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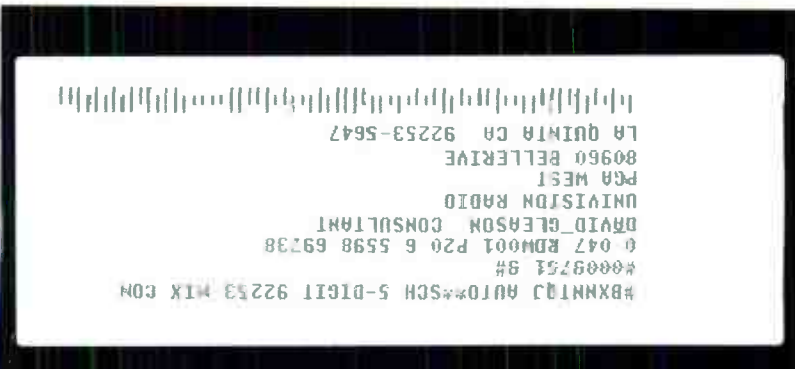

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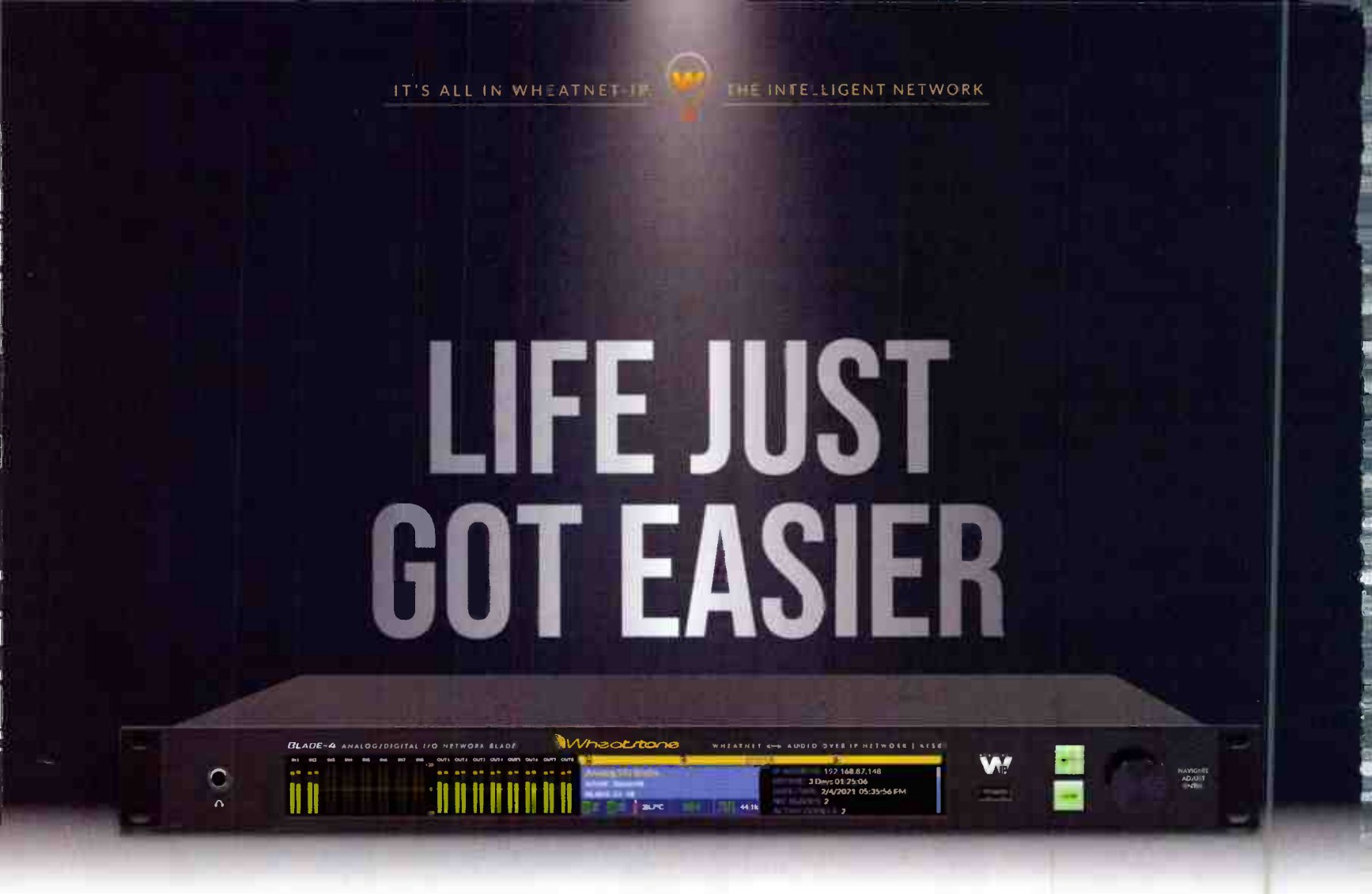

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Remembering Jack Sellmeyer

He was an accomplished engineer and consultant

Paul McLane
Editor in Chief

I am sorry to note the death this month of Jack Sellmeyer at the age of 82.

As we wrote in an obituary on the Radio World website, Jack was one of American radio's leading broadcast engineers of the second half of the 20th century and into the 21st.

During his career he worked with or was mentored by some of the greatest engineers of his era, including Bob Silliman, Jules Cohen, Louis King, Ben Dawson, Bob Orban, Don Everist and Bob duTreil Sr.

"Education is the key to success for any broadcast engineer," he told Radio World late in his career, echoing a sentiment I've heard over and over from the greatest technical minds in our business.

He also told us: "It's a great thing to be able to do the work you love."

Jack received the NAB Radio Engineering Achievement Award in 2009 and the first George Marti Award for Engineering Excellence from the Texas Association of Broadcasters five years later.

"Jack was one of the best, smartest consulting engineers I have ever worked with," said Cris Alexander, director of engineering for Crawford Broadcasting and technical editor of Radio World Engineering Extra.

"He was creative and could think outside the box. He was a master with AM antenna systems and knew how to make even difficult arrays work as they should. We have lost one of the greats."

Tom King, chairman of Kintronic Labs, told me, "Jack and I shared our common faith in Jesus Christ. On one occasion we met at a Radio Disney transmitter site in New York City, where we removed a Continental 317C 50 kW AM transmitter from service that was donated by Radio Disney. After driving the transmitter back to our plant and assembling it for test, Jack visited us and conducted the final commissioning of the transmitter on a new frequency. The transmitter was shipped to Voice of the Martyrs in Colombia in South America, where it has since been in service as a regional Christian radio station."

I've also heard testimonies about Jack from the likes of Tom Silliman, Norm Philips and other leading engineers who were in a position to know.

It's a reminder to us of the great trove of engineering knowledge that exists in our industry and of how much is lost when an expert like Jack passes.

You can read about his career at *radioworld.com*, keyword Sellmeyer. The article also contains a link to our 2009 profile story of Jack.

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On the cover
Jon Accarrino of Capitol Broadcasting. See story, page 22.

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Sage EAS Users May Miss Deadline

Sage Alerting Systems told the FCC in November that many users of its EAS products would not receive a firmware update in time to comply with the commission's pending Dec. 12 deadline.

"We continue to work on the Rev96 update," the manufacturer posted on its website. "We apologize for the delay." It said it would continue to update its website and keep the FCC informed on the release status. "When Rev96 is released, an email will be sent to those who are signed up for our support email list."

In particular, Sage said, the delay may affect users who have a large number of ENDECs or who employ contract engineers with many clients to update.

President Harold Price told Radio World the firmware was in final testing and expected to be released soon, but that the timeline was going to make compliance with the deadline difficult for users.

"EAS is an important national resource and part of a complex ecosystem," he said. "We want to get it right."

Though the number of units in the field is not published, Sage generally is considered to be one of the largest, if not the largest, suppliers of EAS gear to the U.S. radio industry.

Radio World asked the FCC for comment. "While Sage has made staff aware of its issue, we have not received any requests for an extension of time from Emergency Alert System Participants to date," a spokesperson replied in early November.

Part 11 of the rules states that if an EAS encoder or decoder becomes defective, a station can operate without it, pending repair or replacement, for 60 days without further FCC authority, as long as it makes a note in its station log. After that, an informal request normally must be submitted to the regional director of the appropriate FCC field office, asking for more time.

The commission did not comment on whether Sage users in general will be given a period of grace if they miss the deadline, as has sometimes been the case in the past in similar circumstances.

The Sage update is compatible with 3644 ENDEC hardware; it costs $159 and is sold through U.S. distributors. (A Model 3644 purchased new from dealer stock after Dec. 12, 2021 is eligible for a free update.)

The FCC last year adopted new rules intended to result in greater use of IP-based Common Alerting Protocol format alerts and more understandable and informative messages. Manufacturers Digital Alert Systems and Gorman-Redlich released their software updates to users in October. Viavi (Trilithic) issued an update earlier this year.

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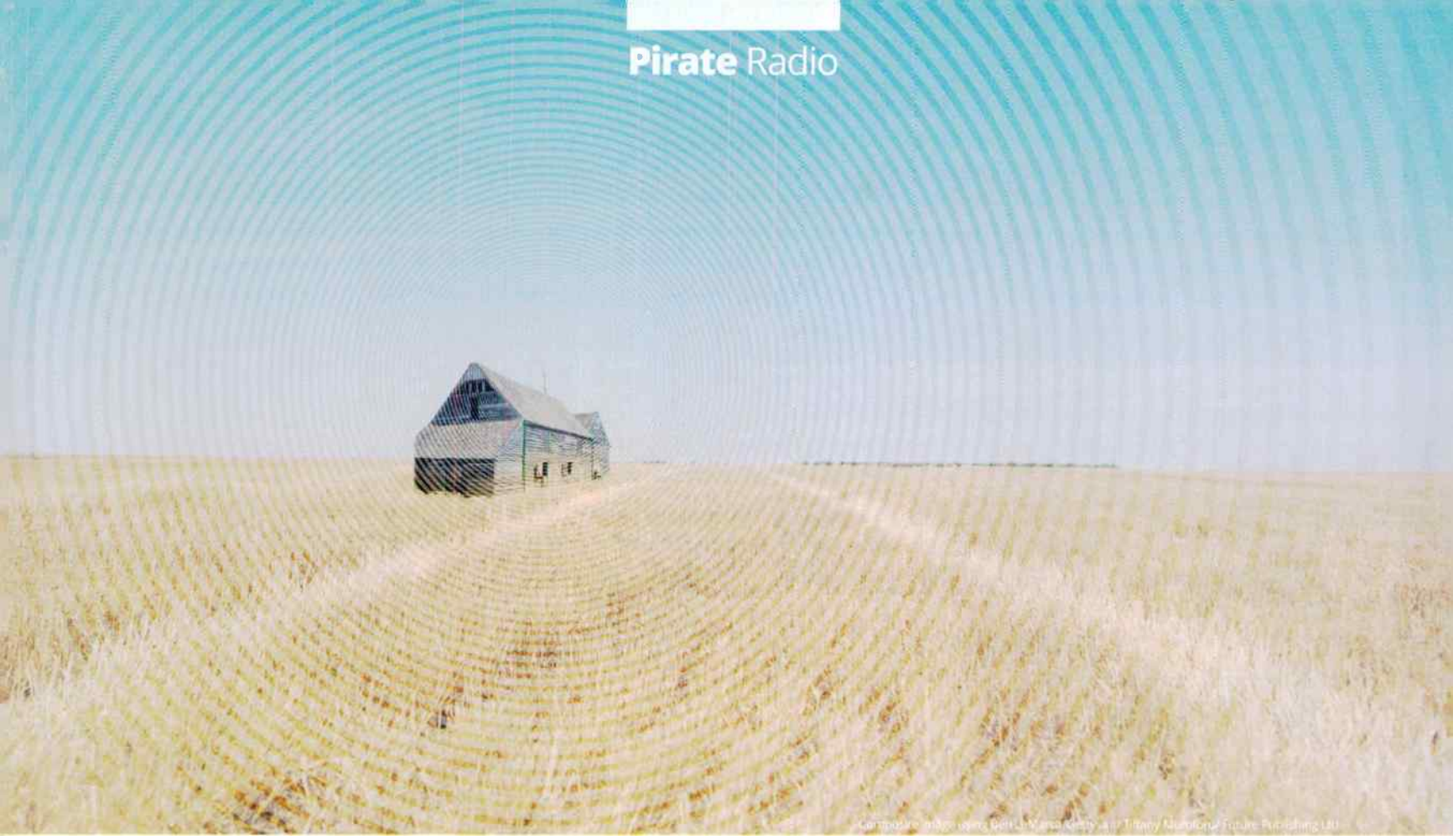

Pirate radio is not just a big-city problem

Illegal broadcasts can be a headache, or worse, in rural areas too

Writer

Randy J. Stine

Radio World's lead news contributor profiled consultant John Broomall in October.

For Ivan James, pirate radio is not only a major-market problem.

He is president of M-4Media, which owns KJVI(FM) in Robert Lee, Texas. His station has been frustrated by a pirate who has been interfering on its frequency 105.7 MHz since 2016, often mimicking out-of-town stations.

The city of Robert Lee is the seat of Coke County and "known as the home of the Rabbit Twisters and the Playground of West Texas, for the many activities we are able to provide to travelers," according to the city website. But its population is barely above 1,000 people, and the radio station focuses its branding on the San Angelo area about 30 minutes to the south.

Its Facebook page reflects the community focus. On a day in early November it featured a "boil water" notice, a promotion for a local furniture and mattress store, an alert about an accident on state highway Loop 306, and a pinned memorial to the victims of 9/11.

James calls the pirate radio activity egregious. "It really hurts in our fringe coverage areas." His Class A FM broadcasts at 6 kW, which James says is just enough to reach San Angelo. But he said the licensed signal is hindered by emissions that have caused occasional interference, especially on weekends, for seven years.

"We've worked very hard and spent money to make our signal as good as possible, yet the illegal broadcasts hamper the signal," he said.

The FCC is now required by Congress to conduct sweeps for pirate broadcasters in certain major metropolitan areas, and the early results have generated news headlines. But broadcasters like James who serve rural or less populous areas can tell you that pirate radio also can be a problem in small-town USA.

Unknown extent

The FCC has received additional funding from Congress in recent years to try to find and shut down pirates,

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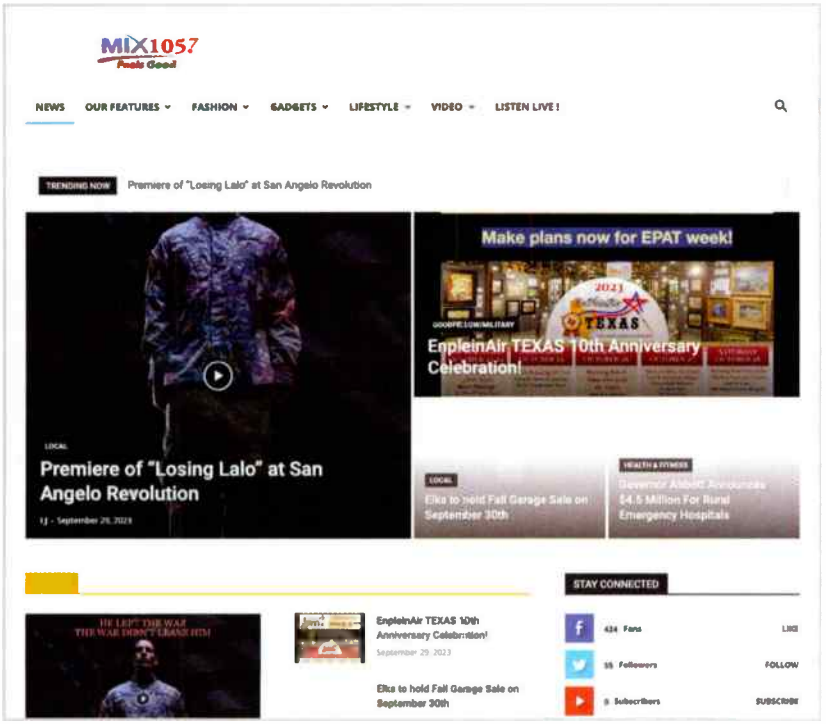

Above
The home page of Mix 105.7, KJVI(FM).

but it is playing catchup from years of relatively limited enforcement, which may have led to a false sense of invulnerability among illicit broadcasters.

The Preventing Illegal Radio Abuse Through Enforcement (PIRATE) Act became law in 2020 and requires the FCC to conduct sweeps annually in the five markets where pirates are most active.

"The commission, however, does not limit itself to investigating pirate radio broadcasting during enforcement sweeps only in these or other large metropolitan areas," an FCC spokesperson told Radio World.

Broadcasters also hope that the commission's recent efforts to pressure landlords of suspected pirates will help.

But it's hard to determine the scope of pirate activity in less populated areas.

Since 2020, the states with the most FCC anti-pirate actions are New York, New Jersey, Florida, Pennsylvania and Maryland. These states include many cities with dense populations, numerous radio stations and a documented history of pirate problems. The chart also lists enforcements in states such as New Mexico, Arkansas and even Alaska; but while the FCC page lists the number of enforcement actions by state, it does not give insight by population size.

Broadcast attorneys contacted by Radio World said pirate activity, while less common in smaller communities, is not unknown.

On Oct. 13 of this year, the commission issued a forfeiture order against Thomas Barnes, who is accused of operating an unauthorized station on 100.5 MHz in La Grande, a city of about 13,000 people in northeast Oregon.

It alleges that he operated the station for years on various frequencies.

The first complaint against Barnes was logged in 2018; the commission received another in 2019. Earlier, Barnes agreed to surrender a transmitter to an FCC agent, according to the commission, but the FCC says it did not receive a reply from Barnes to the latest enforcement effort, and it recently affirmed an $80,000 fine.

The case is indicative of how long it sometimes takes to conclude an investigation, if indeed a conclusion can be reached or a fine collected.

In another case, in 2022, agents from the FCC's Denver field office used RF direction-finding to discover the source of signals on 107.3 and 107.5 MHz in Walsenburg in southern Colorado, which has a population of around 3,000. The FCC wrote the landlord, Raphael Saucie, to warn that allowing pirate radio activity can bring enforcement action and forfeiture against a property owner.

The commission encourages listeners and broadcasters in any area of the country to file a complaint with the agency if they discover pirate radio broadcasting, the FCC spokesperson said.

The informal process requires no complicated legal procedures; it involves no filing charge and does not require the person to appear before the FCC. Complaints are then considered for further review and possible investigation.

Gregg Skall, a communications attorney with Telecommunications Law Professionals and Radio World contributor, says having an attorney is helpful but not necessary when filing a complaint.

"Anyone can file an informal complaint via the FCC's website. Or they can contact an FCC field office directly. Overall I believe the FCC has been pretty aggressive on the issue of pirates," Skall said.

Another observer says that pirates, even in rural areas, have become more sophisticated, using equipment that allows them to move and restart again in another location quickly. "It's like playing Whac-a-Mole in the countryside," that attorney said.

John Garziglia, a retired communications law partner for Womble Bond Dickinson who continues to advise the firm on radio broadcasting issues, said anecdotal evidence leads him to believe that radio piracy is not widespread in rural areas.

"However, the key to combating a pirate broadcaster is to provide as much information as possible to the FCC. Seek out the pirate's transmitter site, the pirate's studio/program origination location, the identity of the people involved in the pirate operation, the frequency and hours the pirate is on the air, and as many other details that can be obtained," Garziglia said.

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He recommends that a broadcaster dealing with a pirate engage a legal or engineering professional who routinely deals with the FCC's Enforcement Bureau

"That can prove very helpful. The FCC receives thousands of complaints annually, so an experienced practitioner will know whom at the FCC to contact with a pirate radio complaint, and how to present persuasive information to agency personnel."

> **"We just haven't heard much back. I'm losing advertising dollars because clients try to listen and hear another station. We just want to serve the people of our community."**

Limited resources

The commission says it treats all reports of illegal radio seriously, but attorneys and others say the FCC does have limited resources and manpower to draw upon, even after the boost from Congress.

Pursuing a complaint may require patience and persistence on the part of the licensed broadcaster; and it may not be evident to an outsider how or whether enforcement people are working on a case.

Garziglia mentioned a well-known pirate radio broadcaster near Adrian, Mich., pop. 20,502, that has plagued a community for decades intermittently and remains on the air to this day. The existence of Radio Free Lenawee was brought to the attention of the FCC in 1996, according to court documents provided by Garziglia.

Meanwhile in Robert Lee, Texas, M-4Media has collected audio proof as evidence of the pirate, said Ivan James, and reached out to the FCC with complaints filed by its Washington-based attorney.

"We just haven't heard much back. I'm losing advertising dollars because clients try to listen and hear another station. We just want to serve the people of our community."

Big Apple Pirate Persists

The FCC in October confirmed a record pirate radio fine of $2.3 million against the operators of an unlicensed station in New York City.

The commission says César Ayora and Luis Angel Ayora never replied to its notice of apparent liability issued last March. The FCC says they are guilty of the "longstanding illicit operation of an unauthorized radio station known as Radio Impacto 2" on 105.5 MHz in Queens.

"Some of the most egregious pirate radio operations are run by individuals who have ignored prior enforcement actions by the commission," the FCC wrote.

"This is one such case. As such, it merits the strongest possible enforcement measures to the fullest extent of the law."

This action and the fine against Thomas Barnes described in the above article were the first fines proposed under the PIRATE Act, which became law more than three years ago and provides for much bigger penalties than in the past.

Collecting pirate penalties over time has proven to be much harder for the government than issuing them. In both of these cases the operators are told to pay within 30 days. "If the forfeiture is not paid within the period specified, the case may be referred to the U.S. Department of Justice for enforcement," the FCC wrote.

In the Queens case, the commission says copies of its notice in March were sent to the operators by first class and certified mail. The certified mail was returned, the first-class mail was not.

The FCC wrote in March: "As part of their PIRATE Act investigation [of Radio Impacto 2], FCC Enforcement Bureau Agents found scores of apparent violations between March and September 2022, including multiple weekly on-air radio programs. The Ayoras even advertised their pirate radio station for no less than 25 weeks, and continue to operate their unauthorized station to date."

The commission previously had issued Luis Angel Ayora a $20,000 forfeiture in 2015, which it said earlier had never been paid. "In 2016, the U.S. Marshals Service executed a warrant in rem and seized the Ayoras' broadcasting equipment," according to the FCC's NAL.

Radio Impacto 2 has not replied to Radio World's efforts to contact it for comment.

The website of Radio Impacto 2 calls it "The Official Radio of Ecuadorians in New York" and gives the impression of a substantial operation. The site lists studios in New York and Ecuador. In the past the website also has featured ads from familiar brands like All-State and Verizon Wireless.

The station's Facebook page has 142,000 followers.

— by Paul McLane

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

Tune in to tips!
Workbench submissions are encouraged and qualify for SBE recertification credit. Email *johnpbisset@gmail.com*.

Ken Beckwith's EAS antenna solution

Don't have time to build it yourself? Let Ken help you

Last time we discussed Ron Schacht's inexpensive EAS receiver idea. Now I hear from Ken Beckwith that he is building and selling antennas to feed your EAS receiver.

We shared a do-it-yourself AM loop antenna several years ago, but many readers don't have time for projects like that, and Ken has solved the problem by offering AM loop and VHF antennas for sale.

The AM version is an untuned shielded loop, based on a Motorola AM Stereo bulletin published in 1989. The antenna is weatherproof, made with PVC pipe.

Because it is a loop antenna, it should be pointed parallel to the desired signal. There is a sharp null when the antenna is perpendicular to the received signal; this feature can be used to null out an offending signal.

The antenna output is an "F" connector, and 75-ohm coax can be used to connect to the receiver. Ken recommends inserting a lightning arrestor, available from Amazon, between the antenna and receiver input.

Depending on mounting hardware, prices for the loop version range from $135 to $180.

The VHF model is tuned to the weather band but is also capable of receiving FM broadcast signals. It was designed as a 2-meter amateur antenna by F.C. Judd, G2BCX, and is commonly known as a Slim Jim.

The antenna, shown on page 12, is vertically polarized. It has a very narrow angle of radiation, about 8 degrees toward the horizon. As such, it has a gain that exceeds that of a 1/4- or 5/8-wave antenna.

The feed is at the bottom, using an "F" connector, and you'll use 75-ohm coax to connect antenna to receiver.

Right
Fig 1: An AM loop antenna designed to feed your AM EAS receiver.

Like the AM version, the VHF antenna can be opened for repair and is designed to be weatherproof. And like the AM version, it is available with several choices of mounting brackets.

It costs $105 to $150 depending on mounting choice.

For information or to order, contact Ken Beckwith at *kebeckwith@gmail.com*.

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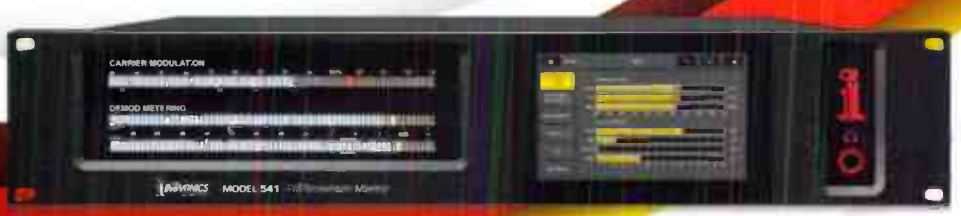

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Above
Fig. 2: The VHF version is tuned to the weather frequencies but also handles the FM broadcast spectrum.

What's on your plate?

Branding has taken over most radio studios, so what's left to stick your logo on? How about the butt end of your microphones?

Dan Slentz found these nifty end plates, which can be screened with your logo and affixed to the rear of a Shure SM7 microphone. The plates screw in but are also available in a magnetic version for quick transfer. They cost about $25 and are available from *https://micplates.com*.

If you don't need to promote your logo, how about numbering each mic in a busy studio setting, 1 through 4, so the board op knows which mic to switch on?

Below
Fig. 3: Promote your station with mic plates designed for the Shure SM7 family.

The ultimate multi-tool?

Leatherman is known for developing the multi-tool market. Its latest model is the ARC.

This substantial offering costs about $230 but provides a total of 20 tools in one, including a MagnaCut steel saw blade designed for wet or dry sawing; large and small bit drivers; wire cutters; scissors and plenty more.

The design of the ARC places the fold-out tools on the outside of the chassis, so they can be selected without opening the jaws of the handle. The individual tools, including pliers, can be opened with one hand, and lock magnetically.

Do you know the story behind the company?

"While on a budget trip to Europe in 1975, Tim Leatherman and his wife Chau constantly came across leaky hotel plumbing and road-side fixes for their cranky Fiat," its website tells us.

"Tim realized the need for a pliers-based multipurpose tool. 'I was carrying a scout knife and used it for everything from slicing bread to fixing the car. But I kept wishing I had a pair of pliers!' When Tim came back to the states, he took his 'multi-tool' idea and some sketches he made on the trip, and got to work. ...

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The company opened in 1983. All of its tools have a 25-year warranty. Find the ARC at *https://www.leatherman.com*.

Makes sense

In August we told you about EEsensors.com and how these devices, designed for monitoring server room temperature and humidity, can help broadcast engineers. Faith Radio's Wiely Boswell, CBRE, CBNE, says the tip from Dan Slentz has sparked a real interest in these and similar sensors. Workbench is all about sharing your expertise with colleagues!

Their pricing depends on what you want to monitor. EEsensors.com also offers an Internet of Things interface platform, should you have your own sensors to connect over the IoT.

World Radio History

Writer

James Careless

The author wrote here recently about refurbishing antique, vintage and retro radios.

KETO travels its own Rocky Mountain way

This low-power FM supports an immigrant community in Colorado

Colorado is a popular place for Ethiopians immigrating to the United States to settle, with 30,000 to 40,000 living in the metro Denver area alone, according to a report by CBS News. It is also home to KETO(LP), Rocky Mountain Multicultural Community Radio, a low-power station that serves the local East African community in Aurora and nearby Denver on 93.9 MHz.

It is a tiny operation with a limited budget but a commitment to serving immigrant listeners.

KETO's parent, Ethiopian Community Television, recently received a $200,000 grant as part of the Federal Communication Commission's $66 million Affordable Connectivity Outreach Grant Program, intended to drive awareness and enrollment in the commission's broadband affordability program.

"We are the only nonprofit organization with a low-power radio station to receive this grant," said Endale Getahun, KETO's founder and radio manager.

Above
Endale "Mike" Getahun visited exhibits at the NAB Show this year.

Diverse community

Since going on air on Sept. 11, 2017, coinciding with the Ethiopian New Year and Ashenda Tigray celebration weeks, KETO has been serving a range of immigrant communities in the Aurora/Denver area. It does this through local music and spoken word programming in Tigrinya, English, Somali, Swahili, French, Amharic and Afaan Oromo, among others.

"We serve an international immigrant community. We are on air 24/7," said Endale, who also answers to "Mike." (East African culture uses first names rather than surnames.)

An immigrant himself, Endale founded KETO in response to what he saw as a lack of non-mainstream voices on local radio.

"There are a lot of diverse people in the community but the media seems to be one-sided in their content and music," he said. "Immigrant communities have specific messages, events, issues and public service announcements that they need to hear on air, but our local radio stations are not really focused on that."

World Radio History

Meeting this need, he said, is why KETO has found an audience in Aurora and Denver.

"Our audience is predominantly African-born immigrants, along with non-Africans from other parts of the world," said Endale. Its programming is largely produced by volunteers, although some content comes from other sources. "The programming we air is governed by our budget, what our volunteers can make, and what we can get from other broadcasters on a non-copyright basis," he said. Endale himself is a volunteer at the station. He makes his living in the local transportation industry and as a photographer/deejay at local events.

Today, KETO's studio and office are in downtown Aurora at 1400 Dallas Street, after launching its operations at Aurora High School, which is still home to its Nautel VS-300 FM transmitter and 100-foot tower. Since KETO's coverage doesn't cover all of its target area, the service is also available to Roku streaming services users as an add-on to their Roku TV channel lineup using a channel search for "KETO FM."

Local support

As an LPFM, KETO cannot sell commercials to raise funds, but it can offer underwriting announcements and give on-air recognition to its underwriters, including commercial entities and non-profit organizations that want to draw attention to their goods, services and viewpoints.

"Our programming and operations are funded by grants or support from the art organizations, the City of Aurora and Colorado Media Project," Endale said.

"We are also allowed to raise funds by having businesses underwrite our shows. But since COVID hit, this has fallen off, so we also raise funds from our members and local listeners."

Despite its shoestring budget, KETO does its best to provide a professional, polished sound. Its facility includes an Axia AoIP network. "We also have RadioDJ automation, because our schedule is 50/50 live and recorded content."

Dedicated to assisting local immigrants, KETO does its best to inform, educate and entertain them. For instance it puts a lot of effort into helping listeners register their children in the local public school system. It also gets behind immigrants seeking fairer pay at work.

"One union reached out to us because a lot of their immigrant members who work for the City at Denver International Airport were only getting minimum wage of $11.10 per hour," Endale said.

"A number of them came on the air to tell their stories, while our ability to talk to these people in their native languages helped them understand what was going on. As a result, the union got several more members, followed by the mayor agreeing to raise the minimum wage to $15 an hour."

The station also "gives voice to the voiceless in the local Tigray community of Colorado and the 'Tegaru Lives Matter' movement in the United States," he said. (A two-year civil war in the Tigray region of Ethiopia saw hundreds of thousands of people forcibly expelled, prompting accusations of ethnic cleansing, according to the Associated Press. A cease fire was declared in 2022.)

"A lot of our listeners drive taxis, Ubers, food delivery vehicles or local busses, so they can listen to us pretty well when they're on the road," said Endale.

"However, our FM signal isn't always easy to receive inside buildings across our coverage area. That's why I took the steps to put us online and on Roku and RokuTV. This proved to be very valuable during the pandemic, because the city and the state were relying on us to reach the immigrant community in the languages they understand. That's when they underwrote a lot of our programs, which allowed us to upgrade our equipment."

He believes KETO is a trusted media source for many in the Aurora/Denver immigrant community and a partner that they want to cultivate.

"They call us up all the time to ask about the music we are playing, and to promote their upcoming events," Endale said. "This is how we know that people are listening, along with the responses we get to our social media accounts."

Above Right
Endale behind the mic. He wears dark glasses indoors for medical reasons.

Below
Part of the studio equipment at the Dallas Street location.

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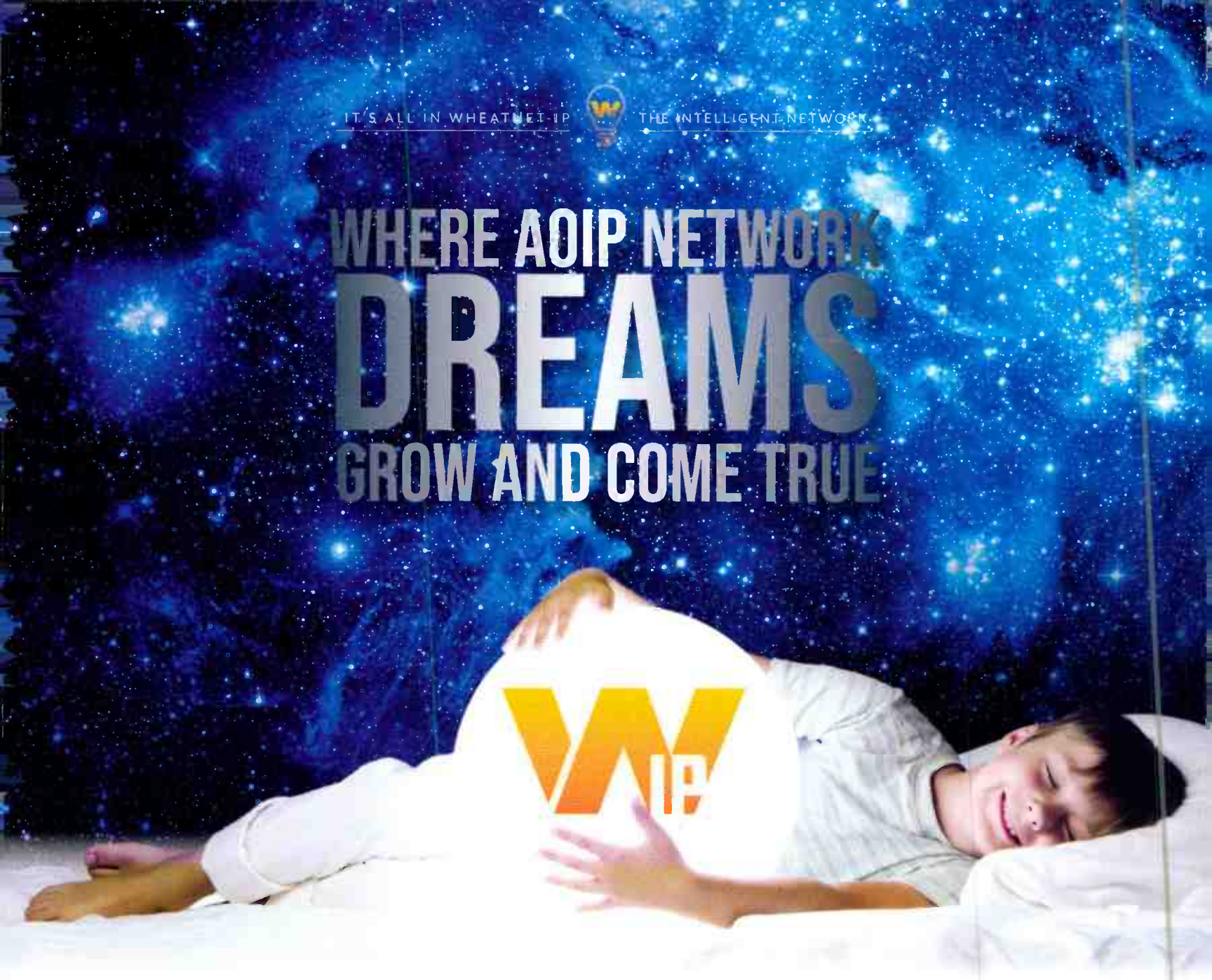

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About Buyer's Guide
This section appears in every other issue, focusing on a particular category of equipment and services. It is intended to help buyers know what's on the market and gain insight into how their peers are using such products.

"Fresh Air" uses Tieline for remotes and podcasts

Iconic public radio show transitioned from ISDN four years ago

Since 1987, "Fresh Air" has been one of public radio's most iconic programs.

"Long-form interviews are an integral part of how we deliver insightful content from a wide range of leading figures," said WHYY Media Technology Manager Julian Herzfeld, shown at right.

The show is one of public media's most popular programs, with over 4 million people tuning in each week on 658 NPR stations. In addition, it has 4 million weekly podcast downloads and is the number 1 podcast in its genre on Apple.

"After ISDN was phased out completely four years ago, we transitioned to high-quality IP audio technologies for recording remote interviews because phone quality audio is not great," Herzfeld said.

"WHYY purchased a Tieline Merlin codec and Report-IT in 2019 to facilitate obtaining pristine audio from interviewees using IP connections."

The team usually record interviews for "Fresh Air" and edit them, so tape sync is used extensively. Longtime host Terry Gross and L.A.-based host Tonya Mosley are recorded at the studio end, and WHYY uses Report-IT to interview remotely located guests.

Report-IT Enterprise is a free app for iOS or Android that interviewees can download on their smartphone.

"We configure Report-IT app settings and provide login credentials to each guest. They download the app, log in, and tap 'connect' to dial and connect securely to our Merlin codec at the studio."

Herzfeld said it's simple for users to operate and Tieline's TieServer manages the connections and settings on the remote device securely, so interviewees need no technical expertise and aren't exposed to IP address details or other technical information.

"With Report-IT the audio quality is high fidelity for real-time live connections," he said. Guests can plug in accessories to improve listening and interview audio quality, or use the built-in phone microphone.

However, IP connectivity can be challenging in some situations.

"For example, we interview people from all around the world, and access to reliable internet can be challenging at times in war zones or very remote areas. Dropouts can occur if data network connectivity is poor and this is where Report-IT really delivers."

The app can be configured to automatically record the guest locally on their smartphone in 20 kHz audio quality during their interview. Then afterwards the app can automatically upload the recording to WHYY's secure server, allowing them to download a perfect recording from the phone and use Pro Tools to edit the interview package for broadcast.

"We use the Tieline gear every week and it is integral to how we deliver 'Fresh Air' programming. Other programs like WHYY's 'The Pulse,' our daily live talk show, and our news services, also use Report-IT and the Merlin codec extensively for interviews. Report-IT's live audio and FTP file upload solution is secure, robust and the quality is excellent, providing the flexibility to deliver excellent programming to a wide audience each week."

More Info
https://tieline.com

Hear the Show
"Fresh Air" archives are available to download from *www.freshairarchives.org*.

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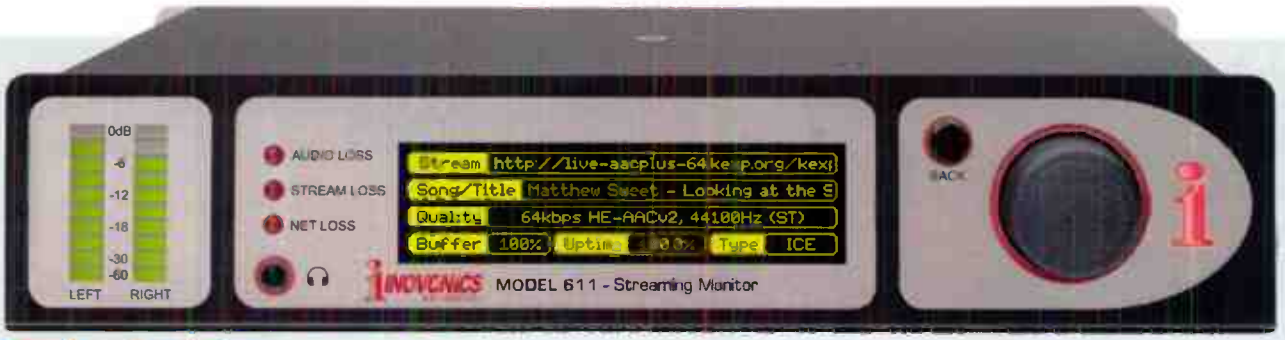


Tech Update

Inovonics 611 Is the Next Generation

Inovonics recently came out with the model 611 Streaming Monitor. It is a dedicated hardware solution for uninterrupted monitoring of network streaming audio such as online internet radio and other IP streaming applications.

"Streaming audio over IP networks has progressed in recent years and the new 611 is designed to meet the technological challenges of today with greater processing power and advanced functionality," the company says.

Features include balanced analog and AES-digital outputs as well as self-logging alarms that check constantly for audio loss, stream loss and internet loss. The 611 can be managed remotely from any web-enabled device and SNMP manager.

The 611 supports HTTPS streams and streaming formats HLS along with Icecast/Shoutcast. It has a Stream Failover function to automatically switch to backup streams, and StreamRotation to rotate through up to 30 preset streams.

Info: *www.inovonicsbroadcast.com*

World Radio History

SENZ deploys Wheatstone for streaming

"New Zealand's Home of Sport" is the local extension of Australia's SEN

With sporting events changing by the venue and the hour, streaming is a dynamic and growing part of Sports Entertainment Network New Zealand.

SENZ streams different content and sponsorships for 17 unique markets in New Zealand as the local extension of the Australian SEN brand. SEN/SENZ deliver live sports broadcasting, racing and sports-talk content to an enthusiastic target core audience of males aged 25–54.

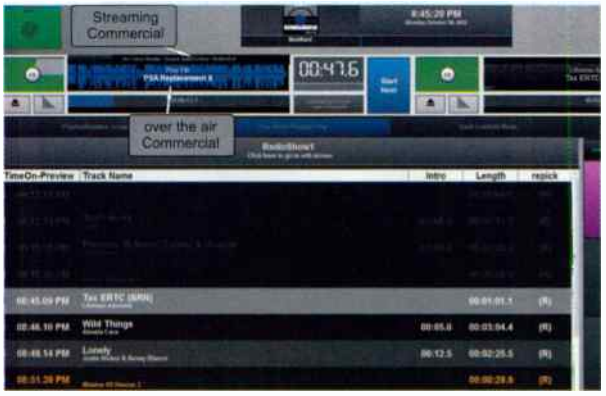
SENZ is using the Wheatstream appliance for provisioning streams, processing them and managing metadata out to its CDN provider and eventual delivery to the SEN/SENZ streaming app. Streaming instances are spun up by Wheatstone's Wheatstream appliance, which is part of the WheatNet-IP native AoIP environment.

More Info
www.wheatstone.com

As a WheatNet IP audio network appliance, Wheatstream is integrated into the busy 24/7 sports network. Streaming is part of the studio operation like other workflow sin the audio chain, with AoIP logic controls for triggering stream provisioning and live coverage and color streamed directly from the studio automation or talk studio.

Each stream is individualized by Wheatstream with the appropriate type and amount of audio processing; Wheatstream audio processing is designed to optimize encoded streams. Multiple streams are managed in one rack unit, including audio processing and metadata unique to each channel.

Both SEN in Australia and its New Zealand counterpart SENZ operate from WheatNet-IP audio-networked studios.



Tech Update

NextKast Splits Ads Through Encoder

NextKast launched its internet radio product in 2012 with the goal of offering straightforward automation for online broadcasters. Over time, it has expanded to include terrestrial broadcasters with OnAir radio automation.

Features that support online broadcasting include a built-in encoder, integrated sound processing and real-time audio asset cue trimming. The latest addition, announced in October, is the capability to seamlessly split online ads directly through the encoder.

"This allows broadcasters to automatically play both the over-the-air version of a commercial and the online-focused ad for their streaming broadcasts," the company said.

"By incorporating this feature into a single automation system, NextKast simplifies the process for broadcasters, enhancing the effectiveness of their online traffic content and streamlining their operations."

The feature is available in the latest software version and can aid FM and LPFMs to better manage their traffic revenue using the flexibility of online broadcasting.

Info: *www.nextkast.com*

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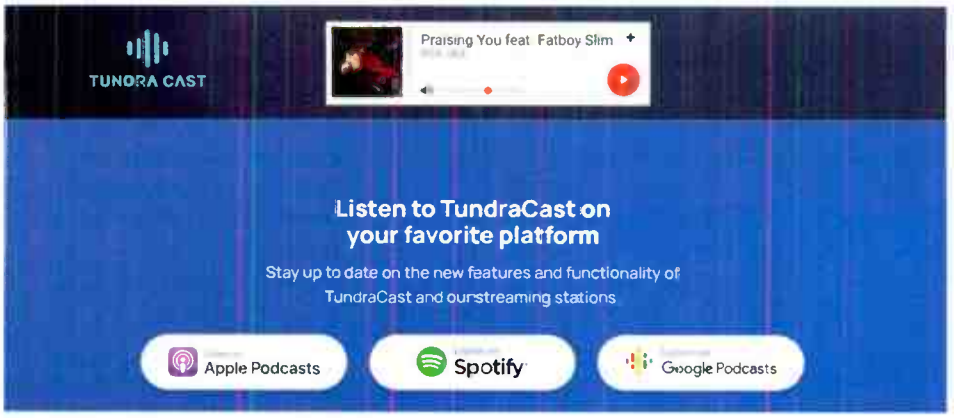

Tech Update

TundraCast Player Beefs Up

Summit Technology Group has made improvements to its TundraCast Audio Streaming Platform. They include a new web-based player that engages listeners with station-provided content, as well as an integration with PostMaster that Summit believes will "revolutionize the way broadcasters handle metadata and integrate with their RDS encoders."

The TundraCast web player includes an advanced HTML5 player, smooth integration of station-provided content and social media integration. The improved player can be located on a dedicated website hosted by Summit Technology Group or embedded into a station's self-hosted website.

"Further, we have integrated TundraCast with PostMaster to provide a cloud-based metadata storage system designed specifically for RDS encoders located at transmitter sites," the company says.

"This integration enables seamless transport of metadata from the cloud to the RDS encoders, eliminating the need for complex IP routing and reducing the chances of lost packets of data."

This means broadcasters can update metadata easily in real time, simplifying workflows and providing a convenient solution for managing metadata. "Broadcasters can now enhance their listeners' experience by delivering an array of rich and informative metadata, creating a more engaging and interactive environment," Summit says. The firm also offers a range of engineering services.

Info: *www.summittechgroup.com*

World Radio History

Capitol Broadcasting doubles ad revenue on SoundStack

It switched to open, robust programmatic ad tech in fall of 2022

With a slate of popular broadcasts and podcasts, Capitol Broadcasting, based in Raleigh, N.C., works hard to ensure its shows earn as much ad revenue as possible so they can continue to inform and entertain their avid listeners.

Adding new programmatic demand partners to fill more inventory was difficult; Capitol needed a monetization partner that could also connect them to incremental advertiser demand easily.

Also, using two different systems to manage streaming and podcasting, Capitol's team was doing extra work to traffic, optimize and analyze their ads and audience. Getting a single and simple view of overall performance was difficult.

"Managing streaming and podcast distribution from separate platforms created needless duplication in reporting and ad scheduling. We wanted a single platform that could manage both," said Anita Normanly, director of podcast operations.

Capitol moved streaming and podcast delivery/monetization to SoundStack in the fall of 2022. Opening up its audio inventory on an independent platform, with direct connections to multiple demand partners, Capitol ensured that more advertisers would have access to the audiences they value the most, allowing them to fill more inventory. The organization more than doubled ad revenue in five months by selling each impression to the highest-paying advertiser.

The move allowed them to unify management and reporting, of both podcasting and streaming, in one system, cutting workload in half. It also gave Capitol access to features like reliable geotargeting, blackouts for exclusive sporting events and provide targeted emergency alerts.

Right
Jon Accarrino is VP, transformation and strategic initiatives for Capitol Broadcasting.

More Info
https://soundstack.com

Tech Update

ENCO Rushworks Streamster Series

The A-List Streamster series from ENCO Rushworks is a cost-effective, integrated hardware and software platform for managing and streaming radio and TV content online.

The Streamster is configured with most of the features of the company's A-List Broadcast Automation System for broadcasters and media networks but is dedicated to IP operations. At 7 by 7.4 by 2.75 inches, the compact design includes an i9 processor, 16 GB of memory, a 256 GB NVMe boot drive and a 1 TB solid-state storage drive.

The Streamster Pro version adds capabilities to support a revenue generation model similar to traditional broadcasting, allowing users to monetize content by selling airtime to businesses that desire a program or an ad presence on the end user's streaming channel. A-List playout automation functionality and playlist building tools provide a graphics-oriented drag-and-drop interface to create and manage a playlist, from events and breaks to multiple types and layers of overlays.

Info: ***www.enco.com***

World Radio History

Tech Update

Telos Rolls Out X/20 and R/20

Telos Alliance recently introduced its next generation of stream encoders and processors.

Z/IPStream X/20, shown here, is successor to the X/2. It is described as an all-in-one streaming audio software encoding and processing platform for Windows PCs and servers. The R/20, successor to the R/2, is a dedicated 1RU encoding and processing hardware appliance with AES/EBU, Livewire and AES67 I/O.

Both offer the codecs and versatile encoding found in their predecessors but add new features and processing options.

One option is Omnia Forza, which makes its debut in Z/IPStream X/20 and R/20 as a mid-tier processing upgrade between the standard Omnia three-band offering and flagship Omnia.9 processor. Forza's AGCs and multiband limiters are tailored for streaming audio. Omnia Sensus codec conditioning is included to bring sparkle and clarity to low-bitrate streams. A new LUFS target-driven ITU-R BS.1770 loudness controller makes it simple to comply with streaming platform requirements.

Another option, Déjà Vu, is a surround sound upmixer from Frank Foti that converts stereo content into rich multi-channel sound using the MPEG-Surround format, which is supported by a variety of streaming players and most AVRs and is compatible with stereo playback systems.

And Nielsen PPM and Kantar watermark encoding are available, allowing broadcasters to track listening on smartphones, tablets and computers.

Z/IPStream X/20 and R/20 feature Fraunhofer audio codecs, including HE-AAC v1, HE-AAC v2, AAC-LC, MP3, and xHE-AAC, as well as Adaptive Streaming for Apple HLS and Microsoft Smooth Streaming formats. Both are capable of encoding multiple MP3/AAC/aacPlus streams and support all popular streaming server platforms.

Info: *www.telosalliance.com*

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The SS 6.1 MLR/BNC is a transparent six input, one output switcher/router with BNC connectors and mechanical latching relays. The SS 6.1 MLR/BNC is perfect for passively switching MPX FM baseband or AES-3id signals. Switching is accomplished with mechanical latching gold contact relays, which means that the unit can route a signal in either direction and it will keep routing signal even after losing power. Due to the passive nature of the switching, any input level and impedance can be used. Inputs may be balanced or unbalanced, while output levels, impedance, distortion, noise, and balancing will match that of the selected input. The SS 6.1 MLR/BNC can be controlled and monitored locally via front panel controls and/or remotely with simple opto-isolated contact closure inputs and dry contact status relay outputs, as well with multi-drop RS-232 serial commands, or TCP/UDP commands over Ethernet.

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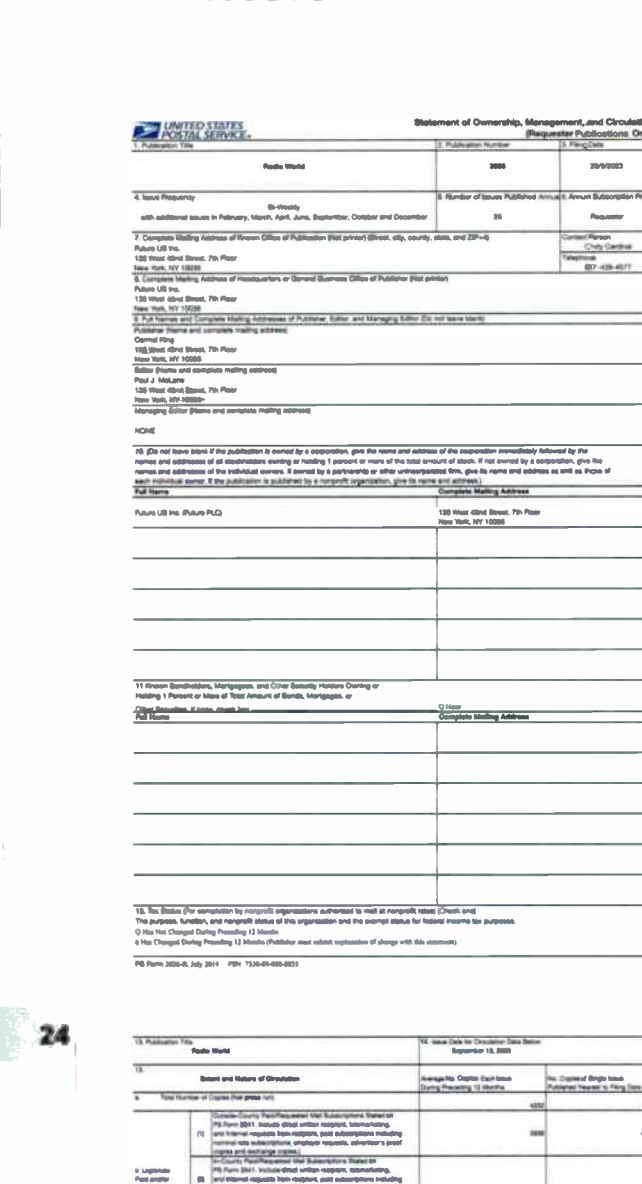

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PS Form 3526-R, July 2014

KERA adds live content rewind

Texas pubcaster deploys SGrewind from StreamGuys

As the NPR and PBS member station for North Texas, KERA's stations 90.1 KERA News, KXT 91.7 and WRR 101.1 FM serve the fourth-largest population area in the U.S. across broadcast, web, social media and increasingly streaming applications.

Recently, KERA's audience development team was tasked with improving the user experience. The ability to rewind live content was among the top requests.

"The ability to pause and rewind live radio is not something we've been able to offer until now," said Alan Melson, shown above, who is VP, digital media at KERA. "It's about giving people extra functionality and flexibility; we wanted listeners to be able to go back minutes or hours, or listen to an entire program from the start.

"We needed a tool that we didn't have to build ourselves, but which gave us the option of building a front end. We found that SGrewind from StreamGuys not only provides that functionality out of the box, but also gives us some flexibility on how to deploy it."

SGrewind uses the HLS (HTTP Live Streaming) protocol, an adaptive HTTP format designed for streaming video and audio content and easy to integrate. It is in use for KERA's 90.1 NPR News and Information station. StreamGuys partnered with Public Media Apps on the service, which initially launched on KERA's mobile app, developed by Public Media Apps. The station is planning to incorporate the functionality to its website over the next 18 months.

"It has a clean user experience that makes sense immediately when people open the app," said Melson. "The live player is fixed at the bottom of the screen, so however you are interacting with the app, the player always provides access to play, stop, rewind and forward buttons."

Melson said StreamGuys recently helped KERA re-architect its workflow and incorporate a hardware upgrade across our Wheatnet AoIP system. "It created a direct handoff from the studio network to the streaming encoder and is an all-in-one streaming encoder which is configurable over the network. They really helped us get it up and running quickly."

More Info
www.streamguys.com

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Tech Update

StreamS Says "Do Podcasts With Pizzaz"

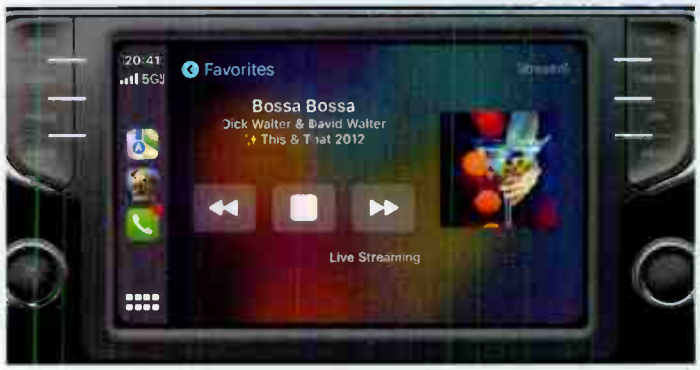
Modulation Index says its StreamS HLS File Encoder "does podcasts with pizzazz." Your podcasts can look just like live streams, with dynamic metadata and revenue opportunities.

The StreamS 1021 Enterprise File/On-Demand Streaming Audio Encoder for IETF HLS and MPEG DASH applications meets the professional requirements of commercial audio streaming using current standards-based segmented streaming protocols.

A scalable approach allows higher performance and quality to reach a wider audience on modern operating systems, streaming and mobile devices, connected-car digital dashboards and smart speakers, giving listeners the experience they expect from expensive high-performance digital players.

File-centric audio segments are uploaded and deleted by the encoder, creating an intrinsic keep-alive for stream reliability. HLS Metadata is extensible and either audio frame accurate (ES) or timestamped (fMP4) for precise display and control. Live streams and files can contain unlimited text and image metadata. Podcasts benefit with rich text and image features.

"HLS streaming is the same tech that has fueled the video cord-cutting craze, which has allowed huge success for video content



providers," says the company's Greg Ogonowski. "Audio content providers should take note. Further, there are several ways to stream HLS. Our HLSdirect gets it right because the encoder actually writes segments to the server. Not all encoders do this, and hence their HLS is not as robust."

Info: *www.indexcom.com/products/filehlsencoder*

THE AUDIOARTS VOICE 1 has all the tools and secret sauce of the Wheatstone M-1 microphone processor. But it's got more: WheatNet-IP, AES67, remote GUI control, password protection, real time clock and presets—complete with scheduler. It can be controlled from the OLED display and, of course, your desktop computer.

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Podcast Creator Uses Text-to-Speech Tech

Cirrus Streaming offers an innovative text-to-speech podcast creator designed to simplify the podcast production process and expand content options.

Traditional broadcasters such as terrestrial and internet radio stations can use it to create podcasts automatically and take advantage of additional content consumption avenues.

With approximately 100 unique voices available, Cirrus says, the podcast creator provides a range of customization. "This easy-to-use tool allows creators to input their podcast script, and the system generates lifelike audio tracks with the chosen voice," the company says.

"This approach eliminates the need for traditional voice recording, saving both time and resources. With a vast selection of voices, ranging from authoritative to conversational and available in multiple languages, creators can cater to a diverse global audience."

The company highlights its integration of an advanced podcast editor. In addition to diverse voice options, creators can trim, splice and seamlessly insert advertisements into their podcast files using the same platform.

"This simplifies the post-production process and makes it a one-stop solution for podcast creation, editing and distribution."

Info: *https://cir.st*

BROADCAST EQUIPMENTEX

GPIO Made Easy

Box-O-Relays 6

The Broadcast Tools Box O' Relays 6 is a six channel optically isolated relay module. It's new design is perfect for converting GPO outputs from AoIP systems and other devices to dry contact closures.

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Broadcast Tools is a Veteran Owned Business Designed, Assembled and Supported in WA State, USA.
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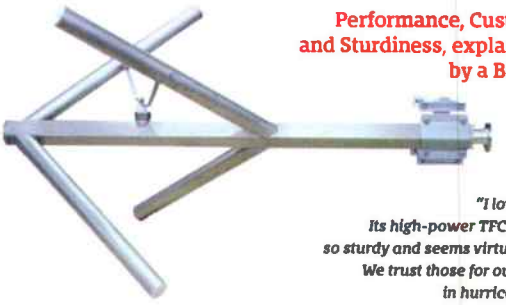

Performance, Customer Service and Sturdiness, explained this way by a Bext customer:

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DAVID HOXENG, ADX Communications, Pensacola, Florida

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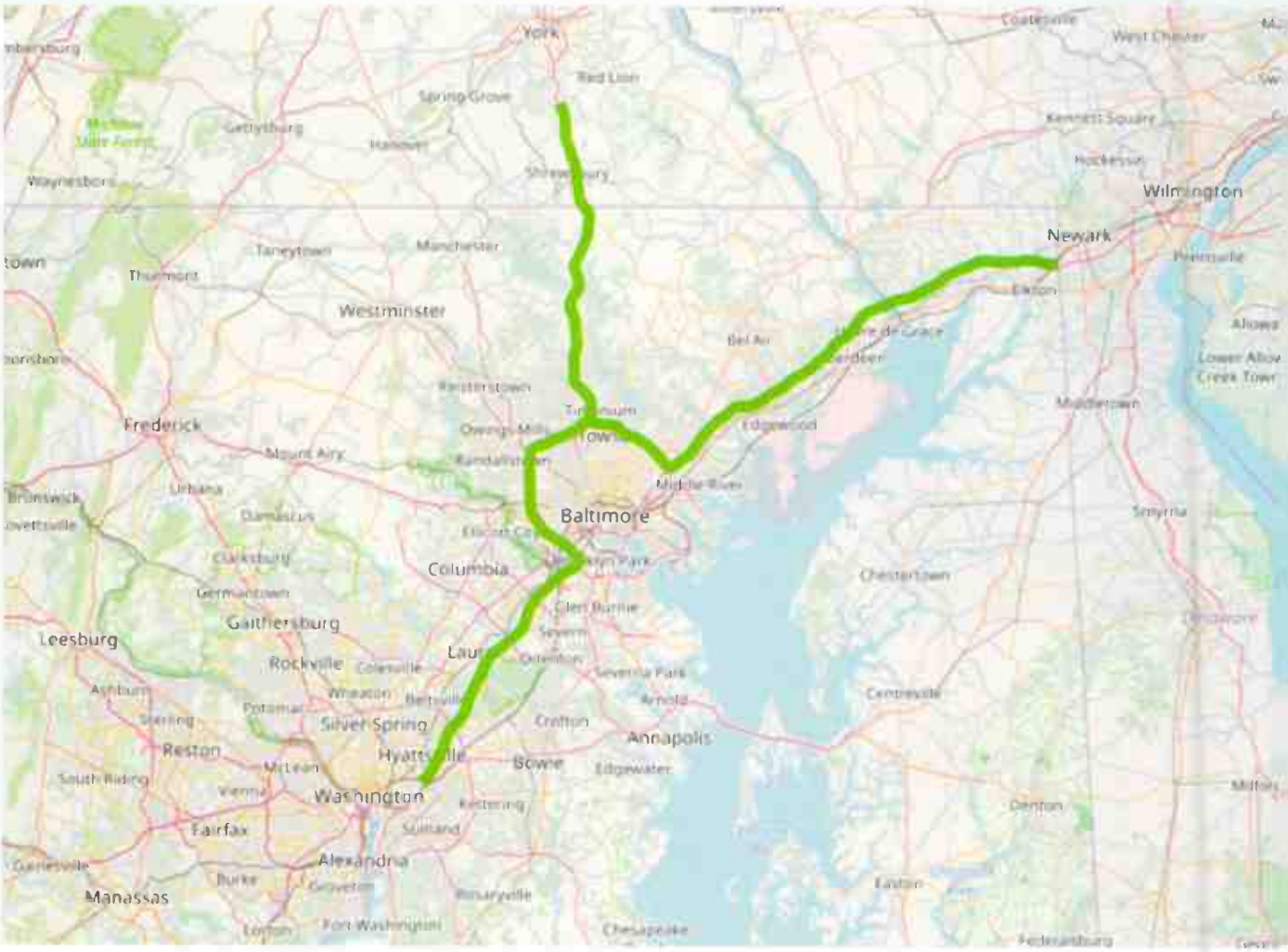

ATSC 3.0 audio services: the how and why

We can deliver audio services through a remarkably efficient, far-reaching system

Above
Distance drive tests in the Baltimore area. Green indicates where audio services could be received and decoded without repeated dropouts, in a vehicle with an unamplified, roof-mounted -8 dB antenna traveling at the legal speed limit.

One of the most interesting applications of ATSC 3.0, the new global standard for broadcasting, has been its use not only for television services but also for pure audio (radio) services.

ATSC 3.0 enables the use of IP (Internet Protocol) as a core part of the standard, allowing enormous flexibility in the potential applications of the specification. If you can send traffic over an internet link, you can also send it over 3.0. At the end of the day, it's all just bits: video, audio, software, files, signals, and so on.

As a result, we can deliver audio services through a remarkably efficient, far-reaching and modern system.

Over the past year, we have experimented with a variety of methods of encoding, transport and physical delivery in several markets across the country including Baltimore, Las Vegas, Nashville, Detroit and Washington. The paper "Audio Services Over ATSC 3.0: A Proof of Concept," given at the NAB Broadcast Engineering & IT Conference, explores in detail the decision-making and testing that led us to the current system design. The key results are summarized here.

Encoding and transport

First, when it comes to encoding, we found xHE-AAC by Fraunhofer IIS to be the most efficient at the targeted

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bitrates while maintaining "Good" perceived quality, compared to AC-4, HE-AACv2, HE-AACv1 and AAC-LC. This allowed us to carry audio at 24 kbps for music services, and even less for talk radio. It also has broad compatibility across devices and operating systems, simplifying integration.

Making a choice regarding the IP transport mechanism was a more difficult decision, as the standard options within 3.0 are geared towards much larger data streams than those used for audio, resulting in significant overhead at low bitrates.

We experimented with UFTP, MPEG TS, muxed MPEG TS, RTP and Pro-MPEG RTP, as well as MMT and ROUTE, which are standard within 3.0. In the end, our decision to use Pro-MPEG RTP was second only to raw RTP for low overhead, but it came with the key benefit of FEC and ease of integration on the receiver side. One other interesting activity that we have been monitoring is BBC R&D's work with QUIC multicast, which shows great promise in efficient distribution.

Below
A diagram of the prototype radio system. Metadata and thumbnails are also delivered over the air, providing a comprehensive experience without the need for an internet connection.

> **To make the math simple, using 20% of a UHF television channel, a station can offer 100 audio services.**

While we could simply insert the data at this point, one item within the 3.0 spec we took advantage of was UserDefined signaling, which allows us broad flexibility by permitting any valid non-conflicting XML to be sent as part of the standard signaling bundle known as LLS, or Low-Level Signaling. We crafted our service listing to allow for dynamic channel listing, some basic metadata and the ability to hand off services as a vehicle moves between markets.

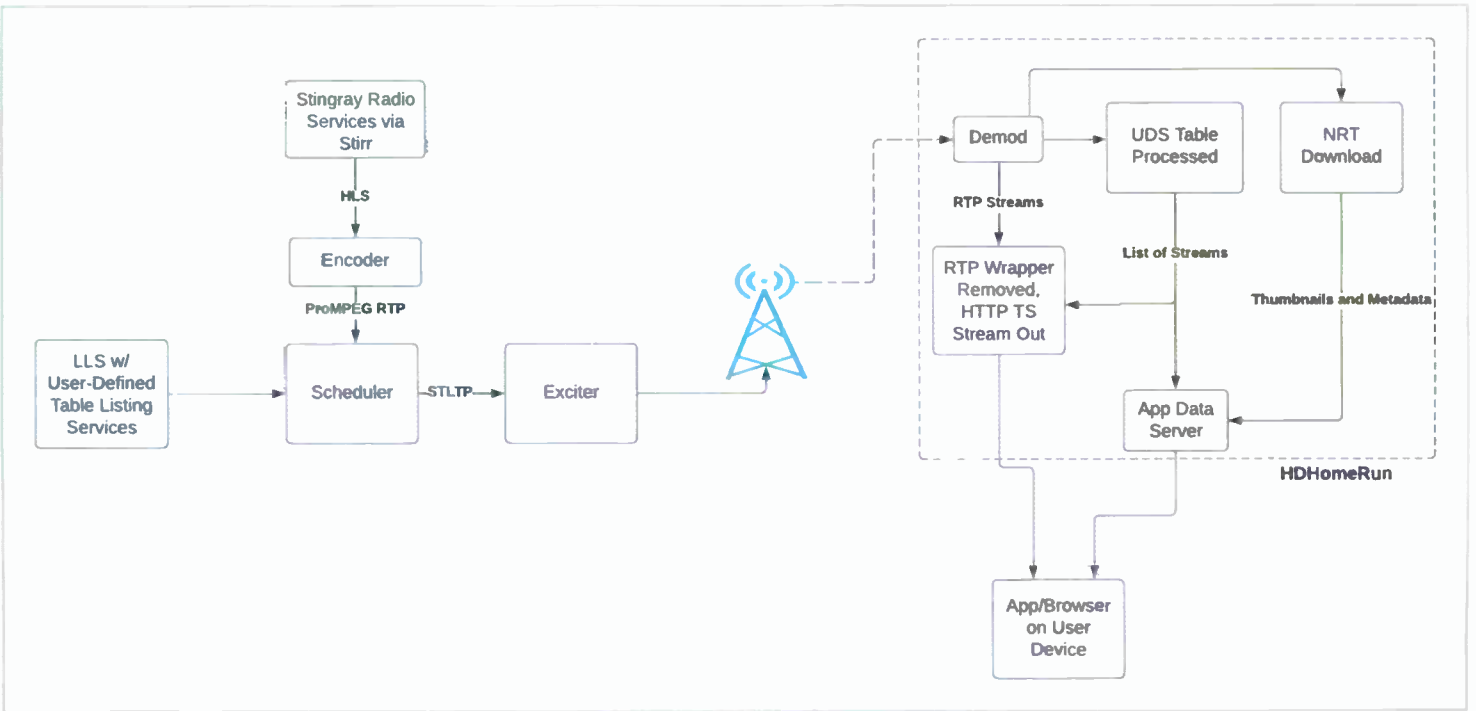
Testing in the car

With signaling and IP in hand, we turned to the physical layer. There are nearly endless parameters that can be tweaked here, allowing us to adjust to any reception case.

For this activity, we focused primarily on a vehicle traveling 75 mph down the highway and secondarily on surface streets and in urban canyons. There are multiple excellent pieces of software that allow us to estimate reception in these cases, which we used in combination with real-world experimentation to determine a configuration that would result in full coverage of our target market.

In our Baltimore tests, we were able to receive the signal out to the Delaware border, to 10 miles north of the Pennsylvania border, and down to Washington. In Detroit, the signal made it into Lansing going west and north past Flint.

In both cases, this outperformed comparable FM stations hosted from a similar location, crossing well into adjacent markets, and notably, taking up a fraction of the bandwidth used to send an equivalent FM channel over the air. To make the math simple, using 20% of a UHF television



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channel, a station can offer one hundred (100) audio services.

These results have several interesting implications for the radio industry and its competitors.

One recent development is the removal of AM tuners from vehicles, particularly EVs. Being primarily on the UHF spectrum and thus unaffected by the interference plaguing AM receivers, 3.0 provides a convenient "lifeboat" for AM stations to still have a presence in vehicles, the primary location for radio listening. Additionally, 3.0 delivers improved audio quality and reach over traditional AM radio. This, of course, relies on vehicles having ATSC 3.0 tuners in them, but we have reasons to be optimistic on that front.

It also isn't just AM that can benefit from the improved quality and reception. FM and satellite can see similar advantages, as it is very simple to tweak the encoding to meet the desired bitrate, rather than being locked into specific quality levels. ATSC 3.0 provides the advantages of digital radio without the quality loss.

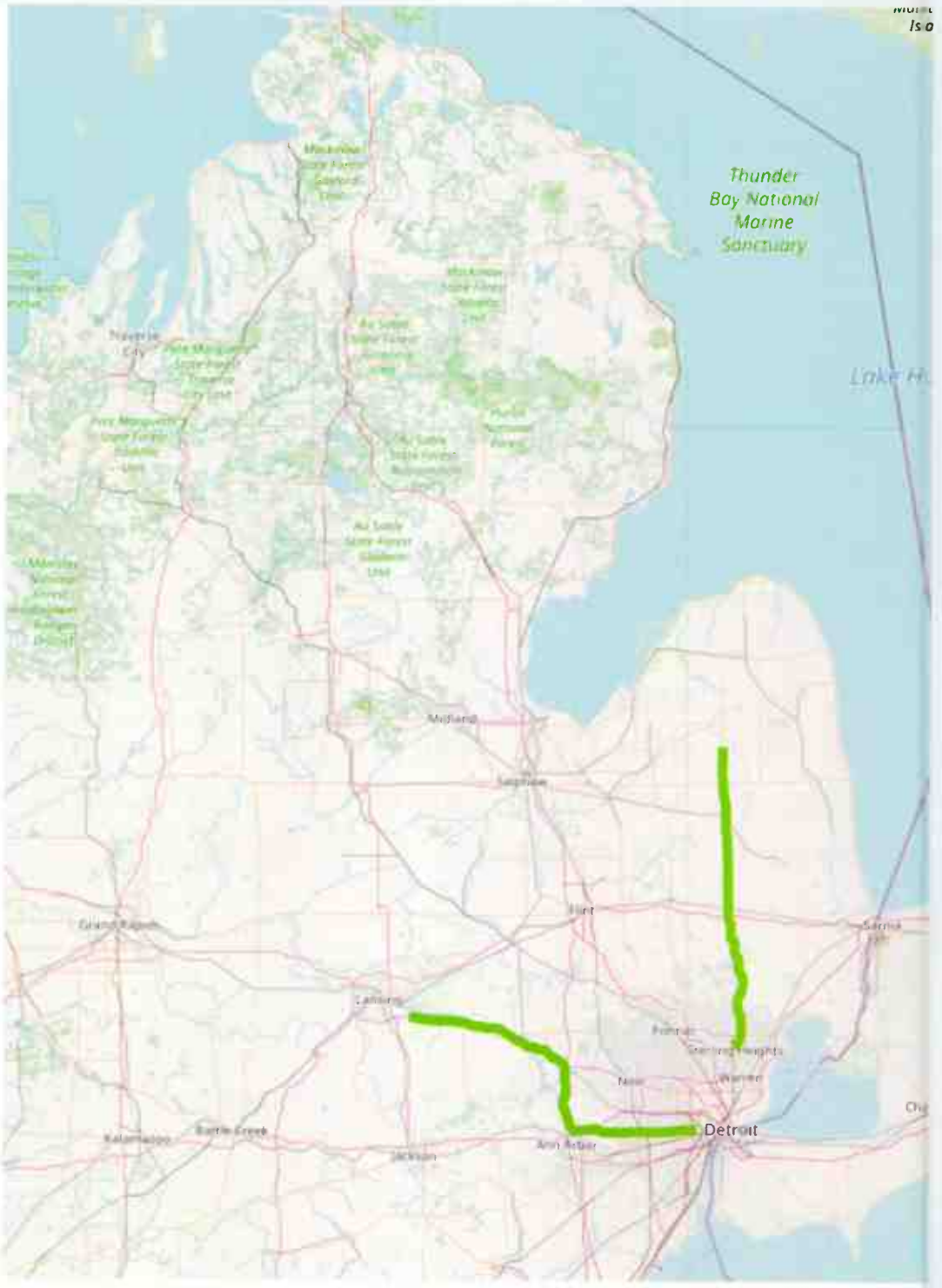
Flexible and efficient

The efficiency of ATSC 3.0 for linear content creates the opportunity to offload expensive internet and satellite delivery onto 3.0, primarily for the satellite and streaming companies, but also for those radio stations that provide online streams of their stations.

Because of the IP nature of 3.0, it can easily transmit audio feeds and fail over to the internet in the event of signal loss or market change. For large-scale providers, it offers the opportunity to bring their distribution costs more in line with those of radio stations, as they can take their most-listened linear streams and dynamically send them over 3.0 as listenership changes throughout the day.

Last, an area being actively explored is the integration of digital radio standards directly into 3.0. We have performed experiments with multiple standards thanks to the cooperation of such entities as Fraunhofer IIS and Xperi/DTS and found the burden of integration to be low. This presents a straightforward way to utilize 3.0 with existing receiver systems by carrying the digital radio data over 3.0 and passing it to the digital radio receiver. Imagine an RF-agnostic delivery method, where a signal could be received over AM, FM, ATSC 3.0 or the internet and presented in the same way to the end user. This would ensure the broadest availability at the lowest distribution cost.

In short, ATSC 3.0 is an immensely flexible and efficient standard, creating significant business opportunities for audio services delivered over broadcast.



Above
In Detroit, the signal made it into Lansing going west and north past Flint. The maps show sufficient overlap with adjacent markets to allow for signal handoff between towers.

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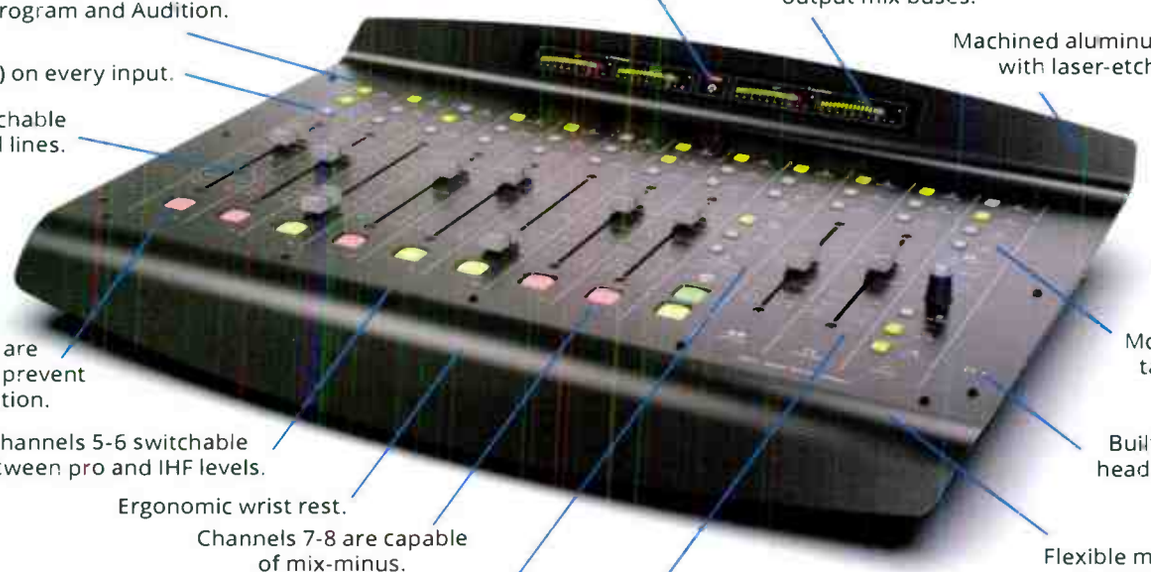

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