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RADIOWORLD

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A Peek at Tomorrow's Car Radios

Here's what we took away from this spring's In Vehicle Experience

DASHBOARD TRENDS

BY THOMAS R. McGINLEY

We've all heard the hype about the connected car and how the internet will transform the dashboards of new cars coming soon to dealers everywhere. If you've been driving a car with a standard AM/FM radio or even a newer model using Bluetooth and a USB port for your smart devices, you've no doubt been wondering what the dashboard and radio will look like in your next car purchase.

It is evident that there are some dazzling new offerings on the market or coming soon. At this year's NAB Show, the In Vehicle Experience pavilion attracted attention and a high volume of attendees; so before the spring show disappears entirely in our rear-view mirror, let's summarize what we saw at that pavilion.

Photo by Jim Peck

Four companies featured their own unique dashboard experiences inside a sleek new automobile in a simulated new car showroom setting. Show-goers were able to sit in most of the cars and get a hands-on demo with a rep explaining the new look and feel, plus all the available options. The entire Las Vegas radio market was on full-throttle, real-time display. In addition to the four-wheeled eye candy and radio demos, a speaker's forum featured panels with experts discussing a range of topics related to the in-vehicle entertainment experience.

Certainly, the internet will play a major role in U.S. automobile dashboards very soon, as it's already doing in Europe. But most broadcasters here are more concerned about how their

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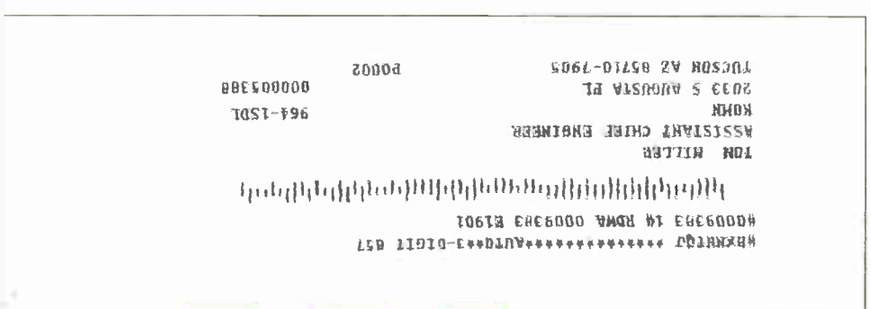

UX Clash in the Dash

The key to unlocking digital radio's value will be the user experience in the car

COMMENTARY

BY ROGER LANCTOT

The in-vehicle user experience group at consulting firm Strategy Analytics recently surveyed consumers in six major countries about their use of audio infotainment sources in the car. Among its headlines was that "radio usage is in fast decline across the U.S., Europe and China, even though in the West it still remains important for some key consumer segments."

Radio World invited Roger Lanctot, the company's associate director in the Global Automotive Practice, to comment about that conclusion, other results of the study and their implications for the radio industry.

The ongoing and intensifying struggle for control of in-vehicle dashboard displays between projected smartphone content and embedded terrestrial radio sources (and satellite, in the U.S.) has taken on an East vs. West

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TRENDS

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radio stations of today will be accommodated in the dashboards of tomorrow's new models.

VISUALS AND METADATA

Since RDS, perhaps the most important feature added to the car radio dashboard in recent years is the display of station logos, song titles and artists, album art, traffic report maps, commercial ad brand logos and other metadata related to the real-time programming. HD Radio was the first to implement an on-screen display of this program-associated data in car radios. SiriusXM has since followed that lead along with many streaming services now available in recently introduced IP-connected radio models.

One of the challenges for the car radio screens of tomorrow is presenting a consistent display of this information to the consumer. Xperi, the publicly held company that acquired DTS after the latter purchased the HD Radio platform from iBiquity, is positioning itself as the global metadata aggregator and integrator for all players. Those include Radio DNS, Arctic Palm, The Radio Experience, Jump2Go and others. By using IP connectivity in the vehicle, the DTS Connected Radio will integrate directly with broadcasters and those third-party platforms to deliver a consistent metadata experience around the world.

Dave Casey, program manager for the DTS Connected Radio project, told us, "Automakers are looking for a consistent user experience for their drivers when they are listening to the radio. Xperi is planning for the DTS Connected Radio to be the leading source of aggregated metadata, from broadcasters, to the manufacturers and their radio hardware suppliers."

SOLVING THE MENU PROBLEM

Another major challenge that has confronted new car radio designers is how best to present an easy-to-use and intuitive menu of stations and services available to choose from in a specific listening area.

Xperi has developed "Live Guide," which actually uses two discrete radio tuners to make this happen.

The first tuner connects at startup, using the location to determine and list all available terrestrial radio services. Signals in the list are then sampled and validated in only one second, eliminating stations that are too weak or undetected.

The second tuner is the CREU (Connected Radio Evaluation Unit)-based reference radio. This is Xperi's SDR developmental platform, which uses an integrated SDK-API software package to deliver a continuously scanning display menu of available stations on a touchscreen user interface.

> **One of the challenges** for the car radio screens of tomorrow is presenting a consistent display of this information to the consumer.

Live Guide allows the user to see a clean list of all stations in their listening areas with metadata, including station logo, station name and what is playing on the station at that time. This feature demonstrates the importance of station metadata and how that impacts the radio listening experience.

Juan Galdamez, Xperi product marketing director, automotive and radio technologies, said, "If stations deliver rich metadata, radio designers can then use features like this to design compelling and intuitive radio experiences in future vehicles."

NAB's Pilot program has been using the DTS Connected Radio platform to show car radio manufacturers and the industry examples of the possibilities for car radios of tomorrow. Pilot has also used the

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Photo by Jim Peck

The radio screen in a 2019 Mercedes A-Class model at the NAB Show pavilion. Artist Experience from HD Radio delivered station logos, displayed here in "carousel" fashion.

Radio Systems Turns a Business Page

Company discontinues manufacturing of its current lineup; adds Lawo representation

BY PAUL McLANE

Business changes are in the works at radio equipment manufacturer Radio Systems Inc.

Industry engineers had spotted an announcement on the company's website that states "Stay Tuned for New Radio Systems Products and Services Coming Soon," and they speculated about its meaning in discussions on social media and listservs.

Radio World reached out to its president, Dan Braverman.

He said Radio Systems has begun a new relationship as Lawo's exclusive sales representative to the radio broadcast industry in the United States. Meanwhile his company has discontinued manufacturing its existing product line due to the termination of a licensing agreement with its tech developer. He declined to provide details.

Lawo AG, based in Germany, makes networking, audio, video and control technologies for several markets including broadcast. Radio Systems is based in New Jersey (near Philadelphia); its offerings had been led by the StudioHub+ CAT-5 wiring product line and Millenium studio consoles.

Lawo Radio Product Manager Mike Dosch confirmed the outline of the relationship and said that the company was pleased to have Braverman representing it. He said Lawo's products seem a good fit as a new anchor around which Radio Systems would become a reseller again and build in a new direction.

Radio Systems over the decades has made several console lines and shipped approximately 6,000 units. Other products have included distribution amplifiers and preamps, clocks and timers, cart and DAT machines, low-power AM transmitters and studio accessories. The company also has been involved in a number of major industry facility projects and turnkey installations.

Braverman said most Radio Systems dealers continue to have its products in stock. A dealer list is found at *www.radiosystems.com*. He said the company will continue to support its legacy products with service and parts, and that most employees will remain on staff in its new iteration.

He added that Radio Systems had made its first Lawo package sale, to Connoisseur Media in Connecticut.

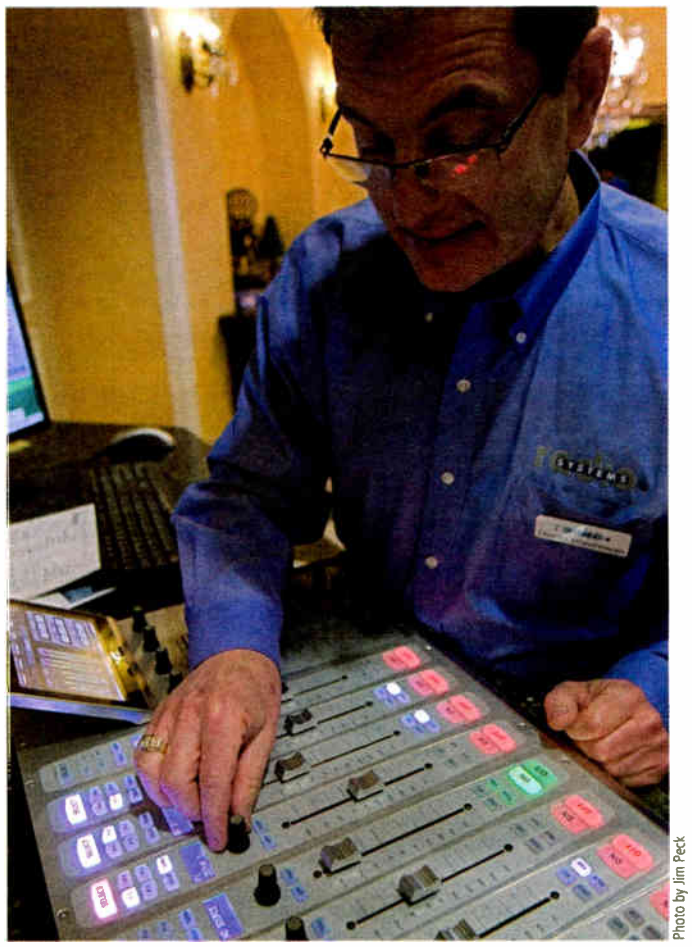

Photo by Jim Peck

Dan Braverman demoing a Radio Systems console in 2010.

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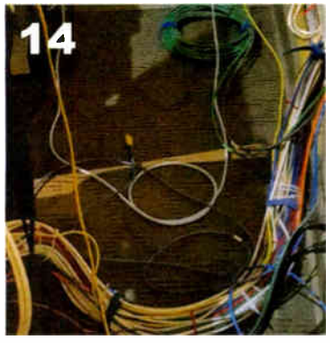

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Photo by Jim Peck

Xperi also demonstrated HD Radio's Emergency Alerts feature in a Mercedes. This is the first factory-installed implementation of the emergency feature by an automaker; the feature expands EAS with images and text to the vehicle in a time of emergency.

TRENDS

(continued from page 3)

DTS Connected Radio platform at several automotive hackathons around the country to create new radio listening experiences.

The main attraction in the pavilion was Xperi's new widescreen HD Radio in a 2019 Mercedes A-Class sports car. This model did not integrate IP connectivity to include internet streams in the menu, but Casey told us this addition is under construction and should be implemented by next year.

The impressive new on-screen menu provides a panoply of options that goes far beyond any present-day car radio's capabilities. As the user "tunes" the dial by finger scrolling, stations across the band are all displayed with call letters and frequencies, plus whatever metadata they've chosen to add like slogans, logos, format, song title/artist, album art, etc. A typical user not familiar with all the area's choices will likely be more attracted to a station displaying the most eye candy and useful information, as opposed to one with nothing but call letters and frequency.

The intuitive menu allows the user to choose and lock in their favorite stations by touching the heart icon. They can also select filters to display only the formats and genres of interest during the scanning process.

Since it's all software-driven, new features can be added as they are invented and become available.

Joe D'Angelo, Xperi senior vice president, radio, said, "As the DTS Connected Radio Platform evolves and achieves widespread acceptance, it will help to accelerate adoption and the manufacturing of a standardized integrated radio product for most all new cars."

HD RADIO'S POSITIONING

Xperi's dashboard demo in the 2019 Mercedes A-Class was a real eye-opener that showed off the power and capabilities of HD Radio. HD supplemental channel stations are automatically awarded a level playing field in the new scanning menu platform and are displayed in the same manner as their primary HD host stations, including the HD Artist Experience. That alone should breathe new life and value into HD2 and HD3 specialized formats that until now have struggled to generate significant ratings and revenue.

This Mercedes also was equipped with HD Radio's Emergency Alerts feature that will allow for EAS alerts to automatically turn on the radio in a time of need.

A quick note to the audio purists reading this: When HD Radio as well as SiriusXM and streaming radio services began ramping up, the audio quality was roundly criticized by many. The early codecs used back then have been upgraded and replaced. As with other first-generation technology rollouts, problems are addressed and bugs are flushed out. The HE-AAC with SBR algorithm variations used in today's codecs have largely eliminated the degraded audio quality complaints associated with most digital and internet based services.

OTHER MARKET PLAYERS

While the Mercedes demonstration on the show floor did not include IP/internet integration this year, several others did.

A very flashy and very expensive ($130,000) black Karma Revero was showing a prototype DTS Connected Radio integration. Xperi worked with Karma to design an all-new radio experience with DTS Connected Radio, though due to technical issues, the demo shut down before the end of the show.

Audi unveiled a very impressive demonstration of its hybrid 4G-LTE internet connected radio with AM/FM integration. Audi appears to be in the lead with connected car technology, having introduced its first model in Europe almost three years ago. They plan to add their newest version of a continuous tuning, touch screen menu driven dial that integrates AM/FM, SiriusXM and the internet next year for U.S. model delivery.

By far, the most innovative feature of the Audi hybrid radio shown in a kiosk next to an Audi eTron was the simulated fail-over of the terrestrial FM reception to its internet stream as the FM signal became unusable. They call it "Service Following Online," which uses special buffering to allow a seamless transition. The rep told us the Audi eTron, includ-

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UX CLASH

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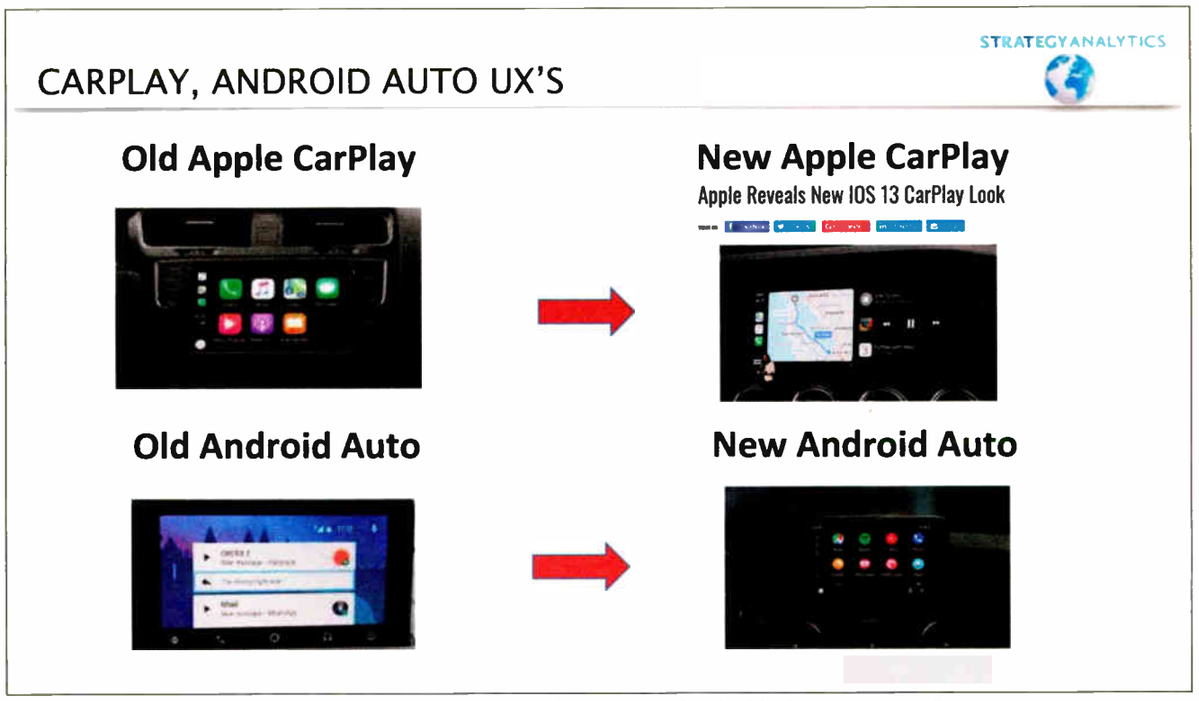
tinge with a demographic edge.

U.S. and E.U. listeners continue to support broadcast radio sources, while drivers in China are shifting en masse to smartphone-based listening of streaming or owned content while driving.

At stake is determining what the dominant source of content in the car will be over the long term and, eventually, in automated or shared transportation scenarios. Surveying consumers across the U.S., U.K., France, Germany, Italy and China, Strategy Analytics found that after several years of explosive interest, consumer appetite for smartphone mirroring systems has finally leveled off.

As more mirroring systems come to market in high-volume cars, and more non-early-adopting segments are exposed to them, their limitations are becoming apparent. Despite this, most embedded systems still do not provide better user experiences than these mirrored systems, according to Strategy Analytics researchers.



Roger Lanctot writes, "Both Google and Apple are themselves groping for the ideal user interface."

FINDINGS

The key findings of the Strategy Analytics study include:

- Radio usage is in fast decline across the U.S., Europe and China, even though in the West it still remains important for some key consumer segments;
- Car owners are sending mixed signals on the next-best "must have" after radio. Flat user interfaces that allow easy access to all audio/media sources will be more important than ever for the next model turn;
- In the search for a successor to the CD player, streaming media has shown a remarkable surge in usage and interest, relative to owned media on portable devices;
- Not surprisingly, older demographic segments continue to lean toward broadcast radio content, while younger populations prefer streaming or owned media.

The reason this matters so much to broadcasters and carmakers is the reality that as much as 50% of radio listening today occurs in cars. Understanding the in-car experience of radio listening or, rather, all listening is essential to understanding how consumers are interacting with content sources in an increasingly connected world.

Google with its Android Auto smartphone streaming platform for use in cars and Apple's CarPlay are seeing rapid uptake in the market with availability rapidly approaching saturation in the U.S. and E.U.

While this is occurring, digital radio is seeing its own robust rollout in the U.S. and a long overdue uptake — country by country — in Europe. Combining all of these trends means that carmakers have their work cut out for them facilitating access to new content sources with little or no historic guidance in the distraction-laden automotive environment.

The confrontation between broadcast, streaming and brought in content comes down to a user interface exercise involving software, operating systems and a substantial toolkit including steering wheel controls, hardware control-

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TRENDS

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ing the new radio, is available in Europe, and they are taking orders now. It's priced around $75,000.

Audi, along with most of the European car radio manufacturers, is now using the UK-based Radio Player that hosts Radio DNS as the metadata integrator. Radio Player is a nonprofit group that had a rep and booth in the pavilion. They claim a presence in 11 European countries, with 80% of all German stations using the service, and came to the NAB Show hoping to sign up U.S.-based companies.

General Motors partnered with Avis Car Rental in the pavilion, showing a new Buick Enclave SUV. The stock HD Radio demonstration featured the addition of a software app that emulates the DTS Connected Radio platform touchscreen, complete with the same look and feel as the real radio demo shown by Xperi in their booth. The software was developed by Open Path in collaboration with NAB Pilot.

Avis rents 600,000 cars in 180 countries worldwide. The new GM/Avis radio offering is targeted at "road warriors" who frequently rent a car and travel in unfamiliar cities and are looking for radio stations based on favorite formats and genres. A trial for real consumers driving Avis vehicles is slated for the third quarter of this year in Kansas City, Mo.

MINIMAL PHYSICAL INTERACTION

As mentioned, the In Vehicle Experience pavilion included panel discussions by experts on pertinent topics. Radio World's Paul McLane moderated one of the more fascinating panels; it tackled the question of what should be the most pressing priorities for the connected car radio of the future.

John Vermeer of iHeartMedia said, "The connected car radio dashboard interface must be simple but fast to deliver desired content to the user with minimal physical interaction." With that in mind, James Buczkowski of Ford Motor Company cited voice command interaction, à la electronic assistants like Alexa and Cortana, as perhaps the best way to control the connected car radio going forward.

Many kinds of consumer devices that use voice commands are becoming popular and widespread. Buczkowski suggested, "Voice commands eliminate the need for multiple button pushes to get what the user wants quickly." And it reduces driver distraction — no messing with the radio instead of looking at the road ahead.

So where do we stand with the internet connected car radio rollout schedule? We're all wondering how soon the impressive new receivers shown at the NAB Show will arrive in new car company showrooms. If you live in Europe, you can buy one now. U.S. consumers will have to wait until at least sometime next year. At the spring show, we learned that LG is now building a connected car radio for a major U.S. car company to be unveiled in 2021 models.

However the connected car with internet integration shapes the car radio experience of the future, it is still safe to conclude that over-the-air terrestrial and satellite radio reception with augmentation of internet streams and interactivity will be the most efficient, reliable and diversified audio entertainment platform available to consumers for many years to come.

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UX CLASH

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lers, touch screens, gesture recognition, speech recognition, drop-down menus and digital assistants. Each interface has its strengths for particular applications, which must be correlated to consumer preferences, which vary.

Apple and Google have taken strong stances in seeking to create uniform in-vehicle experiences across the displays of different carmakers. In fact, both companies now have certification control over how their systems are deployed and displayed in cars.

For carmakers and broadcasters, the onset of digital radio marks an important turning point.

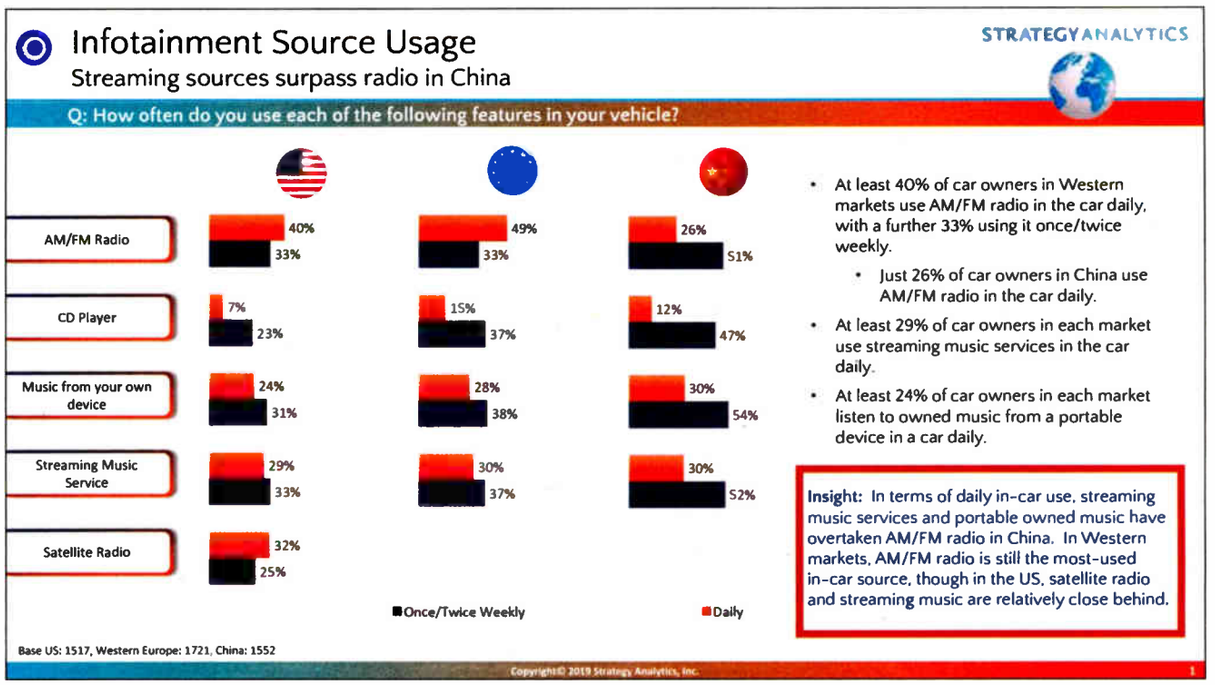
It is almost comical to note that Apple recently shifted its UX toward a more flexible display capable of simultaneously showing navigation and content sources — more along the lines of Android Auto's look and feel. In the process, Apple signaled its intention to move away from on-screen icons — oriented toward touchscreen use.

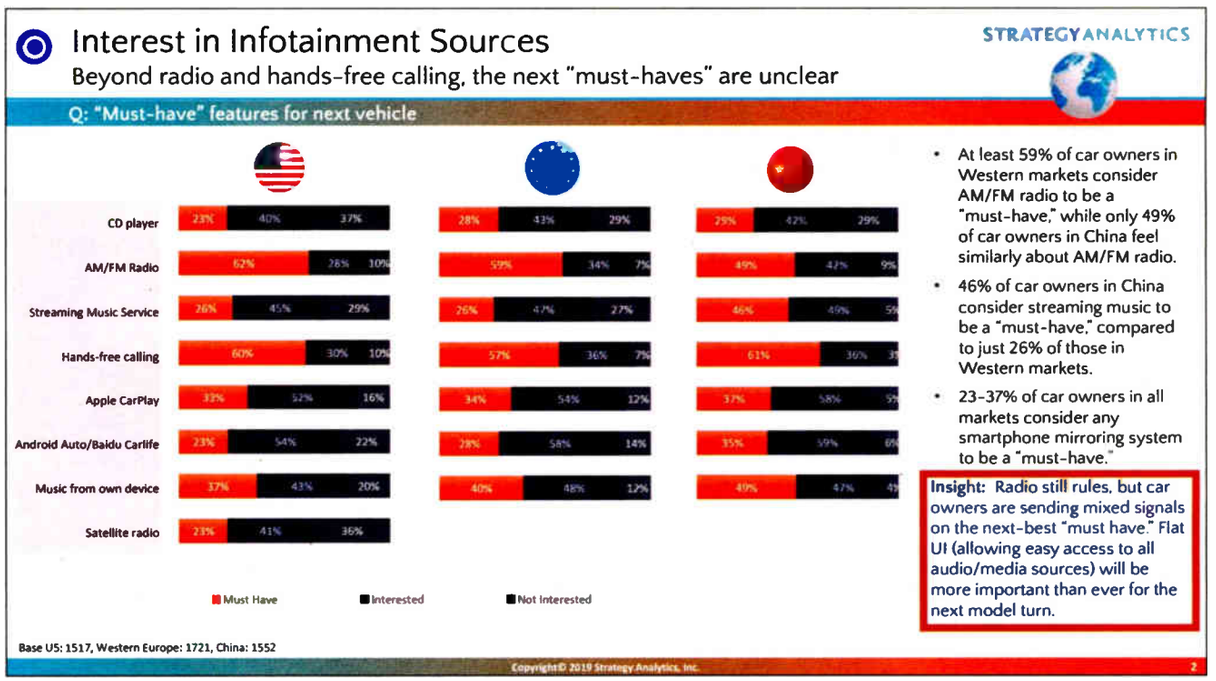
Google, meanwhile, cast aside its dynamic Google Now-style interface in favor of a more "old-style" Apple CarPlay icons-on-screen look.

The clear message for carmakers is that both Google and Apple are themselves groping for the ideal user interface.

TURNING POINT

For carmakers and broadcasters, the onset of digital radio (HD Radio in the U.S. and DAB in Europe) marks an important turning point and an opportunity to redefine the radio experience. European broadcasters are introducing listeners to narrowband content as DAB enables an expanded assortment of broadcast channels. U.S. broadcasters, too, are expanding their broadcast portfolio.





Strategy Analytics finds that in terms of daily in-car use, streaming music services and portable owned music have overtaken AM/FM radio in China. In Western markets, AM/FM radio is still the most-used in-car source, though in the U.S., satellite radio and streaming music are relatively close behind.

But digital radio enables an additional range of capabilities suited to the new connected listening environment presented by automobiles. Digital radio comes with more metadata identifying stations and artists and enabling search for the first time.

The onset of digital radio has also opened the door to hybrid radio experiences capable of switching between streaming and broadcast sources for the same station. Digital radio also comes with a healthy dose of driving information encompassing everything from traffic and weather to local gas prices.

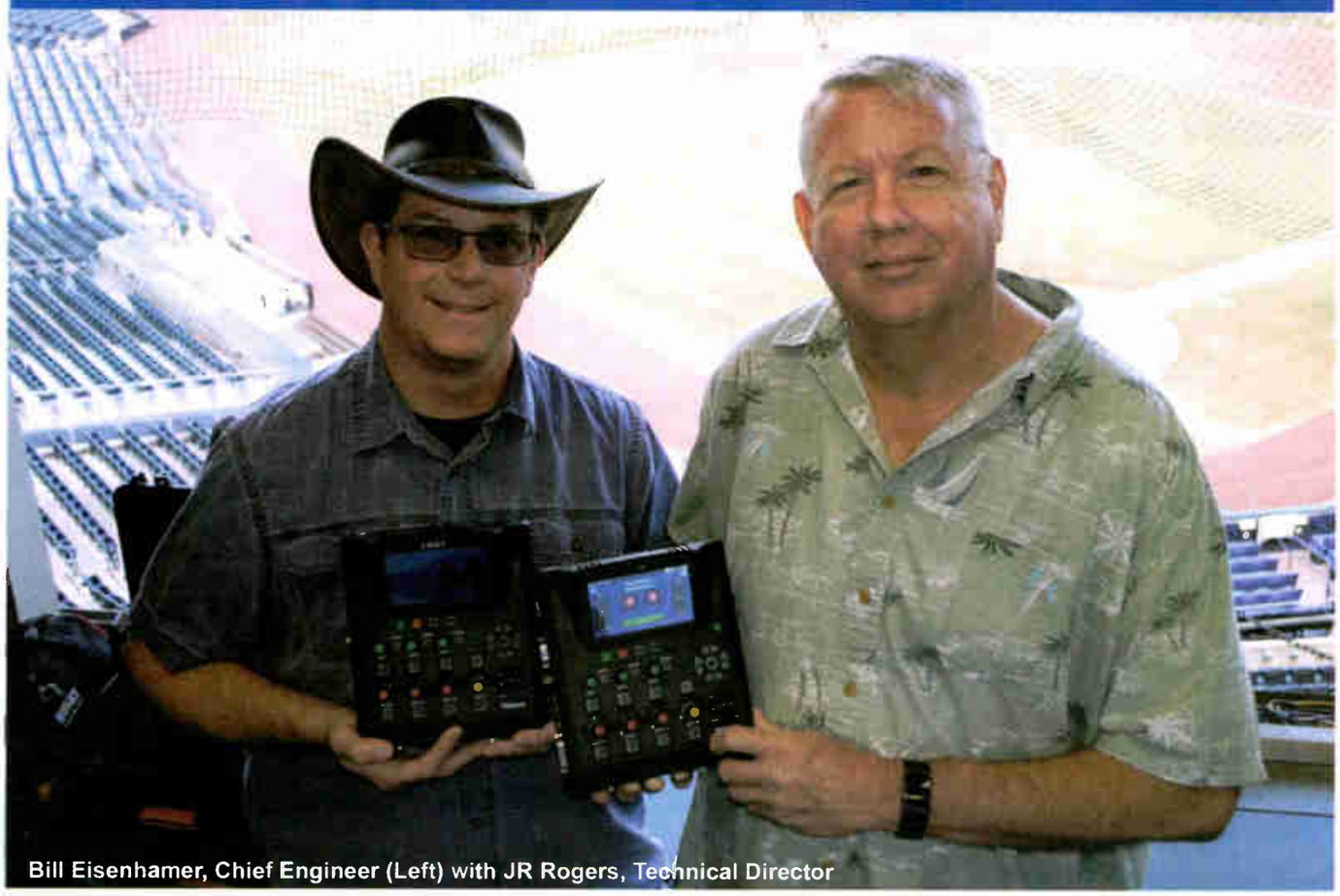
The key to unlocking the value of digital radio — which is intended to level the playing field with streaming and satellite sources — will be the user experience in the car. Global carmakers today are tasked with determining how to use the array of existing user interfaces and on-screen cues to facilitate a re-engagement of all demographic segments with broadcast content.

The first step forward for carmakers and broadcasters will be integrating broadcast sources with mirrored smartphone systems and digital assistants, such as Alexa. The next step will be to refine the built-in radio interfaces to make exploring the expanding range of broadcast content easier and more fun to use.

Radio is changing, and carmakers and broadcasters must change with it.

Roger Lanctot is a connected car and mobility services expert with 30 years of technology research and consulting background. He is a frequent blogger at www.linkedin.com/in/rogerclanctot/detail/recent-activity/posts/. *He will speak in late August at Radiodays Asia in Kuala Lumpur, see* www.radiodaysasia.com.

Cover all Bases with ViA



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

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

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

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

Bill Eisenhamer
Chief Engineer, Entercom San Diego

ViA

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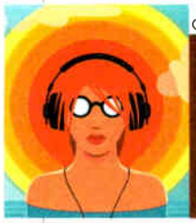


Getty Images/Dmitry Fisher

It's new equipment season again! Radio World's "Summer of Products" feature is all about new gear that has come onto the market in recent months, especially during spring convention season. Over several issues we feature equipment that caught our eye.

SAGE ALERTING RELEASES UPDATE

Sage Alerting Systems has announced a free firmware update for its ENDEC model 3644.

Firmware Version 89-34 "addresses a changed requirement in the FCC EAS rules, Part 11.33(a)(10), which affects how the valid time frame of an alert is determined." That modifies the current method of frame validation, according to the company.

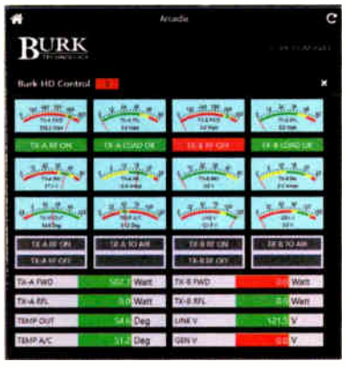
Sage adds, "This release does not affect the ENDEC's reception and relay of the scheduled Aug. 7 National Periodic Test. Whether your ENDEC is running version 89-30, 89-32 or this new version 89-34, your ENDEC will relay the NPT."

Visit *www.sagealertingsystems.com/support-firmware-new.htm* for more information or to download the update.

Perhaps larger than this specific update is a notice from Sage of an upcoming September update that will address changes to the IPAWS server. That update will be a paid update. More information on that coming.

Info: www.sagealertingsystems.com

BURK ARCADIA CLOUD SERVICE



Remote control products manufacturer Burk Technology is promoting its latest version of the Arcadia Cloud Service.

Burk explains that Arcadia "delivers secure web-based access to remote site information for managers and engineers on the go."

Summary screens for each site are generated automatically providing an instant overview of facility status.

Custom views highlighting critical information from multiple sites are created on the fly and stored for future use. Arcadia's user interface adapts to fit each browser's screen size, enabling easy viewing on smartphones, tablets or PCs, according to the company.

NOC facilities running Burk's AutoPilot software can also leverage the Arcadia cloud-based communications architecture, the company says. AutoPilot custom views and alarm logs in the NOC refresh continuously from the Arcadia cloud server, increasing network efficiency and improving coordination among multiple NOC operators and facilities.

According to Burk, "Arcadia's cloud-based resources scale as needed, offering high performance for very large networks and cost-effective operation for smaller installations."

Burk Senior Vice President Worldwide Sales Jim Alnwick said, "Arcadia delivers consolidated access to each user's authorized sites over a single encrypted web link, leveraging the power of HTML 5."

Info: www.burk.com

INOVONICS INOMINI 679 FM/HD RADIO MONITOR RECEIVER

Inovonics describes its INOmini 679 as a third-generation, small form-factor FM and FM band HD Radio broadcast monitor receiver.

It receives both analog FM and digital HD1–HD8 radio channels for confidence monitoring and delivers a high-quality audio feed for rebroadcast or program distribution throughout a broadcast facility with adjustable analog and AES digital audio outputs.

Onboard is a sensitive, DSP-based software-defined radio. Balanced analog and AES digital program line outputs are available simultaneously. The levels are independently adjustable. The screen displays RBDS, PAD info, RSSI, SNR, Cd/No, multipath and HD level metrics to help with receive antenna alignment.

Front-panel alarms and rear-panel "tallies" indicate HD reception loss, low signal and audio loss. Inovonics says the 679 will stay on-mode and on-channel through signal and power loss and won't blend between FM and HD Radio as consumer units do. Split Mode audio monitoring aids transmission diversity delay setup.

Free firmware updates are easily installed in the field via USB.

Info: www.inovonicsbroadcast.com

ANGRY AUDIO GUEST GIZMO AND BIDIRECTIONAL BALANCING GADGET

Angry Audio has introduced itself as a problem-solver.

Its Guest Gizmo (shown above) is a multifeatured RF-resistant metal panel for studio guests. It has a cough button and a headphone amp with volume control. According to Angry Audio, the cough circuit can connect to a small mixer's insert jack, or to the muting logic of a broadcast board. The Guest Gizmo can even light up a mic arm tally, according to the company. It can be installed in a cable/grommet hole.

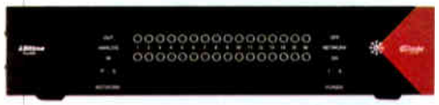
Also Angry Audio says that its Bidirectional Balancing Gadget has exclusive "ground-breaking" technology that suppresses ground loop noise while converting unbalanced signals to pristine, broadcast-grade balanced audio. It converts one stereo pair from unbalanced to balanced, and a second stereo pair from balanced to unbalanced — for the likes of recording devices computers.

Info: https://angryaudio.com

BITTREE PATCH32A DANTE PATCHBAY

Interconnects specialist Bittree says that its Bittree Patch32A was "the world's first Dante audio patchbay to market."

According to the company, "the Bittree Dante patchbay will interface with Dante Virtual Soundcard, countless Dante devices, and almost any analog component in the same system, including audio distribution equipment, digital audio workstations, digital signal processors, mixing consoles, multitrack recorders and video routers."



Bittree Senior Sales Consultant Bryan Carpenter said, "This patchbay streamlines the integration of analog and digital network audio patching, and establishes a foundation for interconnectivity across facilities within central equipment rooms, production studios, and IT closets among other locations. It is flexible enough to immediately solve problems in existing facilities, or optimize flexibility from the start in new facility designs."

Bittree's Dante patchbay supports a sample rates ranging from 24-bit/44.1 to 192 kHz. The design utilizes balanced TT connections to Dante analog and digital conversions.

Settings are configurable using Dante Controller, including sample rates and channel assignments to and from Dante networks.

The compact standalone or rack-mounted 1.5 RU powder-coat enclosure has redundant DC power, external word clock I/O, network status and LED metering.

Info: www.bittree.com

SAMSON CL7A, CL8A CONDENSER MICROPHONES

The Samson CL7a is a large-diaphragm condenser mic with a capsule sporting a 1.1-inch 3-micron thick, gold-sputtered diaphragm. Samson says it is intended to provide a balanced sound built around a smooth midrange and slight high-frequency lift around 15 kHz, ideally imparting a sense of air around the sound source.

The mic features a cardioid pickup pattern, along with a selectable two-pole high-pass filter at 100 Hz to remove unwanted low-frequency content like stage rumble and wind noise. Additionally, the CL7a can handle SPLs of up to 147 dB, and includes a 10 dB attenuation pad, which is used to prevent overloading the onboard preamplifier by lowering the input sensitivity of the microphone preamp circuit. Inside the durable die-cast body, an internal shock-mount provides protection for capsule and isolation from vibration noise.

Meanwhile, the Samson CL8a multipattern large-diaphragm condenser mic has a custom-tuned capsule with a dual 1.1-inch gold-sputtered, 4-micron thick diaphragm. This design provides a range of selectable pickup patterns (cardioid, omnidirectional and bidirectional). Similar to the CL7a, the CL8a has a selectable, two-pole high-pass filter at 100 Hz and a 10 dB attenuation pad, and it can handle SPLs up to 147 dB.

Info: www.samsontech.com

AVID PRO TOOLS 2019.5

Avid has released Pro Tools 2019.5, offering new capabilities including higher track counts, the promise of seamless track and timeline interactions during playback and macOS Mojave support, plus immediate availability of multiseat network site licensing.

According to Avid's announcement, Pro Tools | Ultimate delivers 50% more voices/audio tracks than previous versions, supporting a base voice limit increase to 384, up from 256. Pro Tools | Ultimate software and HD Native customers will be able to further increase the number of available voices up to 768 per system — on par with a three-card Pro Tools | HDX system — with the addition of native Pro Tools | Ultimate Voice Packs.

Pro Tools now supports 1,024 MIDI tracks, up from 512.

The new Pro Tools release has enhanced playback features that enable more fluid creativity in the software, according to the company. For example, users can insert plug-ins, add or delete tracks, change routing or adjust loop duration during playback without playback errors.

Pro Tools | First users can now create and save an unlimited number of projects locally. Users can selectively sync up to three projects to their complimentary cloud storage.

Avid also announced the availability of Pro Tools multiseat network site licensing for facilities and institutions. Multiseat licensing enables administration of multiple Pro Tools seats from a single account and local server, eliminating the need for a multitude of physical iLok dongles and cumbersome site management. A Pro Tools or Pro Tools | Ultimate multiseat license includes the Avid Complete Plugin Bundle — plus HEAT, Pro Tools | MachineControl and Pro Tools | DigiLink I/O License — with all Pro Tools | Ultimate seats.

Pro Tools 2019.5 supports macOS Mojave, which is standard on recent Apple computers including the Mac mini 2018 and MacBook Pro 2018.

Info: www.avid.com/pro-tools

RADIAL DAN-TX2 DANTE INTERFACE

Dante digital networks offer a lot of promise but how does one get non-Dante native audio equipment like CD players, analog mixers, computers or mobile devices onto the AES67/Dante network?

Radial Engineering's DAN-TX2 is designed for such a mission. Housed in the standard Radial Engineering steel box, the DAN-TX2 offers XLR-1/4-inch combo inputs, RCA inputs and a 3.5 mm input.

Other features include inputs pads (18 dB), a stereo link, power over Ethernet and 24-bit/96 kHz conversion of your analog sources. An optional rackmount kit allows for putting a pair of DAN-TX2s into a rack.

Info: www.radialeng.com

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Computer Considerations for 2019

And we reveal the winner of last issue's mystery contest

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

It's only fair, as we highlighted the lowly tape cartridge label in the last column, that we consider its replacement — the computerized playout system. Starting with large, noisy computers with fans and humming power supplies, engineers were quick to adopt KVM systems (Keyboard-Video-Mouse) extenders. Although cable-rich, they permitted engineers to locate the noisy computer in a server or rack room, thereby extending their control.

As the evolution of systems continues, a new device is in favor — the compact fanless computer. Pictured in Fig. 1, these compact computers are super quiet.

Rick Copeland, technology infrastructure manager at Capital Public Radio in Sacramento, has standardized on the MITXPC, which is now available for a few hundred dollars.

You might think something this inexpensive and compact would be short on features. That is not the case.

The MITXPC has dual Network Interface Cards, plus 2K of RAM. It also will handle a high-definition multimedia interface (aka HDMI) monitor.

Because of the size and price, these compact computers can easily be located in each studio. This frees up valuable rack and cooling space in the server or rack room, though they are slightly warm to the touch, Rick says he hasn't noticed any studio cooling problems after relocating the compact computers to his studio rooms.

Fig. 1: Compact fanless computers are ideal for studio applications ...

Fig. 2: ... and can be either mounted in a rack or on a shelf.

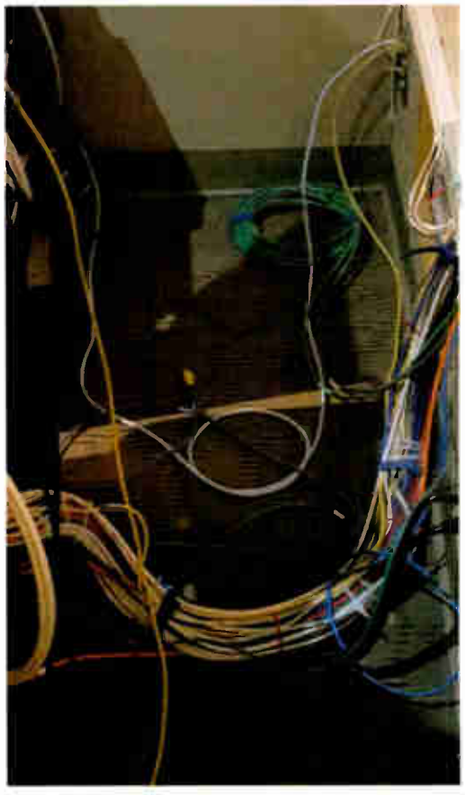

Fig. 3: The best payoff is the bundle of cables that are replaced with two Ethernet cables — one for the playout system and the other for the AoIP network.

Because only two network Ethernet cables are required, the huge bundle of KVM cabling goes away (see Fig. 3), another plus.

As your computers need to be replaced, consider these cost-effective and efficient replacements when you budget for 2020.

Since we are putting everything on computers these days, it's important to keep an eye on power supply.

I spoke to an engineer recently who was experiencing intermittent clicks on his audio. He traced the problem to bad switching power supply capacitors.

If you don't have a large stock of extra supplies, at least stock up on spare electrolytics.

Keep in mind that the capacitor temperature has a direct bearing on its lifespan, and that is why it's important to ensure proper cooling. Defective fans,

(continued on page 16)

Got Blending Issues?

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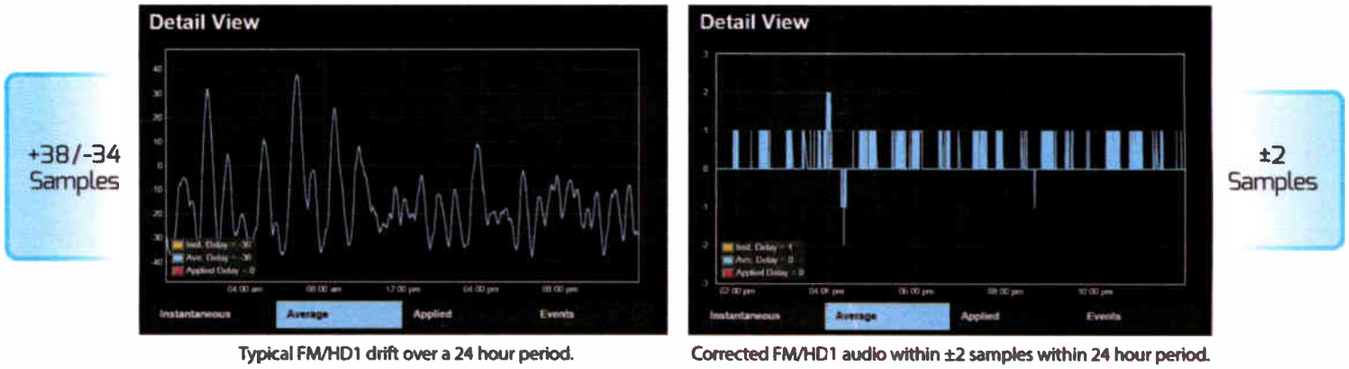
GETTING FROM HERE → *TO HERE*



Typical FM/HD1 drift over a 24 hour period.

Corrected FM/HD1 audio within ±2 samples within 24 hour period.

It really is a "set it and forget it" device. A dedicated device like the JUSTIN 808 eliminates the concern for rock solid FM+HD1 diversity delay. - Mike Friedman. Commonwealth Public Broadcasting. VA

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INOVONICS BROADCAST

WORKBENCH

(continued from page 14)

or dusty supplies raise the electrolytic temperature, hastening failure.

I've always heard that under normal conditions, electrolytics had a life expectancy of about 60,000 hours, or nearly seven years. Of course, they can last longer, but keep in mind you may be on borrowed time after you pass the seven-year point.

It's been fun reminiscing with readers about the cart machine label photo in our last two issues; in the process, I learned something new: Several engineers said they used white adhesive bandage tape, rather than the file folder labels, which were difficult to remove.

One engineer said he cut a strip and stuck it on the roller of the typewriter and typed out the cart label. Others used the same kind of tape, but identified the tape contents using a Sharpie-type indelible marker and a highlighter to give some color to the labels.

Also, Clarke Broadcasting's Paul Shinn explained the difference between the file folder labels and "official" cart labels (which cost more). The "official" labels were a bit wider and shorter, so they fit perfectly on the back of the Fidelipak cartridge.

Phillip Davis pointed out that he worked at a station where each jock had their own color label. This prevented the same voice from being heard back-to-back in a stop set. For music on carts, the color could stand for daypart. Phillip remembers a lot of information being typed on the music carts — in addition to title and artist, tempo, intro time, total time, as well as whether the song faded or ended cold.

During his years in radio, Paul not only worked small, medium and major markets, but did a stint at AFVN in Saigon, Vietnam, in 1970.

It's fun to reminisce, isn't it? Thank you all for your memories and comments!

As for the winner of the "identify the label" contest, the prize goes to 23-year-old James Copeland.

James writes that he not only knew what the labels were really for, but at 23, he had both recorded and played a cart on the air! James also reminded me that the colored file folder "cart" labels were also used to identify analog audio console inputs! Good call, James. How far we have come.

James writes that he was the PD and later operations manager at student-run KSDB(FM) in Manhattan, Kan., on the campus of Kansas State University.

Twice a year, the station participates in a College Radio Days Vinylthon event. James wanted to make it a totally analog experience, so he found an ITC triple-banger in the closet and some Jones connectors, wired them up and was in business. The only other piece of the puzzle was hooking an Audi-Cord for recording purposes.

All said and done, James wanted the distinction of being the youngest person to install and use a cart system. The experience gave him a new appreciation for how everything used to be, being born 40 years too late.

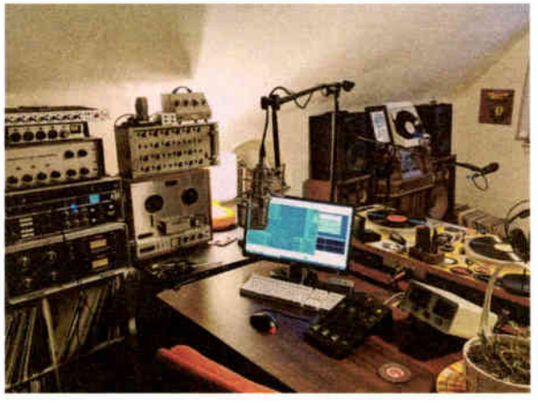
If you're yearning for the good old days, James now DJs on resurrected carrier current station 640 WLHA, which existed on the campus of the University of Wisconsin Madison. In addition to 24/7 music, the site has archived air checks from the '60s and '70s. Its website is *www.lakeshore64.com.*

Contribute to Workbench. You'll help fellow engineers and qualify for SBE recertification credit. Send Workbench tips and high-resolution photos to johnpbisset@gmail.com.

Author John Bisset has spent 50 years in the broadcasting industry and is still learning. He handles western U.S. Radio Sales for the Telos Alliance. He is SBE certified and is a past recipient of the SBE's Educator of the Year Award.

WHO'SBUYINGWHAT

Mitch Anderson is host of "Black Circle Radio" airing Monday nights on **WFFR(LP)** in Muskegon, Mich., which is celebrating a decade on the air. Anderson credits the sound quality of his all-vinyl program to **RME**'s Fireface UFX. ("Black Circle Radio" can also be heard online via **SoRradio.**) According to Anderson, his set up is fairly simple: two Technics SP-15 turntables with Audio-Technica ATP-12t tonearms plugged into a UREI 1601 phono stage. He then converts the analog signal using the Fireface UFX interface preamps and A/D conversion at the end of his signal chain — delivering high-resolution audio to his broadcast equipment at 96 kHz/24-bit sample rate.



Mitch Anderson's studio setup for "Black Circle Radio."

Synthax Inc. is the U.S. distributor for RME products, and recently added the sole right to act as dealer for **Digigram**'s solutions in the United States. ...

Canadian broadcaster **The Jim Pattison Broadcast Group** has chosen **Matrix**'s Monarch media ad sales platform across its radio, TV, and online properties. The broadcaster currently operates 47 radio stations. ...

GatesAir acquired Italian television and digital radio transmission systems provider **ONEtastic** in late May. The move broadens GatesAir's European presence and adds "ONEtastic's strength in high-efficiency, low-power TV and DAB radio transmitters," according to the announcement.

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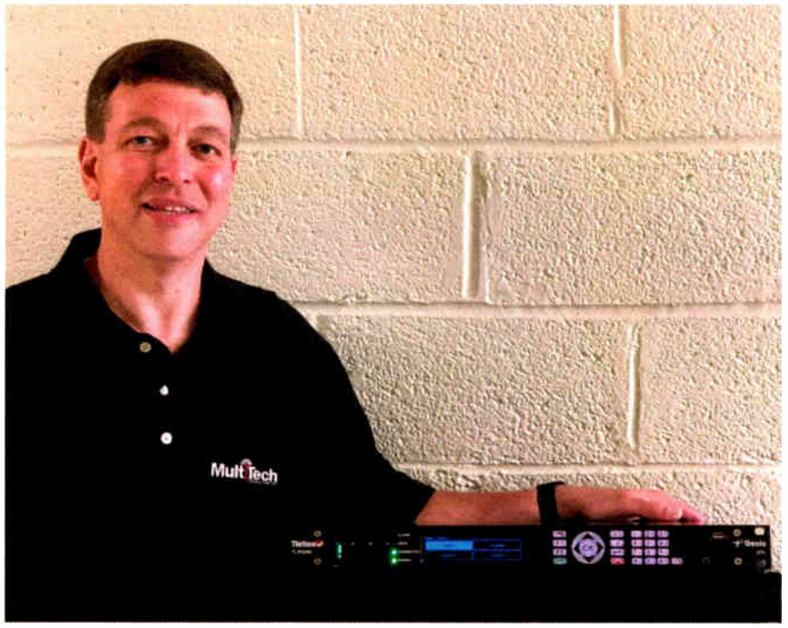
MultiTech Installs Tieline Codecs for Steadfast STLs

Variety of codecs and features builds long-term relationship

USERREPORT

BY TIM NEESE
President, Founder and
Senior Engineer
MultiTech Consulting Inc.



SWANNANOA, N.C. — I started in radio in an on-air capacity while pursuing an engineering degree and, while still in college, transitioned to a station engineering position. In the years following, I served at several facilities in roles from maintenance engineer to director of engineering. Since 2001, I have operated MultiTech Consulting, offering a full range of services tailored to the broadcast and information technology industries, including facility and system design, installation/integration and equipment performance verification/measurement.

We have clients throughout the U.S., and some of the networks I have consulted with include Relevant Radio, VCY Networks, Salem Communications, and ABC television O&Os to name just a few.

I have followed the progression of Tieline ever since they advertised the original Commander in Radio World 15 or more years ago. Since that time, I have installed a range of Tieline codecs including Genie STL, Merlin, Merlin Plus, Bridge-IT, Bridge-IT XTRA, Commander G3 Studio and Field, and i-Mix G3. Primarily, the codecs have been used as STLs, but also for remote contribution.

We recommend Genie STL codecs to customers because of the range of features and built-in redundancy options. Key features that are significant factors in our recommending the product include configurability, the IP distribution options, and backup features like SmartStream Plus, ISDN and POTS. That, coupled with the customer support Tieline has always provided, makes the selection easy.

Our typical configuration is a single-IP stream, either unidirectional or bidirectional, as well as multiple peer-to-peer IP streams, or several multi-unicast streams. We have also configured multicast connections for clients.

REDUNDANCY STRATEGIES

So long as properly engineered networks are implemented, we have found IP connections to be extremely reliable. Redundancy requirements vary from client to client, but are largely fulfilled by the built-in redundancy afforded in the Genie: redundant power supplies, SmartStream Plus redundant streaming, and failover to a backup connection, etc.

Larger clients may implement an N+1 configuration to ensure complete redundancy and utilize the Genie's built-in PSU failure, temperature and connection loss alarms, or more elaborate external silence detection and network traffic monitoring. We have also started to utilize SNMP traps for SNMP monitoring.

Our clients utilize everything from DSL to point-to-point fiber, or microwave IP transport. It is dependent upon location and availability. The most popular options are cable modem for general use and metropolitan area Ethernet networks for our "hardcore" clients. Noticeably, a growing number of studio and transmitter sites are unable to be linked via traditional RF point-to-point methods, or face the ongoing sunsetting of the ISDN and T1 infrastructure. As more and more "real-time" traffic is carried by IP networks, I believe QOS and dynamic bandwidth allocation will require more planning and attention.

We frequently utilize MPEG 2 encoding for its transcode and cascade resilience. Where bandwidth allows, such as with metro Ethernet circuits, we use uncompressed audio. For field work/remote broadcasts, etc., we find AAC and Tieline Music/Music Plus algorithms work well.

Contribution and STL encoding bitrates are usually at 256 kbps or greater, and remote broadcasts at 64, 96 or 128 kbps. With cellular connections we used to employ 32 or 48 kbps, but with the cost of bandwidth almost constantly decreasing and the reliability of mobile networks increasing, we rarely, if ever, still connect at those bitrates.

As clients have transitioned to IP operations, most have adapted to the slight amount of latency that is inherent within the digital environment. Where latency is critical, such as with IFB or comms channels, choosing an appropriate low-delay algorithm like AAC-LD or G.722 is key.

We use a mix of auto and fixed jitter buffering based upon the application; however, we find for most situations auto works quite well. FEC is also a valuable tool for mitigating packet loss.

The Toolbox web GUI interface has always been straightforward and easy to work with and the transition to the

(continued on page 24)

TECHUPDATE

DIGIGRAM IQOYA X/LINK RANGE EASES LIVE REMOTES

Digigram's Iqoya X/Link Range (AES, DUAL, ST and LE) is a stereo- to multi-stereo IP audio line of codecs. It is possible to use them in both legacy audio facilities and in full-IP AES67, Ravenna or Livewire audio infrastructures.

Citing its low energy consumption and a fan-less hardware platform, the company recommends the Iqoya X/Link range for mission-critical and 24/7/365 use.

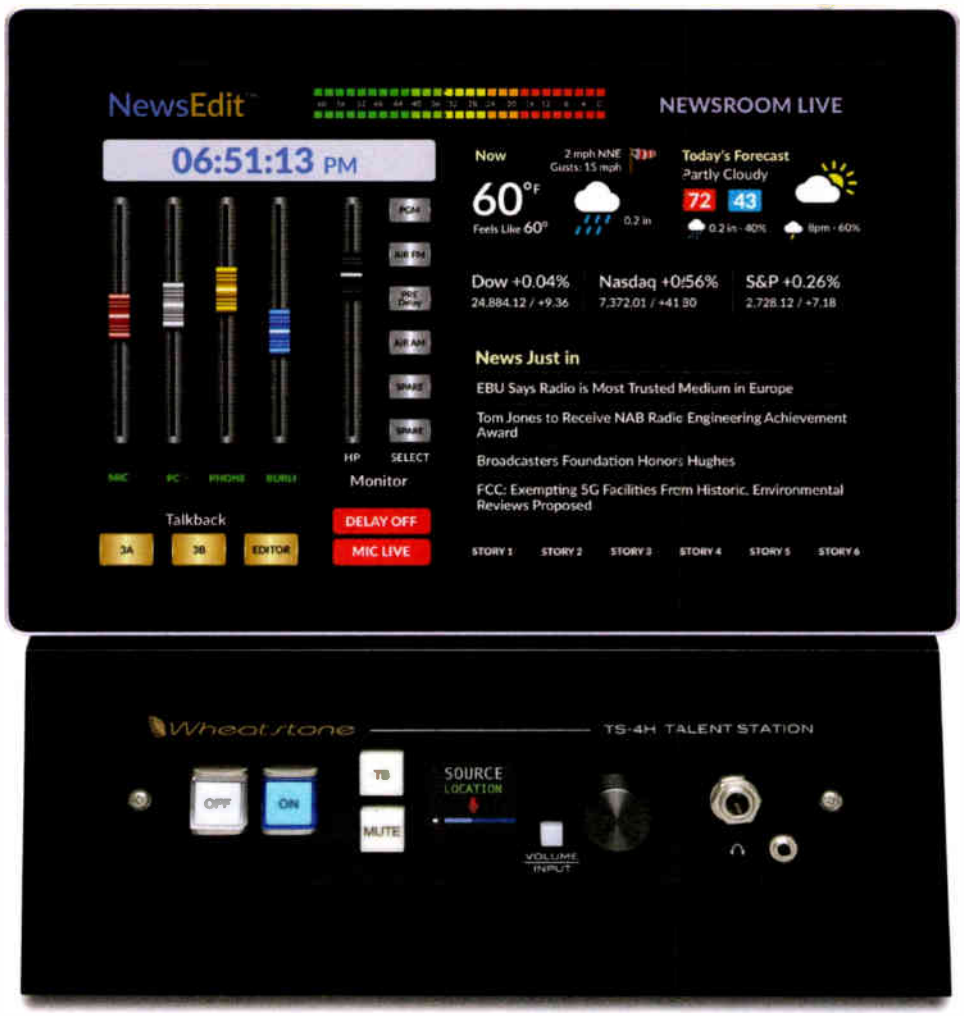
The processing power of Iqoya X/Link promises low-latency audio connections for live remote needs. In addition, multiple levels of redundancy ensure audio service continuity. The solution features two internal power supply units, four network ports for traffic separation (WAN, LAN, management), stream redundancy, audio failovers, audio hardware bypass, and 1+1 hot-device redundancy.

Iqoya X/Link is EBU/ACIP-compliant for interoperability with third-party codecs and any SIP infrastructure. For integration with codecs and network management/monitoring systems, it comes with SNMP and web services.

Iqoya Serv/Link is a high-density 1U box that supports four to 64 stereo (eight to 128 mono) input and output channels with the possibility to simultaneously encode, decode and transcode IP audio streams. It supports various audio I/O formats, such as AES/EBU, MADI, AES67 and Dante.

For information, contact Digigram/Synthax in Florida at 1-754-206-4220 or visit www.digigram.com or www.synthax.com.

NEWS DESK IN UNDER 1 SQ FT



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iHeartMedia Builds Audio Transport Platform With Barix

SIP Opus codecs cover all the bases in transition from ISDN

USERREPORT

BY STEVE GEORGE
Senior VP of Engineering,
Upper Midwest
iHeartMedia

MILWAUKEE — iHeartMedia is America's number one audio company, and with over a quarter of a billion monthly listeners, has a greater reach than any other media company in the U.S.

For over 20 years, iHeartMedia has relied on ISDN circuits for moving audio between our studios, transmitters and other remote field locations. In recent years, however, telephone companies across the country have warned us they will discontinue their ISDN services.

As such, it looks likely that ISDN will go away for everybody in the near future, so we have embarked on a company-wide project to transition our legacy audio connections to IP.

TRANSPORT

While IP audio transport is well-established, a key hurdle we needed to overcome was ensuring that all of the codecs we have in the field would be able to talk to each other seamlessly. We wanted to avoid being locked into any particular codec manufacturer, so multivendor interoperability was critical.

We decided to use the open, royalty-free Opus audio codec combined with the SIP protocol as a common "handshake." Many manufacturers have been moving towards Opus as the preferred codec for interoperability, and we liked that it can combine low latency and excellent audio quality, with built-in error and jitter correction, all at reasonable bitrates.

SIP similarly facilitates interoperability while enabling us to get away from needing public, static IP addresses at each end. Endpoints don't need to know each other's IP addresses; they just "dial" a registered SIP address to start the connection process. By eliminating the public IP address, we can keep everything behind the firewall, significantly increasing security.

We developed the back end of our new architecture first, spinning up a software-defined codec with 24 SIP Opus modules that we have been rolling out in our studio locations.

We then turned our attention to choosing a field codec that we could standardize on for communicating with the Wheatstone Switchblade — and other manufacturers' codecs — to bidirectionally transport high-quality audio.

We brought our requirements to Barix, whose Instreamer and Exstreamer products we have used for over 15 years. We like Barix because their boxes have been fairly bullet-proof; they're simple devices that generally perform one defined task, but do it very well. We had confidence that Barix devices would reliably do what they are supposed to do, and do it cost-efficiently.

HARDWARE

Barix recently launched its next-generation hardware platform, and quickly tailored devices to meet our specifications. We approached Barix in December 2018, and they delivered beta code running on the new hardware in just six weeks. The studio side took us roughly 24 months to develop, but with Barix we went from concept to having hardware live in the field in just over three months — an incredible turnaround time.

We currently use two Barix SIP Opus codec models — the MA400 mono encoder/decoder, and the M400-based stereo decoder — for a variety of applications. We have installed them at TV station partners for contributing live news and traffic reports; at transmitter sites for backup STL; in on-air talent's houses for doing shows remotely and more. Since we started rolling the Barix units out in March, we are constantly finding new ways we can use them, and their affordability has made them our first "go-to" box.

When completed, this project will span multiple sites interconnecting our 850+ radio stations. We started in locations with the most ISDN circuits, and so far have deployed in 50 markets.

We already had many Barix Exstreamer units in the field for disaster recovery, backup STL and other IP audio applications, and the new Barix SIP Opus codecs can also be configured to be backwards-compatible with these setups. This makes it easy for us to phase in our next-generation platform. We can change the Exstreamers out immediately, and switch the new models into SIP Opus mode when the headend in that market is ready.

While our move from ISDN to IP was forward-looking and technology-motivated, we are also already realizing immediate cost savings. The Barix units pay for themselves in less than two months with what we save on ISDN circuits.

We see Opus and SIP as the future of interoperability in our industry. Barix's flexible new hardware and phenomenal responsiveness are enabling us to reach that future faster.

For information, contact Barix Technology at 1-866-815-0866 or visit www.barix.com.

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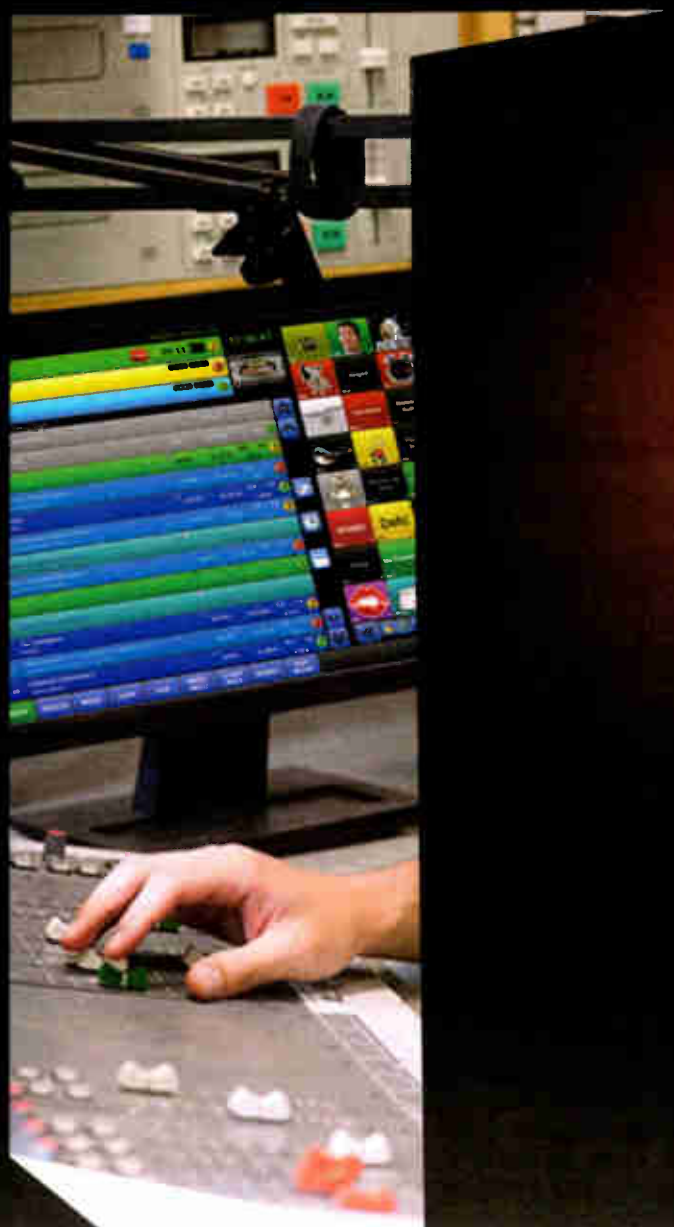

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GatesAir Keeps STL Transport Hopping for WJKS

Three redundant feeds are automatically juggled to keep signal on air

USERREPORT

BY CHRIS VERDI
CTO
Great Eastern Radio

BURLINGTON, Vt. — Headquartered in West Lebanon, N.H., Great Eastern Radio owns 15 radio station in three states, including several in Vermont. WJKS(FM), known to listeners as KISS 104.3, serves the Burlington/Plattsburgh, N.Y. market with a classic hip-hop format.

The WJKS transmitter site, as we like to say, is on the "wrong side" of Lake Champlain. The rural site is distant and challenging to reach both by vehicle and STL transport. For the latter, Frontier Communications provides a long-distance fiber connection to the transmitter with very reliable service.

However, a fiber connection doesn't work when the wire is cut — an unwelcome event we experience several times a year when a snowplow or vacationer comes in contact. Traditionally, these events silence our signal for up to 48 hours. When this happened recently month, we had an ace up our sleeve: A GatesAir Intraplex IP Link solution that can now seamlessly switch between three network feeds.

We have long used Intraplex T1 STL systems, several of which remain on the air with recent IP module upgrades. As T1s fade and broadcasters adopt IP transport with confidence, systems such as IP Link have become the primary transport system. We selected the cost-efficient base model — the IP Link 100 codec — with a standard configuration that places the encoder at our studio and the decoder at the transmitter site. Each device integrates dual power supplies for maximum redundancy, along with support for numerous compression algorithms.

Our IP Links manage three streams: an uncompressed stream over fiber; an AAC stream over a Cradlepoint 4G network; and an Icecast streaming service. When the fiber connection went south last month, the full uncompressed stream automatically switched to the Cradlepoint AAC stream. With the fiber connection down for 28 hours, the AAC stream kept us on the air with no noticeable difference in audio quality. In the future, if the Cradlepoint 4G feed temporarily fails, the IP Links will grab the Icecast feed from our streaming server.

GatesAir's Dynamic Stream Splicing (DSS) software provides the secret sauce for reliable transport delivery. We have two streams operating over the fiber service that are offset by several hundred milliseconds. If packets are missing in the primary stream, the DSS software grabs those packets from the secondary stream to repair the missing audio. While it is not live on the other networks, the DSS software could be applied to take audio from backup transport networks — an option we are looking at for future rollouts on other Great Eastern Radio stations.

Configuration of the IP Link codecs is simple, with an intuitive process that requires little more than logging into the web interface and managing some basic settings. The two codecs were passing audio within a half hour. We folded the IP Link codecs' SNMP monitoring capability into our VPN network infrastructure. The two codecs monitor SNMP traps and will dispatch alarms in the event of any immediate or impending failure. To date, we have had no such issues.

Otherwise, the devices interoperate cleanly with other systems in the air chain: A Wheatstone Blade feeds the encoder at the studio, and the decoder at the transmitter site feeds AES and analog audio to Wheatstone X3 and FM55 audio processors, respectively. The fact that the IP Link integrates AES and analog outputs is an important benefit, as we can switch between the two processors during firmware upgrades and other maintenance procedures.

The IP Links have been so reliable that we are already planning a single-format, three-transmitter Intraplex system that will cover sites in Keene, N.H., and two sites in Vermont (Stratton Mountain and Mount Snow). These sites have also been affected by fiber line damage in the recent past, especially during winter months. We will use the same exact network configuration — fiber with Cradlepoint and Icecast redundancy — with IP Link codecs managing transport over all three networks.

For information, contact Keith Adams at GatesAir in Ohio 1-523-459-3447 or visit www.gatesair.com.

TECHUPDATE

TELOS ALLIANCE INTRODUCES NEW OMNIA MPX NODE

New to the Omnia product line, the Omnia MPX Node from the Telos Alliance provides fresh options for STL applications. Like its namesake the classic Axia xNode, Omnia MPX Node is a building-block technology that helps stations leverage the growing power and capability of data networking the company says.

Omnia says this is the first purpose-built hardware codec capable of sending or receiving full FM signals at data rates as low as 320 kbps, utilizing the Omnia µMPX algorithm, ideal for networks with limited capacity (including IP radios). MPX Node makes peak-controlled L/R baseband, stereo pilot, and RDS data routable from a studio to one or many FM transmitters.

By transporting an FM composite signal rather than left/right audio, Omnia says, broadcasters can keep their on-air processing and RDS encoding at the studio, then deliver a transmission-ready, peak controlled FM multiplex signal directly to an FM transmitter without the need for transmitter-side peak limiting or stereo generation.

The MPX Node is available as either an encoder or decoder, and a pair of units creates a complete system. Alternatively, the Omnia.9 audio processor running MKII software with an Omnia MPX Encoder License can be used with a single Omnia MPX Node Decoder to create an end-to-end system.

For information, contact the Telos Alliance in Ohio at 1-216-241-7225 or visit www.telosalliance.com.

TECHUPDATE

APT MOBILE SURESTREAMER: A GAME-CHANGER IN THE QUALITY OF LIVE REMOTE BROADCASTING

The APT Mobile SureStreamer (MSSr), a WorldCast Systems technology, is a new mobile network access solution designed for live remotes and OBs.

It works with most portable codec types and brands to deliver clear, uninterrupted radio and video directly from the field.

APT says that the Mobile SureStreamer is a user-friendly solution, in a lightweight shoulder bag, with zero-field configuration, so users can rely on immediate and simple connection between the field and the station.

It works with any codec type and brand to improve the quality of remote broadcasting and adds no additional latency according to Worldcast.

Indeed, the company says it provides a link so reliable that the codec's automatic buffering is redundant and latencies can be trimmed to a minimum.

It adds that courtesy of the core technology, SureStream ensures flawless audio and it reduces operating costs by distributing content over affordable 3G/4G public internet links rather than ISDN, MPLS or satellite.

APT says Mobile Surestreamer has proven reliable in field tests of applications for sports broadcasters, remote desktops and journalists at major events.

It quoted Conor Ewings, broadcast engineer at Bauer Media in Northern Ireland, as saying latency was "beyond expectations ... rock-solid at 60 ms and not a single packet has been dropped."

The company says that overall, the product improves the quality and reliability of IP remotes to deliver audio and video for live and local remotes and OBs.

For information, contact WorldCast Systems in Florida at 1-305-249-3110 or visit www.worldcastsystems.com.

ABOUT BUYER'S GUIDE

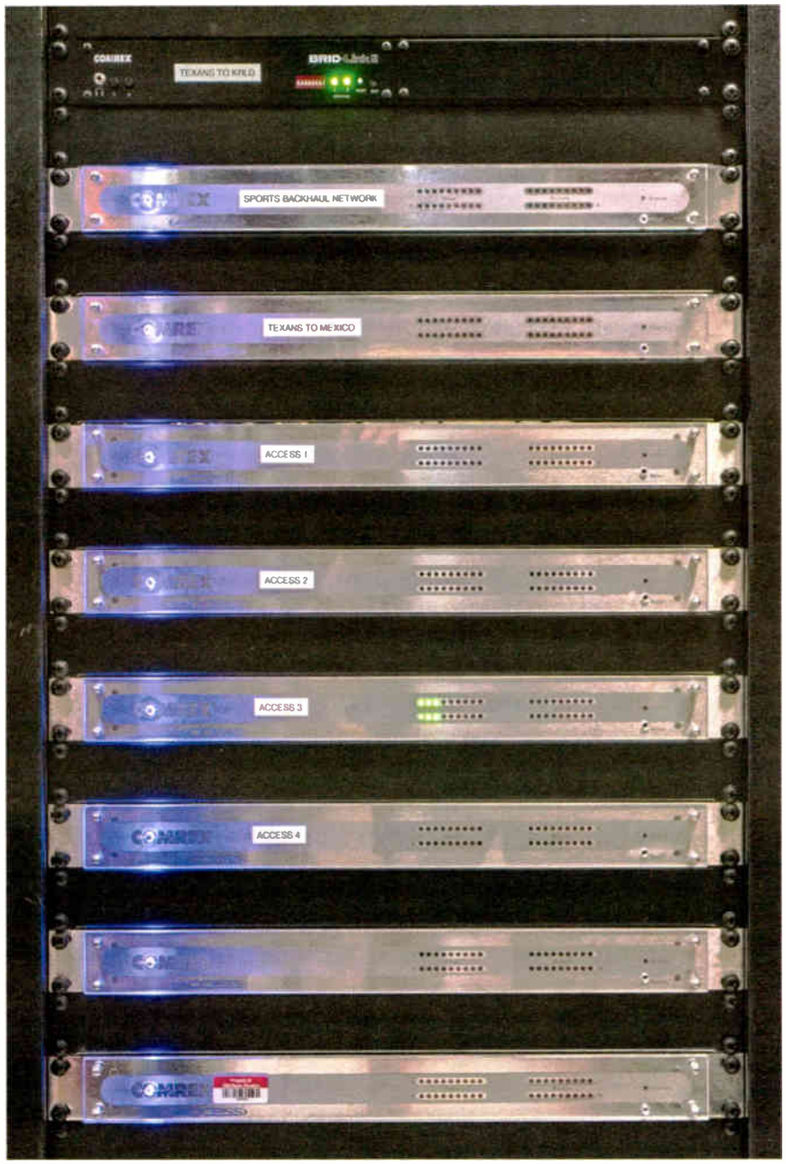
Radio World publishes User Reports on products in various equipment classes throughout the year to help potential buyers understand why colleagues chose the equipment they did. A User Report is an unpaid testimonial by a user who has already purchased the gear. A Radio World Product Evaluation, by contrast, 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.

KILT Stays Connected With Comrex BRIC-Link II

Failure is not an option when it comes to live sports programming

USERREPORT

BY ROBBIE GREEN
Director of Technical Operations
Entercom Houston



HOUSTON — SportsRadio 610 KILT(AM) has been the home of the Houston Texans Radio Network since the team's inaugural year. From 2002 to 2017, ISDN lines were used for backhaul from each stadium to our network studios, and as the primary link to our satellite uplink in Dallas. In 2017, an unexpected 1,000% rate increase on all of our ISDN BRIs let us know the end was near for that technology.

Though the price increase was jarring, it wasn't totally surprising. For us, ISDN had already become problematic. We had discovered that we could no longer rely on it for most of our remote broadcasts, because installations of new ISDN service for normal remote broadcasts at sports bars, restaurants, etc., had already become pretty hit and miss. It would typically take the local phone company two or three tries to deliver a working circuit, and we were wasting an enormous amount of time repeating site checks.

Because of repeated ISDN install failures, we had already migrated most of our local remote broadcasts to IP using Comrex Access 2USB codecs. Using CrossLock VPN with two cellular modems from different carriers, our remotes had achieved ISDN quality while reducing costs dramatically and removing install headaches entirely. We decided it was time to leverage Comrex IP technology for the Texans Radio Network.

For the uplink to Dallas, we selected Comrex BRIC-Link II. Using the internal NIC and an optional USB NIC, we're able to leverage CrossLock VPN for this critical connection. The BRIC-Link II delivers both audio and the contact closures for affiliate automation to our uplink at Texas State Networks.

Game audio is fed to the studios using a first generation Comrex Access Portable via SRB2 from Sports Backhaul Network — a private IP network that connects all NFL stadiums with their radio broadcast partners. Though we haven't ever needed it, we use an Access NX with one cellular modem and whatever internet connectivity the stadium provides for our backup connection to the studios.

After two seasons, I'm happy to say our IP audio solutions have delivered reliably for the Texans Radio Network. In an environment where failure isn't an option, I'm glad we have solid solutions from Comrex to power our Texans broadcasts on SportsRadio 610, the Spanish Texans broadcasts on Mega 101 KLOL, and our 37 network affiliates.

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

TIELINE

(continued from page 18)

HTML 5 interface has made remote configuration and control from virtually any browser even easier.

We recommend clients take full advantage of the built-in security options, have a schedule for password changes and make use of a firewall. The ability to implement SSL security certificate connections is a great addition to the feature set and in many cases removes the need for a VPN connection to securely administrate the codec.

For point-to-point connections, we recommend limiting, via a firewall, the IP addresses that can connect to the codecs. In all situations, we advise they open only the necessary ports, maintain and review logs of connections and connection attempts, and implement firewall monitoring that generates alarms for excessive traffic on administrative addresses/ports.

Clients who use the Genie for STLs often compare it to their former RF-based systems. We most often hear: "Just like the old system — we set it up and forgot about it. It just works." That level of reliability allows them to focus on other day-to-day tasks without worrying about the STL.

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

TECHUPDATES

MOSELEY DEBUTS MAVERIX WIRELESS LINK

Moseley says its new Maverix DT is a dual-transceiver, all-weather outdoor, IP radio operating from 6 GHz to 42 GHz, with modulations up to 4096 QAM, and ultrawide bandwidth operation to 112 MHz ETSI and 160 MHz ANSI.

It specs at up to 5.5 Gbps per radio though it is at home at 2.75 Gbps for less-demanding links. It can operate in both licensed Part 74 and Part 101 channels simultaneously.

Web browser interface and SNMP allow convenient remote monitoring and integration into larger networks.

Moseley also says that "Maverix's high data throughput fulfills audio, data and voice link requirements for even the largest multiple-station radio and TV clusters."

Notably, "In addition to bidirectional audio and video transport, Maverix creates a huge data pipe to and from the transmitter site, enabling stations to employ money saving IP applications and appliances at the site for control, security, off premises mirrored servers and the like." This can provide for adding a live security feed from a transmitter site or utilizing the receiver site as a back-up server and archive.

For information, contact Moseley Associates in California at 1-805-968-9621 or visit www.moseleysb.com.

2WCOM'S MOIN OFFERS INTEROPERABILITY

2wcom says the recently launched Linux-based MoIN multimedia over IP network server eases the day-to-day work of network operators.

The server is available as hardware or virtualized software. The company highlights a new and advanced technological concept that assures flexibility in application by supporting studio-to-studio and studio-to-transmitter links as well as broadcasters' increasing cross-media tasks.

In addition, according to the company, MoIN's high-level compatibility is especially important in mixed networks and expanded infrastructures. For this purpose, the server supports all major protocols for internet interoperability like Ravenna, Livewire+, Dante and SRT.

Harmonization of data exchange between the protocols is carried out by standards such as EBU N/ACIP Tech 3326, AES67, SMPTE 2022-7 and Ember+. To easily exchange data in mixed networks, MoIN can transform protocols, e.g. from Livewire+ to Ravenna, when transmitting from a studio site to the headend.

Eyeing future crossmedia tasks, 2wcom says, customers benefit from MoIN's transcoding feature, which supports all main codec algorithms. For economical needs, like dealing with low bandwidth or uploading files to a station website transcoding, e.g. AAC profiles (even AAC xHE), Enhanced aptX or Ogg Vorbis is possible.

For live events the server efficiently supports the on-site team thanks to features such as the SIP phone book, temporary channel activation, combining individual audio streams into multichannel streams, as well as precise synchronization (PTPv2).

For information, contact 2wcom in Germany at +49-461-662830-0 or visit www.2wcom.com.

Insertel Canarias Trusts AEQ

As network and client list expand company continues to choose AEQ codecs

USERREPORT

BY HENRY REYES
Technical Director
Insertel Canarias

SANTA CRUZ DE TENERIFE, SPAIN — Insertel is a telecommunications company located and operating in the archipelago of Spain's Canary Islands, off the coast of Africa. The company provides broadcast telecommunication services for radio and TV stations, including the hosting of communications and IT systems for third-party transmission centers.

Both Carlos Medina as our project engineer and myself, Henry Reyes, representing the company's technical direction and operations, bet heavily on AEQ technology as part of our services for radio broadcasters. These services consist in transporting their program and contribution audio over IP Networks and especially over the internet.

From the start of the project we relied on AEQ Phoenix audio codecs. We have recently expanded our network with eight Phoenix Venus 3, seven Phoenix Mercury and three Phoenix Alio codecs. The units installed are dependent on our customers' needs, the type of connection that they require and also the type of link available.

The Phoenix Alio has allowed us to expand our services while providing greater flexibility for our users, since it includes a mixer with five inputs (four mono and stereo line), headphone outputs and line output, all in the same unit, allowing us to provide services of outside broadcasts to our clients.

Carlos Medina (left), project manager, and Henry Reyes, technical director working with AEQ Phoenix audio codecs and Phoenix Control software.

Phoenix Alio is a portable audio codec with physical interface that can also be controlled remotely, with a help request button and the smart RTP communication establishment protocol. These characteristics make it easier for us to monitor and control the services we provide.

We currently have point-to-point connections, multipoint connections and outdoor services.

Given the large number of codecs connected in our network, and its wide geographical distribution throughout the islands of the archipelago, from the company's perspective we considered it very important to have a centralized management system. The AEQ PhoenixControl IT platform has all the necessary tools for the network management.

From AEQ PhoenixControl we can monitor the status of all audio codecs connected, see alarms and events, even check the audio levels of input and output of each piece of equipment thanks to real-time precise data on screen, as well as having the ability to initiate and modify of any connection between remote teams in a fast and intuitive way.

On our Insertel network we normally use RTP communications for our point-to-point connections; however, the AEQ Phoenix codecs allow us to use any other common protocols to establish the connections. That can include SIP, either with or without a proxy server.

For connections requiring a SIP server, AEQ provides free of charge the use of their dedicated SIP server. This service is included with all of the codecs that AEQ sells and allows us to connect two codecs without the need for fixed IP addresses.

Also, the AEQ audio codecs allow us to configure and modify the buffer to enable the correction of communication errors.

At Insertel we have trusted the technology from AEQ because it is a manufacturer of recognized reputation and its products offer superior performance in the real world. We can testify that it is up to our standards and very reliable.

For information, contact Peter Howarth at AEQ in Florida at 1-800-728-0536 or visit www.aeqbroadcast.com.

Wheatstone's SwitchBlade Addresses ISDN Challenge

iHeartMedia needed to settle on companywide codec/installed audio network solution

USERREPORT

BY ANDY MIKA
Assistant Director of Engineering, Cleveland
AND STEVE GEORGE
Senior VP of Engineering/ Upper Midwest
iHeartMedia Engineering

CLEVELAND — ISDN is out, audio over IP is in.

Major telecom companies have announced plans for the sunset of ISDN and the service has been terminated by several providers in the U.S. in the past 18 months.

In place of ISDN is a wide variety of audio over IP solutions. Even though AoIP has moved studios into the IP realm, converting that IP audio into a routable codec solution has been a clunky bolt-on solution. In many cases, broadcasters have had to resort to running separate codecs or software on computers in the studio with sound cards wired directly into the console.

By 2016, VoIP was making an enormous difference in corporate telecommunications, both in terms of speech quality and in the range of services available. SIP was already being implemented across different codec manufacturers for interoperability, so a solution of SIP-enabled codecs combined with the Opus open source codec seemed to hold the promise of being a reasonable replacement for ISDN distribution.

We were looking for a way to take WheatNet-IP audio in our studio facilities and seamlessly integrate bidirectional codec functionality into the architecture. The ideal solution would operate natively in both environments — presenting fully-connected AoIP channels on the studio audio side and functioning as fully-featured AoIP SIP/Opus (VoIP) codec for audio connectivity outside the studio facility.

Nothing like this had been developed before, so we enlisted the help of Wheatstone and its partner Radiomation, an Irish company that had already been doing pioneering work linking Wheatstone equipment to existing ISDN and POTS telecommunications equipment.

SOLVED

The result was SwitchBlade, an AoIP appliance that seamlessly integrates 24 remote AoIP connections directly into the WheatNet-IP audio network at the studio. SwitchBlade is a single 1RU unit chassis with a 24 software codecs routed to any source and destination on the WheatNet IP-Audio system.

By the end of October 2017, SwitchBlade had been demonstrated as a proof-of-concept at the iHeartMedia Engineering facility in Cincinnati. After NAB in 2018, SwitchBlade's next stop was the iHeartMedia studios in Cleveland, where we performed beta testing and drove further development, resulting in a widespread deployment across iHeartMedia in 2019.

SwitchBlade has allowed iHeartMedia to proactively migrate away from ISDN to audio over IP for remote audio connectivity. Standardizing on the open standard of SIP for initiating the connection, and the wide adoption of the open source Opus codec, has resulted in interoperability with many different existing codecs in the field.

SwitchBlade has the intelligence to be controlled using all the WheatNet-IP programmability. All 24 internal modules can be individually controlled by custom console interfaces; the Wheatstone ACI; ScreenBuilder, Wheatstone's widely-used programming environment; and integration into RCS NexGen and other automation systems for automating the various remote AoIP connections for each show.

Among the many unique qualities of this appliance is its ability to dynamically assign and pass any of 78 GPIO closures, and have serial network cues associated with satellite-delivered program travel with the program audio, arriving at the remote end still perfectly synchronized with the content. This was achieved by embedding the signals directly into the audio stream so that signals and content are always perfectly synchronized regardless of any delays to the signal path.

Being driven by the iHeartMedia Engineering team for the past two years has made SwitchBlade into a world-class solution — a fact recognized by the National Association of Broadcasters, which gave it the "Product of the Year Award" in the Audio Production, Processing and Networking category at NAB Show 2019.

SwitchBlade has not only met and exceeded the "ISDN-Replacement" challenge, it has changed our thinking on everything from satellite program distribution and telephone contributions to inter-facility content distribution.

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

TECHUPDATE

ORBAN ADDS SECURITY FEATURES TO OPTICODEC 7600

Orban has added several security features in the latest update to its Opticodec 7600 IP/ISDN audio codec.

A new HTTP server now supports authentication, which users can activate for setup or for web pages. The configuration settings as well as the connect and disconnect commands are protected by session IDs to prevent CSRF attacks.

In addition, it's possible to disable direct calls to the audio codec in the system setup menu by using its IP address. Also, the settings related to the remote control of the unit are now located in a separate submenu and it is possible to disable the web interface.

Furthermore, the FTP server now only starts for a software update and the internal FTP server does not support any commands that modify the current directory or access any other one. A nonsecurity-related enhancement includes the ability for operators to restart SIP registration function by pressing the "help" button if SIP registration failed with an error message.

The latest software can be downloaded from the Orban webpage *www.orban.com* for free.

For information, contact Orban in New Jersey at 1-856-719-9900 or visit www.orban.com.

MISCELLANEOUS

WANT TO SELL

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

Radio broadcasts of Major League Baseball, NFL, and some college football games that are on cassette tapes, approx 100 to 125 games, time period of entire collection os from the 1950's – 1970's, BO. Must purchase entire collection. Contact Ron, 925-284-5428 or ronwtamm@yahoo.com

WYBG 1050, Messina, NY, now off the air is selling: 250' tower w/building on 4 acres; 12' satellite dish on concrete base; prices drastically slashed or make offer. 315-287-1753 or 315-528-6040

WANT TO BUY

Collector wants to buy: old vintage pro gears, compressor/limiter, microphone, mixing consoles, amplifiers, mic preamps, speakers, turntables, EQ working or not, working transformers (UTC Western Electric), Fairchild, Western Electric, Langevin, RCA, Gates, Urei, Altec, Pultec, Collins. Cash - pick up 773-339-9035 or ilg821@aol.com.

2" plastic "spot" reels 6.5 or 8" diameter, as used for quad video. Wayne, Audio Village, 760-320-0728 or audiovlg@gte.net.

Equipment Wanted: obsolete, or out of service broadcast and recording gear, amplifiers, processing, radio or mixing consoles, microphones, etc. Large lots preferred. Pickup or shipping can be discussed. 443-854-0725 or ajkivi@gmail.com.

I'm looking for KFRC radio special of Elvis Presley which aired on January 8, 1978. I'd be willing to pay for a digital copy. Ron, 925-284-5428.

I'm looking for the Ed Brady radio show in which he did a tribute to Duke Ellington, the station was KNBR, I'd be willing to pay for a digital copy. Ron, 925-284-5428.

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

I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR, KSFX, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc, I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at ronwtamm@yahoo.com.

Looking for a broadcast excerpt of a SanFrancisco Giant's taped off of KSFO radio from 1959, interviews with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a home-run by Willie Mays and Felipe Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or ronwtamm@yahoo.com.

Looking for KFRC signoff radio broadcast from 1930 Andy Potter, running time is 0:22 & also the KLX kitchen the program guest is Susanne Caygill, a discussion of women's affairs with a long promotion for Caygill's appearance at a local store. Anne Truax, Susanne Caygill, running time is 13:44. Ron, 925-284-5428 or email ronwtamm@yahoo.com.

Looking for K5FX radio shows, Disco 104 FM, 1975-1978. R Tamm, 925-284-5428.

Looking for KTIM FM radio shows from 1981-1984 if possible unscoped. R Tamm, 925-284-5428 or ronwtamm@yahoo.com.

TRANSMITTERS/EXCITERS/TRANSLATORS

RECEIVERS/ TRANSCEIVERS

WANT TO SELL

Johnson Electronic 5CA880 module, 67/92 Khz, 417-881-1846.

WANT TO BUY

AM Stereo radio. Call 417-881-1846.

RECORDING & PLAYBACK HARDWARE

WANT TO BUY

1960s-vintage MacKenzie Repeater machines, magazines, spare parts and manuals, complete or "parts" machines considered, James, 870-777-4653.

Schnader telescriptions 16 mm musical films produced in the early 50s. Bill Cook, 719-684-6010.

Large or small collections of 16" transcriptions or 12" transcriptions, not commercial LPs. Bill Cook, 719-684-6010.

Standard Short-tune series. Bill Cook, 719-684-6010.

(2) LPFM radio stations for sale, located in the NW part of central Florida on the gulf coast, covers the county, get out of the cold weather, come to Florida, call or write for particulars, 352-613-2289 or email boceey@hotmail.com or Bob, PO Box 1121, Crystal River, FL 34423.

RF CONNECTORS

WANT TO SELL

RF CONNECTORS & GADGETS – Parts, Products & More! www.W5SWL.com

TAX DEDUCTIBLE EQUIPMENT

Donate your broadcast facility; IRS approved 501(c)(3) non-profit charitable organization. Fair market value. License (AM/FM/FV), land, building, tower, equipment, etc. Contact (409) 359-3326.

RADIOWORLD *Equipment Exchange*

CONSULTANTS

To Sell or Not to Sell?

COMMENTARY

BY DAVE DYBAS

A leasing company wants your tower — should you go for it?

Getty Images/iexpress

Over the last handful of years, we have seen the rise of tower leasing companies nationally and worldwide.

These companies will build new towers but also often buy existing broadcast towers to use as a "rental property" and lease back to the broadcaster.

Selling their tower is appealing to some broadcasters because it puts a large sum of money in the broadcaster's hands immediately upon the sale closing. Also the tower maintenance, lighting, site upkeep and other overhead items now become the tower leasing company's responsibility. Overall, this concept adds a nice bit of money to use for other areas of the business.

I must say, on the surface, this arrangement looks very appealing to a cash-strapped station owner. But unless the station owner reads and negotiated the details of the sale and lease-back agreement carefully, he or she may eventually encounter some unexpected situations.

DEVIL IN THE DETAILS

Once the broadcast tower is sold, the new tower leasing company is free to put whatever antennas and services they desire on that tower.

In today's world those antennas typically are cell site antennas, although microwave links, LPFM, FM translators, FM broadcast, TV and two-way antennas are still being installed on leased towers.

During the installation of those antennas, it is not unusual for tower climbers to ask that the broadcast station turn down or turn off its signal for the climbers' RF safety.

Without a doubt RF safety is an extremely important issue, but station owners are not happy when their signal is off. This is an important consideration when you think about selling your tower.

SELL YOUR FM-ONLY TOWER? NO PROBLEM

Selling an FM-only broadcast tower is an ideal situation, as very few things can go wrong with the lease back arrangement. The only issues that plague these towers are the occasional request to power down the FM station so workers do not get RF overexposure.

Site maintenance, road access and vegetation control are small items that come up but are often quickly remedied.

YOUR AM TOWER? UH OH

Over the years, I've seen an increase in AM stations using skirted FM towers for their antenna. This is a great way to consolidate your tower usage when you have an FM station along with your AM.

However, if you choose to sell that tower to a tower leasing company, you may find issues with that AM skirt antenna that you weren't expecting. For instance, I have seen skirt wires shorted out by the installation of new cell antenna platforms. The installation crew just let the skirt antenna wire rest against the grounded platform and knocked the AM station off the air.

Unfortunately, many tower crews are well educated at cellular antenna installations but know little about AM antennas. So the radio station owner contemplating the sale of a tower that has a skirted AM antenna may want to include written protection of that AM antenna into the sale and leasing contract.

HIDDEN TROUBLE FOR AM TOWERS

Another issue that I have run into when dealing with leased towers is the AM ground system.

Often, the AM tower is sold and the land around it is purchased by the tower leasing company. Frequently, the cellular companies will build their facility in a 10-by-12-foot building close to the tower. During the construction of the building, I've found, in some cases, the AM ground system is dug up and destroyed and the AM station's signal is significantly reduced.

Understand that this is not malicious destruction, just a result of an industry that is focused in a different direction than AM broadcasting.

When contemplating the sale of any tower that functions as an AM antenna, a long discussion regarding the protection of the ground system is needed. While you are at it, mention the buried coax cables and signal lines you may have, too.

STATION OWNERS BEWARE

Radio station owners need to be aware that once the tower is sold, crews will be accessing the tower to climb, often without prior notice to the broadcaster. It is not unusual for radio stations to get a phone call from a tower crew asking that the station shut off immediately so they can perform their work.

Therefore, it is wise to include a 24- to 48-hour advance notice shut-off clause in the sale or lease contract. This would give you the right to protect your station's programming and have some say on when your station is shut down.

Radio station owners can help shape the sale and lease back contract and include whatever provision they feel important. A discussion with your station engineer is wise in order to make sure you are protected from technical mishaps.

WHAT I'VE SEEN THIS YEAR

Another item that radio station owners need to keep in mind is site maintenance, which includes the roadways, building roofs, vegetation control, sometimes air conditioning and heat, FCC-required signage and tower lights. I mention these as I have seen neglect in these areas by some tower leasing companies.

One company with a very tall tower near Chicago has tower light issues. I've checked and found that they keep renewing their NOTAM (Notice to Airmen). After eight months, the tower, which is located near a regional airport, is still unlit. An issue like this could fall back onto the broadcaster if they are not careful.

A broadcaster in Connecticut I visited recently was having site access issues because site vegetation had become overgrown. He knew this was no longer his responsibility but had to chop his way to the site to work on his transmitter. He also complained about a damaged air conditioner the tower leasing company keeps promising to fix. Needless to say, he isn't happy with how this lease arrangement has deteriorated.

The same broadcaster has another issue that has affected his revenue. The new site owner sold off some of the site land, only to have a residential home built on it and the AM station ground system dug up and never repaired. This is disheartening, as I measured signal deterioration of the station due to this problem.

(continued on page 30)

READER'SFORUM

FUTURE OF AM RADIO

In response to "Where Is Terrestrial Radio Going?" by Jonathan Yinger, radioworld.com*:*

An interesting discussion. But I think you've left out the obvious possibility regarding the future of AM broadcasting to the public: all-digital emissions.

Will it work? I dunno. Will America try it? I really believe it will.

There is already a move afoot asking the FCC to allow AM operators to switch to all-digital emissions at-will. I personally know a number of AM operators who now have FM translators for their AMs who say they'll do it.

I am one of them.

Dave Richards
WOON(AM/FM) Radio
Woonsocket, R.I.

What has happened? We have seemed to lost our way with the potential that once was possible with AM radio.

We went through the 1980s with four different AM stereo formats, that took forever to be worked out. Once we had a set format, AM would have been at the same level as FM. So let's follow where we should be today.

In the 1990s, C-QUAM became the standard, therefore manufacturers then would start making AM stereo receivers alongside FM stereo. In the 2010s we would have started using DRM with AM for both MW and SW broadcast bands, providing for extra data services. Today, most receivers would be DSP-based that would work with C-QUAM and digital radio formats, and we would have worked out how to fit both services together to could run side by side, without interference to each other.

As we now know, this did not happen. We were on track all the way up until the 2000s, when AM radio went backwards — when the number of stereo receivers being made was next to zero.

However developments with AM radio did not stop in the 2000s; we still had a large numbers of AM stereo stations on air providing high-quality music programs, which would have worked in with FM stereo as dual-band service.

FM is for urban areas, where there is a lot of man-made noise, and AM is for rural locations for wider coverage; this will not change as we move into the future. To get back on track, we need radio manufacturers to make an all-in-one radio receiver for both analog and digital services; it is not that hard to do in a single chip these days.

What *is* new with AM radio today? I am working on new forms of amplification for better linearity, alongside improvements to the AM stereo format. This includes an audio compounder for greater dynamic range, as well as a navigational radio data service, making AM radio a high-value service for the automotive industry, providing navigation information alongside GPS that is currently used.

This technology is in the process of being tested; the first navigational encoded transmissions are planned to go on the air here in Toronto later next year. The only real delays are with the DSP receivers for this service, as I am not a programmer but have a background in RF design. The other area is the funding required to push a project like this to the next level of development.

Let's look at these improvements and focus on getting them into the marketplace, where we can use this technology to build a better future for all.

Grant Taylor
Toronto

NAVIGATION VS. DISTRACTION


NEWS

HYBRID

The photo shown with the article appearing in Radio World July 3 article "Hybrid Radio Making Strides" suggests the dashboard of a small aircraft.

But while all the equipment and controls of an aircraft dashboard are required for safe air navigation, the car entertainment center merely invites distracted driving, akin to texting. RDS images worsen the matter by taking the driver's eyes off the road and down to the display screen.

Regardless of the prospective economic opportunities, I look forward to federal regulatory agencies curbing such advanced designs in the interest of public safety.

James B. Potter
Owner & CEO
Cutting Edge Engineering, The Little Spot Shop and JBPotter Agency
Kimberling City, Mo.

SELL

(continued from page 29)

THE BOTTOM LINE

Selling your broadcast tower to a tower leasing company can put some cash in your pocket, but you have to be specific about the conditions included in the sale and the lease-back arrangement.

A wise station owner will have their engineer and lawyer review the sale and lease-back documents and include stipulations that protect the station operation and technical equipment. Make sure the sales and lease-back contract address how any future damage to radio station gear will be dealt with, in the rare case that it does happen. Who will pay for those repairs, address the timeliness of repairs, discuss compensation for off-air time and negotiate common area costs for site maintenance?

If you iron out all the details to your satisfaction, you can create a comfortable arrangement that frees up some operating expenses and keeps your radio station running smoothly.

Comment on this or any article. Email radioworld@futurenet.com.

Dave Dybas is a veteran broadcast chief engineer and the owner of AM Detuning Services in Chicago. Visit www.amdetuning.com.

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