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- We continue our look back at seminal radio stations with a focus on KNX in Los Angeles. — Page 3

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- Smartphone/tablet apps for radio technology. — Page 22

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- NAB lays out the argument for redefining radio's competition. MusicFIRST begs to differ. — Page 27

Audi hailed its MMI infotainment technologies for having much faster processing power, allowing such features as SiriusXM with 360L and hybrid digital radio.

Hybrid Radio Picks Up Momentum

With its emphasis on connectivity and data, the ecosystem of the dashboard is changing

TECHNOLOGY

BY RANDY J. STINE

The coronavirus will not delay arrival of more hybrid radio receivers in the United States. Car manufacturer Audi says it will offer the new infotainment technology — capable of receiving terrestrial analog and HD Radio signals blended with streaming audio — in new cars set to arrive at dealerships in the coming months.

In addition, Audi will support the hybrid system from SiriusXM called 360L in ten of its 2021 model year vehicles. Dodge Ram was the first to offer 360L in a 2019 model; and GM announced in December that it planned to bring 360L to a million cars in 2020. But Audi is believed to be the only system with hybrid radio capability that sup-

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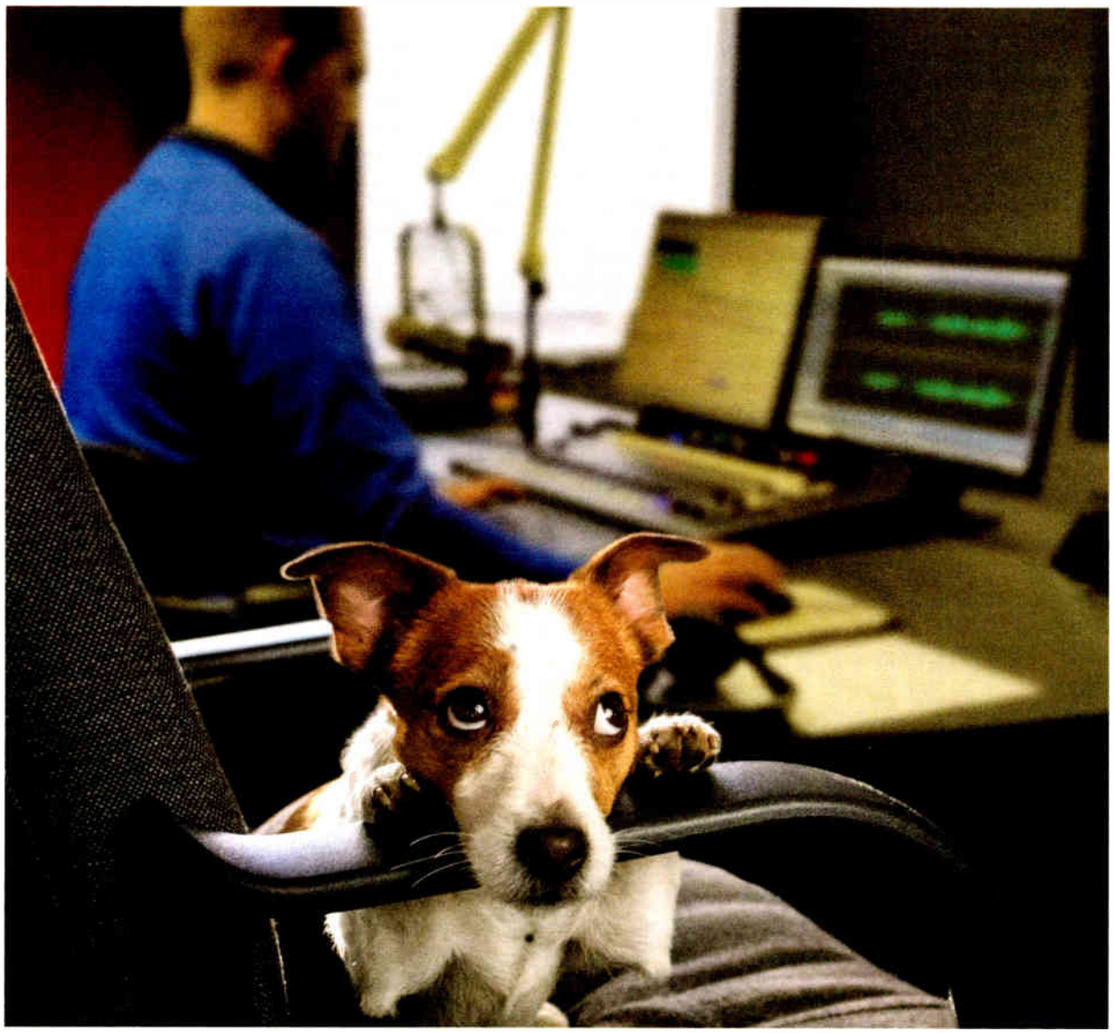

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RADIOWORLD

Vol. 43 No. 14 June 10, 2020

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CONTENT
Managing Director, Content Paul J. McLane, paul.mclane@futurenet.com, 845-414-6105
Senior Content Producer — Technology Brett Moss, brett.moss@futurenet.com
Technical Advisors Thomas R. McGinley, Doug Irwin
Technical Editor, RWEE W.C. "Cris" Alexander
Contributors: Susan Ashworth, John Bisset, James Careless, Ken Deutsch, Mark Durenberger, Charles Fitch, Travis Gilmour, Donna Halper, Craig Johnston, Alan Jurison, Paul Kaminski, John Kean, Peter King, Larry Langford, Mark Lapidus, Jim Peck, Mark Persons, Stephen M. Poole, James O'Neal, Rich Rarey, Jeremy Ruck, John Schneider, Randy Stine, Tom Vernon, Jennifer Waits, Chris Wygal
Production Manager Nicole Schilling
Managing Design Director Nicole Cobban
Senior Design Directors Lisa McIntosh and Will Shum

ADVERTISING SALES
Senior Business Director & Publisher, Radio World
John Casey, john.casey@futurenet.com, 845-678-3839
Publisher, Radio World International
Raffaella Calabrese, raffaella.calabrese@futurenet.com, +39-320-891-1938

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

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KNX, Los Angeles — A Centennial Station

The station will celebrate its 100th anniversary on Sept. 10

BY JOHN SCHNEIDER

This is part of a Radio World series to celebrate early broadcasters as the industry prepares to note the 100th anniversary of what is, traditionally, considered the birth of modern commercial radio. This article was prepared with special assistance from Jim Hilliker.

In 1920, Fred Christian left his employment as a Marconi shipboard radio operator to become the manager of the Electric Lighting Supply Company in Los Angeles. In addition to selling lighting fixtures, he began to offer the radio parts that tinkerers needed to build their own home-made radio sets.

From a back bedroom of his home, Christian also operated his 5-watt amateur radio station, 6ADZ. On or about Sept. 10, 1920, he began broadcasting phonograph records borrowed from a local record store. Music transmission was not prohibited by amateur operators at that time, and dozens of hams around the country were broadcasting on informal schedules.

Fig. 1: KNX 500-watt transmitter in 1926. Paul O'Hana at the controls.

Christian, operating at the bottom of the ham bands on 200 meters (1500 kHz), was only the second radio station to broadcast in Los Angeles to that time. His aim was to promote the sale of radio parts in his store by giving his customers something to listen to.

THE CALIFORNIA THEATRE

In 1920, there were still no fixed regulations governing broadcasting, and the first stations operated under a variety of license classes, such as amateur, experimental or "commercial land station." (The renowned pioneer station KDKA debuted with a new category called "limited commercial" license under the call sign 8ZZ.)

But starting in December 1921, the Department of Commerce required all stations broadcasting news or entertainment to hold a "Limited Commercial" license, and so most of the handful of stations already broadcasting by that date obtained new licenses with new call signs.

By March of 1922, there were 66 such licenses issued. Regrettably, they were all required to transmit their programs on one of just two frequencies: 360 meters (833 kHz) for entertainment, or 485 meters (619 kHz) for market and weather reports.

Thus, Christian's station 6ADZ acquired the call sign KGC, and it was now sharing a single frequency with about eight other broadcasters in the Los Angeles Basin. Those stations met periodically to agree on a shared operating schedule, and KGC was only able to operate a few hours a week.

In May of 1922 Christian made arrangements to broadcast live music from the California Theatre, a prominent silent movie house. He built a new 50-watt transmitter (soon increased to 100 watts), and moved his entire operation into the theatre. The move necessitated a change in operating license, and he was assigned the new call sign, KNX, with the old KGC license being deleted shortly afterwards.

Christian's was one of several stations that changed licenses that year, considered by the government then to simply be the transfer of a station from one license class to the other without an interruption in service. Both licenses were in the name of the Electric Lighting Supply Company, and Fred Christian was listed as the

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Pacific National Bank photo collection

KNX studio building, 5939 Sunset Boulevard, Hollywood.

World Radio History

KNX AT 100

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station manager and operator in both instances.

Calling itself "The California Theatre Radiophone," KNX was now broadcasting live music four or five days a week, featuring Carli Elinor's California Theatre Concert Orchestra and the music of the theatre's organ. A nightly newscast was also featured.

But finances to support the station were limited; advertising was not yet condoned on broadcast stations, and so the entire operation was being supported by the sale of radio parts at the store.

"THE VOICE OF HOLLYWOOD"

In October 1924, Christian sold KNX to Guy C. Earle, publisher of the Los Angeles Evening Express newspaper, who had the means to turn it into a first-class operation. Starting in 1923, stations that agreed to transmit with at least 500 watts and abstain from playing recordings were eligible for the new Class "B" license and their own dedicated frequency, so Earle bought a new Western Electric transmitter and moved KNX to 890 kHz.

KNX was now "The Voice of Hollywood" — on the air from morning to late night with sports, news, informational talks, drama by the "KNX Players" and live evening broadcasts by Abe Lyman's Orchestra from the Hotel Ambassador.

author's collection

CBS/KNX Columbia Square dedication ceremonies, 1937.

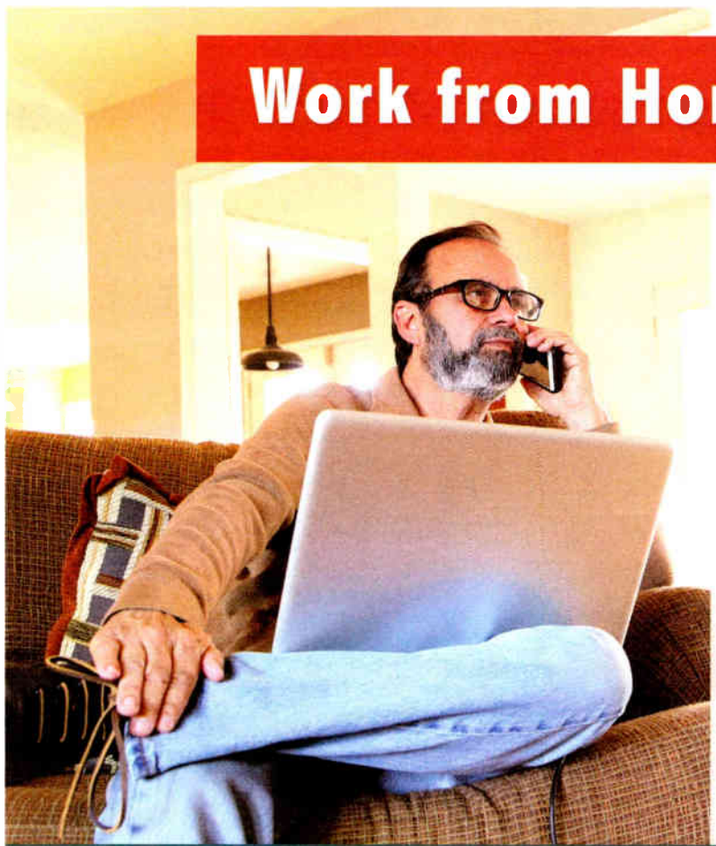
Earle hired Carrie Preston Rittimeister to be his program director. She had experimented with paid programs at another Los Angeles station, and soon had KNX on a paying basis five nights each week. The sponsors were local companies seeking name recognition, and there was a minimum of direct advertising in the programs themselves. By 1925, KNX was showing an operating profit of $25,000.

In 1929, Earle signed a five-year contract with Paramount Pictures, moving the KNX studios onto the Paramount movie lot. KNX was now the "Paramount-Express" station. Taking advantage of its Paramount connections, KNX became the first station to broadcast the Academy Awards in 1930.

In 1929, KNX was awarded 1050 kHz, one of two new clear channels the Federal Radio Commission had assigned to Southern California. A new 5,000-watt transmitter plant was erected in Sherman Oaks in the San Fernando Valley, and a star-studded 24-hour dedicatory program was planned for Nov. 11, at which time KNX would debut its new powerful signal for the first time.

When the dramatic moment came to switch over to the new transmitter, radio listeners heard only a tremendous screech on the new frequency, and then ... silence! After a few moments, the old 1 kW transmitter was coaxed back onto the air.

It was several days before the engineers could sort out the problem and settle KNX into its new channel. Then they discovered another problem: The new 5,000-watt signal was not being reaching out as well as the old signal. Consulting engineers were brought in from across the country to puzzle over the case, and they eventually determined



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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.

that the fault was in the antenna, a 179-foot wire cage suspended between two 250-foot supporting towers. The towers were resonating at the 1050 frequency, disrupting coverage. The problem was ultimately solved by inserting porcelain insulators at the base of the towers.

Guy Earle soon sold his interests in the Evening Express newspaper and devoted all of his energies to KNX, now operating as the Western Broadcasting Company. One of California's renowned engineers, Kenneth Ormiston, went to work planning to increase power on the clear channel frequency — to 10,000 watts in 1932, to 25,000 in 1933 and finally to 50,000 watts in 1934. In all cases, the 1929 Western Electric 5,000-watt transmitter was used as a driver for the high-powered amplifiers built by Ormiston.

After WLW in Cincinnati was allowed to operate experimentally at 500 kW, plans were drawn up for a further increase to 250 kW, but the idea was abandoned in favor of a new half-wave self-supporting tower, constructed in 1935, which greatly increased signal strength at a fraction of the cost of a huge transmitter.

In 1935, Guy Earle bought the 20,000 square foot Motion Picture Hall of Fame building at 5939 Sunset Boulevard in Hollywood, and rebuilt it into the new KNX studio building at a cost of $250,000. It featured six studios suspended on floating floors. Studio "A" was 30 x 60 feet, and Studio "B" featured a new $35,000 Morton organ. Brand new RCA studio equipment was installed throughout.

ENTER CBS

KNX was now a powerhouse station, with a powerful signal covering eleven Western states a night. It's 1935 gross income of $675,000 ranked it among the six highest-billing stations in the country.

But the FCC became aware that much of that revenue was coming from the advertising of patent medicines, which the commission was seeking to eliminate from the airwaves. It decided to make KNX into a test case, and it set its license renewal for hearing over its advertisement of Marmola, a miracle fat-reducing product that the Federal Trade Commission determined to be ineffective and dangerous.

The hearing in October 1935 did not go well, and the KNX license was now in serious jeopardy.

In 1936, under pressure over the license hearings, Earle sold KNX to the CBS network for $1.25 million. It was the highest price ever paid for a single radio station to that date.

Postcard photo, author's collection

CBS/KNX Columbia Square, 6121 Sunset Boulevard, Hollywood.

KNX was now CBS's key station on the West Coast, and would soon become the home base for CBS's Hollywood program origination.

In January 1937, CBS moved its Los Angeles network affiliation to KNX from KHJ and the Don Lee network, which caused a major realignment of network affiliations up and down the West Coast. Then on April 30 1938, KNX and CBS moved into its new $1.75 million Columbia Square studio complex at 6121 Sunset Boulevard. It would be the origination location for dozens of CBS radio shows heard nationwide over the next decade, featuring stars such as Jack Benny, Bing Crosby, Burns and Allen. (KMPC then moved into the former KNX Sunset Boulevard building.)

In September, 1938, CBS debuted a new KNX transmitter complex on a five-acre parcel in Torrance. A gleaming new RCA 50-D transmitter was showcased in a streamlined domed building that was open to the public for regular tours. A new 500-foot guyed tower propelled the KNX signal across all of the Western states in the evening hours. In March 1941, KNX moved to its present frequency of 1070 kHz after the nationwide NARBA treaty adjustment.

As network radio transitioned to the disc jockey era of the 1950s, KNX adopted a middle-of-the-road format, featuring personalities like Steve Allen

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author's collection

The RCA 50-D transmitter installed at KNX in 1938. The photo has been colorized.

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HYBRID RADIO

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ports terrestrial FM radio as well.

OPEN STANDARD

Hybrid radio combines one-way "over-the-air" terrestrial or satellite radio reception with two-day online connectivity and streaming content, to create a new kind of platform in connected cars (see related story, page 8).

The hybrid functionality was announced by Audi of America as part of its Generation 3 infotainment technologies expected to arrive in most 2021 Audi vehicles this fall. Here is how Audi described hybrid digital radio functionality in that announcement: "For terrestrial FM or HD FM radio listeners on the go, hybrid digital radio allows them to continue listening to the same channel even after driving outside of the channel's range. Either automatically or by request, once the hybrid radio senses a weak radio signal, it will switch to the online, digital version of the same channel. Conversely, the channel will switch back from a digital to a radio signal when it senses better reception.Upon cycling a vehicle off and on again, the digital radio station will continue to play."

The spread of hybrid capabilities could set up a critical period of preparation by U.S. broadcasters, according to radio industry observers, as a wider rollout of the new technology gains footing.

Several technology companies are trying to establish themselves in the hybrid radio marketplace in the United States and abroad. DTS Connected Radio, Radioline, Radioplayer and even Audi are "in some ways competing with each other, and in other ways working together," according to a spokesman for the National Association of Broadcasters.

RadioDNS is an open standards platform that can interface with multiple aggregators. "RadioDNS is the connection between radio broadcasting and online," as described by one observer.

Audi radio development engineer Christian Winter said during a recent NAB webinar that the carmaker's hybrid radio will support any radio station that offers data in the RadioDNS service format.

That metadata in a terrestrial radio station's signal stream can include song artist and title and streaming URLs, so the hybrid radio receiver knows where to find the streaming audio. In the case of Audi, the process is completed by RadioDNS, Winter said.

RadioDNS allows for the seamless transition between the terrestrial radio signals and the mobile broadband connection and will accommodate up to 30 seconds of delay between OTA and streaming audio, according to experts. "If the delay is more than 30 seconds the listener will hear a jump," they said.

BMW offers a radio receiver in the United States that uses the RadioDNS database standard to populate radio station guide information including station logos via IP, according to NAB, but does not use streaming audio.

Xperi uses RadioDNS as one of the data sources for its offering, called DTS Connected Radio, according to NAB.

This Audi screen shows four FM stations. 107.3 K-Love is selected and its online stream is playing as indicated by a small Web icon at right. 106.9 KCBS and 107.7 The Bone support hybrid radio seamless linking, indicated by a small arrow in their FM icons at right. (Note that the logo from KCBS provided via the RadioDNS standard has a transparency channel so part of it is invisible on black; if the station updates it to a more readable version, the hybrid radio gets that update within a day.)

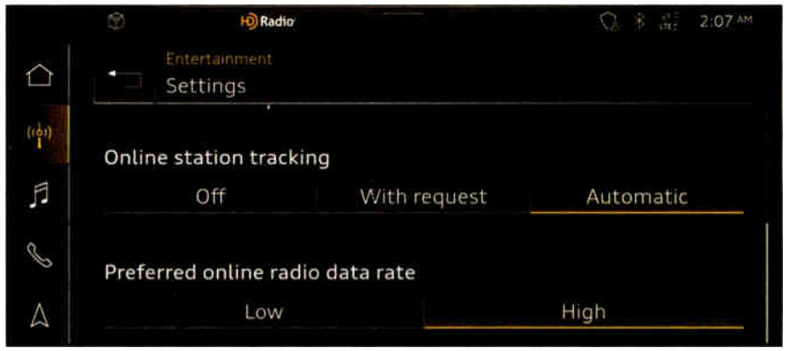
Meanwhile, broadcast advocacy groups like NAB are pushing radio broadcasters in the United States to prepare for "embedded wireless connectivity in modern vehicles" rather than through connected smartphones. In fact, built-in modems in new vehicles will support two-way initiatives, industry experts say, which will be critical for gathering listener data.

New connected cars are expected to feature over-the-air radio reception in addition to internet IP technologies via LTE network connections, experts say, which in turn combines the two ways of listening to radio using a seamless linking process. Those "real-time analytics on listening habits" would be viewed as crucial data for radio advertisers.

Those familiar with how hybrid radio works say once noise is detected in the FM signal, the switching technology transitions the radio to IP technologies and broadband.

ADDITIONAL COSTS

Streaming fees associated with hybrid radio are something NAB is making broadcasters aware of, according to



In Settings, online station tracking can be set to "on request" or "automatic." If the latter, the system detects decreasing FM signals and starts the web stream automatically, and vice versa in the presence of a strong OTA signal. To achieve smooth blending, the receiver aligns audio volume and delay.

KNX AT 100

(continued from page 6)

and Bob Crane, who broadcast his popular KNX morning show from 1957 to 1965 before leaving to become the star of the TV series "Hogan's Heroes."

In September 1965, vandals cut a guy wire, destroying the KNX tower. The station operated from a 365-foot unused tower acquired from KFAC until a new antenna could be built. An experiment using both antennas as a directional array during the 1960s was abandoned, but both towers still exist today.

Bob Crane at KNX, about 1960.

The 365-foot tower is now the KNX standby antenna, located inside a city park in Torrance.

In April 1968, KNX adopted an all-news format, which has successfully maintained it as one of the top ten news stations in the country. Entercom Communications acquired KNX in 2017 when it merged with CBS Radio. KNX will celebrate its 100th anniversary on Sept. 10, 2020.

John Schneider is a lifetime radio historian, author of two books and dozens of articles on the subject, and a Fellow of the California Historical Radio Society. He wrote here in April about Lee De Forest, and last winter about the centennial of KRJ, perhaps the first in the U.S. to achieve a century of continuous broadcast activity.

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David Layer, vice president, advanced engineering for NAB.

"The receiver will time-align the streaming and OTA signals in the background while the OTA signal is strong, so that the receiver is ready to accomplish the seamless transition when necessary," Layer said. "During this alignment procedure, the broadcaster may incur performance rights fees on the stream even though no one is listening to it."

He continued, "One possible approach being considered to minimize this issue is for a broadcaster to provide geographic information to a receiver describing where the station's OTA signal should be strong enough to not require any streaming audio usage. The receiver, which is location-aware, would not use the streaming signal while within that strong signal area."

Layer said the accessibility of URLs used in hybrid radio could also be an issue for some radio broadcasters.

"Sometimes the publishing of streaming URLs can create security concerns for radio broadcasters," Layer said.

Hybrid radio will also add customized capability to listen to on-demand content like podcasting, those familiar with the technology say. Supporters of hybrid radio often compare the concept to that of smart TV.

MORE COMING

Industry observers say traditional over-the-air radio is trying to differentiate itself in the auto dashboard to minimize the loss of traditional radio listeners to other audio services in the era of Apple Carplay, Android Auto and now Alexa integration. Hybrid radio platforms are capable of integrating FM, DAB+, HD Radio, IP streams and podcasts.

DTS Connected Radio by Xperi, the company that developed HD Radio, is expected to announce further development details about their hybrid radio digital platform later this summer once its $3 billion merger with TiVo is completed.

Xperi says product development and/or integrations are underway with OEM manufacturers and suppliers such as Visteon, NXP, Hyundai/Mobis, Harman, Panasonic Automotive, LG Electronics, Alpine Automotive, Karma, Byton and others.

Harman, LG and Panasonic have shown implementations of DTS Connected Radio at CES.

The NAB itself has had a presence at recent CES shows to showcase innovation in radio and strengthen ties with the automotive industry and develop strategic approaches, Layer said.

Industry observers point to "detailed analytic data on listening" as one of the most important features of hybrid radio. Xperi says its hybrid radio system create a "two-way feedback flow" that is measured and sent to the radio broadcaster.

Bob Dillon, senior VP of Connected Radio for Xperi, wrote about the capability in a guest commentary for Radio World earlier this year: "The radio station can learn when people tune in and what made them leave. Did they tune in another radio station? Shut off the car, or did they drive out of coverage? How long did they listen? Ultimately, that's all available audience flow data over time. Hybrid radio is able to provide measurement of their total audience and how that audience flows in and out of their station throughout the day."

In addition, Radioline, in collaboration with Panasonic Automotive Systems Europe, announced this spring it was launching a hybrid radio application, which is compatible with Android Automotive OS.

Xavier Filliol, Radioline COO, told Radio World in an email "all usage data could be collected from listeners of the app."

PILOT WORK

Meanwhile, the NAB's innovation initiative, known as PILOT, continues to chart the way through a variety of hybrid radio industry initiatives and is working with RadioDNS on the hybrid radio rollout.

Its Connected Radio Evaluation Unit (CREU) project, using a CREU device provided by Xperi, wrapped up its work in 2019, Layer said.

"The PILOT CREU project resulted in a 'proof of concept' hybrid radio user interface (UI) and was conducted under the auspices of the NAB Auto Initiative Committee. Some features supported by the UI include on-demand content (instant traffic and weather, podcast con-

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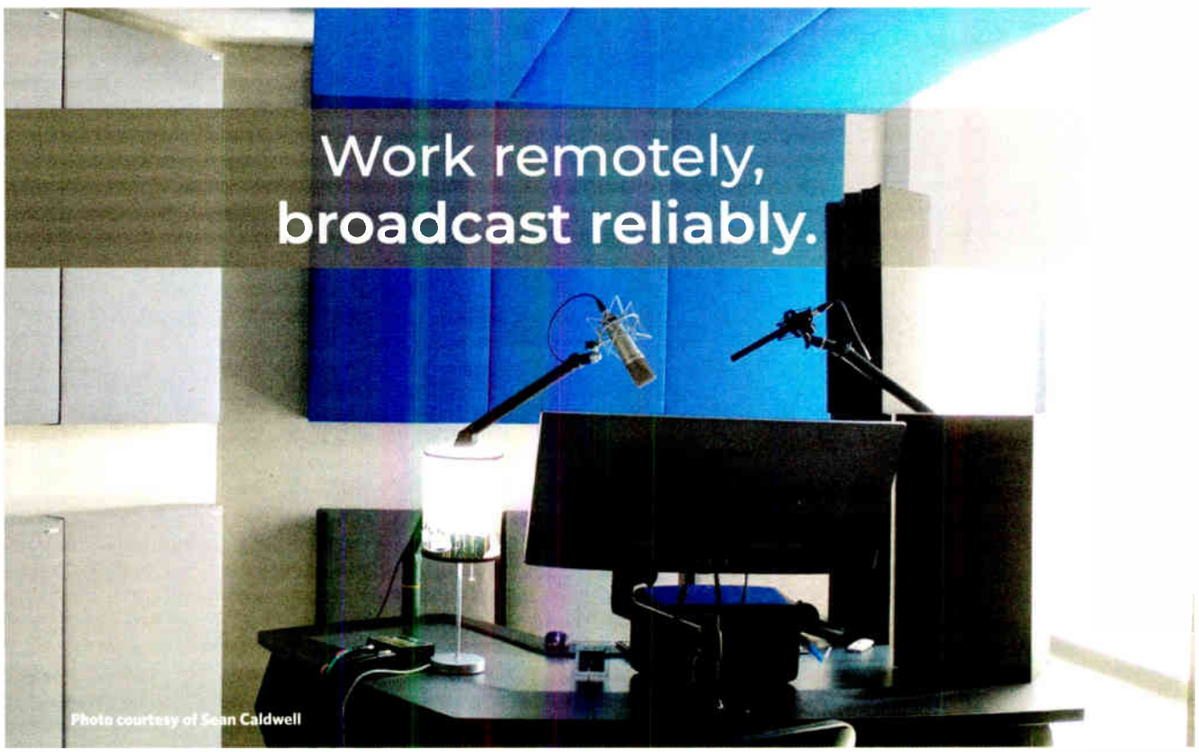

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HYBRID RADIO

(continued from page 7)

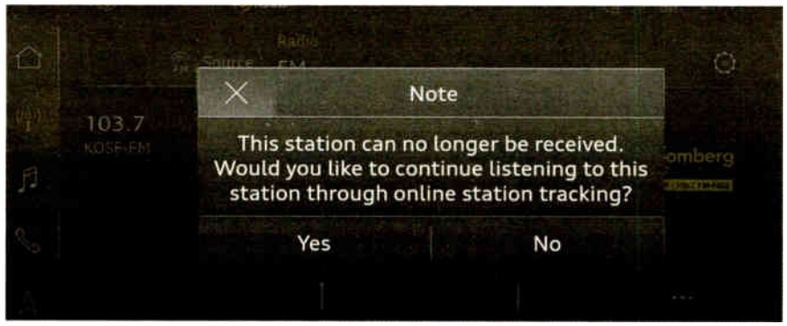
tent) and a TEXT button which sends the metadata for the currently playing song to a user's smartphone," Layer said.

To support hybrid radio services, broadcasters will need to register with RadioDNS and publish the necessary metadata and streaming URL information in a secure and controlled manner to ensure ease of access and consistency for the in-vehicle implementations, according to NAB.

Several sessions from the online NAB Show Express in May featured hybrid radio presentations. Layer said during one session that "U.S. broadcasters are really not positioned yet to fully take advantage of hybrid radio technology, so there is an opportunity to start developing the technology to take advantage once there is a greater percentage of hybrid radio receivers in the market."

There are differences in how RadioDNS works with multiple aggregators and the DTS Connected Radio platform, according to NAB. Those include how internet data is provided to the receiver, Layer said.

"The Audi vehicles will actually have an online radio button. DTS's plan is to be more broadcaster-focused and only provide the streaming audio versions of the over-the-air signals," Layer said.



When FM reception is weak, and if the user has set station tracking to "with request" (see prior photo), a system-wide popup will appear on the Audi receiver inviting the listener to switch to the online stream.

Broadcasters will need to register with RadioDNS and then develop a service information (SI) file, Layer said, which includes all the information on finding station logos as well as the broadband stream for hybrid radio receivers.

The NAB Show Express session identified several technology developers, including Quu Interactive and Pluxbox, capable of helping broadcasters with RadioDNS registration and developing the SI file.

Meanwhile, Xperi says it maintains a global database of radio station frequencies, formats, artwork and audio streams to provision hybrid in-vehicle radios using its DTS Connected Radio platform.

Nick Piggott, project director for RadioDNS, emphasized during an NAB webinar the importance of U.S. broadcasters signing up for hybrid radio.

"In the connected car the dashboard presents visually rich navigation, a consistent experience and often personalized, which means the challenge for radio is to improve its functionality and presentation to remain prominent in the dashboard," Piggott said.

RadioDNS, whose membership includes iHeartMedia, Beasley, Entercom and Cumulus, allows "agile reception" for the listener, Piggott said, which means a hybrid radio receiver can switch between broadcast and streaming, depending on the best experience for the listener.

Hybrid Radio, Some Context

Radio World asked James Cridland, a consultant and radio "futurologist," for some context on the state of hybrid radio.

***Radio World:** Can you break down what hybrid radio is?*

James Cridland: The word "hybrid" means different things to different people. With a typical analog FM receiver, when the radio tunes into 104.9 MHz it knows nothing about the radio station other than the fact it's on 104.9 FM (and, perhaps, an RDS signal).

With a hybrid FM receiver, when the radio tunes into 104.9, it then goes onto the internet to find more detail about what the station is. That might mean a station logo or more program information. But your radio might also discover where the station is streaming, so that you might leave your home in San Francisco listening to 96.5 KOIT, and once you're out of the coverage area on FM for the station, the radio might switch automatically to the internet stream, so you stay with your favorite station without any fiddling with your mobile phone or hitting buttons.

Importantly for broadcasters to know, hybrid radio receivers prefer broadcast radio, so they will switch back to terrestrial FM as soon as it can.

***RW:** Tell us what you know about RadioDNS and what auto manufacturers in the United States are looking at. Could we have competing hybrid radio systems in different auto manufacturers' cars in the States?*

Cridland: RadioDNS is one of the data sources that Xperi uses for DTS Connected Radio. With RadioDNS, broadcasters themselves have total control of their data: They publish it on their own servers, and RadioDNS tells computers where to find it. The data is freely available to anyone who wishes access to it.

The DTS Connected Radio platform uses a lot of different data points from a variety of places, including their own proprietary data work, as well as RadioDNS data. RadioDNS's data is authoritative, from the broadcaster themselves, so typically companies like Xperi or Radioplayer will take data directly from RadioDNS where it exists, and fill from other sources where it doesn't.

For the car manufacturer, their choice is to implement RadioDNS's tools (which are open and designed not to require a central server system); or to implement similar services from Xperi or Radioplayer's WRAPI, which are more complete, but which have a commercial model.

For the broadcaster who wishes to retain full control of their data, they should implement RadioDNS's tools, which will help keep your data updated on these other services as well.

James Cridland

With RadioDNS, broadcasters themselves have total control of their data.

— James Cridland

***RW:** Is two-way "interactive" connectivity for terrestrial radio a "must have" capability in hybrid radio?*

Cridland: Depends what you mean by interactive. RadioDNS allows broadcasters to, as one example, make a button that would allow me to request more information about what I'm hearing, which might be a commercial, might be a song or maybe be a talk topic.

Broadcasters can deal with that request however they like, whether that's to send a push notification to your phone, or to send you an email. The technology certainly allows that kind of interaction, and some broadcasters have experimented with it; but there's a chicken/egg scenario here. Until the majority of broadcasters support it, it's unlikely to be built-in to receivers. There's also, to be honest, a question of whether audiences want it.

***RW:** Hybrid radio has been a big part of NAB's "automotive initiative" in the States to keep radio relevant in the dashboard. How do you think the plan is unfolding?*

Cridland: Broadcast radio's ideal would be to have one simple preset list in the car — one that allows my favorite FM station right next to my favorite SiriusXM station, and perhaps an internet radio station there, too. A hybrid receiver that uses FM and IP means that old-fashioned FM looks and works just as well as SiriusXM or even Spotify in the same vehicle; bright and vibrant artwork, clear audio that never disappears, stations which are easy to find.

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A Good-Looking Weld Is Not Always a Good Weld

Also, here's an industrial and business surface sterilizer (if you can get your hands on one)

WORKBENCH
by John Bisset
Email Workbench tips to johnpbisset@gmail.com

Broadcast contract engineer Tim Walker wrote in to say how much he enjoyed reading solutions to problems from engineers in the field. It's reassuring to see the display of engineering talent visible in the pages of Workbench.

Tim shares an experience with a Collins/Continental "Power Rock" 5 kW AM transmitter. This is a pulse-width-modulated transmitter that, in Tim's case, was intermittently losing modulation of the RF envelope.

The culprit turned out to be a broken connection to the grid of the triode switch modulator tube (Fig. 1). The soldered connection appears solid but was in fact broken, making intermittent contact with the grid ring as the temperature fluctuated and it vibrated from the high volume of cooling air through the tube compartment.

When Tim finally identified the problem, he was reminded of the welder's adage: "A good-looking weld is not always a good weld, but a good weld always looks good." The same applies to electrical connections, so take nothing for granted when tracking down intermittent problems.

Early in my career, I was working with a consulting engineer, brought in by the station to try to determine why the transmitter would occasionally shut down, while the directional parameters went nuts. The consultant and I walked to every tower. Using a long wooden broomstick, he rapped components in the base antenna tuning units, followed by a good rap to the coiled copper tube feedline to each tower. The station chief monitored operation and communicated the status over a two-way.

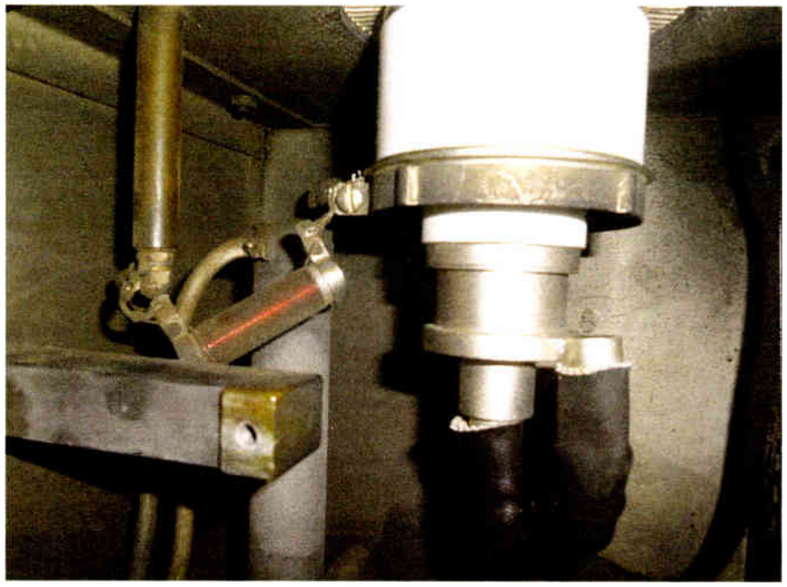


Fig. 1: With power off and circuits discharged, test the security of connections.

On the third tower, when the consultant whacked the copper feed tube, it broke right off the tower! The weld "looked" OK, but a good-looking weld is not always a good weld.

Connections need to be secure. This is especially true in older AM arrays.

Projects engineer Dan Slentz and I were remembering the days of the big 50 kW transmitters, and the way the coils would "sing" with the modulating signal. You could actually hear the demodulated signal singing inside the transmitter, as well as in the tuning units at the tower base.

Dan found a memorable video on Reddit to share these memories with Workbench readers. Head to *www.reddit.com*. In the search block enter "Never touch an AM radio tower."

This would be a good video to post for your entire staff to watch. Hearing the advertisement's phone number as the battery cable is arcing across the tower base is nothing short of amazing to someone who hasn't experienced it.

The fact that you "work" on this stuff as a broadcast engineer should amaze your staff as well. Show it to them! Just another day in the life of a broadcast engineer.

Griffin Communications' Radio Engineering Director Brett Gilbert, researching a simple way to decontaminate surfaces, found an interesting product from CureUV (*www.cureuv.com*).

The company specializes in ultraviolet light sources that sterilize surfaces.

Fig. 2: Check out this video on Reddit. Search "Never touch an AM radio tower."

One particular model that looks promising is the GermAwayUV Premier 35 Watt Handheld UVC Surface Sterilizer.

This handheld device is about the size of a cigar box and is supplied with a 6-foot AC cord. It is smaller than CureUV's other industrial sterilizers and is priced at under $400 list. The device will effectively decontaminate surfaces

Write to Radio World

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

World Radio History

Fig. 3: This is one way to make sure your surfaces are clean.

from viruses, bacteria and molds.

It provides a quick and easy way of sanitizing surfaces, as you plug it in and slowly pass the lamp over the surface to be sanitized. The bulb lasts up to 10,000 hours (about 1 year). In addition to the UV-C emitting bulb, brightened reflectors enhance the accuracy by up to 30%.

UV-C light is ultraviolet, in the C spectrum, and is especially efficient at destroying harmful microorganisms. In addition to being effective against a range of viruses, the UV-C light can be used to remediate mold, quickly killing mold spores.

UV-C light has a range of applications both residential and industrial. It's used in food preparation settings to reduce contamination, as well as in hospitals, clinics and veterinarian offices to sanitize surfaces. The company offers a caution that Ultraviolet UV-C light is harmful to your eyes and skin, and users should never look directly at the bulb. The company recommends the use of safety glasses that can be ordered with the device.

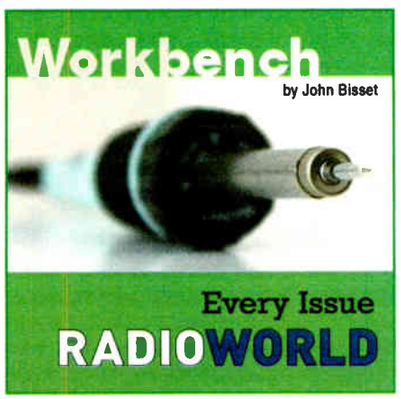
But how do you know it's working? As I read the description, that was my first question; I wondered whether this was snake oil.

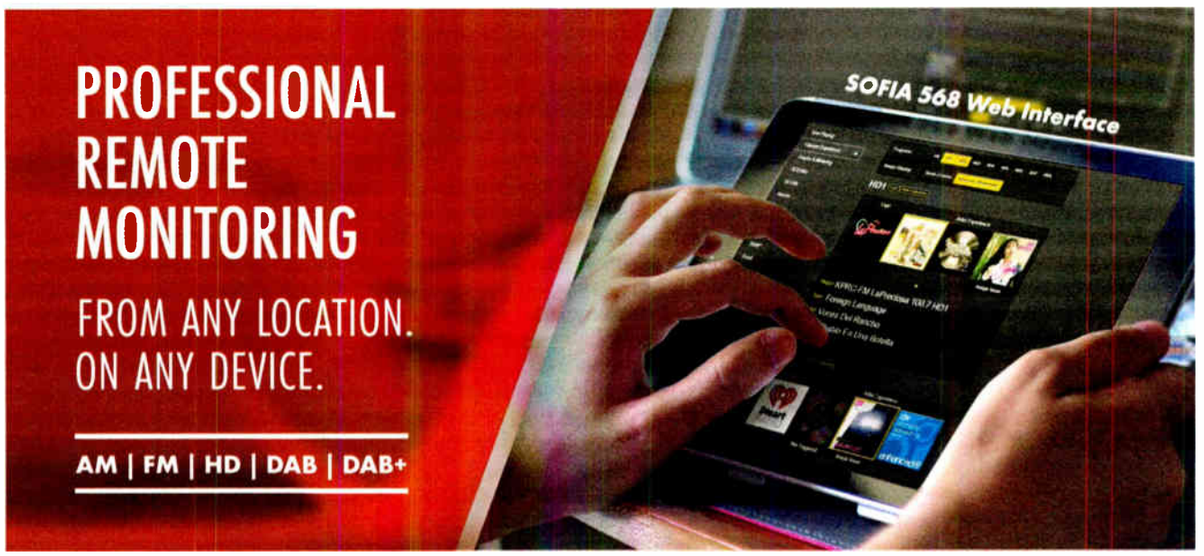
The company acknowledges that this is a natural question, since disinfection is happening at a microscopic level. It includes a set of UV-C Visualizer Strips along with all GermAwayUV Surface Disinfection products. You place the UV-C Visualizer card on the surface you wish to disinfect and run the handheld sterilizer over it. The yellow strip on the card will change from a bright yellow to a light green.

Exposing the surface to the UV-C light until the strip turns green will ensure the surface has been treated properly, the company says. If there is no color change, you have to slow the rate at which you move the handheld sanitizer across the surface, or move the sanitizer closer to the surface.

The website was citing a shipping delay of eight to nine weeks at this writing. If you or your station invests in this device, please drop me a line to tell readers how it works out.

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





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Seven Traits of a Good Engineer

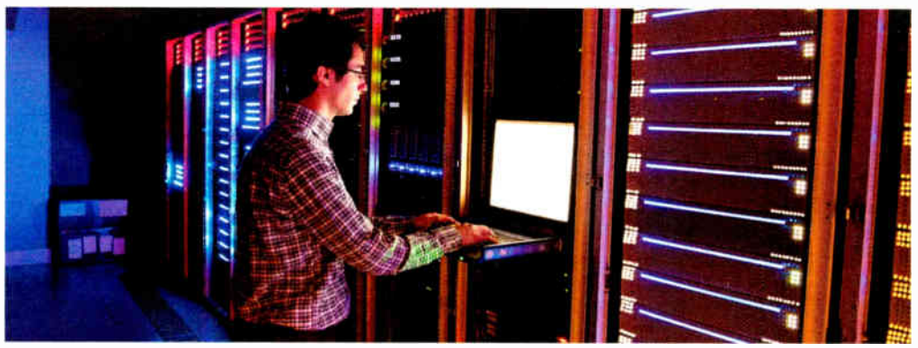
It's as much about people as it is about technology

The list below was compiled by our friend and colleague Larry Wilkins and is excerpted from our recent ebook "Radio Engineering in Crisis?"

The premise of the ebook, which was released not long before coronavirus took over the headlines, was that there is fresh and more urgent concern about the state of the radio engineering profession, with growing awareness at upper levels of management and ownership, and efforts being made by more companies and broadcasters to finding answers, perhaps because more job openings are going unfilled.

In the ebook, other experts like John Poray, Geary Morrill, Mike Cooney, Roz Clark, Michael Beach, Steven Keeler, Gary Kline and Wayne Pecena share their views about the state of the profession and what should be done about it.

You'll find it at *radioworld.com/ebooks*, or under the Resources tab of the website.



This list is provided to students of training classes held by the Alabama Broaccasters Association. It was provided by Larry Wilkins, ABA's director of engineering services.

1 HAVE EXCELLENT ORGANIZATION

Establish effective routines for everything you do and use the simplest tools to get the job done. That is a good way to stay mentally organized.

2 ARE CONTINUOUSLY LEARNING

Equipment is constantly changing and getting more complex and sophisticated. But even without chasing the latest software or hardware solution, we need to be on a path of continual learning in our craft ... where art and science meet to create new experiences.

What does it take to be great at what we do? We have to know the science of sound, the art of creating the product for the listener, how to have a servant's heart, and how to work with other people. If you are in a leadership role, then there's even more to it.

Finally, think about learning with a VERY open mind.

3 HAVE A GOOD ATTITUDE

Without a good attitude, you will make enemies and stunt your growth as an engineer. But with a good attitude, you'll be more able and willing to learn, take direction and properly support the rest of the team, sales, programming and management.

If you love your work then you'll have a good attitude about it. That means being positive, being helpful, and doing your best.

Maybe you don't feel like your work is respected? Why is that? Is it based on a comment someone once said or a lack of regular appreciation? When you have a good attitude, people want to be around you, help you when you have problems, and are more likely to compliment you. And, as I mentioned, the better attitude you have, the more likely you are to do your best work ... and that's something that definitely gets noticed.

4 SERVE AS MENTORS

Nothing fosters your growth or that of the team faster than sharing the ideas and working to support the best ones. When we get to a certain skill level, it's time we spent some of our time teaching what we know.

5 HAVE GOOD PEOPLE SKILLS

The people skills will almost always win out over the technical skills. No one wants to work for the "genius" that treats others poorly.

A successful engineer is one who knows how to talk to people, work through problems, accept responsibility for mistakes, and keep others updated on important pieces of information.

6 HAVE GOOD TECHNICAL SKILLS

- Do you know how to use a volt meter?
- Do you know how to solder jacks to a cable?
- Do you know the different properties of a microphone and why they are important?

7 LISTENING

This pairs well with having good people skills. if someone complains the way the station sounds, ask questions to find out what did they hear that didn't sound right. Don't assume they are wrong just because you are the engineer, LISTEN to what they say and you'll find out if it was a problem with your setup or where they were listening.

Likewise, be slow to defend yourself or your work. If there is a complaint or a problem, listen to what's said, and once the person has nothing left to say, then you can either explain your side of things or explain the reason for the problem.

I know this sounds cliche but you'll learn far more from listening that you will by talking.

While we are talking about listening....listen to your station! We have to have a critical ear so we learn to listen to the specifics of sound. We must train our brains how to listen critically and [know] what to do with that knowledge. Get your ears used to what real music sounds like, without any system and the associated distortion involved.

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Best Practices for AM Directional Systems

More ideas to help keep these engineering marvels running

TECHTIPS

BY MARK PERSONS

Read the first part of this discussion at *radioworld.com*, search key phrase "Best Practices for AM Directional Antennas."

In our earlier exciting episode, we promised a real-life story. There are many, but here is my favorite:

Years ago I was doing contract engineering work for KKCQ(AM) in Fosston, Minn., about 140 miles from home. It was nondirectional day, with a three-tower directional antenna system at night. I just happened to be there one morning doing maintenance in the studio/transmitter building when the 5 kW AM transmitter shut down.

I was pushing the plate-on button when a man walked in and said we should go out to the parking lot. There it was: His potato chip delivery truck had snagged a guy line and pulled the center tower down onto the parking lot and beyond. Trucks like that are large because potato chips take up a lot of space while weighing next to nothing.

The downed tower was just 197 feet so there wasn't a resounding crash when it fell. Astoundingly, no one was hurt, no vehicles were hit and there was little other damage.

The first order of business was to call the power company to have guy lines carefully lifted from overhead power lines.

You guessed it, that now-horizontal tower was the non-directional day tower for the station. Needless to say, the station was off the air. What to do about putting the station back on?

Well, two of the three towers were still standing. I used some #8 electrical wire to make changes in the phasor cabinet, sending all power into the north tower. The tube-type transmitter ran nicely at 1,000 watts even with some VSWR. More power was not going to happen that day because the antenna coupling network was designed to put no more than 1,000 watts into that tower.

Fig. 1: Silicone spray can be used on RF contacts.

On the positive side, I was the "hero of the day" because the station was returned to the air just in time for Paul Harvey's noon news and commentary broadcast.

D VS. ND

In the final analysis, KKCQ ownership looked at losing a tower as a blessing. The 2,500-watt night directional pattern, pointing north, served very few listeners while putting noticeable nulls in populated areas of town, just to the west.

They elected to go non-directional day and night. The station returned to 5 kW on the north tower during the day with 90 watts at night. That 90 watts is sufficient for the community and the directional nulls are gone. They sold the phasor and antenna monitor.

With that money, and insurance compensation, they had a good start to building an FM station. They've not looked back and have lived happily ever since.

KKCQ ran a Gates BC-250GY AM transmitter at 90 watts during night hours, which was becoming expensive to maintain. Replacing it with a Broadcast Electronics AM-5A transmitter was a wonderful choice. That 5m000 watt transmitter will run with good sounding/clean audio at the 90 watt night power level. The design is perfect for that kind of drastic power cutback. Most transmitter designs can't give good audio performance at less than 10% of rated power output. Another station I worked at uses

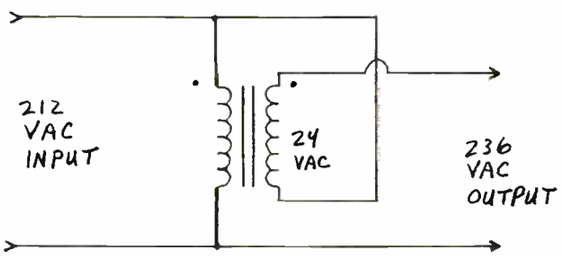


Fig. 2: Boost transformer circuit to raise contactor voltage.

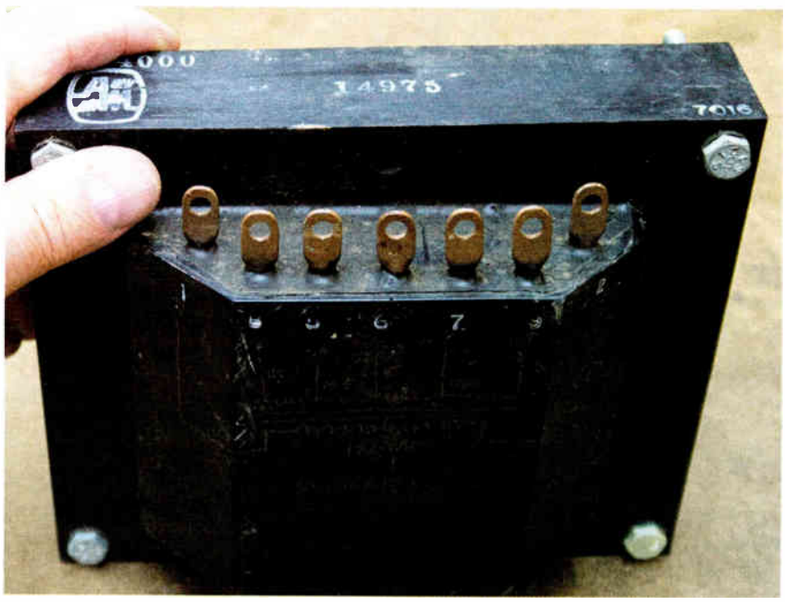


Fig. 3: A 22 volt 21 ampere transformer.

World Radio History

that same model BE transmitter for 5 KW day and 30 watts at night. It also sounds great at both power levels with no interruption in audio as it slides between power levels.

RF CONTACTORS

Minnesota is known for actual winter temperatures that dip to 40 below zero at times. Lowest overnight temperatures usually coincide with sunrise, a worst-case scenario. That's when directional AM stations switch from night to day patterns.

Most contactors/RF relays have solenoids (AC magnets) to pull a contact bar. They get sluggish under cold weather conditions, as you can imagine. Some stations use 100-watt incandescent lamps or electric heaters to keep tower shacks warm in winter. If you do this, it is best to put any heat source below an RF contactor so the heat will rise into the contactor. Do it in a safe way so a fire is unlikely to start.

RF contactors are wear items and will need repair from time to time. The stations I worked on usually had a spare contactor on the shelf because failure is inevitable. When replacing a contactor, I would take the failed one to the shop for repair. I would then put them in plastic bags and back in stock, at the transmitter site, for the next incident.

TIPS & TRICKS

Use 3M Scotch Brite to clean tarnished RF contacts. Tarn-X liquid is normally used in the home to clean silverware, but works equally well on silver-plated contacts.

My experience is that pure silicon lubricant spray works well to keep things moving. It makes sliding contacts slippery and adds some measure of protection against future corrosion. My sources for that are Ace Hardware and stores that sell Gunk brand products.

Yes, the contactor shown in Fig. 1 needs cleaning of its contacts before lubrication and going into service.

VOLTAGE CAN BE LOW

Towers in an AM directional array are often hundreds of feet from the transmitter building. That means power to the solenoid coils might be less than the rated 208 to 240 VAC.

About 212 volts is considered normal for 208 three-phase power nowadays, but it is still less than a full 240 volts. At four amperes of solenoid current, the voltage at a tower could drop to as little as 190 volts, hardly enough to make a contactor switch reliably.

One cure is to use larger-diameter wire to feed the towers. Another is to install a low voltage transformer, wired as a "boost." See Fig. 2.

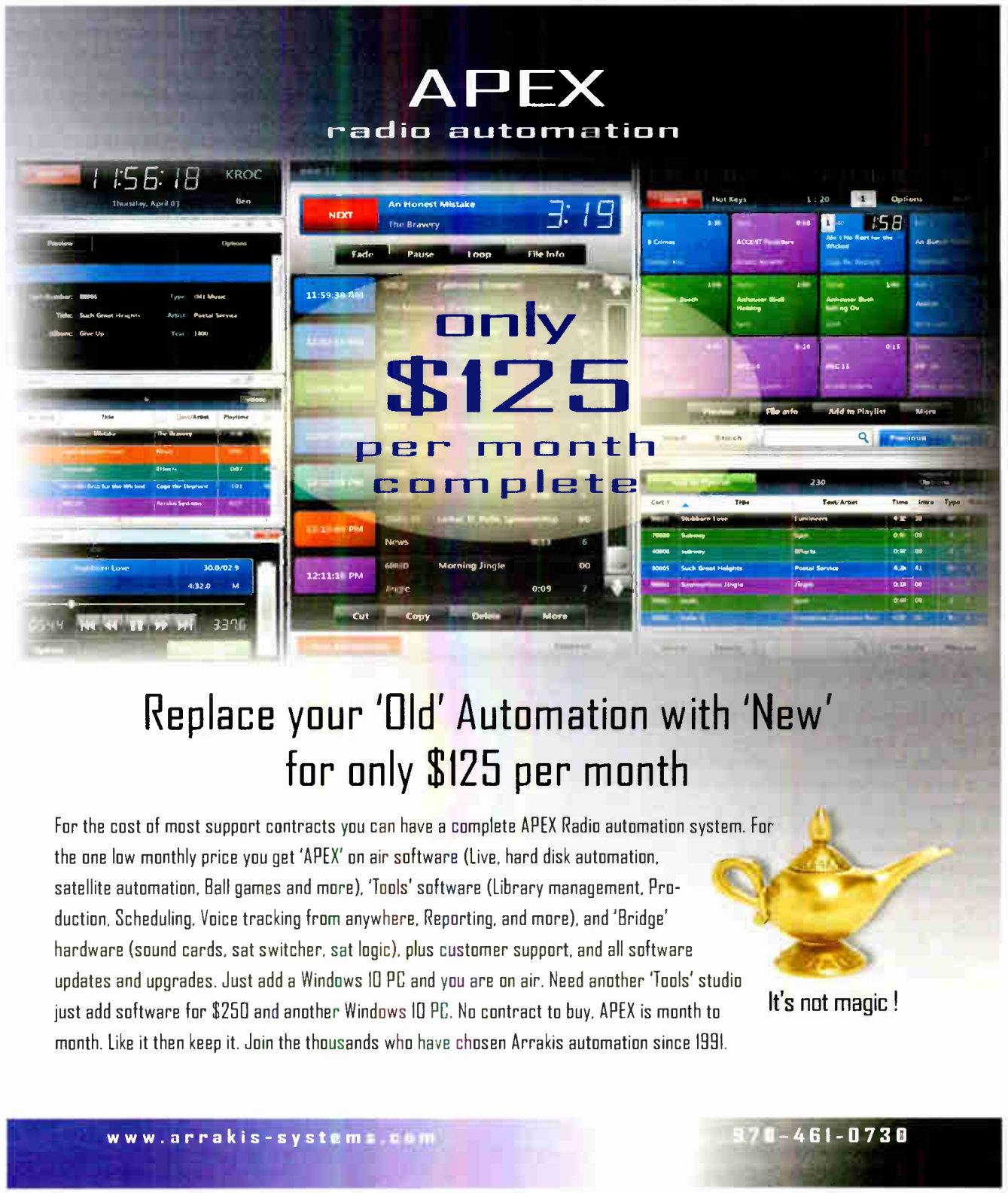
With a 24 volt transformer secondary winding wired in phase and in series with the incoming power, the 190 volts could rise to 214 volts at a tower. Dots on the schematic are for polarity of the windings. Out of phase, the available voltage will be 24 volts less. You likely won't use a 24 volt transformer for day and another for night at each tower. Instead, a single higher-current transformer could do the work for all towers, switching to both patterns.

Transformers of this nature need to be installed in a safe location. The most common place is inside a phasor cabinet which is interlock-protected. Fig. 3 is a transformer from my parts box that can supply 22 volts at 21 amperes. It weighs in at 26 pounds and is enough to help five RF contactors at four amperes each. This one also has more transformer taps for lower voltages.

A three-tower directional would likely need 4 amperes/contactor x 3 towers = 12 amperes of required transformer secondary current. RF contactors in the phasor would be getting the full normal voltage anyway so they don't need a boost because they are at room temperature and there is less chance of them sticking.

(continued on page 16)

Fig. 4: Thermocouple ammeters are often used to measure RF current.



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DIRECTIONALS

(continued from page 15)

TAKE NOTES

Rarely did I go to a transmitter site without finding something that needed attention. I used a piece of paper, in a shirt pocket, to write a few words, jogging my memory to purchase or bring a repair part on the next visit.

Don't let things slide. Keep sites clean and in good repair. Throw out failed parts and only retain usable ones.

METERING

Not all RF current meters are alike. Fig. 4 shows a thermocouple RF ammeter. This one is classified as having an"expanded scale" so it is FCC legal to read currents from 4 amperes to 20 amperes. Less expensive "square law" thermocouple ammeters are only good to read down to one-third of full scale. That means a 20 ampere meter is only accurate above 6.66 amperes, as per FCC rules. Check meter specifications to be sure.

You'll note the meter needle is not sitting exactly at zero. Best to tap on the side of the meter while adjusting the zero set screw on the front to achieve an exact zero when no current is flowing in it. Meter accuracy after that will depend on this easy first step.

Take readings with thermocouple meters during a pause in modulation. That is when the indicated current will be at its least. An FCC inspector will do that too.

Delta Electronics makes transformer coupled ammeters (TCAs) for measuring RF currents in AM antenna systems (Fig. 5). These use a toroid to sample RF and then diodes to turn it into DC to drive a meter. Those are good down to one-fifth of full scale. Their mirrored scales help give better accuracy when you look at one, lining up the meter needle with the needle in the mirror behind. Delta also has meters with digital readouts, giving an astounding 100:1 ratio between its highest and lowest current readings at 2% accuracy. AM pioneers never even dreamed of that!

For those who are unfamiliar with amplitude modulation, an AM station's average power increases 50% when 100% modulated with audio. Traditional thermocouple RF ammeters will read that additional power, but Delta meters do not. However, they will show carrier shift, which is the result of transmitter power dropping a few percent as the transmitter's modulator draws down the supply voltage during high modulation conditions. It can also happen when the transmitter has a weak PA tube. Solid-state transmitters typically have little or no carrier shift.

Meters were once required at the base of each tower to read current. The readings could then be compared as a "ratio" to the reference tower. I say ratio because they all go up or down together as transmitter power changes.

The FCC deleted that rule because antenna monitors do the same thing with a lot less hassle. If the system you are working on has base current meters, I recommend you take readings for future reference. Compare them to the original proof of performance as a double check.

RF PROTECTION

Fencing to keep people away from radio frequency radiation has been required for many years (Fig. 6). Keep fences in good shape, it's the right thing to do. It's also a liability issue. You don't want to be held responsible, in a court of law, when someone claims they were injured because a fence was inadequate.

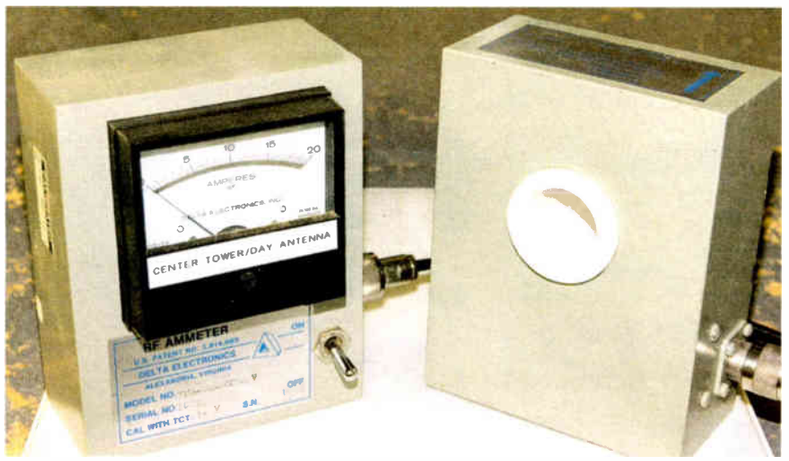

Fig. 5: A Delta TCA AM RF Ammeter.

His potato chip delivery truck had snagged a guy line and pulled the center tower down onto the parking lot and beyond.

Fig. 6: Make sure you have good fencing to keep unwanted visitors out.

MONITOR POINTS

Friend and fellow RW contributor Buc Fitch penned an informative article on field intensity measurements about 15 years ago. That information will help guide anyone in getting reliable field intensity readings. The text is at *https://tinyurl.com/rw-points*.

And, of course, I am not the last word on this subject. For serious changes or repairs to an AM directional, it is best to call a consultant.

In sum: Think the job through to save yourself time and trouble. It makes perfect sense.

The author built four new AM directional systems, from the ground up, using only schematic diagrams and parts in his time as a broadcast engineer. Comment on this or any article. Write to radioworld@futurenet.com.

Mark Persons, WØMH, is an SBE Certified Professional Broadcast Engineer and was SBE Engineer of the Year in 2018. Mark is retired after more than 40 years in business. His website is www.mwpersons.com.

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World Radio History

How WNYC Confronted the Pandemic

New York Public Radio's Steve Shultis talks about the operational challenges

Steve Shultis is chief technology officer of New York Public Radio. He answered questions in May from Editor in Chief Paul McLane in connection with RW's ebook "Broadcasting From Home Around the Globe," which you can read at radioworld.com/ebooks.

N.Y. Public Radio is the home of WNYC(AM/FM), WQXR(FM), The Gothamist, WNYC Studios and the Jerome L. Greene Performance Space.

Steve Shultis

Radio World: *How is your organization's broadcasting workflow today different that it was before coronavirus?*

Steve Shultis: Everything has changed: Approximately 98% of our entire staff is working from home, including talent. The only staff coming into the office on a regular basis are a minimal body of broadcast engineers and broadcast maintenance engineers, facility engineers and some office support staff. All other work groups, including reporters, show producers (including podcast and digital-only stream production), call screeners, membership and development staff, marketing, digital developers, sponsorship, etc. are working and producing from home.

By far the greatest concern for us was to protect the health and safety of our staff: For anyone whom we still require to come into the office/studios, we segregated this staff into three teams such that no one crossed paths with each other; and we perform cleaning between team changeovers.

> **We designed and built** 18 home studios based around Comrex NX codecs, Citrix remote access and the Bionics call screening system.
>
> — Steve Shultis

To form these teams, we scaled back operations, eliminating attended overnights and used that staff, as well as our performance space and remote concert technical staff, to form a skeleton screw for Master Control operations and anything else that we still needed to perform at the facility.

RW: *What technologies are used to enable your new workflows for the major portions of the on-air product?*

Shultis: We immediately moved from a running POC of Teradici Zero Client PCoIP — a remote access platform designed for media — to purchased, permanent infrastructure to allow remote access for our Newsroom production team for the WFH effort. We had been exploring it prior to the pandemic for general mobility needs for the Newsroom reporters/producers so we were positioned to put it into production relatively quickly.

Additionally, Broadcast Bionics offered us an emergency installation of their AudioServer virtual phone PBX and Bionics Studio call screening system, which we migrated to from our legacy, physical PBX/phone hybrids and Bionics PhoneBox call screening system in an effort to move call screeners to their homes.

To complete the installation we had to engineer a new QSIG connection from our separate Business SIP PBX and steal some surplus DIDs from that SIP provider and engineer an AES-67 connection to the new Bionics server for use in virtual sound cards and hybrids.

We designed and built 18 home studios based around Comrex NX codecs, Citrix remote access and the Bionics call screening system; and our engineers delivered installed and tested each of them in the talents' homes. We are currently doing a live on-air fund drive with all of these in use daily.

For our many teams producing shows from home, we are leveraging our enterprise Dropbox infrastructure for sharing audio files between production team members, and worked closely with Avid for providing remote licensing for our many Pro Tools production workstations to allow individuals to work on remote laptops.

Lastly, we are working closely with our console manufacturer SAS, building a soft console and soft switching for full remote control of our audio infrastructure mixing and routing, should we be forced to evacuate the broadcast facility. We are using this now for emergency operations from home during unattended operations.

RW: *What was the biggest technical management challenge you had to meet in the first days or weeks of the coronavirus?*

Shultis: Early on, we were informed by our newsroom that they had reason to believe that the virus was already present in New York City and strongly recommended that we close our doors to any outside entities —guest talent, sales people, etc. — to protect our staff. We took the recommendation to heart and from that time on performed all live and taped interviews remotely and cancelled all of our many upcoming shows in our public performance space.

These were hard calls to make in the early stages of the pandemic, when many venues and entities around us were still open and doing business as normal.

RW: *Was there a particular solution or application that you think your peers would be interested in?*

Shultis: Teradici or their competitor VMWare Horizon might be interesting for those wishing to remote into media infrastructure.

RW: *How will radio operations for our industry be permanently changed in the long term?*

Shultis: There will be many permanent changes to the broadcast industry workplace and workflows.

We are currently running an on-air fund drive with multiple hosts collaborating live on air from their home studios and taking physical cues using Zoom video conferencing in lieu of traditional face-to-face, in-studio collaboration. This workflow for live interviews will be the norm so as to minimize exposure to staff, i.e. leveraging phone and IP technologies for both audio and video feeds.

It will be interesting to see what transpires with "live" music broadcasts; will they be limited to only the smallest of ensembles to fit on a stage with social distancing rules — or will it be relegated to something like Zoom meetings with the musicians performing live but in separate locations … ?

We have a densely populated office and newsroom and have enjoyed the ease of collaboration and social interaction this open workspace has afforded us. Now this appears to be a liability, and we will have to rethink what our office and studios look like and function. We are engaging our architect for the effort and have created an internal task force to work with them and our various teams to devise both a physical and personnel scheduling plan that is safe and productive for our staff.

Wayne Shulmister

Host Brian Lehrer is shown at work in his home studio.

RW: *Anything else we should know?*

Shultis: I would advise our industry peers to make sure they have PPE at shared transmitter sites. Early on we learned of an individual associated with a general contractor who works extensively for a master antenna site that had to quarantine due to exposure. That drove home the point for us that we had to make sure we had PPE to use at the sites when working with or around other entities.

World Radio History

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World Radio History

Report-IT Eases Remote Contribution

Tieline apps and hardware provide seamless remote contribution

USERREPORT

BY DENNIS KLAUTZER
Co-owner and Vice President
Viper Communications Inc.

OSAGE BEACH, Mo. — I am co-owner of six radio stations in the Lake Ozark region of Central Missouri, which include talk, country, soft rock and classic rock formats. I worked for CBS/KMOX in St. Louis for 21 years until I left corporate radio for station ownership in 2001. We have the Number 1 and 2 stations in this three-county area of Miller, Camden and Pulaski counties.

From when we first felt the impacts of COVID-19 we have managed to stay on the air with no major issues, however we did have to initiate "broadcasting from home" for many of our contributors and guests on the talk station.

We have always performed a lot of remotes using our Tieline Merlin codec and the Report-IT Enterprise app, as well as some other Tieline remote codecs. This is a challenging region and we encounter extreme conditions from which to broadcast. There are lots of hills and very few cell sites. We are a resort community and are situated on a huge lake called the Lake of the Ozarks. Maybe you've seen the Netflix series "Ozark" that is partly filmed here.

We have often done remotes from waterfront restaurants and bars using Report-IT. Until we got a Via + codec with SmartStream Plus it was a challenge. This new technology uses the Wi-Fi of the establishment and the cellular service resulting in dramatic cutting down of dropped or skipping audio

We use Report-IT in various ways. For news reports, we often record audio files in the field using Report-IT and then use the FTP upload feature in the app to transfer recordings directly to our server at the station. It's so much easier than messing around trying to pull files from a phone. The audio is waiting back at the station to be edited right away by another reporter. We also have news reporter John Rogger in Florida who regularly uses Report-IT for live hits and co-hosting in some of the talk shows.

During the COVID-19 ordeal we were well prepared and have used Report-IT a lot for our news/talk station KRMS(AM) 1150 kHz. Our host has always been located in the studio, however we have several guests who appear weekly that weren't able to come in. This station covers a range of different topics, from financial to boat repairs, and Report-IT has been very handy and our go-to solution.

I simply created user accounts for each guest and all they had to do was download the free app onto their smartphone, log-in and then connect. Even a non-radio boat mechanic who hosts a show could do it. This has been extremely easy to deploy and allows them to go live from wherever they have their phone. The sound quality is great too, even at low bitrates. Many users plug in an external mic and headphones using a very affordable adapter cable I found online and this makes it sound like they are actually in the studio!

With the Report-IT app we always configure it to use SmartStream Plus. So this means the cellphone being used can stream over both Wi-Fi and cellular simultaneously where it's available.

When we have lots of tourists in town the cell sites can get overloaded, so the importance of redundant streaming cannot be underestimated.

When we have lots of tourists in town the cell sites can get overloaded, so the importance of redundant streaming cannot be underestimated. This has been rock solid in most situations and provides the redundancy we require in such a challenging location.

At the studio we have a fiber connection and run the Merlin codec with two LAN connections with separate IP addresses from the same ISP. This has proven to be the most reliable configuration in conjunction with configuring the unit to use SmartStream PLUS redundant streaming.

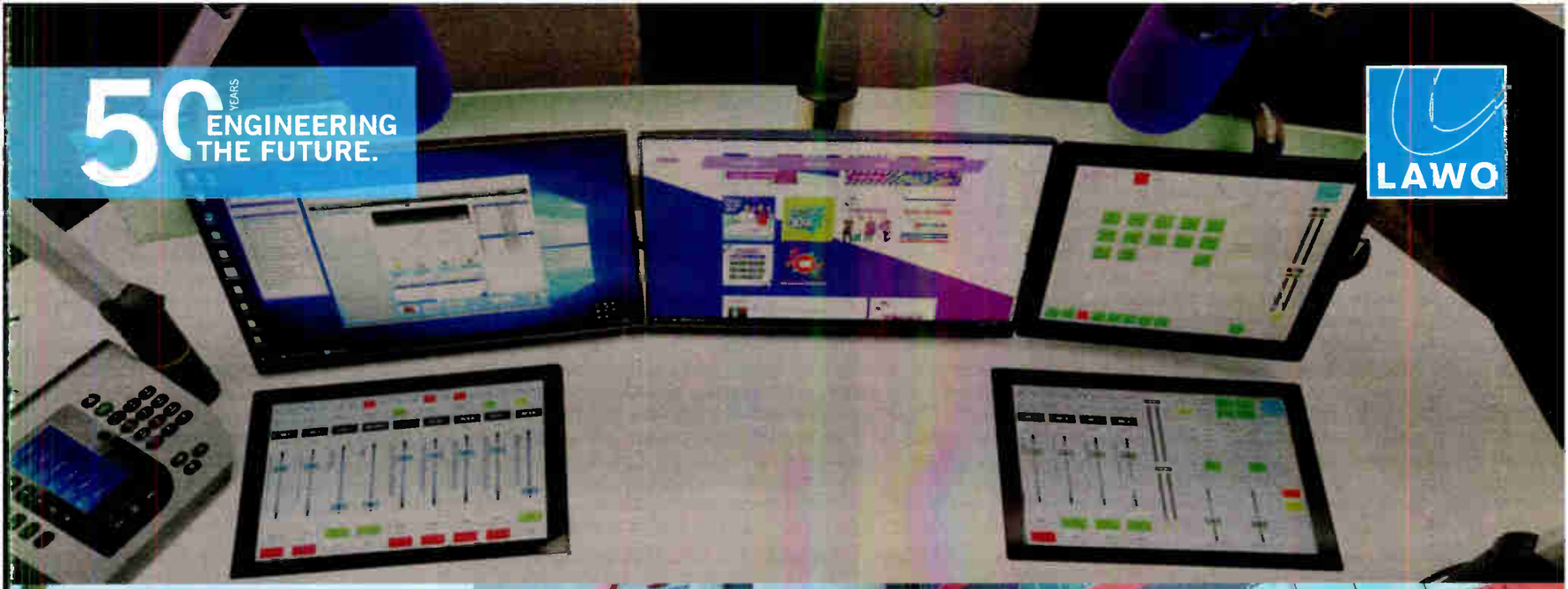
At the time of writing we seem to have been able to manage COVID-19 infections quite well and cases are low here. However, with the tourist season nearly upon us, we will have to remain vigilant. Whatever happens, we are well prepared and can react immediately and ramp up Report-IT deployments if and when required due to any lockdown procedures if necessary.

For information, contact Dawn Shewmaker at Tieline USA in Indiana at 1-317-845-8000 or visit www.tieline.com.

ABOUT BUYER'S GUIDE

Radio World publishes User Reports on products in various equipment classes throughout the year to help potential buyers understand why colleagues chose the equipment they did. A User Report is an unpaid testimonial by a user who has already purchased the gear. A Radio World Product Evaluation, by contrast, is a freelance article by a paid reviewer who typically receives a demo loaner. Do you have a story to tell?
Write to **brett.moss@futurenet.com**.

World Radio History



CASE STUDY

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World Radio History

FieldTap Keeps Hubbard on the Air in St. Louis

Free Comrex app keeps its hosts and producers connected

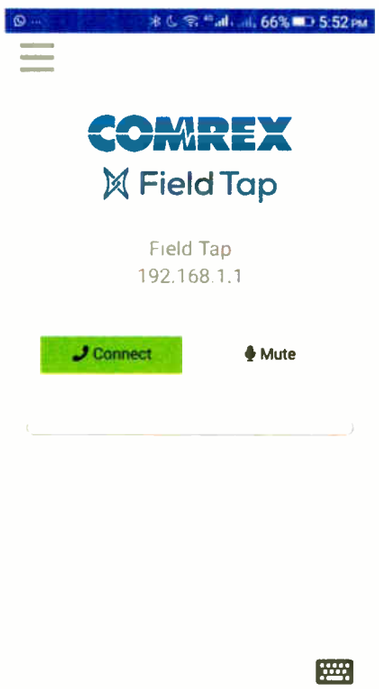
USERREPORT

BY MARSHALL RICE
Engineering Director
Hubbard Radio St. Louis

ST. LOUIS — As the engineering director for Hubbard Radio St. Louis, I handle demands for five different stations. When COVID-19 hit in March, we were caught somewhat by surprise. We received very short notice that the offices would be closed, and so we had to scramble to get everything in place to enable our staff to work from home.

We'd already put a little bit of thought into it because we had drawn up disaster recovery plans years ago, and we could adapt them for this particular emergency. So we had some ideas, but still had to improvise somewhat.

Right away, we needed to set up 23 hosts and producers with equipment so that they could begin broadcasting from home. We were fortunate in that we already had a number of Comrex Access, Opal and BRIC-Link units. Because we had that equipment available, we were able to get people operating from home on fairly short notice. We built kits, and because of isolation, we had to drop them off at the homes of our staff, and train them over the phone. But we didn't have enough portable units for everybody.



For those who didn't get Access or BRIC-Link units, we began using FieldTap immediately. FieldTap is a free mobile app for iOS and Android that allows users to connect to Comrex IP audio codecs from their mobile devices. Our people could begin using it right away — all they had to do was download it onto their phone. Many of our staff have been using FieldTap to communicate with the studio, and to go live.

We originally began using FieldTap when it first came out. In our experience, FieldTap has been very simple for our staff to use without much help from engineering. All they have to do is enter an IP address, press the "connect" button, and they're live.

Currently, we have six of our on-air staff and 10 of our producers using FieldTap with the IK Multimedia iRig smartphone interface nearly every day. We have begun bringing our on-air staff back into the office, but our producers are all still at home, and FieldTap lets them stay in touch. Our producers don't only work off-air — they're also periodically on-air as part of their shows. FieldTap lets them monitor the audio, but also jump in as part of the program if they need to. They're getting excellent quality when using FieldTap over a cellular network.

We're planning to continue using FieldTap with iRigs after all of our staff have returned to the office. Our staff has become addicted to it, and many of our field reporters have been surprised by how much they like using it. They've found it to be easy to use and reliable — even when cell service is shoddy.

Because FieldTap is free, the barrier to entry is very low. Our program directors have embraced it because the audio quality is high, and our talent has embraced it because it's so simple. It's really saved us during this whole crisis.

For information, contact Chris Crump at Comrex in Massachusetts at 1-978-784-1776 or visit www.comrex.com.

TECHUPDATE

NAUTEL BRINGS HTML5 TECHNOLOGY TO AUI TRANSMITTER CONTROL

Nautel said its Advanced User Interface has undergone a major platform upgrade to HTML5, to be available later this summer.

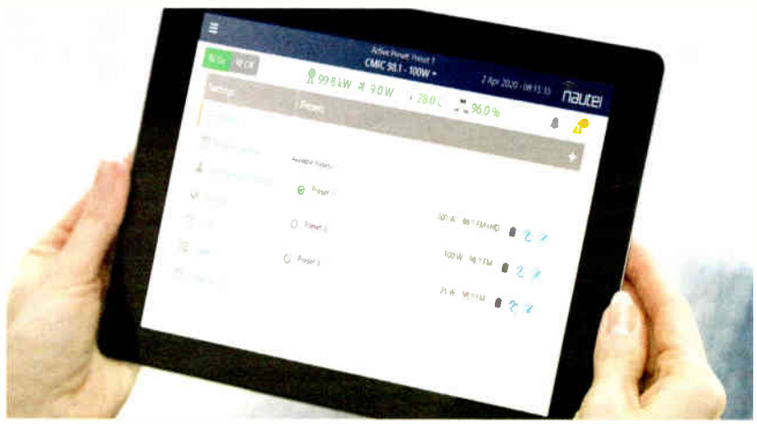
The original AUI was built using Adobe Flash, which will no longer be supported as of the end of this year. The new AUI, which has been in development for several years, eliminates Flash but also gives station engineers something they can use on their phones and tablets.

The new AUI is based on the HTML5 web application, which uses encryption for added security and can run on any browser. Recent updates in frameworks and libraries now allow HTML5 to compete with the richness of Flash.

As with the current AUI, the HTML5 AUI runs from the transmitter itself. Users will connect through their firewall, then navigate to the appropriate HTML page that is posted from the transmitter. The AUI would then load on the user's device. All information will be available on smaller devices such as smartphones or tablets; the browser page is automatically scaled for proper appearance on the device. The current state of the transmitter always appears at the top of the screen no matter what other information is selected via the menus.

Nautel Product Manager Matt Herdon is collecting a list of users who would like to beta test the new AUI; interested parties may sign up by visiting *https://support.nautel.com/aui/aui-beta/*.

For information, contact Nautel in Nova Scotia at 1-902-823-5131 or visit www.nautel.com.



TECHUPDATE

ENCO OFFERS REMOTE SOLUTIONS

ENCO's enCloud Suite includes iDAD, a mobile radio app that allows users to record audio from a smartphone and send it directly to a studio-based DAD automation system. The app provides an easy way to outfit mobile journalists and reporting teams with a direct line to a radio station's library.

The most recent update, iDAD-Remote, allows broadcasts to broadcast live events easily without the need for a board operator at the studio. iDAD-Remote allows users to remote voice track and control playback from a tablet, whether at home or broadcasting in the field. Remote content manipulation and remote control offer additional flexibility for newsgathering or live broadcasting in the field.

For more information, contact ENCO in Michigan at 1-248-827-4440, or visit www.enco.com.

World Radio History

TECHUPDATE

DIGIGRAM IQOYA GUEST DELIVERS GUESTS REMOTELY

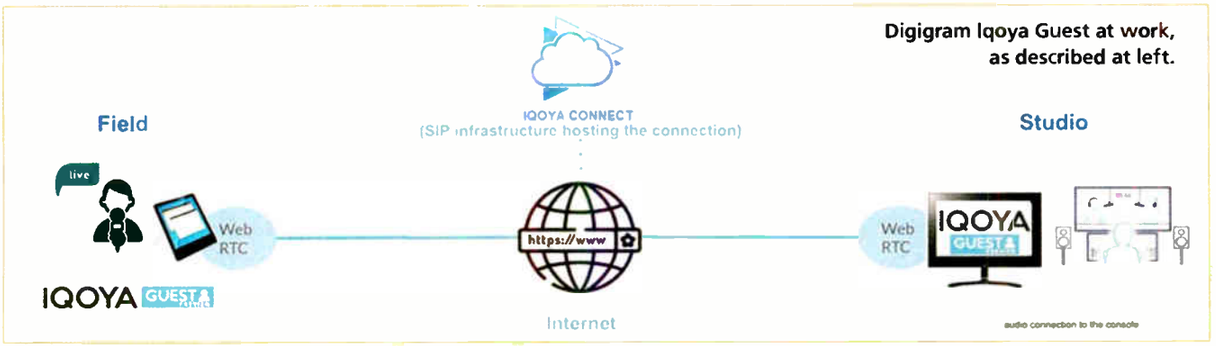
Iqoya Guest is Digigram's web-based solution for conducting remote interviews of guests outside the studio.

It does not require any hardware installation or dedicated software applications to work. A studio can access the complete interface through a smartphone or computer web browser and directly invite a guest to join the call by sending a link directly to the guest's phone or via email.

The link can then be opened with a browser on a smartphone or computer, allowing the user to be on a live program without having to install additional new applications. Digigram says its audio codecs ensure superior audio quality without any expensive peripherals.

The user interface is designed for journalists and nontechnical persons to ensure ease of use and learning.

For information, contact Digigram in Florida at 1-754-206-4220 or France at +33-4-76-52-47-47 or visit www.digigram.com.



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World Radio History

Axia Helps KIOS Make Workflow Changes

SoftSurface teams up with TeamViewer and ENCO WebDAD

USERREPORT

By Greg Dahl
Broadcast Engineer
Second Opinion

Second Opinion is an authorized Telos Alliance integrator.

OMAHA, Neb. — As the coronavirus pandemic began to greatly affect radio stations across the country, many were scrambling to produce and maintain program material for their media services. KIOS in Omaha, Neb., was in a difficult situation since the radio station studios are located in an Omaha Public Schools building and the school system was being ordered to close. Did this order to close mean everyone needed to evacuate the school's property, including the radio station?

A conference call was scheduled to discuss the issue and how we would prepare to evacuate the radio station studios. KIOS had recently completed a studio project of its four studios. This involved remodeling the studios physically, replacing some studio equipment with Telos Axia Fusion consoles from Broadcasters General Store, and upgrading the ENCO DAD studio automation system.

Three important questions had to be answered: how to remotely control the program; how to remotely access the automation and console; and how to provide real-time audio or voice tracks from a remote location. I had just addressed the same situation with WHYY in Philadelphia, as we were halfway through a studio system replacement and needed to answer the same questions.

Fortunately, using an AoIP system is the same from one facility to another, no matter the operational size. First, my equipment recommendation for controlling the audio console and automation is a utility computer to use with technical applications. One of the applications is the Axia SoftSurface software installed on the utility computer. Remote control of the console is taken care of using TeamViewer to access SoftSurface.

Next, we looked at the ENCO automation remote control. During an ENCO software upgrade to the automation system technical support normally has remote access to the system, as they did have remote access setup. We used this remote access setup to remote control the ENCO automation system.

By using this remote access operation in a different way than using TeamViewer, it provided the ability to remotely access both the console and automation with full control from the same remote location computer.

Lastly, the most difficult question to answer is the real-time audio or voice tracks. We only had the internet as our method to provide a media for real-time audio. This would require a codec, same as we use for live remote broadcasts. It would need to be either software codec from a computer or hardware with a network connection at the remote location. If multiple locations are being used, then there would need to be multiple hardware units or traded less units between remote locations.

Since we are restricting contact between one another, trading a unit between locations was not the best solution. Additionally, there is an audio timing issue between audio from the automation at the studio and the codec audio feed that is slightly delayed. This can cause a train wreck on the final program product if not watched very carefully.

Using voice tracks, the remote location needs to have either remote ENCO WebDAD automation or prerecorded audio to be dropped into the ENCO system by Dropbox (file transfer system). The prerecorded remote voice tracking option was the best choice for KIOS. They would not have to worry about the timing issues of a codec and did not have the WebDAD software option installed for ENCO.

KIOS did not fully evacuate the radio station studios, but is operating with a limited staff. Some on-air shifts are using the remote control of the Axia Fusion Console and ENCO automation with prerecorded voice tracks as described. This remote operation will continue until further notice.

I appreciate being involved with KIOS preparing and executing the remote broadcast operation and the team of people involved: General Manager Ken Dudzik, Program Director Todd Hatton, Local Host, "All Things Considered," Michael Hogan, former Chief Engineer Richard Dennis and current Chief Engineer Chuck Ramold.

For information, contact Cam Eicher at Axia Systems/The Telos Alliance in Ohio at 1-216-241-7225 or visit www.telosalliance.com.

TECHUPDATE

ON THE ROAD WITH RCS APPS

Broadcast software developer RCS says that its keystone products have their own mobile web-based sidekicks.

For instance the power of the GSelector scheduler is now harnessed in its go-anywhere version, Selector2GO.

Selector2GO is a way to use a PC or Mac and any browser-enabled smartphone, tablet or e-reader to perform a powerful set of tasks in GSelector. RCS says that whether the user is on a plane or on the beach, they can remotely produce logs for a station or stations using the smarts of this advanced music scheduler.

Also, the RCS Zetta playout system is no longer confined to the studio thanks to a companion called Zetta2Go.

Zetta2GO (pictured) gives users control of a Zetta automation/playout system from any internet browser in a tablet or on a smartphone. See logs, hot keys and a segue/voice track editor. The company highlights its ability to produce quality outside broadcasts.

And on the business side, Aquira2Go lets users on the road or at home use Aquira to plan and schedule advertisements. Aquira2GO is a browser-based application that is part customer relationship manager, part sales proposal tool. The sales team can access data, build a proposal with real time access to station inventory and present it face-to-face to advertiser clients.

For information, contact RCS in New York at 1-914-428-4600 or visit www.rcsworks.com.

World Radio History

TECHUPDATE

BURK SECURES CONSOLIDATED MOBILE ACCESS TO REMOTE BROADCAST SITES

Engineers and managers in the field can monitor and control all their remote sites over a single secure web link when using Burk Technology Arcadia system.

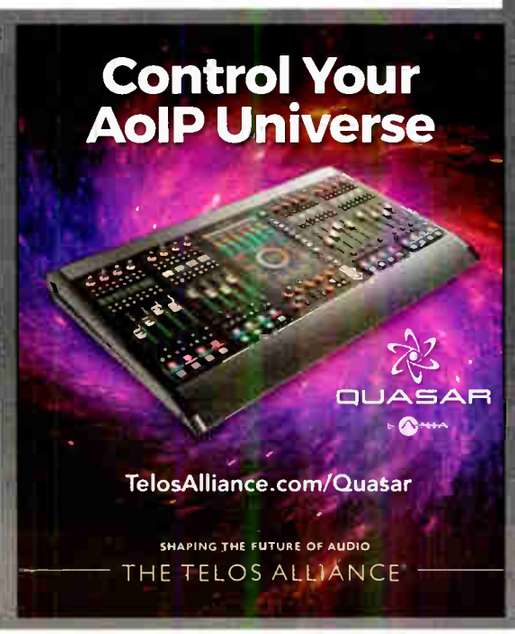
Authorized users utilize a browser window on their mobile device to confirm the status of their entire network and to initiate commands to keep their stations on the air.

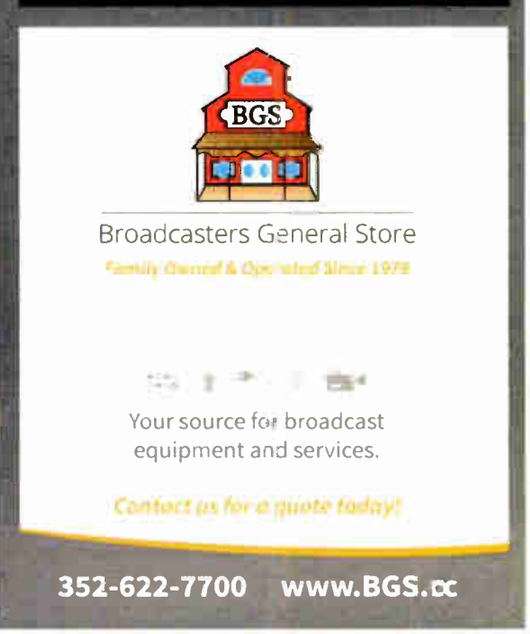
Arcadia resides on either a cloud-based or customer-premises server inside the customer's firewall, providing integrated access to ARC Plus and ARC Solo remote control systems throughout the company's network. User access to the Arcadia server over the public internet is encrypted and secured using Transport Layer Security (TLS). Microsoft Active Directory authenticates each user for access to specifically authorized sites and channels.

Arcadia's customizable interface provides summary data at national, regional or market levels, with the ability to drill down for detailed status and control of individual sites. Default screens for each site are generated automatically, providing an instant overview of facility status. Users can create their own custom screens highlighting information from multiple sites including meters, status indicators, control buttons, charts, graphics, maps and embedded web sites. Alternatively, standardized hierarchies and site views can be created by the system administrator and shared with selected users based on access privileges. Arcadia's responsive user interface adapts to fit each browser's screen size, enabling easy viewing on smartphones, tablets or PCs.

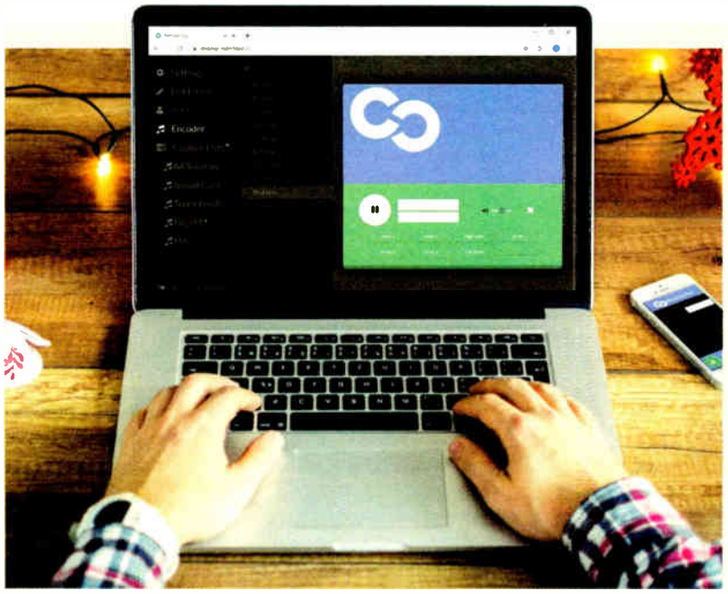
Burk says NOCs running the company's AutoPilot software can also leverage Arcadia's centralized communications architecture. Arcadia compiles data from hundreds of sites at a rate of 100 sites per second using the company's Warp Engine connections, enabling continuous refresh of AutoPilot custom views and alarm logs. NOC operators can view, manage and report on events from a single centralized database while minimizing network traffic.

For information, contact Burk Technology in Massachusetts at 1-508-486-0086 or visit www.burk.com.





World Radio History



TECHUPDATE

CLOUDCAST SYSTEMS RELEASES REMOTE AES67 MONITORING TOOL

Cloudcast Systems says that its RemotePlay is the first remote AES67 monitoring tool. The mobile app allows users to tap into their AOIP network and remotely stream Opus encoded audio to their desktop browser or mobile device.

RemotePlay offers customization options that users can use to create tailored audio source lists to filter and restrict sources such as microphones and codecs. Through SAP, Bonjour and Livewire protocols, users can drag, drop and edit AES67 sources.

RemotePlay is easy to install, the company says, and runs as a service on any Windows machine. With its built-in web server, there is no requirement for IIS or Apache. For security-conscious users, RemotePlay contains both SSL and TLS encryption options for secure hosting and the ability to integrate into Active Directory.

With demand for remote broadcasting capabilities on the rise, Cloudcast says RemotePlay serves as an upgrade to a broadcaster's toolkit of IP capable products.

For information, contact Cloudcast Systems at +1-844-967-2157 or visit www.cloudcastsystems.com.au.

TECHUPDATE

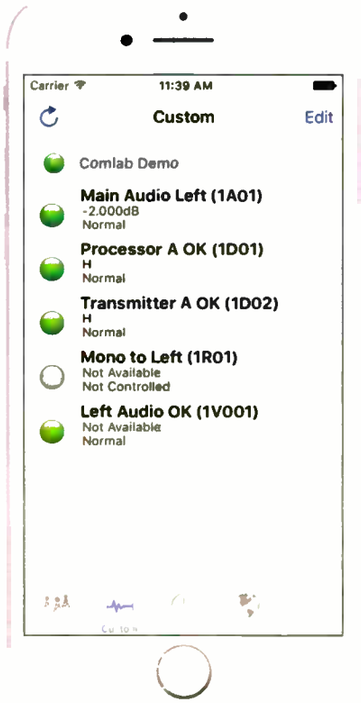
DAVICOM UPGRADES DAV2YOU APP

Davicom says that its Dav2You can put all of a broadcaster's sites at a monitor's fingertips. Operable via a browser, it is also available for iOS and Android phones.

It puts brings precise information where it is needed, on the road, at the office or at the site. It will connect to any Davicom DV-208/216/DV-Mini/ Cortex320/Cortex360 unit.

It offers customizable multiple-site views for displaying relevant parameters such as power to the antenna, room temperature or other data that is deemed useful.

Dav2You has an interactive map that can show the current status of multiple sites at a glance. A particular site's icon color provides an immediate indication of any problem. A touch of the icon on the map provides easy access to that site's parameters.



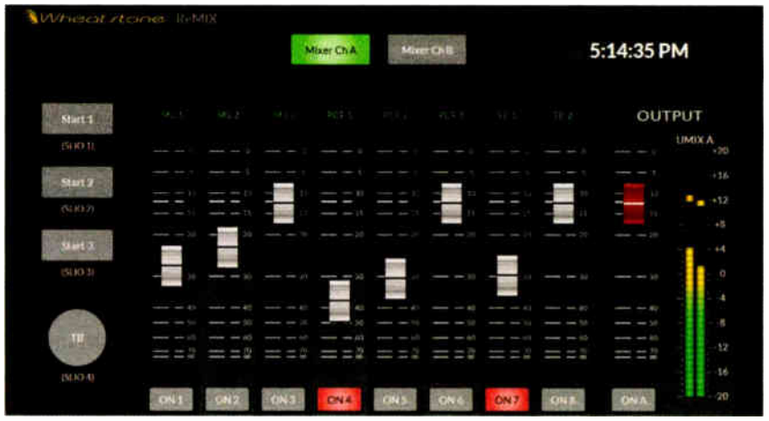
Alarm acknowledgement is simple. When a connected Davicom remote monitoring unit senses that there is a problem at the site, it immediately sends a Dav2You notification.

A manual command wizard has a step-by-step through the process of sending one or multiple manual commands, allowing avoidance of needing to remember long strings of mnemonics.

An onboard report generator creates reports of events, prints them or forwards them by email. Events can be filteredby date, name or description to receive customized reports. There is also a built-in contact module for Davicom tech support.

Dav2You requires Davicom Cortex, DV-Mini or DV-208/216 with firmware version 5.54 or later.

For information, contact Davicom in Quebec at 1-418-682-3380 or visit www.davicom.com.



TECHUPDATE

REMOTE MIXING APPS BY WHEATSTONE

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ReMIX was developed in response to recent events as an affordable remote mixer app for those broadcasters who have blades for I/O, but do not have a Wheatstone control surface capable of remote control.

ReMIX gains access to the WheatNet-IP audio network matrix through the utility mixer and SLIO logic native to I/O Blades. Utility mixers are unique to WheatNet-IP I/O Blades and accessible anywhere in the audio network for simple functions such as performing crossfades and segues between sources. Each I/O Blade includes two built-in 8x2 stereo mixers; the inputs and output busses of which are available as resources on the network.

In addition to ReMIX, Wheatstone offers remote client software for select console surfaces. Remote LXE and other Glass remote client software mirror the physical console, right down to fader count and movement so that if a fader is moved in the client software, the fader also moves on the physical surface.

For information, contact Wheatstone in North Carolina at 1-252-638-7000 or visit www.wheatstone.

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Consumers' Choices Are Virtually Limitless

NAB says it's time for the FCC to recognize the new reality in which radio stations compete

IN THE NEWS

"The Federal Communications Commission should declare the video and audio markets more competitive than ever."

So stated the National Association of Broadcasters in official comments to the FCC. It said the commission should update its regulations and oversight to recognize these marketplace realities.

"At one point in time Americans may have had few audio and video options — listen to broadcast radio, watch broadcast television, buy recordings or visit the movie theater — but today, consumers' choices are virtually limitless."

The text below is excerpted from the NAB filing, from a section about how changes in technology have vastly expanded the number and type of media marketplace participants. The footnoted original, which includes sources for data and quotes cited by NAB, can be found at https://tinyurl.com/rw-nab-competition.

Innovation in digital technologies and the exponential growth of the internet and online services make untenable any contention that radio broadcasters now compete for the public's attention and time only with other radio broadcasters. In contrast to the analog world where broadcast radio and recordings were the only ways to access audio content, today countless sources provide, and multiple devices deliver, both music and informational audio programming, as well as video content.

The FCC's report must conclude that local radio stations compete for audiences in a market that includes, at the least, increased numbers of terrestrial radio broadcasters, satellite radio providers and providers of audio programming over the internet and to mobile devices. In fact, radio stations also compete with innumerable providers of video content for consumers' notice in the crowded digital marketplace.

A. Millions of Consumers of All Ages Have Embraced Music and Other Content Delivered Via Satellite and Online from a Wide and Growing Array of Sources

Despite the continuing broad reach of broadcast radio, local stations face intense and increasing competition for audiences from an expanding universe of content providers, especially streaming services. According to Nielsen, streaming is "mainstream," and recent data confirm that statement.

As of early 2020, 60 percent of the U.S. population ages 12+ (or 169 million people) listened weekly to online audio, up from only 17 percent a decade ago and just two percent in 2000. Other estimates are even higher, with Nielsen reporting that nearly two-thirds (64 percent) of U.S. adults ages 18+ stream audio on their smartphones weekly. Weekly online listeners spend an average of 15 hours and 12 minutes per week listening to online audio, up nine hours a week since 2008.

While the trend is most significant among younger listeners, with 86 percent of those ages 12-34 listening to online audio at least monthly, over three-quarters (76 percent) of those ages 25-54, and 42 percent of those 55 and older, stream audio at least monthly.

In the U.S., the number of on-demand streamed songs reached 745.7 billion in 2019, up nearly 24 percent in just one year. Including music videos, overall on-demand music streaming surpassed 1.15 trillion streams in 2019, an increase of more than 29 percent over the previous year. Online streaming's popularity as a means to access music extends across demographic groups. Indeed, "multicultural listeners are digital trendsetters."

While broadcast radio remains a very prominent source of music and other types of audio content, it now swims in a sea of competition, including myriad online audio and video music streaming services that vary based on content, price point and features.

In 2019, YouTube, Pandora and Spotify had the highest annual usage rates among online music services, and YouTube also attracted the most daily users, followed by Spotify and Apple Music, thereby reconfirming Nielsen's previous characterization of YouTube as the "go-to source for music."

Unsurprisingly, YouTube is the top source for music discovery for teens and Hispanics, while the Web/apps is the leading music discovery source for millennials. YouTube's prominence as a source of music illustrates how audio and video content have converged in the digital world where the same devices access both types of content.

Radio broadcasters have worked hard to grow their streaming audiences, but the dominance of the pure-play streaming services (e.g., Pandora, Spotify, etc.) has increased over time.

Pure-play streaming providers accounted for 79.8 percent of total streaming usage in January 2014, and their share rose to 90.6 percent by December 2018. Looking at Pandora over a longer time period, its monthly average active streaming sessions rose from 147,673 in September 2009, to over one million in December 2015 and two million in November 2017. After that date, its growth rate stagnated, mainly due to competition from Spotify, which has enjoyed exponential growth and surpassed Pandora in average active streams in 2018.

While many consumers still stream for free, the number of those willing to pay for music and other audio content from streaming or satellite services has grown rapidly. According to RIAA, the total number of paid subscriptions to on-demand streaming services in the U.S. (excluding limited tier options) rose from 10.8 million in 2015 to 60.4 million in 2019.31 And subscriber numbers continue to grow very rapidly, with a 29 percent increase just from 2018.

Getty Images/eyecrave

The NAB argues that innovation in digital technologies and exponential growth of internet and online services "make untenable any contention that radio broadcasters now compete for the public's attention and time only with other radio broadcasters."

Looking at satellite radio, fewer than 600,000 people subscribed in 2003; by year's end 2019, SiriusXM had over 34.9 million subscribers. It competes with terrestrial radio stations by delivering via satellite 150+ channels of diverse audio programming into local markets across the U.S., in addition to its streaming service, which offers more channels of music, news/talk/sports and on-demand shows, performances and interviews.

Satellite radio is an especially strong competitor to terrestrial radio in automobiles. As consumers buy newer car models, satellite radio's share of listening time increases substantially.

Following the completion of its merger with Pandora last year, the combined SiriusXM/Pandora has become a more formidable competitor across multiple platforms. Last summer, for example, SiriusXM expanded its streaming offerings by allowing all SiriusXM subscribers the option of taking their subscriptions with them outside their cars by giving them access to the company's mobile app and connected devices at home.

Subscribers to certain SiriusXM service tiers also may create their own customized, ad-free music stations on the company's mobile app, an option called "Personalized Stations Powered by Pandora." As of early this year, SiriusXM and Pandora are investigating how to create a joint subscription covering both services.

Online and satellite options have not only transformed music listening, but also have changed how consumers access informational programming.

SiriusXM offers multiple news channels to listeners. As of early 2020, there were more than 900,000 podcast shows and over 30 million podcast episodes available. Each week about 68 million people (24 percent of the 12+ U.S. population) listen to podcasts, up from only seven percent in 2013, and 104 million people (37 percent of the population) listen monthly. Listening rates have increased quickly and will continue to do so, as younger audiences embrace podcasts at higher rates.

Podcasting is now growing at a faster rate than streaming audio, and Edison Research's "Share of Ear" reveals that consumers' time spent with podcasts has grown significantly. Among persons 18-34 and those 18-49, podcasts rank second behind AM/FM in share of ad-supported audio time spent (ahead of ad-supported Spotify, Pandora and SiriusXM). Podcasts also attract a diverse audience, as monthly podcast

World Radio History

use by Blacks and Hispanics has doubled over the past five years.

The explosion of the number and variety of audio services described above has greatly benefited consumers, who now enjoy unprecedented choices of platforms and programming.

It also has vastly increased competition, which directly impacts AM/FM stations by splintering the previously "mass" audio market and diverting audiences to myriad other options, at the expense of traditional radio. This competition will only become fiercer, given that "radio is streaming's next frontier."

B. Devices Affect Content Choices, and Consumers Today Use Multiple Devices to Access Content of All Types

In early 2020, 85 percent of the total U.S. population ages 12+, or 240 million people, owned smartphones. Smartphone ownership is even higher among younger people; as of early 2019, 96 percent of adults ages 18-29 reported owning a smartphone, as did 92 percent of those ages 30-49.

Fifty-three percent of those ages 12+, or 149 million people, own tablets, and smart speaker ownership is rapidly rising. As of early 2020, 27 percent of the 12+ U.S. population (76 million people) owned a smart speaker, up from only seven percent in 2017, and smart speaker owners now have an average of 2.2 smart speakers in their households. At year's end 2019, there were 157 million smart speakers in U.S. households, a 135 percent increase in just two years. And according to Nielsen, both Blacks and Hispanics own smart speakers at higher rates than the national average.

In contrast to the growth in ownership of newer devices, AM/FM radio ownership continues to fall, particularly among 18-34-year-olds. From 2008-2020, the average number of radios in homes fell from 3.0 to 1.5, and the number of homes with no radios increased from four to 32 percent. Over half (52 percent) of the homes of those ages 18-34 lack radios.

These changes in technology and ownership of technology have altered the public's media consumption habits.

In the third quarter of 2019, Nielsen estimated that adults 18+ spent an average of six hours and 17 minutes per day with digital media, compared to an average of one hour and 41 minutes with radio. And adults under age 50 spent significantly more time (over seven hours per day) with digital media than older audiences. Unlike in the analog past, the average music listener now uses 4.1 devices each week for music (up from 3.4 devices in 2017), with teens and millennials using 4.6 and 4.5 devices, respectively. The virtually ubiquitous smartphone tops the list of devices used for music listening. Indeed, 26 percent of all audio listening is done on a smartphone.

Notably, digital devices are multipurpose devices that permit consumers to access different types of audio content (including radio, streaming services, owned music and audiobooks), and also easily switch between audio and video content, thereby expanding the range of media against which terrestrial broadcast stations must compete. Audio and video services do compete against each other for audiences' time and attention, as streaming audio and podcast consumers spend significantly less time watching TV than the average consumer.

Although newer than smartphones and tablets, smart speakers are already significantly influencing media consumption.

Sixty-one percent of consumers who use a smart speaker weekly for music pay for a subscription service. Close to half (46 percent) of the time spent listening to audio sources via smart speakers goes to "pure play" streaming, with less than a quarter (24 percent) going to AM/FM radio. And according to the Consumer Technology Association, on-demand music services have "room to grow as more and more consumers adopt smart speakers and wireless earbuds."

Following the completion of its merger with Pandora last year, the combined SiriusXM/ Pandora has become a more formidable competitor across multiple platforms.

Smart speakers also can influence consumers' choice of audio brands (e.g., Pandora, Spotify, iHeartRadio, etc.) and even their sources of news. Owners of smart speakers use Amazon Music more frequently than those without smart speakers, which is perhaps unsurprising given that the Amazon Alexa is the leading brand of smart speaker. Smart speakers, moreover, set default news providers, often major outlets such as CNN, which consumers rarely change. Thus, radio stations can be at a disadvantage at the competitive starting gate against other providers of music and news.

Yet another technology presenting competitive challenges for broadcasters are voice assistants. Sixty-two percent of Americans (12+) use some form of voice assistant technology through devices including smartphones, computers/laptops, smart speakers and tablets. Google Assistant now includes a personalized news feature for listeners, a playlist of news stories called Your News Update.

Improved voice controls, such as Amazon's Alexa Auto, also are being integrated into vehicles to help control various functions, including cars' infotainment systems, making it simpler for drivers and passengers to choose a variety of audio options other than traditional radio. Radio broadcasters will face even stiffer competition in an era when music and informational content from innumerable sources may be easily retrieved through voice, whether at home, in the car or at the office.

In the past, consumers seeking audio or video content were technologically limited to a relatively few geographically proximate terrestrial broadcast stations. That is no longer the case.

The rapid adoption of digital devices allows consumers to access a wide array of audio and video content 24/7/365 from virtually any location, greatly enhancing competition for audiences and, ultimately, advertisers. The Commission must consider the profound competitive effects of technological change as it evaluates all the participants in the modern media marketplace in its upcoming report.

The NAB goes on to argue that even before the coronavirus crisis, radio stations were "competing in a slower-growing yet highly competitive advertising

(continued on page 30)

World Radio History

AM/FM Enjoys "Enormous, Unique Advantage"

Radio already has a leg up on competitors because it doesn't pay to use sound recordings

IN THE NEWS

The organizations musicFIRST and the Future of Music Coalition believe that the Federal Communications Commission should consider music creators when analyzing competition in and between audio platforms. They jointly filed comments on the status of competition in the marketplace for delivery of audio programming.

The excerpts below are from a section in which they argue that AM/FM radio "provides substantially less promotional value to music creators than it once did, and still refuses to establish a sound recording performance right."

Read the filing including source references at https://tinyurl.com/rw-coalition.

A number of national and regional media companies with AM/FM holdings, and several broadcasters' associations, have argued that the commission's Local Radio Station Ownership Caps need to be loosened, claiming such deregulatory actions would help "level the playing field" with digital competitors within the inter-platform competitive landscape, while many independent radio station owners who want to stay in business rather than sell their stations to larger entities are steadfast in wanting the commission to refrain from loosening the current restrictions on the number of radio stations that one entity can own in a given market in the U.S.

In addition to the grant of free spectrum to transmit its signals, AM/FM radio already has an enormous and unique competitive advantage against their streaming and satellite counterparts in that AM/FM radio is not yet required by law to pay royalties for the use of sound recordings, while all other audio platforms in the U.S. are required to pay for the privilege of playing recorded music content.

As the United States Copyright Office explained after conducting an exhaustive study on this subject in 2015:

"In the case of terrestrial radio, federal law exempts what is currently a $17 billion industry from paying those who contribute the sound recordings that are responsible for its success. Apart from being inequitable to rightsholders— including by curtailing the reciprocal flow of such royalties into the United States — the exemption of terrestrial radio from royalty obligations harms competing satellite and internet radio providers who must pay for the use of sound recordings. In a world that is more and more about performance and less about record sales, the inability to obtain a return from terrestrial radio increases the pressure on paying sources. The market distorting impact of the terrestrial radio exemption probably cannot be overstated."

This inequity not only harms competitors to AM/FM radio; it deprives recording artists in the United States a share of this substantial revenue in the U.S. as well as royalties collected abroad for the use of their work. The U.S. is one of very "few industrialized countries ... that does not have a terrestrial broadcast performance right for sound recordings."

At least 75 nations have a performance right, which means that "foreign broadcasters pay royalties to songwriters/composers and performers." But since there is no reciprocal right in the U.S. under certain applicable treaties, foreign performance rights societies are not required or simply can choose not to distribute these royalties to American recording artists and copyright owners of sound recordings. Low estimates suggest that this forces American artists and record labels to leave $70 million to $100 million on the table overseas every year.

We respectfully request that when the commission makes its report to Congress, and also if it analyzes the Local Radio Station Ownership Caps in its current Quadrennial Review, that it recognize that AM/FM already has a substantial advantage over its competitors insofar as AM/FM radio does not yet have to pay to use sound recordings.

While competitors to AM/FM radio in the U.S. have often argued that the playing field would somehow be leveled by reducing the amount of performance royalties that those platforms should have to pay, such actions are entirely divorced from market-based principles and dramatically undervalues the music that provides the basis for their entire business model.

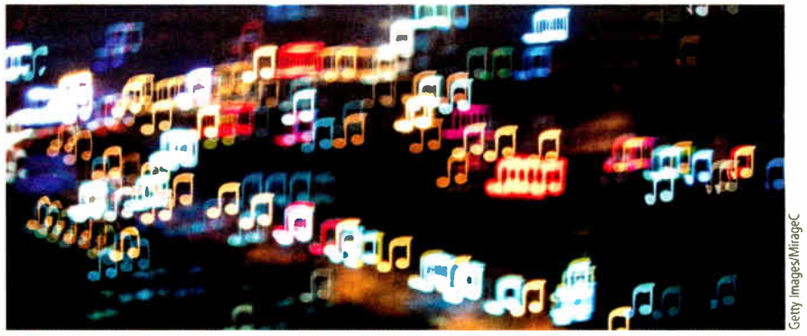
During the COVID-19 pandemic, while royalty-free performance of sound recordings on AM/FM radio continue, the pain is exacerbated, even under the reasoning often espoused by broadcasters that place a value on promoting artists through radio play.

With live performances completely ceased due to public health concerns, radio airplay cannot claim to be promoting any product sale for artists and the harm to artists is especially obvious. Professional musicians now do not have the ability to generate income from sales of tickets to live concerts. Formerly touring artists are also now deprived of revenue historically generated by on-site sales of band merchandise and, to the extent that such performing artists are also songwriters, they are now missing out on opportunities to generate public performance royalties for the use of their musical compositions in live in-person settings.

While the music industry's revenues from recorded music from streaming platforms grew substantially in the last several years, AM/FM radio unfairly still gets to run their music-driven stations without having to pay a cent for the privilege of broadcasting the sound recordings that draw their audiences to them.

Total U.S. revenues "from streaming music grew 19.9% to $8.8 billion in 2019, accounting for 79.5% of all recorded music revenues." The streaming category includes a variety of formats, "including premium subscription services, ad-supported on-demand services (such as YouTube, Vevo, and ad-supported Spotify), and streaming radio services (like Pandora, SiriusXM, and other Internet radio services)." By comparison, the music industry has never collected any performance royalties whatsoever from AM/FM radio for the use of sound recordings.

In a separate section, the filing went on to argue, among other things, that loosening local radio ownership limits would worsen "already harmful impacts of consolidation on diversity and localism." It stated that the mission of the FCC is "not to prop up huge media companies at the expense of smaller broadcasters or music creators." And it argued that with the main studio rule gone, "if the commission were to further loosen the Local Radio Station Ownership Caps, what little actual localism is left at independent and locally-programmed regional AM/FM radio stations would be further jeopardized as syndicated programming and voicetracking takes the place of long-standing local talent and genuine commitment to local concerns."



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In addition to the grant of free spectrum to transmit its signals, AM/FM radio already has an enormous and unique competitive advantage against their streaming and satellite counterparts ...

NAB

(continued from page 29)

market," and that the advertising market has fundamentally changed; that digital platforms command an increasing percentage of the market at the expense of traditional media; and that the pandemic's shock to the ad market is harming local radio stations, making rule reform more urgent.

"FCC ownership limits and DOJ merger reviews remain premised on the view that local TV and radio stations exist in markets hermetically sealed against the vast array of choices available to audiences and advertisers," the NAB concluded. It urged the commission "to carefully analyze non-broadcast sources of competition to local radio and TV stations in the contexts of this biennial report and its pending quadrennial review. As shown above and in numerous earlier NAB filings, agency regulation and oversight must be updated to reflect competitive marketplace realities."

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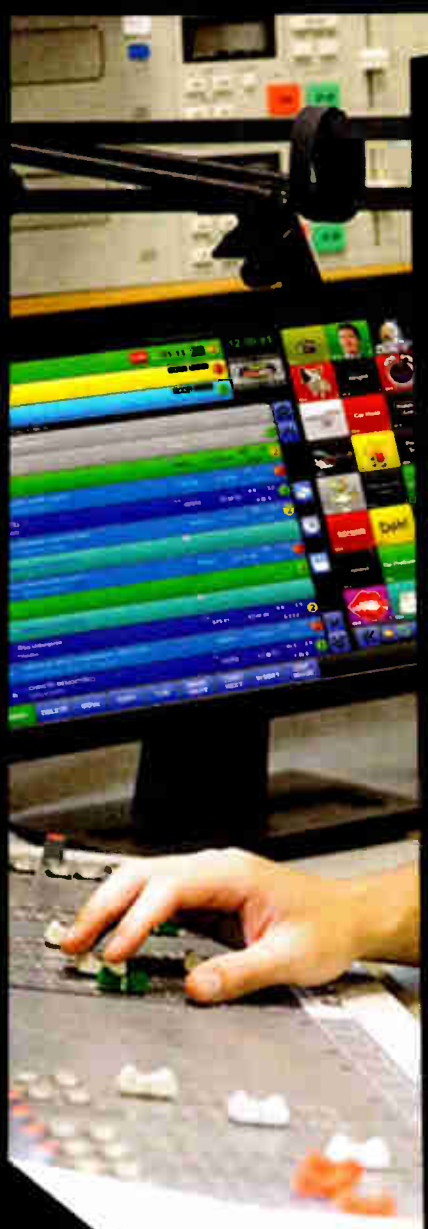

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