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- Written by two guys named Mark. — Page 22

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FCC Seeks RF Harmony With OSHA

More signage and training anticipated as part of updated RF safety rules

BY SCOTT FYBUSH

A rulemaking proceeding underway at the FCC could mean more signage around radio facilities and more training for tower workers, but experts believe it's unlikely to result in any major changes for the way most broadcasters operate.

"It's really a mass of little corrections and changes," said Lawrence Behr, chairman of LBA Group Inc., speaking about the FCC Report and Order published in the Federal Register in June.

The report comes nearly a decade after the commission opened a proceeding in 2003 to investigate proposed changes in its rules concerning "Human Exposure to Radiofrequency Electromagnetic Fields." That proceeding lingered at the commission until just a few weeks ago, when the FCC issued the R&O along with a Further Notice of Proposed Rulemaking in the original docket (ET Docket 03-137) and a new Notice of Inquiry that opens a fresh docket, ET Docket 13-84.

This split enables the agency to consider two topics. In the original docket, the NPRM will examine how the FCC determines compliance with its existing RF exposure limits, while the new docket will examine whether those limits are still appropriate "in light of more recent developments." (Some changes, like clarification of existing rules, specifically for RF safety training, become effective Aug. 5.)

While this all sounds like the sort of obscure FCC process that can yield unexpected headaches for stations, Behr said that's not the case this time around. "For broadcasters, there's very little here that will have any impact, and in the current revision even less so. There's virtually nothing here that isn't a technicality."

Bob duTreil Jr., principal at the consulting firm duTreil, Lundin and Rackley, said the proceeding hasn't been on his radar much, saying the FCC's rule changes mainly "concern the way RF is measured from mobile devices."

So why should radio engineers be paying attention at all?

If there's any reason to be concerned, according to experts, it may be the possibility of new rules stemming from that new docket and from the further rulemaking in the original docket. Among issues for which the FCC is seeking

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Moving Things Around

Buyer's Guide looks at audio transport. Page 30

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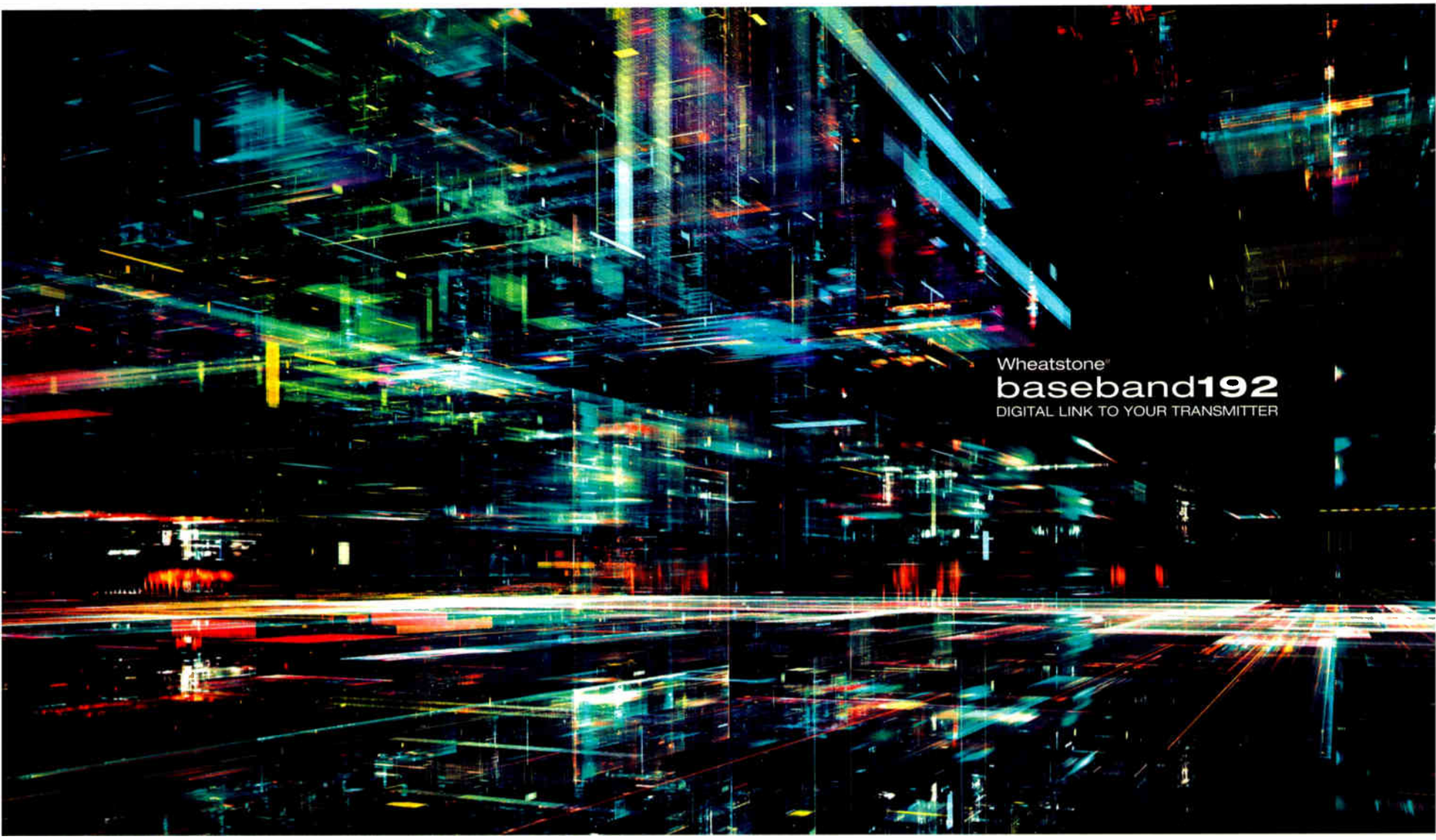

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World Radio History

Ed Glab Calls It a Day at WLS

Says flexibility is key to surviving 40+ years in radio engineering

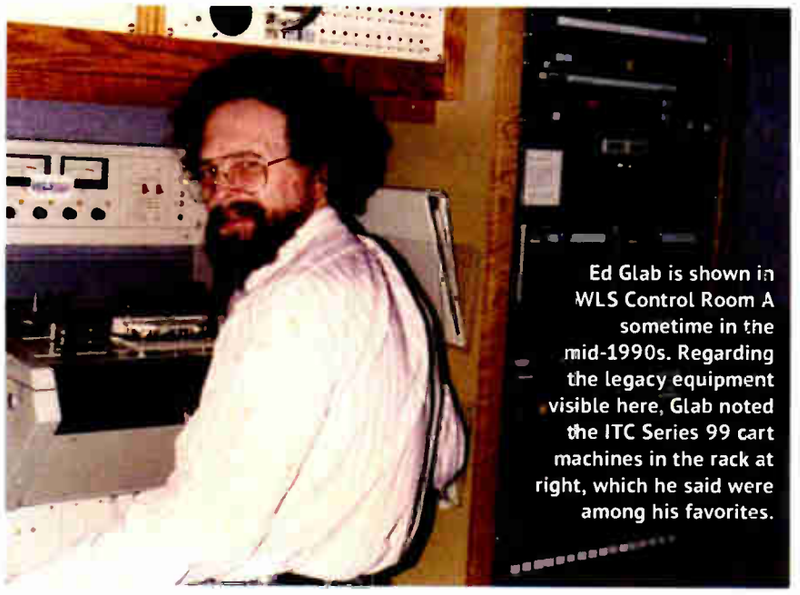
NEWSMAKER

BY RANDY J. STINE

CHIGAGO — Ed Glab tried to learn something new every single day during his more than 40 years as broadcast engineer at WLS(AM/FM) in Chicago. That accumulation of knowledge made Glab an extremely valuable commodity and enabled him to survive lots of management changes and an ownership switch.

Retirement from the Cumulus-owned stations in late June ended what Glab, 65, called "four decades of being on call." That sort of dedication requires a passion for broadcast engineering.

"Radio can be a very demanding mistress, but I have loved most of it. I started with consoles that had vacuum tubes in them and cart machines. I could draw the entire functional diagram of the radio station on a napkin," said Glab.



Ed Glab is shown in WLS Control Room A sometime in the mid-1990s. Regarding the legacy equipment visible here, Glab noted the ITC Series 99 cart machines in the rack at right, which he said were among his favorites.

At retirement, he held the title of engineering supervisor.

'A BIG DEAL'

In 1967, Glab was attending the prestigious Northwestern University, majoring in radio, TV and film in the School of Speech. He answered an ad for an on-air summer relief position at WYFE(AM) in Rockford, Ill. He joined the clear-channel AM directional as an on-air fill-in after passing the test for the FCC's First Class license.

"Then halfway through the summer the CE quit," Glab said, "so I was named chief engineer" — because he held that license.

In 1968, Glab returned to school and by happenstance met Carl Nelson, who was engineering supervisor at WLS(AM). Nelson mentioned that the station hired people for summer relief in the engineering department, so Glab joined them for the summer.

However, the allure of on-air employment was still there for Glab, so after finishing his degree and rejoining WLS for about nine months, he left to work on-air shifts at stations across Illinois in Highland Park and Aurora, which are considered part of Chicago metro.

Glab interviewed for the production director's position at WLS in 1973, but instead joined the station full-time as a board operator, a position that was in the engineering department.

"I figured I would take it until something better came along. Here we are 40 years later," Glab said with a chuckle.

Back then, board ops were the only station personnel allowed to touch equipment, Glab said; on-air folks had a mic, stopwatch and headphone jack. "[WLS] was a very strong union shop. Board ops ran all the equipment. So when the on-air people got a cough switch it was a big deal. Eventually, all that changed, of course."

Glab at one point even had a lifetime guarantee of employment, he recalled. The International Brotherhood of Electrical Workers local in Chicago negotiated the agreement, covered the entire engineering staff, with the then-ABC-owned radio stations.

"I believe it was the only such contract ever negotiated. We had 15 people in the engineering department, but ABC soon came back and renegotiated that out," he said of the guarantee. "They also bought out a number of the engineers and reduced staff."

By that time, Glab had moved to equipment maintenance, figuring it provided more job security than being a board op. "Engineering is more stable than any other department at a radio station. No matter the ownership changes, or program and management changes, they always need capable engineering talent who know the stations."

Glab always looked for opportunities to contribute and make himself more

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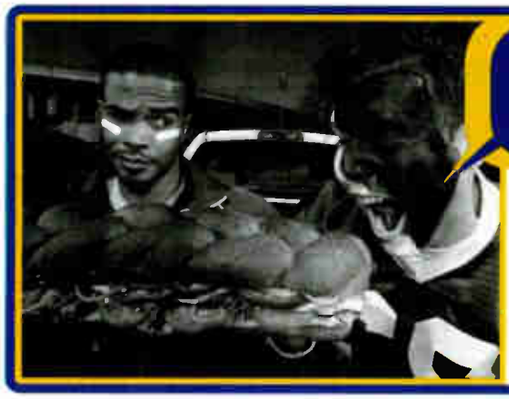

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World Radio History

SCBA Fund Helps Radio Students

Program benefits career hopefuls but also serves needs of SoCal stations

Efforts to develop our next generation of radio leaders are so important.

Let's take note of the Southern California Broadcasters Association, which recently named winners of its 2013 broadcasting awards to students who are pursuing radio careers.

They include Jacqueline Iniga, winner of the Ben Hoberman Radio Broadcasting Award at Cal State Los Angeles, who is studying broadcast journalism; Andrew Louie, recipient of the George Nicholaw Radio Broadcasting Award at Pasadena City College, who hopes to be an announcer for the Lakers and does play-by-play and other on-air work at the school's Lancer Radio; and Brandon Lang, who received the Stan Spero Radio Broadcasting Award at California State University, Fullerton, where he is technical director for Titan Radio.

An explicit goal is to attract the "best and the brightest" to Southern California radio, according to association President Thom Callahan.

If other associations or companies wish to start such a program, what should they know about it?

SCBA's Ellen Dostal, director of events & member services, told me that scholarships range from $500 to $1,000 depending upon the school, and were set up with the guidance of each school. The impetus for the program came from advertising industry leader and philanthropist Dennis Holt, who founded Western International Media and other companies.

"Dennis Holt was instrumental in launching the SCBA Scholarship Fund, established from the proceeds of his Lifetime Achievement Award Event in 2000 when he was honored as SCBA's 'Man of the Millennium,'" Dostal said. "The major endowment came from this event, and we draw a small percentage of the funds each year to be used for the scholarships." The scholarship fund is managed by the California Community Foundation and grants three each year.

Two dozen students have benefited since inception, and the fund balance has increased over time. While there is no recurring event to support the program, SCBA welcomes contributions. Callahan said SCBA hopes to launch more scholarships in 2014 and will be soliciting companies for donations to fund them.

Preference is given to students majoring in radio broadcast communications. Selection is not based solely on GPA; other factors may include commitment to and promise in broadcasting, service to the school and community, or other criteria.

Kudos to SCBA and Dennis Holt for the good work of this program.

ONE STUDENT'S VIEW

I spoke and emailed with scholarship recipient Brandon Lang, 32, who is studying the radio industry and works at Cal State Fullerton's online Titan Radio as technical director. Born and raised in Orange County, he'll graduate this fall with a career goal of being a station general manager.

(Reader, take note: Just because a campus station doesn't have an FM or AM license doesn't mean it can't inspire students to a career in the industry, where the term "radio" itself is being redefined.)

"I have been attending CSUF since 2011, after transferring from Orange Coast College," he wrote. "I have worked a part-time position doing audio/visual production for the last five years, which has given me the experience I need, while learning the necessary fundamentals and gaining the skills in production (in the field and in the studio)."

Brandon Lang at the microphone.

He grew up around audio and video; his dad does production work, and Brandon has DJ'd at clubs and posted content on Ustream. But radio wasn't really on the horizon til he took radio courses at Cal State Fullerton.

"I decided to start volunteering at the college radio station on campus as a radio show host and also did some promotional work. After a semester of volunteering and finding that I really enjoy the work and the environment."

Soon he was hired on as technical director. The position is paid but expires upon graduation. His work includes creating station promos and stop-sets, underwriting promos and making sure the station is functioning smoothly. The GM suggested he apply for the SCBA program.

Lang is a bit older than most undergraduates but two decades younger than me, and I'm always interested in knowing how the medium appears to younger people. I pressed Lang on what he likes about it.

"TV has a more visual aspect," he replied. "It throws it in your face, you see it right there. Radio is more imaginative. That's what brings out the magic in it."

He hopes for an opportunity to help radio "take ownership of my demographic in my region."

"Since working in a radio station now for the last year and learning the daily operations of the station, it's really influenced the drive to learn and get involved more in the industry. I've had a positive experience working in radio and don't plan to stop anytime soon.

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FROM THE EDITOR

Paul McLane

World Radio History

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"It's only getting better; and I feel the industry is finally popping back, with some advancements in technology and the adjustments the market has made recently. So the future seems bright for a career in the radio and production industries and I am very excited."

I told Lang he'd be wise to keep in touch with SCBA, which is a proactive broadcast association that does good work for its members. Both he and the association would benefit from such involvement.

WWVB Notes Golden Anniversary

Reader Charles Lewis was first among several who noted the typo in my column of July 17. I stated that WWVB operates at 60 cycles per second.

"It is 60 *kilocycles* per second, or as we say today, 60 kilohertz," Charles emailed. "*Huge difference*! Otherwise, it's a good article." He's correct about the carrier. I hate all typos, but especially in a technical spec. Blech.

Here's a bit more background about WWVB from the NIST announcement:

"WWVB is unique. Its legacy of innovation began with its unusually low operating frequency of 60 kilohertz ... The wavelength is 5 kilometers long, more than 3 miles. This concept dates back to 1956, when the then-new NIST Boulder campus began operating 60 kHz radio station KK2XEI a few hours a day. The station radiated less than 2 watts of power but proved that low frequencies are extremely stable, with the ground below and ionosphere above forming a huge duct to guide signals around the curvature of the Earth. In 1963, WWVB's received signal was 100 times more stable than WWV's. (NIST experimented with even lower frequencies with standard radio broadcast station WWVL from 1960 to 1972.)"

NEWSROUNDUP

PATENT: DigiMedia has asked the judge in its patent infringement case against several radio groups to allow litigation to proceed. It appeared the U.S. Patent & Trademark Office confirmed and/or allowed some of DigiMedia's claims. The case, which concerns digital media storage and automation, was stayed in November 2011 while the USPTO reexamined the patent claims.

BIG SALE: Hubbard Radio has agreed to buy 10 stations from Sandusky Radio for $85.5 million. The sale concerns five stations in Seattle and five in Phoenix. Hubbard owns outlets in Chicago, Washington, Minneapolis/St. Paul, St. Louis and Cincinnati. When the deal closes, which is expected in October, Hubbard will own 30 stations. The sale also means Sandusky owner Norman Rau leaves radio ownership after 36 years, freeing him, the company said, to focus on the digital transformation of his local newspaper and marketing franchises.

EAS: Digital Alert Systems says recent reports of hacking vulnerabilities in its DASDEC EAS encoders/decoders units are old news and that security software updates were completed months ago. Wired, Ars Technica and other media recently ran items about the EAS hacking incident from February after Web security firm IOActive said that the Cyber Emergency Response Team indicated vulnerabilities still exist in the DAS units. DAS Senior Director for Strategy, Development & Regulatory Affairs Ed Czarnecki said most DAS customers obtained the software update and "the issues could become potential vulnerabilities only where basic network security practices are not followed, such as using firewalls and other measures to secure network connections."

World Radio History

RF EXPOSURE

(continued from page 1)

public input are transmitter site signage, transient exposure limits and the possibility of "contact current" injuries from construction crews working in close proximity to AM stations.

"Broadcasters have had to have signs already," says David Maxson, chief executive officer of Isotrope LLC and head of RFSigns.com, which sells those familiar red "DANGER," orange "WARNING" and yellow "CAUTION" signs.

According to Maxson, "For the first time, though, the FCC is specifying what good practice is and not relying on other agencies."

LICENSEE RESPONSIBILITY

"There probably will be a little more interactivity between the FCC standards and OSHA," said Behr, "only to the extent that the rules seem to be heading toward tightening up licensee responsibility."

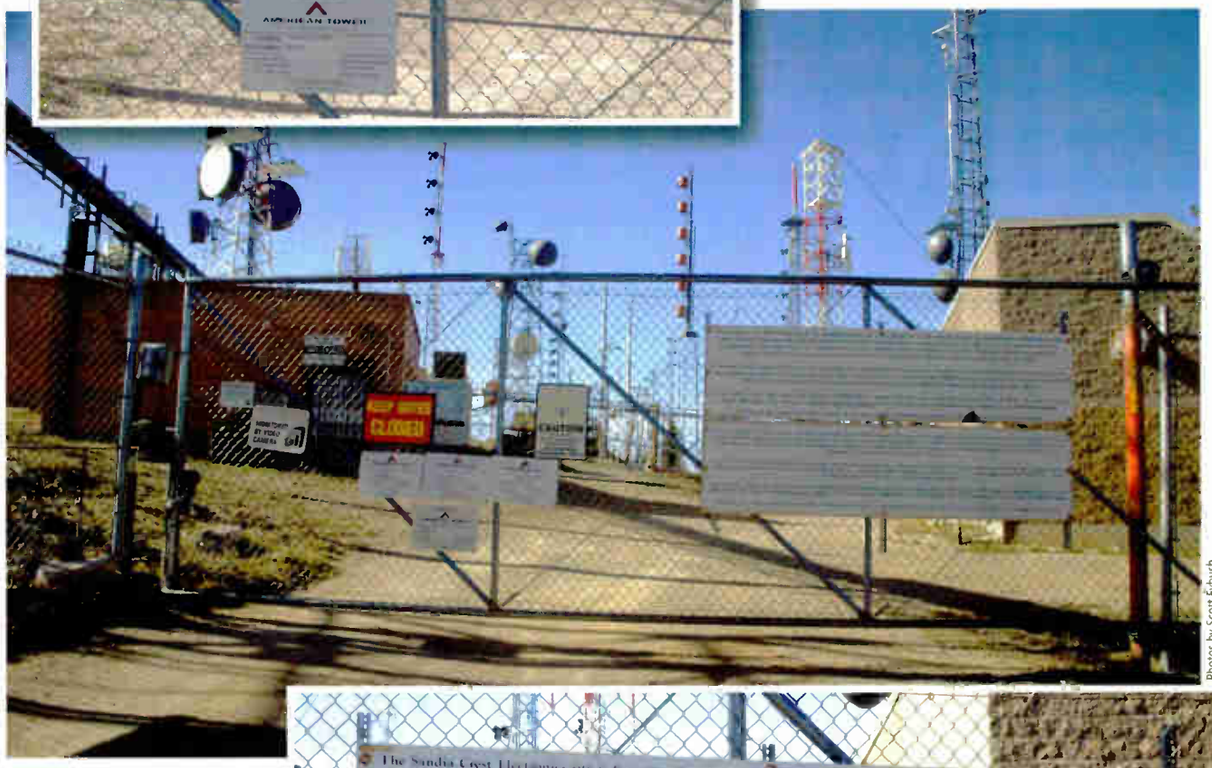
The specific proposal on which the FCC seeks comment would use a modified version of IEEE's standards

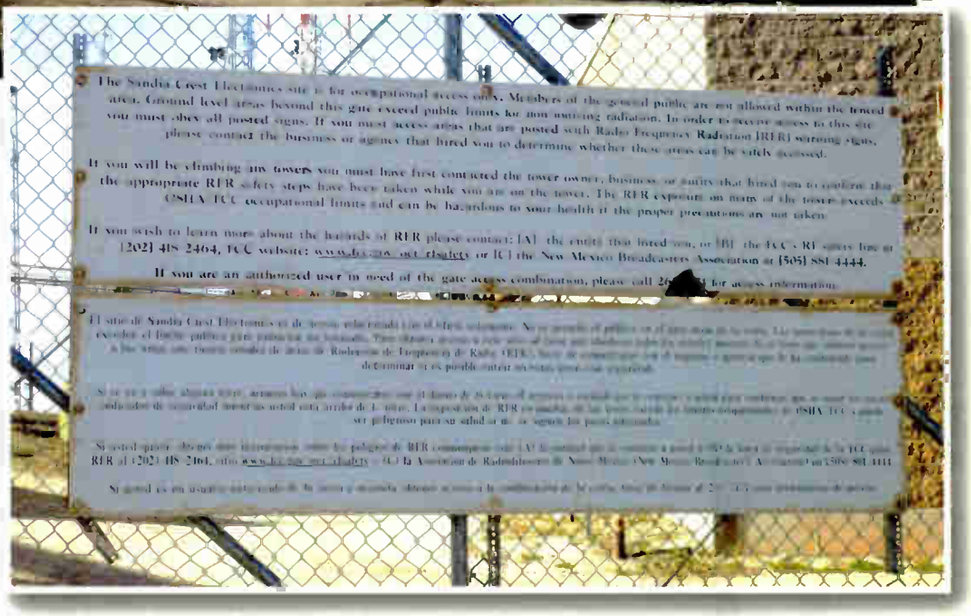
The proposed rules have the potential to become expensive for a handful of radio owners whose transmitter sites are in remote areas.

to specify exactly where "NOTICE," "CAUTION" and "WARNING" signs should be placed at a transmitter site. The commission also is taking a harder look at the question of "transient" exposure, where members of the general public may be passing through areas of higher RF in areas such as hiking trails that run in proximity to multiple-user mountaintop FM and TV sites.

"We request comment on anticipated costs related to implementing this proposal for clear definition of compliance boundaries, given that most sites already likely comply with these proposed requirements," the FCC states in the notice. "We intend to allow sufficient time for licensees to inspect each of their sites for compliance if there may be any uncertainty."

Amateur radio operators may want to pay attention, too; the proposed new rules would take away the blanket exemption that formerly saved ham licensees from having to conduct RF radiation studies. Households where amateur stations operate should be considered under "occupational exposure" standards, which may require signage and education for household members, according to the agency.





Sandia Crest above Albuquerque, N.M., is one of the nation's biggest multi-user FM/TV sites. There are known hot spots beyond the gate — but there's also a hang-gliding launch pad among the towers, so it can't be completely closed off from public access. Shown are examples of RF signage at the gate areas.

Photos by Scott Fybush

The proposed rules have the potential to become expensive for a handful of radio owners whose transmitter sites are in remote areas. The commission notes that in the past, the agency has allowed warning signs to be used without physical barriers in areas that the agency considers "remote." But the commission seeks comment from stations about whether it should continue to try to determine the "remote" nature of a site as it now does, by considering "evidence of public access, such as litter and trails," or whether the commission should automatically require "positive access control," as in fences and gates.

TRAINING

In setting out its new rules, the FCC also is formalizing its expectations for station owners to educate employees and contractors who may be working in areas that exceed general exposure limits.

Among the mass of minor technical changes that take effect on Aug. 5, mainly relating to specific methods of determining RF exposure, the commission is also revising section 1.1310 of its rules for broadcast stations. The

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RF EXPOSURE

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new version of those rules now allows for "transient" workers whose jobs may involve occasional entry into high-RF zones to receive warning information verbally, instead of or in addition to the written warnings now mandated.

Behr said his company's LBA University has been busy helping RF operators understand what they're now required to do by both OSHA and the FCC.

"There is a huge amount of interest in training," Behr said; not only from broadcasters, but also from wireless operators.

It's those wireless operators who may feel more of the sting from the FCC's proposed new rules, as the wireless world has exploded since the original 2003 docket opened. The bulk of the FCC's work here concerns exposure levels, not only from fixed transmitters but from mobile devices.

As for the new docket being opened by the FCC, it's mostly a specific inquiry that even the experts on broadcast RF exposure are unlikely to join, according to some observers.

"Our purpose in opening this proceeding is to provide a forum for full and transparent discussion to determine whether any action may be appropriate," the commission states, but the agency notes that it's especially interested in hearing from experts at other federal agencies — and that the sought-after information is specialized, pertaining to different standards for measuring RF exposure across the human body.

The most interesting issue in the new inquiry to broadcasters, perhaps, has to do with "contact currents," the shocks and burns that can zap construction workers who are near large metal objects like cranes and metal roofs, in close proximity to AM transmitters. The FCC asks for comment on whether the agency should provide maps showing where those intense fields (10 volts/meter or higher) are present, and whether broadcasters already have access to that information.

Photo by Scott Fybush

The Durst Organization recorded RF safety information at 4 Times Square in New York for those who need access to the rooftop transmission site.

It's really a mass of little corrections and changes.

– Lawrence Behr, LBA Group Inc.

Further complicating the matter, the FCC notes, "the AM station may be a long-standing facility, while recent development has generated the construction nearby." The commission is asking broadcasters to weigh in on whether the station or the developer should bear the cost of mitigating this issue, and whether the FCC is even the appropriate agency to ask the question.

"We've been contemplating whether we want to put any comments in and haven't made a decision whether we want to or not," said LBA's Behr. "Some broadcasters may look at this and their attorneys may want to put some stakes in the ground, but I don't see anything I would particularly suggest."

For those who do want to file a comment to ET Docket 13-84, the comment period closes Sept. 3, with reply comments due Nov. 1.

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World Radio History

ED GLAB

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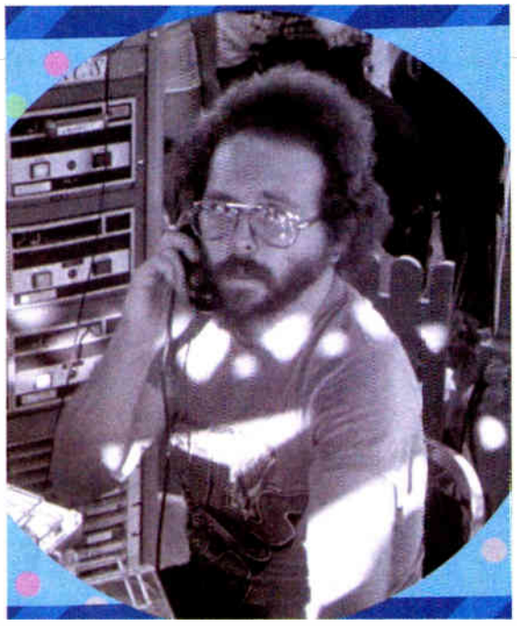
useful. If there was something that needed to be done, he did it.

"If it meant learning the office phone system, even though that kind of work wasn't covered in the engineering contract, I did because I thought it added value to my job," he said.

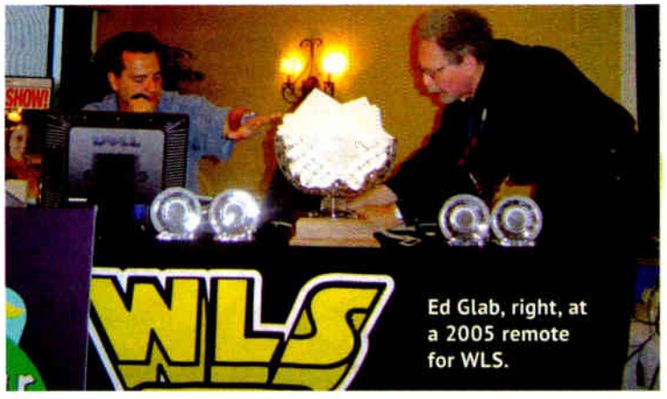
Glab learned how to write computer code in the 1980s and eventually wrote computer software for the online streaming software the WLS stations still use. Glab also wrote the program for the Radio Data System that the facilities use to transmit song title and artist information on receiver displays.

"Some of it is so complicated, I'm having trouble explaining it to my replacement. Sometimes it's a lot of work and effort to find the right solution."

One of the highlights of Glab's career was building new studios for the AM and FM operations of WLS in 1990, he said. Glab designed the floor plan for the studio areas and spent nine months wiring the AM talk studio. "I think being on-air at one point helped me through the process to understand what the on-air people needed to make their jobs easier. It was a very satisfying experience. We came up with something that has served us for the past 23 years and is still serviceable."



Glab engineers a remote for WLS in the 1970s.



Ed Glab, right, at a 2005 remote for WLS.

WLS(AM) is a 50 kW non-directional clear channel station on 890 kHz. It airs a news/talk format and carries local programming in addition to Rush Limbaugh and Sean Hannity. WLS(FM) is a Class B station on 94.7 MHz featuring a classic hits format. The FM broadcasts in HD Radio; the AM aired digital for a short time in 2008. Citadel, which owned the stations at the time, made the decision to limit the AM HD to daylight hours and then to turn it off entirely because of interference concerns, Glab said.

'MORE FLEXIBILITY'

Glab's one regret about retirement is never having the chance to work in a state-of-the-art radio studio environment.

"Now they are doing audio over IP and I see so much more flexibility built into something like that. Today's audio over IP systems make installation so much easier than what we had in 1990. We are still using the basic infrastructure. The consoles and the basic wiring is the same."

If given another opportunity to build a new radio station, Glab wouldn't change the WLS studio design much. "I'd make the talk studios larger. I feel our choice of the Pacific Recorders consoles was one of the best decisions we made. They were built like tanks and have proven their reliability," he said. "There are some systems out there today that don't have the physical ruggedness that Jack Williams built into his consoles. Consoles take a beating. Our AM Control Room A has been on air for 23 years with only a handful of hours down for maintenance."

Still, the physical plant of a radio station today is vastly different from 1973, with computers greatly changing how a radio station is designed and how broadcast engineers do their jobs. "In a way, things are more specialized but infinitely more flexible," he said. "What you can do with computers has changed the business exponentially," he said.

Glab might have retired sooner had Federal Reserve Chairman Ben Bernanke not kept interest rates so low in recent years, which he says limited the growth of his retirement savings. He also doesn't see a great future for terrestrial radio.

"The threat of removing AM/FM from the dashboard and from the entertainment systems in automobiles is real. Some say it could start happening within three-to-five years. The sheer number of entertainment options will make it more difficult to compete for listeners in the car where so much [radio] listening takes place. You have to do good local programming to be successful."

Glab, left, at the base of the WLS(AM) tower.

However, he feels that radio operates in an "atmosphere of huge conglomerates," and that as a result, "the impetus to do good local radio just isn't there. And that is going to really hurt radio."

Replacing Glab in the Windy City Cumulus engineering department is Tim Wright, who comes aboard from Clear Channel. The department also includes Chief Engineer Scott Clifton and IT Chief Carlos Gonzalez.

Clifton called Glab "a very unique and legendary radio engineer," and said the retiring engineer spent most of his last week at work in mid-June preparing others on how to do his job, "including creating a binder of how-to type manuals on many software programs he has written for our operations."

In retirement, Glab might consider a return to the organ. He used to play the instrument in a church and was paid for it.

"I haven't done that for 35 years, but I'm considering it. I have been bitten by the theater organ bug. It's a very whimsical instrument. I am thinking about building a virtual theater organ at home," he said.

Glab has been married to his wife, Lenci, for 38 years. The couple resides in Elk Grove Village, Ill.

NEWSROUNDUP

TELEMATICS: AT&T will provide mobile connectivity to support SiriusXM's suite of security and additional services for Nissans sold in North America. The satcaster says SiriusXM in-vehicle telematics will provide Nissan owners 24/7 emergency support for accidents, stolen vehicle tracking and roadside assistance; additional services will be announced later. SiriusXM describes itself as a connected vehicle services provider for Nissan, expanding its entertainment and information offerings in the car to telematics.

CES: The Consumer Electronics Association is using new attendee badges at next year's CES convention. The badges will employ near-field communication, a set of standards for smartphones and similar devices to establish radio communication with each other by touching them together or bringing them into close proximity. CEA hopes the updated badges will mean shorter lines at the Las Vegas event. Badges will not be mailed to attendees in advance. The 2014 Consumer Electronics takes place Jan. 7–10.

INDECENCY: The public and industry were given more time to add to the 100,000 or so comments filed at the FCC in its docket devoted to broadcast indecency. The agency is taking comments on whether to develop an "egregious cases" policy and focus on those, rather than on fleeting, inadvertent indecent utterances. Comments were due June 19. Reply comments to GN Docket 13-86 are now due on Aug. 2.

PIRATES: Like Florida, New York and New Jersey, Massachusetts wants laws on the books to help local law enforcement prosecute pirate radio operators. The Massachusetts Broadcasters Association supports H.R. 1679, a bill to give its state attorney general the power to seize equipment and seek damages from unlicensed broadcasters. The MBA urges members to contact the broadcast association if a station has been affected by a pirate station.

World Radio History

IP. It's the new ISDN.

Meet Z/IP ONE: The "Z" stands for Zephyr.

It's the question on everyone's lips: "What comes after ISDN?" The answer: Z/IP ONE, the Telos Zephyr for IP connections. Broadcasters fell in love with the original Zephyr for its rock-solid reliability and superb audio; Z/IP ONE brings those same qualities to IP remotes.

Is IP reliable? TV networks say so - they use it for HD video backhaul. And Z/IP ONE is packed with IP-codec "smarts" to ensure reliability, even over the public Internet. Agile Connection Technology adapts to network conditions, delivering audio quality as good or better than ISDN despite packet loss and jitter. Genuine, high-performance MPEG codecs from Fraunhofer for exceptional fidelity — no lame knock-off codecs. No latency build-up, re-negotiation or fiddly adjustments: Z/IP ONE just works.

There's more: Z/IP ONE incorporates SIP, N/ACIP, and IPv6 standards. The worldwide Z/IP Server connection service helps traverse NAT routers and tricky firewalls. And now, you can do great-sounding handheld remotes using LUCI® LIVE smartphone and tablet apps. All of which makes Z/IP ONE perfect for live remote broadcasts, whether concerts, talk show remotes, off-site talent — even full-time STL links or RPU backhauls.

Experience the convenience and flexibility of IP.
Z/IP ONE: the best way to hear from there.™

High-quality remotes are right in your pocket. Z/IP ONE now connects to LUCI LIVE smartphone apps for wideband audio on-the-go.

Telos-Systems.com/zip-one

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World Radio History

We continue our Summer of Products series with more new gear introductions from radio broadcast equipment manufacturers. Don't forget your sunblock!

NAUTEL ADDS TO NV^{LT} LINE

Transmitter maker Nautel has announced additions to its NV^{LT} family (shown) of analog FM transmitters, with new models at 15 kW, 20 kW, 30 kW and 40 kW power ranges.

The NV^{LT} transmitters are based on the NV line but have features from the VS line as well. Features include solid-state construction, analog or AES digital input, Livewire IP audio I/O, Shoutcast or IceCast streaming input, local content storage, USB audio backup, dynamic RDS, dual SCA and stereo coders, scheduler and playlists. An Orban Inside integrated processor card option is available. The series is compatible with Nautel's Advanced User Interface control system.

Turning to the NV line, Nautel has delivered firmware updates for it and the NX AM transmitter family as well. Nautel points to the introduction of the real-time measurement of modulation error ratio as the top of the new features. Other new features include an updated Flash player; SMTP login capability for email; port forwarding support; Network Time Protocol (NTP); the ability to save meters and critical parameters in memory; the ability to take action on audio loss; restructured preset and submenu structures; SNMP traps; summary alarms for remote interfacing; and remote AUI timeout.

INFO: www.nautel.com

RCS MOBILIZES GSELECTOR, ZETTA AND AQUIRA

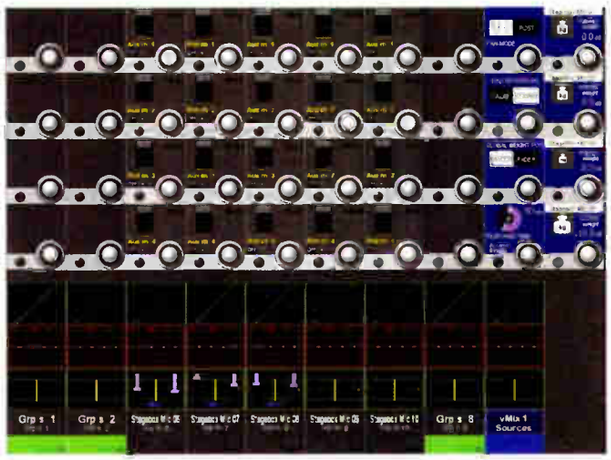
Broadcast software developer RCS says that its Selector2Go is "tailored" for the Web. The music scheduling software system is compatible with all browsers and across platforms and mobile devices. According to RCS, the system is designed to keep the interface simple and straightforward. The data flow is kept small to enable fast performance, even on mobile networks like 3G.

RCSremote (shown) is an app for smartphones or handheld devices that lets users control the Zetta automation system's station log. Basic controls like play, pause, stop and fade can be triggered while deeper items such as station platform or even switching between satellite, live assist and automated modes. Macros can be constructed and along with recording simple voice tracks into the system.

The Aquira traffic system moves online with Aquira Online. This online version lets users stay in constant contact with the traffic team back at the station, anywhere there is Internet access. This allows better customer service; faster data access for delivering prompt and accurate service to clients; and controlled security for limiting access to proposals and client information.

INFO: www.rcsworks.com

SOFTWARE UPGRADES COME TO STUDER CONSOLES



Studer has released version 5 of its operating software for its OnAir console family.

The company says the V5 offers a much-requested "Library" feature where often-used console settings can be stored and made accessible to network users and multiple channels.

A countdown timer function has been added to the stopwatch. A GUI tweak allows for channel labels to be modified when necessary, and stored in user snapshots.

Enhancements include support for CobraNet and Axia Livewire cards used within a Studer D21m system; improved input-to-output patching, monitoring and talkback; and new GPIO functions for talkback groups.

For Vista consoles a major upgrade comes in the form of automatic microphone mixing via a software patch. Studer says this will allow automated and better mixing when multiple mics are being used. It should keep ambient and background noise down while minimizing clipping. Plus, it will allow for weighting a particular input so that it can stand out from verbal "scrums." This is available in VistaMix only (shown).

Studer also recently announced that it has partnered with ENCO Systems to make that company's DAD automation system compatible with Studer's OnAir consoles.

INFO: www.studer.ch

World Radio History

SATELLITE SIGNAL LEVEL METER AND SAT IDENTIFIER

Our new "SAT-BUDDY" satellite signal level meter will measure 950 - 2150MHz L band signals. The unit powers the LNB, and provides digital signal measurement for carriers. The unit can

identify satellites by name, measure signal levels -70 to 10 dBm, plus display carrier-to-noise (C/N), signal quality, and Bit Error Rate. Confidently recognize the satellite a dish is aimed at, and peak the antenna to maximum performance.

SURGE SUPRESSOR FOR LIGHTNING NEAR SATELLITE ANTENNA

Place the "LNB-Zap-Stop" in the coaxial cable line that runs from the dish, to the satellite receiver. Think of it as an "insurance policy" to protect

expensive indoor equipment from lightning hits. Transient Suppressing Diode technology works to block high voltage surges. The lightning protection units can take multiple strikes, with no need for resetting or replacing.

COVERSAT AND HEATSAT MAKE YOUR DISH RELIABLE IN BAD WEATHER

The COVERsat will prevent most signal outages caused by snow and ice. It is wrapped over the front face of a dish, creating a steep and slippery surface to prevent the accumulation of ice & snow. The cover is made to exactly fit the customers specified dish type. The HEATsat satellite antenna

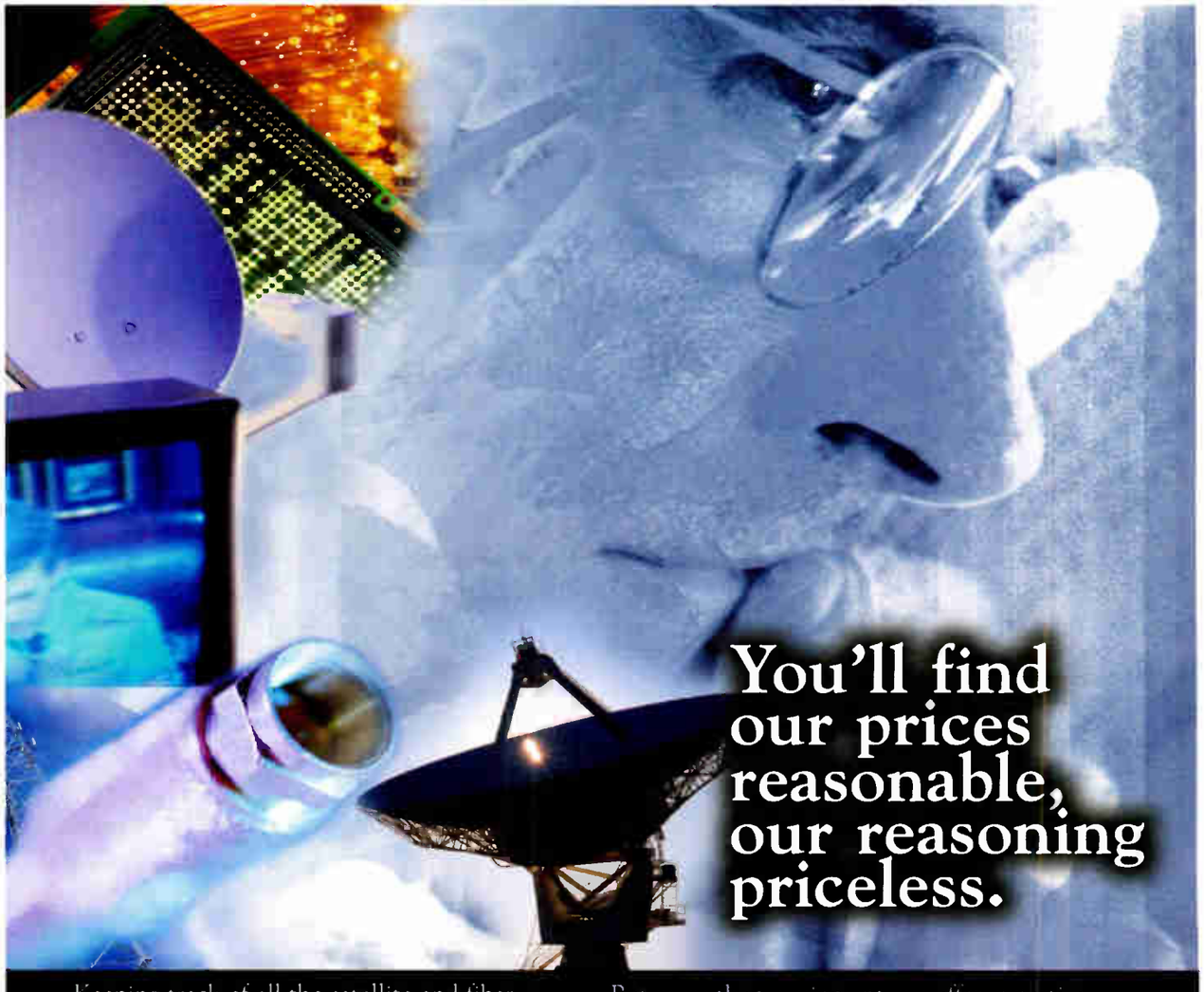
heater will completely stop signal outages caused by snow and ice. This reliable dish back-side electric heater keeps snow & ice from forming on the dish, by heating the reflector when snow and ice conditions are present. Purchase the HEATsat to upgrade existing satellite antennas, and ask for it to be included with your new dish purchases.

HD-GRADE SATELLITE LNB WILL BOOST EBNO ON RECEIVERS

Invest a FEW-HUNDRED-DOLLARS into upgrading your satellite antenna-mounted LNB, to the new DAWNco "L series" LNBs, and watch for improved EbNo readings on your digital satellite receivers. DAWNco's latest generation of C and Ku band LNBs have best-in-industry specs for "1dB gain compression." Install these units to make a real difference in the reception of HD and other MPEG4 or DVB-S2 satellite channels. Internal circuitry has been completely redesigned for reduced power draw, so that indoor receivers and power supplies will never be overtaxed. In order to prevent signal outages, when outdoor temperatures fluctuate, DAWNco's best LNBs feature a highly stable +/- 5 Khz rating.

IMPROVE RECEPTION WITH 3.7 METER SATELLITE DISH FOR LESS THAN $2K

Keep your dish cost under $2K, and permanently improve your satellite reception capability, with our fiberglass 3.7 meter satellite antenna. This is the perfect dish for rooftop or island locations, where the 8 petal design offers easy transport to site. Ground mount USA sites may prefer our HIGH-GAIN aluminum sat antennas, in sizes up to 5.0 meter. The customer will specify stationary or motorized configuration for the dish, and DAWNco offers all other items needed for a complete system.



You'll find our prices reasonable, our reasoning priceless.

Keeping track of all the satellite and fiber optic communications products out there is a full time job.

That's why so many people come to **DAWN**CO. They count on us for everything from satellite antennas, receivers, LNBs, and position controllers to fiber optic broadband links, satellite links and data links.

We offer the broadcast TV, cable TV, radio and educational fields high quality equipment at down-to-earth prices.

But more than equipment, we offer expertise. We can examine your situation and your budget, and recommend exactly what you need. You save both time and money by making the best possible buying decision.

Call a **DAWN**CO expert with your questions by simply dialing **800.866.6969**. Use the same number for our free catalog, or find it all on the web at www.**DAWN**CO.com.

DAWNCO

Reasonable prices, priceless reasoning.

World Radio History

HARRIS SHOWS NEW FLEXIVA TRANSMITTERS AND IP LINK

New from Harris Broadcast is the Intraplex IP Link 200.

The IP Link 200 has two bidirectional stereo inputs for multichannel capability, supports multiple audio formats and has a "multicoding" ability, which enables simultaneous delivery of audio in many formats. Dynamic Stream Splicing sends multiple identical streams over the same network to avoid service interruptions from packet loss.

The company also is moving in a different power direction for its Flexiva line of solid-state FM transmitters: lower power levels.

New models output 50, 150, 300 and 500 W. These are aimed at low-power stations, gap fill and single-frequency transmitter networks with multiple transmitter locations across a market.

In addition, the Flexiva family now offers an optional internal Orban Optimod-FM 5500 series multiband digital audio processor plug-in card. Harris says this gives budget-conscious broadcasters the audio processing power and control of the standalone Optimod 5500, built into the transmitter at less than half the cost. The Flexiva incorporates a DSP-based, five-band audio processor with a dual-band, window-gated AGC. It is integrated with the Flexiva's graphical user interface.

INFO: harrisbroadcast.com

AETA SCOOPFONE CALLS IN HD VOICE

AETA is an early adopter of HD Voice technology, an improved voice codec for cellphone calls, which it says provides 7 kHz (50 Hz–7 kHz) of audio bandwidth while standard voice codecs achieve 3.1 kHz (300 Hz–3.4 kHz).

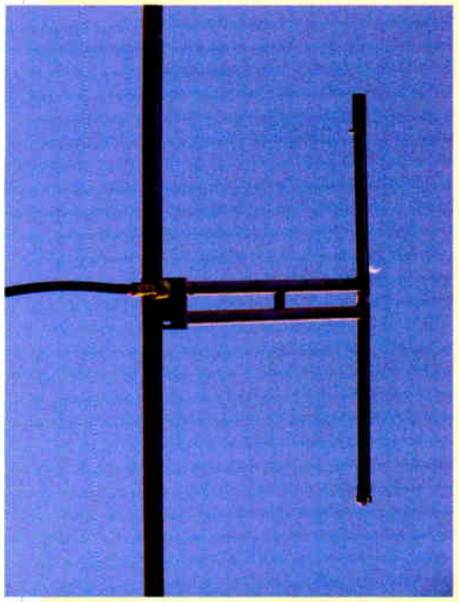
Using that technology is a new AETA product, the ScoopFone HD, a portable phone designed for low-cost remotes and immediate on-the-spot broadcasts from reporters.

The company adds that it performs well in TV wireless coordination and any live long-distance communication where professional-quality performance and interfaces are needed.

ScoopFone HD offers broadcasters features such as OLED display, a friendly user interface, onboard mixing capability for two inputs (mic and line), 48V phantom power, two antenna ports for reception diversity, two headphone jack sockets, a cough key, USB port and an easily accessible SIM card slot. ScoopFone runs from rechargeable or disposable AA batteries, with an integrated charger.

INFO: www.aeta-audio.com

DIPOLE ANTENNA, NOTCH FILTER NEW FROM ALAN DICK



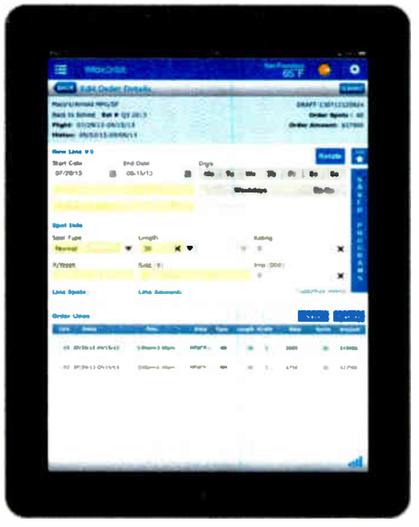
Alan Dick Broadcast says that its ADB-VP vertical dipole FM broadcast antenna is well suited to HD Radio and analog broadcasting applications. The ADB-VP is a vertically polarized broadband FM side-mount antenna, consisting of a balun-fed vertical dipole, power divider and coaxial feed lines; it features symmetrical bandpass.

It is stainless steel with a brass inner conductor. Associated brackets and hardware are made of hot-dipped, galvanized steel. The unit is assembled to full size at the factory and tuned on an electrically similar tower structure to ensure proper impedance match and low VSWR.

The ADB-CNQ is a coaxial quarter-wave notch filter designed for suppression of intermodal products and rejection of a single frequency. ADBL points out that its filter family also features natural temperature stabilization, low insertion loss and VSWR packaged in a compact, high "Q" aluminum cavity. The filter's small footprint, it says, allows it to be mounted virtually anywhere in a transmission system.

INFO: www.alandickbroadcast.com

WIDEORBIT TRAFFIC ADDRESSES TABLETS



Broadcast business software developer WideOrbit has a created an app for tablets, for entering WO Traffic orders.

The app allows for ad order entries into a tablet by providing a form; then it can transmit the order into a broadcaster's central WO Traffic system. An automated email notification can be generated to notify the sales manager of the new order.

Product Manager of WO Traffic Product Manager Arden Ten Broeck stated in the announcement, "The WO Traffic order entry and approvals app will help salespeople go from the customer's desk to submitting orders on their tablet device without being tethered to the office." She added that sales managers will benefit from the ability to approve new orders and order changes while on the go, and they will have a more up-to-date view of sales orders and inventory.

The app is available for Android and iOS devices.

Also, WideOrbit's WO Media Sales sales management module has seen some recent tweaks. It has a new delivery dashboard for broadcasters so they can keep track of their guarantees. It will email them when contracts are falling behind schedule.

INFO: www.wideorbit.com

World Radio History

A Complete Radio Station in Just Two Rack Units

With Logitek and ENCO Inside, all of the functionality of a radio studio can be consolidated into the Logitek JetStream Audio Networking platform. All you need is a microphone to make it complete!

ENCO Inside brings the ENCO DAD audio playout and automation platform to the JetStream router. The complete suite of utilities combines the functionality of list driven playout and automation, user defined hotkeys, content creation, distribution and management, voice tracking, scheduling and reconciliation. All of these capabilities are incorporated within the Logitek JetStream, our integrated console engine and IP audio networking platform that handles routing, mixing, profanity delay and audio processing along with up to 128 digital or analog inputs/outputs and 24 mix-minus busses.

Call today to see how easy it is to incorporate audio playout in your networked audio system.

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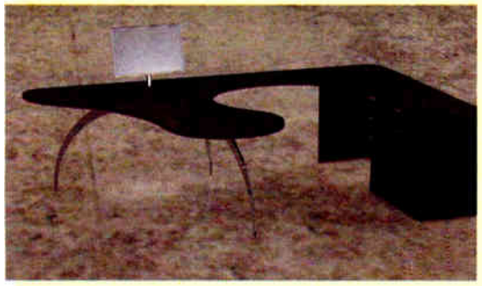
Networked Audio Systems

World Radio History



OMNIRAX SCOOPS THE FURNITURE

Omnirax Furniture Co. wants facility managers to know that it can furnish an entire facility — from specialized on-air broadcast and production furniture to standard office and conference furniture for the traditional office operations.

New for Omnirax is the eDesktop line of private office and staff open office furniture. The eDesktop is a concept built around curved and scoop-shaped desktops that maximize the amount of desktop real estate that can be used.

Omnirax says that this line can be combined with the company's Innova customized and Phoenix manufactured broadcast furniture lines to satisfy a facility's requirements in a stylish way. Both of these lines offer broadcast-friendly features such as cable raceways.

INFO: www.omnirax.com

ARCTIC PALM UPDATES CENTER STAGE

Broadcast software developer Arctic Palm has released updates to its Center Stage platform of broadcast software playout, RDS and information programs.

The Center Stage Live CSRDS module can now capture Tag Station information for use with datacasting processes. It can also feed a second backup stream. In addition, CSRDS is now compatible with Digital Jukebox, MegASeg, Timeless Cool, WireReady and XStream automation systems. It is also compatible with Kavarta and Omnia Omnia.9 RDS encoders.

One more new feature is the Web updater can now send promotional messages to the website when songs aren't playing, but exclude commercials.

The CS Contest Management program can now output a missed contest list for the CSPickup module. A new datacasting option has been added providing authorized on-air staff to post messages to the datacasting services for the CS Contest On-Air module as well as to send contest information to an iMediaTouch On-Air computer. And the data entry window sizing in the On-Air module will be retained for the next use after On-Air has been closed.

Workflow tweaks for CS Copy Management have been added, too, such as the ability to send scripts to multiple stations and multiple folders within an OMT environment, and the ability to move the CSProducer prompter window to a second monitor.

INFO: www.arcticpalm.com

ELENOS EMPHASIZES EFFICIENCY, ROBUSTNESS

Elenos' low- and medium-power Indium FM transmitter line, available with nine power levels from 20–3,000 watts, now includes the new ETG3000 digital transmitter. These compact transmitters, says the firm, offer high efficiency, planar design and remote control operation (SMS, GPRS, SNMP, Internet, Web).

The latest is the ETG3500 Indium (shown). This FM transmitter features audio MPX input, mono, stereo, and AES/EBU, TC TS cards. The 3,500 watt transmitter, which according to Elenos offers an electrical efficiency of 70 percent, has an OLED display, GSM telemetry, Web browser and SNMP agent. It is also equipped with RF LDMOS devices, and planar technology as well as six cooling fans to ensure operation under all environmental conditions.

Also new is the ET30000-5 solid-state FM transmitter, which features ICEFET technology to maintain low temperatures and reduce consumption. The ET30000-5 is a compact unit, housed in one cabinet.

INFO: www.elenos.com

NEW FIRSTLINE P MODEL FOR STACO ENERGY

Power products developer Staco Energy has added a 160–250 kVA model to its FirstLine P series of three-phase uninterruptible power supplies.

Staco describes these units as online, double-conversion units boasting efficiencies of up to 98 percent; and they can be run in parallel, up to eight units.

"Classified as a 'Zero Impact Source,' the FirstLine P provides a high input power factor of 0.99, a low input current distortion of less than or equal to 3 percent, and a power walk-in function that ensures progressive rectifier start-up," it states. The system also acts as a high-performance filter by protecting upstream power supply sources from any harmonics and reactive power generated by the load's power, the company adds.

Staco Marketing Manager Jim Hall said customers asked for a higher kVA UPS for the 480 VAC product family.

For broadcasters, Staco says that the FirstLine P models are suitable for information technology applications such as those found within the broadcast arena's digitized environment, "especially to protect transmitter exciters and HD Radio coders, monitoring, remote control and Emergency Alert Systems, links to remote programming sources via digital telephony, satellite, etc., as well as office computers, standalone computers and computer networks for audio playback, program scheduling and more."

INFO: www.stacoenergy.com

TFT DEVELOPS NEW EAS/CAP ENCODER AND DECODER

TFT says its new EAS911+ is a replacement for its EAS911 device.

Capable of EAS encoding and decoding, it adds Common Alerting Protocol receiving capabilities as well. According to the company it has passed FEMA guidelines for compliance in CAP decoding.

Features compared to previous models include enhanced logging and recording capabilities and text-to-speech conversion. It will interface with TFT EAS devices such as the EAS930A multi-module receiver and the EAS941A remote/status module.

TFT says it can also work with video overlay units for television system use.

INFO: www.tftinc.com

World Radio History

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NEW
VERSIONS
Now available

uniquely powerful, amazing together

The new Sound Forge™ Pro and SpectraLayers™ Pro upgrades represent the nexus of waveform and spectral editing. Reenergized recording and processing environments, more plug-ins, metering for the new critical standards, and fresh editing options give Sound Forge Pro 11 the edge on workflow efficiency, while SpectraLayers Pro 2 comes to the plate equipped with more speed, more convenience, and some astonishing new tools and methodologies for radical sound shaping. And that's only the beginning—this pair of heavy hitters is now wired for seamless audio data transfer, forming a colossal editing system offering immediate gains for professionals everywhere. Sound Forge Pro 11 and SpectraLayers Pro 2 are both available now, thoroughly improved and perfectly aligned to serve as your ideal gateway to the highest level of creative audio editing, including mixing, remixing, mastering, repair, restoration, and pure sound design.

Learn more and download the trials at: **www.sonycreativesoftware.com**

Buy both and save:
Audio Master Suite

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World Radio History

AUDEMAT DELIVERS NEW REMOTE MONITORING SOLUTIONS

Audemat, WorldCast's monitoring and telemetry division, has released new remote monitoring packages.

A release says that many of the packages will be based on current environmental and server room systems. For instance an environmental monitoring package will include all the sensors required to monitor temperature, humidity, smoke and even door contact status. Other packages include sensors for motion detection and power.

These systems will utilize Audemat's Mini Control Silver (shown), Relio or IP2Choice hardware and the Scripteasy software suite along with sensors and other accessories.

WorldCast Group VP of Sales Christophe Poulain stated, "With our new remote monitoring packages, it is not necessary for a customer to spend hours, sourcing and configuring a whole range of equipment. We have done this work on their behalf to ensure that we can offer them a comprehensive monitoring solution with tried and tested components."

INFO: www.audemat.com

Look for more Summer of Products coverage in the next issue.

ARRAKIS BUNDLES UP

Consoles maker and software developer Arrakis Systems is bundling products this season.

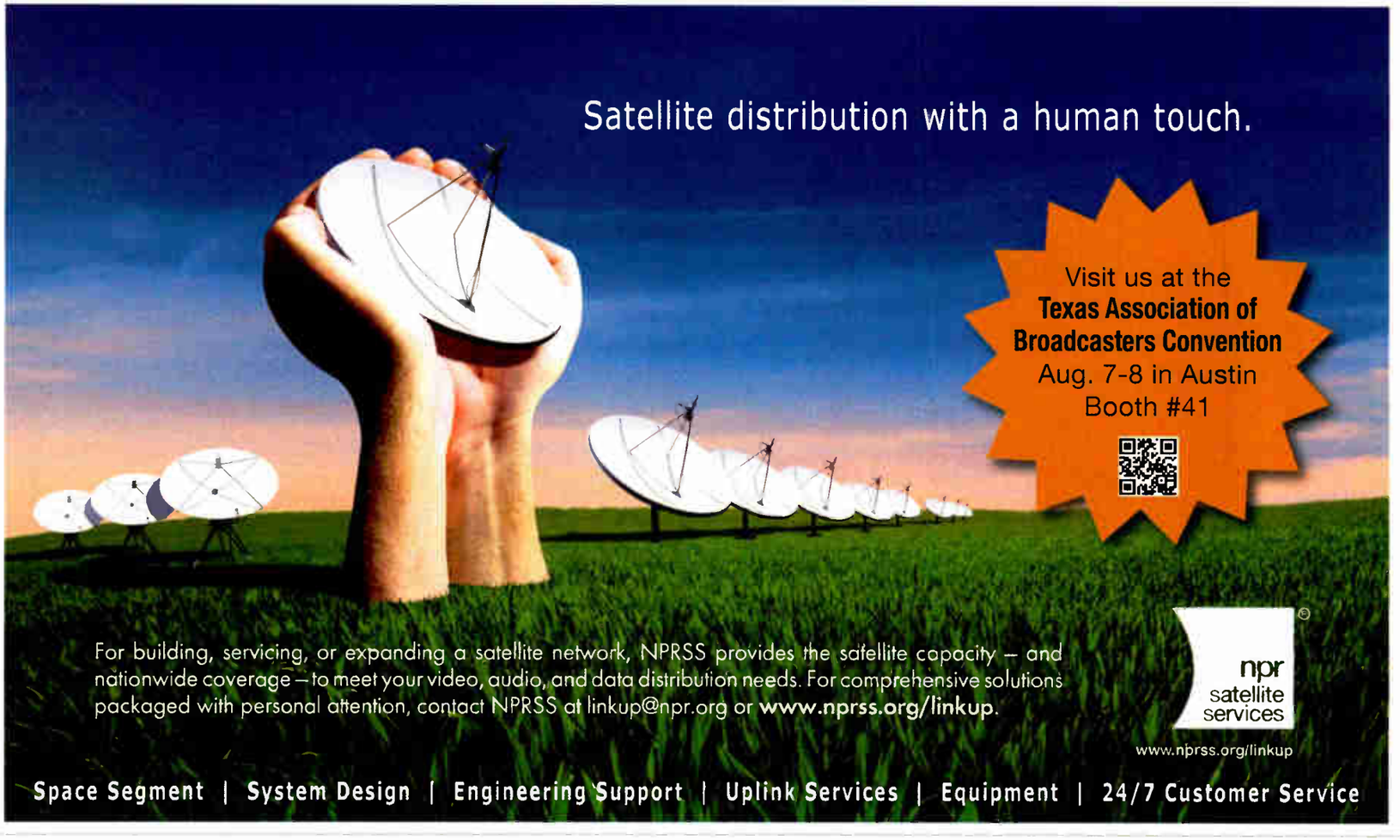
The company's New~Wave automation software is being packaged with the DHD-DAC digital interface.

The combination provides a way to interface a computer with a console and provide several types of outputs — L/R analog via XLRs, a digital S/PDIF via RCA and another analog via RJ-45. A USB port provides connection to the computer.

The Windows-based New~Wave software provides play-out options, live-assist tools, scheduling, routing, Internet tools for streaming and podcasts. Bundle price: $1,100.

Arrakis has also announced the addition of a Bluetooth component for its ARC-10 and ARC-15 consoles.

INFO: www.arrakis-systems.com



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AFTER A DEMO, GMs FIND THE BUDGET FOR AN OMNIA.11

No obligation. 45 Day Demo.

Contact your Omnia Dealer for immediate delivery

Omnia

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World Radio History

Four AM Stations Sharing One Site

How does that work, exactly?

TECHTIPS

BY MARK PERSONS AND MARK MUELLER

Mark Persons writes: It all started in 1963, when Herb Hoppe signed on with a 250 watt AM daytimer on 800 kHz at Sauk Rapids, Minn., some 60 miles northwest of Minneapolis, in a market of 100,000 people. WVAL, as he called it, was named after his wife, Val.

Fast forward to 1982, when the FCC opened up the AM "clear channels," allowing additional nighttime service applications on those otherwise sacred frequencies. Herb moved the station over to 660 kHz at 10 kW by day and 250 watts by night, with four towers using a Harris transmitter and phasor system.

He had to let go of the 800 kHz frequency due to FCC ownership rules at the time.

An FCC rule change in the 1990s allowed broadcasters to have more than one AM station in the same town. Herb applied, with the help of Mueller Broadcast Design, to get 800 kHz back and built a 2,600 watt daytime/850 watt nighttime facility in 1996, using a new Nautel transmitter and phasor from Kintronic Labs, this time with two towers during the day and three towers at night, "diplexed" to share the same towers as 660.

That's right: Two AM stations feeding the same towers at once.

This practice is becoming more commonplace nowadays, as real estate values and construction costs have risen, but at the time it was not as widely done by owners and station engineers. The 660 kHz became WBHR(AM) sports talk, and 800 kHz got its original WVAL call sign.

Station: Frequency/Pattern/Pwr.	Towers in Use Designated by X						
	1 E	2 C	3 W	4 S	5 SE	6 NW	7 N
WXYG: 540 kHz 250 W Day	X	X		X			X
WXYG: 540 kHz 250 W Night		X		X			X
WBHR: 660 kHz 10 kW Day		X		X			
WBHR: 660 kHz 500 W Night	X		X	X			
WVAL: 800 kHz 2600 W Day	X			X			
WVAL: 800 kHz 850 W Night	X	X		X			
WMIN: 1010 kHz 1700 W Day		X			X		X
WMIN:1010 kHz 240 W Night	X		X		X	X	

This chart, provided by Mark Mueller, showed that 2,600 watts by day and 850 watts by night was possible.

Classic country fiddle music, as it was broadcast in the 1960s, was heard again on 800, to the delight of listeners and the station's accounting department.

Herb's son, Gary, became involved and saw an opportunity in the 2004 AM Auction 84 filing window to add to the mix. He applied for 540 and 1010 kHz during the window and got approval for 1010 first. This required building three more towers and "triplexing" three stations into most of the same towers with two patterns. (It's 1.7 kW into three towers daytime and 240 watts into four towers nighttime.)

This one is WMIN(AM), a great call for a Minnesota station that had been used on 1010 in the Twin Cities prior to its move to 1030 and then 740 kHz.

Finally, again with the help of Mark Mueller, they added 540 kHz with 250 watts using four towers by day and three towers at night. This one is WXYG(AM) and now it is "quadplexing." Engineering got more com-

(continued on page 26)

DEVA® BROADCAST

DB4004 Modulation Monitor
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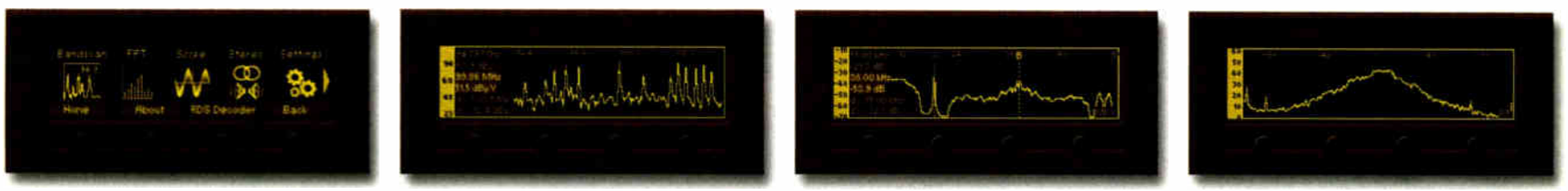

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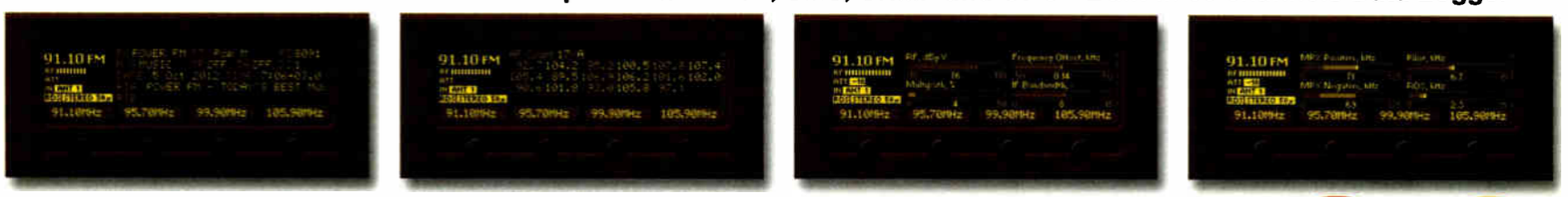

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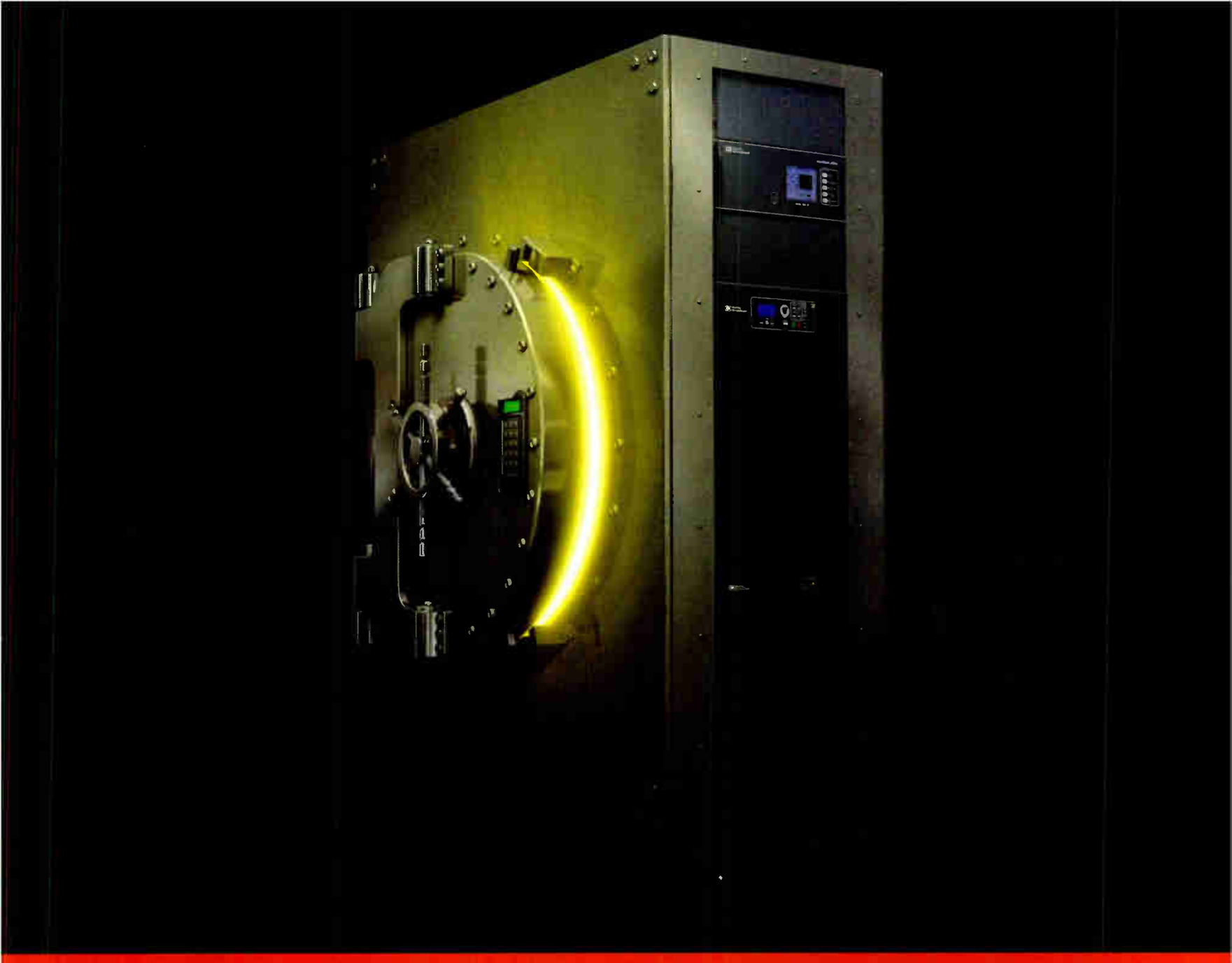

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World Radio History

Radio World Profiles Portland's Seven Station Move

Huge WheatNet-IP system makes it an exceptionally smooth move

Radio World magazine's story about Clear Channel in Portland, Oregon who moved seven stations under one roof. They're under one network, too - WheatNet-IP! Quite an undertaking, this was an exciting project for us.

Get the whole story here:

RWPORTLAND.wheatstone.com

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Under One Roof at Last in Portland

FACILITY PROFILE

ON AIR

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World Radio History

Engineer's Epinion...
Interoperability: Is Radio Ahead of the Game?

By Andrew Calvanese, VP Wheatstone

While other industries are just waking up to the idea of passing audio over an IP network, we have complete interoperable systems today. Broadcasters understand that it is not whether an individual device can stream AoIP, but rather the point is the integrated system itself. Can I route audio where I need it? Can I control it so it plays when I want, how I want? Can I make rapid and substantial changes in the system layout and flow without rewiring or re-patching everything? Can I organize and control my system from one centralized application that manages all the routing, streaming, mixing, logic, and control? With today's latest generation broadcast AoIP system, you can. In that regard, broadcasters are way ahead of the interoperability game.

Get the whole story here: INTEROP.wheatstone.com

Wheatstone Central to CKUA's Epic Move

For the CKUA project, we set up our WheatNet-IP AoIP networking around a central production studio surrounded by control rooms, voice booths and newsrooms that share I/O and line-of-sight between them. Kris Rodts, Director of Engineering, IT, and Facilities for CKUA, gives all the details in the cover story of the June issue of Radio magazine. You can download a reprint below, courtesy of Radio.

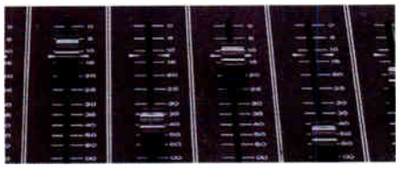
Get the whole story here: CKUA.wheatstone.com

Got MADI? Getting Into The Intelligent Network Is a Snap!

With our MADI BLADE, getting 64 channels from your existing gear into WheatNet-IP is Plug and Play!

The MADI BLADE bridges the gap, literally, between any MADI-capable audio gear/ network and the WheatNet-IP Intelligent Network. For the first time, users can add-on to their existing infrastructure with inexpensive and proven WheatNet-IP equipment. But its functionality is not limited to Wheatstone systems. ANY system that utilizes MADI can now install WheatNet-IP gear and have the full functionality that MADI permits.

Get the whole story here: MADI-BLADE.wheatstone.com



8 Things You Need to Know About IP Consoles

There's just something about that subtle "click" of the controls and the way those Penny & Giles glide up and down. Are we right? Yeah, we've been known to cop a feel every now and then, too, and we make them — hundreds of Wheatstone and Audioarts consoles every year. There's actually some pretty cool stuff we've discovered... Get the whole story here: 8THINGS.wheatstone.com

Winner's Circle

Wheatstone's goal is to give you the best possible tool set to become the best possible station in your market. WheatNet-IP represents an incredible leap forward in AoIP technology and is truly the next generation. More people are hopping on this platform every day and it's making a world of difference in their operations.

Higher Education Chooses Higher Quality Broadcast Equipment

What colleges are looking for when building or updating their studios

Get a look at what is governing the decision making process when it comes to designing modern college broadcast facilities and why Wheatstone is a perfect fit.

Get the whole story here:
COLLEGE-BROADCAST.wheatstone.com

World Radio History

FOUR STATIONS

(continued from page 22)

plicated, but still workable. With such a low frequency, the coverage is phenomenal. Did you know that 250 watts on 540 is almost equal to the coverage of 50 kW on 1600 kHz in areas of low ground conductivity?

What made all of this economically feasible was that no more land was needed to add three towers and three stations to the first one. The original 40 acres of land was enough. A new and much larger transmitter building was constructed to hold the additional transmitters and phasing systems, but that was an interesting project unto itself.

I was involved in most of the onsite engineering work, but most credit should be given to Mark Mueller for the design and tuning of this masterpiece of a system.

The original WVAL ITA AM-250A Transmitter was converted from 800 kHz to be used as a backup on 660 kHz and then converted again as a backup for 1010 kHz. Each time, it performed flawlessly and is still working after more than 50 years.

Plus, because it is a tube transmitter, it was able to handle huge amounts of reflected power while each new directional array was tuned. Only after the tune-up were solid-state transmitters brought online.

IN PRACTICE

Mark Mueller continues: In 1995 the client asked if he could have his old frequency back now that the FCC allowed broadcasters to have more than one AM station in the same town. After a bit of analysis, I determined that the answer was a big yes.

WVAL had moved to 660 kHz in the 1980s but was originally on 800 kHz with 250 watts non-directional day but no night authority. My study showed that 2,600 watts day and 850 watts night was possible, but both would need to be directional. Hmmm, where could the transmitter site be located?

It was an interesting challenge keeping up with this unique project, as there are no other four-station directional antenna arrays to compare it with.

– Mark Mueller

Well, the client already had four towers on a huge piece of property, just outside of town, that was being used for 660 kHz, and the ground system was more than large enough, plus the tower heights and spacings would work fine on 800 kHz. FCC filing windows were still in the future so an application for a new station on 800 kHz was tendered in January 1996 and granted by the FCC

PEOPLENEWS

Clear Channel Media and Entertainment has chosen **Kelly Kibler** as senior vice president of operations. Kibler will oversee the Houston, Dallas, Austin and San Antonio markets and will report to Tom Schurr, president of operations, major markets. **Nathan Daschle** also joins Clear Channel, in the Washington office, as executive vice president for political strategy.

Mat Mitchell has been named program director for **KZZP(FM)** and **KYOT(FM)**, and he will also host middays on KZZP. **Clear Channel Seattle** has named **Katerina Perez** as its new vice president of sales. **Rhonda Lapham** has been named market manager for **Clear Chan-**

Katerina Perez

World Radio History

in 1997.

Kintronic Labs built the phasor, antenna coupling networks and diplexing filters to keep 800 from interfering with 660 kHz and vice versa. Mark Persons did the installation and I tuned and proofed the system with both stations happily running into the same set of towers.

Diplexing can be a great solution for where to locate a station. No new land was required and the transmitter building was just (barely) large enough to house two phasors along with main and auxiliary transmitters for each. WVAL returned to 800 kHz in March of 1999 while 660 kHz became WBHR.

Then, as often happens, clients see opportunity in expansion and with the WVAL addition to WBHR proving that it could be economically done, the question of whether additional frequencies were usable from the site came up. Two were found, and the story continued with the 2004 Auction 84 AM filing window and the addition of the two stations.

Three more towers were built on the same piece of land to optimize the patterns and make it all work out right. 1010 was granted first in 2005 and implemented in 2008, while 540 was granted in 2007 and constructed in 2010.

It was an interesting challenge keeping up with this unique project, as there are no other four-station directional antenna arrays to compare it with. Having three of the four stations on the lower end of the band helped in some respects, like keeping stray inductive reactances from the interconnecting tubing under control, and hindered in others, as when low drive-point impedances were encountered on WXYG.

In order to minimize the potential for unpleasant surprises, the tower houses were rebuilt to hold all of the equipment, which was then installed as a unit instead of piecemeal additions to each existing array. Close attention to grounding and component layout minimized interaction between stations and allowed the system to perform with no significant interaction or cross products.

There are more than 50 pass-reject filters in this system, since none of the stations use all seven of the unused towers, which are detuned through the filters.

The entire system had already been modeled for the design, and development around the site was affecting existing monitor points, so MoM (Method of Moments) antenna proofs were done on all four stations. It has been well over a year since the last station was added and there have been very few maintenance problems, not bad considering four stations are sharing the same site.

The client is happy and I am also very pleased that this kind of setup can and will work.

Mark Persons, WØMH, is a professional broadcast engineer certified by the Society of Broadcast Engineers. He has more than 30 years of experience and has written numerous articles for industry publications. His website is www.mwpersons.com.

Mark Mueller has been a broadcast technical consultant specializing in AM directional arrays for 30 years and can be reached at Mueller Broadcast Design, in La Grange, Ill., by visiting the website www.muellerbroadcastdesign.com.

nel Providence.

Robert Ames has joined Radio World's parent company, **NewBay Media LLC**, as vice president/corporate director of digital media.

Justin Chase

Beasley Las Vegas Operations Manager **Justin Chase** has been promoted to a newly-created position of vice president of programming, reporting to President and Chief Operations Officer Bruce Beasley.

RCS appointed **Keith Williams** as its new vice president for the Asia Pacific Region. Currently, Williams serves as managing director of RCS Australia, and he will temporarily continue those duties.

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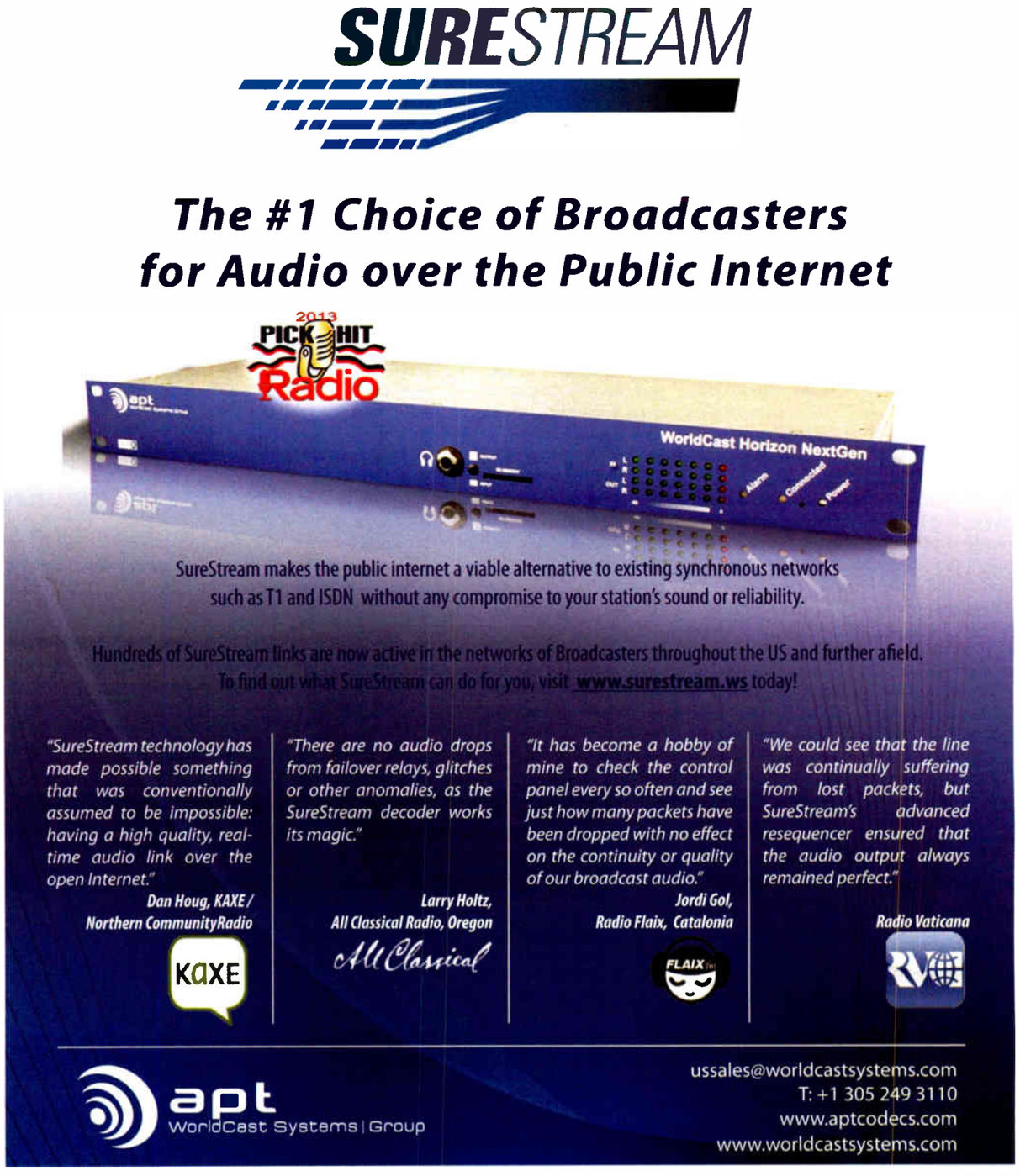

World Radio History

The Ampex Cue-Matic Disk Recorder

ROOTS OF RADIO

BY JOHN SCHNEIDER

KYA(AM) studio engineer Carl Christiansen. Photo courtesy of Kevin Mostyn.

In the radio studios of the 1950s, commercials and recorded announcements were played from 16-inch Electrical Transcriptions (E.T.'s) or reel-to-reel tapes. But with the development of the fast-paced top 40 format, stations needed a better way to quickly play short audio cuts. The broadcast equipment industry responded to this need with several new product concepts.

The first of these was the Gates ST-101 Spot Tape machine. It was introduced in 1959, the same year as the first endless-loop tape cartridge machines, but never gained significant broadcaster acceptance. The Mackenzie Repeater and the Schafer Spotter were two additional formats that found limited adoption. At the same time, broadcasters were embracing the cartridge concept in overwhelming numbers, and within three years it had become radio's gold standard.

Yet another concept that failed to click with radio broadcasters was the Ampex Cue-Matic machine, introduced in 1965. Instead of the conventional audiotape format, these machines played the Ampex Cue-Mat — a 3 mil magnetically coated Mylar disk, 11-3/4 inches in diameter. It recorded analog audio in a spiral track from outside to inside, like a phonograph record. The player ran at 12 RPM, which provided a playing time of 3 minutes 45 seconds on a disk, and used a 30 Hz stop cue tone.

KYA(AM), in San Francisco (now KSFB), was the station selected by Ampex to test the prototype. KYA was close to the Ampex headquarters in Redwood City, and was a top 40 station that needed fast access to short audio cuts. Pictured is studio engineer Carl Christiensen inserting a Cue-Matic disk into one of the Ampex players. (San Francisco was a union town, and so KYA did not have combo operators.)

The Cue-Mat format had several faults. There was no jacket to protect the disks, and so they were subject to scratches, tears, folds and other damage. Another drawback was that the head speed decreased towards the center of the disk, gradually reducing audio quality. The outside speed was 7-1/2 IPS, but the inside speed was only 3-1/2 IPS. A third limitation was the five-second cue-up time, compared to the tape cart's last-minute "slam-and-play" capability.

But perhaps the most significant obstacle to its success was the cost. A new Cue-Matic recorder cost $1,395 in 1966 dollars, while a player was $1,145. (Cue-Mats were 45 cents each.) That was a lot of money for all except the biggest stations. By comparison, a Collins/ATC cart recorder was $875 and a Spotmaster 500B recorder cost $695.

Ampex only manufactured the Cue-Matic machines for two years. But while not successful as a radio format, the concept later made money for Ampex in other areas. The disk patents enabled the much more successful computer floppy disk. Ampex also modified the design to use an aluminum disk with magnetic coating and created the HS-100 video disk recorder. Television broadcasters did not balk at Ampex prices, and the device found quick success in network television sports as the first stop-action instant-replay device.

John Schneider is a lifelong radio history researcher. Write him at jschneid93@gmail.com.

For more photos and information of the Ampex Cue-Mat, visit radioworld.com/links.

WORKBENCH

(continued from page 20)

not beautiful; but it does the job very well. Buc writes that the last one of these he was involved in was on a rig in a miserable station, on an island (heave ho), at the end of an hour's drive for the CE.

After installation, the CE had the affection for Buc to call at 3 a.m. to tell him how very happy he was. He'd just remotely reset the CB, and got his station back on using his telephone on the nightstand rather than getting up, driving an hour, rowing in the dark and walking up the hill to reset the CB. So, these units do have their place.

Buc says these units fit on a model FEL "molded case" circuit breaker, and they are available from 15 to as high as 800 amps. Of course, if resetting the breaker once doesn't do the trick, you probably have a short length of time to go investigate.

Charles "Buc" Fitch, P. E. and Radio World contributor, can be contacted at *fitchpe@comcast.net*.

While contracting, I was called to a station that was tripping on and off. At the transmitter, I found it was the remote control that was resetting the transmitter, over and over again. Local control took care of that, and I could fix the problem.

When I stopped by the studio later, I found the jock had wedged a toothpick between the chassis and the "RAISE" button on the Moseley remote control, forcing the button to stay depressed.

As soon as the transmitter overload tripped the transmitter off, the toothpick-enabled RAISE switch recycled the transmitter back on — if only for a moment or two. It shut down immediately, only to be RAISED again, thanks to the toothpick.

When I asked the jock why he used a toothpick to hold the button down, he replied that his finger was getting tired from repeatedly pushing the button to get the transmitter to stay on the air. Don't you just love this business?

Contribute to Workbench. You'll help your fellow engineers and qualify for SBE recertification credit. Send Workbench tips to johnpbisset@gmail.com. *Fax to (603) 472-4944.*

Author John Bisset has spent 44 years in the broadcasting industry and is still learning. He handles West Coast sales for the Telos Alliance. He is SBE certified and a past recipient of the SBE's Educator of the Year Award.

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Gerry Fernandez, Operations Manager

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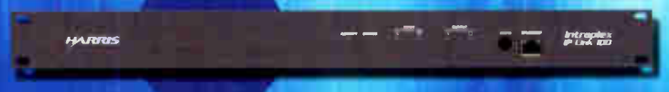
Brad Humphries, Contract Engineer



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World Radio History

Irish Eyes Smile on Telos Z/IP One

Longstanding Internet station uses codecs to facilitate jaunts onto the radio

SPECIALREPORT

BY ANDY LINTON
Director
Total Broadcast Consultants Ltd.

WATERFORD, IRELAND — Zenith Classic Rock is an Internet radio station of some notoriety: It's one of the longest-running, having been online now for more than 10 years, and has therefore picked up a faithful following of listeners who tune in to hear a unique blend of classic rock standards interspersed with deep album cuts and oft-neglected tracks from the rock genre.

At the start of every year, this station gets to broadcast to the southeast of Ireland in the traditional sense, on AM, FM and DAB, by means of a temporary license.

How they do radio in Ireland: Zenith Classic Rock jock Paul Dower toasts the Z/IP One on St. Patrick's Day, 2013.

ON THE AIR

These licenses are relatively easy to come by in Ireland, but duration is limited to 30 days per year. Zenith uses these 30 days as 15 weekends of airtime.

Zenith makes use of automation most of the time, but during their annual forays into the radio frequency spectrum, they present mostly live programs. The studios and transmission facilities are rented from my company, Total Broadcast Consultants, so it was up to me this year to ensure that this station sounded as good as possible on-air.

The studio location is some 30 miles from the transmitter site, which is a mountaintop equipped with a 30-meter tower, antenna system and 1 kW transmitter.

In previous years, the station used a UHF composite link to get its audio from studio to transmitter, but that wasn't possible this year due to a change in studio location. There is now no line of sight.

However, the transmitter site does have Internet access by means of a fixed-wireless Internet service company, and the studio location has Internet from a cable service provider. So this year, we decided to use this medium.

I installed a Telos Z/IP One codec at both ends. I knew this would be a good test of the codec's capabilities because a continuous program feed over the Internet is quite a daunting prospect.

The studio is Axia-based, so interfacing the Z/IP One via Livewire was a piece of cake. At the other end, the AES/EBU digital output fed the FM and DAB processors.

The wireless Internet provider's system has a pretty strict firewall arrangement and initially I found that the Z/IP Ones couldn't manage a direct connection to each other, but the relay system Telos has built in — a connection via one of their Z/IP servers — worked fine while we struggled with port-forwards, NATs and various esoteric mechanisms to get the studio to "see" the transmitter site directly over the public Internet.

This method worked fine for the first weekend's broadcasts, and by the second weekend, we had the codecs connecting one-to-one.

I love how you "introduce" the Z/IP Ones to each other. Just give them a unique name, and they appear in the directory shown on the unit's display. Select the target unit, hit "Connect" and you're off to the races.

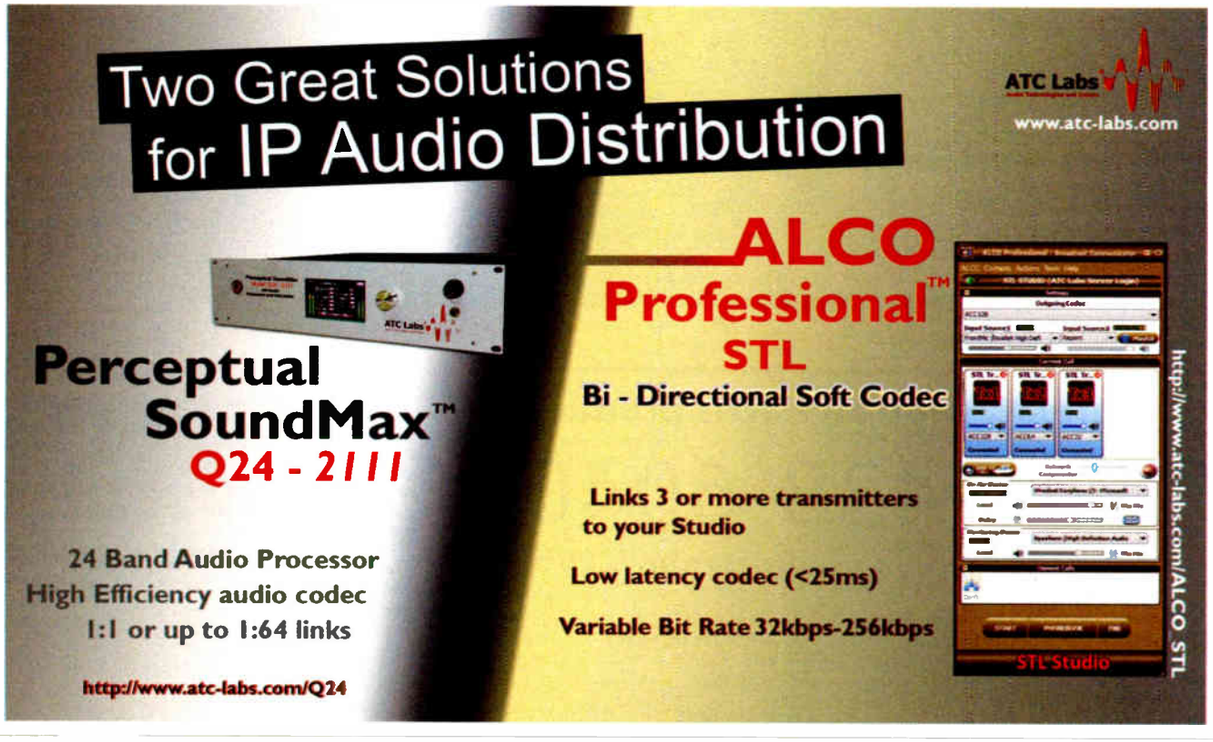
I'm a stickler for audio quality. I hate hearing the artifacts of bitrate reduction, so would have preferred to run the link linear, i.e. with no compression, but the bandwidth required proved too taxing for the Internet upload capacity, so instead I opted for AAC-ELD coding, at 192 kbps.

Honestly? I couldn't hear the difference on the received FM signal between linear and the AAC-fed transmission. In fact, I thought the AAC implementation by the Z/IP Ones sounded better than I had heard with other manufacturers' codecs — a nice clear top end, no "swirling" and full bottom end.

Zenith's FM (and Internet) audio processing is excellent, and always gets praise when on air. This year was no different — ordinary listeners actually did contact the station to say the quality was superb!

And in terms of reliability, I did hear a few fast dropouts, but looking at the logs in the Z/IP Ones, I could see that the upload capacity of the Internet link had simply bottomed out. I also saw that some very bad stuff had happened on quite a few occasions to the data throughput, but the connection hadn't dropped. Telos' "Agile Connection Technology" obviously works. The link was reliable for the 15-weekend run of live broadcasts.

For information, contact Telos Systems in Ohio at (216) 241-7225 or visit www.telos-systems.com.



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Role Reversal: Comrex Aids the Boy Scouts

Access codecs get the Scout Jamboree onto the air

SPECIALREPORT

BY CHRIS CRUMP
Director of Sales
Comrex

SUMMIT BECHTEL RESERVE, W.VA. — In 2010, I was peacefully minding my business as director of sales at Comrex, when the phone rang. The gentleman on the phone was looking for something to help with his remote broadcasts because the gear they were using was not very portable and it was difficult to set up and a bit noisy.

He had heard that Comrex had the best gear for remotes and wanted to know if he could rent or borrow some equipment for this little radio station that the Boy Scouts were putting together for an upcoming event. I stopped him, told him that I am an Eagle Scout and he would have whatever he needed for the 2010 National Scout Jamboree. Next thing I knew, I was on the staff of QBSA (WB4XSA) Jamboree Radio.

This year, the National Scout Jamboree was held at its new permanent home in the New River area of West Virginia. And once again, QBSA broadcast live for the 10-day duration of the Jamboree on 98.3 FM, in addition to streaming live on the Internet. I was there.

The Summit Bechtel Reserve is 10,600 acres of beautiful mountain wilderness in which the Boy Scouts of America have created one of the largest outdoor recreation areas in the United States. During the National Scout Jamboree, this site becomes host to the second largest population in the state overnight, as 40,000 Scouts and 7,000 adult staff arrive to participate. Even though substantial efforts and financial resources have been made to provide infrastructure for this event, the fact remains that the Summit is still in the great outdoors. Obviously, putting together a radio station in the wilderness provides some interesting challenges for transmission, streaming to the Internet and especially remotes. Luckily I have access to some excellent remote broadcast gear that can adapt remarkably well to some of these challenges.

QBSA Remote Director, Tade Sullivan uses a Comrex Access Portable codec to interview the Dragon Boats Aquatic Director on Lake Goodrich at the Summit Bechtel Reserve.

WI-FI WIZARDRY

Our main studio was housed in an RV-type trailer and the scout disc jockeys did their shows in a giant boom box provided by our Chief Engineer Pete Boyce. Over the course of the Jamboree, nearly 2,000 Scouts had the opportunity to get on the air. The morning show was charged with making sure that as many events as possible at the Summit are broadcast live for Scouts and Scouters around the camp as well as family and friends back home. The morning show sent out a remote team with a Comrex Access portable IP codec to accomplish the feat. AT&T, one of the biggest sponsors of the Summit, graciously provided free Wi-Fi service throughout the camp and coverage and bandwidth were pretty phenomenal. The site was also well covered with 4G LTE service from both AT&T and Verizon.

One of the main technical challenges (in addition to having to depend on generators for power) is the fact that there was no wired Internet connectivity. Even though Comrex recommends a wired Internet connection on the studio side, we were forced to depend on AT&T Wi-Fi for uploading our Internet stream and our remotes. Remarkably, the bandwidth was substantial and robust. The plan was to use the AT&T 313U Momentum 4G LTE modem with the Access Portable and connect to an Access Rack in the studio which was connected to a PC in the studio with Internet connection shared Wi-Fi.

Unfortunately, a condition referred to as opposing Symmetric NATs prevented the Access units from connecting. By using our BRIC Traversal Server, the devices could see each other but condition of port blocking prevented connection. I usually carry modems for multiple carriers and I was thrilled when I was able to make an easy connection using a Verizon 4G LTE UML295 USB modem. The speeds were fast, latency was low and throughput was very consistent — the perfect conditions for broadcasting a great remote. Our remote team was able to go out to the farthest reaches of the camp and interview Scouts, staffers and dignitaries.

Our Scout staff and Scout DJs benefited from this great experience thanks to support from our friends at BSW, Wheatstone, YellowTec, BSI and Radio Systems. Thankfully, I have four years to rest until the next Jamboree.

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

World Radio History

AXIA MAKES THE NET WORK.

Choosing an IP-Audio network? Some companies treat AoIP as if it were an RCA jack — nothing more than a way to get audio into a console. But Axia fans know that the network's real value comes when devices truly communicate.

Axia Livewire™ networks are much more than glorified punchblocks. Axia consoles integrate with a big family of more than 70 broadcast products, from 45 partners, to intelligently share audio, data and control between studio devices with the click of an Ethernet cable.

Phones, codecs, delivery systems, audio processors, profanity delays, pro audio cards and more, all form a sophisticated ecosystem. So phone and codec callers receive automatic mix-minus. Satellite feeds record unattended. Broadcast-quality intercoms can go straight to air. Shows are smoother and more error-free. And Axia is a charter supporting member of the AES X192 standards project, so your investment is future-proof.

So when you choose your IP-Audio network, choose the one with all the connections. Axia: we make the net work.

AxiaAudio.com

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World Radio History

Merlin Plus Is Magic for Lincoln Financial

Six input channels at one time bewitches; and what about Opus?

USERREPORT

BY BILL EISENHAMER
Chief Engineer
Lincoln Financial Media
of California

The Merlin Plus (top) shows a full six channels streaming in.

SAN DIEGO — I always like trying new things. While at the NAB Show in Las Vegas, I stopped by the Tieline booth to say hello. That hello turned into a "you must see this new product" speech and then a quick discussion of what it was and why I had to see it.

I knew the Merlin codec was available, but I also knew that an improved version was in the works. I liked what I saw, but with budgets the way they are, I took note and filed that away in the recesses of my mind, hoping to come back to it for further research at a better time.

Two things stuck in my head after that meeting: (1) Up to six simultaneous IP connections and (2) the use of the Opus algorithm.

Well, recently I received a call asking if I would like to take the Merlin Plus codec for a spin. I did not hesitate to sign the loaner agreement.

SIX CHANNELS

I should have asked why a company would make a box that would accept six simultaneous streams, but for me it was a challenge that needed to be tested. If a product is advertised to do something, I want to know that it will. After receiving the equipment — one Merlin Plus and one Merlin codec (for Opus testing) — I quickly set up the bench for testing.

My test was going to be running six connections using digital I/O into my SAS 32KD routing system, so with the excitement of something new to play with, I started preparing the connections. The I/O expansion port is a DB-25 connection, so I wired one up for my tests.

At first I created a typical connection using the Merlin. I also made connections with my Tieline Commander G3 TLR300 rack codecs. The standard Tieline Music Plus algorithms worked as advertised.

Initially, only single connections were made. I did this to make sure things worked "right out of the box." As I am familiar with Tieline codecs, I had no issues navigating the screen and made these connections.

As a pretest for the Opus algorithm, I configured the Merlin codec for such a connection and tested that. Being happy that all systems are a go, it came time to figure out how to make six connections happen.

I downloaded the manual and started to peruse it because I had found that creating the configuration that I wanted was not fully intuitive. But before I could finish I decided to leave work and go home to think about it. After a beer and another perusal of the manual, the light bulb in my head lit and I was ready for the next attempt.

The next morning, I did not hesitate to create the configuration and see if this thing could actually do six connections. It was also a test of our network infrastructure, as we have three codecs that share a T1 circuit to our ISP. In addition, we have other traffic on that connection, though minimal, that could cause issue.

I connected the following to the Merlin Plus:

1. TLR300 on the network
2. TLR300 on the network
3. Merlin on 4G LTE
4. Report-IT app on Android phone and 4G LTE
5. Report-IT app running on Android tablet on a Wi-Fi hotspot connect to 4G LTE
6. An iPhone with the Report-IT app on 4G LTE.

All connections were at various data rates from 33.6 kbps to 48 kbps, and I let these connections ride for two hours. Success! I had six connections at the same time.

Next, my curiosity turned to the Opus algorithm. It is still in the testing stage, but is available on the Merlin Plus and Merlin codecs. The claim of Opus is quality with low bitrate and low latency. I had to test this one over the 4G LTE network. I selected the appropriate configuration, or program, and made the connection. As with any wireless connection, it took a couple minutes to settle down. I looked at the connection details and saw the buffer settled down to 60 ms, and that was a cellular data connection. When broadcasting normally, we see anywhere between 150 ms to 250 ms buffer, due to the network.

I wanted to test the Opus on a live broadcast but, alas, the station cancelled the remote. A quick frequency response sweep while I was connected found a very respectable 50 Hz–15 kHz response, definitely well suited for voice broadcasts.

The programming of the Merlin Plus codec is done via the Toolbox GUI, which is Java-based. Poking around in the program, I was able to configure the 2X mono connections with ease. Where I wanted to go with the 6X connections required more understanding of the codec and user management tools via Tieserver. Once I had this down, creating the larger configuration program was simple.

If the codec is hiding behind a firewall, an understanding of the IP port structure is a must as each individual audio stream has a dedicated port. In my tests the session streams used the same port, so the box is capable of managing the individual sessions within the DSP.

It should be noted that Opus is currently not a choice when configured for six connections. I have been informed that this is a project in progress, so I suspect it will be introduced soon.

I can think of many reasons why our music-only stations would need six streams. If I can think up that many for the music stations, just think of the possibilities for a sports or news facility that I could dream up.

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

TECHUPDATE

DIGIGRAM UPGRADES IQOYA *LINK/LE IP AUDIO TRANSPORT

Digigram says that its Iqoya *Link/LE is suitable for serious broadcasters looking for a mix of reliability, flexibility and affordability.

The company says the codec was developed in collaboration with major European telcos and selected by leading broadcasters. It is a cost-effective version of the full-featured Iqoya *Link codec and supports reliable, flexible IP-based studio-to-studio and studio-to-transmitter links.

Newly upgraded from a decode-only approach, the Iqoya *Link/LE now includes full-duplex encoding and decoding.

The Digigram system is equipped with Fraunhofer's AAC codec pack as a standard feature and an optional Enhanced aptX audio codec is also available. In addition to its dual Ethernet ports and an RS-232 data ports, four GPIOs and an I/O bypass, the Iqoya *Link/LE provides two levels of backup and automatic failover.

Like other Iqoya solutions, the company says, the *Link/LE is based on FluidIP, an ACIP (EBU Tech 3326)-compliant IP audio streaming engine developed by Digigram. This technology assures interoperability with third-party IP codec devices, while promising unrivalled robustness, QoS optimization, stream integrity, dual streaming and audio quality.

According to Digigram, the ubiquity of worldwide IP networks and availability of audio-over-IP solutions enable distribution of mission-critical digital audio over IP networks, giving broadcasters a more flexible solution than traditional models and at a lower cost of operation.

For information, contact Digigram in France at 011-33-4-76-52-47-47 or visit www.digigram.com.

World Radio History

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 Mpbs 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.

EMAIL AND INTERNET ACCESS FROM THE TRANSMITTER SITE

Saves engineers time accessing manuals or technical support from manufacturers during maintenance sessions.

SIMPLE NETWORK MANAGEMENT PROTOCOL (SNMP)

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

Contact The Moseley Sales Team to Custom Configure Your EVENT STL/TSL Today!

moseleybroadcast.com

World Radio History

Harris Helps Envisage Rock All Night

New program syndicator finds content distribution a snap with IP Link 100

USERREPORT

BY RUSS MOTTLA
President and Owner
Envisage Radio Group

The author is in the 'Rock All Night' studio.

SAN DIEGO — Envisage Radio Group is a new radio program syndicator based in southern California. Our vision for flagship program "Rock All Night" is to create an overnight community of listeners that brings live voices back to the airwaves after 7 p.m. The program delivers a mix of rock music and related talk that is also designed to serve as an ideal morning program lead-in.

For some time, I have been drawn to the idea of using audio over IP to distribute syndicated program audio and contact closures for ad breaks, show opens and other needs. The high cost of satellite delivery made it clear that the ROI is far quicker using IP, considering the fairly low cost of the devices and monthly operating bills.

RECOMMENDATIONS

Doug Tharp at equipment dealer SCMS recommended that we evaluate the Intraplex IP Link 100 audio codecs from Harris Broadcast. To date, we have units up and running at the encode and decode points, transporting high-quality 128 kbps MP3 streams to broadcast "Rock All Night" at KXRC(FM) in Durango, Colo. Audio quality has been excellent, and we expect to install additional units to support more streams as new stations are added to the network.

Harris Broadcast has been at the top of our vendor list for some time, as we recently purchased a complete "Desktop Radio" solution through SCMS featuring a PR&E Oasis console with a direct automation connection. We were drawn to the company for IP audio codecs because they deal specifically in broadcast, and we heard from other broadcasters who offered positive feedback about their use of the IP Link 100 as an STL backup.

The IP Link 100 price is similar to a satellite receiver but, as noted, the ongoing costs of operation for IP delivery are far less expensive than satellite. We dug into the boxes after performing our cost analysis, and have found the feature set to have everything we need. Setup was simple. Configurations included routing the outside IP address to an internal IP address on the network, followed by opening two ports to initiate streaming.

During configuration, we provided the transmitting and receiving information for format and bitrate, along with the necessary contact closures. The IP Link 100 encodes and transmits all audio and closures in sync so that all commercial breaks are received at the proper time.

The biggest benefit is on-air reliability. The broadcast in Durango just recently went live, but in three months of testing, the units went down only once — and that was due to an electrical outage. Built-in redundancy, which they call "dynamic stream splicing," offers three ports to ensure that there is no packet loss during audio and closure transport. These three ports include a management port and two streaming ports.

Built-in audio memory or a plug-in USB thumb drive add another layer of redundancy, allowing us to add content to the IP Link 100. This enables direct play-out from the unit in the event of unusual on-air silences.

Moving forward, we will get a second service provider soon with the dynamic stream splicing feature, giving us one primary and one secondary feed that can ultimately borrow from each other if necessary. This will ensure the dependability of the Intraplex brand's STL products.

It's an exciting opportunity to be able to launch a new syndication network with IP as a distribution platform. It is a great way for small groups and start-up syndicators to enter the marketplace and deliver programming from station to station easily, reliably and cost-effectively. The IP Link 100 audio codec is helping us to achieve these goals without hassle.

For information, contact Brian Clifford at Harris Broadcast in Ohio at (513) 459-3714 or visit www.harrisbroadcast.com.

TECHUPDATE

IDC STAR PRO AUDIO PROVIDES LOCALIZED AD INSERTION

IDC says that its second-generation STAR Pro Audio Solution opens up revenue generating opportunities for radio networks with localized ad insertion. It adds that the new platform also enables time-shifting functionality, allowing broadcasters to play the right content at the desired time. Broadcasters can adjust for time zones and rapidly adapt to conflicting live programming schedules.

In addition, tne STAR Pro Audio solution significantly lowers per-channel costs through shared hub support, according to the company. It uses up to 70 percent less bandwidth compared to competitive solutions, IDC says.

The STAR Pro Audio solution includes a copy split capability that allows operators to send select ads to specific regions or specific receivers. Stored audio files can be inserted into live or recorded programming. The company says cost savings are realized through shared hub support, which enables multiple radio networks to share one four-channel receiver instead of having each network deploy its own standalone, single-channel receiver.

Furthermore, IDC says, the STAR Pro Audio solution requires 120 kHz space segment for stereo, as opposed to 440 kHz for competitive systems, resulting in further cost savings.

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

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at 212-378-0400 ext. 511 or email dcarson@nbmedia.com.

World Radio History

TECHUPDATES

BARIX REFLECTOR TRANSPORTS AUDIO OVER IP

Barix says that its Reflector Service is a system solution for streaming audio that replicates a received stream to an unlimited number of destinations through the public Internet. In radio, the solution is suitable for STL connectivity and syndicated program distribution, according to the company.

According to Barix, the solution is based on a server/client architecture scheme. The client encoder device pushes the audio stream to the server and the client decoder devices pull the stream from the server. The number of receiving locations is limited only by network bandwidth.

The company says client devices don't need a public IP address and don't require any specific configuration for audio transport. All client devices are configured automatically on startup from the server, where they are registered with their MAC address. Thus, the devices can be shipped directly to their locations, and no manual intervention is needed for configuration.

Depending on the chosen hardware, it is also possible to pass contact closure information in the same stream. The Barix Exstreamer 500 professional IP audio device (shown) is one example. At the destination, a failover to USB playback can be used to ensure a continuous audio feed out in case of network failure.

A free iPhone app is also available to monitor live audio streams.

The Reflector Service can be hosted by StreamGuys, a content delivery network partnering with Barix; or the server software can be licensed for other management.

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

AEQ DEBUTS CODEC AND PHONE SYSTEM

Broadcast equipment manufacturer AEQ has a number of new products available this season.

Top of the list is the rackmounted Phoenix Stratos, the latest member of AEQ's Phoenix codec family. The Stratos is an IP/ISDN model. The Stratos shares many of the same features as the Phoenix Venus but has a full-featured front panel and adds the ISDN interface.

AEQ has also launched a new multiline talkshow/conference call system, Systel-IP (shown). As the name indicates, it is a voice over IP system that can be used in radio or TV broadcast facilities. The Systel/IP can handle four lines for up to two studios and 12 lines in four studios.

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

AN OLD CLASSIC, REVITALIZED

The handy, compact, RemoteMix 2™
It's a two-channel field mixer / headphone amplifier that's a little more hands-on. Providing a communications interface, it's a convenient solution for remote broadcasts, IFB, or a backup audio path. The integrated headphone amplifier provides sidetone to monitor all inputs as well as an external feed. Also featuring a phone line hybrid with keypad along with a wired notebook/cell phone headset interface, these components were designed to work together, saving setup time and wiring in the field.

Perfect for Live Remotes.
Use it as a front-end mixer for your POTS, ISDN, IP or Smart Phone Codec. Or, use it as a phone line hybrid, calling in to your studio phone lines.

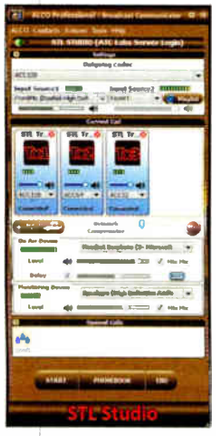
TOLL FREE: 800.552.8346 TEL: 815.786.2929 www.jkaudio.com

JK Audio 20th ANNIVERSARY

World Radio History

TECHUPDATES

ATC LABS ADDS TWO-WAY IP AUDIO SOFT CODEC STL



ATC Labs is now delivering two options for IP audio distribution to remote locations.

ALCO Professional STL is a low-latency, high-resolution soft codec-based bidirectional STL for connecting a studio feed to one or more transmitters. It can work with either fixed or dynamic IP addresses and incorporates firewall tunneling and auto-reconnection capabilities; the company promises persistent connectivity over even temperamental data connections such as 3G/4G wireless.

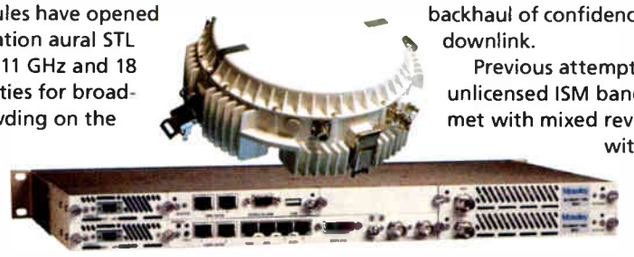
Bidirectional variable bitrates from 32 kbps to 256 kbps are included and controlled from the studio end. Bitrate and buffer level can be dynamically adjusted without dropout, according to the company. Two-way communications ensures a reverse talkback channel from each transmitter site and multiple remote monitoring options. Private SMS text and file transfers are supported for each end.

ALCO Professional STL uses ATC Labs' low-delay ACC codec that delivers quality sound with less than 25 ms delay. The base configuration supports single STL application or up to three transmitter locations with the option to expand to six or more locations. The codec is compatible with wired and wireless 2G, 3G and 4G networks and runs on Linux, Windows XP, 7 or 8.

ALCO Professional STL joins the Perceptual SoundMax Q24-2111 product line, which can stream one-directional audio over IP to up to 48 remote locations. Perceptual SoundMax Q24-2111 is a compact 2.5 rack unit with digital and analog audio I/O and it supports multi-unicast and multicast options. It incorporates ATC Labs perceptually-optimized implementation of standard AAC/AAC+/MP3 encoding with stereo bitrates from 32 kbps to 256 kbps. Perceptual SoundMax Q24-2111 also includes a 24-band audio processing engine allowing the studio to optimize the sound for the genre or the distribution format. A software/server version of Perceptual SoundMax Q24-2111 is also available.

For information, contact ATC Labs in New Jersey at (973) 624-1116 or visit www.atc-labs.com.

MOSELEY EVENT OFFERS AURAL STL IN NEW LICENSED BANDS



Recent changes in FCC rules have opened up frequencies for radio station aural STL use. Portions of the 5 GHz, 11 GHz and 18 GHz bands offer opportunities for broadcasters faced with overcrowding on the traditional 950 MHz band.

According to Moseley Broadcast, the Moseley Event series of high-capacity radio links can transport multiple radio station programs with uncompressed digital audio to create a cost-effective multi-station STL. Moseley says that Event could be coupled with the company's Rincon audio transporter or Starlink T1 to create a high-capacity audio and data transport system.

Moseley says that linear uncompressed audio produces the cleanest, artifact-free on-air sound and that its Event products do not rely on fidelity-robbing algorithms to achieve high capacity. This combination of multiple uncompressed audio channels and Ethernet payload provides the signals necessary for HD Radio and HD2, HD3 multicasting.

Event's wideband IP Ethernet capacity supports network applications, remote servers, surveillance and security, Internet, and email connections. It is bidirectional for backhaul of confidence monitor, RPU or satellite downlink.

Previous attempts at using data radios in the unlicensed ISM band for audio transport have met with mixed reviews, the company says, but with Event in the newly available bands, stations have the confidence of a licensed frequency assignment.

Moseley says that Event is a true carrier-class transport system. It was originally designed for the telecommunications industry where "all 9s" performance is a must, according to the company. Conservative use of the radio's capability, adaptive power control and Reed-Solomon error correction give Event the robustness needed for STL use, it adds.

Combining payloads over a single bidirectional high-capacity digital radio link saves money when compared to discrete audio, voice and data links.

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

DVEO POLYCODER AUDIO 40CH/IP TRANSCODES 40 CHANNELS

DVEO says its new broadcast-quality, remotely manageable, multichannel audio transcoder, the Polycoder Audio 40ch/IP, captures up to 40 simultaneous analog audio inputs and transcodes them to various audio formats in real time.

The embedded Linux-based system streams hundreds of simultaneous IP audio streams to various playout devices — like mobile phones, tablets, computer desktop media players (e.g. Real, Microsoft Windows Media, Flash, VLC and JW players) or any device that can play a live IP audio stream.

Input formats include analog audio and MP3, WMA, AAC+ and Ogg Vorbis audio streams. Transcoded output formats include AAC, Ogg Vorbis, optional MP3, optional MPEG-1 Layer II or optional SurCode for Dolby Digital AC-3.

The Polycoder Audio 40ch/IP captures up to 40 analog audio feeds from RCA unbalanced, balanced XLR or digital AES/EBU. With these sources, users can create or transcode to various bitrates and delivery protocols — HTTP Live (HLS or Apple Live), HTTP, WMA, RTP, RTSP, HTTP Smooth and RTMP. Depending on the types of streams and bitrates, hundreds of various outputs are possible.

Inputs can be scheduled to be received at specified dates and times. It relies on dual eight-core CPUs and features a redundant power supply.

DVEO says that radio broadcasters can use the system for music and news content delivery — for live and breaking news or scheduled content.

For information, contact DVEO in California at (858) 613-1818 or visit www.dveo.com.

2WCOM FMC01 DISTRIBUTES FM MPX CODEC

2wcom's new FMC01 is designed for FM MPX contribution and distribution via IP or E1 (G.703). The company calls it the industry's first codec to combine encoder and decoder functions in the same unit, saying this offers significant advantages and substantial infrastructure savings.

The company believes these benefits, combined with lossless audio encoding/decoding and optimized bandwidth technology, sets the FMC01 apart as a point-to-multipoint distribution solution for radio networks.

According to 2wcom, with the FMC01, a broadcaster can achieve substantial savings by simplifying the delivery infrastructure. There is no need to use an RDS encoder and stereo generator at each station, because it's unnecessary to generate an MPX signal at the transmitter site.

The FMC01 also ensures low installation, service and maintenance costs with minimal configuration of the device required, says 2wcom.

Crucially, it allows broadcasters to create a signal distribution system that delivers the same high-quality signal for each transmitter site.

Features include Reed-Solomon forward error correction to minimize bit errors, input source switchover between E1 and Gigabit Ethernet IP in case of failure, quality parameters via SNMP v2c and relay switching, and FM demodulation with L+R XLR, headphone outputs and RDS decoding.

The FMC01 will be available from 2wcom in September.

For information, contact 2wcom in Germany at 011-49-461-662830-15 or visit www.2wcom.com.

World Radio History

RemoteMix 2 Lives Up to Its Name

USERREPORT

BY MARK MCCONNELL
Assistant Engineer
KZZO(FM)

SACRAMENTO, CALIF. — When I think of JK Audio's RemoteMix line of products, I think of useful tools in small packages. Continuing with this ideal, JK Audio has put forth the RemoteMix 2, their newest two-channel field mixer, in the familiar RemoteMix package and style. It is like the little brother of the RemoteMix 3.5 and 4 products.

The RemoteMix 2 maintains many features of its elder brethren — XLR microphone inputs with the second channel providing a switchable microphone to line-level pad, 1/4-inch TRS headphone outputs, 1/4-inch TRS/TRRS shared cue/cellular interface, 1/8-inch line input and line outputs and a nice LED vu meter — but it also maintains the analog POTS hybrid and a handy dual 9V battery compartment that allows for hot-swapping your batteries during extended use.

In order to fit all of this into a package that is two inches narrower, 1.5 inches shallower and a little more than 0.5 inches shorter than the RemoteMix 3.5 and 4, some features of these products do not exist in the RemoteMix 2. The company has removed Bluetooth and the handset accessory interface, as well as the 48V phantom power supplies. It maintains the cue volume input control, but it trades the master volume output for an auxiliary input volume control.

In practical terms, it's still a very useful device, but some missing features may limit its utility. For many of our live remotes, we came to really enjoy the handset accessory interface, as cellular service can be spotty and a POTS line is not always available. The ability to interconnect through a PBX or VoIP handset saved the day on many occasion, even when we had an IP codec available. The handset interface was an excellent method for calling into our hybrid located at the studio and providing a low-delay IFB or caller audio path for mixing at the remote location, or for covering during the inevitable codec dropout.

We received a pre-production demonstration unit from JK Audio early June and after the standard unboxing and bench tests, we wanted to see how this mixer measured up to its bigger brothers in the field.

Luckily, we found the perfect opportunity at a concert we were covering. The situation required delivering remote audio by using a laptop with a USB audio interface at the remote site to edit the audio and then upload it to the studios. For this remote, the onsite crew wanted to add a second microphone for interviews as well as a line-level input for capturing the audio from the stage.

In this setup, we connected the microphones directly to the XLR microphone connectors, and the talent headphones were connected to the first headphone port. To feed the computer audio back to the talent, we used the included 1/8-inch-to-1/4-inch cable and connected that through the cue input connector. Finally, for the stage feed, we were provided a 1/4-inch stereo line and connected that to the auxiliary input through a 1/4-inch-to-1/8-inch adapter.

For this duty, the RemoteMix 2 was an excellent solution. Setup and staff training were quick and easy, and we were able to leave the device in their hands and on battery power for the entirety of the six-hour remote without incident.

In the end, even though it lacks some high-end features of the RemoteMix 3.5 and 4 products, it's every bit as rugged and easy to use, and the sound quality is still excellent.

For information, contact JK Audio in Illinois at (815) 786-2929 or visit www.jkaudio.com.

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World Radio History

Broadcast Partners Praise APT Codecs

Benelux transmission specialists deploy APT codecs throughout their network

USERREPORT

BY WERNER DE SCHEPPER
Manager, Technical and Engineering Dept.
Broadcast Partners

TERNEUZEN, NETHERLANDS — Broadcast Partners is a provider of broadcasting solutions, specializing in building and maintaining transmission networks for a substantial number of commercial radio stations throughout Denmark and the Benelux countries (Belgium, the Netherlands and Luxembourg). In total, the company manages more than 350 FM transmitters, about 40 DAB transmitters and a number of AM transmitters.

I am responsible for the design, building and maintenance of this extensive transmission network.

Throughout the Broadcast Partners' network, we use a range of APT codecs in various applications, for both contribution and distribution of audio and RDS/TMC data.

SELECTION

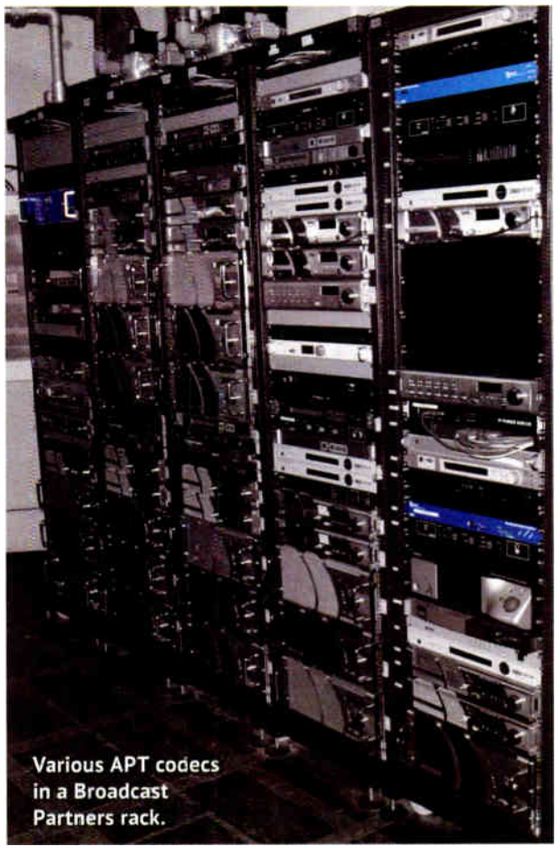
Managing an extensive network such as that of Broadcast Partners, I find that the choice of equipment is critical, as we simply do not have the time or resources to attend to frequent failures or maintenance requirements. As a business, we need to have confidence that the equipment within our network will deliver the high quality and performance level demanded by our customers and the assurance that we can control a geographically widespread network from a single location. We have found that APT codec equipment has been able to meet these stringent demands and we are very happy with their operation within our network.

We introduced APT codecs into the Broadcast Partners' network in 2010 and we have had a good relationship with the company since. Our network includes more than 50 stereo APT codecs and 15 multichannel platforms.

Initially, we tested the stereo WorldCast Horizon IP audio codec and compared it with several other codec brands that we used or were considering using in our network. We were significantly impressed by the reliability and stability that the APT units offered, as well as our ability to manage the units remotely.

Given the fact that our network is widespread geographically, we want to minimize the need for site visits whenever possible, so these two factors in the product were critically important.

We require that the equipment in our network is as uniform as possible and delivers quality audio and APT was able to offer us a platform that offered exceptional audio performance at an acceptable price. All of these factors combined made APT codecs an easy choice.



Various APT codecs in a Broadcast Partners rack.

The APT Horizons were deployed on the installation of all-new IP connections and on many existing links where ISDN connections were replaced by IP. In 2012, we introduced APT's latest stereo codec, the Horizon NextGen, into our network, again after extensive testing. While the conventional Horizon IP audio codecs have proven reliable in service, we are replacing these with Horizon NextGens, which are both cost-effective and also offer greater flexibility as they can be deployed in both analog and digital configurations.

The Horizon NextGens are particularly suitable for establishing flexible, temporary audio links over the Internet.

Also deployed throughout our network are a number of multichannel WorldNet Oslos, to interconnect our main datacenters and serve as studio transmitter links for our primary program feeds. In these locations, units must be failsafe in operation; the Oslo provides us with great peace of mind. We have deployed the Oslos largely on E1 connections, but some of the units are working on IP links with APT's SureStream technology, which provides fantastic reliability.

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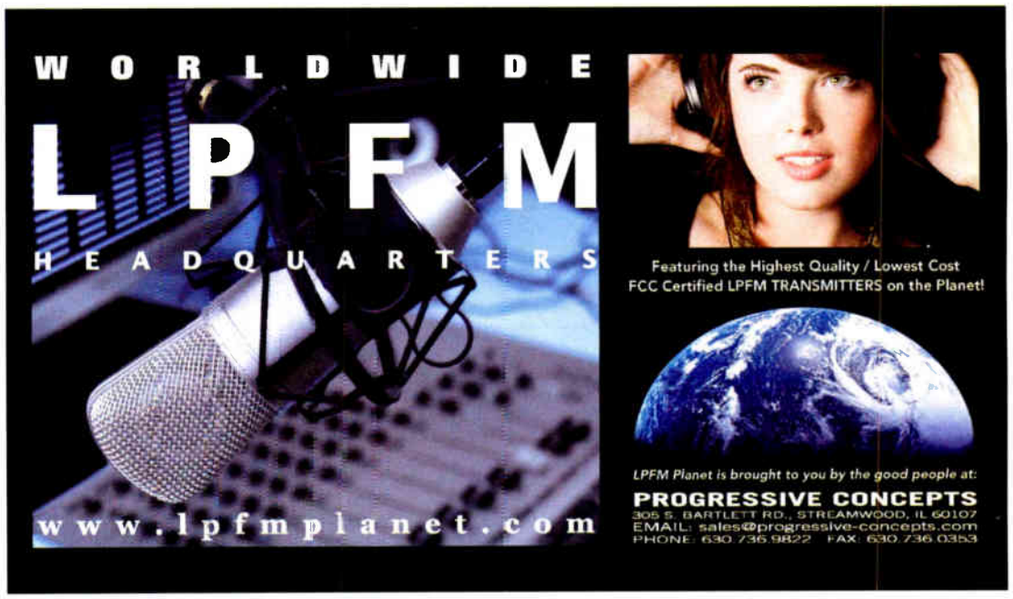

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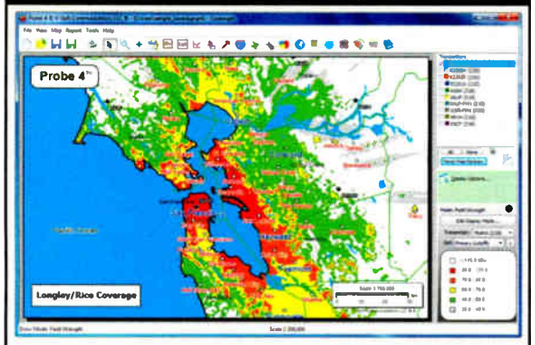

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World Radio History

We Need a Dialogue on Cyber Security

In the broadcast and public warning sectors, current precautions may not be as safe as we think

COMMENTARY

BY ED CZARNECKI

The author is senior director of strategy, development and regulatory affairs with Monroe Electronics Inc.

Ed Czarnecki

Broadcasters have grown increasingly reliant on the Internet, whether it is to reach a potential audience and advertisers, conduct daily business or fulfill their FCC EAS obligations to monitor the IPAWS CAP service.

The downside of Internet dependence, of course, is that the broadcast industry is now at the front line of potential assaults by any number of cyber threats. Like it or not, cyber security will continue to be a fact of life for broadcasters and EAS manufacturers.

MUCH TO BE DONE

EAS technologies are not security appliances in and of themselves. Broadcasters must protect these technologies as they would any sensitive system in their operations.

Protection means, at a minimum, keeping all network connections to the devices firewalled from the public Internet, regularly checking with vendors to ensure software is up to date and regularly checking the facility's EAS systems for any potential indications of attack or unauthorized access. (For DASDEC users, the current 2.0-2 release issued in April includes several cumulative security and feature updates.)

On May 15, FEMA posted a reminder to various industry e-mail lists about the importance of maintaining updated software/firmware on CAP EAS devices.

However, there is much more to be done. Common best practices and critical controls need to be identified and implemented in each of the key stakeholder areas in the EAS system: broadcasters, CAP EAS manufacturers and CAP EAS networks, including IPAWS and the various state CAP networks that are evolving. These best practices do not necessarily need to be onerous, but they do need to be implemented system-wide. The system is only as strong as its weakest link.

BEST PRACTICES

What kinds of security practices or controls should the industry consider? And who should be the arbiter or advocate for these cyber security best practices? Well, an initial list of "Best Practices for Public Warning Cyber security" could include:

Safeguarding Equipment — Make sure that CAP EAS equipment is behind a firewall, at minimum, and that it has the most current versions of firmware/software from manufacturers. All remote administration should be performed over secure channels, preferably with strong encryption, or over a secondary SSL or IPSEC channel.

Securing Configuration — Of firewalls, routers and switches. These elements are often left less secure than they ought to be. Broadcasters also should limit access to ports and other services.

Perimeter Defense — Create a strong "perimeter defense," as a simple firewall may not always be sufficient. Broadcasters should consider a creating layered boundary by using firewalls, proxies, DMZ perimeter networks and network-based intrusion protection and detection, as well as filtering both inbound and outbound traffic. Digital Alert Systems issued a white paper on this matter in 2011. ("CAP, EAS and IPAWS: Introducing a Defense-in-Depth Security Strategy for Broadcasters," available at *www.digitalalertsystems.com/pdf/wpdas-122.pdf.*)

Malware Beware — Defenses against malware may become even more important in the future, if and when CAP messages contain resource (file) links to third-party Web servers. Even if a CAP message comes via the FEMA IPAWS

This energy industry partnership provides a real benchmark for how a public-private partnership could function for cyber security in the public warning area and, ultimately, to produce mutually beneficial outcomes for government and industry.

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server, that CAP message may contain a link to some separate multimedia sever that the device may automatically attempt to access.

Foster Skills and Training — A stronger culture of awareness around cyber security is needed in the mass media sector. There also must be greater training opportunities that aid key personnel in developing or enhancing skills in the cyber security area. With the support of key government agencies, national organizations such the Society of Broadcast Engineers or NAB could take the lead to promote these activities.

Controlled Access — Take charge of who can access CAP EAS equipment by changing all default passwords for applications, operating systems, routers, firewalls, wireless access points and other systems to a difficult-to-guess value, and limiting administrative privileges.

Broadcasters have a financial and competitive incentive to safeguard their own networks. Government agencies including FEMA and the FCC have an inherent incentive to safeguard the overall resilience and reliability of the Emergency Alert System, and this means addressing the risks that accompany its new dependence on the Internet.

The alarming incident this past February, when someone hacked into the EAS and issued a warning that zombies were real and on the attack, has at least sparked a dialogue on cyber security. However, this dialogue remains uncoordinated between industry and government, and is far from yielding a security framework addressing the interests of both the public and private sectors.

PARTNERSHIP

Since President Obama's February executive order on overall cyber security, the White House has favored combining voluntary security measures along with incentives for companies that comply. Congress, for its part, seems to be leaning toward legislation that would promote the adoption of cyber security best practices by both private sector and public sector entities.

What this approach lacks is a means of identifying, translating and promoting those best practices across the broadcast industry. Creating a public-private partnership around cyber security for public warning could be an effective way of bridging this critical gap. The outcome of such a partnership would be the sharing of information on best practices, practical approaches and potential cyber security threats to the overall CAP EAS system.

This is not a hypothetical suggestion. Just this type of public-private approach is already being embraced in other industries. In principle, it could be replicated in the broadcast industry.

The Department of Homeland Security, along with the Department of Energy, recently partnered with a number of energy companies to identify and combat threats in that industry. Through this working relationship, the energy industry is sharing information about risks that it faces, and the government is sharing information on potential threats.

This energy industry partnership provides a real benchmark for how a public-private partnership could function for cyber security in the public warning area and, ultimately, to produce mutually beneficial outcomes for government and industry.

A further recommendation is the inclusion of EAS-related technologies and systems under the DHS Protected Critical Infrastructure Information (PCII) Program. PCII is an information-protection program that enhances voluntary information sharing between infrastructure owners and operators and the government. PCII protections mean that homeland security partners can be confident that sharing their information with the government will not expose sensitive or proprietary data.

Simple steps can be taken to enhance the security of the new CAP EAS system, and many of these steps fall within the control of the local broadcaster. However, CAP EAS is a system — a system that will be only as secure as its weakest link.

Therefore, now is the time to open a dialogue on forming a public-private partnership on cyber security in public warning. Now is the time for broadcasters to become more aware of the increasing network security requirements that CAP EAS demands of them. The growing sophistication of cyber threats is not going away, and the interconnected nature of an Internet-based CAP EAS system puts all broadcasters on the front lines.

Radio World welcomes comments on this or any article. Write to radioworld@nbmedia.com *with Letter to the Editor in the subject field.*

READER'SFORUM

FEMA IS BROKEN

Warren Shulz's guest commentary ("It's Broke; Stop Trying to Fix It") was long overdue. The points needed to be made. However, the reason why EAS is broken is because FEMA itself is broken. It has lost its edge in hiring and retaining experts in the fields of emergency communications, EAS and public warning.

While FEMA may repudiate my accusations, the facts are clear: It has walked away from the broadcast station protection program, the EMP protection and maintenance program, the warning siren program and the Radio Amateur Civil Emergency Service. Particularly in FEMA Region II, people who had actual communications and broadcast expertise have retired and been replaced by specialists who are nothing more than IT geeks.

When it comes to EAS, no broadcaster, cable operator or state OEM likes or wants to be bullied into compliance on a program that even its governing agency doesn't care about or have its heart in. In my 28 years with New Jersey OEM, I could see this deterioration and lackluster response. Another lesser-known example is the Cold War-era National Warning System (NAWAS).

Ever since the threat of a Soviet missile attack lessened and the National Warning Center moved out of the NORAD facility, America has gotten complacent and nonchalant about other kinds of attacks and disasters. During 9/11, I was in my office at the NJ State EOC, and was aghast that the national NAWAS circuit remained silent the entire morning.

The very system intended for when we're under attack was not used by FEMA (or anybody else) on that fateful morning.

I also agree with Mr. Schulz that the national EAS test, while sorely needed, was a dismal technical failure. Whatever happened to the dedicated and hardened telephone circuits that used to feed each PEP station? In an actual emergency, who has time to set up a telephone conference bridge from FEMA HQ to all the constituent stations?

I also agree with Mr. Schulz that since practically everything runs on the Internet now, hacking into EAS can be accomplished at any level. Even more disturbing is that one of my EAS partners here in New Jersey has suffered several IP attacks in which one of his satellite transmitters was taken off the air numerous times by a hacker.

What good is EAS if some psycho or junior high school kid can shut your transmitter off?

Americans have become too naive and complacent about the Internet. As a cost saving effort, many have discontinued their copper telephone service (POTS) in favor of the cellphone. Nothing could be more foolish.

Haven't we learned our lesson after suffering the various infrastructure failures during 9/11, Katrina and most recently Hurricane Sandy? The traditional over-the-air delivery system, as Mr. Schulz points out, is slowly becoming obsolete — not because of technology, but because of subtle marketing efforts to make it so. He mentions replacing car radios with WiFi hotspot receivers. How incredibly foolish is that?

Sadly, the public swallows this up like lemmings going over a cliff. As long as the glitz and "wow factor" are waved around, the public will buy into anything. Wasn't P.T. Barnum right?

Robert Schroeder
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NEWS

It's Broke; Stop Trying to Fix It

A former state EAS chair believes that the system cannot be saved

June 5, 2013

GUEST COMMENTARY

BY WARREN SHULZ

I believe EAS "as we know it" should be removed from the public broadcast arena. It is nonfunctional and gives the public and government a false sense of security.

As Frank McCoy pointed out in a recent commentary ("Take EAS Back to the Drawing Board," radioworld.com, key word McCoy), the "spoofing" vulnerabilities run even deeper than have been reported. A low-power transmitter can be linked into a Local Primary entry point to open the gate with the Emergency Action Notification header code, deliver an audio message and lock up an operational area for hours. We saw that in June 2007 when the Federal Emergency Management Agency conducted a closed-circuit test that leaked to air via the Illinois Emergency Operations Center.

I was Illinois state EAS chair at the

Warren Shulz, shown at the base of the WLS(AM) tower.

time. A day after the erroneous test, I received a call from the state of Missouri EOC because an unattended station was still linked to its monitor assignment. The leaked test had included the EAN header but had then been aborted; thus, no audio or end-of-message data. Bad choice. The EAN header by itself pro-

vides for an immediate takeover yet carries no time-out code.

It's one thing to send a distorted message. It would be a whole other thing to repeat WGN audio over WLS!

TOO MANY SILOS

FEMA planners continue to dump millions into an AM emergency backbone that has a diminishing number of listeners and an aging base of receivers.

What nationwide alert would require immediate alarm yet not be carried by CNN, CNBC, the Internet and general news reporting agencies? The concept has aged out. We have been awaiting a presidential message, over an untested system, since 1951.

When I served on the board of the Primary Entry Point Advisory Committee, a White House representative asked when the last end-to-end test had been done. It was an uncomfortable question: We could report only polling tests; there had never been an end-to-end test. That was 2003. It took another eight years and a lot of conversations to get to the nationwide test of November

FROM THE EDITOR

This guest commentary is from Warren Shulz, former engineer of WLS(AM) and, for 16 years, the state EAS chair in Illinois. He is now retired.

— Paul McLane

must be prepared by a volunteer EAS committee. It's up to that committee to work out the mechanics to link the state entry point to a Primary Entry Point station or NPR station that sources the EAN alert. You have 50 state plans in the works, developed by volunteers receiving little direction or review.

You may recall the six EAS summits subsidized by the NAB and supported by the National Alliance of State Broadcasting Associations. Most of the discussions ended up going no place. The FCC sucked in comment after comment; the whole rewrite of Part 11 went full circle. Yet only the Internet component CAP was added, and the industry spent millions of dollars to add that component. Otherwise, the system

World Radio History

OPINION

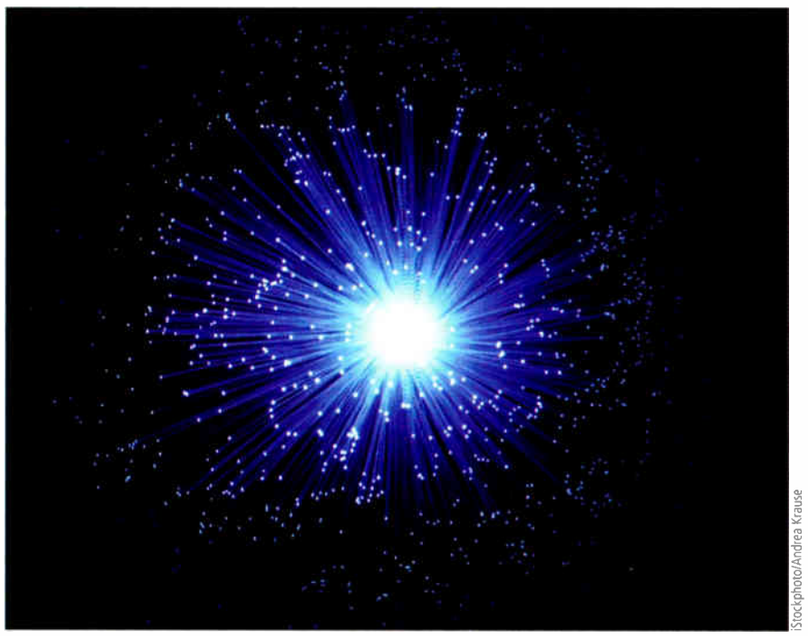
Dark Fiber Extends Reach of AoIP

Clear Channel's Portland project demonstrates the possibilities

COMMENTARY

BY KELLY PARKER

The author is field support and systems engineer for Wheatstone Corp.



iStockphoto/Andrea Krause

A recent profile in Radio World about a facility project by Clear Channel Portland, Ore. ("Under One Roof at Last in Portland," July 3), noted the use of fiber. It highlights a trend that we at Wheatstone think is notable because, from where we stand at the edge of the network, there's nothing about dark fiber that audio over IP can't handle.

It's all ones and zeros at this point, so something like a fiber optic STL at the end of a WheatNet-IP Intelligent Network is a matter of routine. Plug a fiber cable into the SFP (small form-factor pluggable) fiber modules at the Gigabit Ethernet switches on each end, and it's "lights, action, audio."

In the case of Clear Channel Portland, WheatNet-IP audio into fiber gave the group a broadband STL that is noise-free over long distances and cost about the same as the T1s once used to link its two transmitter sites to the main studio downtown. So instead of four T1s at almost six Mbps being used to link up five FM stations, Clear Channel Portland ran WheatNet-IP audio to the transmitter sites over fiber at one Gbps, resulting in all kinds of new data, like HD channels, HD data and feeds from traffic cams at the Oregon Department of Transportation.

DEDICATED LINK

It's a good working relationship, WheatNet-IP and dark fiber. Dark fiber is essentially fiber optic cabling that was overbuilt back in the broadband speculation heyday, and is unlit — hence, "dark."

Many metro areas have dark fiber already trenched in, and telecoms are often willing to lease these lines for not much money. In Clear Channel Portland's case, dark fiber happened to terminate at the two transmitter sites and was available to its new studios as well at Triangle Pointe.

Because dark fiber is a dedicated link, there's none of the latency that's typical of already-lit fiber, which often routes its payload over someone else's circuit before it gets to its final destination. (Ours is a Gigabit Ethernet AoIP system from one end of the network to the other, then on out to the switches, so there's no noticeable latency on our end, either.)

There's no audio bit-rate reduction or coding required, and no audio delay whatsoever. It's straight linear audio all the way, from full Gigabit Ethernet connectivity throughout the WheatNet-IP'd studio to the Gigabit fiber STL strung across each of the two transmitter sites, both more than 10 miles from the new studio in Triangle Pointe.

Our friends in television have been using fiber for some time now because of the big data payloads that come with TV broadcast. By comparison, the data needs in radio have always been much smaller. But that's changing. We are talking to more radio broadcasters who are looking for ways to add that extra HD channel or two to their STLs, along with all the data that comes with it.

In Clear Channel Portland's case, they have the added burden of backhauling video for Clear Channel corporate's Total Traffic Network division. They are supplying streaming traffic cam video to the group's radio stations, which requires more broadband than traditional STLs can put out. Even getting an extra STL frequency on the 950 MHz band practically takes an act of Congress these days.

CLEAN BROADBAND

Fiber is a viable option for many broadcasters, and if they have a WheatNet-IP system, that's even better. Clear Channel Portland has WheatNet-IP Blades (what others compare to IP nodes) at its studio and the same at each of the transmitter sites for fiber connectivity on both ends. The group added another IP Blade at the Rose Garden arena for its Portland Trail Blazers feed, and has a broadband fiber optic connection to the video circuits and camera feeds at the Oregon Department of Transportation for Clear Channel's Total Traffic Network.

Once Clear Channel Portland began locating audio servers at the transmitter site for HD2 programming, latency became a fairly important consideration. A trial run with lit fiber, for example, resulted in delays up to 30 minutes for booting up the servers due to packet priority issues. Gig for gig, WheatNet-IP and dark fiber are a good match. WheatNet-IP operating on Gigabit Ethernet throughput into dark fiber running out Gbps to the transmitter is a good combination all around.

Since Clear Channel Portland has been running WheatNet-IP into its fiber STL, we've seen them make some good use of the technology over the past several years. They've been able to patch signals around easily, from one station feed to another in an emergency, and all with transparency. And with the addition of a voice-over-IP telephone system at the new Triangle Point facility, they find the operation just that much more seamless, from starting, stopping or cueing call-in guests straight from voice-over-IP through the WheatNet-IP Intelligent Network and on out to the fiber connection for transport to the transmitter.

Together, our WheatNet-IP network with a fiber STL make a clean broadband system that we expect to see more of as time goes on.

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

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ACCESS 2USB

COMPLETE REMOTE STUDIO ON TWO WHEELS

We are pretty sure this is a first – an open-air moving studio broadcast on two wheels (well, six, technically).

All audio was fed to a Comrex ACCESS Portable, complete with optional mixer, which Dan used to mix the live on-air feed as the trio traversed the winding roads of Perth. How did it all work out? Absolutely flawlessly – the show went on without as much as a speed bump!

Dan Jackson, engineer for 92.9 FM in Perth, Australia was faced with a unique challenge. Breakfast hosts Paul Hogan and Lisa Fernandez would be cycling for hours in strong winds and pouring rain as part of the 92.9 Kids Appeal for Telethon.

The unique solution was to equip Dan's bike as a mobile production facility. The talent wore wireless mics AND in-the-ear monitors which communicated with receivers and transmitters in a rack bag on Dan's bike.

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