others are likely to fail soon.

What you are seeing was the exciter running into a dummy load. In a transmitter environment, the troubled exciter was feeding a broadband solid-state 400-watt RF amplifier. The signal coming out of the amplifier was likely very similar to what we saw in Fig. 3 because there is no

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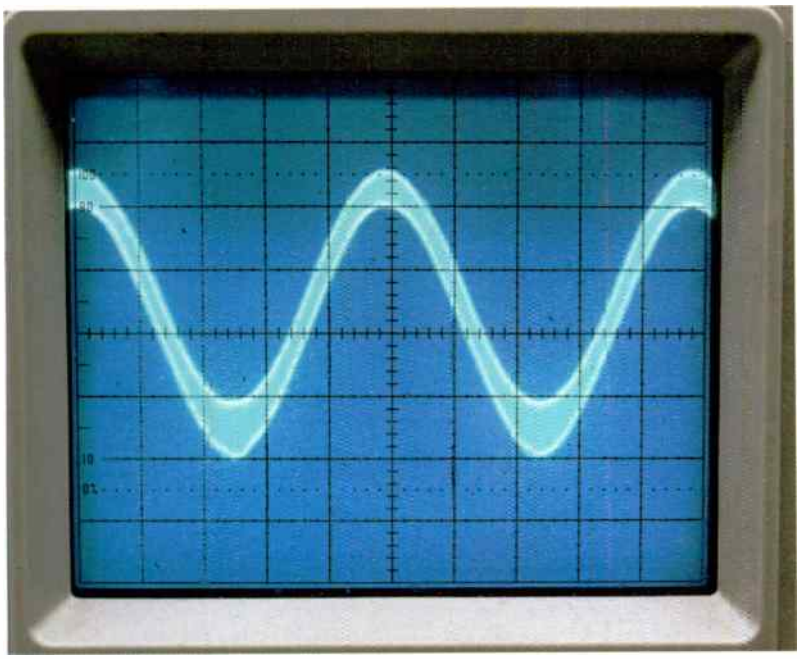
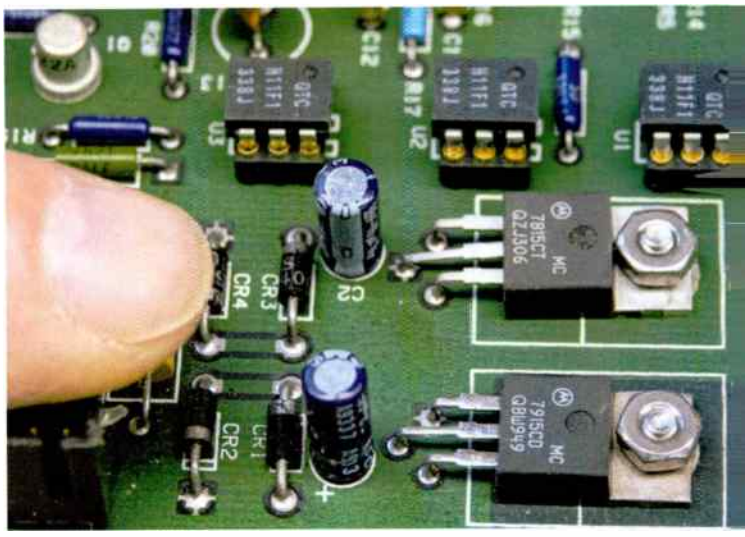


Left
Fig. 6: A 1 kHz sine wave with oscillation riding on top.



Right
Fig. 7: Two three-terminal voltage regulators with their capacitors.

bandwidth limiting. The transmitter's tube input tuning network, along with tube plate and loading network and then the antenna, likely limited how far up and down the dial the unwanted radiation went. For sure, the station was heard 210 and 420 kHz in both directions from the licensed frequency.

In this instance, the engineer reported the 400-watt RF amplifier metering showed higher than normal reflected power when it was feeding the final tube. He could not tune it out because the tube's input tuning was mostly allowing the licensed frequency through. Some of the +/- 210 kHz and +/- 420 kHz unwanted spurious signals were reflected back to the amplifier. A spectrum analyzer would have told the story immediately.

> **When building something from scratch, I prefer poly foil capacitors, which have a much lower equivalent series resistance, especially at frequencies above 50 kHz.**

But there's more

Fig. 6 shows an oscilloscope view of a 1 kHz sine wave tone going through the exciter and being demodulated by a radio. The tone was thick with unwanted 220 kHz riding on it. That's right, oscillation degrades station audio as well. The waveform became a pure, clean and thin sine wave after the capacitor was replaced.

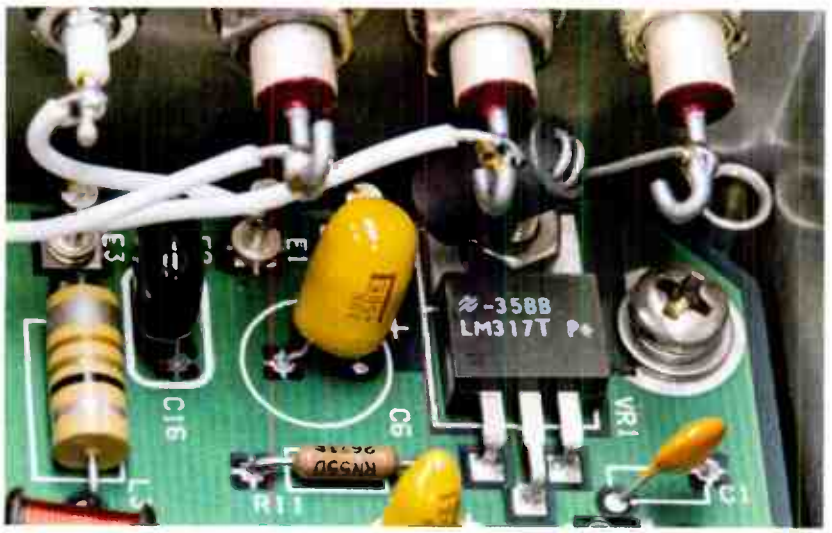
Capacitors

Fig. 7 shows another pair of regulators, with capacitors nearby, on the audio/automatic frequency control assembly of the exciter we are discussing. Circuit designers and manufacturers seem to like inexpensive electrolytic capacitors in regulator applications. They work way past the equipment warranty but fail 10 or so years down the road. Even the modulated oscillator has one, as seen in Fig. 8. They are everywhere!

When building something from scratch, I prefer poly foil capacitors, which have a much lower ESR (equivalent series resistance), especially at frequencies above 50 kHz. They last forever too. The value I choose for three-terminal regulators is usually 0.39 mfd and I've never had a problem. Those capacitors are small enough to mount directly to regulator leads in a point-to-point wiring scheme as shown in Fig. 9.

Learned

The lesson here was that replacing one small capacitor saved a $5,000 expense for a new FM



exciter, not to mention the hassle of recycling. This exciter will live for years to come.

Left
Fig. 8: Modulated oscillator regulator.

Right
Fig. 9: Poly capacitors on a regulator.

New regulators

More efficient switching regulators are showing up in recent equipment designs. More power can be handled in the same size component package, but they come with their own drawbacks. Unlike the linear/series regulators that we discussed, these chop up the incoming DC voltage and let the just right voltage out. Capacitors are needed to keep them clean so the outgoing DC power does not have noise riding on it to cause circuit problems.

In summary, be informed about the technology so you can do the best in your broadcast engineering job.

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

Adthos Posts AI News Demos

"Good afternoon, it's 4 o'clock and you're tuned into KAGY(AM). Here are your top headlines for today ..."

That's the opening audio clip of a demo page from software company Adthos, showing off what an AI tool for news radio applications can do.

"Adthos for News" is intended to let broadcasters produce content in multiple languages using synthetic voices and AI technology. It integrates with newsroom systems like Burli and NewsBoss.

"Broadcasters and publishers can create complete news bulletins, including quotes and clips, with multiple voices, music beds and idents in an instant," the company states.

"Weather, traffic and sports updates can be completely automated and localized for every possible location, with the ability for stations to write segments using their own format."

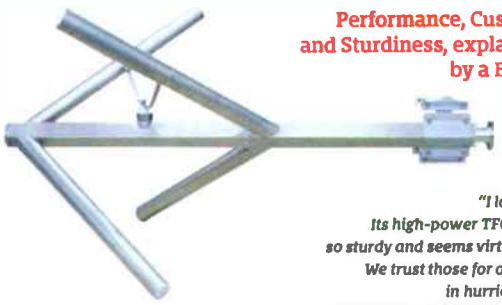
Adthos is a trademark of Wedel Software. CEO Raoul Wedel says the tool "can help to automate and streamline the creation of news content to not only increase cost efficiency but also allow them to scale and reach a wider audience."

Users can choose from one of the platform's voices or add their own host's voice to the library.

While AI-based tools have been showing up for applications across radio, the nature of news is such that companies have approached it cautiously.

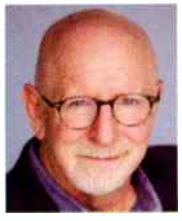
"While content for traffic news and sports is data driven and AI-generated, the obvious sensitivity around news content means that the creators have chosen to implement connections with trusted newsroom systems," Adthos stated in the announcement.

For information email *press@adthos.com*.



Above
A Beasley station deploys the dashboard for a good cause with a "text-to-donate" message and a QR code.

Writer



Fred Jacobs
Founder, Jacobs Media Strategies

A dashboard tactitional from Fred Jacobs

With dashboard metadata in the toolkit, radio's best days in the car may still be ahead

This commentary appeared on the blog of Jacobs Media Strategies. Read the author's posts at https://jacobsmedia.com/.

Programmers are either going to love me or curse me for today's post. For everyone else in and out around the world of broadcast radio, I hope it's an eye-opener about how radio's relationship to the car in general, and the infotainment screen in particular, is changing.

I'm an old-school PD who programmed in the age of car radios with two knobs and six presets. No RDS. No album artwork. No digital.

The world of analog car radio didn't have a whole lot of strategy behind it. The key was to become one of the car owner's six preset buttons, preferably the station in the #1 position. Beyond that, it was pretty much a matter of how well you programmed your station and its relative loudness as a driver punched around between stations.

Today, programming in the car has become synonymous with military tactics. New technology, toys and weaponry are available to the programmer — IF (big "if") she decides to use them.

I got to sit in on a presentation by Xperi mastermind Joe D'Angelo. His new deck is loaded with new features and tools for stations, ranging from actual usage data with heat maps (think ratings) to song lyrics on the screen — even synced to the song so you can karaoke on your way to work, school or the Taylor Swift concert. And down the road (sorry), some of the technology we've seen at CES — the car reading your mood and adjusting the music to match it — is around the corner.

So we shouldn't be surprised that dashboard messaging is becoming more sophisticated, now that more and more clever, tactical PDs have had a chance to use it over the past few years.

A message for PDs

Paul Jacobs and I got our education in this space thanks to Steve Newberry, now CEO of Quu, the company that has brought this technology to the radio industry. In his former life at the NAB, Steve hired us to run audits of dashboard displays in three markets back in 2017 — Grand Rapids, Philly and Charlotte.

The results were revealing in that so many stations' metadata displays were inaccurate, inert or just plain lame. In a world where broadcast radio shares dashboard "real estate" with streaming audio platforms, satellite radio, podcasts and even video, the way AM/FM stations look in the car becomes yet another indicator of our industry's relevance in the fast-changing world of audio.

Top
Fig. 1: Ad text and images are displayed by HD Radio while the programming airs on KKCW in Beavertor, Ore.

Below
Fig. 2: Our TechSurvey reveals the value listeners place on certain kinds of dashboard data.

The data was published for all to see (including non-NAB members) and has been updated by the NAB team. You can get it at *https://nab.org/innovation/autoInitiative.asp*.

And yet, a half dozen years later, I regularly speak with programmers in commercial, public and Christian radio who have no earthly idea this technology is even possible.

They somehow don't notice it when in a car and/or they believe they have no control over the metadata and the messaging it can deliver.

While it might be wise for the NAB to commission a follow-up audit, my subjective evaluation is that radio broadcasters as a whole have made significant progress in recent years. In general, stations look better on dashboard touchscreens, metadata messages have improved (and are even shorter), and album artwork has been upgraded.

On the sales front, many reps have connected agencies and retailers to this technology, allowing for advertisers to include logo artwork and slug lines during spots breaks, but also during programming content. (See Fig. 1.) To my knowledge, no other audio platforms offer this service. Advantage: radio.

And there's no shortage of research that shows "brand lift" for advertisers that include their artwork and a sales line on vehicles capable of RDS and/or HD Radio visuals.

So, how's it going? While there is still a lot of digital detritus on dashboard screens, radio broadcasters have made great strides.

But in a reversal of typical radio fortunes, the programming department has lagged behind. When I first started learning about metadata and its capabilities, my PD brain started moving and shaking, envisioning the possibilities. We have even tested some of them in our recent Techsurveys among the nearly 80% of respondents who have at least RDS technology in the vehicles they drive. Fig. 2 shows the current metadata feature hierarchy based on our 2023 data.

It's pretty straightforward. Artist and title information of the song being played is table stakes. Nearly three in four consumers with the technology in their cars show the highest degree of interest in this now-basic feature. Emergency info is a solid second, while the artist and title of the *next* song, and the current score of a sports event you're listening to are in the running, too.

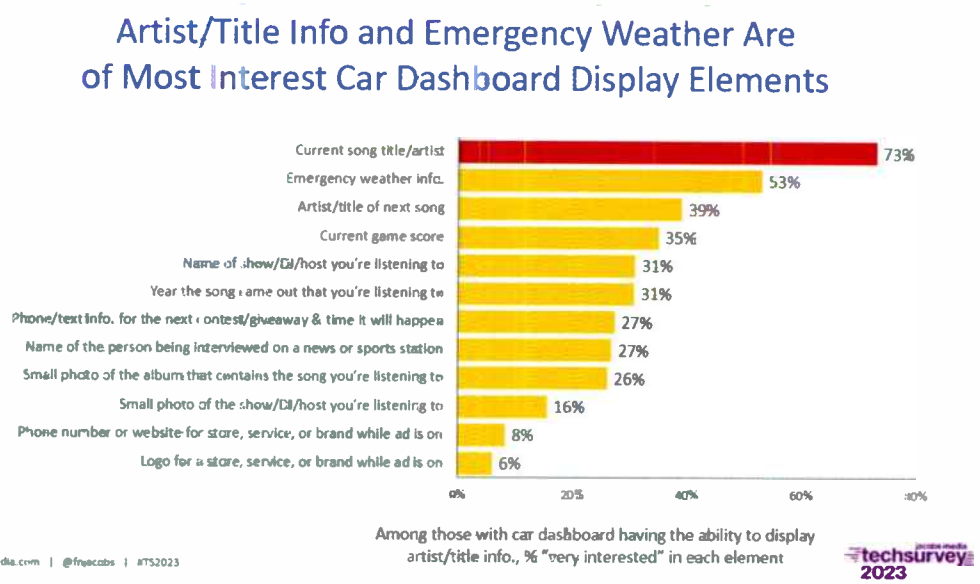
I expect many of these metadata-driven features will increase in popularity as consumers get used to seeing them. It's like going to a baseball game and seeing the speed of the pitch, a relatively new addition to scoreboard data. After you see it again and again, you being to start looking for it, you expect it to be part of the data set that is shown. Same thing with dashboard messaging for radio.

Motor City mentality

I spend most of my time in Detroit, so I've had an eye on what Beasley's VP/National Content Scott Jameson has been whipping up in this department for the company's two leading rock stations in the market: the mighty, mighty WRIF and classic rock stalwart WCSX.

Scott has approached the art of metadata programming both strategically and tactically with his messaging. Some of it is subtle while other use cases have been highly intentional, hoping to spur a reaction or at least an impression from drivers and passengers.

Take the recent Aerosmith concert, for example, their final appearance in Detroit: "We wanted to try something different when giving away tickets. I built a two-day vertical in prime time on Wednesday and Thursday, the last day and first day of a PPM week. On-air and online promos directed fans to *'watch & win'* their vehicle display for when the next pair is given



Photography: Ken Settle

Above
Fig. 3: WCSX Detroit leverages an Aerosmith concert using Quu.

Below
Fig. 4: Timely Quu messaging on Beasley's WBOS(FM) Boston.

Bottom
Fig. 5: A high-tech Togg dashboard as seen at CES 2022.

away, with the trigger being an Aerosmith track we play." (See Fig. 3.)

"Two hours before each giveaway, the information appeared on the dashboard display, revealing exactly when to listen and win. For added visual engagement we worked with legendary Detroit rock photographer Ken Settle using a suite of Aerosmith images he photographed over the years in the Motor City."

Scott also talked about why dashboard metadata is an untapped resource for programmers.

"We live in a screen-centric world, so when you combine the intimacy of the car environment, you're adding another level of connectivity complementing the audio. We do a nice job monetizing client ad-syncs and sponsorships, so there's no reason we can't broaden the use for content and consumer engagement, which can ultimately over time build brand loyalty."

And more listening. What about moment-to-moment listening using metadata as a trigger?

"This is the first time we used the vehicle dashboard as a TSL tactic. While stations typically display information that's happening in the moment, the technology of Quu allows programmers to create anything they can dream up using text and images for both HD and analog radio displays. I would encourage PDs and digital content creators to look at this as another content branding tool, along with an opportunity to bring new revenue ideas to the sales team."

There are other benefits beyond expanding time-spent listening and occasions. For the 50th anniversary of Pink Floyd's "Dark Side of the Moon" album earlier this year, Scott had his team create special artwork that played during the days they featured this iconic piece of classic rock.

The approach is more low-key than "watch & win," but that suits this moment and celebration. Dashboard metadata doesn't always have to be in your face. In fact, regular impressions drive recall.

I also love the capability to be "in the moment," something radio used to do better. With some planning and a little creativity, dashboard metadata allows radio to meet those occasions head-on with relevant messaging as shown in Fig. 4.

There's also those moments when messaging can save lives — or repair them. The Beasley stations have been especially active across their portfolio of stations during the many disasters we've witnessed over the past few years. A "text-to-donate" message and/or a QR code gets the job done. (See the photo at the top of this story.)

Scott mentioned a new Michigan law that was signed this summer by Governor Gretchen Whitmer. It is now illegal to hold or use a cellphone while driving in the state. Drivers can get pulled over and ticketed if they are caught holding or using a cellphone for any reason, whether it's to make a call, send a text, scroll social media, etc.

For this type of legislation, which is likely to spread to more states, dashboard metadata becomes a legal way to disseminate messages.

Scott, Paul and I have collaborated with Steve Newberry and his team on smart uses of this messaging for a couple years now. I like to think of it as the equivalent of push messages on your dashboard. Instead of the "Check engine light" coming on (which we always notice), metadata on our car infotainment screens gets noticed.

Clearly, this is a new programming and marketing tool for radio content creators. It's exciting to think about how this technology will be used moving forward.

It is also about improving the visual interface of today's vehicle displays, which are only getting bigger, more beautiful and more attention-getting (Fig. 5). As Scott notes, it's all about using the metadata "to engage, inform and entertain."

Full disclosure: Xperi and Quu are clients. We love working for both and believe they are contributing in huge ways to radio's future in the dashboard.

Radio has come a long way since our DASH Conferences that began exactly one decade ago. With dashboard metadata in the tool kit, radio's best days in the car may still be ahead.

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