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Your guide to radio t

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FUTURE

Is this the end for FM6?
Franken FM operators aren't giving up easily

Passionate about mics

Engineers, voice talent and other pros tell us their favorite microphones and why.

Photo by Gregory Pizzi, Sennheiser/Neumann, courtesy Jo

Nielsen PPM, ready for the cloud
Here's what to know about the Nielsen Audio Software Encoder.

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Build an LED fixture dimmer circuit.

WebDAD: native-level access to your automation system from anywhere.

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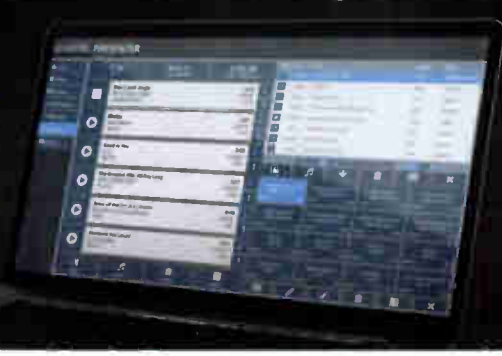

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Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by Future US, Inc., 11 West 42nd Street, 15th Floor, New York, NY 10036-8002. Phone: (703) 852-4600, Fax: (703) 852-4583. Periodicals postage rates are paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 282, Lowell, MA 01853.

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Microphones are personal!

Paul McLane
Editor in chief

Comment
Share your personal experiences of microphones with me at *radioworld@futurenet.com.*

Of all the pieces of the radio air chain, the microphone is probably the most personal.

My former program director Pete Booker at Delmarva Broadcasting used to remind those of us who worked on the air to remember that we were very close to our listener's ears. Talk with that person as though the two of you were lying next to each other with your heads on your pillows, I remember him saying — not meaning that we should whisper, but reminding us how close we were to each listener and therefore to be personal, intimate, conversational.

The microphone is the conduit to make that possible. In fact, when you put your lips an inch or two from that transducer, you effectively are speaking to someone in their car from only a foot or two away ... or if they are wearing earbuds, you are literally inside their head. Wow, that's quite a responsibility.

Our recent reader survey told us that you like to read about microphones. In this issue I asked a sampling of industry professionals, including engineers, programmers, owners and voice talent, to tell me about their favorite microphones and why they loved them. Find that coverage starting on page 18.

Featured on our cover is Joan Baker, a friend to Radio World who is the co-founder of the Society of Voice Arts and Sciences. SOVAS was created to help fill a need for education, training and job opportunities for voice actors and people looking to get into that field.

She also is the author of "Secrets of Voiceover Success," a book that eventually led to the creation of the career expo "That's Voiceover!" and the Voice Arts Awards, run by SOVAS.

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FEMA's IPAWS Playbook

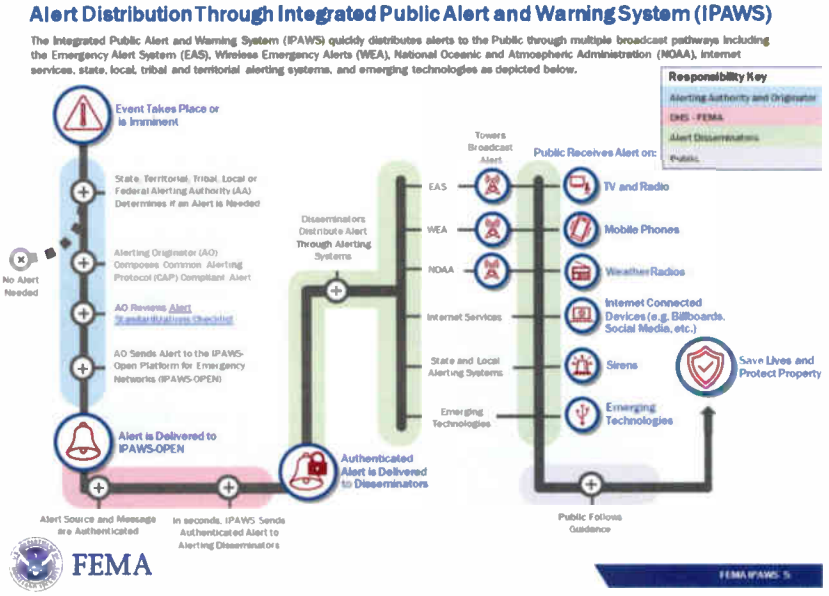
The Federal Emergency Management Agency has added an IPAWS Process Map Playbook to its collection of online materials to help alert originators design successful emergency messaging procedures.

Part of the agency's IPAWS Programming Planning Toolkit, the playbook illustrates the interconnected processes at federal, state and local levels and is intended to streamline knowledge for the IPAWS alerting community, including broadcasters. Find it at *fema.gov*, search IPAWS toolkit.

The playbook includes diagrams depicting the Integrated Public Alert and Warning System alerting tree and process for authorities to secure the needed IPAWS equipment and training to disseminate alerts. It also details the process for sending EAS and WEA alerts. Standardized checklists are included to ensure those messages align with national and international standards used by IPAWS.

While the documents are intended mostly for alerting originators like emergency managers and public information officers, FEMA says all stakeholders will benefit.

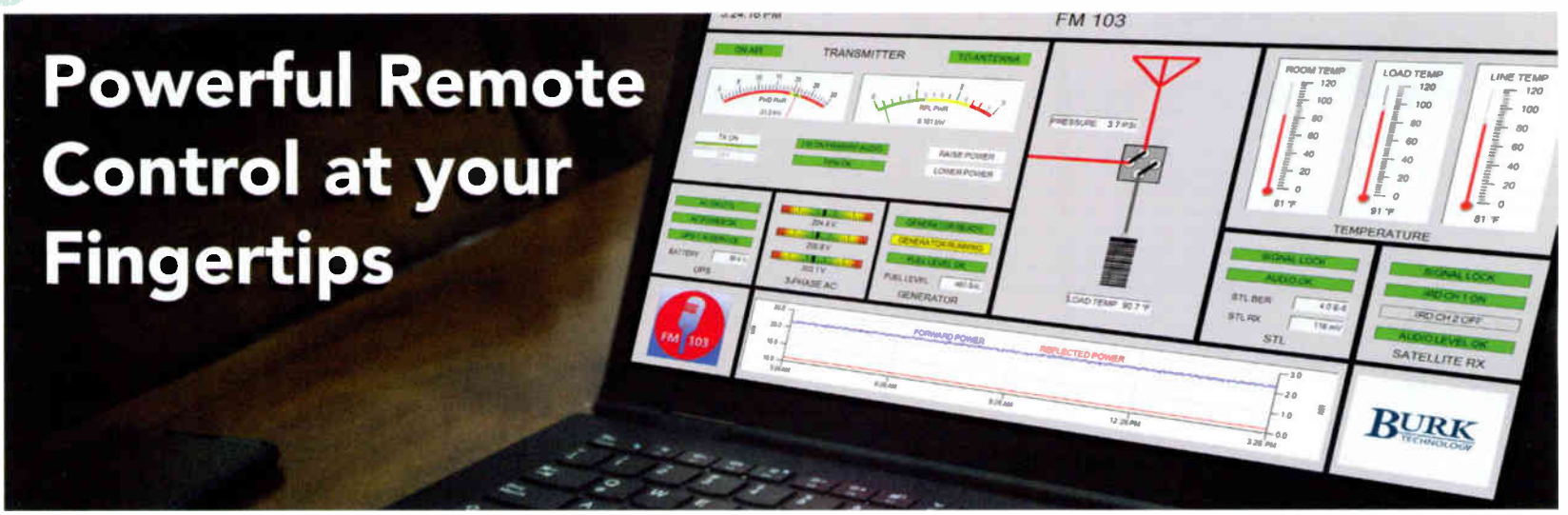
Rob Dale, planner for Ingham County (Mich.) Emergency Management, says he is a big fan of the FEMA IPAWS training documents.



"While vendors try their best, they don't all seem to treat message development at the same level of professionalism. Having FEMA produce some templates is a great resource," Dale said.

In addition, Dale says the Process Playbook is a valuable resource to introduce IPAWS to new emergency managers and broadcasters.

Other entries in the IPAWS Programming Planning Toolkit include a guide for constructing EAS and WEA messages, a training capsule, the IPAWS Lab fact sheet and FAQs.



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Writer
Randy J. Stine

Longtime contributor to Radio World, he wrote about the status of the C Band migration in our previous issue.

Time running out for FM6 stations?

Advocates still hoping for OK to air analog audio after July deadline

The future of "Franken FM" stations remains in serious doubt because the operators of those stations, along with any other low-power Channel 6 TV broadcasters, face a deadline of July 13 to cease analog broadcasting and begin digital TV transmission.

As of mid-May the Federal Communications Commission had not answered requests to allow TV stations that present themselves as radio stations on 87.7 MHz to continue analog broadcasts on that frequency.

Some proponents don't think they actually need further permission.

The FCC was notified by one LPTV station that it had converted to digital but plans to continue FM6 operations too. Venture Technologies Group, licensee of KBKF(LD) in San Jose, Calif., hopes its correspondence will help clarify the commission's stance. It also operates FM6 signals in Los Angeles, Chicago, San Diego and Sacramento.

The FCC confirmed to Radio World that it had received KBKF's notification, which it described as a "request," and said it was "being considered and remains pending," a spokesperson said in April.

The TV station began ATSC 3.0 digital operations in February. "The station is in compliance with the ATSC 3.0 rules for digital LPTV stations," wrote Venture Technologies.

"The ancillary or supplementary audio signal occupies a portion of the remaining bandwidth assigned to the station as part of its DTV channel."

It continued: "The licensee provided notice to all potentially affected Channel 5, Channel 6, 87.7 FM and 88.1 FM stations in San Jose-San Francisco-Oakland and adjoining DMAs that it was beginning digital service with ATSC 3.0 video and an ancillary audio signal. None of these stations has reported any interference or other issues to the licensee. Should any unexpected interference occur, the licensee will promptly take remedial action, including termination of all or part of the station's signal, if necessary."

Paul Koplin, president of Venture Technologies Group, said, "We believe the FCC's existing rules permit the use of an analog audio carrier on an ancillary or supplementary basis under these circumstances."

Above
An image from the media kit for WDCN(LP) near Washington, D.C.

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Right
A logo for Almavision Miami, including its 87.7 dial location. The LPTV station is WEYS(LP).

KBKF airs contemporary Christian music from the Air1 Radio Network from the Educational Media Foundation. EMF in March urged the FCC to "act expeditiously" on the FM6 proceeding because stations need to be able to plan "to avoid a potential unhappy surprise should their audiences lose service that they have enjoyed for many years."

"Uncertainty" created by FCC

Meanwhile, the Preserve Community Programming Coalition (PCPC), which represents a half-dozen LPTV Channel 6 stations, said the earlier ATSC 1.0 digital television standard did not contemplate the use of less than a full 6 MHz.

"Under the ATSC 3.0 standard, the DTV signal can occupy as little as 5.509 MHz, leaving room for an analog audio carrier that does not in any way derogate the station's DTV signal. The KBKF(LD) application describes this configuration, but prior FCC approval is not required to offer an ancillary or supplementary service."

According to PCPC, the language of the FCC's rules permit digital LPTV stations "to offer services of any nature" including audio as long as they "do not derogate DTV broadcast stations' obligations" to transmit at least one over-the-air video program signal at no direct charge to viewer.

"In fact, the rule goes on to state that services may be provided on a broadcast, point-to-point or point-to-multipoint basis — meaning they do not need to be part of the primary ATSC television signal," a PCPC spokesperson said.

The group believes that no further FCC action is required, though it hopes the commission will clarify its position.

"The FCC should authorize currently operating analog Channel 6 LPTV stations to continue using a portion of their spectrum to provide an analog aural service on 87.7 FM following the digital transition," it wrote in comments to the commission.

A PCPC spokesperson added, "Given the uncertainty that the FCC has created ... the commission should reassure the underserved listeners these stations serve that their 87.7 FM stations are not going away."

Legitimacy question

The so-called Franken FM phenomenon has sparked radio industry debate about the legitimacy of the operations. There are two dozen or so such stations in the United States. Their leaders say they are serving the public interest by carving out a radio niche and have found a profitable business model in doing so.

These Channel 6 LPTVs air limited visual programming to meet their license requirements while transmitting an audio signal programmed and branded as a radio station. The FCC has an open rulemaking on whether to permit FM6 operations to continue on an ancillary or supplementary basis after the July date.

It asked for additional feedback in a public notice in December whether digital LPTVs should be allowed to operate analog radio services. The FCC first asked the very same question in 2014.

> **"The commission should reassure the underserved listeners ... that their 87.7 FM stations are not going away."**

Operators of FM6 stations have lobbied for several years to be able to maintain an analog output on 87.7 even while converting to a digital TV6 service. But their outlook seemed to dim when the Media Bureau released a Public Notice this year reminding LPTV stations on Channel 6 that their deadline to terminate all analog operations was "fast approaching."

LPTVs were allowed to request an extension to complete their digital TV facilities beyond July 13, but such extensions do not allow for continued radio operations beyond that date, the FCC said.

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> **These small businesses and the focused broadcast services they provide are a night light, if not a beacon.**

FM6 advocates met with Media Bureau Chief Michelle Carey in March to discuss "the process for converting existing analog Channel 6 stations to digital in the absence of a decision by the commission on whether to permit digital LPTV stations to operate analog FM radio type services on an ancillary or supplementary basis," according to an ex parte summary.

Public interest

Critics of the LPTV FM6 stations, including National Public Radio, have consistently argued that the FM6 stations are a misuse of public airwaves since their TV licenses were not issued with radio service in mind. In addition, they pose an ongoing threat of harmful interference to public radio stations in the adjacent FM band reserved for noncommercial educational broadcast stations.

NPR commented previously: "So-called Franken FM stations exploit regulatory gaps to transmit a silent video signal for TV receivers and an unrelated audio service for reception by FM radios tuned to 87.7 with each Franken FM occupying 30 times the spectrum a traditional FM station uses."

But PCPC claims the FM6 stations "don't fit in any regulatory box." It dismisses the interference argument, saying that Channel 6 stations have been broadcasting audio on 87.7 MHz since the 1950s without causing interference to other services, and further that "there has never been a documented case of any Franken FM interfering with another radio or TV station."

Supporters also say FM6 programming often focuses on underserved ethnic and minority communities who historically have had limited access to the airwaves.

For example, an 87.7 FM station in New York serves the Korean community, while a station at 87.7 MHz in Los Angeles targets Latino audiences. In Sacramento, an FM6 provides programming for the Russian community.

In Chicago an FM6 station airs a soft AC and oldies format on 87.7 and claims to average a weekly cume of over a half million people.

"A voice and lifeline"

WDCN(LP) "La Nueva 87.7 FM" is a low-powered Spanish-language station with offices in Rockville, Md., and a radio signal that covers much of Washington, D.C. It is owned by Signal Above LLC, which says Washington is the country's 13th largest and most affluent Hispanic market.

Wray Fitch, managing member of Signal Above, says the station has targeted the market with Spanish-language radio programming for 11 years. It broadcasts a community bulletin board on its video signal.

"This should be the moment when all small businesses are encouraged, especially those that are serving as a voice and lifeline to underserved communities. These small businesses and the focused broadcast services they provide are a night light, if not a beacon along the path of COVID recovery and flourishing to all these small communities. That light should not be unplugged," Fitch wrote in an email to Radio World.

Fitch said he has requested an extension for the digital TV migration since WDCN's digital facilities will not be completed by the July deadline.

"We plan to timely construct our digital Channel 6. We are negotiating for equipment, tower space and hiring tower crews. The engineering has been completed," he said.

Snycom Media Group operates KXDP(LP) in Denver, which is branded as La Invasora 87.7 FM and serves the local Hispanic community.

"We are the only station in Denver that broadcasts live news, traffic and weather reports in Spanish," said Christopher Blair, owner of KXDP. "Our intentions are to continue to serve our listeners as we have in the past. We are hoping the FCC has the wisdom to realize we are essential lifelines to our communities."

KXDP, which broadcasts music videos on its TV signal, has yet to build its LPTV digital facilities; it too requested an extension from the FCC.

"We focus on the local community. We identify needy families during Christmas, Thanksgiving and other times and help them with cash or presents. And provide no charge, weekly on-air time for Alcoholics Anonymous to come to our studio and extend an invitation to those who may have the need to attend meetings," Blair said.

Daniel Melendez, president of Omega Media Broadcasting, licensee of KIPS(LP) in Beaumont, Texas., said his station is the only Spanish-language radio station in the city and is important for public safety.

"We are in an area with tons of hurricane activity and our station has been essential to bring the community detailed information. We also have been able to help with community services," Melendez said.

KIPS(LP) transmits video loops on its TV signal and plays Spanish music on 87.7 MHz, Melendez said. He has requested an extension to transition its digital facilities and hopes there will be some kind of provision to extend the station's analog aural services too.

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Nielsen PPM is ready for the cloud

Here's what to know about our Nielsen Audio Software Encoder

Writer

Nick Mannion

Director of Product Management, Nielsen Audio.

Comment

We welcome your thoughts on this or any article. Email *radioworld@futurenet.com* with "Letter to the Editor" in the subject field.

In today's modern landscape, there is no company or industry that has not considered moving some portion of its operation to the cloud.

The modern vernacular for data operations is cloud-based, and most things now operate from the cloud, including shopping, email, banking and many other conveniences in our modern lives.

The release of the Nielsen Audio Software Encoder will now bring your station's PPM encoding to the cloud.

If you are well-versed with PPM encoding, you are likely familiar with the dedicated rack unit, industrial-grade hardware encoder that is offered today. You probably have a rack full of these in your facility, with each one playing a critical role in ensuring your station's audience is properly counted.

The Nielsen Audio Software Encoder was born out of the simple idea to give you, the radio broadcasters, more options when it comes to your station's PPM encoding and to be ready to meet you in the cloud when your station(s) are ready to make that transition.

Simple idea

The concept behind the Nielsen Audio Software Encoder is simple.

We took the PPM encoding algorithm (Enhanced CBET) out of the hardware that it lives in today and made it available in the form of a software development kit (SDK). This SDK is then made available to industry participants enabling them to integrate PPM encoding into their products.

Once an integration is complete, Nielsen works with the manufacturer of that product to perform a rigorous certification process. This certification process ensures that the PPM encoding generated by the manufacturer's product meets all of Nielsen's encoding quality standards.

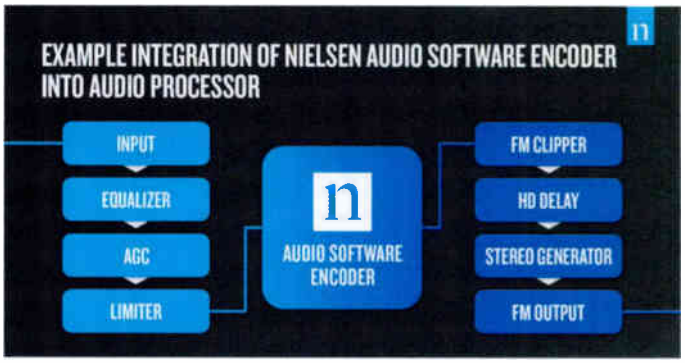
Today, the broadcast radio industry primarily utilizes an on-premise broadcast audio chain, and the initial Nielsen Audio Software Encoders have been largely with products created for that world. Additionally, Nielsen has been working with top audio processor manufacturers to integrate the Nielsen Audio Software Encoder into their products.

To date, we have certified integrations across a variety of Orban, Omnia and Wheatstone audio processors, with many more in the pipeline.

Three-phase rollout

In the near term, the Nielsen Audio Software Encoder will enable you to perform your station's PPM encoding in products from leading audio processor manufacturers that you have trusted with your station's sound for decades, while also providing the opportunity to reduce the footprint (rack space) consumed by each of your stations.

As we continue to evolve our industry and station playouts move away from single-purpose dedicated hardware in favor of either channel-in-a-box architectures or straight to cloud-based approaches, the Nielsen Audio Software Encoder will be ready to power your station's PPM encoding.



Nielsen will release this capability in three waves: first AM, followed by FM and then streams. Each of these releases will be preceded by successful completion of a field evaluation using certified integrations on that platform.

We released this capability for AM stations at the end of 2020. We anticipate the release for FM to be in mid-2021, with streams to follow in the back half of the year.

As you continue to think about how your station's facility may evolve, I'd urge you to stay connected with your Nielsen client engineer via phone at (866) 767-7212 or email to *encoding@nielsen.com*, or through the Nielsen engineering portal *https://engineeringportal.nielsen.com*, to ensure that you are up-to-date on the latest Nielsen certified software encoder integrations.

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John Bisset
CPBE
has spent over 50 years in broadcasting and is in his 31st year of Workbench. He handles western U.S. radio sales for the Telos Alliance. He is a past recipient of the SBE's Educator of the Year Award.

Shed a little light
Share your own Workbench submissions, which qualify for SBE recertification. Email *johnpbisset@gmail.com.*

Above
The finished project: three individually dimmable LED lights. Frank is the master of recycling; the wooden mounting pedestals are the panels from a decommissioned ATI console!

Right
Frank chose ultra-flexible silicone wire. Similar to "Zip" cord, it resists tangling.

Build an LED fixture dimmer circuit

Get only the light you need with Frank Hertel's workbench project

Thanks for your comments on the super-bright tri-panel LED light "bulb" described in the last column.

Workbench contributor Frank Hertel of Newman-Kees RF Measurements and Engineering described another approach to lighting your shop or workbench with LED bulbs — and this one is dimmable.

The dimmer selector means you won't blind yourself with overly bright light unless you need to.

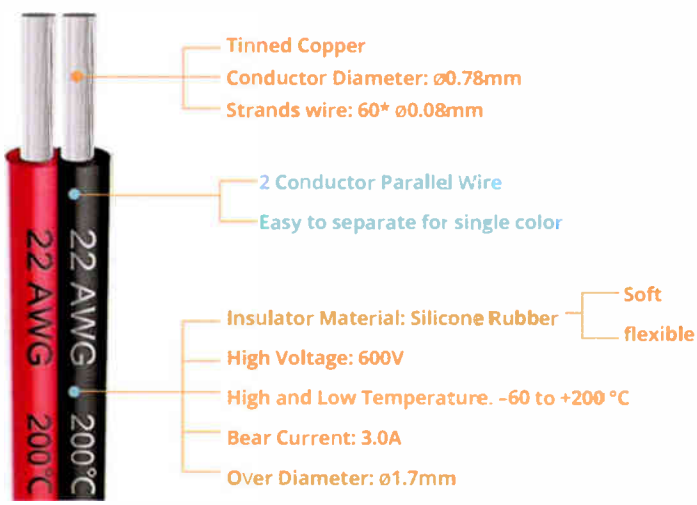
What started it

Frank needed to replace spot and floodlights on his tractor, and found the LED fixtures shown on page 14 on the internet.

Before installing them on the tractor, he tested them on the workbench. Frank was impressed with how much light both fixtures provided, exceeding the brightness of his more expensive 120V LED shop lamps.

However Frank felt there might be cases where the brightness was too much for the work at hand, so he decided to build a dimmer circuit.

In selecting a method of dimming the LED fixtures, Frank first considered the simplest method: varying the DC voltage. This will work, but because of the "avalanche" turn-on point — it's not a smooth ramp-up or down — varying the DC voltage makes for a sloppy dimming control.



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Enter the 555

Frank decided on the ever-so-handy 555 Timer IC, which was configured as an adjustable duty cycle square wave generator.

Seen in the accompanying schematic, the 555 square wave generator drives an MPF102 FET, which in turn drives a D718 power transistor that provides a "pulsed" 12V variable duty cycle driving the LED lamp fixture.

The fixture is only pulsed long enough with the 12 volts to establish the desired brightness level. This method overrides the "avalanche" "on-off" effect that is noticed when a variable voltage is used to attempt control of the fixture's brightness.

Stated another way, the LED fixture's brightness can be viewed in relation to the length of time the 12V pulse is present. Therefore, the duty cycle of the 555 IC's square wave is the determining factor for the LED fixture's brightness. Pretty slick!

He used a widely available and inexpensive D718 power transistor that is rated for 8A at 120V. With a properly sized 15VDC supply and heatsink for the D718, you could power several LED fixtures with just one dimmer. Alternately, the circuit is small enough that you could mount several dimmers in one chassis, for individual control.

Frank realizes you can buy a pre-made dimmer but asked, "What fun is that?"

Besides, this dimmer circuit can handle a lot of current and is small enough that multiple dimmer circuits can be mounted inside one chassis.

After outfitting his tractor, Frank mounted three fixtures on wood pedestals so he could focus the light on what needed illuminating. Frank adds that if pointed at a white ceiling, the fixtures provide ample room illumination.

The completed project provides for three individually dimmed LED fixtures. You'll note in the photo that Frank chose silicone jacketed wire to connect the fixtures to the dimmer. This wire is super-flexible, albeit expensive. The silicone helps avoid tangles. The 22 gauge wire had an almost immeasurable voltage drop over the 30 foot length that Frank chose.

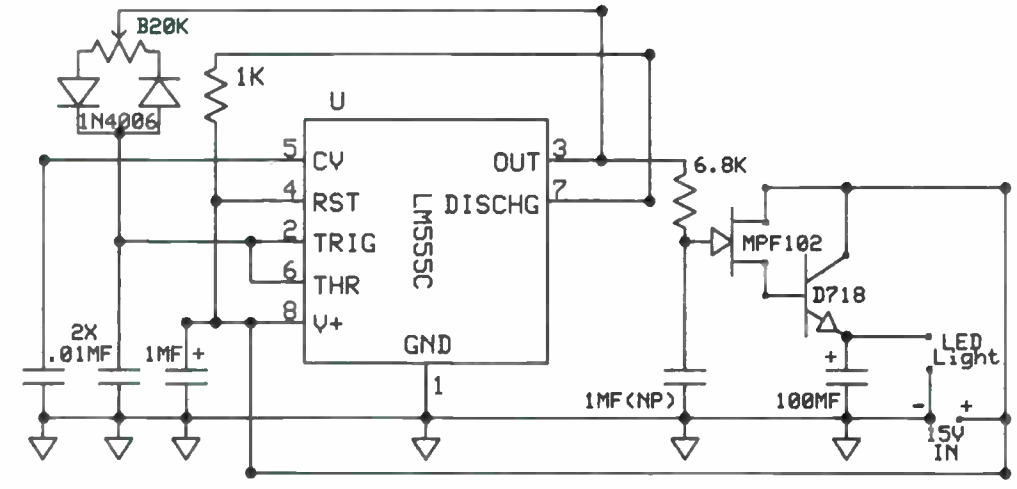
Parts are listed here. Keep in mind that when selecting the working voltage of the capacitors, good engineering practice dictates choosing a capacitor rated at twice the supply voltage. Since we're talking about 15VDC in this circuit, choose capacitors rated at either 30 or 50 Working Volts DC (WVDC).

PS: If you've made it this far, you are definitely an engineer who likes to build and tinker. San Diego's Marc Mann reminded me of a site that will occupy your interest for hours with the variety of parts for sale. It's Marlin P. Jones and Associates at *www.mpja.com*. Their online catalog is fascinating, and the site features bargains and closeouts. You can sign up there for an email flier or access their online catalog.

Above left
A wide-beam rectangular LED light, with a sharp cutoff on the edges.

Above right
A small round LED floodlight.

Below
Frank's LED dimming circuit is based on a 555 Timer chip.



Dimmer Project Parts List

- 1 each 20K Pot (linear) (B20K or 20KB)
- 1 each 1k 1/4W Resistor
- 1 each 6.8k 1/4W Resistor
- 2 each 0.01MFD Capacitors
- 1 each 1MFD Electrolytic Capacitor
- 1 each 1MFD non-polarized Capacitor
- 1 each 100MFD Electrolytic Capacitor
- 2 each 1N4006 Diodes (non critical)
- 1 each MPF102 F.E.T.
- 1 each D718 NPN Power Transistor
- 1 each Heatsink for above transisto
- 1 each 15VDC Power Supply, sized for LED fixture demands
- 1 each Enclosure of your choice
- 1 each Knob for pot
- 1 each perf board and hookup wire

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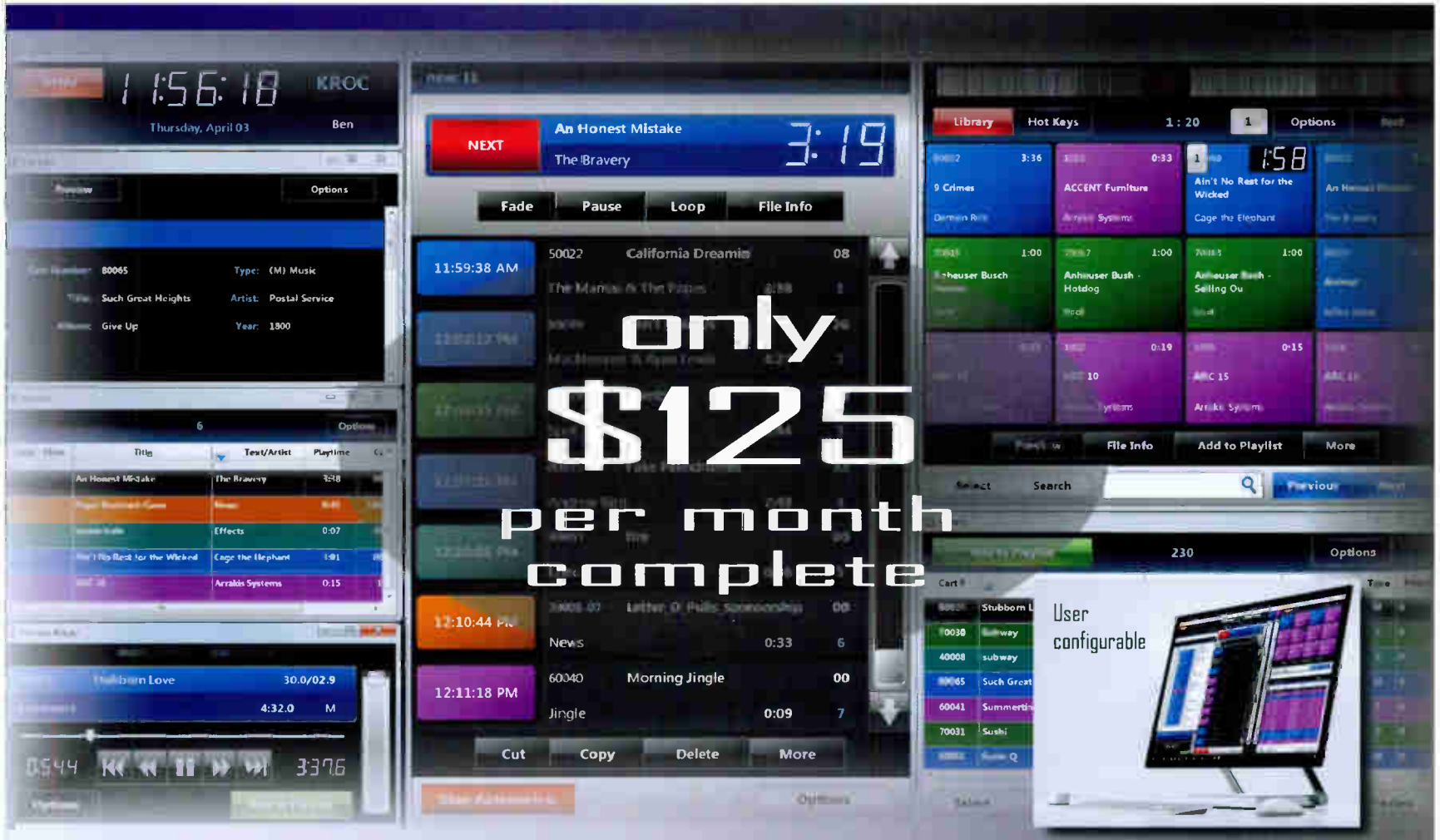

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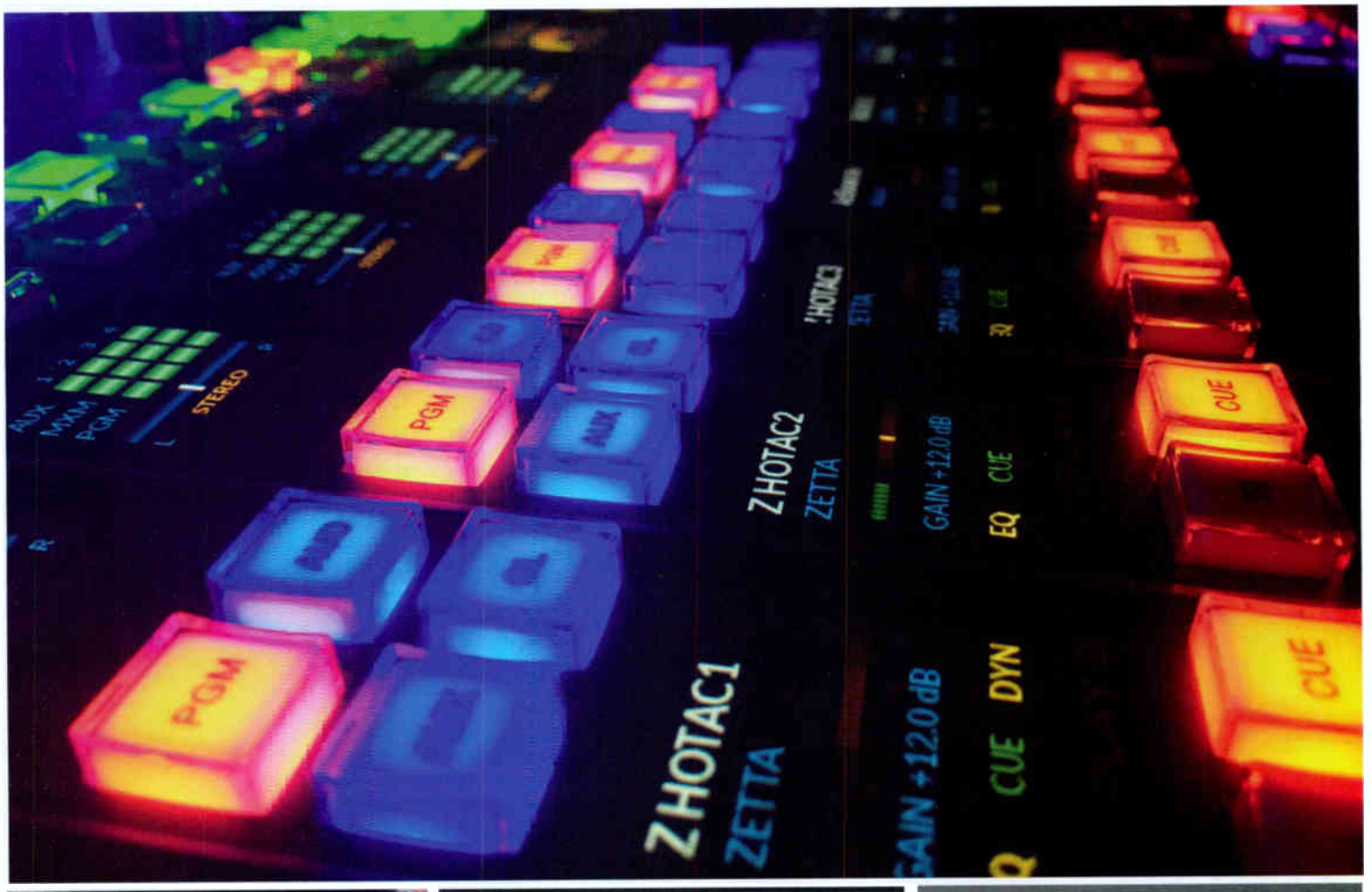

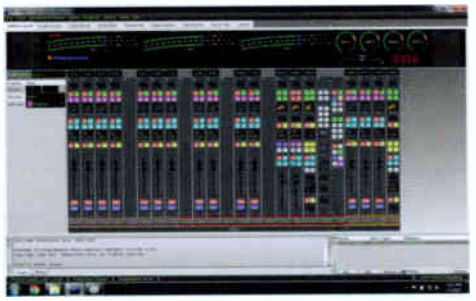

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Writer
Paul McLane

On the Cover
Joan Baker is a voice talent, author and co-founder/VP of SOVAS and The Voice Arts Awards, and executive producer and host of "That's Voiceover!"

Today's microphones offer a buffet of choices

We asked a bunch of radio/audio pros for their favorites and for shopping tips

What's your favorite on-air mic and why? Which models do you turn to for remote work, newsgathering, live music?

Radio engineers, voice talent and other professionals shared their preferences and some tips for getting the most out of your mics.

Vladimir Godnik/Getty Images

Josh Rogosin

Broadcast/recording technician and technical director, NPR Music

As the audio engineer for the popular "Tiny Desk" program, Rogosin says Heil's large-diaphragm dynamic PR 40 sounds great on a kick drum, with the PR 30 for guitar amps. He loves the Cole 4038 ribbon for brass and drum overheads.

"Nothing looks like Ear Trumpet Labs' handmade mics. Nadine sounds great on upright bass, Delphina has a nice full sound for strings and vocals with a nice low end. I love how you can angle the Chantelle wherever you need to focus it."

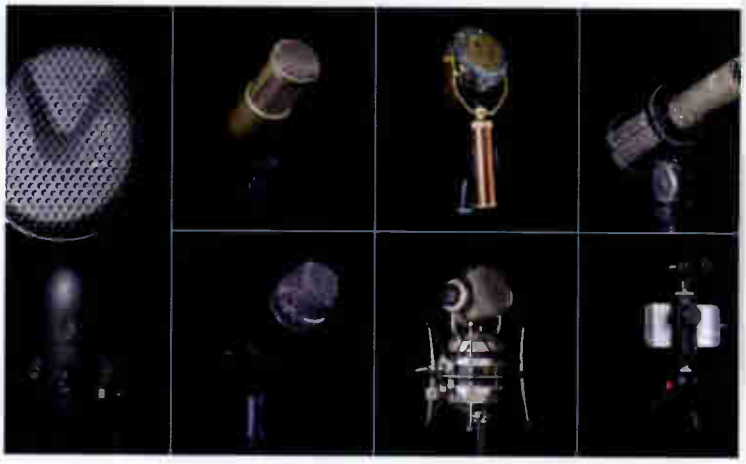
Rogosin says he "adores" the ICON Pro from Earthworks for his home setup. "It's a condenser that's amazing at off-axis rejection, ignores table thump as good as any dynamic I've used but sounds so much airier than an SM7B without being such a gain hog."

The Shure Beta 57A is the best mic he's heard under $140 and has a nice hot output for a dynamic. "Sounds great on everything."

Rogosin says the Blue Hummingbird condenser mic is small, sounds great and the pivoting head makes it great in cramped spaces.

"The signature mic at the Tiny Desk is the Sennheiser MKH 418s," he concluded. "It's crystal clear on vocals and the mid/side configuration is flexible enough to capture off-axis sources. I place it far enough away to see faces and avoid proximity effect and plosives."

That said, he added, "Never underestimate the power of post-production to make or break a great sounding mic."



Right
Read Rogosin's article on the NPR website about the mics he uses for "Tiny Desk." Just Google "Tiny Tech Tips: Microphones."

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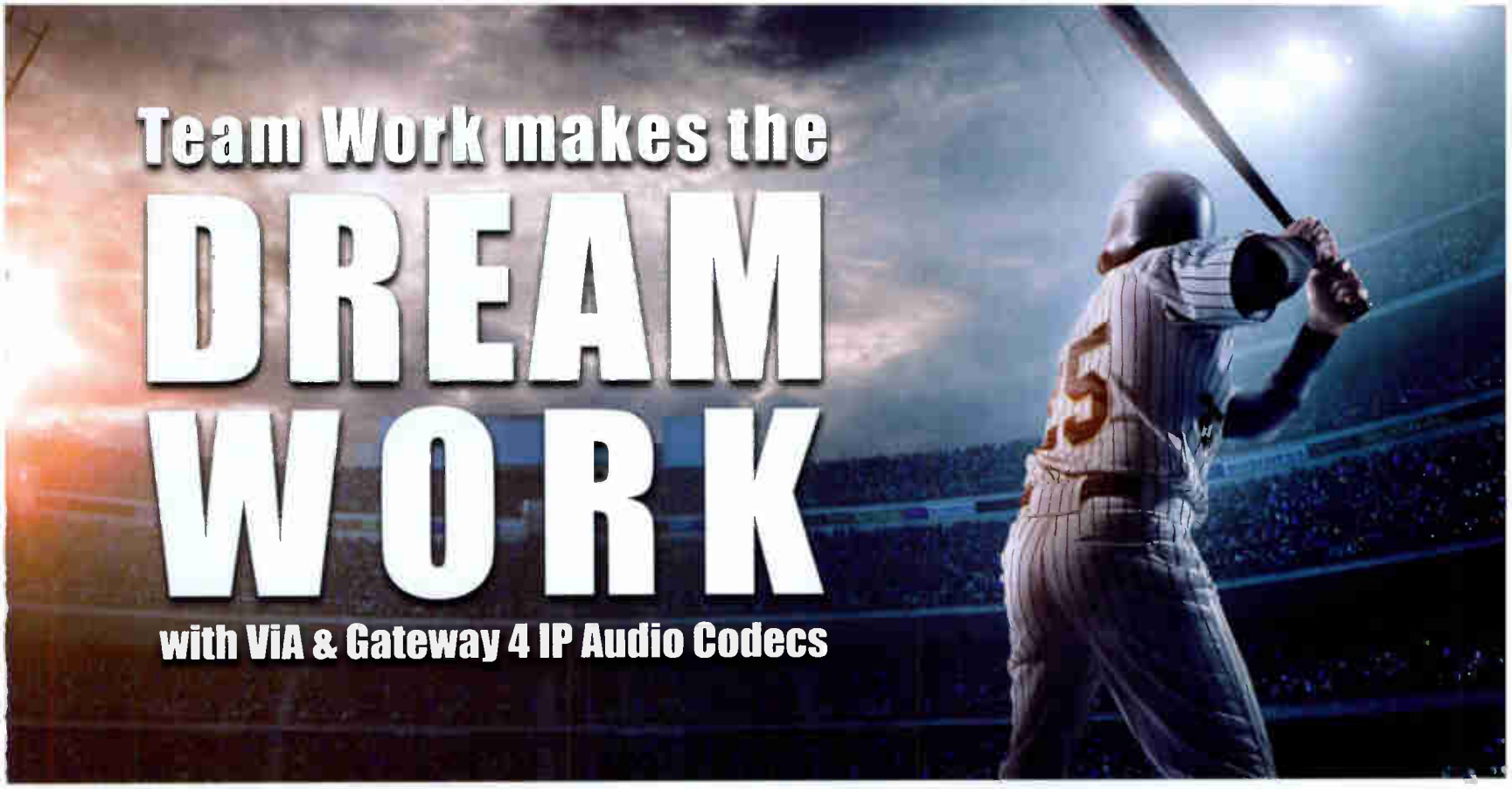

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* The Gateway 4 codec supports 4 channels only and is not upgradable to support more channels.

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Larry Langford

Owner and chief engineer of WGTO(AM/FM) in South Bend, Ind.

"I love the RCA 77-DX but let's be real, who can afford that sweet but expensive and delicate broadcast icon," Langford told us when we asked for his favorite.

"Aside from it making you feel like a 'real broadcaster,' use of such expensive units like that are more emotionally based than technically necessary for great audio!"

Speaking practically he finds good quality in recent new models, where the FET capsules do a great job for typical on-air voice, and the prices are very reasonable.

"I like the performance and pricing of the MXL imports, the MXL 770 goes for 80 bucks and the MXL 990 is about a hundred."

For mics that are going outside, he wants something that is a bit more rugged and does not need phantom power. "The Electro-Voice 635 has always been my omni favorite in the street, and the Shure SM58 for cardioid. You can't kill them and they are cost-effective."

Langford tells folks that no radio station ratings have ever been tied to the mic used in the studio.

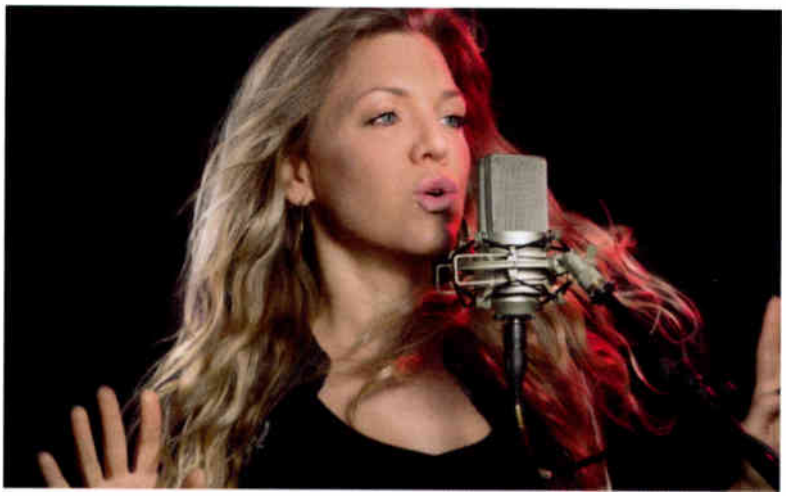
"Years ago some stations went way overboard on studio mics. NBC-owned stations used 77-DXs for all DJ operations, and I know WIND in Chicago used Neumann U 87s for AM announce work," he said.

"While certain mics can be tied to certain time periods as the 'standard' — EV 666, Sennheiser 421 and EV RE20 — nowadays there are many inexpensive choices that will do very well in podcasts, broadcasts and general voice recording.

"My advice: Put money into the mixer and processing. The MXLs are dirt-cheap, sound fine and if you want to change after a couple of years, you can toss them and not feel you have thrown out a piece of gold."

Above Larry Langford with his RCA 77.

Below Promotional image for the MXL 990.



Randy Williams

Chief engineer, Learfield \| IMG College

Working for a major sports operation, Williams has experience with headsets, and for live play-by-play he favors the Sennheiser HMD-26 II headset, finding it "extremely durable, repairable, with replaceable parts, and great noise reduction in loud venues."

His choice for studio recording is the Shure SM7B, for its "warm vocal reproduction, wide frequency response and great noise reduction outside the cardioid pickup pattern."

For home studio or podcasting setups, he recommends the Blue Yeti or Blue Snowball for their low cost, reproduction quality, multiple patterns and easy setup — "almost completely plug-and-play."

Williams urges mic users to really know and understand the demands of a given venue or studio setup, in terms of noise, acoustics and size.

"Then have a strong understanding of the microphone capabilities and pickup patterns to maximize the quality of the vocal reproduction. Pop filters and windscreens can be lifesavers!"

Jose da Fonseca Bolacha

Broadcast Engineer, Radio Mozambique

For on-air work, count him as a fan of the Electro-Voice RE20 and its effective management of proximity effect.

"Normally the dynamic mics are susceptible to external inductions, a problem that I faced for a long time with the AKG D3800 and only was overcome with the RE20," he said.

Out in the field, he turns to the Sennheiser MD46, a dynamic cardioid with clear voice pickup.

"The metallic envelope provides good robustness, especially for a reporter in the field; it can fall and resist the impact without damage. Excellent response for reporting on the go."

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Don Elliot

Voice veteran

Don Elliot applied his music training to radio and jingles, working as a voice talent, PD, DJ, production guy and agent. Among his many credits is work at L.A. stations KIIS and KFI/KOST.

He encourages mic users to look beyond the "ubiquitous, oversized repurposed kick drum mic" that many stations use.

"Every voice and every microphone is different. You have to try them and listen."

For him, it's the Sennheiser MKH 416 with a Hook Studios pop screen when he has to work closer than a foot.

"It just finds that sweet spot in my voice without any EQ. Much better to spend $1,000 on a mic that works than to spend $300 on one and then $4,000 in outboard gear to make it sound like the $1,000 mic in the first place! Simple."

For location work, he discourages the use of common omni pattern mics but says, "Above all, pay attention to the quality of your interface. I use a CEntrance MicPort2 with its amazing boutique-quality preamps, 48v phantom, headphone amp and built-in limiter, to get the most out of any mic on location.

"As for misconceptions, one must realize that 'proximity effect' does not change the pitch of your voice but instead causes an artificial low-end mushiness that can lead to loss of intelligibility in a mix or overcompensation for something that is not natural. You must consider listener fatigue."

Learn proper placement — and which polar pattern to use. "When I'm singing, I like either my U 87 in a good studio environment, or my Vanguard V13 — I heard Bill Rogers doing Disney promo work on one,which prompted me to buy — which has the advantage of remote-controlling the pattern so you can hear the changes immediately. And it's continuously variable. I like the openness of this mic in omni, knowing that all mics sound best in omni, but we are hampered by environments into which we are forced. The V13 is a problem-solver."

Above: Don Elliot with his Sennheiser MKH 416 and Hook Studios pop screen.

Right Elliot uses a CEntrance MicPort2 mic preamp.

World Radio History

Rob Bertrand

Senior director of technology for WAMU 88.5 in Washington

"We use the Neumann BCM 104 in our host positions when we're in the studio, because it sounds consistent alongside the higher-end condensers found throughout NPR programming," Bertrand said.

"There is no presence effect so it is very forgiving of hosts who tend to operate from quite a distance of the microphone, however, it does require a very quiet studio to sound clean."

The Shure SM7B impresses him for its versatility and because "it is hard to make sound bad." He said its low-level output corrects for many room distortions and background noise issues, and it has a great balance of simultaneously sounding warm and crisp.

WAMU is using a lot of SM7Bs in home setups, sometimes with external mic preamps.

For someone making a microphone decision, any tips to share or common misconceptions to dispel?

"Start simple. Use your ears. Be clear for yourself about what you're trying to achieve, then go out and get different opinions," he replied.

"In trying to find a new standard field reporter microphone for WCBS in the mid-2000s, I ordered about a dozen different handheld mics. I went out to different environments throughout New York City and recorded with them, wanting to find a nice presence for the subject but sensitive enough to provide reasonable nat sound.

"We eventually landed on the SM63LB, which despite being omnidirectional, sounds great when used up close in an interview, with little-to-no handling noise. It gave WCBS a nice kick to its long-time field sound, enabled us to roll out a consistent mic, and gave the reporters an easy tool for recording better audio in the field," he said.

"As we deployed digital recorders and laptops, this enabled the station to provide a whole new level of rich audio to its listeners — whether listening on AM, HD or streaming."

Above: Bertrand poses with his vintage Electro-Voice 664.

Right Bertrand loves the long-handled version of the Shure SM63 for field interviews.

Tony Abfalter

Director of engineering/IT, Leighton Broadcasting

Abfalter goes with the proven quality of the Electro-Voice models RE20, RE27 and RE320. Same with specialty applications.

As far as he's concerned, "No sense in trading quality outside the studio." He's a believer in doing your research and talking to the air staff, and then ultimately making your own call. "There's no right answer."

Andrew Gladding

Chief engineer, Salem Media New York, and chief engineer, WRHU Radio Hofstra University

"The Shure SM7B packs a great punch at a reasonable cost," Gladding says when asked for his choice in a radio studio.

"I really like how the pattern and dynamic response lends itself to both experienced and novice users."

For remote podcasting, he recommends the EV RE20. "It seems to handle room noise fairly well and is fairly easy to use. Plus it can sound really fabulous when paired with a decent mic processor or preamp."

When working with student engineers, he encourages them to start with the basics.

"Higher cost doesn't always equal better quality. Knowledge of good mic placement and usage is more important than specs."

Thor Waage

Chief Engineer-Portland for Alpha Media

The Sennheiser MD421-II and the Electro-Voice RE20 are his picks for on-air work. "Both are excellent for just about any type of voice, but the MD421 with the roll-off switch in the flat position, marked M for Music, is hard to beat."

For specialty environments, it depends on the application, but the one he has found the most forgiving is the Shure SM7B. "In an ideal acoustical situation, add a Cloudlifter and it really comes to life."

Waage puts the emphasis on proper mic technique. "If you're making an investment to improve your sound quality, learn how to use that tool."

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Rob Byers

Director, Broadcast and Media Operations, at Minnesota Public Radio and American Public Media

Byers doesn't endorse a particular make or model but says that in a good-sounding, well-treated room, a quality large-diaphragm condenser can sound wonderful on the voice.

"Combine that with an onboard high-pass filter and you get a natural, clear and present sound."

In a room that doesn't sound so great, a dynamic might be the ticket, though they usually require tonal shaping. "There are some traditional choices when it comes to dynamic mics in radio, but I find they sound too muddy and unnatural to my ears. I prefer to reach for a mic that reduces proximity effect and provides clarity in the low mids."

In remote or live work, a choice of microphone will be driven not just by what is being recorded.

"The environment plays a critical role. The size and ambient noise level of a space can influence a mic choice, as can factors like weather, mobility, and any potential risk to the gear," Byers said.

"Working outdoors, some accessories are essential. Proper wind protection is well worth the investment, as are ways to mitigate vibrations. Backups — even for microphones — are essential. And don't forget that a dynamic omni can be a great tool in windy, wet, less-than-ideal weather conditions!"

And the high-pass filter, he said, is your friend. "It can mitigate many issues like vibration, low-frequency muddiness, HVAC rumble or wind and plosive problems. Engage it at the mic, which will prevent these issues from ever reaching the preamp."

When choosing a mic for voice work, find a mic that achieves — out of the box — clarity in the low mids, he said.

"The 100–400Hz range makes all the difference in intelligibility and naturalness."

David Antoine

Chief technology officer, WBGO Jazz 88.3 FM \| Newark Public Radio.

Antoine likes working with quality large diaphragm condenser microphones such as the Neumann TLM103, which he compliments for its "very smooth sound" when paired with right processor, especially for jazz or classical commentary.

"For a microphone that won't break the bank I also like Audio-Technica's AT4040. This mic works very well with female voices."

Out in the field, he turns to the Shure SM58. "There's a reason most of Shures wireless mic offerings have SM58 heads."

Antoine doesn't think you have to drop big dollars to get quality sound.

"Take some time to talk into a mic, listen to how it sounds with your voice or the voice of a good announcer. You can find its sweet spot and the settings that are right for a particular microphone."

Also, don't over-process or over-EQ a quality microphone. "If a mic is well designed and well-made it will faithfully reproduce the source, whether it's voice or an instrument.

"Distance from the sound source matters a lot. Not too close, not too far. Again, take some time with the microphone and you'll get the desired result."

Ira Wilner

Owner/engineer of Wilner Associates and chief engineer of Monadnock Broadcasting Group and Saga Communications of New England

"We engineers have very personal biases when it comes to studio mics. My favorite for on-the-street interviews was the EV 655C, a long omnidirectional stick mic made by Electro-Voice. It had a very large three-pin connector, precursor to the more diminutive XLR. It sounded really good when connected to a Nagra tape deck."

He is a fan of the Electro-Voice 635, the classic small handheld dynamic mic for field work, thanks to its ruggedness.

"My personal 'go to' mic for recording musical events indoors and outdoors has always been the Shure SM81 electret condenser mic. I've used them in all sorts of inclement weather where the talent was uncomfortably cold or hot, in rain in bright baking sun and the mics have always worked well."

For studio voice and location concerts he likes the Neumann U 87, but finds it a difficult mic to use.

"For most radio jock use, I prefer the EV RE20. Easy to talk into and fairly insensitive to room acoustics. I've found the lower-cost RE320 to be good for most of the voices at my Saga stations. The RE27ND with higher output and more mid high peaking sounds a bit closer to a condenser mic.

"Likely the best dynamic studio mic is a moderately priced Neumann BCM 705. Moderate only by Neumann standards. Some folks prefer the Sennheiser MD-421 for its fairly bright response. I find it a bit grating. But then I'm spoiled by pricy German condenser mics."

Above: Ira Wilner with son Matthew behind an RE20 at WKBK(AM). Wilner suggested the caption, "Act your age. Don't fuss with the mic."

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Joan Baker

Co-founder and vice president of the Society Of Voice Arts And Sciences.

The voice actor, author and coach is at a place in her career where she can afford several quality mics.

"Some I rarely use unless a client specifically asks me to use a certain mic to help better match with previously recorded material. But I'd say the one that sets me apart is my Neumann U 67. I can use it for multiple genres in voice acting especially commercial and narration because it blends the lower, mid and upper tones in a way that seems to add a certain sparkle to my sound. Also, no one's ever asked for their money back, so why fix what isn't broken?"

For remote work in unfamiliar or less than ideally treated spaces she turns to the Sennheiser MKH 416 (below). "I use it for promos as well, because it cuts through with a touch more edge, even when I'm performing in a naturalistic, conversational voice."

She recommends that her students speak to full-time audio engineers and learn to discern the different mic qualities when comparing "apples to apples" under various conditions to choose the best microphone for themselves.

Josh Rath

94.7 and The Mighty 790 KGHL

Rath is the programming manager and afternoon drive host on "94.7 and The Mighty 790 KGHL," which is KGHL(AM) and its FM translator. He also oversees IT operations for Northern Broadcasting System with its 70 or so radio affiliates across four states. Both are based in Billings, Mont.

He too is a fan of the Shure SM7B for studio work. "I'm sure more than half the industry would say the same; but you simply cannot beat a legendary microphone with a build quality tougher than the Terminator."

He adds that the company is beginning the process of a complete AOIP transition.

"If you have the ability, start with all-digital end to end. Provides you total control, all from a nice digital dashboard, of your mic EQ, gate and more."

Above Josh Rath, left, and a Shure SM7B at right.

Martin Stabbert

SVP/Engineering, Townsquare Media

For studio mics, and if cost isn't a factor within reason, the Neumann BCM104 would be near the top of his list.

"To my ear, it offers a nice proximity boost but still maintains a pleasant spectral balance. The single-pattern design is also well-suited for most studio applications and the body doesn't have any external switches to invite unauthorized adjustments." It's also easy to clean, which is more important than ever.

"That said, the real workhorse and one of the best values in the broadcast studio has to be the Heil PR-40. Its cardioid pattern and conventional, end-fire physical design and lack of switches makes it easy to use and difficult to misuse."

He finds the frequency response of the PR-40 smooth and likes its high-end boost for a touch of brightness. "It is an excellent option for most applications and hard to beat from a cost/performance perspective."

For remotes, basic PA or MOS interviews, the Shure SM58 and Sennheiser e835 are his staples. "Both are even available with an on/off switch for applications that might benefit from it."

Stabbert's favorite handheld for an interview that might end up on video is the Sennheiser MD46, with its camera-ready matte finish, low handling noise and suppression of wind and extraneous noises.

Left Neumann BCM 104

World Radio History

Writer

Dan Slentz

Veteran radio and TV engineer, and longtime RW contributor.

Pondering microphone choices in 2021

Will XLR survive in a USB world?

In a world ... full ... of microphones ...

When I type that sentence I hear famed voice-over guy Don LaFontaine saying the words with his golden tones.

Although the world seems full of mics — and new ones coming all the time in the age of the podcast — not all mics are created equal. One size rarely fits all.

With podcasts flourishing and home studios proliferating, a lot of new mics are marketed as "voice mics" or as intended for "podcasting and broadcasting." Some are very good, others may disappoint radio people who have come to expect certain quality.

In recent decades radio, or at least commercial U.S. radio, has tended to gravitate to a few very good models for studio work. For instance, the Electro-Voice RE20 (and its siblings the RE27ND and RE320) are common, as is the Shure SM7 and its variants, Sennheiser MD421-II, Heil Sound PR40 and a few others. You sometimes see Neumanns in radio studios and production rooms as well.

For voice work, it's not uncommon to see a shotgun mic like Sennheiser's MKH 416 being used, despite the original intention of that style for capturing distant sound. A user must know what they're doing to use it for proximity voiceover situations.

Recently, decent USB microphones have hit the streets, and some are variations of mics we know and like, such as the USB version of the Shure SM7, called the MV7.

I've used a few other USB mics along the way for traveling (when a last-minute voice job comes in), and they work well in a pinch. Examples are Samson mics like the Satellite, the numerous Blue mic

World Radio History

Mic Sampler

Here's a list of mics on the market for podcasting and radio work; by no means is this a complete list. **Prices are MSRP.** Important: Veteran shoppers know that most popular mic models are usually sold at a good discount from dealers, so shop around.

ART D7	$269
Aston Stealth	$379
Audio-Technica AT2020	$99
Audio-Technica AT2020USB+	$149
Audio-Technica BP40	$349
Blue BluebirdSL	$299
Blue Snowball iCE	$49.99
Blue Yeti	$129.99
Electro-Voice RE20	$609
Electro-Voice RE27N/D	$700
Electro-Voice RE320	$337
Golden Age Project D2	$150
Heil Sound PR40	$329
M-Audio Nova	$35
MXL V87	$199.95
MXL 990	$99.95
MXL BCD-1	$149.95
Neumann BCM 705	$849
Neumann TLM 103	$1,349
Neumann U 87 Ai	$3,999
PreSonus PD-70	$169.95
Rode PodMic	$150
Rode Procaster	$369
Rode NT1 Kit	$395
Samson Satellite	$148.99
SE Electronics V7	$129
Sennheiser MD 421-II	$399.95
Sennheiser MD 441-U	$999
Shure SM58	$124
Shure SM7B	$499
Shure MV7 USB	$311
Telefunken M82	$459
Zoom ZDM-1	$79.99

Top
The Audio-Technica ATR2100, upper right, is a dual USB/XLR microphone, as seen in the closeup of the connectors above.

Above
The Rode Podcaster Pro

models and Audio-Technica's 2020 USB.

Though it's not common, a few manufacturers have combined USB and XLR connections into one microphone such as Audio-Technica's ATR-2100 handheld.

As I've explored these mics for my own voiceover work, I tend to go back to two mics depending on the job: the EV RE320 and the Sennheiser MKE 600 shotgun, which is more affordable than its cousin the MKH 416.

These are not USB, they have standard XLR connections. If you are married to XLR favorites, carry a XLR/USB adapter with you.

One important consideration is that USB connections are not nearly as durable or "repairable" as an XLR connection.

A different approach is to use a utility XLR-input mixer with a USB port, such as a Mackie ProFX, to get audio into your computer. The biggest advantage of this over an adapter or cable is the ability to take multiple mics (or outboard equipment) into the computer over one connection. The disadvantage is that this system is far less portable if your idea is to make the system portable and/or very simple to connect.

If you have the budget, there are excellent feature-packed dedicated mixers designed to be USB interfaces. A notable example is the Rode Podcaster Pro with multiple XLR inputs, mic processing, built-in

> **"In many cases, list price is meaningless. Veteran shoppers know that street price for most popular models is often much lower."**

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recorder, quick-player pad and multiple headset jacks.

Not to be forgotten are the desktop audio interfaces for getting XLR-sourced audio into a computer. As with microphones, there has been a wave of desktop digital audio converters at all sorts of price and feature points on the retail market. An examination of those would be an article in of itself.

As always, it's advisable to demo a mic before buying. To narrow prospects, the internet can provide a wealth of information and helpful videos.

Above
XLR-to-USB adapters from Polsen, Shure, Roland and Senai.

The website Podcastage, for example, has a video in which the host compares no fewer than 14 dynamic broadcast mics from EV, Shure, Rode, Audio-Technica, MXL, Golden Age, Heil, Neumann, Aston, Telefunken and ART. At YouTube search "All Broadcast Dynamic Mic Comparison."

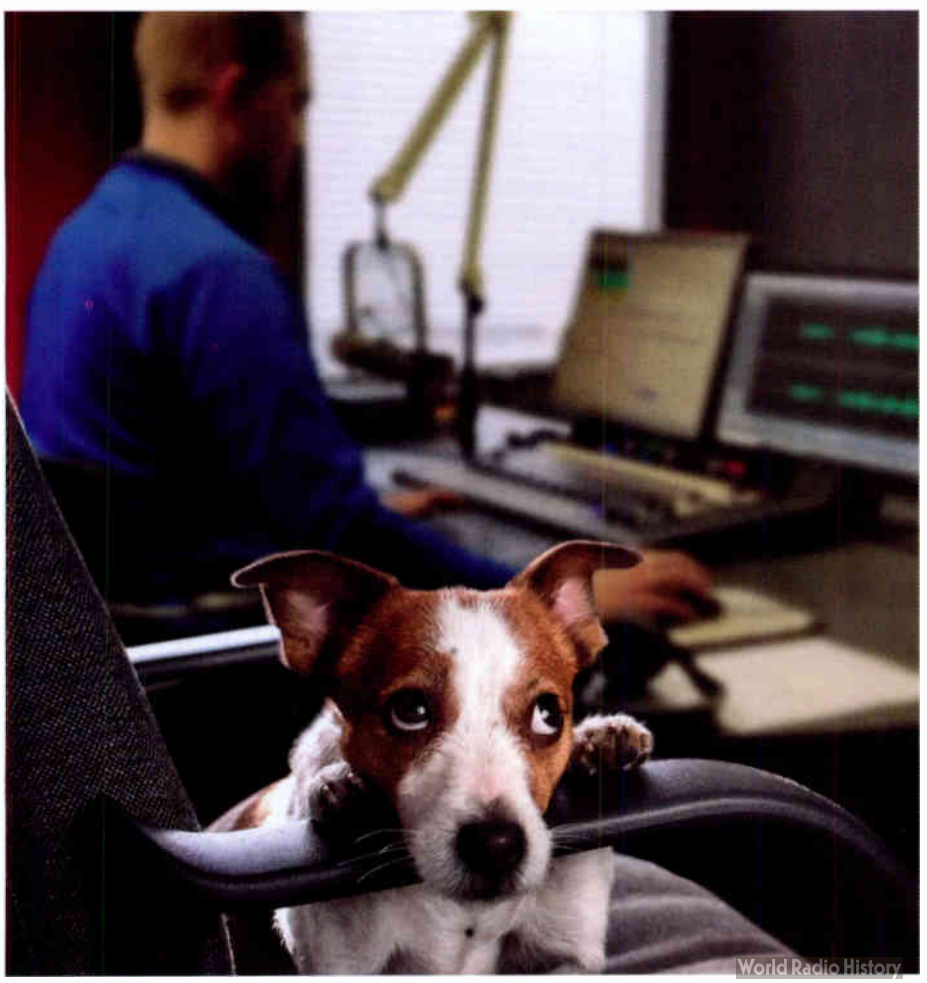
The video is comprehensive, though the way he stacks the mics in his arms at the beginning made me cringe.

Keep in mind that asking someone which mic is best is a pretty subjective question. Voices, rooms, hardware and any processing vary so if you are tailoring the mic for one particular person or situation, that will have an impact on which one to choose.

XLR to USB

If you just can't leave your XLR microphone behind try an XLR-to-USB adapter.

Polsen XLR-USB-48 XLR to SUB adapter..... $51.95
Roland Black Series USB to XLR Cable $35.99
Senal XU-1648 XLR to USB adapter..... $123.95
Shure X2u XLR to USB adapter.....$99



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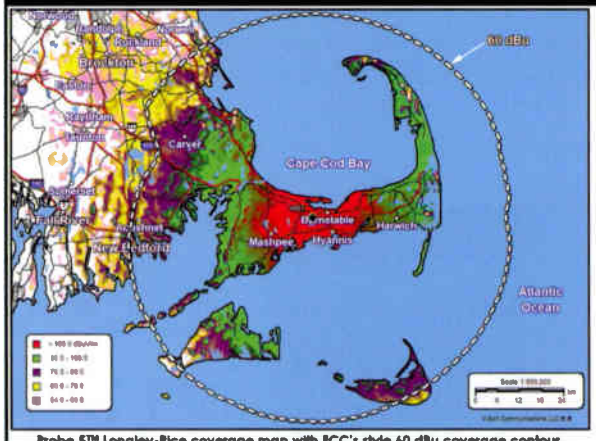

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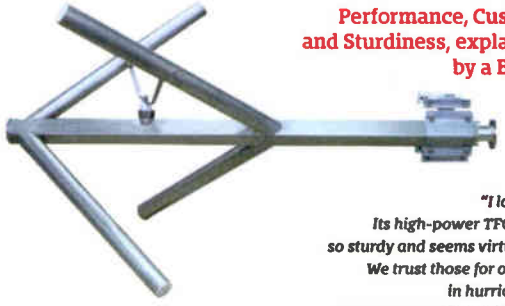

Performance, Customer Service and Sturdiness, explained this way by a Bext customer:

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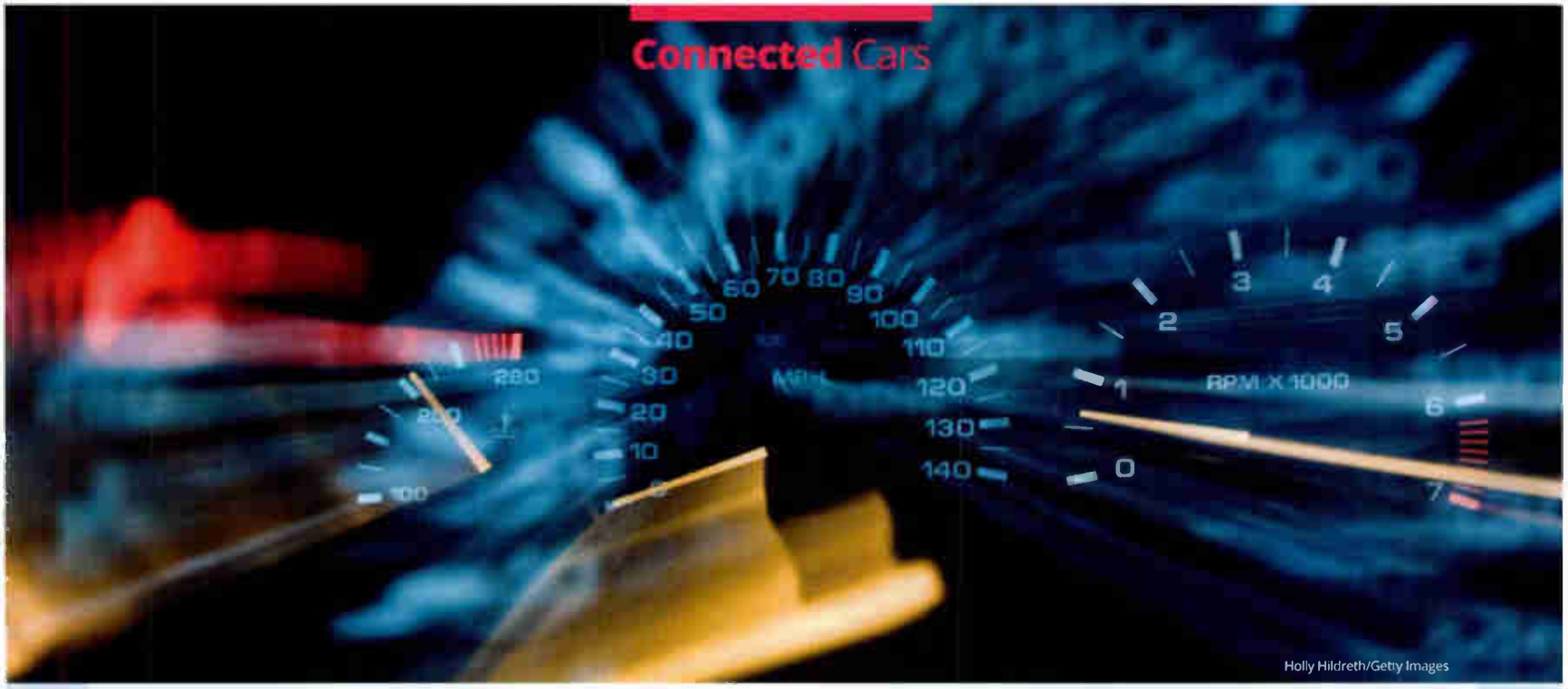

Holly Hildreth/Getty Images

Writer
Roger Lanctot
is a director in the Global Automotive Practice at Strategy Analytics.

Broadcasters conspiring in their own demise

To survive, radio must fix its management of metadata in dashboards

Just a few years ago, Jacobs Media Strategies conducted a study for the National Association of Broadcasters identifying the critical shortcomings facing the broadcast industry in its management and delivery of metadata for its content and advertising.

Prior to the encroachment of the digital age and streaming, this didn't seem like such a high priority.

To its credit, the NAB sought out Jacobs to conduct an audit of digital station content as rendered in automobiles to assess the varying levels of digitalization across the radio dial.

Conducted about four years ago, the Jacobs audit was carried out in three markets and found significant shortcomings in the availability and rendering of metadata in vehicle infotainment systems.

The mere fact that such a study would be conducted at all was clear validation and recognition of the primacy of in-vehicle radio listening.

There is no dial

Just as radios of all kinds — clock radios, boom boxes and Walkman-style portables — have all but vanished, automobiles have increasingly become a key focal point for consuming audio content, second only to smartphones.

Most estimates suggest that in-vehicle radio listening today accounts for 50 percent or more of all radio listening, at least in the U.S. This figure is generally seen as somewhat lower outside the U.S.

The NAB has long recognized the importance of car radio listening — especially after witnessing the rise of SiriusXM, which has built one of the world's most successful and largest networks of subscribers almost entirely upon and through its relationship with auto makers. Rare is the automobile in the U.S. that doesn't leave the factor or the dealer's lot equipped with SiriusXM satellite radio.

The importance of the listening experience in the car is twofold. The listener in the car represents a captive audience — seatbelted in place and focused on the driving task. The infotainment system, previously known as the car radio, is the focal point for content consumption in an environment designed to mitigate distraction.

The big change that has thrust metadata to the forefront, though, is the reality that the "car radio" as we once knew it is gone. There is no radio dial. There is now an increasingly large digital display and a built-in wireless connection.

Now every infotainment system has become something of a "box of chocolates," to borrow a line from Forrest Gump. No two infotainment systems are identical.

At the same time, Strategy Analytics research has shown that even though radio listening in the car is king,

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content consumption more broadly considered is increasingly fragmented. This experience is global and reflects the introduction of app-centric in-dash systems and smartphone mirroring.

The Jacobs Media audit highlighted the magnitude of the problem on the ground in cars on the road today. Jacobs concluded:

- There is room for improvement.
- The display of radio station text and image information is generally inconsistent, creating a sub-optimal user experience.
- The radio industry needs a standardized approach.

Above Xperi's DTS AutoStage is available in Daimler S-Class vehicles.

- Dynamic vs. static information. Some stations provide a static environment for their content, while others use a dynamic approach and "scroll" or "chunk" information, creating a sub-optimal experience that can be harder to read.
- Album art for FM-band HD Radio stations. There is a lack of consistency in the use of display pictures and illustrations when music is playing.
- Case consistency. Some stations use all caps, while others blend in all caps for some items and title case for others.
- There is a lack of consistency during commercial breaks. There is no industry standard for showcasing advertisers during commercial breaks.
- Inconsistent use of available fields. (RDS systems have two available fields for content display. The Program Service (PS) field has both static and dynamic capabilities and is comprised of just eight characters. It typically resides at the top section of the dashboard display. The RadioText (RT) field is comprised of up to 64 characters and is typically on the lower portion of the dashboard display.)
- There are missed opportunities to showcase HD1 (main channel) stations, especially in the spoken word formats.
- HD multicast channels generally lack branding of any kind.
- Format designations need to be reviewed and expanded. Too often, the name of the format of the station is incorrect, or is simply listed as "Other."

In its report, Jacobs Media highlighted these failures with images from in-dash displays.

Four years later a company, Quu, is engaging directly with broadcasters to help overcome the overwhelming metadata shortfall that persists to this day.

This matters because in today's in-dash systems the radio is no longer the default screen. Drivers and passengers have to search for the radio, and may not even recognize it when and if they find it.

Quu is directly taking on this challenge, as is Xperi.

Transformative

The latter has emerged on the metadata scene — actually Xperi has been toiling for the past 15 years to stitch together the back-end infrastructure now capable of delivering what can only be described as radio-as-a-service, or RaaS.

Xperi's Raas platform, DTS AutoStage, aggregates station, artist and genre information suitable for in-dash display clarifying the consistent appearance of what a connected radio should look like while simultaneously enabling non-linear listening with search and program guides along with the ability to integrate events and interactive advertising opportunities, from organizations such as Instreamatic.

Xperi is perhaps best known as a digital radio advocate, with particular emphasis on HD Radio. But the scope of AutoStage is sufficiently transformative that it is enabling a redefinition of the concept of hybrid radio (a combination of streaming and broadcast) pioneered by Audi.

It's true that each automaker has its own idea about what radio should and will look like in the car. At least with Xperi, automakers can start with a consistent look and feel applicable across the globe and capable of integrating analog and digital broadcast sources and rendering them in a familiar fashion in any car.

This Xperi value-add is essential in a market increasingly dominated by Android-based infotainment systems increasingly skewing toward app-based solutions, or smartphone mirroring solutions that exclude broadcast content sources. Xperi's RaaS platform allows broadcasters to compete and allows auto makers to create differentiated systems, while preserving familiarity.

The weakest link — as demonstrated by Jacobs Media in its NAB audit and still in evidence today — are the broadcasters, many of which have yet to remedy the shortcomings in their metadata strategies.

As radio listening declines in automobiles — a phenomenon that Strategy Analytics has documented from consumer surveys conducted over the past 10 years across China, North America, and Europe — broadcasters will have no one to blame but themselves for that fading signal.

The message from the Jacobs Media study, from Quu, from Xperi and from Strategy Analytics surveys and customer clinics is clear: Fixing the management, delivery and rendering of metadata in dashboards is essential to the survival of broadcast radio.

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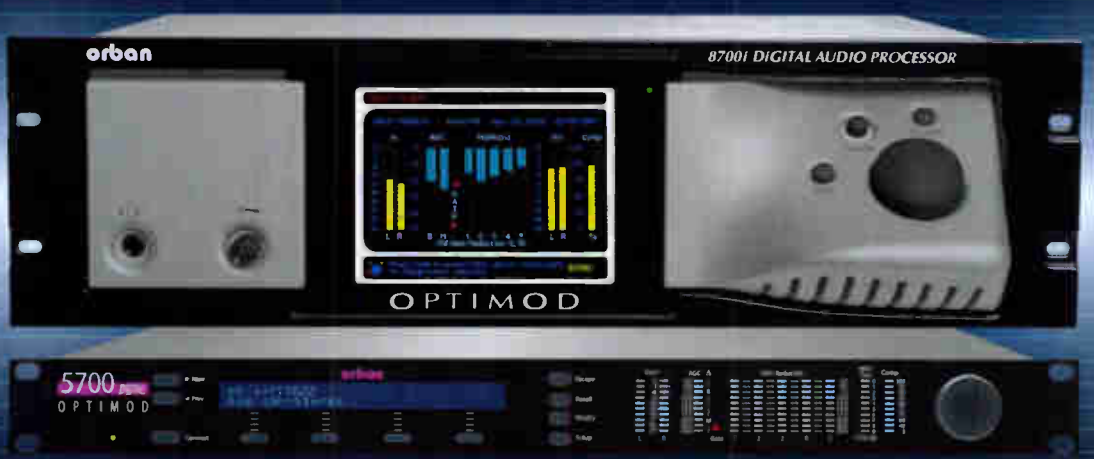

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