



RADIO WORLD

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NFCB: “We’re Better Together”

Takeaways from the federation’s 40th Community Media Conference



LPFM Summit participants from around the country posed for a “victory snapshot” at the end of the conference’s first day. They heard from experts about operating requirements, regulatory compliance and tips and experiences from fellow LPs.

notice the striking diversity among 247 attendees hailing from 38 states, Puerto Rico, Canada and Denmark.

Wednesday featured half-day workshops for dozens of newcomer low-power FM stations as well as for more-established Native American and Latino broadcasters. The conference offered crosscutting tracks for administration, operations and content as well as a novel interactive “Makers Intensive” track focused on integrated digital strategies being practiced at energetic stations.

Designed as a stimulus for others, “Makers” focused on what these innovators are doing in the multi-skilled media environment. It featured an in-depth look at the open source “Audience Engine” initiative at WFMU that pro-

(continued on page 6)

MAKERS

At most national broadcasting conferences, diversity among attendees remains a challenge, though this has been improving slowly over many years. But at NFCB16 one couldn’t help but

At RFA, Tech Hires Need a Passport

David Baden and his team must be ready to go where Radio Free Asia sends them

RADIO IT MANAGEMENT

BY TOM VERNON

One in a series of articles profiling radio broadcast industry chief information and chief technology officers.

The duties of CIO/CTOs at most broadcast plants may be similar; but some work environments bring unusual demands.

The CTO position at Radio Free

Asia comes with a somewhat different job description. For example, when David Baden spoke with Radio World for this article, he had recently returned from India, where he had set up and managed the technical end of RFA’s coverage of elections in neighboring Tibet.

ACCURATE AND TIMELY

RFA, created by the U.S. government and funded by a grant from the Broadcasting Board of Governors, is a nonprofit international broadcaster with headquarters in Washington and

(continued on page 8)

FIRSTPERSON

BY MIKE STARLING

There is something of a revival going on at the National Federation of Community Broadcasters, which is celebrating 40 years of service.

CEO Sally Kane’s call for stations to “create unity in local communities” resonated throughout the NFCB Community Media Conference in Denver in June. As NFCB put it on its website, the conference covered a range of topics such as journalism, digital strategy, development, fundraising and engagement.

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EDITORIAL STAFF

EDITOR IN CHIEF, U.S. Paul J. McLane
GEAR & TECHNOLOGY EDITOR Brett Moss
TECHNICAL ADVISER Thomas R. McGinley
TECHNICAL EDITOR, RWEE Rich Rarey
PRODUCTION EDITOR, RWEE Karen Lee
CONTRIBUTING EDITOR Emily Reigart
CONTRIBUTING EDITOR John Bisset
WEB EDITOR Michael Balderston
EDITORIAL ASSISTANT Cameron Vigliano
INTERNATIONAL EDITOR IN CHIEF Marguerite Clark

EDITORIAL CONTRIBUTORS

W.C. Alexander, Susan Ashworth, James Careless, Harry Cole, Ken Deutsch, Mark Durenberger, Charles Fitch, Christopher Friesen, Harold Hallikainen, Craig Johnston, Alan Jurison, Paul Kaminski, John Kean, Peter King, Larry Langford, Mark Lapidus, Daniel Mansergh, John Merli, Jim Peck, Mark Persons, Stephen M. Poole, Carl Lindemann, James O'Neal, Tom Osenkowsky, Rich Rarey, John Schneider, Randy Stine, Richard Strickland, James G. Withers, Tom Vernon

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PUBLISHER John Casey
EDITORIAL DIRECTOR Paul J. McLane
PRODUCTION MANAGER Karen Lee
ADVERTISING COORDINATOR Caroline Freeland

AUDIENCE DEVELOPMENT

CORPORATE DIRECTOR AUDIENCE DEVELOPMENT Meg Estevez
CIRCULATION MANAGER Kwentin Keenan
ASSOCIATE CIRCULATION MANAGER Michele Fonville

SUBSCRIPTIONS

Radio World, P.O. Box 282, Lowell, MA 01853
TELEPHONE: 888-266-5828 (USA only 8:30 a.m.-5 p.m. EST)
978-667-0352 (Outside the US) FAX: 978-671-0460
WEBSITE: www.myRWNews.com
EMAIL: newbay@computerfulfillment.com

CORPORATE

NewBay Media LLC
PRESIDENT AND CEO Steve Palm
CHIEF FINANCIAL OFFICER Paul Mastronardi
CONTROLLER Rick Ng
VICE PRESIDENT OF DIGITAL MEDIA Robert Ames

VIDEO/BROADCAST GROUP

EXECUTIVE VICE PRESIDENT Carmel King
VICE PRESIDENT / SALES DIRECTOR Eric Trabb

ADVERTISING SALES REPRESENTATIVES

US REGIONAL & CANADA: John Casey, jcasey@nbmedia.com
T: 212-378-0400, ext. 512 | F: 330-247-1288
US REGIONAL: Michele Inderrieden, minderrieden@nbmedia.com
T: 212-378-0400, ext. 523 | F: 301-234-6303
EUROPE, AFRICA & MIDDLE EAST:
Raffaella Calabrese, rcalabrese@nbmedia.com
T: +39-320-891-1938 | F: +39-02-700-436-999
LATIN AMERICA: Susana Saibene, susana.saibene@gmail.com
T: +34-607-31-40-71
JAPAN: Eiji Yoshikawa, callems@world.odn.ne.jp
T: +81-3-3327-5759 | F: +81-3-3322-7933
ASIA-PACIFIC: Wengong Wang, wng@imaschina.com
T: +86-755-83862930/40/50 | F: +86-755-83862920
CLASSIFIEDS: Michele Inderrieden, minderrieden@nbmedia.com
T: 212-378-0400, ext. 523 | F: 301-234-6303
LIST RENTAL: 914-925-2449, danny.grubert@lakegroupmedia.com

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NEWSROUNDUP

A roundup of headlines from Radio World's NewsBytes. Sign up at radioworld.com/subscribe under "Subscribe to email newsletters."

BEASLEY+GREATER MEDIA: Beasley Broadcast Group will acquire Greater Media in a deal valued at \$240 million in cash and stock. Greater Media also will receive cash proceeds from the sale of tower assets, estimated to be \$20 million. Beasley initially will acquire 21 radio stations in seven markets, including four where it doesn't now have stations: Detroit and three in New Jersey. Beasley's portfolio will grow to 73 stations (52 FM and 21 AM) in 16 markets; its net revenue is expected to more than double. Beasley plans to divest certain radio stations in Charlotte, N.C. The transaction was approved by both boards.

5G: The FCC approved new rules to open spectrum bands for 5G wireless and fixed broadband, including for the kind of augmented reality that swept the nation via Pokémon Go. It would open four new bands — three licensed and one unlicensed — and seek input on opening up three more. Chairman Tom Wheeler said the vote meant the U.S. was the first country in the world to identify and open vast amounts of high-frequency spectrum for 5G, which he called the first step in enabling high-speed, high-capacity, low-latency broadband.

EAS: The FCC added event codes for "Extreme Wind Warning," "Storm Surge Watch" and "Storm Surge Warning" so communities can receive relevant alerts during hurricanes or other severe weather. Expect to see codes "EWW," "SSA" and "SSW" added to Part 11 EAS rules. The change had been sought by the National Weather Service. Virtually all commenters supported adoption, the FCC said; three EAS manufacturers filed in support and said accommodating the change was a matter of software or firmware updates.

AFCE: The Association of Federal Communications Consulting Engineers appointed two to its board and elected four officers. It advocates for proper federal regulation affecting communications engineers and aids in educating engineers. Jon Edwards, lead engineer at CityScape Consultants in Atlanta, and Chris Horne, a consulting engineer at Comspec Corp. in Greensboro, N.C., were appointed to the



As part of its 2016 annual meeting, some AFCE members toured National Institute of Standards and Technology radio stations WWV and WWVB in Fort Collins, Colo. From left, kneeling: John Garziglia, Bob Weller, Claude Crump, Steve Crowley, Chris Clark. Standing: Tom Silliman, Matt Sanderford, Romez Clark, Bobbie Clark, Eric Wandel, Sterling Davis, John Collinson, Martin Doczkat, Bob Culver, Cathy Culver, Jack Mullaney, Anne Crump, Mark Fehlig, Larry Will.

board, joining Marshall Cross, Steve Crowley, Mark Fehlig and David Layer. At the annual meeting in Estes Park, Colo., the new board voted in Bob Weller as president (he had been VP), John Lyons as vice president and Chris Horne as secretary. Ron Chase continues as treasurer.

NAB FOIA: The FCC is expected to leave broadcast ownership regulations essentially as they are, but the National Association of Broadcasters wants to see the data the commission used to come to that conclusion. In an unusual move, NAB filed a Freedom of Information Act request for studies, reports, articles, surveys and other sources of information related to the commission's latest review of local and cross-media ownership rules.

PIRATES: An engineering survey by the New York State Broadcasters Association sought to quantify the number of illegal stations in New York City and northern New Jersey. It found 76, though it suspects the number is higher. These were concentrated in the Bronx, Brooklyn, Newark and Paterson. The association has been pressing the FCC for more action. Its survey was conducted by Meintel, Sgrignoli and Wallace.

More Radio, More Voices

Make Radio World part of your day every day. Visit our website for great Web-only Radio World content, including the following recent posts and stories:

"NATE Is on the Front Lines of Wireless Innovation" — Todd Schlekeway comments on the organization's role in the FCC 600 MHz incentive auction, the FirstNet public safety broadband network, drones and 5G infrastructure. See radioworld.com/nate4.

"Updating the EAS Operating Handbook" — A chat with Gary Timm, chair of the EAS Operating Handbook Update Project Team. See radioworld.com/timm.

"On the Air: Professional Broadcaster Uses Talents to Give Back" — Jack Wilson settles himself in front of a microphone each Tuesday afternoon, a stack of small town newspapers before him. See radioworld.com/wilson.

"China Presents Its Digital Radio Standard" — Davide Moro has the story on China's iBQC efforts. Read it at radioworld.com/china.



The Future of Digital Radio Archives

How WFMU is confronting the challenge of preserving its 58-year history

BY **KEN FREEDMAN**

It's hard enough to describe the present, let alone predict the future. But at WFMU we keep bumping into the future, especially with regard to our digital archives.

Most radio archivists focus on historic airchecks living on physical media such as reel and cassette tape, which means that the process of digitization becomes incredibly time-consuming and laborious, especially when adding metadata, tags and art. In comparison to that, digitizing media of the present is a cakewalk!

It always astonishes me that so little archival effort is put into preserving the present, when last I heard, the present instantaneously becomes the past. The easiest, cheapest way to preserve radio for the future is to focus on the present, and then deal with the past when you have more time and money. As if that ever happens.

EVOLVING STORAGE MEDIA

We started archiving our airchecks digitally in 1997 and went whole hog in 2001, saving each and every radio



show that we've broadcast and maintaining multiple backups. Unfortunately, when we first started archiving everything full-time, we did so using very low fidelity online streaming formats. Some of those formats have since fallen into obscurity, which has meant the

laborious process of transcoding years of archives into more contemporary streaming formats.

But the good news is that storage gets cheaper and cheaper, and for the last few years we've saved our program archives as uncompressed FLAC files, as well as

FROM THE EDITOR



I am an ardent believer in efforts to save America's radio heritage, including the work now being done by the Radio Preservation Task Force (<http://radiopreservation.org>). Here is the second in a series of occasional guest commentaries by or about those involved in the effort. Ken Freedman is general manager of WFMU (wfmu.org) in East Orange, N.J., the popular and longest-running freeform radio station in the United States.

— Paul McLane

MP3 and MP4s. We've learned the hard way that with digital files, we have to back them up and recopy them from one machine to another, over and over again. The folks at the Library of Congress told me that they "refresh" their digital archives every two to three years. Doing this prevents the problem that I have with a handful of external drives from a mere six or seven years ago; they've been rendered obsolete and unplayable due to pesky hardware issues like outdated BIOS and unsupported operating systems.

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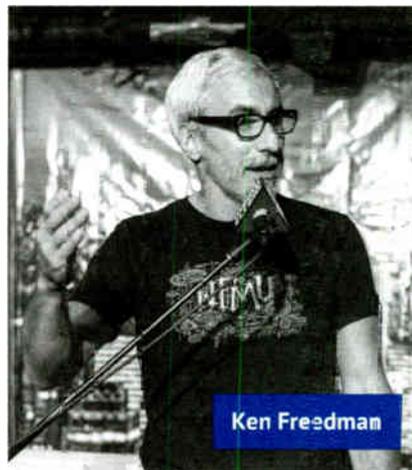
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Contrast that with good, old-fashioned reel-to-reel tape. I was contacted in 2001 by Tex, a former WFMU engineer, who had reel-to-reel airchecks of the station going back to 1961. Forty years later, Tex was able to copy of all these tapes to my format of choice — which was, unfortunately, DAT. No sooner did I receive a few boxes of DATs than I started plotting how to get them off of DAT and onto something with more longevity (like reel to reel tape?!).

We've learned the hard way that with digital files, we have to back them up and recopy them from one machine to another, over and over again.

WFMU signed on the air in 1958, and listeners and ex-staffers frequently contact me and offer up shoeboxes full of cassette, reel-to-reel and DAT airchecks. I accept them every time, no questions asked, and give them the place of honor I reserve for all historic tape archives: the climate-controlled crawl space located conveniently above the bathrooms. I like to pretend that someday we'll have the money and manpower to convert all of these to digital. It's fun to pretend. Meanwhile, I'll keep archiving the present and wait for it to miraculously turn into the past.

FREE MUSIC ARCHIVE

When bands and artists perform live on the air, we ask them to license their performance under an alternative copyright license known as a creative commons license. The idea behind creative commons is "some rights reserved," as opposed to "all rights reserved." Most bands do sign the release, and then we can put these files available for the pub-

NEWS

lic on our Free Music Archive (www.freemusicarchive.org). The FMA now houses 100,000 songs, all available to the public and free for non-commercial use. We started the FMA with the aim of creating an online library for podcasters and royalty-free webcasts, but this library's most popular use is among film and audio documentarians, who seek free or low-cost music for their creations.

Music that is performed live on the air is relatively easy to license and archive. It's our other 400,000 records that exist on vinyl, cassette, LP and 45 that present the challenge. For all the insurance that we carry, the only radio asset that could never be replaced is our physical record library. That, and the stuff in the crawl space above the ladies room.

So we've begun planning out how

we might raise the money to digitize the entire record and historic archive library. What we've learned is that the audio part is not the hardest part. The real time-consuming part is digitizing the record art, the liner notes and the tags. LPs present a real challenge, since the typical LP cover exceeds the size of typical flatbed scanners.

We're working with the Internet Archive and New York's ARChive of Contemporary Music for this project, and we're at the very early stages of it. My staff is engaged in a lively debate over whether the project is better described as Herculean, or Sisyphian. As soon as we finish, I'll let you know.

Tell us about your own radio history preservation efforts at radioworld@nbmedia.com.



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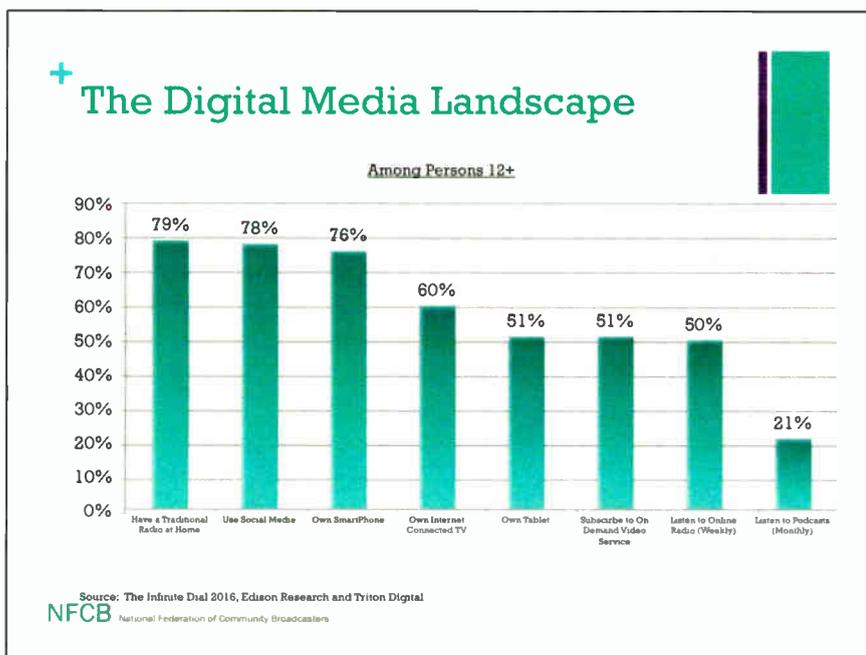
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vides tools and templates for community building, fundraising and cross-platform publishing. [See RW's 2015 story at radioworld.com/wfmu.]

Kane, a veteran of community radio and student of change management theory, came to NFCB as CEO in 2014; her job includes a mandate to identify essential services needed for stations "navigating the technological demands and opportunities of the digital age

half are in rural areas where they are often the only local radio presence in economically challenged communities.

The duality of NFCB membership is evident in that 404 stations are CPB-qualified stations, receiving community service grants that puts them typically well into six figures of revenue annually. Many rural and LPFM stations are getting by on far less, often by the grace of active corps of volunteers. Some stations are "all-volunteer" operations, where passion rather paychecks are truly the primary motivation.



Mike Henry of Paragon Media Strategies reviewed challenges and opportunities for community radio (here, in a slide based on "The Infinite Dial 2016" from Edison Research and Triton Digital). He told attendees that audiences now have continuous access to digital media on a multitude of devices, so community radio needs to provide quality, engaging programming both on-air and through channels such as digital media and live events. Digital/mobile strategies should be added to traditional fundraising to grow station revenue.

and severe economic downturn." Kane opened the conference with a plenary session. Panelist Erika Pulley Hayes noted that in an era when Uber, the largest cab company, doesn't own cars, and Facebook, the largest content provider, doesn't make content, all stations need to think critically about their roles in their communities.

Mike Henry of Paragon Research set the table with a reality check that only 12 percent of Americans listen to noncommercial radio and that among the 776 community radio stations, over

The message from the Corporation for Public Broadcasting, delivered by Vice President for Radio Erika Pulley-Hayes, was that smaller stations actually are declining in revenue growth compared to larger ones; the latter spend only 40 cents per dollar raised versus the \$1.20 spent by some smaller stations.

While overall radio listenership is relatively flat, CPB data indicated public radio has seen 26 percent growth in radio station revenues since FY09, but smaller stations are seeing minus 10 percent to flat growth, according to CPB figures. Clearly, smaller stations are swimming against the stream. Yet that is exactly what the "rural" and "LPFM" stations are doing. As was evident at the conference, a number of those are succeeding and innovating despite such challenges. But speaker Valerie Arganbright, who talks about "sustainable revenue solutions" for non-profits, talked about the importance of collaborations, warning the audience

that "the days of going it alone are over."

GOING INTO HOPELESS CORNERS

Sue Schardt of the producers' network Association of Independents in Radio detailed its "Finding America" initiative. With funding from several major entities to support its effort, AIR sent reporters into the "hopeless corners" of 15 local communities.

The mechanism was disarming; Schardt calls it repose: "Simply go and sit in a chair in a forgotten neighborhood every day, likely for weeks ... and eventually people will come to you with amazing stories you can capture if you've established trust by just 'being there' and finding the rhythm of the community through humility and vulnerability."

This made for dramatic "localore" radio and online stories; see finding-america.airmedia.org. The project is moving forward with "Finding America Live" now supporting drive-in movies, bike rides and stories under the stars to bring together "amazing minglings of the full community." Schardt called it an effort to "re-engineer interconnectiveness" across America's communities.

June Fox, station manager at Seattle Public Schools station C-89.5 KNHC in Seattle, provided insights into how to motivate skeptical staff (show them that pushing to meet a big goal can succeed) and how to lead by being your happy self.

"If you're not happy doing what you do, you have to change your job." Fox summed it up: "Happy stations are the best stations."

Another highlight was learning about "Day 001: Voices of Recovery" from KNBA Koahnic Broadcasting in Anchorage, Alaska. This is an eight-part video and radio series in which Alaskans tell personal stories of overcoming alcohol addiction. It's another example of riveting, personal radio that has added impact via an online content buildout.

NFCB tied the ribbons on this year's conference during an awards banquet by recognizing Pete Yadlowsky of WTJU(FM) at the University of Virginia in Charlottesville, Va., as its Volunteer of the Year.

It also named Sue Matters of KWSO(FM) in Warm Springs, Ore., as first recipient of its Golden Torchlight Award. This recognizes "a station that has carried the torch of inspiration in community story-telling and public service media." KWSO is licensed to the Confederated Tribes Warm Springs Reservation.

The author is former chief technology officer and vice president for engineering at NPR Labs and past chief engineer at KPBS(FM) in San Diego and WKYY(AM) in Amherst, Va. He is chief volunteer of WHCP(LP), Cambridge, Md., in which capacity he spoke at the conference.

MORE TAKEAWAYS

NFCB posted a summary of the event themes; here's a sampling. Read the full post at tinyurl.com/nfcb2016.

Gender diversity and youth shifts are underway — "A lot gets made of aging demographics in public media. Much is also made of the dominance of men in leadership roles. On the ground, inside and outside the public radio ecosystem, these dynamics are changing dramatically. ... Community radio has often crowded (and rightfully so) that it has the kind of community involvement the big kids' table of public media wants. It seems as though we're starting to see such engagement include new producers, talent and station leaders."

Collaboration is strength — "It is easy for a station or a producer to go it alone or have reasons why working with others can be challenging. Yet even successful organizations don't have the money they used to, and partnering with others can yield fantastic results."

LPFM offers something special — "There's a lot going for LPFM: service, localism and diversity are a few pluses that come to mind. Sustainability seems to be the big puzzle for LPFM, and one has to anticipate NFCB will be in that mix of finding a formula to help these grassroots outlets flourish and shine brighter."

Race and culture still matter — "From a host of podcasts ... to more and more local radio, listeners want to hear about our changing world. Diversity was part of so many discussions at NFCB's conference in no small part to acknowledge this trend. ... In addition, never more has a visit about tolerance, acceptance and understanding seemed more needed."

We are better together — "Conferences like our meeting in Denver show just how necessary, in these economic and cultural times, unity is for community media."

Find a history of NFCB at <http://nfcb.org/about/history/>.

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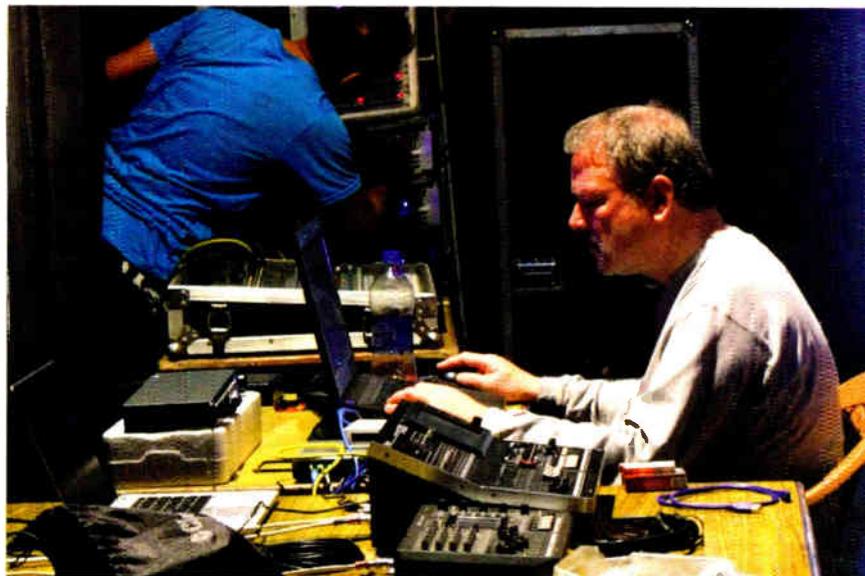
satellite studios throughout the Pacific Rim. It broadcasts content in nine languages to listeners in China, Tibet, North Korea, Vietnam, Cambodia, Laos and Burma; its stated mission is to provide accurate and timely news and information to Asian countries whose governments prohibit access to a free press.

Baden joined RFA when it was formed in 1996; before that, he had worked for Radio Free Europe/Radio Liberty. Now he travels overseas two to three months out of the year.

"I usually stay abroad at least three weeks at a time. Some of that time is spent at overseas studios, but I also set up remote broadcasts. I usually try and get to two or three sites per visit, since it takes so long to get there."

With so much time spent traveling, what does Baden do during those long flights? "Usually I just sleep or watch movies. Since RFA is a government agency, we always fly economy class. The seats are so cramped you really can't use a laptop. I've tried using tablets, but you really can't get any work done on them."

Airline travel aside, broadcasting overseas is challenging due to a lack of many things engineers in the United



David Baden works backstage before the Sikyong Debates in March at the Tibetan Institute of Performing Arts Hall in Dharamsala, India.

States may take for granted: a clean and uninterrupted source of AC power, broadband Internet connections, a dust-free environment for equipment, even reliable phone connections.

"We ran an emergency generator for the entire [Tibet] show, just in case," Baden said. "Sure enough, the power went out three times during the broadcast."

Sometimes equipment setup uncon-

ventional. During the Tibet election coverage, "Our internet connection went under a door, down a hallway, got taped to a banister going upstairs to the roof, and crossed over two rooftops before arriving at its destination. I'm thinking that if the fire marshal sees this, he'll shut us down. But there is no fire marshal. It works, so you just turn a blind eye."

In addition to the technical challenges of working abroad, there are cultural differences to consider when interacting with local people.

"Many of them don't have the same sense of time as Americans. They're not used to working with deadlines. You need to build in extra time to get things done. I realize that I can't do everything myself, but I also need to allow enough time in my schedule to step in near the end and pick up the slack."

Local customs can be problematic to a visiting American broadcast engineer. "The Thais, for example, don't like to say 'no' to someone; it is considered impolite in their culture," said Baden. "So they say 'yes' to everything, even when they know they won't be able to do it. It's just another thing you need to build into your workflow."

What Americans must not assume is a lack of technical savvy on the part of engineers in developing nations.

"They may not have access to the educational resources that we take for granted; but they are skilled at improvising and making things work with outdated equipment in harsh environments. Many have built their own hi-fi gear from scratch. As a result of these experiences, they are self-educated in electronics and communications technologies."

Surprisingly, foreign language skills are not required for his overseas work. "It's really true that English is the universal language. I'm very lucky in that

(continued on page 10)

NEWS ROUNDUP

GOODBYE GARRISON: Garrison Keillor signed off as full-time host of "A Prairie Home Companion" in July. President Obama called in to the show to congratulate him. Hear segments and an audience sing-along with Keillor at <http://prairie-home.org/shows/july-2-2016/>. Chris Thile takes over as host in October; Keillor remains as executive producer. The first PHC show was on July 6, 1974, at the Janet Wallace Auditorium at Macalester College in Saint Paul, Minn.

NPR+iHEART: National Public Radio struck a deal with iHeartMedia that will enable member stations to stream content via the digital platform. The partnership applies to some 260 stations. NPR hopes to expand listening audience and help stations develop new sources of funding. Members that choose to participate will be allowed to use half of the banner ad inventory on their iHeartRadio station's landing page. Those ads can be used to prompt listeners to donate to their favorite stations.



nextradio

NEXTRADIO: The Canadian Google Play Store added the NextRadio app to its offerings. Users with FM radio-compatible smartphones can now download the app for free.

LPFM: A new signal at 107.9 in the San Fernando Valley area is closer to reality over the protests of two area broadcasters. The application for a low-power CP from the Los Angeles Social Justice Radio Project granted in late June by the FCC despite objections about site assurance and other challenges to the application. It was given the call sign KXSX(LP). Once the station is built, the signal will be centered near the neighborhoods of Chatsworth, Reseda, Canoga Park and Winnetka. Nine other organizations had been listed by the FCC as having filed mutually exclusive applications. Objections were filed by neighboring stations licensed to Univision and Calvary Chapel of Costa Mesa.

TECH OPS

Baden provided an overview of technical staff in Washington and their areas of primary responsibility. Six people staff the Help Desk, offering user assistance through desktop support. Four handle network and systems, taking care of security and physical infrastructure, connectivity and mostly administrative systems like finance, email, FTP servers and SIP VoIP phone system; they manage 20 physical servers and over 50 virtuals.

Five people manage broadcast systems that support radio and video, with 30 servers and storage; five manage the website and 30 related servers. Twenty staffers run Master Control and assist with production; three are in the front desk and mail room operations. Baden noted that staff often cross over and work together on multiple systems and projects. Nine Asian offices are staffed by 20 local support technicians.

The Washington operation is built around Master Control, 23 small one-room editing studios, 13 two-room production studios and two video studios. Five radio studios also can stream live video to the internet.

Notable systems include Rivendell Open Source Radio Automation, AP ENPS with MOS servers for video, NewTek TriCaster video camera system, Asterisk open-source phone system for general business, Telos VX phone system for broadcast, Telos Axia audio consoles, Plone open-source enterprise content management system and Livecast video streaming.

"It gets kind of confusing to look at a single area of responsibility because systems tend to touch each other," Baden said. "With the phones, for example, there are some hardware PSTN and GSM gateways, but mostly a SIP system with two servers in D.C. and separate appliances in each Asian office that all are part of a whole system."

"So if you make a call to Hong Kong from DC on a desk phone, you are being routed over the internet to Hong Kong that is placing the call through a local SIP provider. The phone system is more like a global network with least-cost routing for a normal call," he said. "In the studio for air, it functions on the best-quality route; the VX system would route the same call through Asterisk to a copper line in Hong Kong for better quality in the studio. Help Desk does the normal programming of the phone sets. P&D maintains the servers in D.C. while local technicians would be handling the Asian end."

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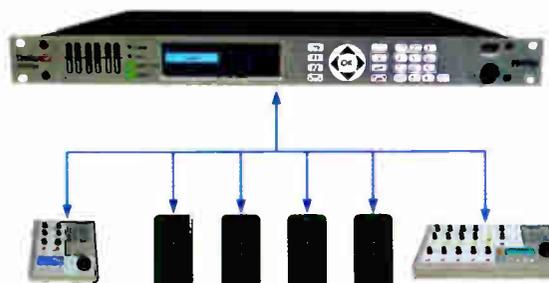
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BADEN

(continued from page 8)

regard.” When a Thai and Indian, for instance, want to speak to each other, they usually do it in English.

NO BIG EGOS

The mission of RFA helps to define a unique culture in its Washington headquarters and throughout the 256-employee organization. It attracts the type of engineers who are looking for something different.

“We’re not like commercial broadcasters. We don’t have disc jockeys with big egos. People aren’t working for the money, they’re working for their country and something they believe in.”

RFA’s relatively limited funds — its budget was \$38.3 million in FY 2015 —

also mandate a different culture.

“We work with a lot of open source software and create some of our programs from scratch. A knowledge of

They’re also very passionate about what they do, often working nights and weekends to get a project done.”

While Radio Free Asia maintains

People aren’t working for the money; they’re working for their country and something they believe in.

— David Baden

Unix and Linux is essential. Some engineers like to take things out of the box and just plug them in, but the people we seem to attract appreciate the challenge of starting with a blank piece of paper and figuring it out on their own.

streaming audio and video feeds, it is unique among broadcasters in that the bulk of its audience listens via shortwave.

“A quarter of the world’s population doesn’t have electricity, and half doesn’t have internet access,” he said. Therefore,

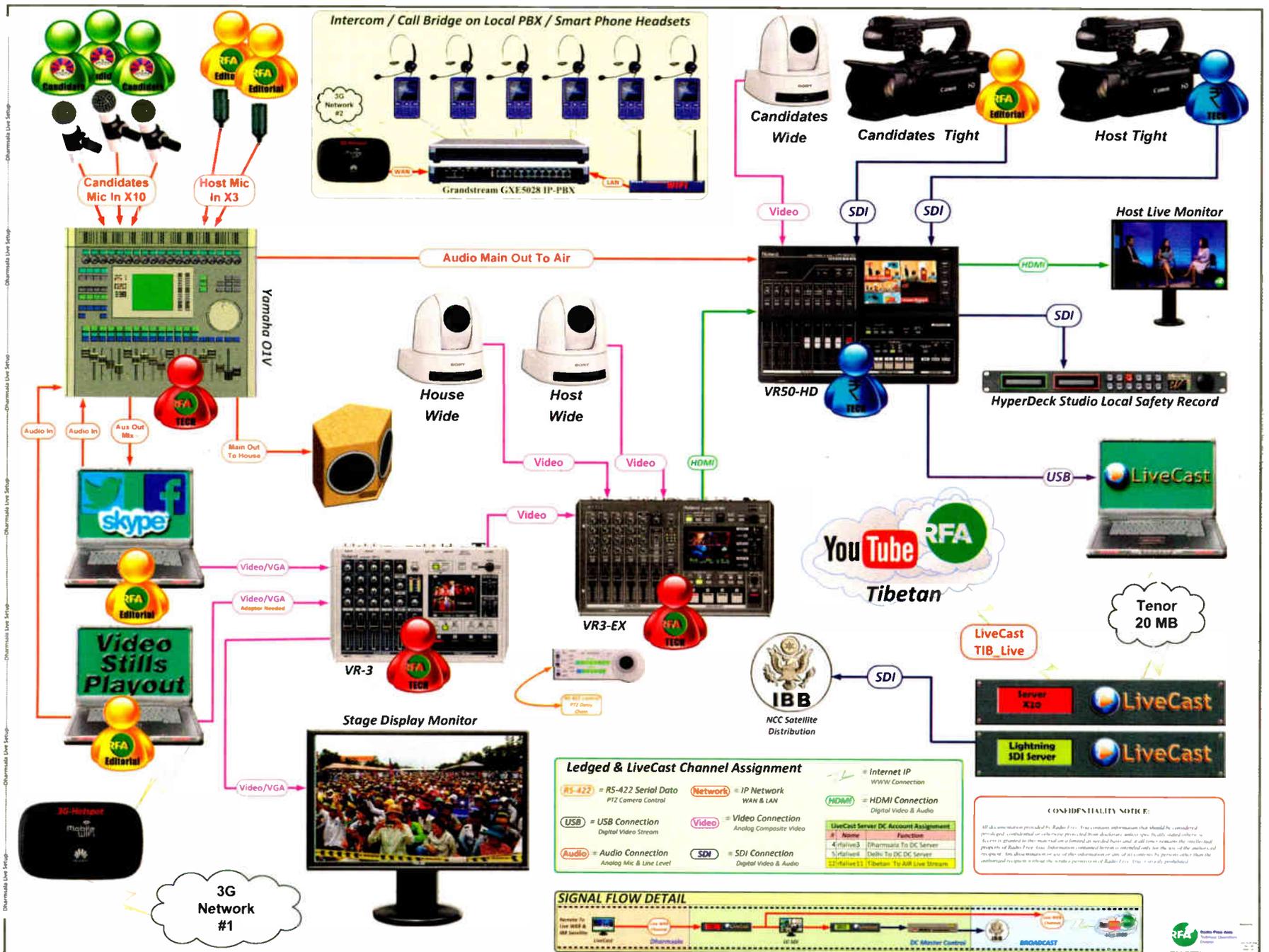
an understanding of “old” tech concepts — high-power RF circuits, HF propagation and curtain antennas — is useful.

And those overseas assignments are part of the job for aspiring RFA engineers.

“We tell all new hires that if they don’t have a passport, they need to get one ASAP.” The nature of foreign cultures and tight budgets is such that travel can come up on short notice. For the Tibet project, Baden was the only engineer available at the time who had both a passport and the necessary visa to work in India.

Finally, the organizational chart for RFA is pretty flat, Baden said; it’s not about suits and corner offices. “All the managers here get their hands dirty and do real work.”

Tom Vernon profiled FCC CIO David Bray in March. See radioworld.com/bray.



Baden’s setup for coverage of the 2016 Tibetan elections involved a traditional audio feed for shortwave broadcast as well as live audio and video streams over the web.

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World Radio History

Brush Away That Cable Mess

Also: Test components in the comfort of your workshop

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

Selling IP-based products helps keep my hands on Cat-5/6 cabling techniques. When I hear of something that will neaten your rack, I want you to know about it.

Cumulus Media Tucson Market Engineer Julio Alvarado brought a cool prod-

uct to my attention recently. Manufactured by Middle Atlantic, the BR1 is a 1RU rack panel with a cable entry slot covered with a row of nylon brush bristles. These bristles can be pushed aside to permit routing of cables, keep-

ing the wiring smart, as seen in Fig. 1. The bristles have the additional advantage of keeping dust out of racks, as seen in Fig. 2.

The panels can also be mounted in the top of racks to cover cable holes.

While we're talking about cleaning up our equipment rack appearance, consultant Charles "Buc" Fitch, P.E., found something in the latest MCM catalog that might be useful. It's

a cost-effective way to get rid of all that AC cable clutter in your equipment rack.

Search for part number 28-11161 on the mcmelectronics.com website. The part is a Stellar Labs "eight switched AC outlet" panel, mounted in a 1 RU chassis. Eight lighted on-off switches are mounted on the front, with eight AC plugs on the rear.

The original MSRP is nearly \$60, but this panel is on sale for \$29.99.

Buc adds it may not be a high-end

product, but considering that most rack device loads are under an ampere at 120 VAC, the panel should be adequate for the task.

Elsewhere, MCM sells multiple outlet strips for under \$10, a lot less than the wire mold units at the big box stores. That part number is 28-21285.

Back in the March 30 edition of this column, we featured a translator rack that iHeartMedia Aurora's Dave Agnew had put together. By pre-mounting and wiring the transmitter, processor RF switch and controller in the comfort of his office, Dave could test and ensure all of the components were



Fig. 1: Nylon bristles can be pushed aside to permit wires to pass into the rack from the switch.



Fig. 2: The bristles cover the opening, keeping the rack cleaner.



Fig. 3: BDI's new transmitter controller adds remote control capability.

functioning in his workshop, rather than on the top of a mountain.

Dave's equipment setup included the Broadcast Devices SWP-200 series transmitter controller. Bob Tarsio of BDI introduced an upgrade at this year's NAB Show, the SWP-300-1 2T. Shown in Fig. 3, this unit provides all the attributes of the SWP-200 series controller but adds 16 control outputs, eight more status inputs and four analog inputs.

These added features permit the unit to provide transfer switch control as well as the total remote control solution for both low- and high-powered stations in a 1RU package. Dave Kerstin of Broadcasters General Store points out a great feature for customers that have purchased the original SWP-200 — the SWP-300-1 2T wiring pinout is the same, making the addition of the remote control features an easy install.

Something else that may be a Eureka moment: BDI offers pre-made RF switch control cables. If you've ever had the pleasure of wiring up control and interlocks for a transfer switch, you realize

(continued on page 14)

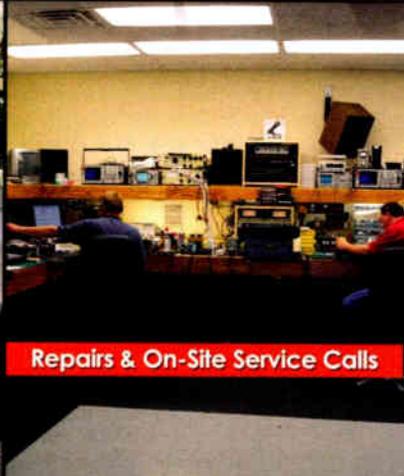
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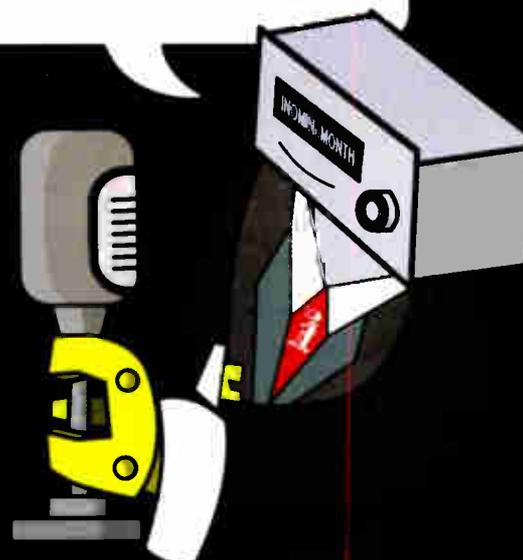
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What's Black and Red and Hears All Over?

It's the Scannocular, a novelty scanner made by Memorex and bought on eBay

OFF-BEAT RADIO

BY MARIO FILIPPI

I've always had a penchant for the weird, the off-beat, the non-mainstream. In high school I felt most at home with fellows who were ostracized by the general student populous, who acted and thought differently, had the intestinal fortitude to walk the road less traveled and were genuinely interesting individuals.

The same affinity goes for electronic devices; the weird stuff interests me. That's why I recently acquired a Memorex Scannocular from an eBay auction.

Many folks will remember Memorex as the company that manufactured recording tape, but apparently they ventured into the radio world 16 years ago when they came out with this scanning device for race car fans.

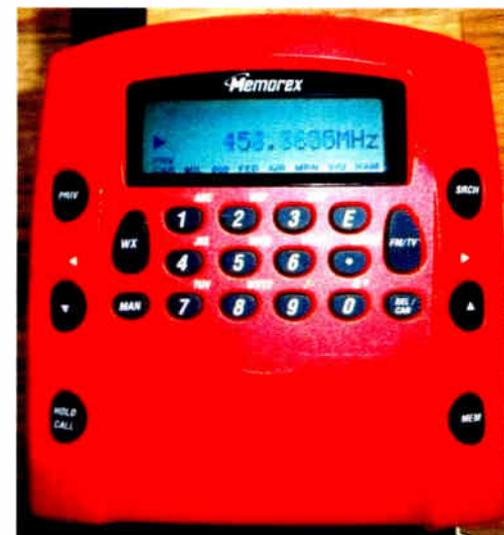
At the track you could listen to your favorite race car driver on his/her specific transmitting frequency and keep an eye on the car at the same time while peering through the built-in binoculars. Pretty sensible and useful device by all accounts, and even though I'm not a racing fan, the weirdness of it all was a draw.

The "Buy It Now" price was \$26 plus shipping, and I hit the button of no return. In a few days it arrived in the mail along with the original box, packaging, manual, rubber duck antenna, lanyard with Memorex logo and headphones.

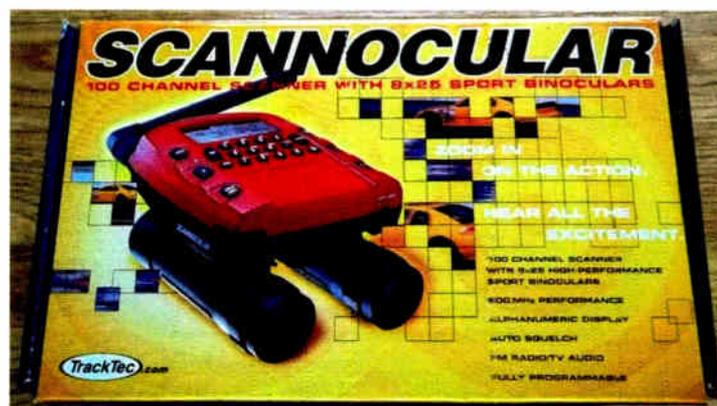
It was in mint condition cosmetically and electronically; even the binoculars needed no cleaning. So after inserting fresh batteries, reading the manual and programming in the local first responder frequencies, I was ready to evaluate its performance as a scanner. Even though it was designed originally for race car aficionados, this device has now fallen out of use due to new technologies and can be repurposed as a general purpose



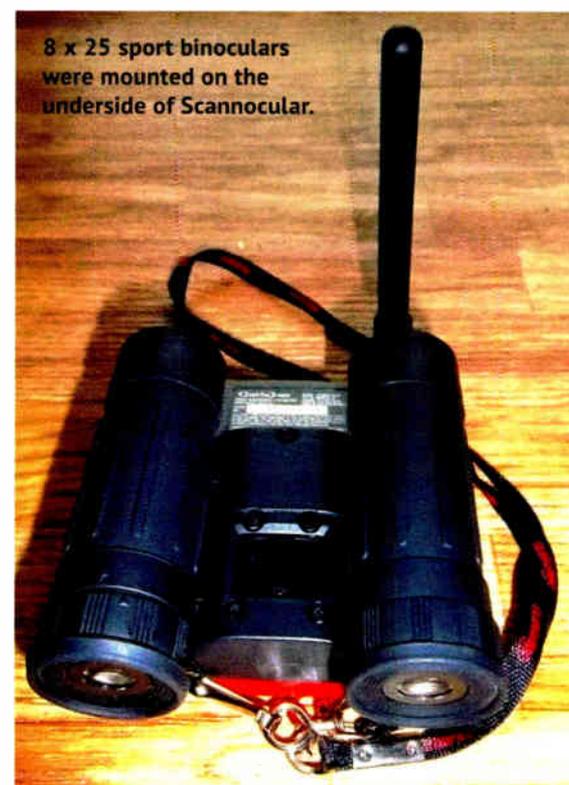
Scannocular for the racing car enthusiast was used at the track to keep touch with a favorite driver.



The clean, neat, organized dashboard of Scannocular makes it a snap to program. Note the old TV (FM/TV) band button.



Scannocular from Memorex, a combo radio scanner and 8 x 25 binoculars. Talk about innovation!



8 x 25 sport binoculars were mounted on the underside of Scannocular.

desktop/portable scanner for listening to police, fire, EMS, marine, aircraft, FM radio, etc.

FM, TOO

First off, the Scannocular comes programmed for the scanning enthusiast with many popular bands such as marine, ham, aircraft, NOAA weather, police, etc. You can also receive FM broadcasts to boot. However, you can program up to 100 channels of your own preference, and it's pretty straightforward to do so. You can even insert alpha tags (i.e., the name of the station you are listening to) if you have the patience. Not too shabby for a \$26 scanner.

Within an hour or so, all 56 of my favorite channels were programmed into the Scannocular's memory, and the National Oceanic and Atmospheric Administration weather channels were scanned as a first pass to evaluate its performance. With the supplied antenna, the NYC (KWO-35) and Allentown, Pa. (WXL-39) NOAA weather stations came in loud and clear.

For better performance, the Scannocular has a BNC antenna jack for connection to an outdoor antenna, and once connected to my broadband antenna on the roof, it worked as well as any scanner I've ever owned. It also has a search function for finding unknown frequencies in your area.

The only downsides to this radio is the lack of an adjustable squelch, no built-in speaker, no programmable delay (default is about 5 seconds) and no provision for attaching a wall-wart (aka A/C outlet power transformer)

for external power. I chose to use good rechargeable batteries and it seems to run forever between charges.

The Scannocular is a no-frills rudimentary scanner that performs well and doubles as a great conversation piece to show your radio compatriots: it engenders smiles and occasional laughs due to its eccentricity. It is a part of racing history, guaranteed to invoke interest among those who now use smartphone apps to accomplish the same goal.

You'll find these up for auction now and then, so if this article has piqued your interest in the weird, different and offbeat, don't let your inner nerdy voice be silenced; be part of that bohemian brigade who find value in the odd and uncanny.

Mario Filippi is a freelance writer, radio amateur (N2HUN) and an avid shortwave, longwave, VHF/UHF and satellite enthusiast. He wrote about RDF radios in January; read it at radioworld.com keyword RDF.

WORKBENCH

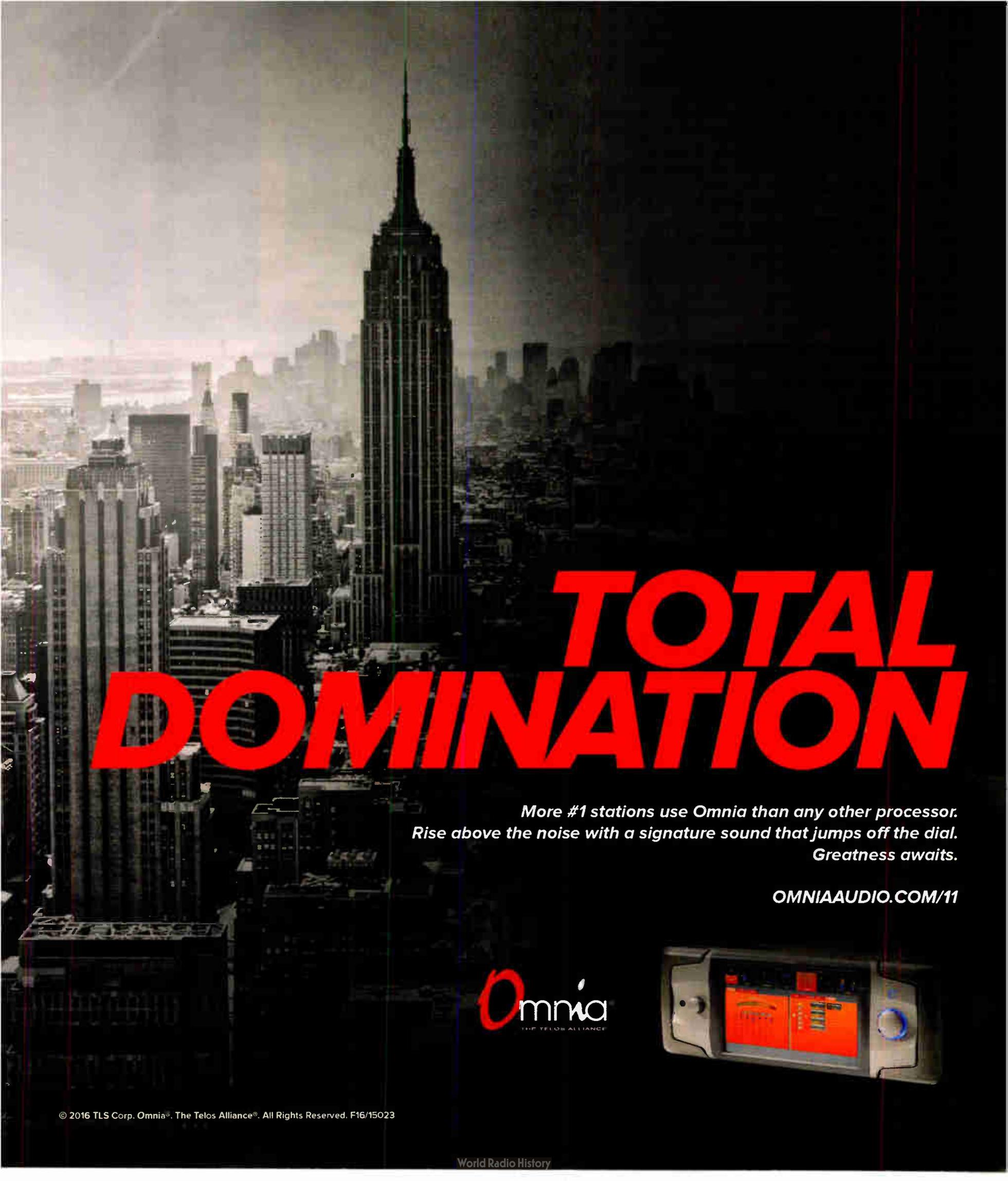
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how important this feature is. Not only does it save time, but you know the switch is wired correctly — and fully interlocked. The cables come pre-assembled in lengths to fit all major RF switch models.

For more information on BDI's products, go to www.broadcast-devices.com. Reach BGS at (352) 622-7700.

Tips to Workbench help your fellow engineers and qualify for SBE recertification credit. Send your good ideas to johnpbisset@gmail.com. Fax to (603) 472-4944.

Author John Bisset has spent 46 years in the broadcasting industry. He handles West Coast sales for the Telos Alliance, is SBE certified and is a past recipient of the SBE's Educator of the Year Award.



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Remembering CBS Radio's Beginnings

Media company's 90-year history is full of ups and downs

ROOTS OF RADIO

BY JOHN F. SCHNEIDER

News that CBS was looking to split off its radio network prompted us to reflect on the glorious 90-year history of the company's radio business, and gaze backward from this stretch of the road toward the media organization's beginnings.

In the 1920s, Arthur L. Judson was a well-known manager of musical artists. After a meeting with RCA chief David Sarnoff, he thought he had a verbal agreement to provide musical talent for the new National Broadcasting Company, but he soon discovered that Sarnoff had instead set up his own NBC artist's bureau. Furious over the humiliation of being outmaneuvered, Judson resolved to start his own radio network, to be called the United Independent Broadcasters.

He lined up a few investors, rented studio space at WOR in New York and signed up 16 stations. The network would pay the stations for carrying its programs, plus the talent costs and the hefty AT&T network line charges. All expenses would be paid for by advertising. The Columbia Phonograph Company agreed to provide an infusion of cash, and it became the Columbia Phonograph Broadcasting System.

The network debuted Sept. 27, 1927, with a live orchestra broadcast, and thereafter provided 10 hours of programming per week — mostly serious music and opera. But the expenses were huge and advertisers were scarce, so the new network was immediately in financial peril. After only a few weeks of operations, Columbia Phonograph pulled out, and the paychecks for the network's 12 employees stopped.

Desperate for a solution, Judson offered to sell controlling interest in the network to Isaac and Leon Levy, owners of WCAU in Philadelphia. The Levys brought in additional investors, including Sam Paley, owner of the Congress Cigar Company.

Then, after a difficult year of trying

to run the business remotely, they offered to sell part of the network to Paley's 26-year-old son, if he would run it. William S. Paley was intrigued by the offer. He had managed his father's cigar company radio advertisements on WCAU and the Columbia network and had been impressed with its impact on sales. And so, barely a year after the struggling network's first broadcast, Paley moved to New York and took charge.

Paley was a radio neophyte, but energetic and a quick learner. He shortened the name to the Columbia Broadcasting System, made crucial changes to the affiliate agreements and signed dozens of new stations and important major advertisers, tripling the revenue in just a few months.

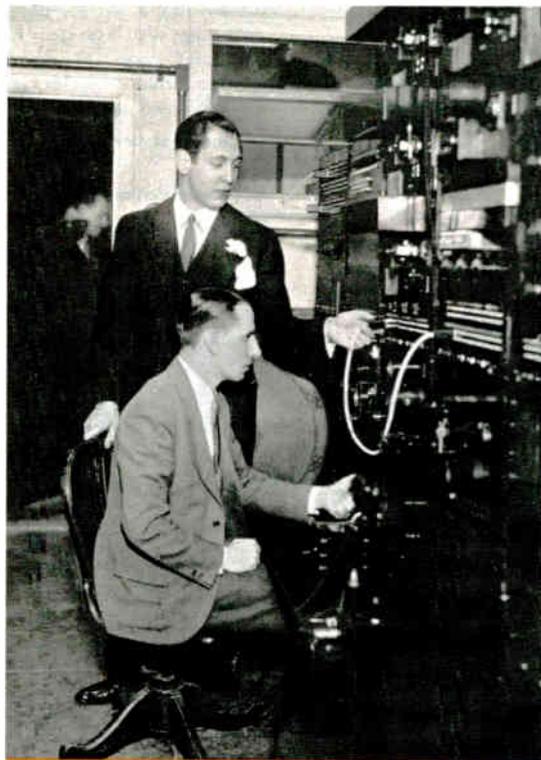
He changed the programming emphasis from high-brow music to more mainstream tastes, signing the Paul Whiteman Band and a young singer named Bing Crosby. Vaudeville entertainers and comedians began appearing on the Columbia Network, including Jack Benny, Burns and Allen, and Fred Allen. Announcer Ted Husing was sent out to broadcast sporting events.

In need of more cash, he sold 49 percent of the company to Paramount Pictures (later buying it back in 1932). He bought New York's WABC (now WCBS) and moved the studios out of WOR. And he signed a 10-year lease for five floors of studio and office space in a new building at 485 Madison Avenue, close to the major New York ad agencies.

By 1931, at the bottom of the depression, Columbia had 400 employees, 79 affiliates and a net profit of \$2.3 million.

One of Paley's dilemmas was that Columbia was not a national network; it only reached as far west as Omaha, Neb. To compete with NBC, which had been nationwide since 1927, Paley had to reach the West Coast, but the first AT&T broadcast lines across the Rockies, still being laid, were scarce and expensive.

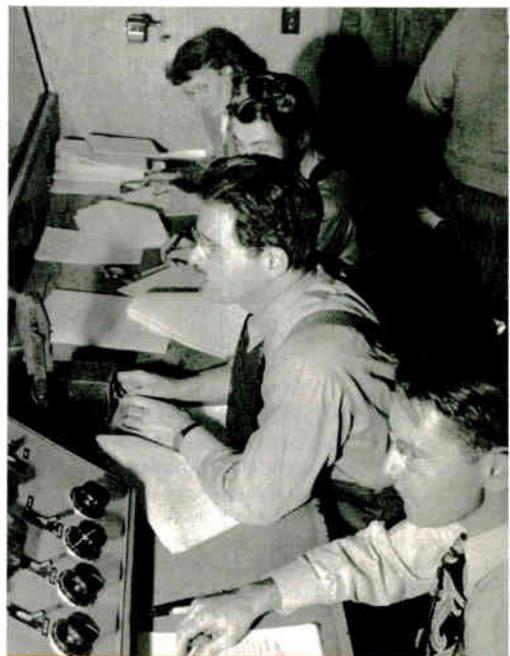
Photos from author's collection



January 1929: Columbia Broadcasting System President William S. Paley completes a circuit feeding the West Coast, turning CBS into a national network for the first time.



H.V. Kaltenborn was CBS' foremost news commentator in the 1930s. His knowledge of foreign affairs gave him the ability to analyze and interpret the growing conflict in Europe for audiences. He was fluent in German and French, which allowed him to translate Hitler's speeches for his audience as they were being received via shortwave. During the Munich Crisis of 1938, he stayed in the CBS studios for 18 days, sleeping on a cot between reports. In 1940, NBC hired him away, just as it had done with Lowell Thomas before him.



Norman Corwin, radio's "Poet Laureate," was CBS's star program producer. He wrote and directed some of radio's most memorable special programs, including "We Hold These Truths" (1941) and "On a Note of Triumph" (1945). In this photo, he directs his series "One World Flight," which described a 37,000-mile trip that took him to 17 countries in 1947.

In January 1929, Paley contracted with a new West Coast network, the American Broadcasting Company, operating out of KJR in Seattle. The networks agreed to exchange programs, bringing some Columbia programs to the West. But just a few months into the agreement, the ABC network suddenly went bankrupt when its owners were imprisoned for embezzlement.

Desperate for an alternative, Paley hopped a train to Los Angeles to meet Don Lee. Lee owned a chain of Cadillac automobile dealerships, as well as KHJ in Los Angeles and KFRC in San Francisco, which he had connected as a regional network. Paley hoped to cut a quick deal with Lee to build a new Pacific Coast network using Lee's sta-

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FEATURES

off the coast that ate up a precious week. Lee agreed to sign an affiliate agreement which Paley was to dictate without any negotiation whatsoever. Lee signed it on July 16, 1929, and the Columbia-Don Lee Network was born.

The 1930s and '40s were golden years of the Columbia Network, now simply known as CBS.

Paley hired Frank Stanton as a research assistant in 1935, and he rose to become a top executive, almost equaling Paley himself in stature and influence. That same year, CBS became a public company on the New York Stock Exchange.

Sensing the importance of news reporting for network radio, they hired newspapermen Edward Klauber and Paul White to assemble a crack news team. It proved to be one of CBS' strengths. As war loomed in Europe, the voices of H.V. Kaltenborn, Edward R. Murrow, William L. Shirer, Eric Sevareid, Robert Trout and many others were heard daily in America's living rooms.

These were also the years that CBS acquired many of its flagship O&O stations, including KMOX, WBBM, KNX and KCBS. And the company bought the remnants of the old Columbia Pho-

nograph Company, which became CBS Records.

CBS was a pioneer in international shortwave broadcasting, FM and early television. By 1950, there were 3,000 employees and annual sales of \$100 million. When the television age dawned, its TV network and stations catapulted it into the giant multimedia corporation that it is today. But CBS's roots and heritage have always been in radio, and so we pay homage to William S. Paley, his associates and successors for the impressive contributions they've made to the radio industry.



"The March of Time" was an innovative CBS program that dramatized and recreated the important news events of the week, sponsored by Time Magazine. Harry Von Zell is shown announcing one of the programs from the CBS studios at 485 Madison Avenue in New York in the 1930s.



Arthur Godfrey was a morning disc jockey at CBS station WSJW in Washington in 1945 when he was tapped to cover the network broadcast of the Roosevelt funeral procession. His emotional firsthand account garnered national attention; CBS soon awarded him his own morning network program. His program of unscripted interviews and music was a network radio staple until 1972. Here Godfrey interviews Democratic National Committee Chairman and Postmaster General Jim Farley about 1948.

tions and some of the former ABC stations. But Lee was not someone to be rushed into a business deal.

Before Lee would bargain with Bill Paley, the network executive, he wanted to take the measure of Bill Paley the man. He invited Paley for a cruise on Lee's sailing yacht *The Invader*, where he refused to conduct business and limited conversation to social chatter. "The rule here is that no one discusses business on this boat," he said, reportedly. Finally, after two leisurely cruises

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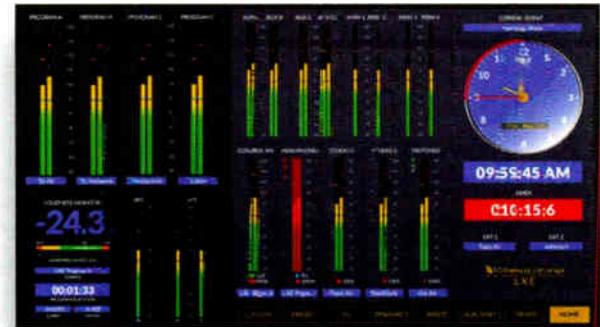
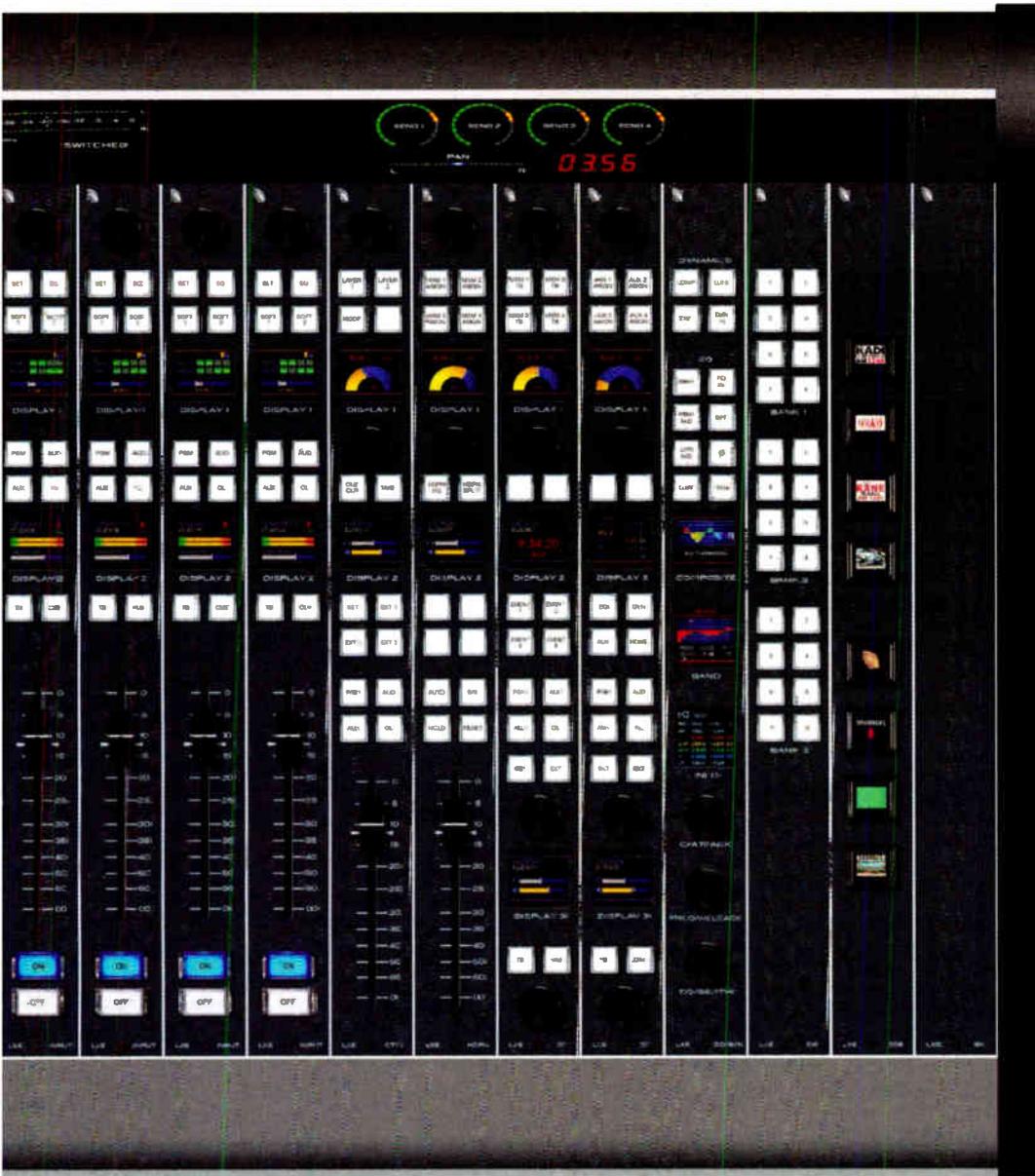
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The LXE can have up to 32 physical motorized faders, with full DSP processing available on all 32 channels. Surface(s) interface seamlessly into the WheatNet-IP Intelligent Network, and utilize BLADE-3s for audio, control and associated logic data flowing on single CAT6 interconnecting cables. The system can ingest and convert virtually all audio formats: analog, microphone, AES/EBU, SPDIF, AoIP, MADI, SDI and even AES67. Loudness metering, phase control, and full EQ/Dynamics are included.

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LXE's new GUI has pre-built screens for everything you normally use – metering, clocks, timers, dynamics, EQ, assigns, and more. All are touch-screen accessible with gestures you're used to using on your smart devices. And, the GUI is just as customizable as the LXE surface. Using our ScreenBuilder-LXE software, you simply drag and drop objects and define their functions via a simple wizard interface. You can store multiple custom screens, if you like, to go with your custom LXE setups.

THE ALL NEW LXE BROADCAST AUDIO CONSOLE

Next-Gen Engineers: Dustin Hapli



Name: Dustin "Hap" Hapli, 34
Company/title: Chief Engineer, 88.5 WMNF(FM)
City: Tampa, Fla.
Certifications/memberships:
 SBE member (Chapter 39), Certified
 Broadcast Networking Engineer

"There's nothing worse than putting hours of work into something, only to have to redo it all because it's not very practical for non-technical people."

ENGINEER PROFILE

One in our series about engineers in their 20s and 30s who are helping to answer the question, "Where will the next generation of engineers come from?"

Radio World: How did you get into the field?

Dustin Hapli: My first paid job was in high school. My dad saw a classified ad in the local paper that read "Like Chicago Bulls Games? Apply in Person WTAX-AM" and thought I might enjoy it more than the typical part-time job. I showed up one day after school and filled out an application. I had assumed they would simply throw it on the pile with the others. ... I hadn't given any thought to what I might say and was definitely not dressed for a job interview.

The PD was a nice guy, but almost immediately started to imply that I was too young and inexperienced for the job while trying to be as kind as possible. I can be a very stubborn guy and wasn't willing to take the hint. I explained that I understood where he was coming from, but I did have some audio experience and was sure I could do the job. ... He left the station a few weeks later, but I stayed on as a board op and eventually a fill-in host on the various stations in the group until I went to college.

RW: How do you think your age affects your approach to your job, if at all?

Hapli: I'm part of the first generation to be raised on computers, and started in radio around the end of the analog era, so I've been able to learn and adapt as we went from carts and index cards to total building automation and on demand everything. Audio, RF and IT are no longer separate domains. I've

learned from a number of veteran engineers who've forgotten more about RF and component level troubleshooting than I may ever know. However, not all of them were able to adapt to the age of IP everything.

This divide gave me a great opportunity to partner with them as an apprentice of sorts. They taught me about the analog stuff, and I helped them with the onslaught of digital technology. This helped me to grow my own knowledge and skills while gaining valuable real-world experience. ...

That said, there have been some disadvantages to being younger. There is definitely a stereotype of the older, curmudgeonly engineer, and it can be hard to break people's preconceived notions.

RW: What do you see as the most important industry trend affecting broadcast engineering today? How might it affect the profession?

Hapli: Finding good, qualified engineers is going to be a struggle in the short term. I would say the majority of the chief engineers across the country

are close to retirement, and I don't see enough people my age in the industry to replace them. There's plenty of IT people, board ops and operational engineers who can run the equipment, but not very many who can build a studio from scratch or fix your transmitter. Finding people with RF knowledge is the hardest part. Most of the veteran engineers learned it in the military. That technology was surpassed by satellite and IP networks, so relatively few people get that training anymore. I learned it because I was personally interested and was lucky enough to have smart people around me who were willing to share that knowledge.

Keeping up with technology is always a struggle. ... Everything from HD multicasting to podcasting to on demand is changing how people interact with our content. We have to try to be everywhere and that can be overwhelming. How many of these technologies will be around in another year or two? Nobody really knows, and anyone who says they do is kidding themselves. Do what you can to stay abreast of things, but don't feel you have to be first at everything. Let other people be the guinea pigs. The worthwhile ideas will stay around, and the bad ones will fade away.

RW: What advice would you give to younger or aspiring engineers?

by stations such as Radio ONE FM in Derbassiyeh City. "The device is very easy to use, does not require much effort and works on battery or electricity if available," said Farhad Yunis, a reporter working for Radio One FM. "The battery runs for hours."

Using the Pocket FM transmitter, Radio One FM can deliver a professional sounding radio broadcast over a 1.4 mile (3 km) radius "without the cost and bother" of building a conventional FM transmitter site, said Yildiz Shehab, a Radio ONE FM reporter based in Amuda City, Syria. At the same time, the system is discreet: "The antenna is small and no one knows that it is a broadcast radio antenna," said Shehab.

The bottom line: "Pocket FM is an effective technological solution to the problem of getting radio information to the people who need it most, at a price that virtually anyone can afford," said Katina Sostman. "It shows what can be done with the creative application of low-cost Raspberry Pi computers to challenging situations."

WAR RADIO

(continued from page 16)

to see where it can be employed to improve our coverage," said Al-Mawsili. "One of the locations chosen for testing is near Bashiqaq mountain, which can be challenging for the main transmitters to reach due to the barrier of the mountain. Locating the PFM beyond the mountain can help cover some areas where we have potential audiences."

Where Pocket FM could really pay off for Alghad Radio is in reaching temporary settlements with lots of potential listeners, such as internally displaced person camps. "Putting a Pocket FM in an IDP camp is ideal because we don't have to spend a lot of money on buying and powering big transmitters," Al-Mawsili said. "The Pocket FM can provide the same service with a much lower cost."

Pocket FM is also being used by the Syria Radio Network,

Hapli: Radio engineering is a mix of several disciplines with a fair amount of making it up as you go along! You can't be a good engineer if you can't relate to the people you're there to support. I've worked just about every job in broadcasting, short of sales, at some point in my career. It makes it easier to understand how your colleagues do what they do and helps you in the design and implementation of new systems. There's nothing worse than putting hours of work into something only to have to redo it all because it's not very practical for non-technical people. What's easy and makes sense to an engineer, doesn't always work for everyone.

RW: What's an important thing that you've learned from an industry mentor?

Hapli: My biggest mentor was a guy named Mike O'Shea. He was the chief engineer at WUSF for 43 years and just recently retired, a rare achievement these days.

O'Shea had a never-ending stream of jokes and little sayings. The one that I'll always remember is, "You can have it cheap, fast or good. Pick any two." He's certainly not the first guy to say something like that, but it really stuck. Managers will always want all three, even though it can't be done. Stick to your guns as often as you can. Try to avoid doing something you know will fail just because you've been told to do it. Hopefully, you can convince them of the error of their ways before it becomes a trainwreck on the air.

Also, document everything you can, so that anyone with the requisite knowledge can figure out how you did what you did. I've worked at stations at both ends of the spectrum. Nobody has ever been irritated by too many labels, but we've certainly cursed predecessors who never labeled anything.

Know an up-and-coming young engineer? Let us know at radioworld@nbmedia.com.

HIGH CAPACITY EVENT STUDIO TRANSMITTER LINKS



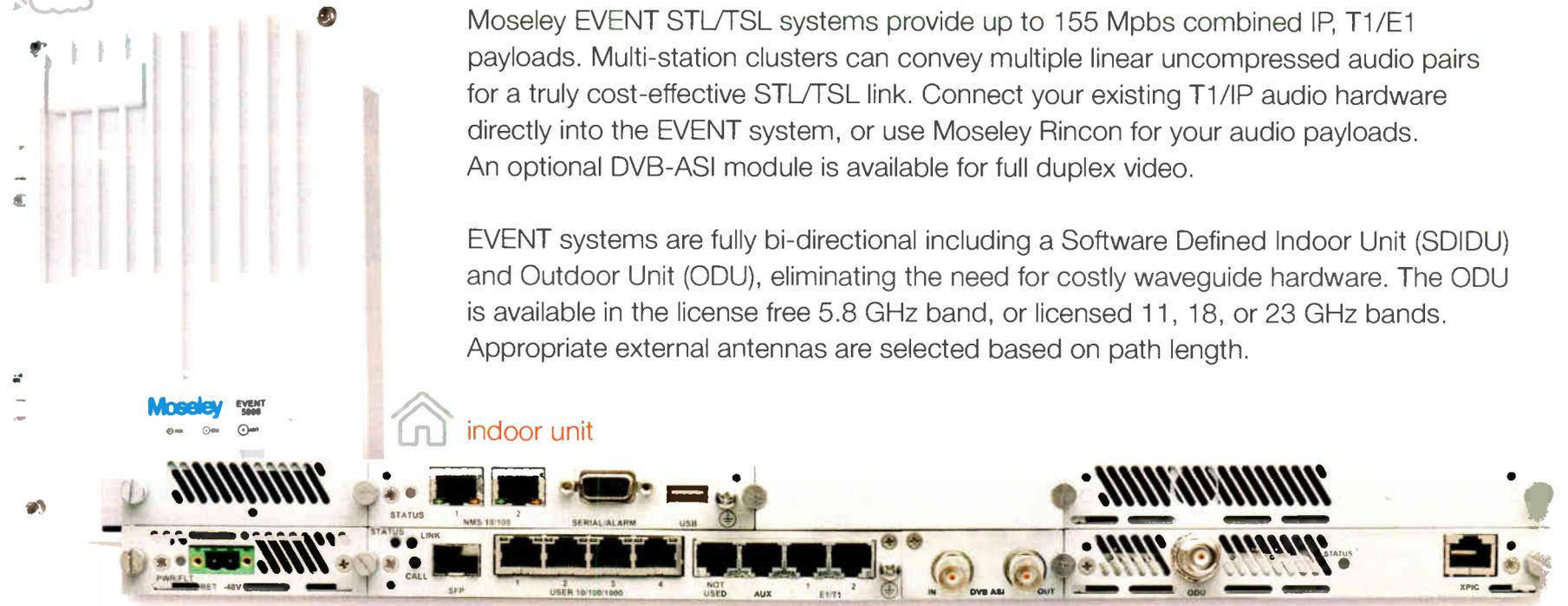
outdoor unit



TAKE ADVANTAGE OF WIRELESS HIGH PAYLOAD STL/TSL CAPACITY

Moseley EVENT STL/TSL systems provide up to 155 Mbps combined IP, T1/E1 payloads. Multi-station clusters can convey multiple linear uncompressed audio pairs for a truly cost-effective STL/TSL link. Connect your existing T1/IP audio hardware directly into the EVENT system, or use Moseley Rincon for your audio payloads. An optional DVB-ASI module is available for full duplex video.

EVENT systems are fully bi-directional including a Software Defined Indoor Unit (SDIDU) and Outdoor Unit (ODU), eliminating the need for costly waveguide hardware. The ODU is available in the license free 5.8 GHz band, or licensed 11, 18, or 23 GHz bands. Appropriate external antennas are selected based on path length.



indoor unit

INTELLIGENT SYSTEM DESIGN

Spectrum-scalable digital radios with user-selectable data rates enable broadcasters to have greater flexibility in STL planning and future growth. The integrated T1/E1 and Ethernet interfaces allow for a combination of T1/E1 and IP packet data.



IP APPLIANCES AND APPLICATIONS

Offer IP transmitter control, surveillance security, and site monitoring to reduce downtime, and protect valuable station assets while saving travel time to the site.

REMOTE MIRRORED SERVERS

From the transmitter site, offers backup of business records and programming content to get you back on the air quickly in the event of a studio outage.



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Full SNMP package with GUI provides easy monitoring and configuration changes.

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Tieline Supplies Solid Links in Newfoundland

Bridge-ITs and Genies save big money for Canadian broadcaster

USERREPORT

BY SHAWN BASHA
Director of Engineering
Steele Communications

ST. JOHN'S, NEWFOUNDLAND — Steele Communications is part of Newcap Radio and its studios in St. John's are the hub for radio transmissions throughout Newfoundland and Labrador in Eastern Canada. These regions are vast, mountainous and sparsely populated, which creates a number of broadcast challenges. Apart from the extremes of weather, some of our transmitters literally take days to get to.

From St. John's we run AM and FM stations in Marystown, Clarenville, Gander, Grand Falls, Corner Brook and Stephenville, Newfoundland. VOXM (AM/FM) is the main station in St. John's and delivers various network talk programs to affiliates. K-Rock 97.5 runs a classic rock format and is also important for distributing a morning show.

BEGINNINGS

I first installed a pair of Tieline codecs about six years ago as a backup STL connection for sending IP audio from our studio in St. John's to our transmitter site in Carbonear, Newfoundland. The first Bridge-ITs replaced mono satellite links to three main STL sites in Labrador and we now have 20 Bridge-ITs installed as IP STL links across our network.

All connect using regular DSL internet links and their reliability is awesome. So much so that after running copper backup links for about a year (at \$550 per month), I took the plunge and decided to cancel them and run with the Bridge-ITs on their own. They haven't missed a beat since, saving us thousands of dollars annually. A single telco is used for all our DSL links and I suspect this one of the reasons the DSL links are so reliable.

Earlier this year I oversaw the upgrade of aging satellite equipment which needed replacing. This was a

major project that took around a year to scope and implement, but it has paid rich dividends.

We installed two Tieline Genie Distribution codecs in St. John's and they send audio to 12 Genie STL codecs at different sites. One Genie Distribution uses multi-unicast mode to transmit from VOXM to six Genie STL codecs at our AM stations. The other Genie Distribution codec uses multi-unicast mode to transmit from K-Rock 97.5 to our four FM stations. We also send return audio from the Grand Falls studio back to St. John's. We feed this back to the Genie Distribution units and use connection profiles to transmit to Genie STLs in Springdale and Baie Verte, which are repeaters of Grand Falls.

All stations integrate network programming with local programs. We use the control ports on the Tielines to accommodate split functions across the network. While the network stations are running network programming they split to local commercials and sponsored casts as required.

This project saw us integrate a massive fiber backbone to cover all our remote sites. Originally we had different providers delivering data in all regions, until we realized that Eastlink, the "cable guys" in our part of the world, also managed WANs for business customers. After negotiations and some cable upgrades near St. John's, we managed to consolidate our data requirements through Eastlink. This was for everything, not just our audio STLs.

LINKAGE

This allowed us to drop our satellite links and we now have 100 Mbps links to each studio and 1 Gbps return paths for audio and other data requirements to our head office in Dartmouth, Nova Scotia. We have configured network QoS to guarantee the bandwidth allocated to our codecs while streaming and the links run flawlessly. We could run linear uncompressed audio if we wanted to, however we are impressed with the performance of Tieline's Music Plus algorithm and this is more than adequate for our requirements.

Many of our hubs like Grand Falls have repeaters and before installing the Tieline Genie Distribution and STL



services through Eastlink.

We have configured all our Tieline codecs with static IP addresses, which allows us to remotely monitor and configure them using Tieline's Toolbox browser graphical user interface. We also recently upgraded all our Bridge-ITs with new firmware so we can take advantage of Tieline's HTML5 web interface.

Satellite is an expensive beast and I would encourage engineers whose networks have large outlays for satellite or leased lines, to investigate IP alternatives. With the Tieline IP codec equipment our network has realized enormous savings and this will allow us to invest in other equipment. Our example shows you can successfully implement IP solutions over both managed and unmanaged IP networks — even if repeaters or transmitters are in extremely inaccessible remote locations.

Newcap Radio has made the decision to roll out similar Tieline setups across the country over the coming months. This is due to the success of the Newfoundland and Labrador networks, and their ability to provide network programming while splitting local commercials at a much lower cost than satellite.

For information, contact Tieline USA in Indiana at (317) 845-8000 or visit www.tieline.com.

TECHUPDATE

DIGIGRAM ADDS TO IQOYA *CLOUD WEB APP



Accessible from anywhere via the web browser of any connected device, Iqoya *Cloud provides an integrated master control room application, according to Digigram. It's built on a secure SIP broadcast infrastructure that makes it easy to deploy, configure and control a fleet of IP audio codecs.

It supports efficient real-time monitoring of registered ACIP audio over IP codecs across the network. The centralized, cloud-enabled tool allows control room operators to accept and initiate calls, monitor current codec status and deploy and configure codecs on the fly.

A new software-as-a-service version brings cloud benefits to small- and medium-sized radio operations. The enterprise version (a virtualized platform of services) is engineered for broadcasters willing to integrate the whole application into their own IT systems with support from Digigram Professional Services.

Integrated with Digigram's Iqoya *Call and *Call/LE audio over IP codecs in MCR or OB vans, Iqoya *Cloud is a solution to create seamless outside remote broadcasting, the company says.

For information, contact Point Source Audio in California at (415) 226-1122 or visit www.point-sourceaudio.com or www.digigram.com.

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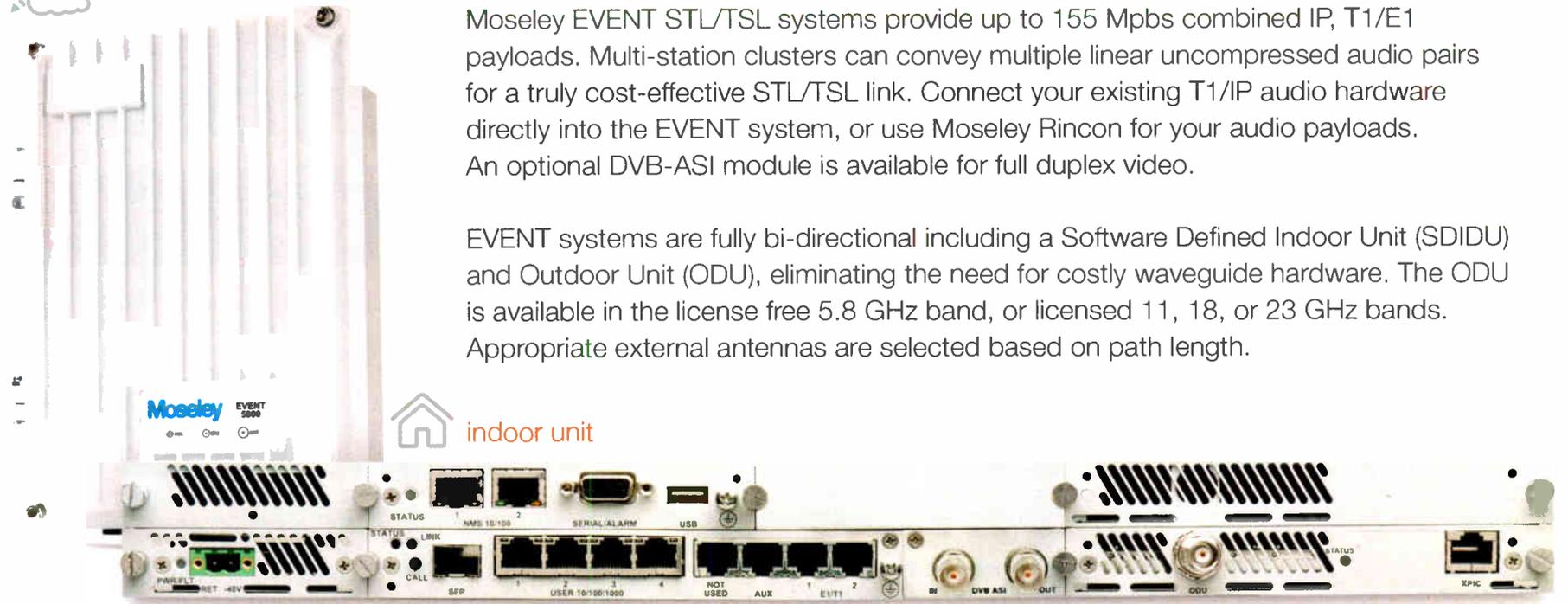
HIGH CAPACITY EVENT STUDIO TRANSMITTER LINKS



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INTELLIGENT SYSTEM DESIGN

Spectrum-scalable digital radios with user-selectable data rates enable broadcasters to have greater flexibility in STL planning and future growth. The integrated T1/E1 and Ethernet interfaces allow for a combination of T1/E1 and IP packet data.



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GatesAir IP Link Delivers Robust STL, Multipoint Connections

Radio One deploys IP Link 100 and IP Link 200 in various applications

USERREPORT

BY JOHN SOLLER
Vice President of Engineering
Radio One

CINCINNATI — There is no question that IP has become the way of the world. In broadcasting, IP connectivity has become more commonplace for a variety of business and technical reasons. Looking specifically at radio, IP establishes a more efficient means of moving multichannel content around a studio facility and addresses the need for additional spectrum and data transport functionality to and within RF plants.

At Radio One, we use a variety of IP codecs, favoring certain models for certain applications. When it comes to robust, “nailed up” point-to-point connections and flexible multipoint contribution and distribution, the GatesAir IP Link codec family has become my favorite goto.

GO-TO SOLUTION

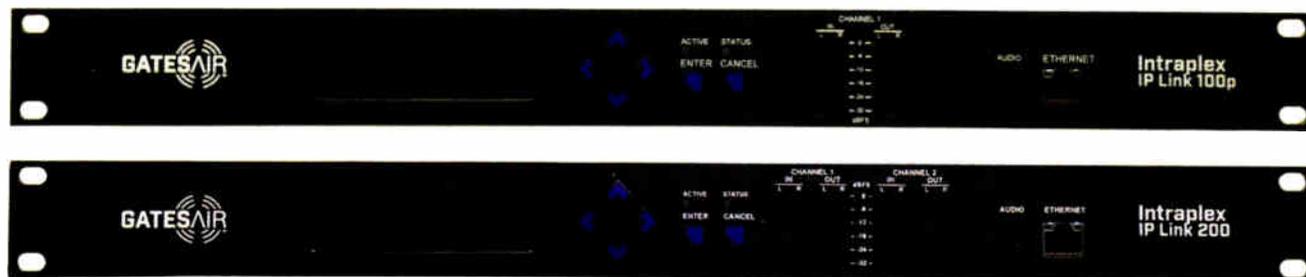
The IP Link is a part of the long-established GatesAir Intraplex range, which has a reputation for reliability in STL transport across microwave and T1.

The IP Link continues that tradition of a transport platform that can be counted on: It's a solid, bidirectional device that is compact and easy to use, the

Elsewhere, the IP Link serves as a reliable secondary path for a 950 MHz fixed microwave link or T1 circuit. In the case of the latter, we expect this

A great feature of both models is the use of forward error correction to compensate for network jitter and dropped packets, which makes artifacts virtually unnoticeable to listeners. Also, the firing of a closure on the far end of an IP Link is extremely reliable due to embedded logic which is time-aligned to the program source. This is a must-have for our syndication network.

The IP Link 200 is the more feature-rich version, adding a second bidirection-



former being especially helpful even the limited real estate in many equipment rooms and transmitter sites. The IP Link is deployed in a number of Radio One markets including Washington, Atlanta, Cincinnati and others.

The deployment strategy and model selection differ site by site. We employ a mix of IP Link 100 and IP Link 200 models for point-to-point STL applications, and, depending on each site's transport architecture, the codecs are used as either primary or backup links. Often, we will configure the IP Link as our primary path through an IP-based microwave link, and sometimes telco-based IP paths to a transmitter site.

strategy to evolve more toward IP as a primary transport method as many telco providers are getting away from supplying TDM-based services.

MULTIPOINT

For multipoint networking, we have found that the IP Link is a reliable and lower-cost alternative for distribution of syndicated content. We use a considerable number of IP Link 100 and 200 codecs to pass audio originating from various markets to our satellite providers uplink. GatesAir provides an IP Link scheduler that manages the switching of streams that need to point to various destinations at various times.

al stereo stream. Both offer webbased GUIs for codec management and signal monitoring, but the 200 adds frontpanel confidence monitoring LED VU meters. I appreciate the ability to visualize activity indicators on the front panel.

Both codecs otherwise offer a diverse feature set. We appreciate its support for transport of multiple audio codec formats over the same network. The IP Link offers plenty of user control, flexibility and configurability and has been proven reliable. It has filled our needs and has lived up to the Intraplex name.

We will typically configure the IP Link to operate in linear mode on our MPLS (our internal private network) and/or a microwave environment. However, in situations with bandwidth limitations, we will configure the IP Links to take advantage of built-in AAC+ or another algorithm to preserve bandwidth.

We have additionally integrated GatesAir's Dynamic Stream Splicing application to several of our IP Link paths, which can send multiple identical streams over the same connection, or two different paths, to borrow data from each other in compensation for packet loss. Our initial thought was that we could use this service with an unlicensed microwave link or with a DSL where the link could take occasional hits. However, to date we have not had to take advantage of this option.

I'd like to add that GatesAir has always been reliable from a service and support standpoint, whether for their IP or legacy STL systems; or for their transmitters and studio equipment. I can't speak highly enough of their products and staff.

For more information on GatesAir, contact Keith Adams in Ohio at (513) 4593447 or visit www.gatesair.com.

TECHUPDATE

ARRAKIS RELEASES SIMPLE IP NETWORK TECHNOLOGY

Arrakis Systems says audio over IP need not be expensive, proprietary or limiting. Partnering with Audinate's Dante platform, it created what it calls a cost-effective and powerful approach.

The Simple IP AoIP link box offers 8 in x 8 out (mono) or 4 in x 4 out (stereo). This allows for interconnecting studios or sources on a local network, eliminating complicated audio cabling to punch-blocks and messy cable runs.

With the advent of AES67, Simple IP is interoperable. Users can connect Simple IP to an existing AES67-compliant studio quickly. With Simple IP and AES67, users no longer need to be exclusive to a manufacturer.

Simple IP means that Arrakis ARC and MARC series boards can be interconnected via AoIP. This is true for all existing and new purchases of Arrakis analog or digital consoles.

Simple IP is a Dante product, and as such works with all Dante-enabled equipment. This includes the Dante Virtual Sound Card. At only \$29.99, users can get a license that connects a production or control PC to the Simple IP/Dante network.

Being a Dante product, Simple IP is controlled using the Dante Controller. This software will auto-recognize devices on the local network. It will then allow users to choose which sources to connect via a checkbox interface. This can be accessed safely, anywhere on the network, using built-in security protocols.

Choose the analog RJ-45 input/output model or the digital XLR AES3 model.

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



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* This is the price for the 8-channel. Regular list is \$5450.

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Bradley Division
800-732-7665

Axia Aids Multi-Station STL via IP Radios

Using Livewire to turn IP networks into STL systems

USERREPORT

BY KIRK HARNACK, CBRE, CBRE
Director of Multimedia Marketing
Telos Alliance
and VP, Engineering and IT
Delta Radio LLC and South Seas Broadcasting Inc.

GREENVILLE, Miss. — In two small Mississippi towns — Cleveland and Greenville — my radio stations needed new STL systems. We already had traditional 950 MHz composite STLs from studio to transmitter site in each town. However, we were adding additional transmitters at both transmitter sites and had to come up with more STL capacity. Being small-town stations, our budget is small, so we had to try something inexpensive.

We've seen quite a few IP radios come to the market lately. Available in both licensed and unlicensed bands, prices start under \$100. They advertise data rates of about 150 Mbps for the lower-cost systems, and upwards of 1 Gbps for the more expensive IP radio systems.

We know these IP radios can carry "coded" or "bitrate reduced" IP audio with little trouble. Wanting to keep expenses low, my goal was to get Axia Livewire+ IP audio from studio to transmitter. That way no hardware codecs would be needed; we would need only to place an Axia xNode at the transmitter site, extending our Livewire network to there via IP radios.

RURAL PATH

After some office testing, I confirmed that inexpensive IP radios can transport Livewire audio streams, including the clocking required to slave the Axia xNode at the transmitter site. This extra research into the best configuration of the IP radios has paid off in our avoiding the purchase of numerous hardware codecs, and getting perfect, linear audio delivered right to the transmitter sites.



Under conditions involving a clear microwave RF path, we proved that even very inexpensive IP radios can handle the "Near Perfect" requirements for Livewire AoIP networking. It has also been tested with four Livewire standard streams in each direction and found to work fine as well.

The IP radios used — Ubiquiti NB-5G22 NanoBridge M5 — were purchased for under \$100 each. Indeed the high-quality, outdoor-rated, shielded CAT-5e cable, shielded connectors, and CAT-5e surge suppressors cost nearly as much as the IP radios. The latter were so inexpensive that an additional pair was purchased for off-the-shelf backup.

MULTISTREAM

These IP radios are now carrying two Axia Livewire standard streams in each direction. At the far end (transmitter site) only an Axia xNode is there to convert the linear audio program streams into analog audio for two stations' audio processors.

In another real-world case — this one in Greenville, Miss. — reliable STL for four FM radio stations was needed from a studio in a small town of 35,000 to a new transmitter site, common to all four stations. The IP radio RF path crosses the downtown area, proceeds across a university's agricultural experimentation complex, and looks directly through a multicarrier cell tower close to the far end (transmitter site). The RF path is just over 13 miles long.

For this STL system, we chose a full-duplex IP radio, the Ubiquiti airFiber 5. To achieve full-duplex operation, this IP radio has two antennas at each end for full-time transmit and receive. This scheme reduces packet jitter caused by receive/transmit switching, making this full-duplex IP radio system behave more like a long run of Ethernet cable.

An Axia AoIP network already exists at the studio, serving all four FM stations. As such, only one additional xNode was needed for the transmitter site. This xNode brought the entire cost for a four-station linear STL system to about \$4,600, or under \$1,200 per radio station.

IP RADIO CONFIGURATION

The goal of proper IP radio system configuration is to obtain reliable data transfer from end to end. For the more stringent case of "near perfect" data transfer required for linear AoIP systems like Livewire, we have the additional goals of zero packet loss and very low jitter; in other words, we also want the IP radio link to operate like a wired connection.

The radios are set to operate without automatic adjustment of parameters. Such parameters include power level, frequency, modulation mode (or scheme), and distance-based parameters such as wait-time for the next send cycle (in half-duplex IP radio systems).

Experience has shown that by setting most, if not all, "automatic" functions to a manual mode, and configuring that manual setting properly, IP radios will happily operate continuously and without trouble, as long as the RF path remains viable.

One non-intuitive parameter shown on some IP

(continued on page 27)

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TECHUPDATE

SURF'S UP FOR MOSELEY'S MALIBU X5

Moseley Broadcast Malibu X5 is a four-channel stereo STL link that can handle wireless, IP or TDM links.

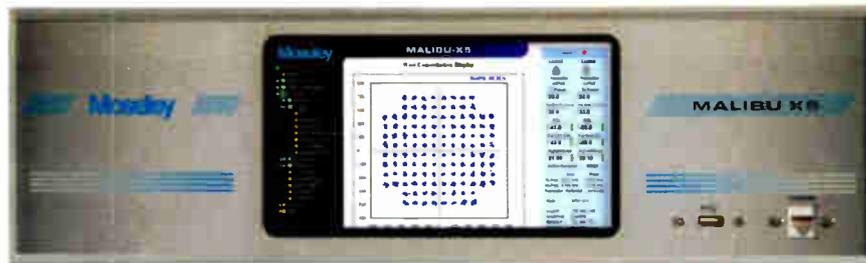
In certain situations it can utilize eight digital audio channels. It offers simplex, duplex, unicast and multicast modes.

Moseley says the Malibu X5 supports up to four stereo audio channels, each of which can be transported with up to 24-bit linear quality or with user-selectable source coding at user-defined sample rates. "Audio distribution, switching and failover are supported at both AES/EBU and analog audio levels. AES192 MPX Composite is also supported without compression." Traditional analog composite can also be transmitted digitally, delivering over 90 dB signal-to-noise ratio.

Major transport codecs are sup-

ported along with Gigabit Ethernet, AES/EBU digital and AES192 MPX, T1/E1. Also included are XPIC modems for additional transmission capacity. "Lite" versions will be available for users with simpler needs.

Management controls include forward error correction on each stream, packet size and adjustable jitter buffers.



The Malibu X5 has programmable alarms and silence detection. Redundant power supplies are provided. A large touchscreen interface operates the Malibu X5 locally; it

also operational via IP for PC and smartphone remote control.

For information, contact Moseley Broadcast in California at (805) 968-9621 or visit www.moseleysb.com.

(continued from page 26)

radios is the "Modulation Rate," "Max TX Rate. Mbps," or similar. This is referring to the modulation mode or scheme. It's a label or code which references the data modulation scheme and maximum bitrate using that scheme in a given RF channel width. Explanation and a list of these codes and parameters is given here: https://en.wikipedia.org/wiki/IEEE_802.11n-2009.

I settled on using a modulation scheme that results in a lower overall bitrate than the units are capable of, but more robust operation.

Our smaller system — with sub-\$100 IP radios — has been on-air for over a year. It's carrying two FM stations to our transmitter site in Mound Bayou, Miss. We've heard no dropouts in the on-air audio.

Our larger system — using \$1,000 IP radios — has been on since March 2016. We've watched it carefully during extremely heavy rain and have seen only about 2 dB in signal degradation. We've heard no off-air time, and that link is now carrying perfect, linear audio for four FM stations to a rural transmitter site in Heads, Miss.

The broadcast industry used to borrow technology from the telephony sector. Now broadcasters are using plenty of tech from the IT sector. Properly engineered it's working quite well.

For information, contact Cam Eicher at Axia Audio in Ohio at (216) 241-7225 or visit www.axiaaudio.com.

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Tieline Supplies Solid Links in Newfoundland

Bridge-ITs and Genies save big money for Canadian broadcaster

USERREPORT

BY SHAWN BASHA
Director of Engineering
Steele Communications

ST. JOHN'S, NEWFOUNDLAND — Steele Communications is part of Newcap Radio and its studios in St. John's are the hub for radio transmissions throughout Newfoundland and Labrador in Eastern Canada. These regions are vast, mountainous and sparsely populated, which creates a number of broadcast challenges. Apart from the extremes of weather, some of our transmitters literally take days to get to.

From St. John's we run AM and FM stations in Marystown, Clarenville, Gander, Grand Falls, Corner Brook and Stephenville, Newfoundland. VOCM (AM/FM) is the main station in St. John's and delivers various network talk programs to affiliates. K-Rock 97.5 runs a classic rock format and is also important for distributing a morning show.

BEGINNINGS

I first installed a pair of Tieline codecs about six years ago as a backup STL connection for sending IP audio from our studio in St. John's to our transmitter site in Carbonear, Newfoundland. The first Bridge-ITs replaced mono satellite links to three main STL sites in Labrador and we now have 20 Bridge-ITs installed as IP STL links across our network.

All connect using regular DSL internet links and their reliability is awesome. So much so that after running copper backup links for about a year (at \$550 per month), I took the plunge and decided to cancel them and run with the Bridge-ITs on their own. They haven't missed a beat since, saving us thousands of dollars annually. A single telco is used for all our DSL links and I suspect this one of the reasons the DSL links are so reliable.

Earlier this year I oversaw the upgrade of aging satellite equipment which needed replacing. This was a

major project that took around a year to scope and implement, but it has paid rich dividends.

We installed two Tieline Genie Distribution codecs in St. John's and they send audio to 12 Genie STL codecs at different sites. One Genie Distribution uses multi-unicast mode to transmit from VOCM to six Genie STL codecs at our AM stations. The other Genie Distribution codec uses multi-unicast mode to transmit from K-Rock 97.5 to our four FM stations. We also send return audio from the Grand Falls studio back to St. John's. We feed this back to the Genie Distribution units and use connection profiles to transmit to Genie STLs in Springdale and Baie Verte, which are repeaters of Grand Falls.

All stations integrate network programming with local programs. We use the control ports on the Tielines to accommodate split functions across the network. While the network stations are running network programming they split to local commercials and sponsored casts as required.

This project saw us integrate a massive fiber backbone to cover all our remote sites. Originally we had different providers delivering data in all regions, until we realized that Eastlink, the "cable guys" in our part of the world, also managed WANs for business customers. After negotiations and some cable upgrades near St. John's, we managed to consolidate our data requirements through Eastlink. This was for everything, not just our audio STLs.

LINKAGE

This allowed us to drop our satellite links and we now have 100 Mbps links to each studio and 1 Gbps return paths for audio and other data requirements to our head office in Dartmouth, Nova Scotia. We have configured network QoS to guarantee the bandwidth allocated to our codecs while streaming and the links run flawlessly. We could run linear uncompressed audio if we wanted to, however we are impressed with the performance of Tieline's Music Plus algorithm and this is more than adequate for our requirements.

Many of our hubs like Grand Falls have repeaters and before installing the Tieline Genie Distribution and STL



services through Eastlink.

We have configured all our Tieline codecs with static IP addresses, which allows us to remotely monitor and configure them using Tieline's Toolbox browser graphical user interface. We also recently upgraded all our Bridge-ITs with new firmware so we can take advantage of Tieline's HTML5 web interface.

Satellite is an expensive beast and I would encourage engineers whose networks have large outlays for satellite or leased lines, to investigate IP alternatives. With the Tieline IP codec equipment our network has realized enormous savings and this will allow us to invest in other equipment. Our example shows you can successfully implement IP solutions over both managed and unmanaged IP networks — even if repeaters or transmitters are in extremely inaccessible remote locations.

Newcap Radio has made the decision to roll out similar Tieline setups across the country over the coming months. This is due to the success of the Newfoundland and Labrador networks, and their ability to provide network programming while splitting local commercials at a much lower cost than satellite.

For information, contact Tieline USA in Indiana at (317) 845-8000 or visit www.tieline.com.

TECHUPDATE

DIGIGRAM ADDS TO IQOYA *CLOUD WEB APP



Accessible from anywhere via the web browser of any connected device, Iqoya *Cloud provides an integrated master control room application, according to Digigram. It's built on a secure SIP broadcast infrastructure that makes it easy to deploy, configure and control a fleet of IP audio codecs.

It supports efficient real-time monitoring of registered ACIP audio over IP codecs across the network. The centralized, cloud-enabled tool allows control room operators to accept and initiate calls, monitor current codec status and deploy and configure codecs on the fly.

A new software-as-a-service version brings cloud benefits to small- and medium-sized radio operations. The enterprise version (a virtualized platform of services) is engineered for broadcasters willing to integrate the whole application into their own IT systems with support from Digigram Professional Services.

Integrated with Digigram's Iqoya *Call and *Call/LE audio over IP codecs in MCR or OB vans, Iqoya *Cloud is a solution to create seamless outside remote broadcasting, the company says.

For information, contact Point Source Audio in California at (415) 226-1122 or visit www.point-sourceaudio.com or www.digigram.com.

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TECHUPDATES

DAWNCO "SPLITS" WITH DIVINSUP

Satellite communications equipment provider Dawnco says that its "DivinSup" satellite signal splitter might have a funny name, but it has some serious features that help broadcasters efficiently feed signals to multiple satellite receivers.

The name tells users what the device does for your satellite signals: it's a *divider* and an *inserter* and a *power supply*. When users install a 1RU rack-mounted DivinSup unit in the control room, signals from an LNB are divided to feed up to nine satellite receivers.



The DivinSup features an internal amplifier to compensate for losses in signal splitting, resulting in zero through loss and proper signal levels reaching each receiver. When users need to feed more satellite receivers, a second DivinSup unit can be added to provide signals to up to 18 receivers.

The unit features a power supply and DC power inserter, allowing users to connect the LNB signal cable and feed the proper 18 VDC power back up the signal cable to power the LNB. Everything is tidy when signal wires running between the satellite dish and receivers converge on a new rack-mounted DivinSup unit.

Front panel status lights monitor the LNB health.

For information, contact Dawnco in Michigan at (248)391-9200 or visit www.DAWNco.com.

BUYER'S GUIDE

COMREX OFFERS BRIC-LINK II

The Comrex BRIC-Link II is described as a low-cost, high-performance IP audio codec for point-to-point transmission. It provides an elegant solution for moving linear or compressed audio with low delay over a wide range of IP links. Comrex says that the BRIC-Link II maintains superb audio specifications and hardware reliability, making it suitable for STLs and other mission-critical applications. It also offers streaming server capabilities.



BRIC-Link II works on a variety of data networks including T1/E1, ISM band IP radios, satellite, WANs and LANs, and public internet connections. It also offers a variety of codecs, including stereo and mono linear mode (with no audio compression), FLAC modes, AAC/HE-AAC modes, Opus, G.711 and G.722. In linear modes, BRIC-Link II offers delay of less than 25 mS, or less than 30 mS in FLAC modes.

Users control BRIC-Link II through a web interface. By logging into BRIC-Link II through a browser, users can view connection status, extensive network diagnostics and audio level meters for remote monitoring. Users can configure profiles for various connections with point-and-click commands from any location.

BRIC-Link II is compatible with smartphone applications, including Lincphone and Lucif Live. This makes connecting to the codec from a smartphone quick and easy, for simple drop-ins and spontaneous remotes.

For more information, contact Comrex in Massachusetts at (978) 784-1776, or visit www.comrex.com.

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Exstreamer Provides Cost-Effective STL

Solid reliability is a winning feature for Wisconsin's Metro North Communications

USERREPORT

BY MARK HELLER, CPBE
President
Metro North Communications Inc.

TWO RIVERS, Wis. — Metro North Communications' WEMP(FM), 98.9 MHz, is a fairly new FM station licensed to Two Rivers, Wis., featuring an easy listening format. The station piggybacks on a tower used by its sister station, WLKN(FM) 98.1. Both stations are located on the western shore of Lake Michigan, in Manitowoc County. While WLKN's transmitter site is less than four miles from its studio and offices in Cleveland, Wis., the studio for WEMP is eight miles in the opposite direction.

I built the station from the ground up, and looked to Internet-based audio

delivery for the studio-transmitter link to overcome obstacles at our tower that precluded a microwave solution. A regional cellphone provider was renting on the



WLKN tower for many years before WEMP arrived. This created a real challenge for locating a second microwave STL antenna, not the least of which was wind load on this older tower structure that dates back to the mid-1980s. IP audio also seemed appealing for giving us the digital audio quality I desired.

SOURCES

I first learned of Barix IP audio solutions, now distributed in the U.S. by LineQ, from two rather uncommon sources. The first was a Midwest grocery chain. It uses Barix devices to send audio to their grocery stores from their home office, with the ability for headquarters

to customize ads and other announcements in each store. I received a second glowing reference from a Dallas-based church that was using Barix equipment to do Sunday remote broadcasts over a Detroit area radio station.

These references sold me on Barix and the viability of IP audio for our

STL. I chose the Exstreamer 1000 IP audio decoder/encoder, as it delivers the deepest feature set of the Exstreamer family, including providing four contact closures. While not used in WEMP's initial deployment, the future flexibility of using the contact closures for rebooting equipment or monitoring was notable in our choice of model. We purchased two Exstreamer 1000 units: one as the encoder in our studio, and one as

the decoder at our transmitter site.

Configuring the Exstreamer units was straightforward through Barix's intuitive browser-based interface. The controls were easily accessed from the studio by using the station's PC, while a laptop at the transmitter site provided similar setup convenience. I configured static IP

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WHO'S BUYING WHAT

AVT DELIVERS MAGIC CODECS TO RADIO NRW

Radio NRW provides programming for 45 local radio stations in North Rhine Westphalia, Germany. It is using the new AVT Magic ACip3 as a central backup and distribution system for those programs.

If the main satellite link fails, two redundant systems at Radio NRW central operations in Oberhausen activate to distribute programming to individual or all local studios at the same time.

The Magic ACip3 backup is implemented via an audio over IP SIP dial-up connection which is established automatically within seconds from the local stations' in response to a loss of signal alarm.

To compensate for different delays between the individual local studios, all Magic ACip3 systems in the local stations are synchronized using NTP. In addition, via an integrated data channel additional switching commands can be transmitted from the central location to the local units.

Central monitoring and management software allows a quick overview of the complete system status. Complete monitoring via SNMP is also possible.

To ensure flawless functionality in the, hopefully rare, case of failure, an automatic daily test of the backup path is executed.

Naturally, even if there are no emergencies, the local studio can make use of their Magic ACip3 codecs for standard audio codec duties.

For information, contact AVT in Germany at 011-49-911-5271-0 or visit www.avt-nbg.de.



addresses at both ends and reinforced security with a strong password. To give us the studio-quality audio we required at the transmitter plant, I set the Barix box to deliver MP3-encoded audio at 192 kbps, which was the highest bitrate that our internet service provider at the time could reliably keep up with.

Not only was setup easy, but once the units start working, their reliability and resilience to any internet disruptions mean you can sleep confidently all night. In the rare event of the loss of the internet circuit, the units automatically "ping" each other until connectivity is reestablished, allowing minimal downtime.

In addition to the system's reliability, the Barix STL solution has also delivered the audio quality we wanted. WEMP's easy listening format requires full dynamic range, without static interference and fade. As a non-microwave solution with digital audio, the Barix Exstreamer proved to be a perfect, cost-effective solution from a reliable supplier.

Since installing the Barix Exstreamer STL solution a year and a half ago, I continue to learn of other satisfied Barix users in our region, including a regional Wisconsin sports network feeding multiple affiliates from one sending unit at its studio. This type of future-proof flexibility further validates our choice of Barix as our IP audio codec supplier. There are a variety of options available for internet-fed audio, but for the price, reliability, quality and ease of installation, in my experience the Barix Exstreamer 1000 is the best in the field.

For information, contact Brenda Stadheim at LineQ/Barix at (866) 815-0866 or visit www.barix.com.

TECHUPDATE

IDC UPDATES STAR RECEIVERS

International Datacasting Corp. has been adding features and functionality to its radio distribution platform to help networks reduce cap-ex and op-ex items. It says the enhancements are aimed at

broadcasters transmitting via satellite to unattended FM transmitters in addition to staffed sites.

The company says unstaffed transmitter sites are becoming more common as networks seek to optimize network implementations and reduce costs.

IDC's in-band NetManager satellite distribution network management system has been updated to permit over-the-satellite disabling of transmitters in case of failures, to meet evolving requirements of regulators such as the FCC. The new NetManager features allow the maintenance and engineering staff at the studio origination site to disable any defective transmitter in the network, then re-enable the transmitter once maintenance is completed.

Unmanned transmitter operation is made more cost-effective with new pre-emphasis and limiter features in the IDC's Star audio receivers. Networks can reduce the cost and complexity of transmitters by moving these functions to the Star receiver where they are provided at no charge, the company says.

In addition, the same satellite network can deliver both flat (non-pre-emphasized) audio to studios as well as pre-emphasized and limited audio to transmitters, all at the appropriate respective audio levels.

For information, contact International Datacasting Corp. in Ontario at (613) 596-4120 or visit www.datacast.com.



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AudioTX STL-IP Plus Delivers the Signal

SureFlow 5 technology impresses Chicago broadcaster

USERREPORT

BY FRANK MCCOY
Chief Engineer
Salem Media Chicago

CHICAGO — The AudioTX STL-IP Plus is a novel twist on IP program delivery. As engineers, we all recognize that the connection from studio to transmitter is probably where our programming is most vulnerable. Usually it involves one or more outside connectivity providers. Failures often have us waiting on hold, opening trouble tickets and other time-sucking activities that we can ill afford. The answer up to now has been redundant delivery schemes — perhaps keeping that old equalized telco circuit as backup for the T1.

But with T1 service facing sunset, what to do? We all know that IP delivery schemes suffer from dropouts. The promise of 0.99999 (five nines) reliability should mean arithmetically less than a second of outage every week. But when the data passes through a hundred devices along the way, that percentage is degraded further. Sometimes I think that ISPs just make up their statistics anyway. As evidence, where I've used simple codecs with low latency like the Barix and equivalents, short delivery interruptions occur pretty regularly. This just isn't acceptable where I work.

MULTISTREAMING

So I started looking around for something better. Intuitively, I knew I was looking for a product that supported multiple IP streams and that could switch between them seamlessly. The



odds of both streams being interrupted simultaneously seemed low. Any such solution would have to time-align the received packets, since data packets traveling different IP routes might get there at different times. This dictated that a buffer be employed on the receive end, allowing time for the receive codec to recognize a dropout and act to fix it. There are now several products that do just that, supporting two identical streams that the user can direct over separate paths. These devices provide separate RJ-45 jacks on the backplane, further increasing redundancy.

The problem with this "Version 1" architecture is that it fails to acknowledge that different IP paths have differing throughput capabilities. Maybe you have a DSL and a cable modem circuit at the transmitter. Or maybe it's a 54 Mbps Nanobeam and a DSL. Whatever you have, it's reasonable to assume the throughput and reliability will be different for different methods. Being locked into one coding algorithm and one data

rate for both routes means you must choose the worst performer for all.

The Audio TX STL-IP Plus recognizes this weakness. Lime Broadcast, the manufacturer, started over in how audio delivery is handled. They designed what they call SureFlow 5. Instead of two identical streams, it allows as many

The IP stack in the device allows the user to route outbound data to separate upstream gateways for each stream.

as five — but the truly revolutionary feature is that users can choose the coding algorithm and bitrate for each stream independently and assign the order of preference for use in the audio output. In addition, the IP stack in the device allows the user to route outbound data to separate upstream gateways for each stream.

The devices are, of course, full-duplex.

In Chicago I have a 100 Mbps duplex 11 GHz link between studio and transmitter and a Comcast cable modem at the transmitter site, along with 6 Mbps office-type MPLS at the studio. I am running four simultaneous, fully-redundant streams from studio to transmitter.

First up is a 48 kHz linear PCM at about 1.5 Mbps, just like the old Intraplex this system replaced. Next is a 320 kbps MP2, also on the 11 GHz link. Yep, two streams on the same medium. Why? Because the statistical probability of both streams suffering a dropped packet *at the same time* is pretty low; in fact, this adds more "timing-diversity" than you might imagine as the different streams have differing packet sizes and encoding latencies too. Streams three and four exit the studio via our ISP. One is a 320 kbps MP2 and the other is a 64 kbps MP2, again sharing the same outbound route and arriving via the Comcast cable modem. This plays the odds of packet drop in the Comcast world.

All this is accomplished by embedding metadata in the streams with time sync marks that the receive AudioTX STL-IP Plus uses to time-align the

received audio. All four streams are decoded to AES and any required substitution happens only then, seamlessly, in the order of preference established during setup.

The device has a bunch of other features, like setting packet size for each stream, logging, email alerts, contact closures and all the other things you'd expect. But this strategy of allowing simultaneous delivery across multiple paths with data rate and packet size chosen to match the path characteristics has made the performance bulletproof.

I was a little surprised that this design wasn't protected by a patent. From what I know, it's probably too late now. So look for other makers to copy the idea eventually, though the DSP-based designs now popular lack the computing power needed, or this function would probably be offered as a firmware upgrade. So for the foreseeable future, if you are looking for a solution that addresses the real world statistical probabilities of IP delivery, this is your answer.

For information, contact Mo Dutta at Lime Broadcast Group in England at 011-44-121-256-0200 or visit www.stl-ip.com.

TECHUPDATE

DOUBLERADIUS INC. MAKES IP STLS SIMPLE

DoubleRadius has introduced a new piggyback or underbuild solution that adds IP throughput to existing 950 MHz STLS.

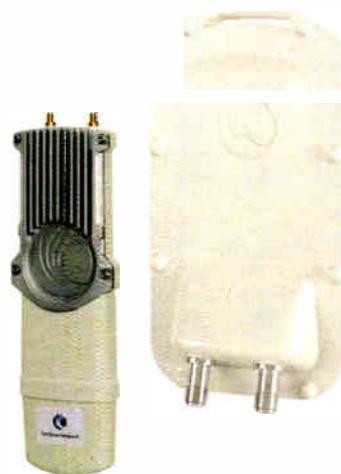
By diplexing a 902-928 MHz bidirectional IP radio DoubleRadius can now bring a transmitter site to a user's local area network, making audio over IP easy. No tower climb needed

Current deployments are seeing between 5-20 Mbps of connectivity between the studio and transmitter sites, some of these tests have been greater than 20 miles. Because this is a Layer 2 solution it can carry audio, remote control data, VOIP, and internet data with no trouble at all.

This solution is a huge benefit to the industry. It allows broadcasters to eliminate high-priced leased lines. Eliminate the unreliable internet connection and add something that works, something you own, something reliable.

DoubleRadius offers this in two versions, a simple point-to-point, and a multipoint configuration for those that have more than one 950 STL in use.

For information, contact DoubleRadius in North Carolina at (704) 927-6100 or visit www.doublerradius.com.



APT Multichannel Makes Connection at Rice

Digital MPX to transmitter is a winning feature for school broadcaster

USERREPORT

BY ROB MEUSER
Chief Technology Officer
Engineaux Inc.

HOUSTON — Engineaux Inc. is dedicated to implementing new technologies. As CTO, it's a real passion of mine to get involved in cutting-edge deployments.

In this role, I recently designed and specified equipment for one of the first digital MPX over IP studio to transmitter links in the United States, for Rice University's KBLT(FM)/K-TRUE, in Houston.

KBLT was looking to set up a completely new connection; searching for the best way to use existing fiber infrastructure for the STL link while meeting IT standards. We wanted the full MPX baseband to be passed from the studio via IP over fiber. This was, in part, to keep active devices at the transmitter site to an absolute minimum.

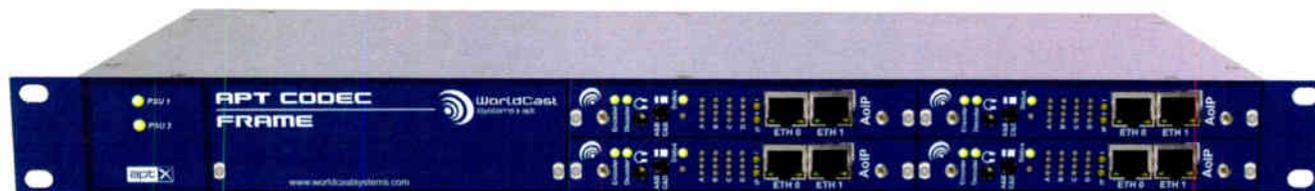
DIGITAL MPX

To my knowledge, there are only three codec models available offering digital MPX over IP, and we had to find the one most suitable for our needs. While cost is always a consideration, we also had to look at the features and overall effectiveness of the solution.

We selected the APT Multichannel

codec. It was competitive on price and offered the reliability we required as well as, critically, SNMP features for remote control. This eliminated the need for a separate remote control system, which lowered the cost of the total

learned that there was only one fiber path to the transmitter site. Since this is dedicated, point-to-point dark fiber, the single path is highly reliable. However, if there were alternate paths such as two diverse IP radio links, I would recom-



This deployment is believed to be the first APT system in the U.S. to use the digital MPX option.

solution and was in keeping with our goal of minimizing active equipment at the transmitter site.

We used the composite AES digital multiplex option on the APT Multichannel codec with studio-generated RDS embedded in the digital composite. GPIO is also used.

We did initially consider using APT's SureStream technology to strengthen the reliability of the link but then

mend SureStream in this application for seamless diversity.

I understand that this deployment was the first APT system in the U.S. to use the digital MPX option, and I believe there are no more than six operating in the country at present.

Our experience installing the APT system was straightforward, and when we did have an issue with option licensing, Tony Peterle in the Miami office went

above and beyond to straighten it out.

While developing their MPX option I learned that APT worked directly with the German ARD Group in developing the active OMC (Over Modulation Cancellation) Technology.

OMC means that if the MPX IP stream is interrupted due to a "Loss of Connection" event or dropped packets, there is no possibility of an overmodulation of the RF carrier due to sharp signal

transients caused by the network.

The OMC algorithm prevents the occurrence of high-energy peaks by means of a moving average filter. It suppresses any harmonic frequency above the 15 kHz spectrum, and the RF deviation will not exceed the allowed limits (2 percent). Crucially the OMC algorithm only acts on dropped packet(s) and does not alter the original signal in any way in normal operation.

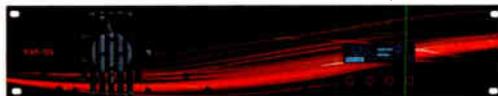
So far, the APT units have been flawless, stable and reliable and, in the long term, the use of digital MPX is helping Rice University make significant savings by reducing the manpower required to maintain the plant.

For information, contact Tony Peterle at WorldCast Systems in Florida at (305) 249-3100 or visit www.worldcastsystems.com.

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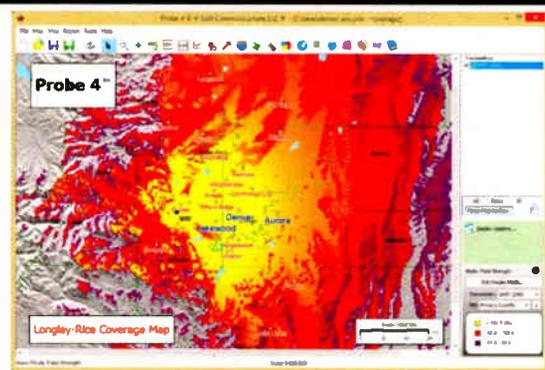
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CCA FM8000G Trans 107.9, great cond; 4-Bay Jampro antenna w/deicers; 3-bay Shively antenna FM. D Brockman, 606-965-3436.

SC48 Marti STL Antenna, \$600.00, and an XLink STL Frequency Agile Receiver, \$750.00, new, both in original

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DIY-DJ Version 2.0 is now available. Over 500 copies of DIY-DJ, a Linux based radio automation system, have been distributed and now version 2.0 is available. Voice tracking, join satellite feeds, do unattended sports and remote events, temperature announce, scheduler, automatic cut editing on import, and much more. It's FREE. If you are using version 1.0 or would like to try DIY-DJ, go to krwsfm.com, register and download your free full version. The only thing we ask is that you let us know if and how you are using the software. Call (406) 679-0527 or email krws@digitaldevelopment.net for a copy today.

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Looking for a broadcast excerpt of a San Francisco 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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Don't Underestimate Radio's Enduring Strengths

Despite its challenges, radio remains an important part of most advertising plans

COMMENTARY

BY MARK FRATRIK

The author is senior vice president and chief economist at BIA/Kelsey.

Throughout nearly a century of operating, commercial radio has faced an array of challenges — from initially convincing local and national advertisers that airing audio advertisements would work, to combating over-the-air television and then cable television, to the most recent entry of online/digital audio consumer options.

Growing competition affects the public's usage of local radio stations, and the stations also face increased challenges in the local advertising marketplace in which they operate. Smaller audiences and the slowing of over-the-air advertising revenue growth have led to decreases in the values of local radio stations and the public companies that own them.

Radio serves as a megaphone to the local market and has an established relationship with its audience and advertisers.

Despite these challenges, radio is holding its own and maintaining a prominent position, both for listeners and advertisers, in the local marketplace. Radio serves as a megaphone to the local market and has an established relationship with its audience and advertisers.

To put the most recent local radio industry revenues in perspective: In the late 1990s and early 2000s, the local radio industry experienced substantial double-digit annual increases due in large part to the consolidation allowed under the new ownership rules. After those strong years, radio industry revenues grew slightly.

During the most recent recession starting in 2008–2009, radio revenues declined substantially, similar in size to those of other local media. In 2009 alone, radio station revenues declined

by nearly 20 percent. The following year radio industry revenues recovered somewhat, growing by nearly \$800 million (+5.5 percent).

Since then, total radio industry revenues have remained relatively constant, with over-the-air advertising revenues either holding steady or decreasing by a few percentage points. Online/digital revenues generated by local radio stations have shown much stronger growth, mitigating some of that decrease.

In a new report by BIA/Kelsey, “The Position of Local Radio Stations: Trends for 2016 & Beyond,” we examine the state of radio and reveal some of the top reasons radio is remaining relevant.

For example:

1. In the context of all local media that compete for advertising spending, radio ranks fifth, showcasing it is easily seen that radio is still an important part of an advertising mix.
2. Soft over-the-air revenues are being improved by growing online revenues because stations are offering more appealing digital offerings.
3. Over 34 percent of advertisers rate radio as “excellent” or “extraordinary,” as revealed by our most recent Local Commerce Monitor study of the advertising and marketing decisions of small and medium-sized businesses.
4. Local radio stations are trying to expand and improve the over-the-air reach of their signals through greater use of FM translators, the adoption of HD Radio services, and over-the-air reception on smartphones. They are also attempting to expand their listener base by streaming their own content over the Internet.
5. VIP industries like automobiles, finance and insurance and technology companies spend close to \$6 billion collectively a year on radio advertising.

Even with all these positives, certainly the local radio station industry is not in the same position as it was in prior years, and challenges remain ahead that the industry must stay attuned to. Competition continues to erode its place in the audio entertainment and information marketplace, as well as in local advertising. Yet radio remains an important part of most advertising plans.

With the correct attitude toward the new reality, strategic planning and a continued focus on delivering valuable

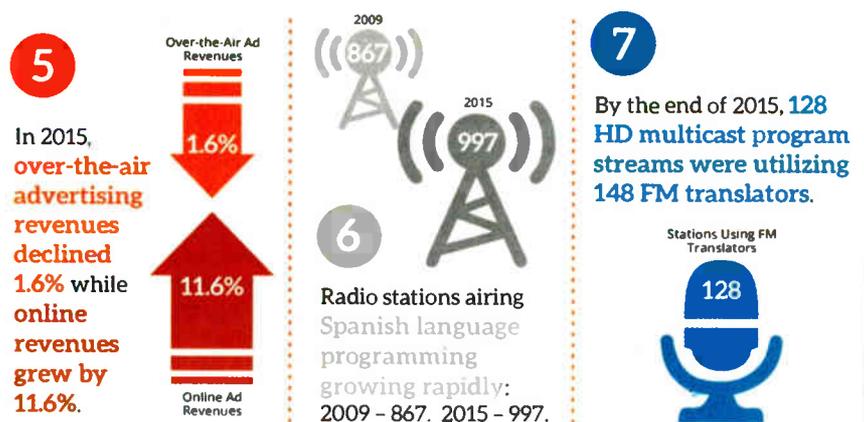
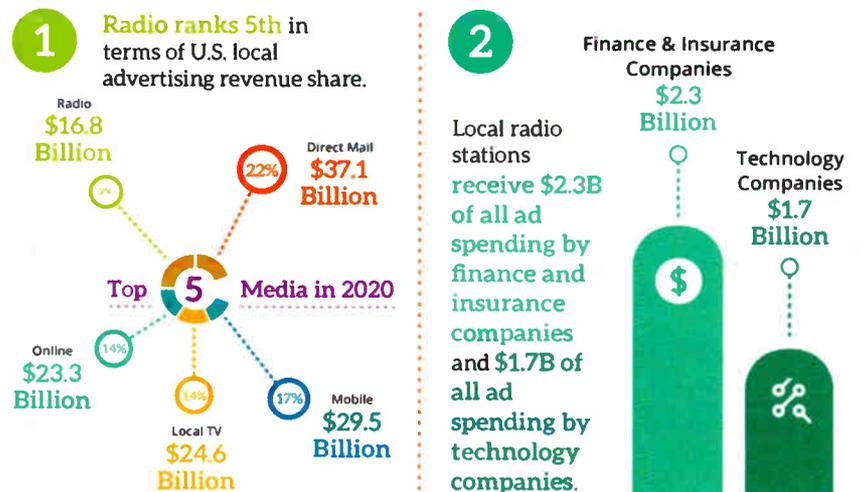
digital offerings, local radio stations can prosper and thrive.

BIA/Kelsey's report “The Position of Local Radio Stations: Trends for 2016 & Beyond” is an assessment of the industry intended for those focused on

the trends and direction of local radio, including groups and financial institutions and companies building interactive digital solutions. It is available for purchase at <https://shop.biakelsey.com>, search “Local Radio.”

State of the Radio Industry 2016

TOP FACTS



BIA Kelsey

Source: BIA/Kelsey U.S. Local Advertising Forecast 2016, five-year forecast delivering national overview of total U.S. spending in local markets and individual breakdowns for direct mail, local video, local over-the-air television, local cable television, out-of-home/OOH video, newspaper, online, radio, mobile, directories, social and magazines

READER'S FORUM

FINDING THE POSITIVE

The story on radio finding the positive ("You Have the Power. Use It or Lose It." RW April 27) was a good one.

Much of radio is automated and non-creative. Here at FaithAndFriendsRadio.com in Dayton, Ohio, we launched a personality-driven contemporary Christian music internet station in 2011. After working many years in top 40 and news, and at a 50,000 watt local Christian station, I saw the technology zooming quickly to the internet.

We have engaging hosts 6 a.m. to midnight. Melody Morris and I have co-hosted a morning show in the Dayton market for 17 years. There's local news and traffic, weather from a local TV meteorologist and Fox News Radio 24/7. In 2014, we were the first internet-based radio station on the iHeartRadio app.

Our desire for compelling, creative programming includes "Hands Of Time," a one-on-one with legendary artists; "Cross Connection," examining a pop hit for spiritual value; and "Kaleidoscope," a live radio variety show done on location with live house band, audience and live ad lib commercials — it's from a bygone era yet it works well today. These one-hour shows feature a major artist who is in town or who visits for an interview and several songs.

This was launched and produced by my company in 1999 and continues today.

While worldwide and so far heard in 177 countries, we keep a local focus, to serve the community with annual events like our 100-mile bikeathon for charity and the annual Chocolate Festival. We have the privilege of promoting God's love and doing so in positive and creative ways.

Bill Nance
Co-Manager
FaithAndFriendsRadio.com
Dayton, Ohio

AM RADIO REMINISCENCES

When I was a kid in the 1960s, I knew almost every radio station jingle on the AM band and could spit out call signs for almost every spot on the dial. During the day, I listened to Wibbage Radio 99 WJBG in Philadelphia, but when dark fell so did their power, so I spun the dial and found those stations that made it to Bethlehem, Pa.! From WLS in Chicago, WBZ in Boston, WOWO Fort Wayne, WARM in Wilkes-Barre and Scranton, CKLW in Canada, to name just a few. And I could listen to New York's WABC, WNBC and WOR almost anytime. In those days, AM radio was *king*.

After reading "How to Make AM Revitalization Better" (RW April 27), and remembering that Bethlehem's only AM radio station WGPA goes away at sunset, I've got to agree that allowing all those stations more power, at least the ones that can afford it, will do more harm than good for what is left to the AM band.

Most Saturday nights in the recent past, I listened to Mark Simone when he was on WABC in New York. If I was on the road, the car radio worked. At home, I listened online.

Also when I am on the road, I try to catch the CBS Evening News on KYW 1060 Philadelphia at 6:30 p.m. Sometimes it comes in better on WBZ 1030 Boston. There's too much interference in today's world already.

One last thing: FM translators, I think, could do more good and cost less for local AM radio. Recently, I found WODE Easton 99.9 FM was operating a translator on 94.7 at a reported 10 watts. I found that I could listen to that station many of the places that I traveled to locally just as well as their regular frequency. They have since replaced it with WWYY, but I was impressed with the signal.

Also, how many FM low-power slots are left in many areas? Of course, I think HD2 slots are great spots too, but you need to be in a good signal area and have an HD Radio! And what about using the expanded AM radio band?

Mark D. Withers
Bethlehem, Pa.

LOW POWER

The FCC commissioners should immediately consider fairer protections for LPFM stations. The need is demonstrated by the experience at WDPE(LP) in Dover, Ohio.

I consult to this low-power FM, which is licensed to Dover-New Philadelphia Educational Broadcasting. WDPE was over five years in the making and went on the air July 13, 2015.

But in May 2016, the FCC granted another licensee approval to relocate an FM translator so its daytime-only AM station might enjoy the benefits of a second FM. WBTC(AM) in Uhrichsville, Ohio, is co-owned with 95.5 WNPQ, licensed to New Philadelphia, Ohio. Many years earlier the owner decided there was more money in relocating the transmitter to better cover a much larger market (Canton) and rebranding the station as a Canton FM. Naturally, the owner, like many others, lays claim to being a struggling AM and applied to relocate 101.9 FM as his translator, as is now allowed by FCC rules.

WBTC as a 250-watt AM daytime-only station could benefit from this improvement — but at whose cost? With our LPFM only recently licensed at 102.3, we worry about the overlapping contours of our signal and that of WBTC in the same cities. Though technically things look good, this is always under the idea that proper engineering is being maintained and modulation limits are followed. Perhaps I'm just old enough that I remember the days where stations weren't so closely spaced to allow for a cleaner band.

If WDPE were anything but an LPFM, there'd be consideration about the potential interference; but no, not for an LPFM, because §74.1204(a)(4) says translators are not required to protect LPFM second adjacent channels.

This development comes after five years of many people working together to create a community sta-

tion whose mission is to offer anyone the opportunity of education in communication and music, and a secondary mission to be "the voice for all non-profits in the DoverPhila area." Non-commercial, educational, community and local.

But now an AM daytime station that is not in Dover or New Philadelphia, owned by a person who earlier moved and promoted an existing FM to a larger market 20 miles to the north, is now rewarded with a second FM.

This translator is to be 398 feet above ground level and operating at 250 watts, the same FM power as the AM, while WDPE's antenna is about 50 feet above ground level operating at its 100 watt ERP. On paper, the FM translator matches the contour of the AM signal; in real life, I have to believe it has much better coverage than an AM station with 250 watts on 1590.

As someone who has been in radio and TV since 1979, I've often had cause to question the fairness or good intention of the rules; but this one hits close to home. WDPE has few legal rights here thanks to the nearly zero protection afforded to LPFMs.

I do understand and agree with AMs receiving FM translators but I suggest certain restrictions. The AM station should be a stand-alone and the rules should be configured to avoid "dipping into the well twice." Also, the broadcaster in question should be required to demonstrate actual local community support/commitment with a minimum of live programming, just as LPFMs are required to show. I'd also suggest that stand-alone AMs also be prohibited from applying if they had an FM but sold it off, another form of "dipping in the well twice."

Dan Slentz
Miami Beach, Fla.

Dan Slentz is a Radio World contributor. Opinions are his own.



READER'S FORUM

NEXT-GEN ENGINEERS

I appreciate your series "Younger Engineers Defy Common Wisdom." I remember an old TV commercial where two job candidates sat next to each other in a waiting area. One was a young college grad, the other was older and seasoned. The question was "Do you want his eager energy or his vast experience?"

On the eve of our 40th high school reunion I arranged with the principal for the reunion committee members to tour the building. I was initially dismayed to see the electronics lab no longer had the high voltage power supplies, tube type oscilloscopes, RF and audio oscillators, VTVMs and so on at each workstation. Now it was a computer lab. Upon further reflection it occurred to me that equipment is what was in common use in my time (1969-1973). It is no longer.

Today's broadcast engineers must be fluent in IT and network technologies. That is the present and the future. On the other hand the program audio must be

delivered to the audience. This is accomplished by the transmitter. Transmitters of the past employed tubes where as most of today's models are solid state. The transmitter produces RF which is fed to an antenna. The engineer must also be familiar with RF technology in order to diagnose problems and ensure proper operation.

I totally agree with the sentiments of thinking outside the box and coming up with creative solutions. I have mixed feelings with seeking out help with a problem from someone who may have faced the same issue prior. Experience is the best teacher and unless the situation is critical it may be best to resolve it on your own and value the lesson learned.

The sole purpose of this email is just to express my appreciation for the article. The perspective is enlightening. When I wired studios I used (expensive) multipair audio cable. Today an inexpensive CAT-6 cable is all that is needed. Crosspoint AOIP allows more features at less cost and greater flexibility. Progress....

*Thomas G. Osenowsky
Radio Engineering Consultant
Brookfield, Conn.*

What about all the engineers over 40 who have all the knowledge and expertise in repairing transmitters, consoles and all the other equipment that's 20 + years old that's still being used in stations?

Most, if not all, new engineers are IT techs and just want to replace modules and not fix or repair problems that may or may have caused the malfunction to begin with. Are we going to be called on to teach these youngsters the dos and don'ts of correct repair of said equipment?

I have seen this happening already. They don't want to work on something that they may have to correctly identify a bad part and (god forbid) unsolder it and resolder in a new one.

I'm 58 and grew up on replacing parts down to the resistor, diode, capacitor and all the other small and tiny parts that make the world go 'round.

The new guys want new transmitters and new boards and all new equipment so all they have to do is pull a module if there is one and replace it, or replace the whole unit. I don't call that engineering work; I can teach a chimp to pull modules and replace.

*William Boyd
Contract Engineer
Boyd's RF Engineering
Asheville, N.C.*

PRESERVATION

The recent meeting of the Radio Preservation Task Force was inspiring to people like me who've been working for years to preserve air checks and memorabilia.

After putting together a rather extensive collection of St. Louis radio tapes, I'm branching out to gather material from outstate Missouri stations so we can preserve what was done in smaller markets and places like Springfield, Joplin, etc.

With the help of the Missouri Broadcasters' Association we are beating the bushes to find old recordings. Most stations, as you might assume, have long ago discarded them, but individuals (engineers too) have kept them.

I'm hoping Radio World will help me get the word out. We will take anything from Missouri, and I'll make sure the airchecks are routed to the proper radio archive for digitizing and preservation.

*Frank Absher
St. Louis, Mo.
history@swbell.net*



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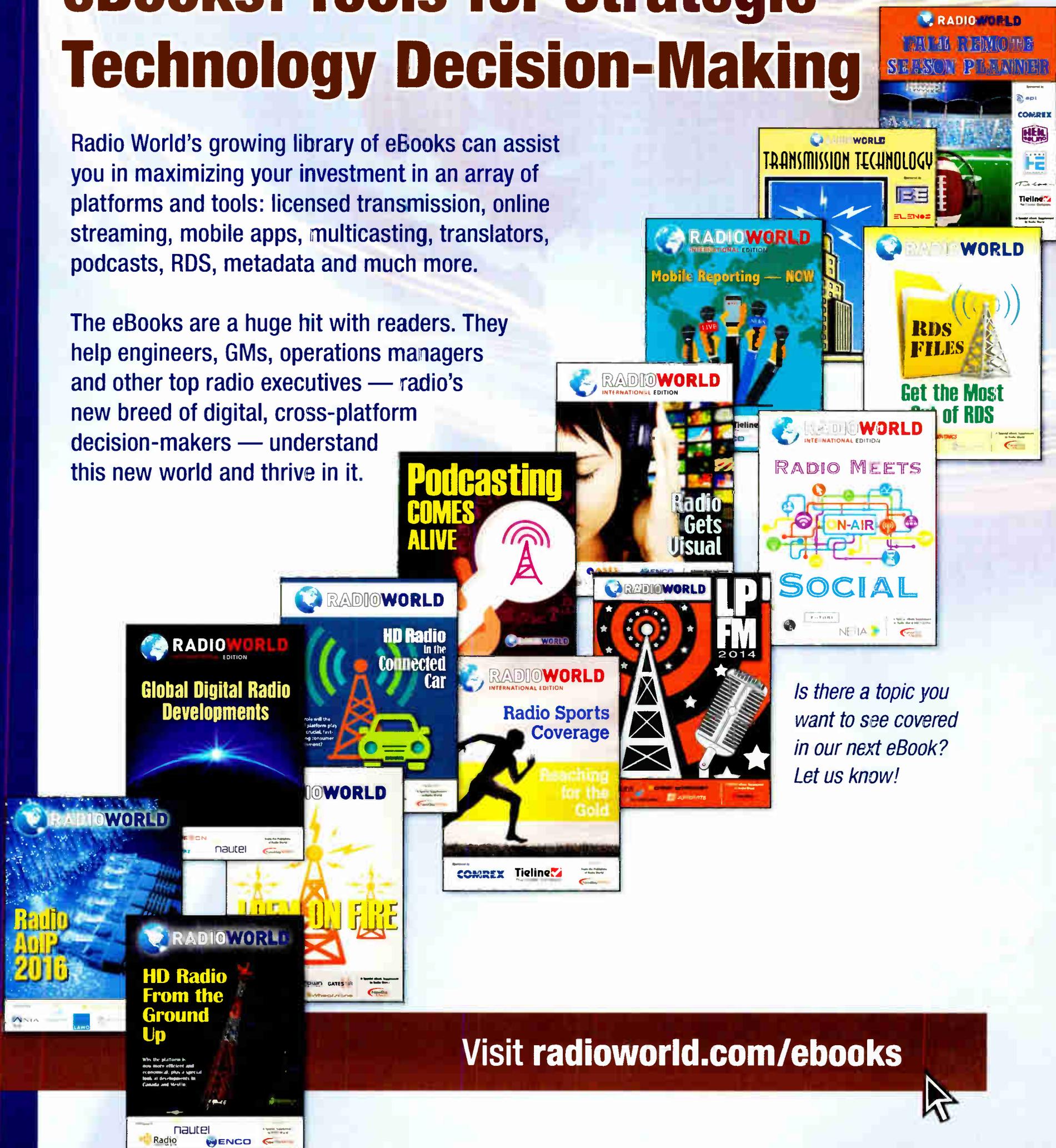
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