WHAT'S IN YOUR "GO BAG"? — Page 3

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Noise Inquiry Spurs Recommendations

Engineers concerned about spectrum noise wait to see what's next from the commission

SPECTRUM MANAGEMENT

BY STEVE JOHNSTON

dcast engineers are becoming vare of the impact of environ- radio noise on reception. The efforts at "AM improvement" ghlighted this challenge to AM , and evidence is growing that reception on FM and TV bands is being impaired as well.

The general public, however, is far less aware of our growing *noise pollution* issue. Listeners or viewers may not know *why* there is a reception problem; they just perceive the signal as "weak" and may switch to a competitor. Broadcasters are hearing a common pattern in listener complaints: "I used to get good reception, but not anymore…" I wrote about this in Radio World in a 2011 article titled "Johnston Laments FM Noise."

Other industries using RF wireless technologies report growing noise trouble as well. A recent IEEE Spectrum article was subtitled "Electronic Noise Is Drowning Out the Internet of Things." Designers of IoT devices are not getting the range they expect due to unexpectedly high background noise, it reported.

Recent broadcast engineering conferences have included presentations on the noise problem. The topic was extensively covered at last fall's IEEE Broadcast Technology Society Fall Symposium; four presenters focused on the subject of "man-made RF noise issues."

FCC TAC INQUIRY

Growing awareness of the problem of excessive radio noise in the environment last year led to the FCC's Technical Advisory Council forming a working group to study the problem. Inquiry ET-16-191, released in June 2016, sought public comments.

The responses came from about 100 individuals, companies and organizations.

(continued on page 5)

Corus Ventures Boldly Into HD Radio

Here's how one Canadian broadcaster is exploring the format

DIGITALRADIO

BY JAMES CARELESS

Although Canada does not have an official digital radio broadcast standard, Corus is now providing HD Radio broadcasts in Calgary, Toronto and Vancouver.

An operator of 39 Canadian radio stations plus numerous broadcast TV and cable/satellite-only TV channels, the company is using HD Radio over FM to deliver simulcasts of its existing AM stations in the three markets.

The AM stations being simulcast, using experimental government licenses, are:

- Calgary's CHQR, via CKRY(FM)'s HD2 channel;
- Toronto's CFMJ, via CING(FM)'s channel in nearby Hamilton, while CHML(AM) is on HD3;
- Vancouver's CKNW and CHMJ, via CFMI(FM) on HD2 and HD3, respectively.

(continued on page 6)

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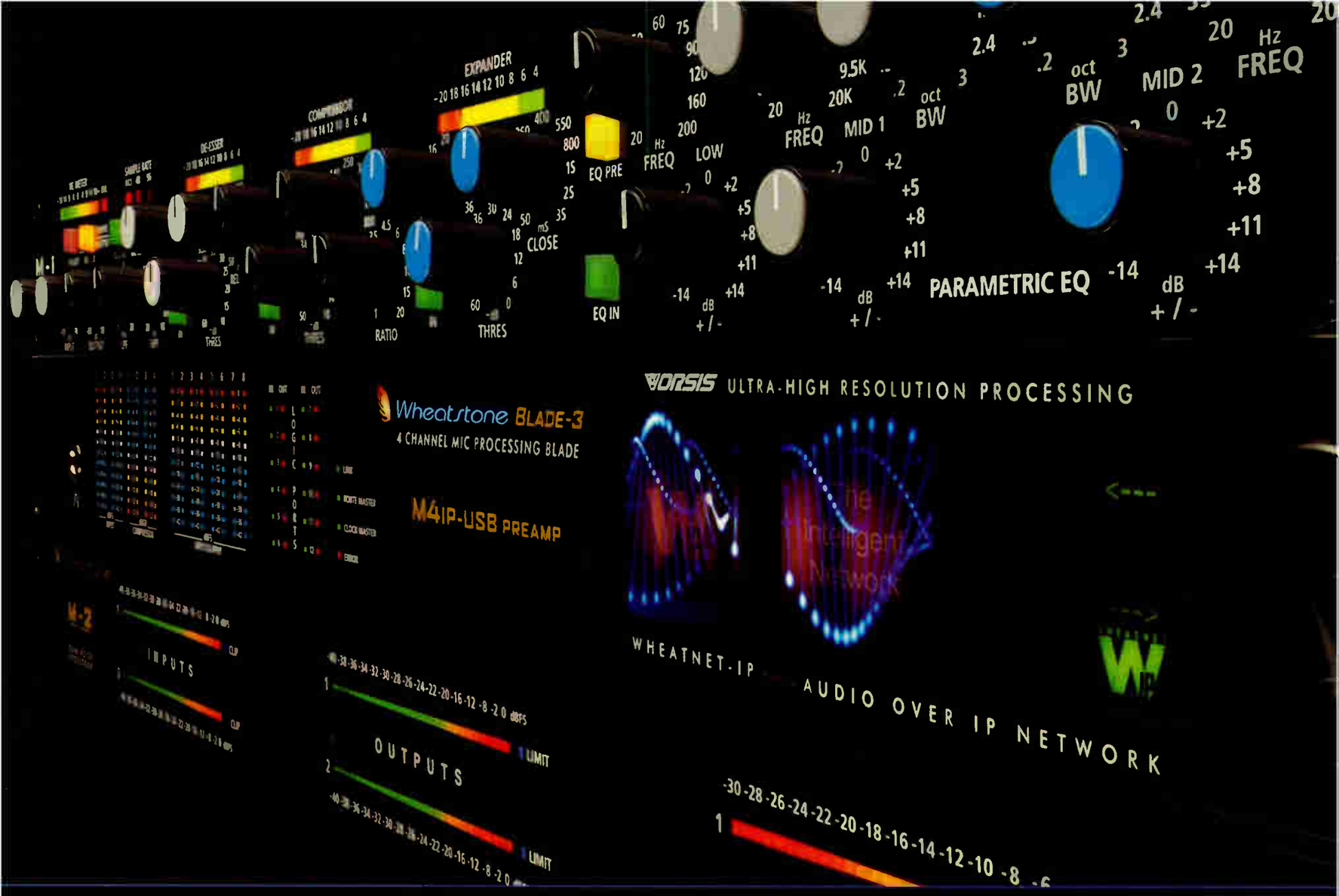

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RADIOWORLD
Vol. 41, No. 17 July 5, 2017

Next Issue of RADIO WORLD July 19, 2017
Next Issue of ENGINEERING EXTRA August 9, 2017

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978-667-0352 (Outside the US) FAX: 978-671-0460
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Radio World Founded by Stevan B. Dana

Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by NewBay Media, LLC, 28 East 28th Street, 12th Floor, New York, NY 10016. Phone: (703) 852-4600, Fax: (703) 852-4582. Periodicals postage rates are paid at New York, NY 10079 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 282, Lowell, MA 01853.

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How Does Today's Radio Reporter Roll?

Wherein the Warrior finds the more things change, the more they stay the same

RADIO ROAD WARRIOR

Columns are archived at radioworld.com

BY PAUL KAMINSKI

The duty of the radio reporter today, whether for a commercial or non-commercial station, is the same as envisioned by Paul White when he stood up news bureaus all across America for CBS News. To wit: The reporter gathers news, whether by observation or interviewing; processes the news for broadcast; and submits completed reports to the newsroom.

But what tools are today's reporters using? We talked with reporters and managers at four news operations.

HOW DO REPORTERS GATHER SOUND?

Separate audio recorders and microphone remain popular at many facilities.

Pat Duggins, news director for Alabama Public Radio and its stations in Tuscaloosa, Ala., still goes into the field with his Marantz PMD660 flash recorder and Audio-Technica ST95 Mark II microphone. "Some of the younger reporters like the all-in-one Zoom units. As long as it works, and if it's transparent to the audience, it's OK to me."

Models of recorders we encountered for this story include the Zoom H2, Zoom H4 and Marantz PMD661. Microphones range from the venerable Electro Voice 635A to the Shure SM58 and the A-T model mentioned above.

Bruce Ferrell, assistant news director at Curtis Media Group — which owns WPTF Radio and the North Carolina News Network in Raleigh, N.C. — is among those who noted that gathering sound from streaming audio, whether in the newsroom or in the field, is part of the arsenal now.

Ryan Burrow, reporter for WGN Radio in Chicago, uses his Zoom H2 for pulling audio from streaming sources, if necessary, by running a cord from the laptop's headphone jack into the H2's input.

Don't overlook video as a source for audio. Duggins covered a Civil War reeenactment and used audio from the video he shot, mailing it back to himself in the newsroom.

TRANSMITTING STORIES

Emailed reports are becoming the norm. Live hits are certainly possible with smartphone apps like Tieline Report-IT (which KOMO uses to transmit studio grade sound over a cell network) and tools like Luci Live Lite, to name two examples.

There is a caveat, though. According to Pete Combs at KOMO Radio in Seattle, Apple's decision to omit a headphone jack in recent iPhones made a lot of equipment obsolete.

Photo by Ryan Burrow

Here's what's in Ryan Burrow's "go bag." He's with WGN Radio in Chicago.

"The iRig accessories needed to connect a microphone and/or laptop [for playback of recorded audio] no longer function. That leaves us with the ability to use Report-IT for live voice only using the phone's on-board microphone." So Combs uses a JK Audio Bluetooth device to get both live voice and recorded audio into the phone and back to the station for live shots on the cell phone when necessary.

At WPTF in Raleigh Burrow has a Comrex Access to go live from the field if necessary, but the primary method of getting news back to the newsroom is now email or FTP. The "alligator clip" for the 21st century radio reporter is now often a Wi-Fi hotspot.

EDITING

Adobe Audition is still a go-to program for reporters editing audio in the field or back in the studio. Burrow also uses smartphone app Voddio, which allows for multitrack editing on a smartphone, though he still prefers Adobe Audition, which is installed on his laptop. "I find that easier, especially when editing other elements" to a report.

Combs has been using Audition and its predecessor Cool Edit for the better part of 20 years; Audition is used, too, by WPTF and the North Carolina News Network.

For managing stories, Burrow, Ferrell, Combs and Duggins all mentioned NewsBoss news management software. For emailed submissions, the software has an ingest feature that lets the reporter in the field file to a certain email address and then the story goes into the system.

At WPTF, Ferrell says, "Editors here only have to make minor adjustments to get the story to the desk for our anchors. The sound goes straight into our virtual 'cart rack.'"

LESSONS LEARNED

We asked these professionals for "lessons learned."

From Burrow: Have multiple recording devices to limit mistakes and avoid missing content. This also helps in the era of social media. "Freeing up the

(continued on page 4)

World Radio History

NEWSGATHERING

(continued from page 3)

phone is key, as interest has been growing in live tweeting, streaming video and taking photos. If there's a press conference, and you're plugged into a mult box, you want the freedom to grab [sound of] nearby protestors, or take photos, tweet or perhaps grab a nearby newsmaker without having to disassemble your feed."

Combs: News vehicles like the Subaru Forrester used at KOMO can be equipped with many tools to help reporters file from the field, especially a scanner, two-way radio and beefed-up electrical system with a switchable power inverter. "Don't forget to turn off the inverter when you're done for the day. For occasions when I forget to do so, I have a portable battery jumper and keep it charged up regularly."

Duggins covered news and the space program for NPR for many years while in Orlando, Fla. One device he found most useful for using with the mult box found at many news events was a turnaround cord, XLR male-to-XLR male, which effectively allowed the user to plug two microphones into one mult box output. Duggins also mentioned that a simple mic cord with a business card attached, plugged into a mult box, can save trouble if the reporter has to take the recorder and cover another aspect of an event.

What new or unusual audio tools and techniques are you using? We'd like to hear about them. Reach us at *radioworld@nbmedia.com* with ideas.

Paul Kaminski, host and producer of msrpk.com's Radio-Road-Test program, is a semi-retired radio reporter, most recently with CBS News, Radio. A longtime Radio World contributor, he is retired from the United States Army. Twitter: msrpk_com. Facebook: radioroadtest or PKaminski2468.

Photo by Pete Combs

Gear used by Pete Combs at Seattle's KOMO News Radio.

IN CASE YOU MISSED IT

A sampling of headlines from recent weeks as seen by subscribers to Radio World NewsBytes.

Ajit Pai Defends FCC Budget Cut
The chairman explained a plan that would include 102 fewer full-time employees.

Pai Taps Rosemary Harold to Head Enforcement Bureau
She was a top aide to former Commissioner Robert McDowell.

FCC Proposes Blue Alerts for EAS
"While some localities have used other codes for such purposes," said Commissioner O'Rielly, "it is a helpful exercise to understand whether a new code is needed and the potential benefits of a nationwide code."

Charles Ellis Passes Away
A short illness claimed the life of the Louisiana-based engineer.

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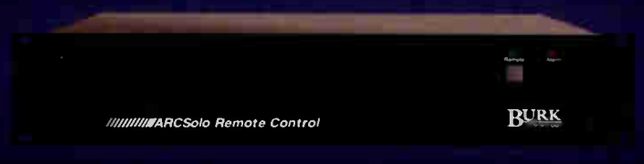


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NOISE

(continued from page 1)

from a broad array of RF users including broadcasters, equipment manufacturers, consulting engineers, radio astronomers, amateur radio groups and users of other spectrum services such as cellular, GPS and public safety communications. Industries often blamed for interference were also represented. Fig. 1 lists some of those that offered comments.

Commenters cited radio noise sources such as power lines, modern lighting systems, switching power supplies, motor speed controllers and cable TV leakage. Several respondents pointed out that these devices needn't cause interference problems *if designed properly*. Unfortunately, too many seem to not meet that standard.

Twenty respondents had concrete suggestions for study methodologies. Nineteen comments specifically called for more effective enforcement of current regulations. And respondents were virtually unanimous in calling for an official noise study.

RECOMMENDATIONS

In December, the TAC Working Group recommending important steps for the FCC to tackle the problem of excessive ambient radio noise. The primary recommendation is that the FCC should issue a Notice of Inquiry or Notice of Proposed Rulemaking to resolve unanswered questions and take corrective action. Fig. 2 shows some of the questions to be addressed to further characterize the noise issue.

In addition, the TAC Working Group raised several enforcement concerns:

- There is evidence that devices claimed to be "FCC compliant" were actually never tested, or the design was cost-reduced after they were tested, leading to non-compliance in delivered products.
- The FCC enforcement bureau needs to stop the manufacture and important of non-compliant switching power supply "wall warts," LED and CFL lights, and other products.
- The current FCC limits must be enforced effectively to stop the rapid rise in the noise floor across the spectrum before the problem becomes completely unmanageable.

(continued on page 6)

Background by iStockphoto/anigoweb

Fig. 1: A partial list of commenters to the FCC's Technical Advisory Council.

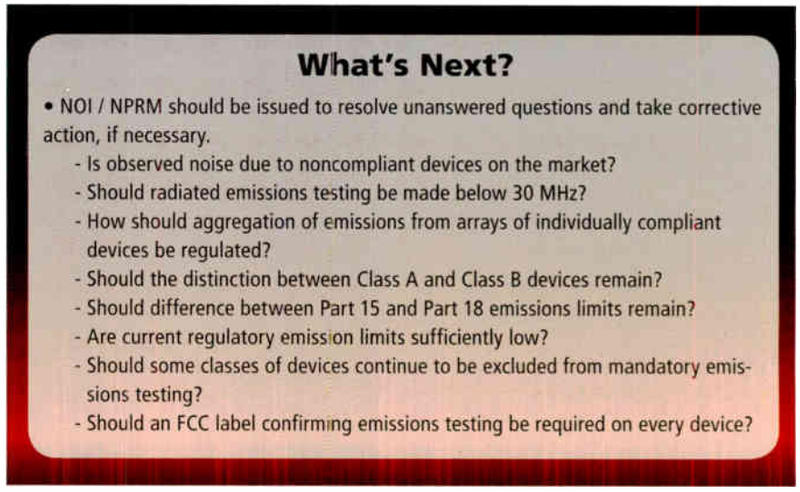
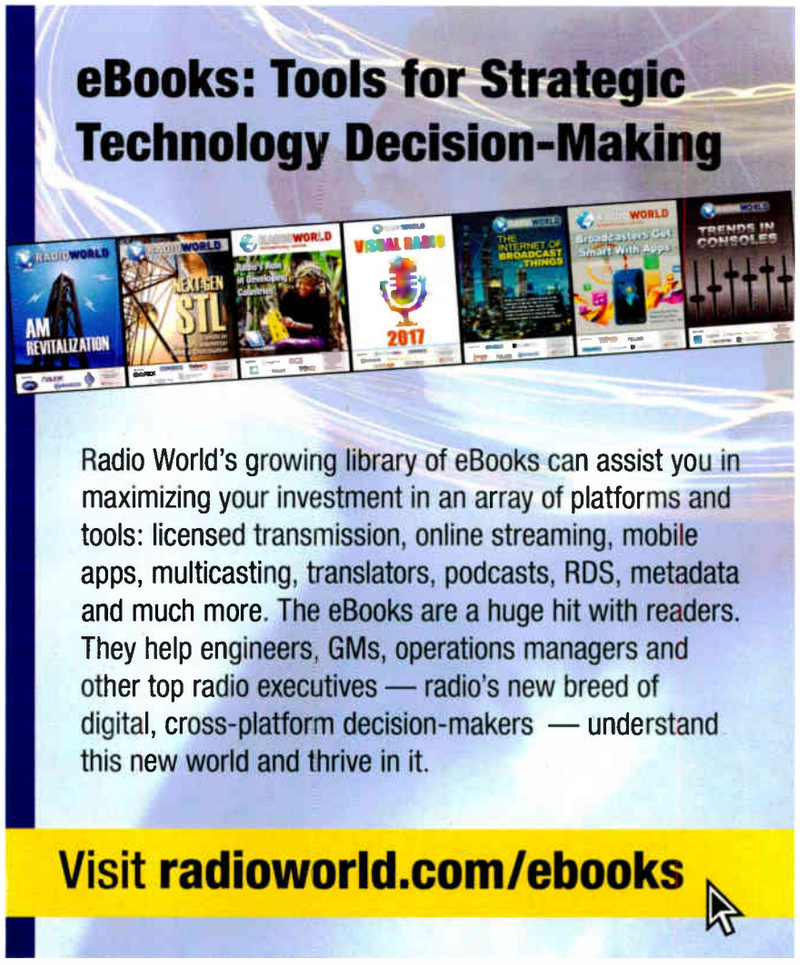


Fig. 2: Some questions to be addressed to characterize the noise issue further.

THIS ISSUE

JULY 5, 2017



World Radio History

CORUS

(continued from page 1)

"Our AM signals have been having an increasingly hard time penetrating the downtown areas of these three cities, due to the proliferation of taller buildings," said John Coldwell, Corus' director of radio technology.

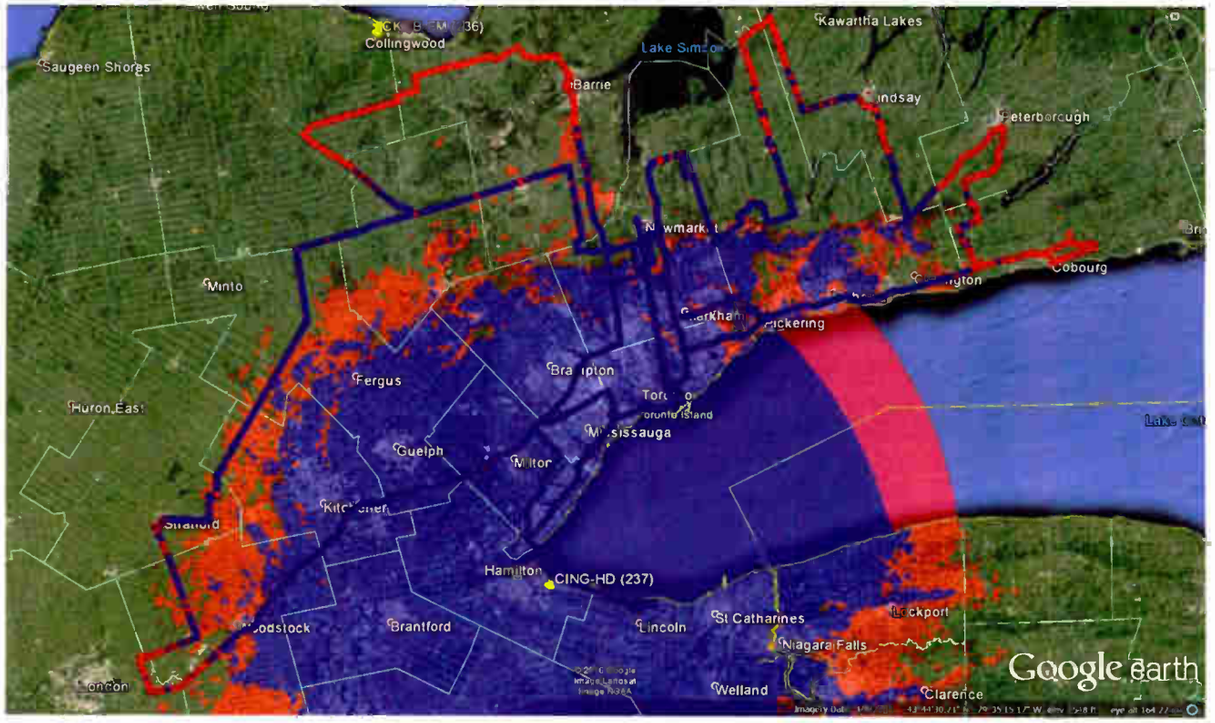
"Using HD Radio via FM to simulcast into these areas, combined with the format's superior sound, seemed a good solution to the problem, especially since HD Radio is being offered as an option in many new Canadian cars."

A FAMILIAR RISK

Corus's decision to experiment with HD Radio in Canada is not a risk-free venture. Broadcasters here felt burned by rolling out European-derived DAB (Digital Audio Broadcasting) coverage in major Canadian cities and, before that, AM stereo service. In both cases, according to common wisdom, the efforts died due to lack of affordable and widely consumer receivers, devouring millions of dollars in unrequited infrastructure investment.

Moving into HD Radio poses the same risk to Canada's radio broadcasters, save that this format is actually turning up in new North American-built cars. Further, proponents say, HD Radio simulcasts can help building-impaired AM stations penetrate the downtown core. Other major Canadian private radio groups are also experimenting with HD Radio via FM for AM simulcasts. Bell Media has HD Radio stations in Ottawa and Vancouver; Rogers Radio in Toronto and Vancouver. Two small private FM broadcasters, Brynes Communications and Durham Radio, are serving their southern Ontario markets with HD Radio.

CKRY shares space on a master FM antenna near the top of this stick.



Map shows HD Radio receiver signal locks in blue and non-locks in red. CING(FM)'s HD Radio signal blankets the "Golden Horseshoe" around Lake Ontario.

"Investing in HD Radio via FM is a gamble," Coldwell of Corus said, "but it is one that addresses our AM reception problems effectively, adds the extra channels and on-screen program information that this format supports, and is in line with what our U.S. neighbors are doing.

"This last point matters, because we cannot imagine any form of digital radio succeeding in Canada that is not in line with what the U.S. is using."

THE SETUP

Ideally, Corus would have been able to venture into HD Radio via FM by simply adding HD Radio upgrades to existing transmitters.

This proved to be the case in Calgary and Vancouver. In both cities, the company was able to inject HD Radio signals into existing Nautel NV-20 FM transmitter broadcasts without diminishing the

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NOISE

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On April 11, 2017, representatives of the Association of Federal Communications Consulting Engineers met with FCC Chairman Ajit Pai to discuss the problem of the rising radio noise floor, according to Tom King, president and CEO of Kintronic Labs and a member of the association. [See related article, page 29.]

These respected engineers reviewed the nature of the problem with the chairman and made a strong case for enforcement of regulatory limits on noise. The group's recommendations covered both the rising noise floor issue and enforcement challenges.

AFCCE stated that:

- There has been no systematic study of RF noise since the 1970s.
- Many radio services are being compromised due to the rising noise floor.
- "Internet of Things" system performance is suffering due to the background noise.
- The FCC should re-establish the random sampling program to test products for compliance.
- The FCC should stop turning a blind eye toward "at variance" practices.

GUIDANCE ... FROM 1993?

The AFCCE presentation made one final point: The commission's current offering to consumers experiencing interference is the "FCC Interference Handbook." This booklet is offered online but was last updated in 1993 and is long out of date. The group encouraged the commission to update this important document and create an online portal for submission of interference complaints.

"We are fortunate to have an FCC chairman who is pro-broadcast and appears to be receptive to our concerns," Tom King said. But as of mid-June there's no word so far from the commission in response to the recommendations of the TAC Working Group or the AFCCE representatives' meeting with Chairman Pai.

Steve Johnston has 35 years' experience in broadcast engineering and now consults on projects worldwide. He was among those submitting comments on FCC Inquiry ET-16-191.

The commission's current offering to consumers on this topic is the "FCC Interference Handbook." But it was published in 1993 — 24 years ago.

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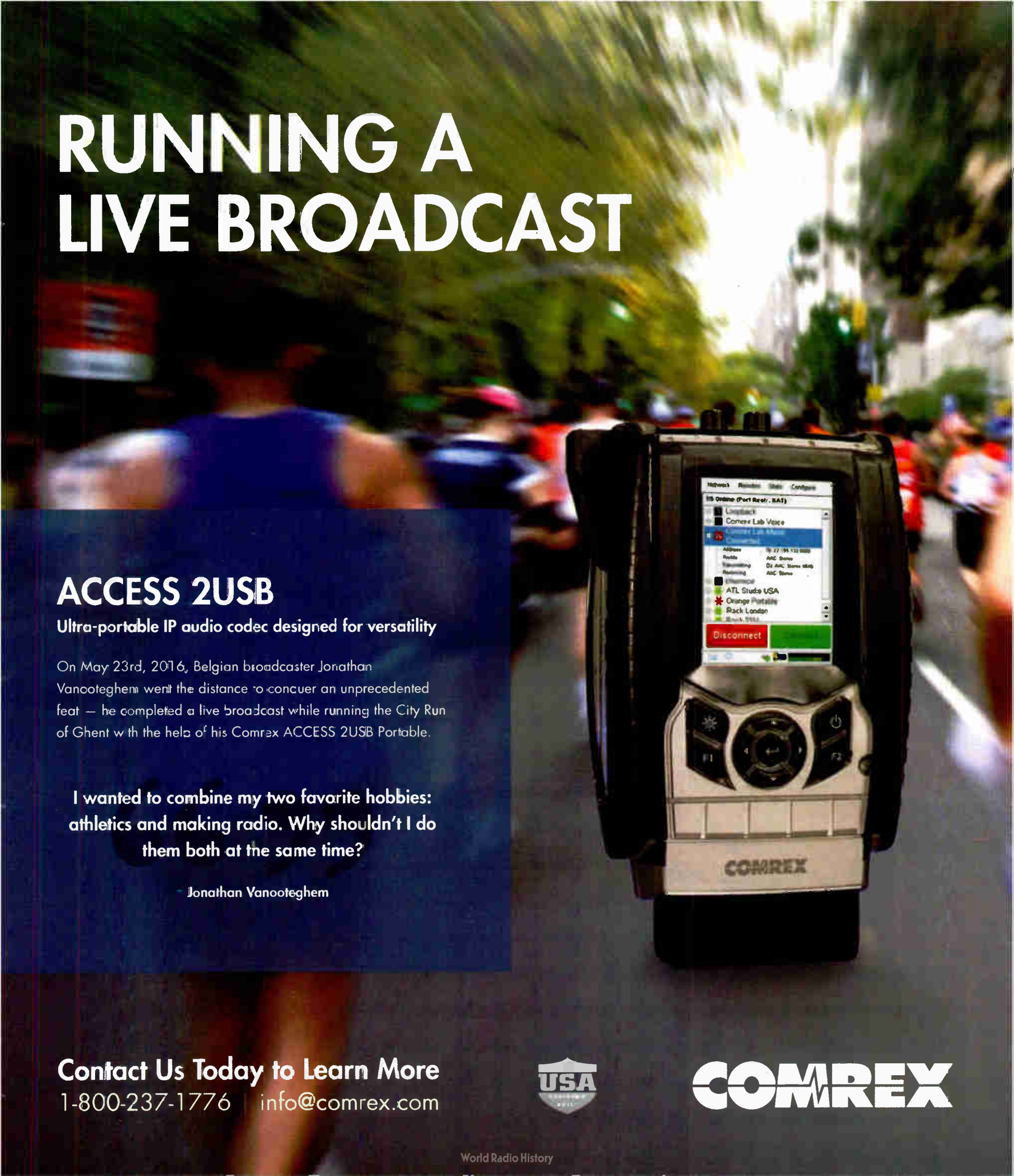
RUNNING A LIVE BROADCAST



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CORUS

(continued from page 6)

power of their analog FM transmissions. (The Calgary HD Radio signal injection level is –16 dBc, in Vancouver it is –12 dBc.) The Calgary signals are emitted through a shared broadcast facility/tower owned-and-operated by the publicly-owned Canadian Broadcasting Corp. In Vancouver, Corus has its own tower and transmitter at the city's shared Mount Seymour broadcast site.

Toronto was a different matter. Like most radio broadcasters in that city, Corus' analog FM signals are emitted from the CN Tower through a broadcaster-owned consortium that manages a shared transmission facility there.

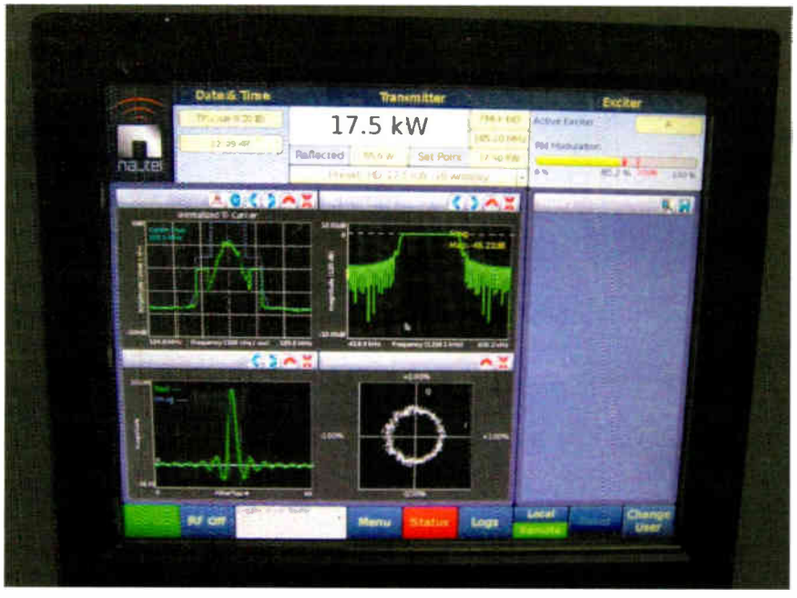
"Unfortunately, the 40-year-old Marconi signal combiner is not capable of handling HD Radio, and since the unit is well out of date, no one is making parts to make this possible," said Coldwell. "As a result, we had to find another way to serve HD Radio via FM into the Toronto market, and we did."

Geography made the difference: Corus' CING(FM) transmitter site, on the shared CHCH-TV antenna in Hamilton, Ontario, has a clear line-of-sight path into downtown Toronto and beyond directly across Lake Ontario.

"We don't share the radio antenna that's mounted on tower, which is already mounted on the tall Niagara Escarpment with a commanding view to Toronto, so there was no one that we had to negotiate with," Coldwell said.

"Our antenna is at the 1,000-foot mark above ground, powered by a 20 kW Nautel NV-20 transmitter making 100 kW ERP, so the line-of-sight path to Toronto over water is exceptional. Add the fact that we don't have a combiner to contend with, and the conditions were ideal for reaching Toronto from Hamilton, using HD Radio on FM."

Dashboard display of Hamilton/Greater Toronto's CING HD2 (AM 640).



Advanced User Interface display on Nautel transmitter serving CKRY Calgary.

The result: Corus is simulcasting CFMJ(AM) via CING(FM)'s HD2 channel, from Hamilton directly into downtown Toronto.

"Since we upgraded the NV-20 to a higher-power GV-30 transmitter, we are broadcasting HD Radio using a full –10 dBc signal injection, while maintaining CING(FM)'s analog transmission at its original 20 kW," said Coldwell.

"We've been told that we are actually operating the most powerful HD Radio station in North America."

SOLID COVERAGE

Having spent the money to add HD Radio via FM, Corus was eager to measure its actual coverage.

Deducing performance was relatively easy in Calgary and Vancouver, since the company's HD Radio signals are coming from the company's existing FM broadcast sites. But what about downtown Toronto, and Corus' innovative direct-from-Hamilton solution?

To find out, Corus conducted extensive in-car and stationary measurement tests throughout the Greater Toronto area. The accompanying map on page 6, which shows successful HD Radio receiver signal locks in blue and non-locks in red, tells the tale: CING(FM)'s HD Radio signal blankets the "Golden Horseshoe" around Lake Ontario. Although metropolitan Toronto's eastern edge has some spotty coverage, downtown Toronto is solidly served by HD Radio. So is most of the city and surrounding areas.

"We frankly have achieved better results that we had projected for," said Coldwell. "HD Radio is a solid solution for getting our AM content in downtown Toronto, interference-free via FM."

The only thing that Corus does not know is how many people are tuning into its HD Radio signals. Nor does anyone in Canada, because this data is not being measured by Numeris, the country's ratings collection service.

This lack of data, plus the Canadian government's reluctance to institute a new official digital radio standard post-DAB, explains why Corus and other Canadian broadcasters are holding off on a full HD Radio rollout.

"Nevertheless, with the advent of HD Radio in new cars, I believe this technology can be a player on the Canadian digital dashboard," said Coldwell.

"In the meantime, we are impressed with how well HD Radio via FM is solving our AM propagation problems in downtown areas."

Comment on this or any story to radioworld@nbmedia.com.

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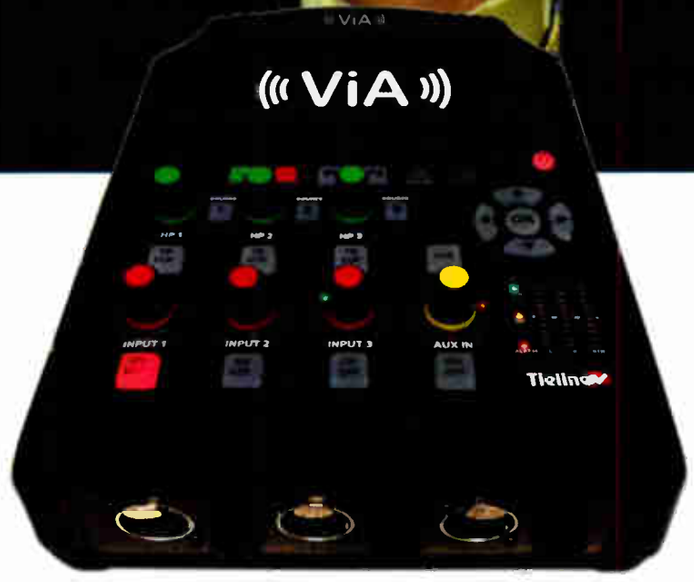
More than just an IP Codec...

"ViA's touch screen is a game changer for us. It allows you to access what you want quickly and this is particularly useful when connecting over Wi-Fi."

- John Herath, Director of Operations, Farm Journal Radio



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Shine a Little LED Light on the Subject

Or choose color to set the mood in the studio

WORKBENCH
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Read more Workbench articles online at radioworld.com

Illuminating the inside of equipment racks has been simplified with LE (Lighting Ever) LED light strips, available from big box stores like Lowes and Home Depot.

Broadcast technician Phillip Smith at EMF's K-Love/Air1 stations showed me this innovative way to illuminate a rack. The LED strip lights, seen in Fig. 1, can be cut and linked so the whole inside perimeter of the rack can be illuminated. Chief Engineer Jeremy Preece says one length of LE Light Strips measures 5 meters and contains 300 LEDs.

Although the back of the strip lights has an adhesive, Phillip took a belt-and-suspenders approach to keeping them in place by affixing them to the racks using 3M VHB double-sided tape. A roll is seen in Fig. 2.

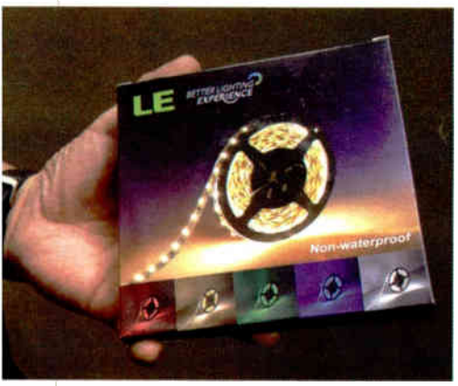

Fig. 1: A roll of Lighting Ever LED Light Strips helps illuminate equipment racks.

So how well do the LED lights illuminate? See Fig. 3 and 4. Illumination for only 24 W at 12 VDC (a power adaptor is provided with the LED strip).

The lighting described above comes not only in white light but also in colors your choice of red, blue or green.

Over at CBS Radio's "New Country 105.1" KNCI(FM) in Sacramento, Calif., Director of Engineering Jason Ornellas and Chief Engineer Joe Foft used the blue LED strip lights to add some mood to the KNCI studio, affixing strips under the lips of the pedestals in the control room. Their handiwork is seen in Fig. 5. Little touches like this spiff up the studio at minimal cost.

Send us your own tips for making studios look classy on a budget.

Stu Wright hosted mornings at South Carolina's WORG until the station was sold March 31.

He notes that in 1967 — 50 years ago — the Beatles released the iconic Sgt. Pepper's Lonely Hearts Club Band album. There was never a single from the album, at least in the U.S., although a few songs, including "A Day In The Life" and "When I'm 64" were still played on AM top 40 radio. Stu remembers himself and his teenage friends laughing at the prospect, of being, well, 64. Fast forward to 2017 and guess what? Their tune has changed.

As a 47-year radio veteran and now an independent voice talent, Stu jotted down a few things he learned in nearly five decades of radio.

- You've been in the biz a long time if you know what "cue burn" is.
- Especially in broadcast engineering, nothing is ever simple or cheap.
- A corollary: maintenance is cheaper than repair.
- When the radio station is sold and new owners say, "There will be no changes," there *will* be changes.
- Contract engineers: When traveling a long distance by car, figure your time on 50 miles an hour.
- Another travel tip: Always have enough cash (yes, *cash*) to get home; it can pay for gas and food. Stash a $20 bill (or more) in your wallet for emergencies.
- You cannot borrow yourself out of debt.
- When interviewing for a job, *never* be tardy. Ten minutes early is better than 5 minutes late.

What nuggets of hard-earned broadcast wisdom can you add?

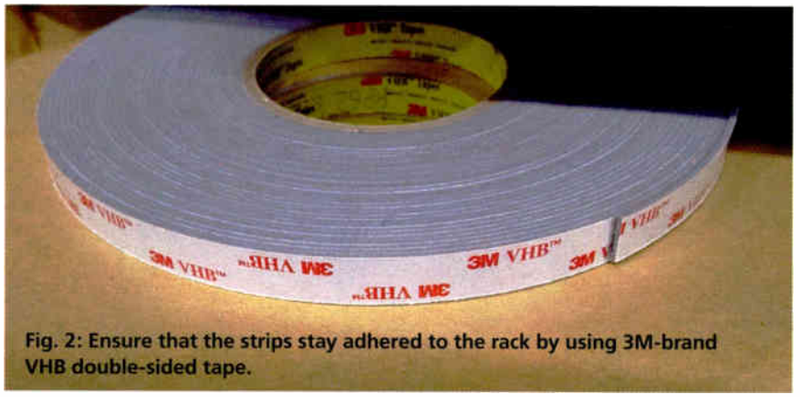

Fig. 2: Ensure that the strips stay adhered to the rack by using 3M-brand VHB double-sided tape.

Fig. 3: The LEDs efficiently light an equipment rack.

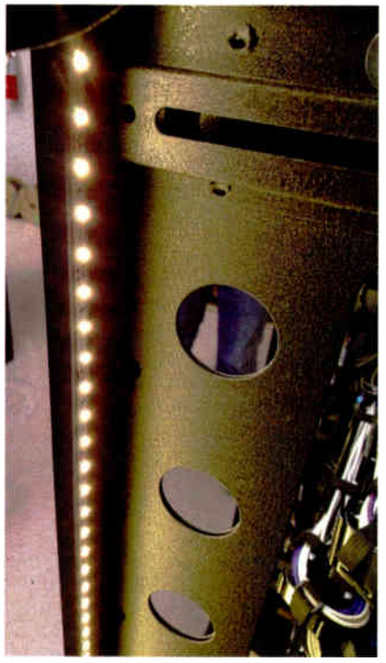

Fig. 4: A close-up of the strips inside the rack.

Fig. 5: Add pizazz to your studio with the colored light strips.

Bible Broadcasting Network's Steve Tuzeneu shares a test jig that makes testing LNB voltage out of a satellite receiver easier. Fig. 6 shows a short piece of RG6 hooked up to two alligator clips on one end, and with a slide-on F connector as pictured in Fig. 7.

The slide-on connector makes hooking this up very fast. The alligator

(continued on page 12)

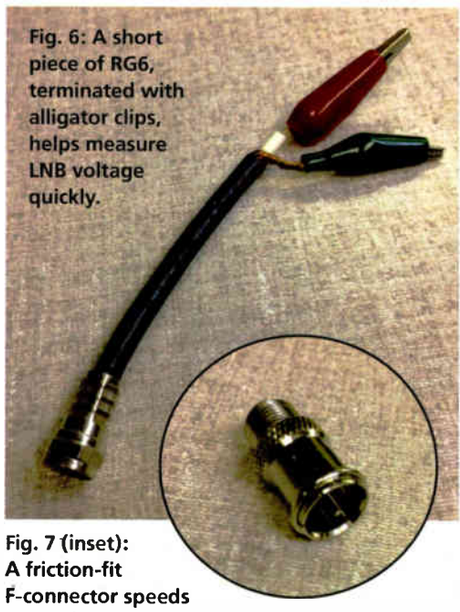

Fig. 6: A short piece of RG6, terminated with alligator clips, helps measure LNB voltage quickly.

Fig. 7 (inset): A friction-fit F-connector speeds LNB voltage measurement.

World Radio History

THERE'S A NEW MEMBER TO THE AARON FAMILY

INTRODUCING THE AARON 655

REBROADCAST/TRANSLATOR RECEIVER

The AARON 655 is the first of its kind—combining an FM/HD Radio Receiver with an Audio Processor, Dynamic RDS Encoder, and IP-Streaming. With premium features and unparalleled performance, the AARON 655 excells in the most challenging reception conditions.

FEATURES

- Uncompromising DSP-based (SDR) receiver
- Program Sources: HD 1-8, FM, IP-streaming, Analog/AES Line Inputs
- RDS Encoder: Converts HD Pad Data, IP-Stream Meta Data or IP Telnet Data
- Audio Processor: Powerful 3-band, 10 factory resets, Dayparting
- No Dead Air: Assignable failover audio backup
- Dynamic Web Interface for remote control & monitoring
- Alarms & Notifications via email, SMS messages, SNMP support

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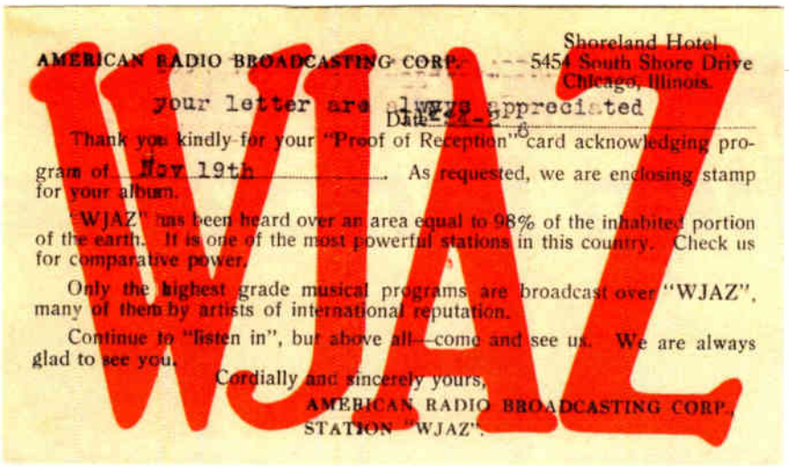
World Radio History

MCDONALD

(continued from page 12)

of operation or to deny a license to any applicant!

What followed was a two-year radio free-for-all, during which dozens of stations freely chose their own frequencies and transmitter powers, and Commerce was obliged to issue a license to any applicant. The extreme interference and the subsequent listener complaints this generated finally compelled Congress to replace the outmoded radio regulations.



This QSL card from WJAZ, Zenith's Chicago station, was issued in 1926.

THE BIRTH OF THE FRC

On Feb. 18, 1927, it passed the Radio Act of 1927. This created the new Federal Radio Commission, which was given the power and a congressional mandate to bring order to the radio spectrum. (With passage of the Communications Act of 1934, the FRC became today's FCC).

Due to the controversy over this court case, McDonald stepped down from his role as president of the NAB, but he continued to be an active participant in the organization for many years.

Unfortunately for Zenith, the new FRC did not treat WJAZ kindly. It moved the station to the undesirable 1480 kHz frequency, where it shared time with WHT and WORD. Finally, in 1931, the FRC cancelled the licenses of all three stations, awarding the frequency to WCKY in Covington, Ky., which had pleaded that northern Kentucky was underserved by radio. (WCKY later abandoned Kentucky and moved to Cincinnati.)

BACK TO BROADCASTING

McDonald and Zenith stayed out of broadcasting for eight years, concentrating on the radio receiver business, but they returned to broadcasting in 1939 with the construction of two experimental stations.

The first was W9XZV, the first Chicago television station using the new all-electronic standard, which operated on Channel 1 until 1953.

The second was W9XZN, one of the country's first experimental FM stations. In 1940, it became W51C, equipped with a 50,000 watt custom-built transmitter and boasting a 100-mile coverage radius. It broadcast 16 hours daily at 45.1 MHz in the old FM band playing "only good music" from specialized high-fidelity transcription discs, ranging from classical and Latin music, to Gilbert and Sullivan. W51C's only advertising was one announcement each hour promoting Zenith products. Program guides were sold to the public on a subscription basis. When W51C moved to the present FM band, it became WEFM, which stood for "Eugene F. McDonald."

In the 1970s, Zenith sold WEFM to General Cinema Corp., and it is today known as WUSN.

Under Eugene McDonald, Zenith grew into a major radio manufacturer in the 1940s and began producing television sets in 1948. His many contributions to radio helped shaped the industry we know today. "Commander" Eugene F. McDonald Jr. died in Chicago in 1958. In 1967, McDonald was posthumously inducted into Broadcast Pioneers Hall of Fame.

Read more of John Schneider's history articles at radioworld.com, *keyword "Schneider."*

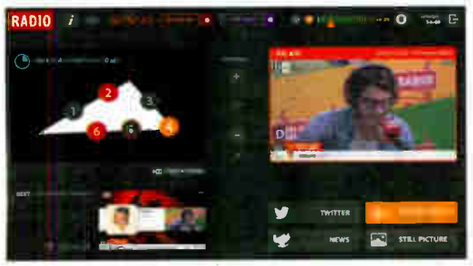
World Radio History

STAY COOL WITH HOT NEW GEAR

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. Here and in the next several issues we feature equipment that caught our eye. Send ideas to radioworld@nbmedia.com *with "Summer of Products" in the subject line.*

MULTICAM COMBINES SOCIAL WITH VISUAL

MultiCam Systems has introduced Dynamic Social Media Moderation, a set of social media moderation tools for its automated visual radio solution, MultiCam Radio. It will give operators control over which tweets and Facebook comments to show, as well as the ability to filter and move approved content into the display queue; and quickly overlay graphic scenes to enhance the mood.



The company says its MultiCam Radio solution offers a convergence of reliable server and switching hardware, and feature-rich software that brings together artificial intelligence, speaker detection, automated graphics, and live streaming and podcasting capabilities. The unified solution brings dynamic visuals to life for the broadcaster seeking new ways to engage and build digital audiences.

The company points to better social media integration as an important pain point to solve in the evolving visual radio landscape, from both operational and experiential perspectives. It says its tool set makes it easier for broadcasters to moderate and deliver an engaging social media platform, while audience interaction is encouraged through the ability to share video content and provide input across the social network.

Info: www.multicam-systems.com

WHEATSTONE RELEASES SECOND-GEN FM-55

The Wheatstone FM-55e multiband processor retains the functions of its FM-55 functions and adds enhanced iAGC controls and a new bass processor design.

The iAGC, a five-band intelligent gain controller, is coupled to a five-band limiter and stereo generator, plus five-band stereo enhancement and program adaptive L-R control for multipath mitigation, according to the company.

Wheatstone Processing Systems and Support Engineer Mike Erickson said in an announcement, "The FM55e is another step forward in the creation of processing that is naturally loud, where stations that are on a budget can still sit at the grownups' table."

The 55e is compatible with WheatNet-IP, and it can deliver baseband192 digital MPX.

Current FM-55 owners can upgrade their units to 55e with a free software reload, to be available later this year.

Info: wheatstone.com

RYCOTE HITS A HOME RUN WITH THE BASEBALL

Though it looks more like a gray tennis ball than a baseball, the Baseball from Rycote is a new windscreen option.

It is designed for use with boom microphones to prevent annoying "swooshes" that come from moving the boom too fast.

The inside of the Baseball is made of open-cell foam and an open cavity. It is fitted with a soft, though durable, plastic/rubber thermoplastic elastomer end-cap that secures the Baseball on the mic and provides an effective seal against wind.

It is available in two sizes: 19/20 mm for the DPA 4018, Sennheiser MKH 8050 and Schoeps CMC641 long supercardioid microphones, and 24/25 mm for the Sennheiser MKH 50.

Suitable for sports stations and programming — especially those with visual radio programs.

Price: $39.95.

Info: www.reddingaudio.com

MXL DISPLAYS NEW BROADCAST MICROPHONE

MXL, the studio microphone division of Marshall Electronics, has a new broadcast microphone.

The BCD-1 is a dynamic cardioid end- or top-address model.

It is designed to minimize side noise, has a built-in shockmount and a "tuned" grille to eliminate internal reflections. MXL specs the BCD-1 at 40 Hz–15 kHz.

The debut version comes in black. Price: $249.95.

Info: www.mxlmics.com

WINMEDIA 2017 FEATURES IMPROVED SYNCHRONIZATION

WinMedia 2017 automation and visual radio software allows users to assign audio output to two devices simultaneously.

The audio or video clip being played is sent directly to two outputs at the same time by just pushing one button, without requiring the user to re-encode or synchronize the video stream to be inserted in the audio stream.

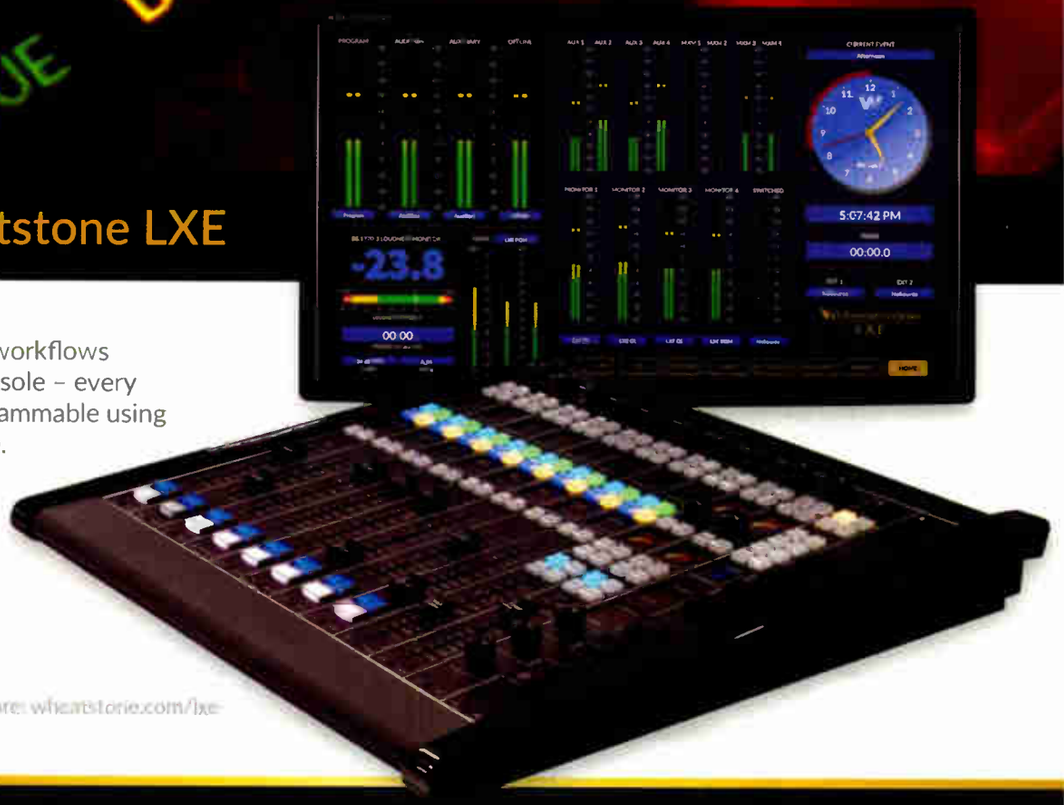
The company, which develops its audio drivers in-house, says the encapsulation delay of the new version is just 12 ms and that the audio is sent simultaneously on air via a physical sound card such as Digigram, Axia Livewire, Wheatstone, a video card such as Blackmagic or a virtual device like Network Device Interface.

The system's NDI, developed in collaboration with NewTek, allows for the transfer of content to a TV control room, software or production software.

Info: www.winmedia.org

World Radio History

The Forever Console...Wheatstone LXE



Adapt to new technology, new techniques, and new workflows with LXE. Completely configure/reconfigure your console – every button, knob, and display on the surface is fully programmable using our intuitive ConsoleBuilder™ GUI/scripting interface.

With ScreenBuilder™LXE, you can design dynamic custom touchscreen interfaces to augment LXE's extensive screen set. Beautiful to see and use.

Need more input faders? Enable up to four layers to double/triple/quadruple the number (up to 32) in the same footprint.

LXE is built to last in every way.

Learn more: wheatstone.com/lxe

Wheatstone
BROADCAST AUDIO PERFECTIONISTS®

World Radio History

THE High Performance Standard for Radio Broadcast

What makes Wheatstone consoles best-of-class? Breakthrough technology with award winners like WheatNet-IP Intelligent Network with bus-minus®. Unique design ingenuity. Precision production/starship-grade materials. Obsessive Wheatstone quality. FullTime support*. What does all that get YOU? Absolutely spoiled...

LX-24 –This Really Changed Everything

THE standard in radio today. Exceptional console at every level, fully loaded and completely modular.

L-8 & L-12 – Full-Featured, Smaller Size

Outstanding companions to the LXE and LX-24. Perfectly sized for newsrooms, etc.

IP-12 & IP-16 – Best $ Per Channel Ratio

Precisely designed and engineered for peak performance at mid-size stations.

Intelligently Network Your Consoles

Each powerful BLADE-3 (point-of-use interface) contains a map of the entire WheatNet-IP Intelligent Network to route I/O, access sources, add processing, mix to/from any device. Plus routable logic, silence sensing, gain control, automated mixing, discovery/control, and much more. Format agile: MADI, AES/EBU, TDM, Analog, and AoIP. AES67 compatible.

Learn more: wheatstone.com/consoles

NEW!

VoxPro Crushes It In The Ratings Thing

Getting rid of ALL your dead air makes better shows. Research shows that tighter programming dramatically retains listeners. Retained listeners = higher ratings. Download our free white paper, "*The Business Case for VoxPro*" at the link below.

Speed To Air

VoxPro's software tools let you edit, remove silence, re-record your voice, add effects, and be ready to go...in seconds.

Obsessive Organization

Hot buttons put a library of clips and tracks at your fingertips. Have your entire LIVE show programmed before you even start.

Creative Controller

With VoxPro hardware, you control every aspect of the software. Designed and laid out for maximum speed and agility.

VOX 7 PRO

RECORD/EDIT/PLAYBACK AUDIO LIVE, IN REAL-TIME, ON THE AIR

Learn more: voxpro.wheatstone.com

NEW!

Bring Your Sound Into *This* Century with Phase Linear Audio Processing, RDS, & Built-In HD Time Alignment

Wheatstone crafts powerful, persuasive modern sound by developing integrated processing tools like: Mastering Limiters, Intelligent AGC, BassTools, Multipath Control, and Baseband 192 for the all-digital processor-to-transmitter chain. All algorithms share data interactively, constantly optimizing your settings for remarkable consistency, track after track. Our new flagship, the AirAura X4, has a built-in HD tuner for automatic Time Alignment as well as full RDS capabilities. New Phase Linear processing delivers detail and transparency unheard of in on-air processors. Brilliantly modern.

Learn more: wheatstone.com/processing

Includes on-site commissioning, in-factory total system proof-of-performance testing, installation support, and real 24/7/365 service. We don't mess around.

Designed and built in the USA | Phone +1-252-638-7000 | wheatstone.com | sales@wheatstone.com

World Radio History

WOHLER PRESENTS AUDIO MONITOR

Audio specialist Wohler Technologies has a new rackmount monitor.

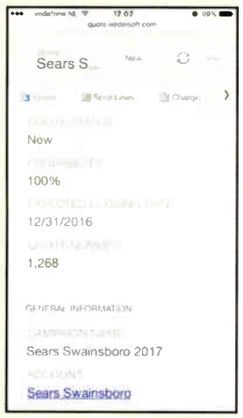
The single-RU AMP1-2SDA provides two-channel monitoring for up to 16 input channels, analog and/or digital sources.

The front panel offers two-speakers, adjustable volume and balance controls, two 26-segment LED meters, source selector, screen, average phase indicator, balance control, headphone output and volume control.

Options include an AES input for additional input of eight pairs of AES audio on a 25-pin D-sub and an analog input with an additional input of eight pairs of analog audio on two 25-pin D-subs.

Info: www.wohler.com

WEDEL SOFTWARE ADDS DIGITAL CONTRACT SIGNING



Wedel Software has added digital contract signing to its MediaSales Quote application.

Wedel says that with this module, MediaSales Quote lets sales teams add a customer signature to their device and immediately send a confirmation message to both the customer and their team, while automatically updating the customer file. With digital contract signing, users no longer have to deal with paper contracts and immediately have their documents in digital format.

The application allows signatures to be added on touchscreen devices and keeps track of information such as GPS location, IP address and device details. In addition, the system provides a full audit trail and is integrated into the rest of the workflow, thus if contract revision is required, a new signing request can be sent.

Info: www.wedelsoft.com

ROLAND RELEASES VR-4HD AV MIXER

Music and A/V specialist Roland has a new A/V mixer that might be right for stations wanting to dip a toe in the shallow end of video.

The portable VR-4HD has three HDMI input connectors compatible with a variety of equipment and offering 1080p/1080i/720p video resolutions. A fourth input includes a scaler to support video and computer resolutions along with supporting analog RGB and component input, as well as HDMI, so older devices can be used as sources without the need for external conversion equipment. HDCP is supported for input of copy-protected content from devices such as Blu-ray disc players.

An 18-channel audio mixer offers three-band parametric EQ, reverb, a compressor/gate on the mic inputs and level/multiband EQ on the master mix. The VR-4HD supports auto-mixing, echo cancel, audio follow and up to 500 ms of delay for lip-sync between audio and video. Its audio mixer can mix the four XLR microphone inputs, unbalanced stereo inputs on RCA and 1/8-inch mini connectors, along with the audio embedded in the four HDMI inputs. The final mix can be outputted via XLR or RCA and embedded into the HDMI output.

A loop-back audio capability via USB 3.0 port can bring in audio from a connected PC using a conferencing software such as Skype and return audio to the PC without any audio feedback courtesy of the echo cancellation feature.

Info: proav.roland.com/global

COUNTRYMAN DISPLAYS B6 CONNECTORS

Countryman Associates, known for small lavalier microphones, thinks it has now covered every conceivable connection option for its tiny B6 omnidirectional lav microphone.

According to the company, "new detachable connectors span more than 400 models of equipment from AKG, Shure, Sennheiser, Lectrosonics, Sony, Wisycom and many additional equipment manufacturers. The connector types include 3.5 mm, Hirose, TA3F, TA4F/Tiny QG, TA5F, LEMO and XLR (for use with phantom powered equipment such as digital recorders and mixing consoles)."

Countryman Associates President Chris Countryman said, "Due to its unusually small form-factor, our B6 omnidirectional lavalier has proven to be incredibly versatile. Because of its popularity, we regularly receive requests to make the B6 better able to interface with a wide range of equipment."

In addition, Countryman has upgraded construction for a tougher and more RF-resistant connector, the company says. The connectors are available individually.

Info: www.countryman.com

OMNIRAX BUILDS THE CONTOUR

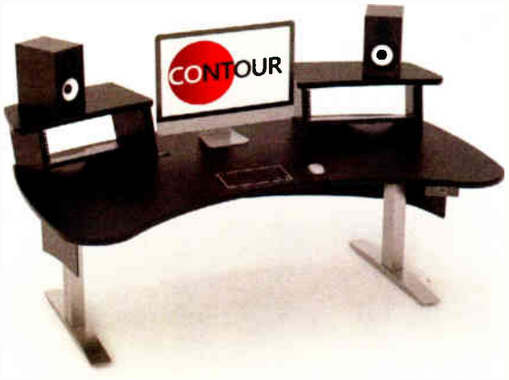
Omnirax Furniture Co. specializes in technical furniture. It recently introduced the Contour series of ergonomically superior workstations.

The Contour series is available in adjustable-height (motorized sit/stand) or fixed-height models; three sizes; multiple rack configurations; built with American-made steel; and with a choice of finishes. Other finishes are available at an additional charge.

The adjustable height models have Bosch German motors and four-position programmable controllers with numeric readout.

Contour is a range of products designed to create a work environment that fits a client and its way of working. It also brings work closer, allowing users to wrap work around them for an intimate studio experience, Omnirax says.

Contour is available in approximately 5-foot-, 6-foot- and 7-foot-wide models. The base configuration is two rack bays by three rack spaces. Nearly any configuration can be built, including adding rack spaces and making the larger CS6 and CS7 with additional rack bays or one-piece tops.



Rack bays are positioned within easy reach and angled for neck-neutral sightlines, either sitting or standing. They are open in the rear for access to gear and wiring, with cut-outs in the modesty panels to feed wires back to the wire trays beneath the desk.

Contour desktops are constructed of high-pressure laminate over "green" particleboard cores trimmed with durable tee-molded edges.

Omnirax says that courtesy of its CAD/CAM manufacturing process, with 0.005-inch tolerance, clients will get a precise fit and finish on their studio furniture. The Contour series is shipped flat-packed, with specialized tools and simple, clear instructions.

Options include fully-articulating Omnirax KMS keyboard/mouse shelf, 7500 VESA mount monitor arm and SpaceCo CPU holder.

Info: www.omnirax.com

World Radio History

Leave Your Competitors in the Dust

Introducing VOLT, the hotrod new processor from Omnia that gives you more processing power and sonic performance in one rack unit than others give you in three. Sharing technological lineage with top-of-the-line Omnia products like the Omnia.11, VOLT drives you faster, with exciting sound that will take you from zero to *100* in seconds! In the race for electrifying, competitive, market-leading sound, VOLT puts the competition squarely in the rearview.

TelosAlliance.com/VOLT

Omnia

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World Radio History

Adding Studios the ScreenBuilder Way

Wheatstone app comes to the rescue with flexibility and cost savings

USERREPORT

BY HENRIK POULSEN
CTO, Radio
Nordjyske Medier

AALBORG, DENMARK — Building studios is the fun part. Deciding which show to broadcast from which studio is a challenge, and that requires decisions about how many studios to build and whether they should all be the same size and have the same equipment.

We had made all those decisions more than six years ago, when we built studios in Aalborg, Denmark, for Nordjyske Medier's two radio formats, the predominantly AC format Radio Nordjyske and our CHR station ANR that feed 37 transmitter sites covering the northern territory of Denmark.

Nordjyske Medier started with a newspaper and has occupied the Danish territory of "Nordjyske" since 1781, making it a few years older than the U.S. Constitution. The media company's radio group hasn't been around quite as long — about 30 years.

For six of those 30 years, our backbone for the two stations (and eight commercial splits) has been Wheatstone's WheatNet-IP audio network system with E-6, E-1 and SideBoard control surfaces. We ended up building three on-air studios: a bigger studio with a lot of mics and the ability to host live music, a normal-sized studio, and then the small one.

As you may know, WheatNet-IP is based on "Blades" with I/O and GPIO. The best part is that everything runs on a Cat-6 cable between the Blades and the mixing console. That gave us a huge advantage when it came time to maximize studios resources. Each I/O Blade in the network comes standard with two stereo 8x2 utility mixers and they're used for splitting and summing the right commercial feeds to the right destinations in the 37-site network.

But slowly over time, things changed — new shows, and more of them, meant that we were continually challenged with which show to broadcast from which studio and how to effectively switch between the two stations. We began looking for options, including the possibility of adding a whole new studio.

Then we learned of Wheatstone's ScreenBuilder app and found that not only could we save money, we could be more flexible with the studios that we do have. In fact, we quickly discovered that we could change studios to get the best setup for each show, and even move stations entirely across the facility if need be. This would be impossible with a hardware solution, but with ScreenBuilder, it's a two-button workflow on a PC monitor.

ScreenBuilder is a WheatNet-IP application and a lot like playing with Legos (coming from Denmark, that's like a home run). The software is like an advanced remote with options for faders, meters, buttons, clocks, timers, controls and other widgets that are arranged on a PC screen and are defined and linked to elements in the network.

We bought the software and started designing the screen for the task of switching studios. One thing led to another, and today we're not only switching studios, we're also controlling "Hotspare" in the RCS Zetta system.

Hotspare is a function in the Zetta automation system that allows you to switch from one computer to another while on-air. We have dedicated PCs for each studio, and the Hotspare function moves the audio from one playout Zetta to another. We route mix-minus to phones, codecs, for podcast and the trigger for the on-air/mic signs — all done with a two-button setup on ScreenBuilder.

Our DJs/hosts use the screen four times a day to move our stations from studio to studio and sometimes even place them back in the server room in order to free up studios for track/recording. It's saved us having to add more studios and the best part: I never have to write a single line of code.

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

World Radio History

REAL. VIRTUAL. RADIO.

LAWO

ruby – the radio console with a whole new viewpoint.

Meet ruby, the new radio console from Lawo. So elegant and uncluttered, you might think something's missing — and you'd be right. We've moved most of the controls that litter the faces of other radio consoles onto an intuitive context-sensitive touchscreen, while essential controls like faders and monitor selectors are right where you'd expect them to be. ruby gives you the best of both worlds: familiar physical operations, and a modern graphical interface.

ruby's powerful visual interface is designed for fast-paced radio, with fingertip access to source, bus, and mix-minus assignments, as well as EQ and dynamics processing — freeing your talent to perform instead of searching for settings. You can even use ruby's GUI-building app to centralize control of studio software and peripherals. With intelligent AutoMix hands-free mixing and one-touch AutoGain mic calibration, your operators will tackle the most complex shows with ease. Even voice-tracking while on the air takes only the push of a button. Be prepared: your talent may actually thank you! And because ruby is engineered and built in Germany, it might just be the last console you'll ever need to buy.

ruby, from Lawo. The console with a refreshingly new point of view.

Join us @ IBC, #8.B50

www.lawo.com

World Radio History

Logitek Launches University Into Digital Age

In Texas, JetStream network, Mosaic, Pilot consoles offer easy installation

USERREPORT

BY JUSTIN MCCLURE
Chief Engineer
VilleCom LLC

STEPHENVILLE, TEXAS — I've worked in the broadcast industry for more than 24 years for various groups of stations here in Texas. Twelve years under 377 Broadcasting, 11 years under Cherry Creek Radio and now a year under VilleCom LLC. I also do quite a bit of contract engineering work for other groups around my area.

In the summer of 2016, I inherited a console installation project for Tarleton State University in Stephenville. A former engineer had specified the system, which included four Logitek JetStream Mini units, two Logitek Mosaic-12 consoles and one Logitek Pilot-6 console. After Tarleton bought the system, it sat in a closet for almost a year.

This was the first time I have installed Logitek or had the experience of installing a console that had RJ-45 inputs for all of the audio cards. I'm used to Autogram boards, so this was the first installation I have done without picking up a soldering iron! I didn't even have to heat it up. I was all ready to solder a bunch of connections, and punch down cables on 66 blocks, and found out we didn't need them at all. We ordered a bunch of pre-connectorized Cat-5 cable adapters, so this installation was basically "plug and go."

Our installation covered two full air studios for KTRL(FM) and KXTR(LP) and a shared production room. The Mosaics went into the air studios and the Pilot was installed in the production room. When I started the physical wiring, I realized that we didn't need any of the old cabling, so the first thing we did was pull it all out and clean up the studios. All of the old 66 blocks and cables filled half a dumpster!

With the dongle adapters and Cat-5 cables, everything went together in a hurry and aesthetically, it looks beautiful. Including the tear-out and rebuild, it only took me about 2-1/2 days per on-air studio and only a few hours for the production room to get everything done.

After I finished all of the wiring, John Davis, Logitek's customer support manager, came in over the internet and helped me configure everything. In setting things up, I realized that since the equipment had been in a closet for a year or more, we'd missed out on some software upgrades. I ended up calling Logitek on a weekend; they logged into my system and did all of the upgrades on the spot. I also learned a great deal about just what these consoles will do.

I told Logitek what I wanted the boards to do; they suggested things I wasn't aware were possible. After our collaboration we had all kinds of new features, a lot more than we'd expected.

It's cool that the Logitek system has the profanity delay built in; that saves a couple thousand dollars right there. We also have onboard mic processors, so we were able to remove the old outboard processors and free up some rack space. We went from a 5-foot rack to a 3.5-foot unit. All of the features we needed were right in the Logitek system.

With the ease of installation and the great initial and continued customer support I have received from Logitek, they have definitely earned another customer with me. These were the easiest consoles I've had the pleasure of installing. If you haven't considered a networked console system, it's time to consider moving into the future and Logitek is on the top of their game in this category.

For information, contact Frank Grundstein at Logitek Electronic Systems in Texas at (713) 664-4470 or visit www.logitekaudio.com.

TECHUPDATE

ARRAKIS FEATURES BLUETOOTH

The Arrakis Systems ARC-Talk-Blue is for news-talk or small radio applications. At $1,099, it has five mic channels (Channel 5 is A/B with line input), one USB and two Bluetooth channels.

The Bluetooth channels allow users to connect to Bluetooth-enabled devices. Whether it's a need to connect a cell or landline phone, this eliminates the need for a separate phone hybrid to take callers. If users need to conference the two callers into a single stream, it can be done using the talk button to talk to the caller off-line.

The Bluetooth channels can connect to an MP3 player, tablet or recorder. This provides quick wireless access to devices to play on-air.

The five mic channels allow accommodation of any host/guest setup. The mic channels are high quality and will work with dynamic or condenser mics (phantom power supply needed).

The last channel is a USB sound card on Channel 8. Any Windows or Mac PC will recognize the sound card, allowing users to play audio from a PC onto the board, or record audio from a board onto a PC.

With its small profile, it is suitable for taking on the road or using in small studios.

For information, contact Arrakis Systems in Colorado at (970) 461-0730 or visit www.arrakis-systems.com.

World Radio History

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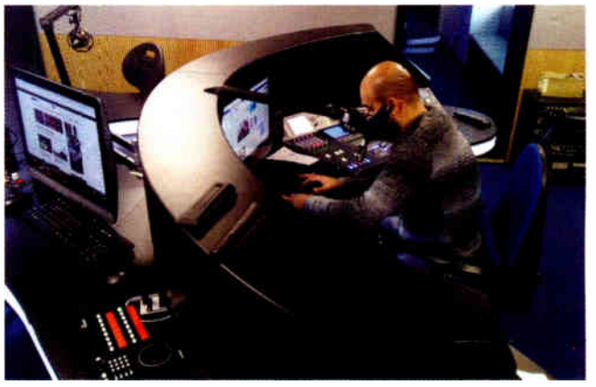
World Radio History

AEQ Installs IP System at TSF

Includes unique AoIP devices such as Venus 3 audio codec and Netbox 4 MH interface

USERREPORT

BY ALBERTO SANTOS
Technical Director
TSF



LISBON, PORTUGAL — TSF is a Portuguese FM radio station that counts on a great network of international correspondents and covers all of Portugal.

The rapid spread of AoIP distribution systems opens new paths for audio distribution for broadcasters: it reduces required wiring and makes operation simpler, but even in that case, it is not a good idea to completely renounce the advantages of former TDM bus-based systems.

TSF has certain specific technical requirements due to its news and talk programming format. So when its new Program Production Center engineering planning was started, a system combining both technologies was proposed to take advantage of strengths of each and salvage what had been installed.

There already was a Dante-based intercom system serving the editorial office and news production. This was linked to a redundant TDM bus-based matrix combining and routing the production studios and radio broadcasting circuits.

In addition, a VoIP-based telephone and talk show system had been integrated, featuring two AEQ SysTel IP 12 devices, which provided flexible and economical communications along with the station's on-air calls.

Outside contribution came via installed AEQ Venus 3 AoIP audio codecs.

Both on-air studios are equipped with 15-fader AEQ Arena consoles. The audio engine frames are located in the Technical Center and are connected to the matrix using 64 AoIP channels with AES/EBU backup.

To send microphone audio and receive the returns to each headphone, two new AEQ Netbox 4 MH AoIP interfaces have been installed in each of these studios.

All three control PCs have AoIP input/output capability and are backed up in AES/EBU for security.

There are four production control rooms equipped with AEQ Capitol consoles. The audio engines are located in the Technical Center. Each core links 16 channels with the matrix through the AoIP network.

In order to send microphone audios and receive the returns for each headphone at each studio, each of these control rooms has a Netbox 4 MH AoIP interface. Each control room PC is equipped with AoIP input/output.

There are five recording, editing and voice over booths. A PC with AoIP capability is installed in each one of these cabins together with a Netbox 4 MH AoIP interface.

Program and return channels are backed up using AES/EBU links in Central Control and also through a Netbox 8 AoIP terminal. Also in this area, the emergency playout system can be found. It would be used in the unlikely event that all redundant signals from Central Control fail.

The intercom system is installed in most of the technical rooms: controls, studios, technical center, booths and also on the editorial rooms. That's why it required a dedicated installation. This system includes 64 AoIP channels.

AoIP technology has made possible the integration of all devices and systems within TSF's Technical Center. The six engine frames of the audio consoles for the studios and control rooms can be found there.

The main elements in this new Technical Center are two AoIP-connected matrixes: CrossNet intercom matrix, and an AEQ BC-2000C TDM bus-based matrix for audio switching and distribution with AoIP interfaces, as well as AEQ Netbox 32 AoIP interface devices.

As noted, in the Technical Center, AEQ Arena and Capitol IP audio engines can be found, both of them featuring AoIP network connectivity.

Besides the broadcast hardware, the network also offers Dante interfaces for production PCs.

This centralized installation has provided great savings in facility wiring since all the devices are located in the same place. These systems have been wired to a new audio switching and distribution system that allows any connected signal to reach any destination easily using control interfaces that may be located in the Technical Center, the studios or even in a remote, internet-connected location. Maintenance tasks are reduced as they can be remotely managed without technicians needing to travel to the Program Production Center.

The main and novel aspect is the implementation of a mixed topology where an AoIP network is unified, made more flexible and rendered processing capabilities whereas all the audio signals are routed through TDM-bus based matrixes.

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

TECHUPDATES

HENRY ENGINEERING RELEASES AES DISTRIBUTION AMP

Henry Engineering now offers the AES Digital DA 2X4, a zero-delay distribution system for digital audio signals. There are two inputs (one for AES and one for S/PDIF) and four AES outputs.

The AES DA 2X4 accepts either an AES or S/PDIF digital audio signal and creates four identical AES output "clones" of the signal. It operates at sample rates up to 192 kHz and up to 24-bit resolution. According to Henry, the AES DA 2X4 is 100 percent bit-accurate and transparent to the source, adding no delay or latency to the signal. All AES I/O is transformer-isolated to prevent ground loops and noise. S/PDIF inputs are converted to AES outputs; a blue signal LED confirms the presence of an AES output signal.

The AES DA 2X4 is powered with a built-in linear power supply; no wall-warts are needed. The unit is 1/3 rack wide and can be rack-mounted using the optional Henry Engineering Rack Shelf.

Henry says the box is in stock, with a list price of $295.

For information, contact Henry Engineering in California at (562) 493-3589 or visit www.henryeng.com.

YAMAHA QL CONSOLES OFFER BROADCAST ABILITIES

Yamaha Professional Audio says its products maintain an open approach to network integration and support a number of protocols, including a range of I/O devices and expansion cards that adapt to any requirement.

The Yamaha QL series digital audio console features Dante networking, facilitating a flexible system configuration. In addition to ample analog input and output capacity, console circuitry and components have been designed to achieve outstanding audio purity from input to output. Dual MY expansion slots allow processing capability or I/O to be added as required. Input and output capacity includes 32 inputs and 16 outputs on the QL5 and 16 inputs and eight outputs on the QL1. The "Port to Port" feature can patch any input port to any output port so the QL can function as a remote I/O device for other Yamaha QL or CL Series consoles.

High-quality onboard processors such as the Portico 5033/5043 created in cooperation with Rupert Neve Designs shape and create as required. For a range of speech applications, automatic mixing functionality from Dan Dugan Sound Design provides optimal channel balance.

Yamaha QL Series consoles feature touch-panel displays as well as "Touch and Turn" knobs that make a smooth, efficient control interface. Remote control via an iPad or computer adds refinement. Each QL model features two-track and multitrack recording capabilities.

For information, contact Yamaha Pro Audio in California at (714) 522-9011 or visit www.yamahaproaudio.com.

World Radio History

TECHUPDATE

D&R UPGRADES AIRENCE-USB MIXERS

D&R says that, in response to customer interest, it has added an extra function on the two hybrid modules of the Airence-USB on-air mixer.

Now it is possible (selectable by jumper settings) to alternate between fader start and ring signalling when phone calls come in. A simple two-wire connection to the start remote jack can switch a ring signalling device.

In addition, a digital AES/EBU output as option for the main program output has been added.

The Airence-USB is available in a split-version design. It offers program and sub buses; studio, announcer and phones outputs; bidirectional cue communication bus; two built-in hybrid channels; studio remote cough muting; studio remote cue comm bus; and two mic on buses (studio, control room).

For information, contact D&R/Progessive Concepts in Illinois at (630) 736-9822 or visit www.progressive-concepts.com or www.d-r.nl.

YELLOWTEC PRESENTS A NEW-GENERATION INTELLIMIX

Yellowtec's Intellimix is a small and handy desktop mixer, consisting of a 19-inch rack-mountable base unit and a control unit built into a slim aluminum body. They combine for a smartphone-like ease of use paired with broadcast connectivity, making Intellimix a good fit for multipurpose desktop mixing.

Its footprint fits for any desk or remote broadcasting. Individual user profiles and setups allow for personalization while an organized, intuitive user interface provides quick reliable audio production. The four G-Touch 120-millimeter faders offer a new controller approach that is suitable for visual radio, allowing users to work without having to look at faders.

The company says that besides the look and usability, Intellimix stands apart in terms of connectivity. Offering features similar to loaded high-end recording consoles, it can perform as a desktop mixer for ambitious productions.

I/O connectors are found on the Intellimix's base unit. While a mic input and headphone output are placed on the front panel, the base unit's rear side has numerous options. Analog I/Os allow for connections to mics and monitors without separate A/D-D/A converters.

Offering integration with your system setup, the digital domain provides various AES/EBU, PUC-USB, MADI (optional), ADAT, Dante, AES67 and optional Livewire interfaces. GPIOs assure flexibility for remote control. Four additional RJ-45 ports allow for various add-ons like SDI-embedder/De-embedder and I/O extensions.

Intellimix's external slot will allow it to integrate with various additional AoIP standards in the future.

For information, contact Yellowtec USA in California at (805) 931-6081 at visit www.yellowtec.com.

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World Radio History

TECHUPDATES

DIXON UPGRADES NM-250

Dixon Systems says over the past year or so, it has listened to comments and suggestions from demanding engineers concerning its popular NM-250 Newsroom Mixer and incorporated many suggestions into NM-250 MKII.

The NM-250 MKII features onboard 48V phantom power; a line-level input for a telephone hybrid; built-in mix-minus bus for feeding telephone hybrid; an input/output for a computer sound card; front-panel jack input for unbalanced DAT and cassette recorders; two balanced +4dBm line inputs; talkback system with two send and receives; cue system with dimming; headphone amp; LED VU meter; and monitor select (mixer output or off-air). Each input has its on cue control.

The monitor output mutes when the mic is activated.

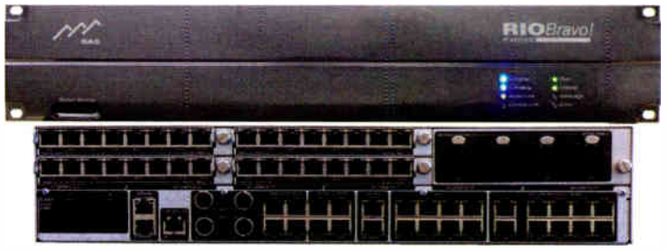
In addition, On and Off controls have been added for the telephone hybrids, as well as a Start and Stop control for the computer, and talley LEDs on the talkback switches so users can identify callers.

For information, contact Dixon Systems in Illinois at (705) 487-2915 or visit http://ram68.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 **bmoss@nbmedia.com**.

SAS RIO BRAVO WORKS WITH DANTE



The Sierra Automated Systems RIO Bravo mixing and routing engine now works with Dante AoIP network technology to interface with network studios, control rooms and technical operations centers via standard gigabit networks.

The company says the RIO Bravo provides the DSP power needed for control room and studio environments with up to 96 I/O channels, console data connections, GPIO and enough mixing to provide independent program or mix-minus signals to every output. In addition to Dante network connections, six expansion module slots provide room for any combination of local analog or AES digital I/O.

Its web-based virtual dashboard serves as a command center, providing critical information and tools so users can program information for each source, destination or button.

The RIO Bravo can interface with the spectrum of Dante devices and provides AES67 connectivity with other products, expanding its reach and flexibility. It is compatible with existing and new SAS consoles and routers. Recent firmware updates allow integration with existing SAS 32KD systems, allowing the user to evolve and expand later with a hybrid of existing TDM with AoIP.

Recent projects and installations include three studios to Cincinnati Public Radio, a six-studio build at Sonoma Media Group and a 13-studio project at KUOW in Seattle.

For information contact Sierra Automated Systems in California at (818) 840-6749 or visit www.sasaudio.com.

AXIA FUSION CONSOLE IS A TRIPLE THREAT

The Telos Alliance has three new offerings for its flagship Axia Fusion Console, including the IP-Tablet software, Fusion Flushmount Mainframes (shown) and the Fusion T Fader module. The company says these make the console line sleeker, more functional and more customizable.

The Fusion IP-Tablet is a step toward the virtual studio; Telos calls it the first of its kind. The software minimizes the need for a desk monitor by putting the most-used console functions on a tablet that can be mounted inside the Fusion console itself or elsewhere. Software modules are available to control Omnia VOCO 8 and Omnia.9, Telos phone systems and Z/IP One, as well as all varieties of Axia xNodes plus PowerStation and StudioEngine.

Fusion FlushMount mainframes are modern, convenient versions of Fusion available in four-, five-, eight- and 12-channel versions. These allow a Fusion console to mount into a desk or other furniture for a streamlined appearance that many broadcasters want.

With the new Fusion four-fader T module, Axia says it has redesigned the layout of its standard four-fader module, which remains available, based on user feedback. The T module has the same functionality but with a slightly different layout including toggle on/off, larger preview button and extra programmable button. The four-fader T module can be used with any line, mic, hybrid or codec sources. The Rotary Options control knob can be programmed to trim source or fader gain when turned, and invokes options screen when pressed.

For information, contact the Telos Alliance/Axia Audio in Ohio at (216) 241-7225 or visit www.telosalliance.com.

ALLEN & HEATH DLIVE ADDS EXPANSION OPTIONS

Allen & Heath says its dLive is a versatile digital mixing system that can work for a variety of applications from houses of worship to festivals. The flagship S Class series been installed in many TV studios in countries from Germany to Panama. It has also mixed live TV shows, such as "The Voice" in Turkey, "Holland's Got Talent," "Dance with the Stars" in France and the "Gadget Show" in the UK.

The dLive C Class series consists of three new MixRacks, the CDM32, CDM48 and CDM64, and three control surfaces, the 19-inch rack-mountable C1500, C2500 and twin-screen C3500. The MixRacks house the 96 kHz/96-bit XCVI Core and each surface and rack provides up to 128 inputs and 16 dedicated stereo FX returns, plus a configurable 64-channel mix bus architecture, with processing on all mix outputs.

Supported by various networking cards including Dante, Waves SoundGrid, MADI and GigaACE, the dLive C Class is also compatible with S Class hardware and the Allen & Heath ME personal mixing system, and is supported by an ecosystem of apps and accessories. It is possible to mix using a MixRack with a laptop or tablet and the recently released IP6 and IP8 remote controllers, which interface the dLive via standard TCP/IP network connections.

The V1.5 firmware update adds expansion options, supporting four new AES3 I/O cards with output sample rate conversion of 96 kHz, 88.2 kHz, 48 kHz and 44.1 kHz.

For information, contact Allen-Heath USA in California at (800) 431-2609 or visit www.allen-heath.com.

World Radio History

TECHUPDATE

LAWO RELEASES RUBY CONSOLE

Seeking a streamlined design for the ruby console, Lawo says its design engineers moved controls for advanced functions to a graphical interface, leaving the physical mixing surface itself free of clutter.

Ruby's visual interface is intended for fast-paced radio, with on-screen access to source, bus and mix-minus assignments as well as EQ and dynamics processing, while essential controls like faders and monitor selectors are accessible in their familiar locations.

The onscreen GUI is ready to go right out of the box, but Lawo's software tools allow its look and feel to be customized to a station's workflow. These custom screens can include controls for studio software with Web-based interfaces, such as codecs, delivery systems, phone management and audio editors. Tools available on each DSP channel include an equalizer with three fully-parametric bands and a dynamics suite with gating, expansion, compression and limiting.

Other notable features include Lawo AutoMix hands-free mixing of up to 32 inputs; Autogain one-touch mic gain calibration; motorized faders linked to SmartSnaps dual-purpose console snapshots; an EZConfig Wizard for fast configuration; and an integral Web server for system diagnosis, remote maintenance via VPN and software updates.

Ruby is an AES67-compliant radio console and was designed with networking in mind, Lawo says. Its mixing engine comes with dual-network redundancy for instantaneous recovery from any network fault. Standard audio inputs and outputs include two AES67/Ravenna ports and four high-density MADI ports, each with 64 channels of I/O. Eight rear-panel expansion slots can be loaded with more analog, digital, microphone and MADI cards.

Ruby is available in desktop or flush-mount version, in four-, eight-, 12- and 16-fader frame sizes that may be combined to build consoles of up to 60 faders in single- or split-frame configurations.

For information, contact Lawo Group USA at (888) 810-4468 or visit www.lawo.com.

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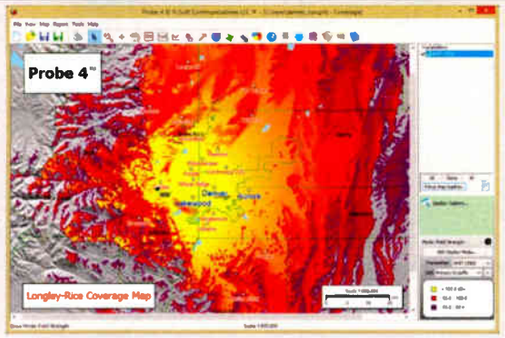

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MISCELLANEOUS

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: 8-channel Harris/Gates console; 250' tower w/building on 4 acres; collection of very old 78s dating back to 1904; 12' satellite dish on concrete base; prices drastically slashed. 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 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 homerun 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 KTIM FM radio shows from 1981-1984 if possible unscoped. R Tamm, 925-284-5428 or ronwtamm@yahoo.com.

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World Radio History

Steps to Lower Noise Floor and Revitalize AM Radio

Noise interference is the menace of all wireless broadcast communications services

COMMENTARY

BY TOM F. KING

The author is president of Kintronic Labs Inc.

Background noise interference is degrading the quality of broadcast reception, two-way communications, mobile cellphone services and every other form of wireless communications used today at an alarming rate.

The FCC and the ITU agree that the DC to 60 GHz+ wide-spectrum background noise floor is increasing as more and more unregulated electronic devices are used by more consumers in more ways every day.

While it is true that large numbers of these devices have been in use for some time, the question becomes: What can we do to lower the noise floor now that the floodgates of unregulated devices have been open for so long? Is this an impossible task? I believe the answer is an emphatic "no."

On June 15, 2016, the FCC Office of Engineering and Technology Technical Advisory Council opened a noise floor technical inquiry in the form of ET Docket No. 16-191 to seek answers to the following basic questions:

1. Is there a noise problem?
2. Where does the problem exist? Spectrally? Spatially? Temporally?
3. Is there quantitative evidence of the overall increase in the total integrated noise floor across various segments of the radio frequency spectrum?
4. How should a noise study be performed?

The most prominent responses were from the American Radio Relay League, the Society of Broadcast Engineers, the NAB, the National Public Safety Telecommunications Council, the National Electrical Manufacturers Association, the State of California Governor's Office of Emergency Services Public Safety Communications, Verizon and AT&T.

Unfortunately, most were anecdotal, not accompanied with measured quantitative data. This is largely because the responders did not have the instrumentation resources nor the budget to provide the quantitative evidence being sought.

Despite the scarcity of quantitative data submissions, one clear outcome of this TAC technical inquiry is an unmistakable consensus among the responders: A noise floor study is not only needed but overdue.

TESTING

In August 2016, Jack Sellmeyer, P.E., and I measured the electric field intensity and the associated (power cord) impulse noise voltages produced by various LED lights that we purchased off the shelf at a Home Depot that resulted from the lack of filter components in the lamps. One of the lights we tested was a Phillips 100 W LED light bulb.

Test setup.

The test setup in the image above shows the flat line trace on the oscilloscope with the LED light off, and the oscilloscope trace on the right shows the +/- 3 V peak-to-peak impulse noise that was measured using a current probe on one of the two AC power cord conductors when the light was turned on.

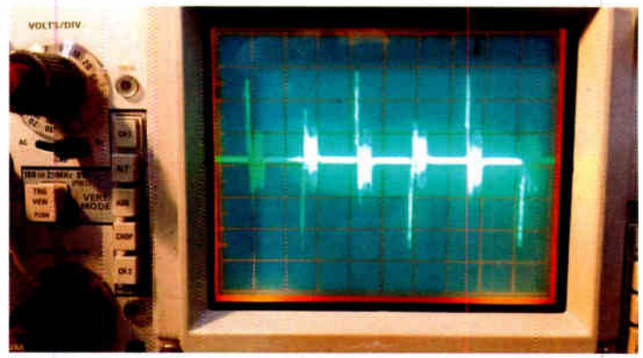
The associated field intensity measured at 3 MHz was 35 uV/m with the loop antenna immediately adjacent to the lamp. This value quickly decreased to the noise level in less than 1-foot distance from the lamp. Hence, the most significant noise contributor from this particular lamp was the conducted impulse noise that was due to the fact that the currents on the two AC power leads were not equal and opposite. The proper filter components had not been included in the lamp design.

Another lamp that we tested was a Philips 100 watt flood lamp. This light yielded a field intensity at 3 MHz of 400 uV/m at a distance of 3 inches from the light, which decreased to the noise level 5 feet from the lamp. We located the FIM-41 loop antenna adjacent to the lamp power cord feeding this lamp and walked it down the length of the power cord for a distance of approximately 10 feet from the lamp.

The field intensity ranged between 60 and 70 uV/m over the length of the power cord measured. It never dropped below 60 uV/m. The audible noise associated with the RF emissions from these lights at 3 MHz was undeniable. These results together with other video recorded test results were submitted in response to the TAC inquiry.

These are just a small sample of the numerous LED lights that are available. You can imagine the cumulative results for multiple LED lights in one residence or manufacturing plant.

These lights are just two examples of a plethora of RF-emitting consumer products, including compact fluorescent lights; LED traffic lights; all manner of switching power supplies associated with commonly used consumer electronic devices, such as computer modems, LCD and plasma TVs, cell phones, computers and UPS units; automobile electrical systems and controllers; and photovoltaic power systems that are now commonly used throughout the United States, Canada, Mexico and the developed world.



AC power cord +/- 3 V P-P impulse noise.

WHAT TO DO

We at Kintronic Labs believe that the following steps should be taken to lower the noise floor and specifically to revitalize AM radio:

1. FCC Lab should perform random off-the-shelf product testing of consumer electronic products to confirm compliance. Manufacturers found to be guilty of selling non-compliant products should be issued commensurate fines that will serve to inform them and other manufacturers that the manufacture and importation of non-compliant products into the US market will not be tolerated.

2. AM stations must become actively involved in reporting utility and Part 15 and Part 18 home device offenses to the FCC. Provisions for doing so are now available on the FCC website (*https://www.fcc.gov/consumers*).

3. The NAB, SBE, ARRL and other wireless communications associations need to take an active role in keeping up with new technology developments and identifying the potential impact they may have on the RF noise floor. One example is the wireless charging systems being developed for electric cars. Some of the planned systems will operate at power levels of tens or hundreds of kilowatts at frequencies of a few hundred kilohertz. One can expect that even a relatively small amount of harmonic emission from such devices could wipe out radio reception over long distances.

The author thanks Bob Weller, P.E., president of the Association of Federal Communications Consulting Engineers, for helpful comments incorporated in this article.

See related story, page 1.

World Radio History

The One That Got Away: EMP

We were proud of our work with LPFM but deeply concerned about another acronym

COMMENTARY

BY DON SCHELLHARDT

The author is a longtime advocate of low-power broadcasting. He has been a government relations attorney since 1975.

The late Nickolaus Leggett and I were very proud of the work we did, in concert with many others, to establish low-power FM community radio.

Nick passed away in April; you can read my Radio World remembrance of him at *http://tinyurl.com/rw-leggett*. Looking back, we didn't achieve all of our LPFM objectives but we reached most of them; and after 14 years of activism, we saw the number of LPFM stations rise from zero to more than 2,000.

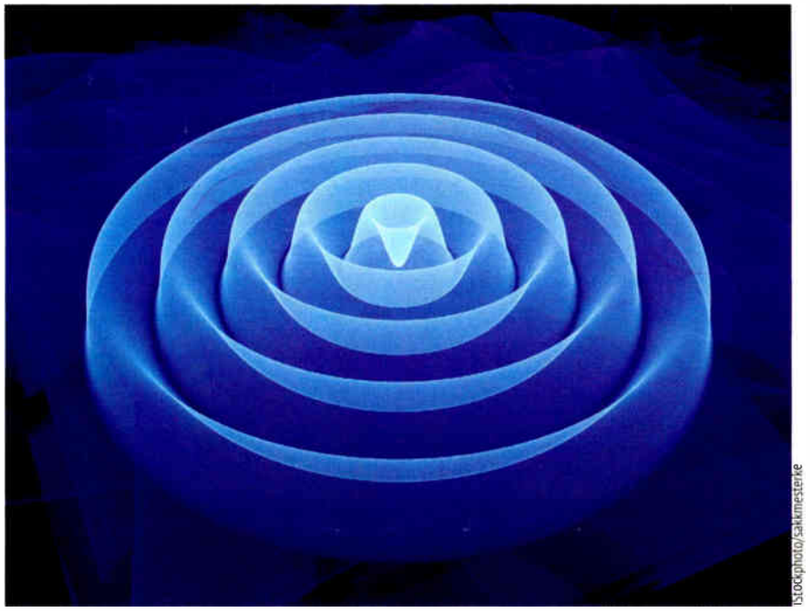
Still, Nick and I were haunted by The One That Got Away: a great white whale of an issue that eluded us whatever we tried.

The issue was shielding civilian electronics equipment against an electromagnetic pulse.

DISABLING ELECTRONICS

EMP has been a documented fact of life since 1963, when it displayed itself in the high-altitude test of an American nuclear weapon over the Pacific.

When a nuclear or thermonuclear weapon is detonated at a sufficiently high altitude, in a vacuum or near vacuum, much of the usual heat and blast effects are converted into electromagnetic energy. This pulse can then spread out for literally thousands of miles, instantly disabling electronics equipment from computers to power grids to vehicle ignitions.



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If a "rogue nation" and/or a terrorist group can combine a single missile with a single hydrogen warhead, it can paralyze unprotected electronic activity across most of the continental United States. Even a small atomic bomb, such as North Korea now has, can paralyze unprotected electronic activity over a substantial area — such as the West Coast from San Francisco through San Jose, where Silicon Valley is located.

(In the specific case of radio broadcasting, an EMP burst would ionize the atmosphere, blocking radio signals; this would be a temporary problem, disrupting radio service for hours but not longer. The more serious problem would be permanent disabling of radio equipment and/or of the electric power grid that serves broadcasters.)

Further, although a high-altitude nuclear explosion may be the most likely EMP event, EMP can also be generated "naturally" by a sufficiently large solar storm.

In 1986, 23 years after the theory of EMP was proven to be a reality, Nick and I were alarmed by the lack of government action to require any shielding of vital civilian electronics equipment against an EMP.

Joined in this case by Nick's wife Judith Fielder Leggett, we petitioned the FCC for action in Docket RM-5528. In an effort to be moderate, we sought only a Notice of Inquiry to assess whether any mandatory shielding was needed.

Despite the modesty of our agenda and a post-decision appeal, our petition was denied completely.

In 2001, after the 9/11 attacks, Nick and I decided we couldn't live with ourselves if we didn't try again. This time, however, we were more aggressive.

Instead of calling for an NOI, we called for a Notice of Proposed Rulemaking in RM-10330. The commission solicited public comments and received some, but ultimately responded with silence; it neither granted nor denied our proposal. Technically, RM-10330 is still alive and could be a vehicle for FCC action, though the commission has left it in limbo for 16 years so far.

We also tried contacting others, including congressional legislators and technical experts. No one was willing to join us in "rocking the boat."

Now, as America reaches the 54th anniversary of the first proof of EMP — and the 31st anniversary of the Schellhardt/Leggett Petition in 1986 — North Korea clearly is capable of launching EMP strikes against its Asian neighbors and perhaps against our own West Coast.

Some American leaders hint of launching a "pre-emptive strike" to "disarm" North Korea, but anything less than total success in this attack would leave other nations vulnerable to devastating retaliation. Compared to sustaining the electronic destruction of (for example) metro Seoul, metro Tokyo, metro Kyoto, metro Seattle and Silicon Valley, it would surely be more cost-effective to mandate EMP shielding and expand current missile defenses.

WORTHY WORK

Getting back to the individuals named Leggett and Schellhardt: We often wondered why efforts to promote LPFM succeeded while our efforts to mandate EMP shielding did not.

The answer, I speculate, is that we had allies in the LPFM movement. Not as many as we would have liked, but enough to get the job done.

With the EMP issue, we were never able to find anyone — except ourselves — who was willing to invest real "sweat and tears" in getting results. Indeed, I still don't see any motivated potential allies on the horizon.

So America has now entered a completely avoidable era of added vulnerability to rogue nations and possibly even terrorist groups (that is, anyone with one nuclear weapon and one missile).

I think back to one of many conversations Nick and I had about a possible afterlife, I believed in one and still do. Nick, ever the scientist, was waiting for more definitive evidence.

Still, he had an open mind. "If there is an afterlife," he said, "and if there is a God, and I am ever asked what I did to justify the gift of my life on Earth, I intend to reply as follows: 'Dockets RM-5528 and RM-10330.'"

The author welcomes queries from those interested in pressing for action on EMP shielding at highdesert131@gmail.com.

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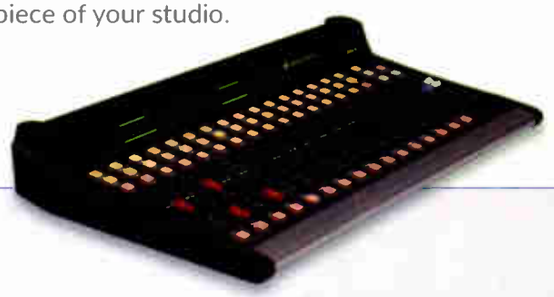

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