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INSIDE

ENGINEERING

- GEM will slow down copper thieves — and maybe improve effectiveness of your ground wires. — Page 10

- Amateur radio hams it up in Dayton. — Page 14

PINION

PFM advocate Hannah Sassaman reflects on 'lessons learned' and what's next for the service. – Page 46

DRM+ Tested In Mobile Field Trials

Real-World Tests Performed in Germany, Sri Lanka, Scotland

BY DANIEL MANSERGH

Since its formal standardization as Mode E of the Digital Radio Mondiale specification in 2009, the DRM+ digital radio system has been the subject of keen interest in countries evaluating their options for digital radio services. In places where DAB or DAB+ are being implemented, DRM+ is of interest to local, community and other broadcasters who operate on a smaller scale than would normally be covered with a DAB multiplex.

Of particular interest to regulators is the compatibility of the DRM system across a range of frequencies, its low operating power requirements and its spectrum efficiency, allowing it to work in regions that use 100 kHz FM allocations.

(continued on page 18)

FM Translator Uses Morph Quickly

Broadcasters Find Them an Attractive Tool For Expanding Reach in Untraditional Ways

BY RANDY J. STINE

WASHINGTON — Translators aren't just for filling in FM signal coverage gaps anymore.

They have become a more important part of radio owners' spectrum strategy toolkit. Many commercial and noncommercial radio operators — both AM and FM — are using FM translators in ways previously unimagined, not only supplementing local signal coverage but leveraging them to gain a more lucrative footprint on the FM dial for content that originally airs on AM stations or FM HD2/HD3 channels.

Demand for translators also is increasing as broadcasters realize they effectively can create additional radio stations in markets by location-hopping and moving towards more heavily populated areas, according to several technical radio observers.

An FM translator retransmits the signal of an AM or FM radio station without significantly altering characteristics of the original other than its frequency and amplitude. FM translators historically have been used to fill in coverage where terrain blockage

(continued on page 6)

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Digital Radio 'Round the World

A sampling of digital radio news items from abroad, to accompany the DRM+ story on page 1.

— British supermarket giant Tesco sells 13 models of DAB receivers, mostly tabletop units, ranging in price from the house-brand Value DAB123 tuner for just over $40 U.S. to the Teac R-4iDNT Internet/DAB radio with iPod dock for about $295 U.S.
Source: Tesco Direct website

— More than 80 different digital radio models are on sale in Australia, in 700 retail outlets plus online stores. The average sales price has fallen to about $112 U.S. When talking to consumers about digital radio, the Australian radio industry has been using the line "It's radio as you know it, plus ..." in print, online and on air to highlight the additional stations, lack of signal fading, data services and other plusses of DAB+.
Source: Commercial Radio Australia

— Fourteen models of in-dash DAB+ receivers, three of which also receive DMB-A, are available in the U.K., including units from Axis, Bluestate, Crystal, Dual, JVC, Kenwood, Mpman, Philips, Prolinear, Pure and Starwaves.
Source: wohnort.org, a site that tracks DAB developments and receiver deployments

— All Ford U.K. cars are to include DAB receivers as standard by year-end 2012, starting with the new Ford Focus, which launched in the United Kingdom in March.

— From RAJAR's First Quarter 2011 audience survey:

- 2/5 of British population (38.2 percent of adults, 15+) lives in a household with a DAB receiver.
- 43.1 percent of all radio listening in the U.K. is via digital platform. RAJAR defines digital listening as listening that occurs with DAB receivers, the Internet and digital television set-top boxes.
- 63.1 percent of all digital listening in the U.K. is done via a DAB receiver; 7.1 percent via a digital television platform; 28.3 percent via the Internet.
- In total, more than 26.5 percent of all radio listening in the U.K. is via a DAB receiver

— *T. Carter Ross*

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NEWSROUNDUP

LPFM: The FCC has taken initial steps to implement the Local Community Radio Act and eventually license more low-power FMs as well as reach a compromise on the question of spectrum priority between LPFMs and FM translators. In a third Notice of Proposed Rulemaking, the FCC seeks comment on a proposed processing policy for thousands of pending Auction 83 FM translator applications. It hopes to open an application window for new LPFMs by summer of 2012; it also plans to drop the planned cap on translators that one organization can have and is taking comments on those changes.

EAS ALERTS: Manny Centeno, EAS test program manager for FEMA's Integrated Public Alert and Warning System, says the Nov. 9 national test of the Emergency Action Notification that will originate out of Washington "is not a pass or fail measure," nor will it test CAP equipment or procedures. The government wants to make sure existing EAS is ready for future improvements.

OWNERSHIP: A federal appeals court upheld the FCC's 2008 decision not to relax radio ownership rules — including AM/FM subcaps — and radio-TV cross-ownership limits. The Third Circuit Court of Appeals said the FCC adequately justified keeping its limits in place, and rejected efforts to use HD Radio multicasts to lift the subcaps, concluding that HD Radio is still in its early days.

STEVE CLATERBAUGH: Former equipment sales rep Steve Claterbaugh, his girlfriend Kathleen Smith and two others died when a car hit their motorcycles, Dallas-area newspapers reported. A suspect from the Houston area was charged with four counts of criminally negligent homicide. The 53-year-old Claterbaugh most recently was a consultant. Prior, he worked for Comet North America, Crown Broadcast and Continental Electronics.

APRE: Membership of the Association of Public Radio Engineers voted in board elections. KQED(FM), San Francisco DOE Dan Mansergh is now APRE president, succeeding Ralph Hogan, director of engineering for KJZZ(FM), Tempe, Ariz. The new vice president is Paxton Durham, chief engineer for WVTF(FM), Roanoke, Va., and WFAE(FM) Charlotte, N.C.

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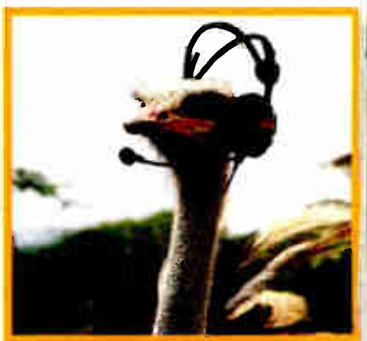

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Does Pirate Radio Create Jobs?

Blogger Says Yes and Tries to Put a Number on It

How much does pirate radio help the American economy?

Say what?

Matthew Lasar of the website Radio Survivor has done some musing on the economic stimulus effect of illegal broadcasting, all the while giving NAB a dig in the ribs.

The NAB recently commissioned a study to try to figure out how many jobs — and even how much of the U.S. gross domestic product — can be attributed to local commercial radio and TV. It sought to dramatize broadcasting's role at a time when regulators have been debating spectrum policies.

The report by Woods & Poole Economics with research firm BIA/Kelsey found that $1.17 trillion — that's 7 percent — of the country's annual GDP "originates" in local commercial broadcast radio and television, and that 2.52 million jobs are attributable to the industry each year.

Those are some whomping big numbers. Radio, the study found, directly employs 118,000 people and contributes $18 billion to GDP, while TV has 187,000 people and accounts for $30 billion. But the study also included "ripple effects" of broadcast employment through consumption, and it looked at economic activity generated by local commercial broadcasting as a forum for advertising goods and services.

GUESSTIMATE

Reacting to NAB's study, Lasar did his own back-of-the-napkin calculations and wrote about it. He thinks illegal radio stations in the United States annually generate 19,220 jobs, worth $576.6 million to American workers. "That's more than a half a billion dollar yearly boost to the U.S. economy."

He frames his discussion in serious terms, though it's easy to imagine a tongue planted in a cheek. He started by noting that Wikipedia lists 45 pirate stations. "After years of following the unlicensed station phenomenon, my sense is that these lists should always be multiplied by a factor of 10, given the frequency with which pirate stations clandestinely launch."

Further, though pirate stations usually "run on volunteer power," he says some unlicensed stations "run income-generating community events and sometimes air commercials. Thus these stations employ paid deejays, managers, event managers, food service workers, entertainers and engineers. Thus I estimate that on average, your pirate radio station employs eight people in full- or part-time positions. That's 3,600 direct jobs."

Lasar goes on to discuss the impact when pirate stations and staff buy gear, use electricity, take public transportation, hire lawyers to fight fines and so forth, and he assigns "job creation" totals to all that. Then he talks about "jobs that are stimulated by the music and public affairs activities of pirate radio stations," like musicians, restaurants and (yes) FCC enforcement, to come up with his 19,000+ jobs and half-billion-dollar total.

"I think that this is a conservative guesstimate of the job value that pirate radio stations bring to the U.S. economy," Lasar said.

"If you think that my methodology is off, fine. But this logic isn't terribly different from that used in your typical trade association-commissioned industry job estimate study. The biggest difference is that I did this one in about an hour and received no consulting fee for my work. You're welcome."

FROM THE EDITOR

Paul McLane

RESPECT THE COMMUNITY

The Radio Survivor website professes to love radio "in all its forms" and is up front about including illegal radio in that. Lasar has written that the site advocates for "participatory" radio, defining this as "community, public, college, low-power FM, Internet, satellite, public, mobile and pirate."

While NAB did well to point out the economic benefits of commercial broadcasting, I chuckled at Lasar's poke of NAB's huge, speculative "ripple effect" numbers. It's reasonable at least to approach such large numbers with caution.

But Lasar would have done better to discuss the economic value of other legal forms of radio rather than that of pirates.

I do not endorse illegal radio, and neither should you.

I support — and RW writes about — community, low-power, high school, online, "micropower" and many other forms of radio, even TIS and radio reading services — if they comply with the law.

I've worked in commercial radio but

(continued on page 12)

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Photo by Skip Pizzi/NAB

I told you in our June 1 issue about the Transmitter Efficiency Calculator from NAB FASTROAD and Cavell, Mertz & Associates. Radio World presented them with their "Cool Stuff" Award at NAB headquarters in June.

Shown in the photo from left are NAB Senior Director of Advanced Engineering David Layer; NewBay Media Executive Vice President of Broadcast & Video Carmel King; NAB Senior Vice President of Science and Technology Lynn Claudy; me; and from Cavell Mertz, President Gary Cavell, Senior Engineer Cindy Hutter Cavell and Vice President Richard Mertz.

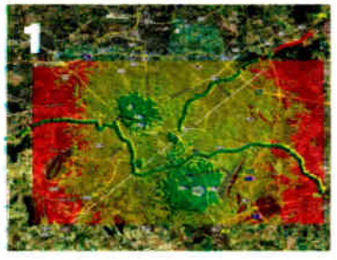
Also involved in the calculator project at the company were Dan Ryson, Mike Rhodes and Bob Clinton.

World Radio History

THIS ISSUE

AUGUST 1, 2011

NEWS
DRM+ Tested in Mobile Field Trials. 1
FM Translator Uses Morph Quickly 1
Digital Radio 'Round the World. 3
News Roundup 3
Does Pirate Radio Create Jobs? 4
Exhibit Setups Will Change Again for Radio Show 5



FEATURES
Workbench: Enhance Your Ground With This 10
Who's Buying What 12
Another (Slightly Different) Radio Show 14
Marketplace 22
Talk TECH to Your Elected Officials . 26
People News 28

BUYER'S GUIDE
WMHT Relies on Harris Intraplex 30
Tieline Bridge-IT Retrieves Signal 32
Barix Saves on Satellite Fees 34
JK Audio's Universal Host Goes North 36
Money Pit Says 'Bye, Bye, ISDN' 38
2wcom Supports RMF Group 40

OPINION
LPFM: A Dream That Never Died. 46

Selected content from Radio World's "The Leslie Report" by News Editor/Washington Bureau Chief Leslie Stimson.

EXHIBIT SETUPS WILL CHANGE AGAIN FOR RADIO SHOW

Conference planners have changes in mind for the exhibit area at the upcoming Radio Show to be put on by NAB and RAB this September. They're dropping the tabletop setups used at last year's show in Washington and going back to booths.

Also, the exhibits will all be on one level again. Though most exhibits were on the lower level of the hotel last year, there was some larger exhibit/suite space one floor up from the tabletop area. Not all attendees were aware of this additional space, vendors told me, and indeed when I was in those areas traffic was sparse.

Organizers are keeping the new name "The Marketplace" for the exhibit area, and offering vendors booths ranging in size from 10x10 to 10x20 feet.

Last year's fall show was the first since the event reverted to a hotel format after years in larger convention centers, a move driven by smaller attendance trends during difficult economic times. About 1,800 people registered for the 2010 show, conference organizers said at the time. The 2011 show will be at the Hyatt Regency in Chicago Sept. 14–16.

NAB Vice President of Communications Ann Marie Cumming tells me conference organizers are trying to drive traffic to the booths by holding super sessions and networking events there like coffee breaks and other meal events. Organizers also will bring back the exhibits-only pass for the radio show. Exhibitors will be given guest passes to distribute to customers, according to Cumming.

"We look forward to this year's Radio Show in Chicago and are committed to making it the best possible experience for the radio community. NAB and RAB have taken into account feedback from exhibitors and attendees to enhance this year's show," said Cumming.

"By having exhibitor booths in the Marketplace and creating an integrated environment with super sessions and networking events, we expect increased interest in companies wanting to exhibit," she told me.

The exhibitor feedback was pretty vocal at the end of last year's show, with exhibitors venting to organizers about the squeezed space in the main exhibit area. Most vendors who spoke to me at that time felt the tabletops were too small and too tightly packed, giving suppliers little space for displays and customers little room to maneuver.

To be fair, NAB had already chosen the hotel before RAB joined it in co-hosting the convention in Washington. This year, they've been able to plan the show as a combined event all along.

At the end of the big meeting with the exhibitors last year, show organizers vowed this year's show would be different.

Photo by Jim Peck

The exhibit floor of the fall 2010 show drew criticism from exhibitors.

World Radio History

TRANSLATORS

(continued from page 1)

was an issue.

There were 6,141 licensed FM translators and boosters as of March 2011, according to the FCC. That compares to 3,897 in 2005 and 3,243 in 2000, according to commission data. FM boosters essentially are translators that operate on the same frequency as the primary station. The FCC doesn't distinguish between FM translators and boosters in its database.

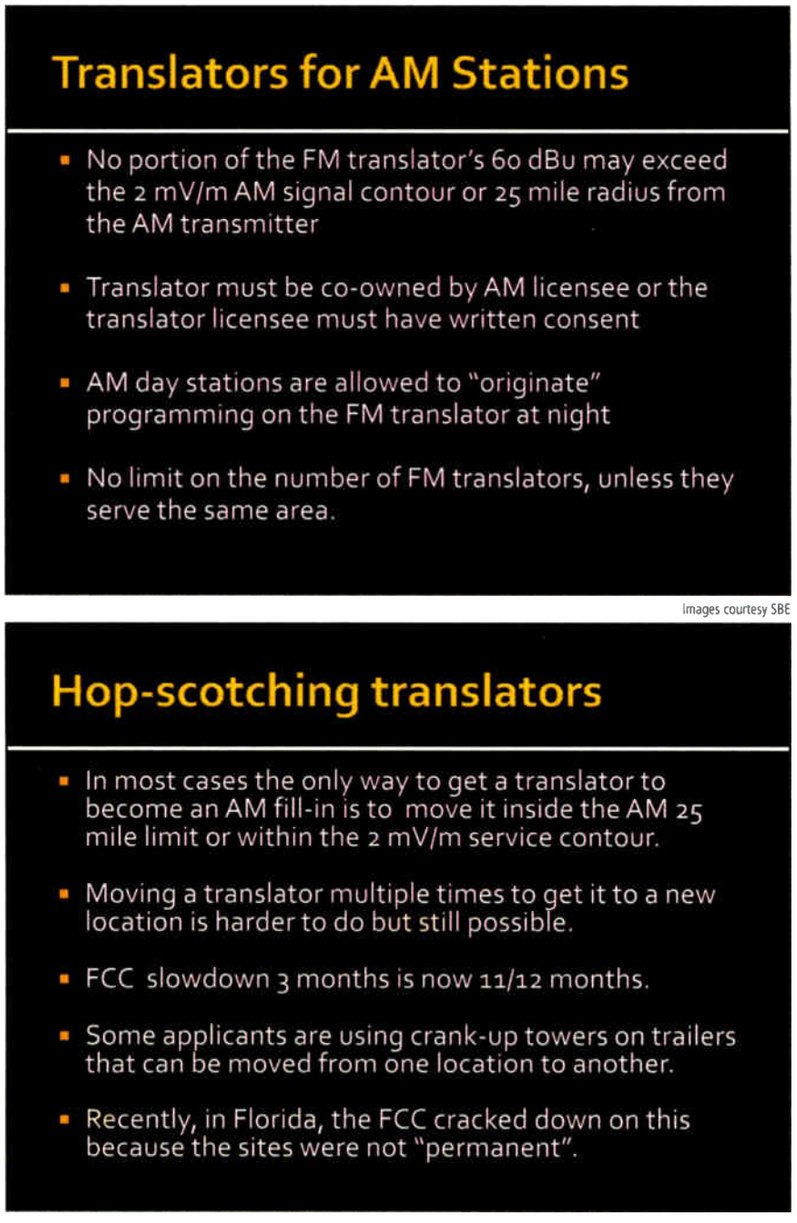
Approximately 500 FM translators simulcast AM broadcast stations. That's a measure of the success of a rule change, adopted just two summers ago, allowing AMs to use existing FM translators in certain circumstances.

Observers say radio's evolving translator strategies simply take advantage of current translator rules. For instance, a broadcaster can add a fill-in translator with power up to 250 watts regardless of antenna height as long as it does not exceed the protected contour of the associated primary station.

Interestingly, the 60 dBu of a 250 watt fill-in translator at 2,000 feet height above average terrain presents the same coverage area as a Class B or C2 FM station, thus "creating fairly high-power entities," said Doug Vernier, president of broadcast engineering consulting firm V-Soft Communications.

This creative use of translators is a fairly recent phenomenon, Vernier said, as broadcasters have learned to recognize the opportunities.

"A fill-in at 250 watts in a small town could cover 10 miles. People have also figured out how they can move translators into AM coverage areas and the FCC seems more comfortable with that. The rules really haven't changed, but the benefits have," Vernier said. He hosted a Society of Broadcast Engineers webinar in May on creative strategies for translator use.



Images courtesy SBE

A discussion of translator considerations from a presentation by Doug Vernier.

MULTICAST CHANNELS

In addition, the advent of HD Radio has stimulated interest in using FM translators, said Vernier.

"A broadcaster with an HD2 or HD3 can take a signal to feed a translator as a fill-in, and all of the sudden you have another FM station in the market. So you have your primary FM and another FM with the HD2 programming."

FM translators typically are not subject to the multiple ownership rules, Vernier added, but the commission has warned that it is an abuse of agency rules to use two or more cross-service translators to effectively create a de facto FM station to circumvent local ownership limits.

Broadcasters certainly have been anxious to gain access to additional FM outlets where they can, observers said.

Backyard Broadcasting, which operates 29 stations in six radio markets, is in the process of acquiring a broadcast license from Educational Media Foundation for translator W275AJ in Muncie, Ind., which eventually will simulcast programming from the group's WXFN(AM). The sports talk station is a 1,000 watt full-time AM at 1340 kHz.

"We think it is all about making programming more accessible to the listener. Whether it's a mobile phone app or adding another frequency, it's about finding ways to get our stations in the hands of our listeners. It's about convenience," said Backyard Broadcasting President/CEO Barry Drake.

National Public Radio has promoted the use of FM translators throughout the public radio system since at least 2002, said Vermont Public Radio Director of Engineering Rich Parker. The statewide network of public stations uses a series of 14 translators to enhance coverage area.

"The expansion of our VPR classical network allowed us to switch to two full-time networks — news and classical — in 2007. We have since worked to optimize our translator strategy to reduce redundancy," Parker said.

Vermont Public Radio, which applied for 20 translators during a 2003 filing window, budgets approximately $25,000 per translator expansion, Parker said.

"Ultimately, five of the translator licenses we applied for were either allowed to expire or in some cases sold to local broadcasters at our cost," he said.

HOP LIKE A BUNNY

Some evolving strategies prompt the question of whether translators were intended to be used this way.

The FCC is unaware of any formal complaints filed against the practice of using an FM translator to rebroadcast the HD2 or HD3 channel of a primary station, according to an agency official, outside of "normal interference complaints."

However, illegal translator hopping has gained attention of the commission, as in the case of a Florida licensee who earlier this year attempted to move translators from the Florida Keys into the Miami area.

Communications attorney David Oxenford of Davis Wright Tremaine explained in the Broadcast Law blog that sometimes it takes multiple hops to move a translator to a more desirable location. In order to accomplish a move using a minor modification application, at each hop the translator licensee must build a station, license it and then file to move it to the next location before reaching its ultimate destination.

"In this recent case," writes Oxenford, "a broadcaster entered into a consent decree with the FCC, forfeiting several existing translator licenses to the FCC, dismissing a number of pending applications and agreeing to sell a remaining translator within one year. The licensee was also forbidden from doing business in Florida, and agreed to abide by FCC rules in the future."

Observers believe it wasn't the practice of moving translators but how it was done that apparently led to the penalty.

"Two other broadcast companies complained to the FCC about the moves, and the agency concluded that the translator licensee had allegedly 'constructed' some of his intermediate hops not on broadcast towers, but at roadside pull-offs. At most, according to the FCC, many of these 'constructed' sites involved nothing more than driving a truck with an antenna on it to the location of the transmitter site specified in a construction permit, pulling off the road, operating for a few hours, then packing it all up and driving away," Oxenford wrote.

The attorney continued: "Yet the translator operator filed a license application claiming to have constructed the station (never mentioning that the station soon went off the air when the truck drove away).

"Compounding the problems were that at least one of the construction sites was off the air for over 30 days without notifying the FCC, and there were questions of site assurance as many of the transmitter site locations were in public parks and parking lots, where it was very unlikely that there could have been permission to use the site for a broadcast transmitter, even had the truck stayed put."

LEGAL OPTION

However, this case seems to be an exception.

(continued on page 8)

World Radio History

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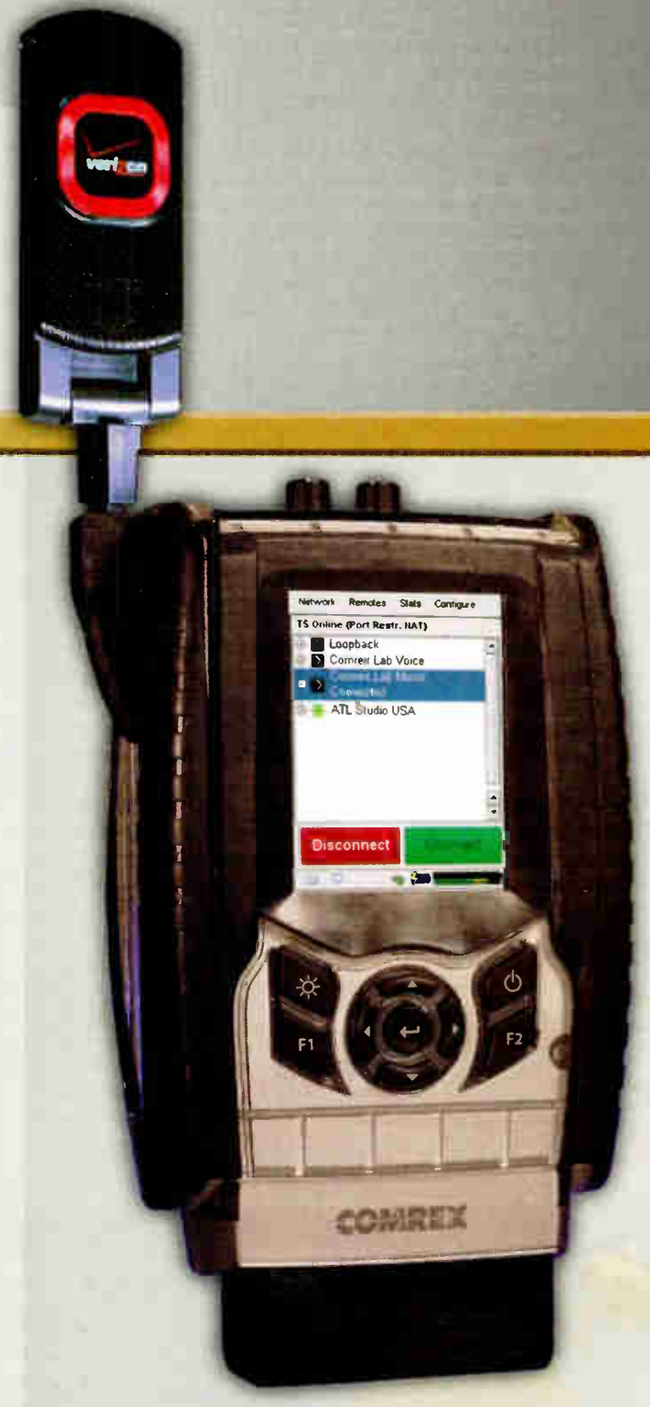

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World Radio History

TRANSLATORS

(continued from page 6)

Translator location hopping has become a popular legal option for broadcasters hoping to edge a signal contour to a major population area, Vernier said.

"A licensee can move a translator as long as some of the old 60 dBu crosses over into the new contour. There are no principal community service rules when it comes to translators, unlike FM full-service stations," he said.

Broadcasters in general also are finding it easier to change translator frequencies to avoid interference issues, Vernier said.

"FCC rules say that a change of channel greater than the third-adjacent would be considered a major change," he said. "However, the FCC has become kinder and gentler on channel moves greater than three channels."

The commission also no longer allows a commercial-band FM translator to move into the noncommercial band unless the translator has been licensed for two years or more. The same applies to noncommercial stations hopping into the commercial band, said Vernier.

The agency approved cross-service translation in 2009 as a means to mitigate AM coverage problems. An AM daytime station can originate programming on its FM translator at night, according to the commission.

According to the FCC's rules, no portion of the FM translator's 60 dBu may exceed the 2 mV/m AM signal contour or 25 mile radius from the AM transmitter. AMs that want to re-transmit their signal on an FM translator are limited to those translators with existing licenses and permits as of May 2009.

The relatively low cost of setting up a translator also is attractive to broadcasters. Most all translators have a similar implementation: a small transmitter, a signal receiver or input device and an antenna. An FM translator can be set up for as little as $5,000, observers said. However, monthly tower rental expenses could add additional costs.

Noncommercial and commercial broadcasters have been active in the translator market, said Larry Patrick, managing partner of Patrick Communications, a radio brokerage firm.

"Interest in translators is very strong. As a broker there is a big demand. We routinely ask engineers to find translators that can be moved into markets for clients who want them," Patrick said.

"Saga was active in this several years ago and now dozens of other groups are adding stations this way. Cumulus among them has been quite active in the translator market."

IN SUMMARY

A summary of key translator points from Doug Vernier's presentation:

- Fill-in FM translators offer significant opportunities for both FMs and AMs.
- There is a freeze on new translators.
- Translator upgrades and site moves are popular.
- Translators can be displaced.
- Outgoing and incoming interference is an important issue.
- A translator can run another station's HD2 or HD3 as input.

Cumulus has made several recent move, putting translators on the air in Atlanta and Kansas City. In Atlanta, the broadcaster is rebroadcasting the HD2 channel for WWWQ(FM) on a translator at 97.9 MHz. Meanwhile, in Kansas City it has launched a comedy service on the HD2 channel of KMCO(FM) and is rebroadcasting it on a translator at 102.5 MHz, according to the company's website.

Cumulus officials didn't return calls seeking comment on their translator strategy.

A number of translators are on the market thanks to the FCC's 2003 filing window for new FM translator stations in the non-reserved band, experts said. Auction 83 included commercial and noncommercial broadcasters who combined to file some 13,000 applications.

Controversy arose when thousands of allegedly speculative applications were filed by several organizations.

The FCC processed thousands of translator construction permits resulting in a range of translator licenses available on the market, observers said. However, the FCC invoked a freeze on issuing any new FM translator licenses on March 17, 2005, to "figure how best to harmonize our licensing processes for FM translators and LPFM stations to enhance localism," according to a Second Order on Reconsideration and Further Notice of Proposed Rule Making (FCC 05-75).

The commission issued an NPRM last month on the issue of prioritizing licensing LPFMs and FM translators.

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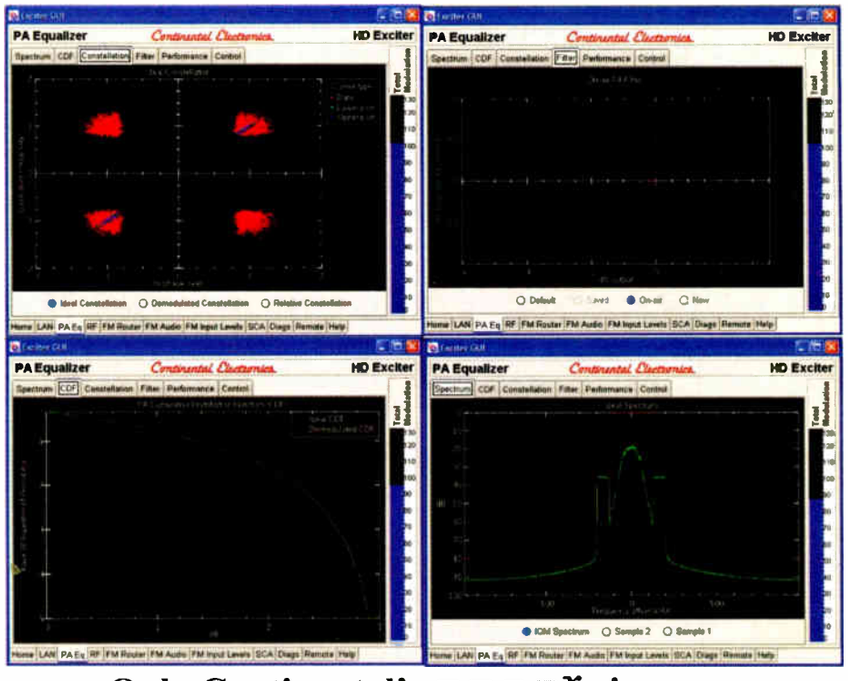

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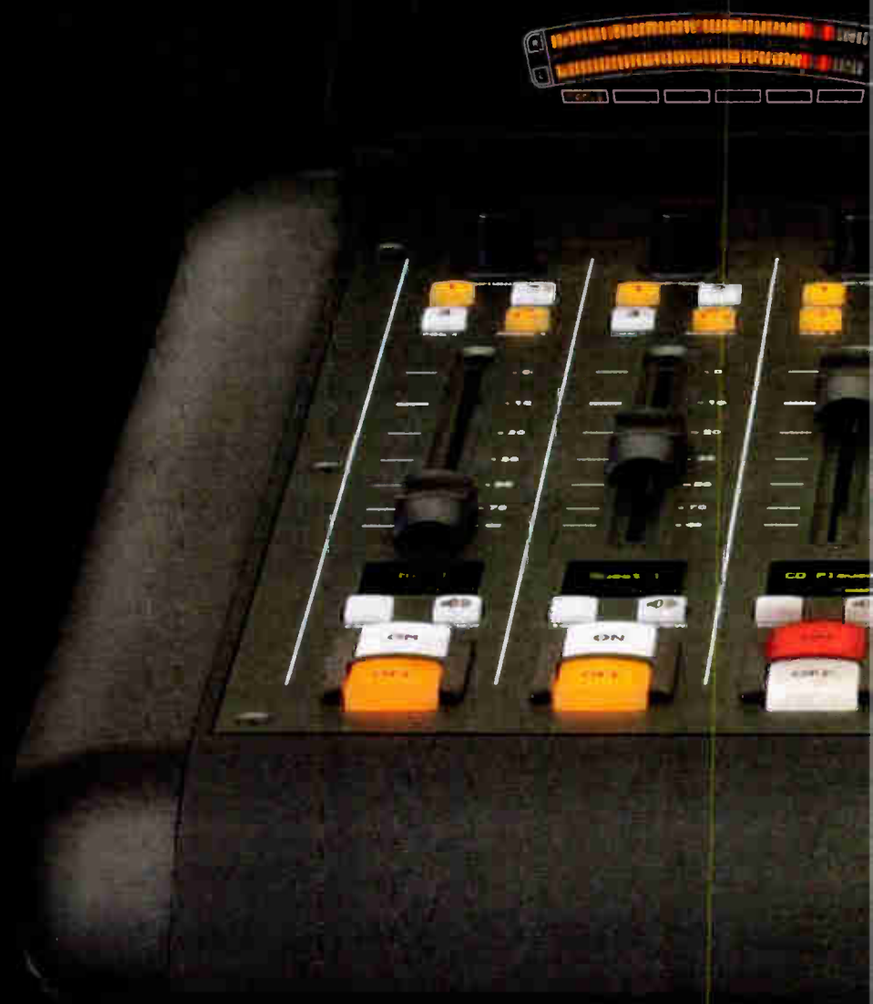

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World Radio History

Enhance Your Ground With This

Engineers Find Two Vastly Different Solutions to Combat Vandalism

Alan Shea, an engineer with the technical department of HCJB, discovered something that might be useful for helping to cut down on copper losses, at least for ground rods, close-in radials and ground straps.

WORKBENCH
by John Bisset
Read more Workbench articles online at radioworld.com

ERICO International Corp., makers of Cadweld and other grounding and protection equipment, has a product called GEM25A.

GEM stands for Ground Enhancement Material. GEM25A is a carbon-loaded Portland cement with an effective typical resistivity of 12–18 ohms. Pouring this around ground wires would seriously slow down copper thieves, encouraging them to go somewhere else.

It would also improve the effectiveness of the ground wires. Alan's not sure if this would affect antenna impedances; maybe one of the consulting engineers who read this column can weigh in with an opinion.

ERICO has a downloadable calculator for estimating the amount of GEM required for a particular application. Find it at *www.erico.com/products/GEM.asp*.

Senior Technical Support Specialist George Kub states that the conductive materials added to GEM for its ground-enhancing mission reduces its overall strength, so GEM is not suited for structural intent, such as in a footing or foundation, or freestanding applications such as supporting a pier or pylon. Conductor encasement (in a trench) in GEM would help to lower system resistance and likely make life more difficult for copper thieves.

Send application questions to George Kub at *gkub@erico.com*, or call ERICO Customer Service at (800) 677-9089.

Thanks, Alan, for sharing this information with readers of *Workbench*. Alan Shea can be reached at *ashea@hcjbtech.org*.

I'm a long-time user of ERICO products. If you haven't used them for welding strap and cable to ground rods, you're missing out on a really neat technology. The process is quick and secure. Visit the company's website to find out more, *www.erico.com*. Under the library tab, search for cadweld video.

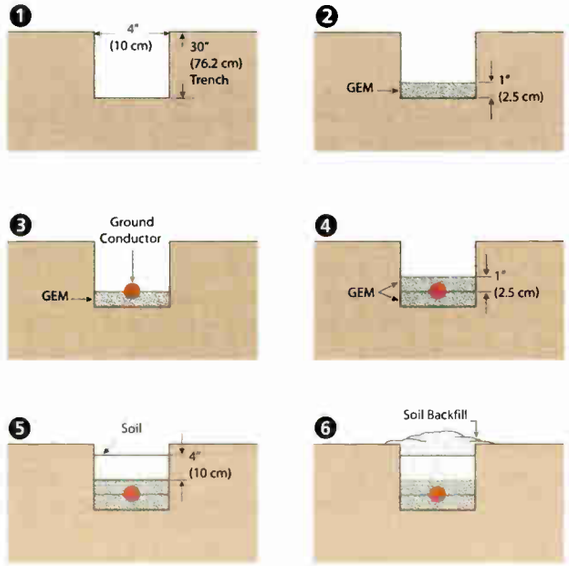


Fig. 1: ERICO Ground Enhancement Material is a conductive material that solves grounding problems and makes an interesting deterrent for copper thieves. This example shows a trench installation.

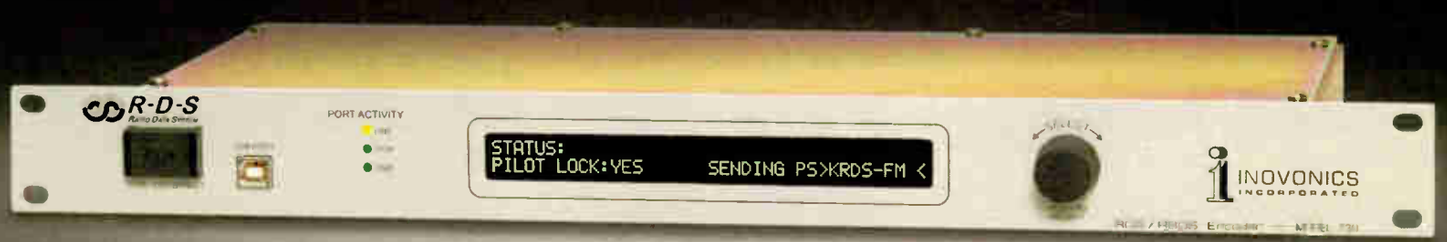
Jon Hosford is director of engineering for Montpelier Broadcasting in Vermont. Robert Combs' story about bullet damage at the transmitter site (*Workbench*, June 1) made him think of one of his old facilities.

The original WNCS(FM) site was controversial when built in the early 1980s. Given the controversy, the original station owner was worried someone would try to shoot the building.

So he experimented. He took a 30-06 rifle and shot at a 2-by-4, in the thick direction. It went through. He worked

(continued on page 12)

"Name That Tune."



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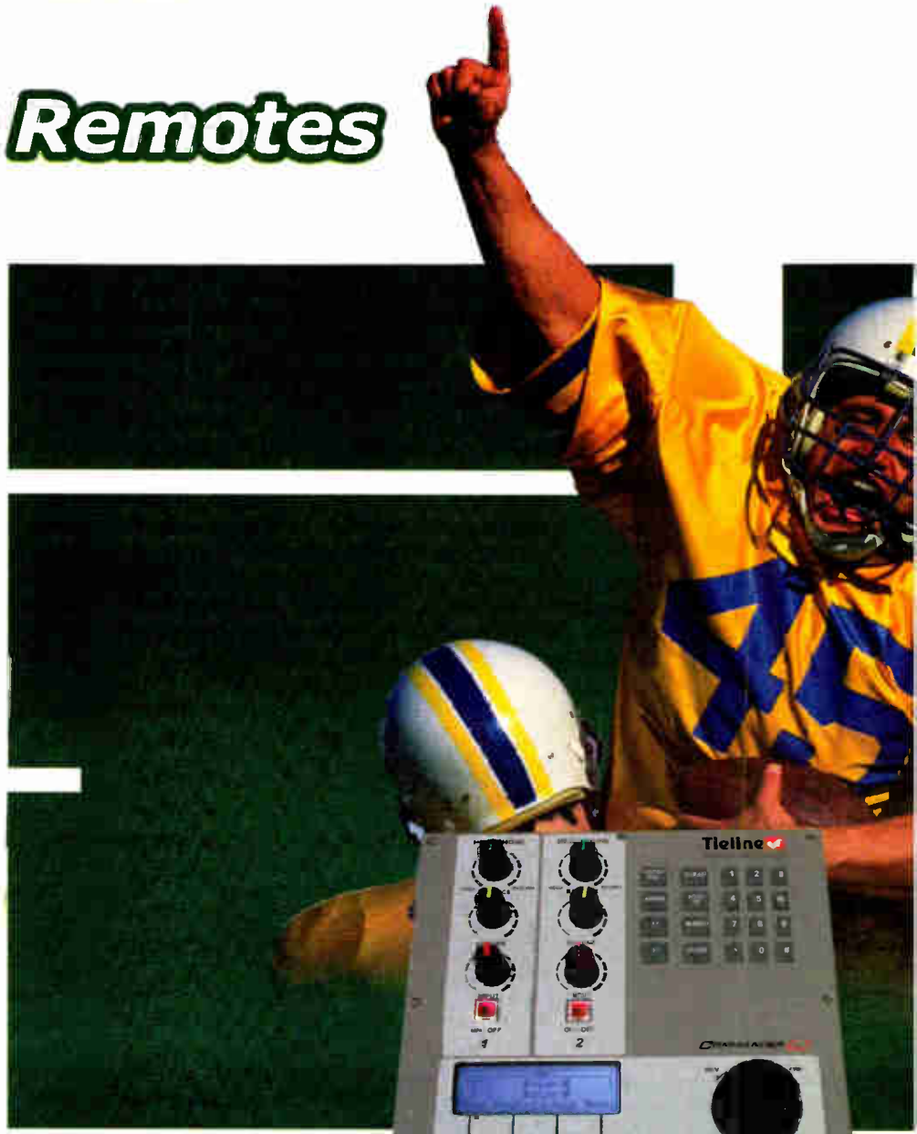

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World Radio History

WHO'S BUYING WHAT

Clear Channel Radio chose **Sage Systems** gear for its EAS conversion. Steve Davis, senior VP of engineering and capital management, said Dan Mettler, senior VP of engineering for the central region, spearheaded the broadcast group's compliance effort. Mettler "arrived at a tiered approach that will get us compliant by the deadline," Davis said. The initial rollout will involve 246 new units. Those will be tied to Clear Channel's remaining existing decoders so all of its 890 stations are covered. "We will undertake a second rollout in 2012 to add enhanced functionality once the 'must carry' rules are solidified," Davis told Radio World

Allan Brace, SVP engineering project management and capital purchasing, headed procurement. Davis declined to name the sole-source dealer handling the sale. ...

Entercom ordered 110 **Sage** Digital Endecs from dealer **SCMS** for its 113 radio stations, according to Corporate Engineer John Price. ...

South African commercial station **OFM** bought a **Jünger Audio** DO6 Level Magic processor to help maintain audio consistency for its phone-in programs. ...

Telos Systems named recent buyers of its Nx6 multi-line talkshow system. They include **Clear Channel's** four-station cluster in Tuscaloosa, Ala., the University of Florida's **WUFT(FM)** in Gainesville; Marconi Media's **KKCS(FM)** in Denver; and the University of Minnesota - Duluth's **KUMD(FM)**. ...

Barix AG noted the sale of its 100,000th device. Among recent activity, it provided approximately 1,200 audio over IP devices for the Commonwealth Games in India last summer. ...

Lincoln Financial Media selected **Triton Digital** to provide live streaming technology for 11 of its radio stations. Triton Digital's Streaming Division is previously known as Ando Media Group.

Entravision Communications recently purchased **Orban** 8600HD processors for two of its stations. KSSE(FM) in Los Angeles and WNUE(FM) in Orlando bought the digital audio processors from Doug Tharp of dealer **SCMS**. Rick Hunt is corporate engineering manager for Entravision.

Continental Electronics Corp. completed modifications to **WYPR(FM)**'s 816HD transmitter to allow for a 10 dB increase in HD power from 1 percent (20 dB below carrier) to 10 percent (–10dBc). WYPR's Chief Engineer is Ray Hepner.

Jan Van Der Walt at OFM

PIRATE

(continued from page 4)

I'm also a former board member of a block-formatted, eclectic college radio station, and I tend personally to sympathize with people who want to bring more diverse, nontraditional voices to the broadcast spectrum — if they comply with the law.

RW covers pirate radio news, and we have published opinions of its supporters (generating criticism for doing so) because I believe that perspective needs to be considered. But that doesn't mean I concur with their methods.

I was an early backer of responsibly deployed LPFM (and took heat for that too); but where some find a natural affinity between low-power FM and pirates, I draw a distinct line. An LPFM station has shown that it respects the larger community in which it operates: its local town, its country's elected officials, its listeners and its fellow broadcasters. A pirate has not.

Some see pirate radio as a form of civil disobedience and convince themselves they're "sticking it to the corporate fat cats" by flipping that transmitter switch.

But doing so ultimately is a selfish act. It says, "I know better than the larger community, including those who create our laws, how best to use this resource." And among those who suffer are the smallest broadcasters who put great toil and money into creating broadcast outlets while playing by the rules.

We have a radio community in this country, and while it includes corporations like Clear Channel and CBS, favorite bashing targets for some, it also includes tiny college stations, struggling mom-and-pop AMs, mid-market commercial independents, big public stations, TIS, radio reading services, new LPFMs and others who also honor — and understand the need for — a system of licensing and spectrum management.

If you want to "participate" in this community, respect its rules. If you don't like that system, work to change it, just as LPFM advocates have done.

Meanwhile, commenting on the original study, NAB President/CEO Gordon Smith said local broadcasting "is a remarkable engine for commerce and economic growth, creating high-paying jobs and helping business drive sales through advertising of goods and services."

You might dispute NAB's numbers but he's right in his conclusion. And Radio Survivor's humorous comments about pirate radio inadvertently remind us that the larger community of law-abiding, "participatory" radio outlets generates economic benefits too.

WORKBENCH

(continued from page 10)

his way up to a 2-by-10 board, which finally stopped the bullet.

Experiment completed, he build the building entirely of 2-by-10 boards laying flat! The door was steel.

Yes, this construction made penetrating the walls to run lines tougher; but Jon reports there was never a problem with vandalism.

Jon Hosford can be reached at *jhosford@pointfm.com*.

A few days ago, our Radio World colleague Buc Fitch realized he was running short of *small* 6-32 nuts. Those are the ones you use when a nut needs to sit up tight against a component or chassis wall.

Fig. 2: Not all nuts are created equal.

A more usual requirement is when you need to screw down a solder lug; bigger nuts are so large that they sometimes cover the first solder hole in the lug.

Buc had trouble finding a supplier of the smaller cross-section nuts, at least in quantities in the hundreds. (He did find a vendor who could provide them, with a minimum order of 40,000 pieces!)

His old friend Xen Scott mentioned that he'd just bought some 6-32 hardware from Lowes, and that the nuts in the box were notably small. At Xen's suggestion, Buc went over to Lowes and, yes, the nuts in the bubble pack that came with the 6-32 bolts were ultra-small, so tiny that they needed a 7/32-inch socket driver instead of the usual 1/4-inch driver.

Lowes has a strange pricing structure for these parts. The 1/2-inch to 1-1/4-inch bolt length in 100 quantity are all the same price, just under $5 a pack. The 1-1/2-inch lengths come 75 in a pack for the same price.

Since his goal was to acquire the nuts, Buc chose the 1-1/4 inch, a length he didn't have in the parts drawers. The Lowes part number is H# 35277.

He now has three sizes of nuts for 6-32 screws: the usual 0.303 to 0.313 inch "large" nut; the typical 1/4-inch nut; and these new, useful "ultra small" nuts from Lowes.

With parts being increasingly sourced from Asia, Buc finds it getting harder to find good-quality parts he needs. He raises a good point with the quality issue. Use caution when selecting bolts and nuts to mount heavy items like coaxial transfer switches. The quality of steel in hardware sold at many stores is suspect. In a typical failure, the head of the screw or bolt breaks off as the device is tightened — disastrous when hanging a transfer switch or filter.

Reach Charles S. "Buc" Fitch at *fitchpe@comcast.net*.

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.*

John Bisset has spent 43 years in the broadcasting industry, and is still learning. He works for Tieline Technology, is SBE Certified and is a past recipient of the SBE's Educator of the Year Award.

World Radio History

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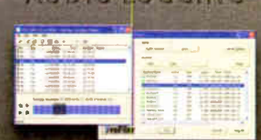

PC Software for archiving and logging all of your stations audio.

World Radio History

Another (Slightly Different) Radio Show

BY JAMES E. O'NEAL

DAYTON, OHIO — Imagine the NAB Show scaled to three days and fitted into a 16,000-square-foot venue that can accommodate a normal crowd of perhaps 7,000.

HAMRADIO

Imagine also a show where the parking lot, instead of hosting a couple dozen remote trucks, is the scene of fast-paced wheeling and dealing, with 2,000 or so venders waiting to sell you anything from the latest test gear to a vacuum tube for a 1920s radio receiver.

If you've been to the Dayton Hamvention, you don't have to imagine. You've lived it.

In recent years this annual event has drawn 20,000 or more radio aficionados (more than a few of whom work in broadcast engineering) to a town of 141,000. It is *the* place to be if you're really serious about amateur radio; and the parking lots are full of cars with amateur radio call signs from virtually every state in the union.

"Dayton" traces its roots back nearly 60 years to 1952 and the efforts a small group of amateur radio operators working with $100 in seed money. That ham convention has steadily grown to become today's three-day premier event in ham circles.

AN INTERNATIONAL CALLING

So what exactly is "Dayton?"

In addition to the obvious convention aspects, with wall-to-wall presentations and a lot of socializing, it's a gigantic flea market that features electronic gear of every description, and a very respectable trade show, where manufacturers of amateur radio and allied equipment get the chance to display their latest wares and (hopefully) create a market for these new products.

The outdoor flea market is a big draw. Some 2,000 tailgating/table spaces are available and most are occupied during the show.

On the main show floor, this massive 'portable' 145-foot crank-up tower from Luso drew a lot of attention. It lists for $40,000, though the 'show special' was $36,000.

Gerry Moersdorf's philosophy is 'Never operate any transmitter that can't kill you if it falls over!' This creation is a commercial Collins 20V-3 AM broadcast transmitter modified to operate on the ham bands in a mobile configuration. It's powered by a generator; a special frame allows him to lift the 1,000-plus pound transmitter quickly on and off the pickup truck.

This year's Hamvention, held in May, was themed "Global Friendship," a phrase that typifies the spirit of amateur radio. Radio waves know no international boundaries. Ham operators revel in the number of wireless contacts they are able to make with like-spirited individuals, sometimes operating from some of the remotest locations on earth (or even from space). And during emergency situations, amateur radio can be the only communications link to the outside world.

"It seems as if world events continue to bring forth both major political and geographical upheavals affecting millions of people throughout the world," said Michael Kalter, general chairman of this year's Hamvention.

"Amateur radio could not be more relevant or needed than at the present moment. At the heart of these political uprisings and natural disasters are the amateur radio operators who tirelessly hold open the communication lifeline to the outside world. I heard news accounts

(continued on page 16)

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World Radio History

DAYTON

(continued from page 14)

that during the crisis in the Middle East the Internet was shut down for periods and the only communication available was through amateur radio."

Kalter remarked that ham radio has been responsible for promoting friendships on a global basis and that it provides one of the best opportunities for doing so.

As part of the Global Friendship initiative, this year's event featured booths with representatives from amateur radio organizations in Great Britain, Germany, Japan, China and Qatar on hand to greet attendees and field questions about amateur radio activities in their respective countries.

A special guest, astronaut Doug Wheelock, was on hand to greet show attendees. Wheelock is a licensed radio amateur and spent part of his time aboard the International Space Station making radio contacts with earthbound hams, including groups of young people at school and camp ham stations.

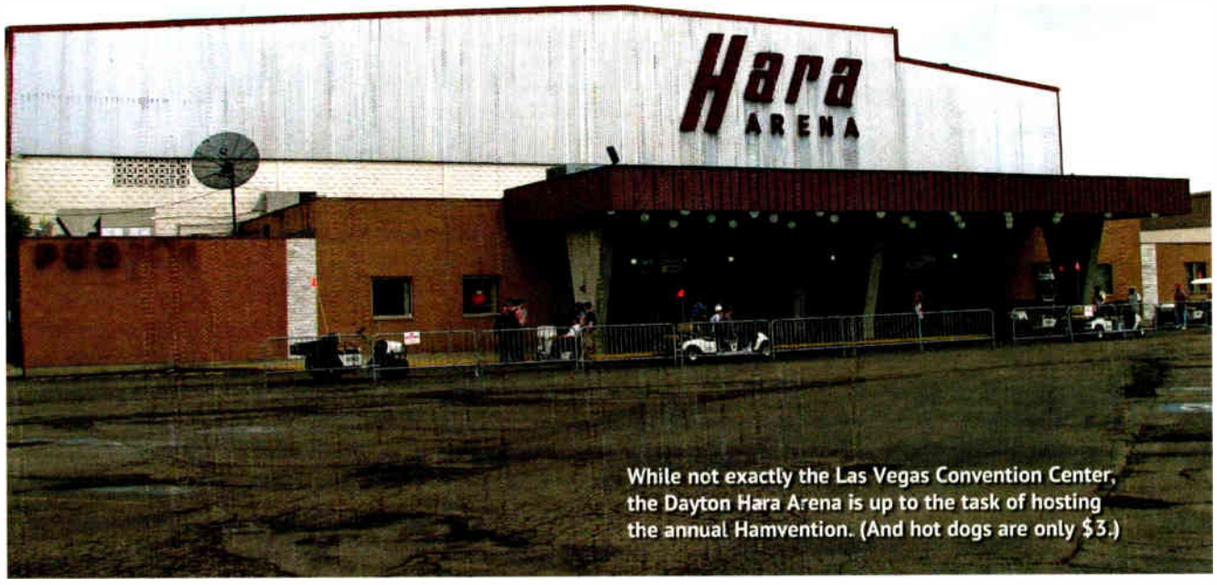
THE UNUSUAL IS COMMON HERE

Just as at NAB, crowds start to gather early outside the main entrance to the exhibit hall — in this case, Dayton's Hara Arena — and at the appointed time pour into every nook and cranny of the building to check out the latest gadgets from the commercial venders and to station themselves at the locations of radio-related presentations and forums.

However, many stream right on through the building and out onto its parking lot for some of the most unusual sights and sounds of the show.

This is the location of truly one-of-a-kind items, be they a collection of "QSL" cards (a mailed transmission confirmation report) from the 1930s, military communications equipment or even some high-end audio gear. The 2,500 stall-space flea market area is a showplace for hams wanting to display something special that they've created.

Crowds this year weren't disappointed. A big draw was a Collins 20V-3, a 1 kW transmitter that had pressed into amateur radio service after many years of duty at an AM broadcast station. It's now owned by Gerry Moersdorf (amateur station call sign KC8ZUL) and holds the title of "the world's first mobile AM broadcast rig."



While not exactly the Las Vegas Convention Center, the Dayton Hara Arena is up to the task of hosting the annual Hamvention. (And hot dogs are only $3.)

Ted Randall, a familiar voice to listeners of the 50,000 Watt U.S. shortwave station WBCQ, brought his 'QSO Radio Show' to Dayton and broadcast live from the Hamvention exhibits hall.

The vintage broadcast transmitter was modified extensively to allow frequency-agile operation within the HF ham band assignments and to be controlled from the confines of Moersdorf's pickup truck cab. The 1,300 pound transmitter rides in the bed of the truck on a special mount that allows it to be installed or removed quickly.

Moersdorf erected a 40 meter dipole near his truck for the occasion and was inviting licensed hams to give the unique rig a try on 3.885 MHz.

He has a large collection of broadcast transmitters and a rather unique philosophy to describe his affinity for "big iron" (the nickname for commercial transmitters within the ham community), "Never operate any transmitter that can't kill you if it falls over!"

When he's not collecting and modifying Gates, Collins and RCA tube transmitters, Moersdorf is president of Audio Power Labs in Columbus, Ohio. In addition to the mobile 20V-3, he offered another attraction for visiting hams, a sample of company's top-of-the line audio amp, the 833TNT.

Demos were staged in the trailer section of an 18-wheeler (which also contained the carcass of a Gates broadcast rig destined for restoration and hamming). The massive tube-type audio amps are based around a pair of 833C transmitter-type graphite anode triodes and crank out an honest 200 Watts RMS with a distortion of less than 1 percent. They weigh in at 160 pounds each (you'll need two for stereo) and come with a price tag of $175k for the pair.

Inside Hara Arena, the scene was booth-after-booth-after-booth — somewhat reminiscent of the NAB Show. According to Henry Ruminski, one of the show's volunteer organizers, floor space this year was at the "sell-out" level, with some 250 commercial exhibitors showing off wares.

One of the largest exhibitors space-wise was the ARRL (American Radio Relay League), the non-profit organization that represents the interests of ham radio operators.

"We estimate that there are some 600,000 to 625,000 amateur radio operators in the United States," said Harold Kramer, the group's COO. "And 157,000 of them are ARRL members."

REMOTES TO THE WORLD

Another "indoor" attraction was Ted Randall, host of the QSO Radio Show on WCBQ, a 50,000 Watt international broadcast station based in Monticello, Maine.

Randall was set up in a broadcast booth environment and did live broadcasts during the run of the show. And despite the deemphasis in recent years on shortwave broadcasting by such entities as the BBC and VOA, Randall is upbeat about its potential.

"It's really surprising," he said. "When I play music, I sometimes get 300 or more e-mails an hour. That's something that even the big clear channel AMs can't claim anymore."

The staging of the Dayton Hamvention is an all-volunteer effort, with some 750 to 800 persons volunteering their time each year to make the event run smoothly. Next year's show is set for May 18–20.

James O'Neal is technology editor of TV Technology and a frequent contributor to Radio World.

World Radio History

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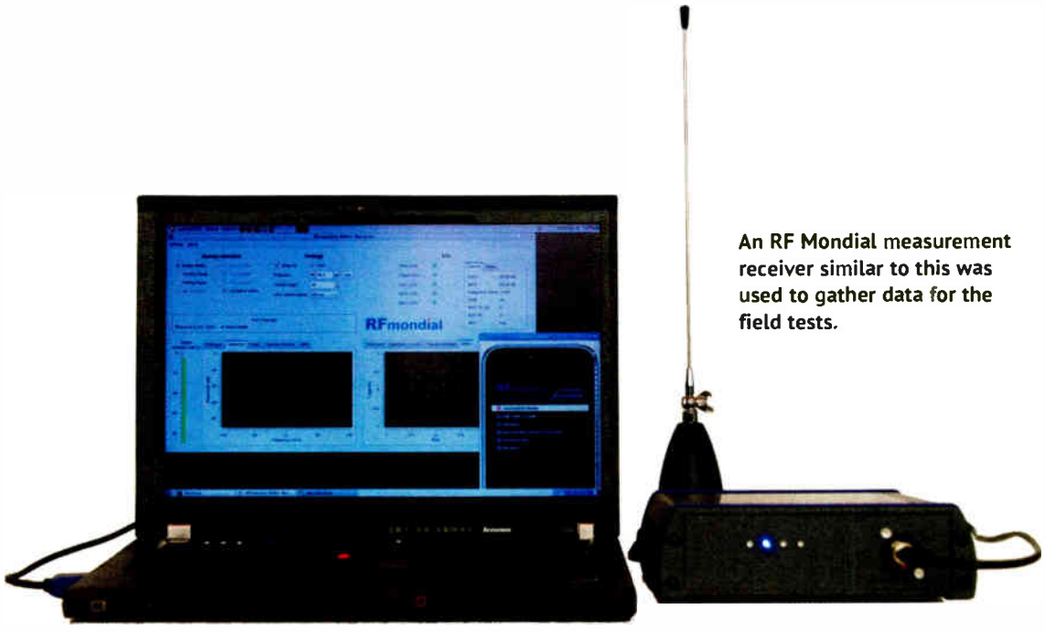
DRM+ TRIALS

(continued from page 1)

DRM+ is designed to operate in the VHF bands, having been tested in Bands I and III as well as Band II, the traditional home of FM radio. Its counterpart, DRM30, is designed for broadcasting at frequencies below 30 MHz, including medium-wave (the traditional AM band) and shortwave.

Dr. Jens Schroeder, founder of equipment manufacturer RFmondial, reviewed recent activities around the world to evaluate the DRM+ system and presented those results at the NAB Show this spring.



An RF Mondial measurement receiver similar to this was used to gather data for the field tests.

LAB TESTS

Recent lab simulations by engineers of the Institute of Communications Technology at Leibniz University in Hannover, Germany, are giving system planners a clearer idea of the effects of frequency and receiver speed on DRM+ system performance.

In particular, understanding the causes of audio dropouts due to various forms of signal fading is a key area of interest, as this is a primary concern for reliable reception in moving vehicles.

"In mulitpath environments, you get frequency-dependent Doppler shifts, and they will lead to inter-carrier interference," Schroeder explains. The lab team simulated this "fast fading" effect on a 100 MHz transmission system at receiver speeds ranging from 62 to 186 mph to determine the signal-to-noise ratio required to ensure reliable reception of the DRM+ signal.

The study found that the system needs about 20 dB at 62 mph and increases to 22.5 dB at 186 mph, and that the difference between 100 percent availability and the 99 percent availability planning factor often used to predict real-world system performance is negligible at these speeds.

Another study attempted to characterize the effects of "slow fading." At lower receiver speeds, long-wavelength multipath fading can be a problem, since fades longer than the 600 ms interleaver in the DRM+ system will cause dropouts. Simulations of a slow-moving (6.2 mph) receiver attempting to receive a DRM+ signal on indicate that at 100 MHz, 25 dB SNR is required for reception, while on 200 MHz, the system will operate at 22 dB SNR. As frequency increases, this trend continues due to the decreasing wavelength.

FIELD TRIALS

The DRM+ system has been receiving close atten-

(continued on page 20)

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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.

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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.

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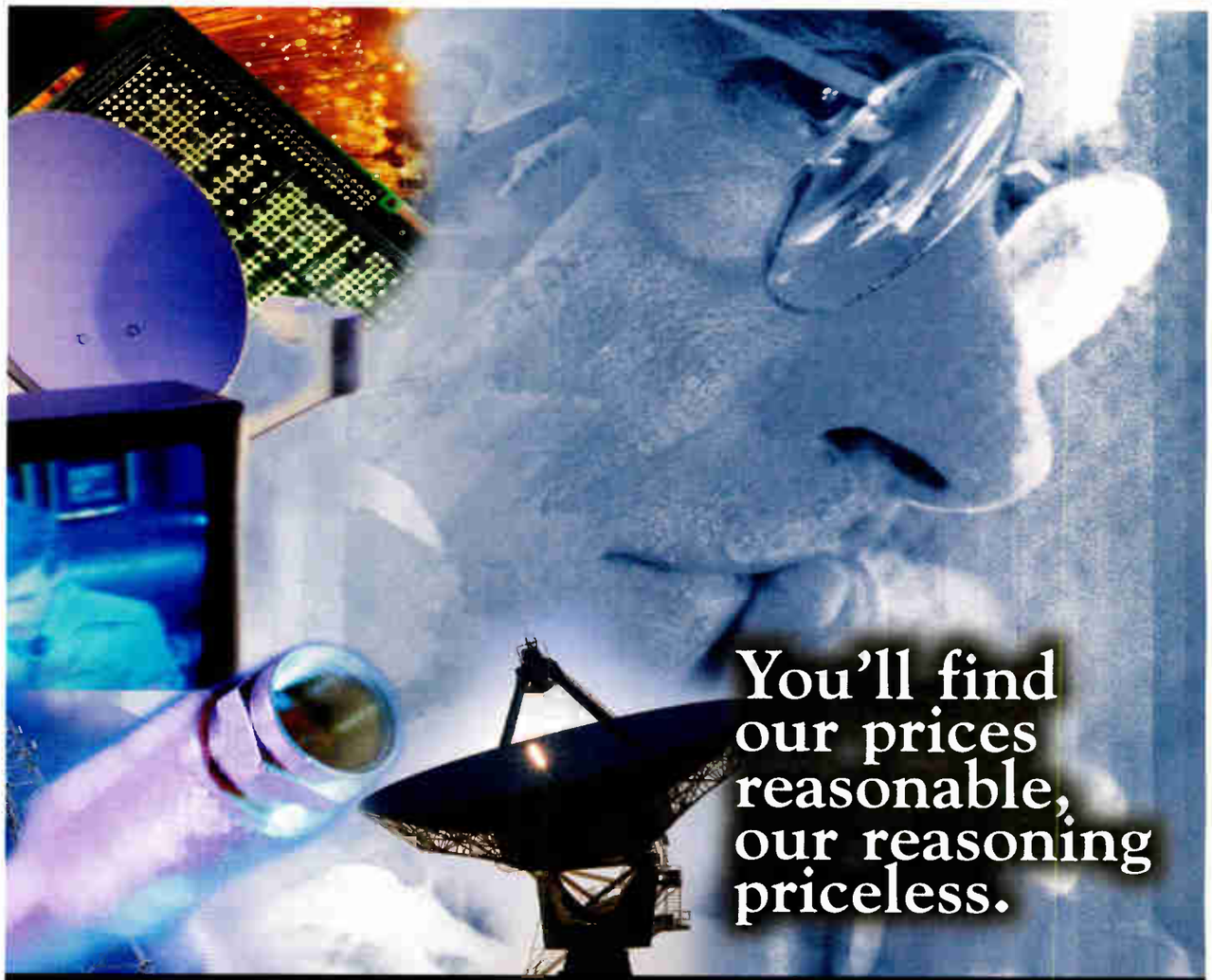

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World Radio History

DRM+ TRIALS

(continued from page 18)

tion in several field trials over the past two years, Schroeder noted. In addition to the multi-system evaluations performed by ETRI in Korea [see RW, July 13], DRM+ has been evaluated in Germany, Sri Lanka and the United Kingdom. All of these trials involved drive testing with equipment provided by the DRM Consortium, including RFmondial modulators and mobile test measurement systems.

In Hannover in early 2010, a small test DRM+ station was constructed atop a university building (approximately 230 feet above ground) with a directional yagi antenna operating at 30 W ERP on 95.2 MHz. Tests were conducted of a variety of system configurations, Schroeder said, but the results of one of the least robust operating modes (16-QAM, 0.5 code rate, 149 kbps) were quite encouraging.

Even with such a low power and reducing error correction to maximize the data rate, solid coverage was received out to a distance of about nine miles with good stereo audio quality down to a field strength of 46 dBμV/m at 18 dB SNR.

In Sri Lanka, a whirlwind measurement campaign of a test station in Colombo was conducted as part of a DRM+ workshop jointly organized by the Telecommunications Regulatory Commission of Sri Lanka, the Sri Lanka Broadcasting Corp.and the Asian Broadcasting Union from Nov. 29 to Dec. 2, 2010. The nature of the test was similar to the Hannover trials, with a relatively small 47-watt station operating on 87.6 MHz from a Sri Lanka Broadcasting tower southeast of downtown Colombo.

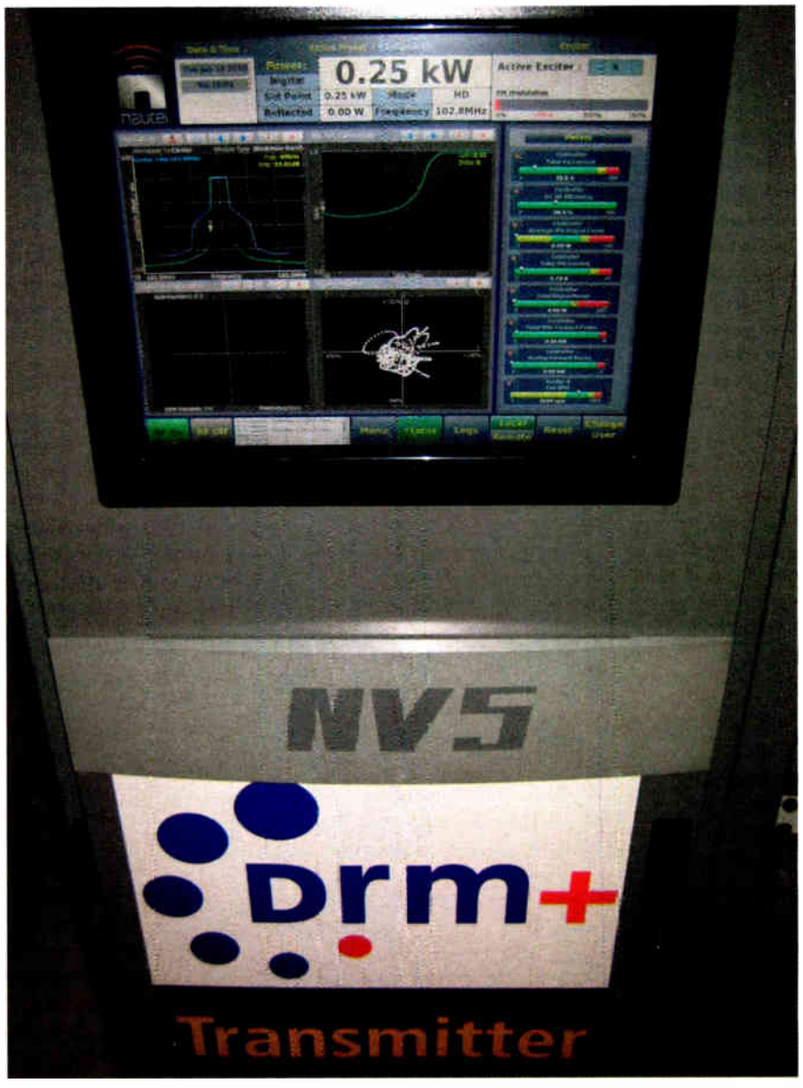
In this case, 4-QAM modulation was used with a code rate of 0.25, delivering 37.3 kbps. As predicted in Longley-Rice coverage projections, coverage extended roughly 5.5 miles north of the transmit site through the urban center of the city, with good quality stereo available down to 35 dBμV/m. This exceeds the performance of analog FM, Schroeder said, since the ITU recommends a field strength of 66 dBμV/m for quality stereo in urban environments.

Surround broadcasts were also demonstrated at the Sri Lanka workshop, with the system operating in 16-QAM at 149 kbps, and delivering a surround audio program along with a stereo program, a text news ticker and Journaline "teletext"-style messages.

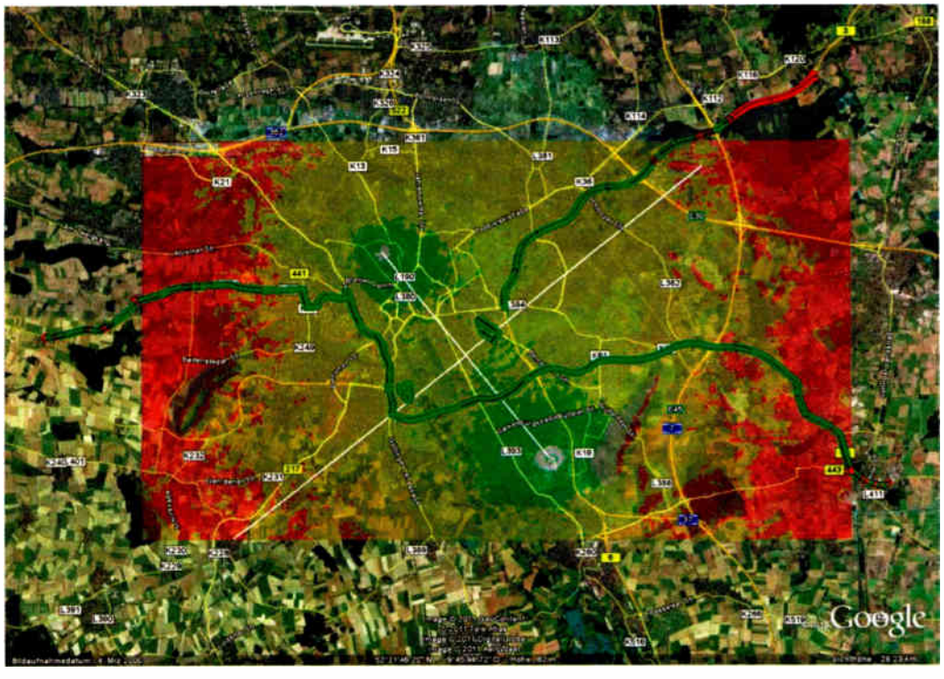
REAL WORLD

From January to May of this year, the BBC in the U.K. conducted the most "real-world" test of DRM+ to date, according to Schroeder.

Using an available frequency vacated by a former commercial FM station on a combined antenna at the Craigkelly tower just north of Edinburgh, Scotland, the BBC operated a test station broadcasting with 1 kW ERP at 107 MHz. The system was configured to allow easy switching between two operating modes: 16-QAM with code rate 0.5 delivering 149 kbps, and a more robust 4-QAM with code rate 0.33 delivering 49.7 kbps.



A Nautel NV5 DRM+ transmitter was used in the Hannover field trials.



This image shows coverage of the Hannover DRM+ system operating with multiple transmitters in a single-frequency network.

Prior to the field tests, the BBC prepared comprehensive coverage predictions by using the U.K. Planning Model, a statistical terrain-sensitive coverage prediction model originally developed for digital television allocations and coverage analysis and extensively validated over the past decade.

Two field measurement periods in February and March yielded copious performance data about DRM+ operating in both the 4- and 16-QAM modes. The BBC chose measurement routes to characterize the extent of coverage around Edinburgh and the surrounding communities, and to determine performance of the system in dense downtown areas known to be challenging to radio reception. According to the test report published by the ITU, more than 1,500 miles of mobile test data were collected over the course of the tests.

Dr. Schroeder characterizes the Scottish trials as a successful, highly credible real environment for evaluating DRM+ performance on a broad scale and said preliminary analysis indicates that "the system appears to perform as expected." In particular, he said the operation of a 1 kW DRM+ in 4-QAM mode delivers coverage roughly the same as a 5 kW analog FM station.

Schroeder believes these tests, and others scheduled for this summer in New Delhi and at other venues in Europe and Asia over the coming year, will further cement DRM+ as a viable digital radio platform where broad compatibility over multiple frequencies, spectrum efficiency for challenging allocation environments and the ability to deliver advanced digital services alongside audio programming are desired.

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MARKETPLACE

CODECS 'BRIDGE' VIA IPV6

Tieline said its Bridge-IT IP audio codecs performed a "world-first IPv6 transmission."

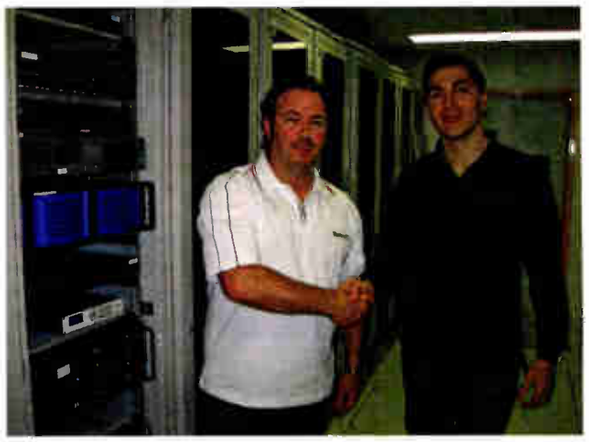
On World IPv6 Day — a day in June when organizations focused attention on the so-called "new Internet" and its expanded number of IP addresses — Tieline sent live bidirectional stereo audio over multiple international hops using IPv6 infrastructure.

The company has been vocal about the importance ensuring IP codec compatibility across both IPv4 and IPv6 IP networks to maintain connectivity across wide-area networks.

International Marketing Manager Darren Levy said Tieline worked with HostAway, an Australian data center, to connect to IPv6 infrastructure that day. Two Bridge-IT audio codecs were programmed with IPv6 addresses and connected to each other and transmitted for several hours over the open Internet.

"The quality and reliability of the connection was excellent and even the web-GUI for remotely programming the codecs was run over IPv6," Levy said.

Info: www.tieline.com



Tieline's Charlie Gawley, left, with HostAway's Ashley Hadassin

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VARIANT ON BPHS1 AVAILABLE

Audio-Technica's BPHS1 broadcast headset now has a variant with the standard three-pin XLR connector exchanged for a four-pin XLRF connector.

The new connector on the BPHS1-XF4 allows for use with intercom systems from certain manufacturers.

The BPHS1 has closed-back circumaural (around-the-ear) ear cups and a flexible boom dynamic cardioid microphone. The boom can be swiveled for right or left side orientation. Each padded earpiece has a 40 mm neodymium driver. The adjustable headband is cushioned for listening comfort.

The BPHS1-XF4 has a user-replaceable detachable 6.6-foot cable (that can also be swapped out for the standard broadcast three-pin XLR-terminated cable). It ships with three replaceable windscreens. Price: $279.

Info: www.audio-technica.com

World Radio History

MEDIA ACCESS PRO GETS 2010 CENSUS DATA

Media market research firm BIA/Kelsey announced a major database update to its Media Access Pro data and analysis program for radio, TV and newspaper media.

Information from the 2010 U.S. Census now is available. The information covers some 5.5 million geographic areas, according to a BIA/Kelsey release.

"MAPro now offers population estimates of all television and radio stations' coverage patterns for their license facilities, as well as any construction permits. The inclusion of this type of up-to-date data provides those analyzing these industries a detailed view into the population served by a station in a particular market."

Vice President Mark Fratrik said the inclusion of current data will help users better evaluate a particular station's competitive position in a market.

"By overlaying the predicted contours of a station's facilities and construction permits with the census block information to generate population estimates, we're giving MAPro users the most accurate and detailed information available to understand the current situation for each station in all markets as well as those outside of markets."

MAPro also has added information on station ownership histories.

Info: www.biakelsey.com

V-SOFT MAKES UPDATES EASIER

Test, measurement and design software company V-Soft Communications has announced a new interface that will aid in the updating of V-Soft programs that use dynamic (i.e., regularly updated) databases (e.g., FCC AM/FM/TV frequency).

Previously, updates had to be performed by hand, requiring downloading of specific databases and then applying them to the proper target folders.

The new Windows-based system should make everything almost hands-off and perform seamlessly, including proper authorizations and updating of correct databases.

The interface also allows for regular scheduling of the updates through a task scheduler.

V-Soft suggests that users of programs such as Probe 4, AM-Pro 2, FMCommander6, Microwave-Pro, XField and more will find the new module most useful.

Info: www.v-soft.com

AURALEX HIGHLIGHTS NEW PANELS

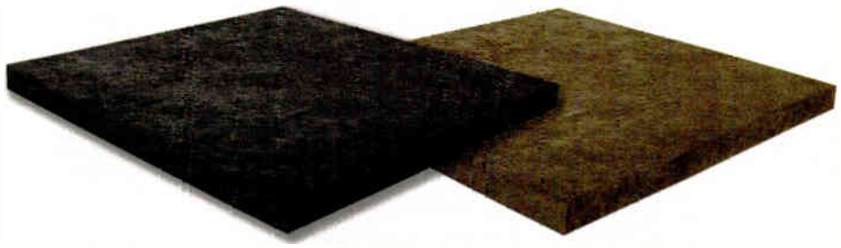
SonoLitePro from Auralex is the latest in the SonoLite line of sound absorbing acoustic panels, aimed at users such as studios, retail outlets and restaurants.

This is a fabric-wrapped, melamine-free acoustical foam product available in two sizes: 2 x 2 feet ($64.99) and 2 x 4 feet ($119.99), both 1.5 inches thick.

Founder and President Eric Smith said there's demand for more acoustical options for commercial facilities that require Class A fire rating.

SonoLitePro has a Noise Reduction Coefficient rating (NRC) of 0.90.

Info: www.auralex.com



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World Radio History

Talk TECH to Your Elected Officials

Why SBE Supports the 'FCC Technical Expertise Capacity Heightening Act'

BY BARRY THOMAS

The author is chair of the Society of Broadcast Engineers' Government Relations Committee and immediate past president of SBE.

One of the most persistent issues the Society of Broadcast Engineers has

SBENEWS

championed is the improvement in technical competence at the policymaking level of the Federal Communications Commission.

The SBE engaged in a dedicated legislative campaign starting in the 1980s to add a requirement to the Communications Act that one of the five FCC commissioners be an engineer. While well-intentioned, this objective in retrospect was a bit naive. In this scenario, the "technical" voice would always be in the minority.

Considering that the FCC commissioners meet only in their public sessions — though there is a reform measure pending in Congress that might change that — the impact of an engineer on the commission wouldn't translate to an increase of technical competence. Furthermore, the goal was unachievable, as FCC commissioner appointments are highly political.

Last year, the SBE strongly supported and worked for passage of House and Senate bills that would have greater potential impact on the technical decision-making of all commissioners, regardless of their backgrounds.

Unfortunately, as so often happens, the congressional session ran out before the bill could pass — despite bipartisan support in both houses.

The bills have been introduced again as the FCC Technical Expertise Capacity Heightening (TECH) Act, Senate Bill S. 611 and House Bill H.R. 2102.

SBE President Vinny Lopez, Vice President Ralph Hogan, Executive Director John Poray, SBE Counsel Chris Imlay and I have visited with Senate and House staff working to gain sponsors, cosponsors and supporters for the bills. The society also has requested action from our members to support this important legislation.

In the course of that, and as part of my role as chair of the Government Relations Committee, I've discussed the issue with many members. Several of these friends have brought up excellent points worth discussing.

CONDUIT

The question most often asked is, "The FCC has experienced and skilled engineers at its bureaus. If commissioners need technical direction, why don't they just call them?"

Indeed; why don't they? As a practical matter this is just not done. Aside from the social differences between the disciplines — which present a cultural chasm between lawyers and economists at the policy level, and engineers and scientists at the bureaus — the decision to engage a bureau-level engineer in a policy decision is left to the judgment of the commissioner and his or her staff.

As a result the bureaus are not part of the decision but are instead charged with "making the decision work" after the fact. Perhaps it's simply that commissioners' staffs simply don't know that certain decisions have technical impact, or maybe they have the hubris to think they "know better" than engineers. I prefer to believe the former. Either way, the skill of the bureaus usually isn't applied until too late.

As an analogy, consider how many times you have been faced with an obligation that a high-level radio station staff member has made, one that is well-nigh impossible. Maybe it's a remote that the salesperson "simply had no idea would be a problem." Had you been involved before the promise was made, you could have saved the station money, effort and maybe even a client. If someone had even mentioned the idea to you in the hallway, you could have sent up a warning flare or asked for detail so the idea could be researched.

SBE's Vinny Lopez, Barry Thomas, Ralph Hogan and Chris Imlay are shown during one of the society's visits to Capitol Hill.

That's what we do; we see the unintended consequences and try and manage the risk. Having a policy-level engineer would help reduce instances like this, situations in which the FCC bureaus have to "make a decision work."

This would happen in two ways.

First, an engineer or computer scientist likely will have a greater understanding of the applied consequences and will be better able independently to judge the veracity of technical claims, sometimes wildly optimistic ones, made by proponents.

A second and maybe more important consideration is that this staff-level engineer would be a vital conduit to the bureaus. The engineer is a better judge of issues that have an engineering impact when they are still at the

(continued on page 28)

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SBE

(continued from page 26)

planning stage. Even if a commissioner's staff engineer doesn't understand the issue directly, fluency and comfort with the technical disciplines will present an automatic common framework that can foster a more productive two-way relationship between the bureaus and commissioners' offices.

Anyone who has worked with these engineers knows they are exceptional and skilled career professionals. When consulted, they are an asset to the decision-making process. Considering the level of skill, competence and ethics of the bureau staff, greater integration of their work at the policy level could be nothing but positive.

INSIGNIFICANT COST

Several SBE members simply oppose any increase in government. In the current political and economic climate, increases in federal staff or cost may be unpopular.

There are a couple of issues to consider in response to that concern. Before the current FCC administration, there was a fairly large wave of retirement at the bureaus. Many of those people have not been replaced and may never be.

In one respect, adding a staff level engineer actually may be more than offset by the loss at the bureaus, meaning a net reduction in government size — but that's an anecdotal response.

There's valid research that supports the concept that adding this staff engineer wouldn't have a negative impact on the federal budget. A revised Congressional Budget Office report from November found that the earlier versions of the bills, substantially identical to the current ones, would have an "insignificant" impact. The annual salary and overhead would cost approximately $1 million, with a gross cost of $7 million over a five-year period. Although the amount is small in governmental terms, that is still not what makes the cost "insignificant."

The revised budget estimate states: "Under current law, the FCC is authorized to collect fees from the telecommunications industry sufficient to offset the cost of its regulatory programs. CBO has determined that the costs incurred under S. 2881 would be reimbursed through such fee collections. Therefore, CBO estimates that the net budgetary impact of S. 2881 would be insignificant. Pay-as-you-go procedures do not apply to this legislation because it would not affect direct spending or revenues."

NO MORE BPLS

Consider too that the FCC commissioners' staff size has been unchanged since 1964 and the staff qualification requirements haven't changed since 1982.

In contrast, during the past decades, the industries regulated by the FCC have exploded. The complexity of the issues and problems with which the FCC works now is staggering.

The sheer workload increase alone would require additional staff; now, considering the complexity of issues, a breadth of experiences and skills is required even to understand the issues put to the commission. The need is greater. Think about trying to run today's radio station clusters without an IT person, or with the skill set that you had in 1982.

Think about trying to run today's radio station clusters without an IT person, or with the skill set that you had in 1982.

As a practical matter, managers hire based on comfort level and more often than not will surround themselves with the team they trust most, even if that team may not grasp all the issues fully. It's more important that the team work together. Minimum staff requirements can push managers out of their comfort zone but serve to ensure competence in appropriate areas, as well as a social competence. The FCC certainly would gain not just in manpower, but in increased quality of decisions.

The issue of broadband over power lines is a great recent example of a monumental waste of time and money that could have been avoided by the injection of engineering expertise at the FCC decision-making level.

The idea made sense to the lawyers and economists, and there were many proponents who said it would work. The experienced staff in the bureaus knew it wouldn't, but that message either didn't make it to the policy level or just fell on deaf ears. In fact, the engineers' warnings about the interference potential of this technology were scuttled by the commission.

Can you imagine five staff engineers for the FCC commissioners letting the idea of broadband over power lines go by unchallenged?

REPRESENT AND ADVOCATE

Finally, during an e-mail discussion, one of our members responded with a pragmatic if admittedly pessimistic view. I am quoting because I cannot state it better:

"Because the commissioners respond to political pressures and loyalties rather than the sound advice of the long-tenured bureau chiefs and staff counsel ... your plan for engineers would fall into the exact same hole. Sound advice would be ignored."

I understand the sentiment. We've been disappointed by the political vagaries of the FCC in the past.

But for the same reason, why should we vote? All politicians are self-interested. Perhaps we are being naive again, but it's important not to give up on the system.

We are working toward a more capable and informed regulatory body, one that maximizes the resources available to the FCC and requires at least a working awareness of the technology that is being regulated.

It is part of an engineer's nature to make things better; and it's an SBE core purpose to represent and advocate the interests of broadcast engineers. Working toward FCC improvement is an important part of that, the third in our board-ratified list of legislative goals. We have to believe that the system works. And with greater input by an engineer or scientist, the system will work better.

The SBE website has information available about these bills, along with legislative goals and efforts of the society. In support of the FCC TECH Act, we even have directories, sample letters and updates.

We are asking everyone in our industries to join the society through their individual support. Contact your senators and request their support of S. 611 and your representatives and ask them to support H.R. 2102.

Barry Thomas, CPBE CBNT, is vice president of engineering for Lincoln Financial Media in Atlanta.

PEOPLENEWS

The **Michigan Association of Broadcasters** elected its 2011–2012 board and officers in June. They include Chairman **Duane Alverson**, president of MacDonald Broadcasting in Saginaw/Lansing; **Vice Chairman/Chairman-Elect Trey Fabacher**, vice president/general manager of WWJ(TV) and WKBD(TV) CBS Television, Detroit; **Secretary/Treasurer Tim Feagan**, general manager of Clear Channel West Michigan; At-Large Director **Jill Saarela**, vice president/CEO of station WPBN, WTOM, WGTU and WGTQ(TV), Traverse City; and Immediate Past Chairman **Michael J. King**, WILX(TV), Gray Television, Lansing.

MAB Board of Directors Executive Committee, from left: Vice Chairman/Chairman Elect Trey Fabacher; At-Large Director Jill Saarela; MAB President/CEO Karole L. White; Immediate Past President Michael J. King; Chairman Duane Alverson.

The Society of Broadcast Engineers changed the name of the SBE Lifetime Achievement Award to the John H. Battison Award for Lifetime Achievement. **John Battison** is credited as the founder of the SBE for his organizational efforts in the 1960s; he was its first national president.

UNLV's **Hank Greenspun School of Journalism and Media Studies** this spring named **Frank Mueller** as general manager for KUNV(FM) and its sister HD2 channel. Mueller was operations manager and a part-time instructor at UNLV. He is former operations manager for Micro Communications Inc. in the Salt Lake City area and has worked for several other broadcasters. The previous GM was **David Reese**. He retired at the end of March.

Frank Mueller

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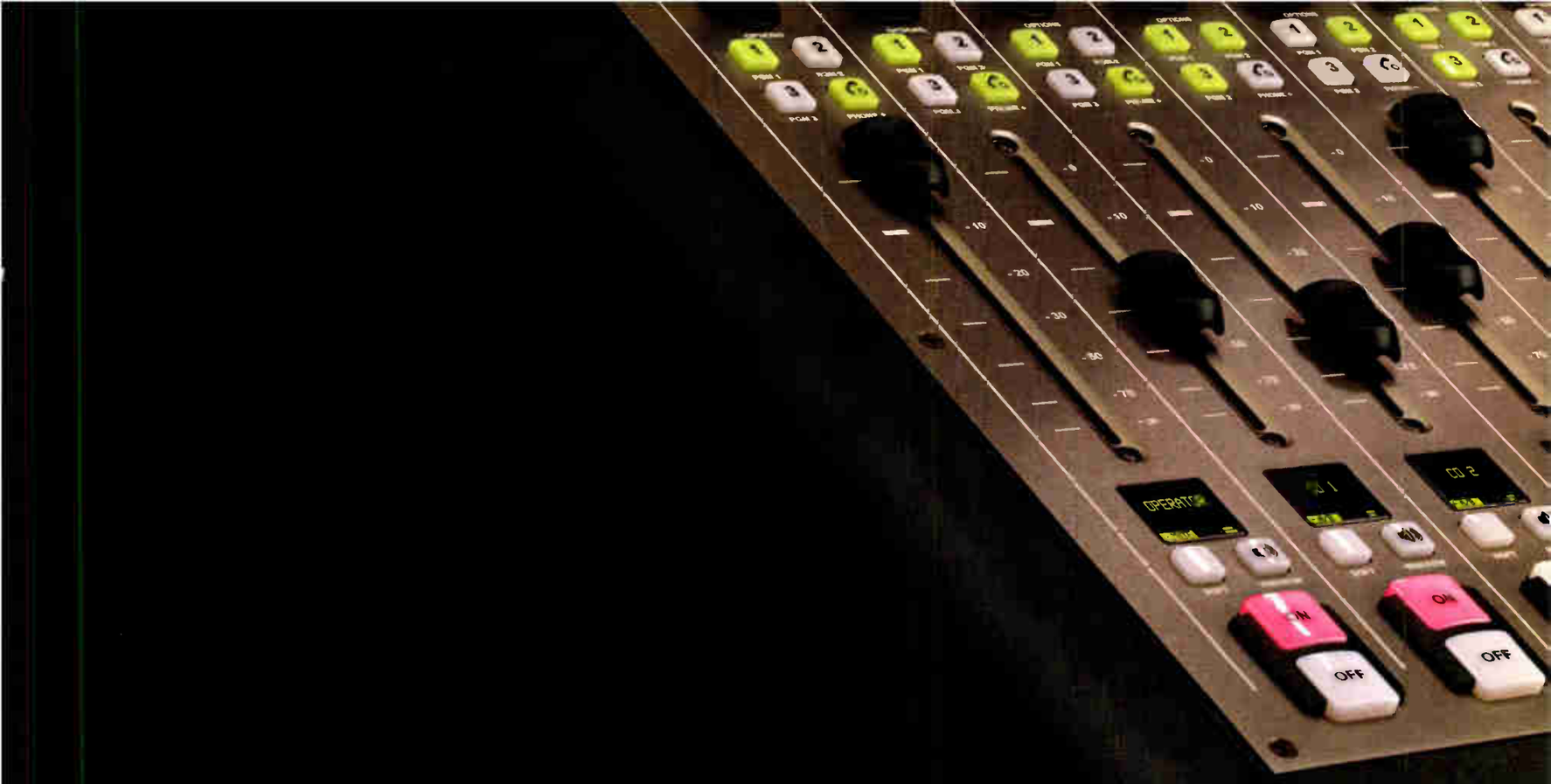
World Radio History



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World Radio History

WMHT Relies on Harris Intraplex

Public Radio Station Implements Digital Buildout With Harris Package

USERREPORT

BY DAVID NICOSIA
Manager of Engineering
WMHT Educational
Telecommunications

TROY, N.Y. — As a public radio broadcaster serving upstate New York through western New England, WMHT(FM) 89.1 provides classical music programming, including nationally renowned and local concert presentations. Sister station WEXT(FM) 97.7 offers an eclectic adult alternative music mix that crosses genre boundaries.

We consider it paramount to offer the best listening experience possible since our service is largely supported by music aficionados. Classical music especially is challenging to broadcast, as listeners want to hear quiet passages, like a solo violin, without distractions from circuit noise or digital artifacts.

KEY FEATURES

When our facility transitioned from analog to HD Radio in June 2010, we based our critical studio-to-transmitter (STL) link on the Harris Intraplex HD Link digital 950 MHz STL gateway. The Intraplex HD Link is designed to relay IP-encapsulated, uncompressed audio programs.

HD Link was part of a Harris HD Radio transmission solution that included the company's Z16-HD transmitter and FlexStar HD Radio system (HDI-100 importer, HDE-200 exporter and HDx digital FM/HD exciter).

We purchased a second Intraplex HD Link to serve as a hot standby for redundancy. Both systems are configured to run in parallel, although switchover is manual.

HD Link carries a multiplex of signals including WMHT(HD), WMHT(FM) and WEXT(HD), as well as a stereo pair and analog signal for RISE, our reading service for the blind and print-disabled.

The system is capable of carrying ancillary IP data with advanced forward error correction. Although we do not have this feature enabled at present, its availability was key to our decision.

The Intraplex HD Link digital 950 MHz STL carries a signal multiplex from our studio facility in Troy, N.Y., to our transmitter site 16.25 miles away in the Helderberg Mountains. Our digital microwave system gives us a "clean shot" from the studio to the transmitter building. A Harris feature called low-density parity check (LDPC) coding provides advanced error correction for an efficient, high-performance STL signal transport.

The signal is fed directly to the exciter at the transmitter site, feeding our 11 kW Z16-HD transmitter. The Z16-HD blankets our extensive coverage area, including Schenectady, Albany, Troy, Amsterdam and Kingston, N.Y., as well as western Massachusetts and southern Vermont. Another station in our group, WRHV(FM), picks up the WMHT signal off-air for broadcast to the Poughkeepsie, N.Y., area.

We're a public radio broadcaster, so cost and reliability were factors in our decision to purchase the Harris package. The new Z16-HD transmitter replaced two older Harris analog transmitters, a 10H installed in 1972 and a 10K installed in 1983 as a backup. Both served us well over the years.

We like the high-caliber technical and customer support and one-stop-shopping convenience Harris provides. The Harris HD Radio and STL solution is an integrated, robust, end-to-end system that saved us from cherry-picking and integrating components from various manufacturers. A Harris technical representative handled the installation and systems integration, and provided on-site training for our engineering team including Chief Operator Dirk van Rijsewijk, Engineer Dave French and myself.

The system is capable of carrying ancillary IP data with advanced forward error correction.

Being able to multiplex and monitor the signals from the studio is a time-saver and a convenience. System monitoring is accomplished using the front-panel interface and LCD display of the STL transmitter unit situated in one of our control room racks, via a touch-screen PC, or using a remote Web browser user interface and SNMP remote control for off-site monitoring. The system can be configured to send alarms or alerts to designated personnel.

The greatest benefit is the "set it and forget it" operation. The HD Link is stable, with a power meter that just remains in the same spot. We've had no signal disruptions since our HD Radio infrastructure went on the air. Reliability is of utmost concern since WMHT, WEXT and RISE must rely on the Intraplex HD Link 24/7. Because it transports uncompressed, CD-quality audio to our transmitter site dependably and is easy to maintain, Intraplex HD Link has proven to be an excellent investment for our facility.

For information, contact Brian Clifford at Harris in Ohio at (800) 231-9673 or visit www.broadcast.harris.com.

World Radio History

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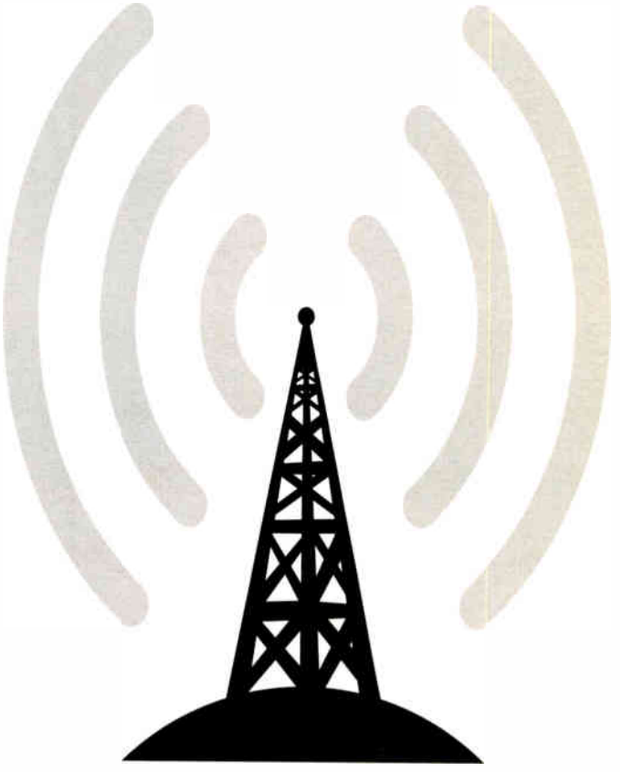

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World Radio History

Tieline Bridge-IT Retrieves Signal

Canadian Broadcaster Multiplies Opportunities Across Large Province

USERREPORT

BY SHAWN BASHA
Director of Engineering
Steele Communications

ST. JOHN'S, NEWFOUNDLAND — Steele Communications is part of NewCap Radio, the second-largest private radio broadcaster in Canada. Steele consists of 27 licenses in the eastern half of the country, primarily in Newfoundland.

We first bought a pair of Tieline Bridge-IT IP codecs as a backup STL connection for sending IP audio from the CHVO studios in St. John's, Newfoundland to our transmitter site in Carbonear, Newfoundland. The Bridge-ITs performed well over the regular Internet and we were so impressed that we decided to use Bridge-IT codecs to replace the mono satellite links from our studios in St. John's to our three main STL transmission sites in the Labrador part of the province (officially known as Newfoundland and Labrador; Labrador is the mainland).

The impetus for the change came not only from a cost perspective, but also because we were performing AM to FM conversions for the stations. The sites previously had received mono audio via satellite; adding another channel would have been costly. When Tieline announced that Bridge-IT was able to multi-unicast to several locations, I decided to give it a go based on the reliability of our Carbonear installation.

THE BIG LAND

The FM stations in Labrador consist of one main transmitter site (CFLW) and two repeaters (CFLN and CFLC) at remote locations, where receiving repeater signals using off-air receivers was not an option. These transmitters are 1,700 miles from St. John's and 370 miles apart. One is located at Labrador City, the second is at Churchill Falls and the third at Goosebay.

The Newfoundland and Labrador regions are vast, mountainous and sparsely populated. In fact the area is known as "The Big Land," which covers around 115,000 square miles. As a result, a lot of our transmitters have to be fed program using either satellite or telco copper.

Both of these options are expensive to install, operate and maintain. The reliability and cost-effectiveness of the Bridge-ITs changed our way of thinking and have allowed us to place our product in communities where cost would originally have made this impossible.

To get up and running we installed regular DSL connections with static public IP addresses at the studio and each of the transmitter sites. Using the Tieline multi-unicasting and AAC codec package at our St. John's studio allowed us to send high-quality AAC-LC audio at 128 kbps to these three transmitter sites in Labrador. We have been on air successfully to these sites for six months using Bridge-IT as our main source for stereo transmission, while the satellite is now our mono backup.

In general Bridge-IT codecs are simple to set up and we have found the connections to be reliable. We use the default auto jitter buffer settings and have noticed that the automatic gain controls within the codec are transparent.

We also found the link quality reading on the codec helpful for troubleshooting. On one occasion one of our sites had a bad cable pair for the DSL line and we discovered that the link quality was jumping around in high winds from as high as 99 (good) to as low as 30 (bad) according to the unit's connection quality meter. This helped immensely to find the source of the problem and to this day I am not sure how we would have figured this out so precisely without this feature.

Another useful feature is the Bridge-IT Web-GUI, which is a user-friendly way to program the codec. It is convenient, especially for our remote locations. We can log in and view our connections via the Internet using a Web browser and check the line quality of our remote locations from a single page anytime, from anywhere.

You shouldn't have to sacrifice convenience for cost; with Bridge-IT you don't have to. Of course we have other IP codecs in our organization but Bridge-IT works the same or better for less than half the price and with more options.

Overall, when you broadcast using IP you get better value for your investment dollars and more control over your connections. Our engineers love the sound of the codecs and they are compact and cost-effective.

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

TECHUPDATES

MUSICAM USA COMBINES AUDIO AND VIDEO

Musicam USA's new portable codec, IkusNet, handles both video and audio.

IkusNet is designed for use with IP networks but can also handle satellite linkage via DVB-ASI as well as wireless 3G and 4G. Audio is AAC (8–256 kbps) and video is H.264. SD cards can be used for removable storage. Two 4.5-inch video monitors and a touchpad menu highlight the unit. Dual Ethernet inputs and dual audio inputs are included.

The IkusNet is designed to handle outdoor situations.

Musicam USA President Alvin Sookoo said: "The Internet is altering the axis of radio stations ... Radio engineers may be thinking they don't need to concern themselves with video, but the truth is they do. Streaming audio on the Internet is rapidly shifting to streaming audio and video on the Internet. We're also hearing from news station clients how they'd love to not have to grovel for video from a sister station for major events to broadcast on the stream."

For information, contact Musicam USA in New Jersey at (732) 739-5600 or visit www.musicamusa.com.

THE SCOOP ON AETA'S ESCOOP

AETA Audio of France has joined the app game with eScoop, a recording and broadcast codec app for mobile and computer audio use.

It is designed to work on iPhones and iPads as well as Mac and Windows computers. An Android version is expected to be released soon.

AETA developed the app with Technica Del Arte, creator of the Luci handheld recorder app. Those familiar with Luci will find eScoop easy to use. AETA plans additional features beyond Luci.

EScoop is designed to function as a recorder and broadcast codec. It is compatible with N/ACIP-SIP codecs and can handle MPEG II, AAC, AAC-HE, HE-AAC v2 streaming along with G.711 and G.722. It can also act as Shoutcast and icecast streamer. There is a built-in audio editor as well.

For information, contact AETA Audio in France at 011-33-141-361-200 or visit www.aeta-audio.com.

World Radio History

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World Radio History

Barix Saves on Satellite Fees

'Ace & TJ' Switch to Barix for Syndicated Program Distribution

USERREPORT

BY RICK ROBERTS
Digital Engineer, IT Systems and Web Developer
"The Ace & TJ Show"

CHARLOTTE, N.C. — "The Ace & TJ Show" is a morning-drive syndicated radio show with 12 affiliates in seven states. Based in Charlotte, N.C., the program has been distributed over satellite since its inception in the late 1990s.

We started looking into alternatives last year. Satellite fees are expensive and the costs had risen to the tune of $4,000 a month between ISDN lines and satellite services. The time had come to explore new and effective ways to distribute the show and reduce costs. It is a common theme today across the radio broadcast industry.

SAVINGS

I had evaluated and experimented with many pieces of equipment without gaining much comfort. I had been working toward testing Barix equipment and moved it up the ladder based on the recommendation of another morning show producer. It wasn't long before we launched an all-IP distribution network based on the Barix Exstreamer 500.

I'm not easily impressed, but I am beyond impressed with the capabilities of this box. From a cost perspective, we have saved approximately $4,000 a month. We also have added four affiliates since switching to Barix based on the lower insertion cost for the show. This reduced cost favors the affiliate since the shared satellite fees amongst the affiliates are eliminated.

The Exstreamer 500 encodes the live feed at the flagship station direct from the on-air console, distributing them to multiple affiliates. The receiving devices decode the signals for live broadcast. The Exstreamer 500 also delivers contact closures over the same stream to trigger ad breaks at the stations, by way of relays and closures built into the devices. The closures are activated through a push of the button at the flagship station.

Device configuration is simple. We set the encoding frequency to MPEG I at 48 kHz, at a bit rate of 192 kbps. It's my belief that the audio quality is as good, if not better, than the quality we received using satellite distribution. The open nature of the Barix software provides an added value, providing us the freedom to program our own unique twists to customize the service.

The setup process is simple. I configure the devices at my office, assigning IP addresses and programming the various settings, and run them in test mode for 48 hours by connecting to the primary Exstreamer 500. The devices are shipped to the affiliate stations once the quality and stability of the device are confirmed. Most of the affiliate engineers are able to activate the device without issue.

We occasionally hear from an engineer who is resistant to change. That tune typically changes once the Barix device is implemented successfully. Typical feedback is that the audio quality is higher quality than expected, and the bitrate stream runs higher than it had on satellite.

We are mapping out next-generation plans with the 500. This is a flexible device with a full set of professional features for broadcast. The size of the device, at one-half rack unit, makes it simple to rackmount professionally.

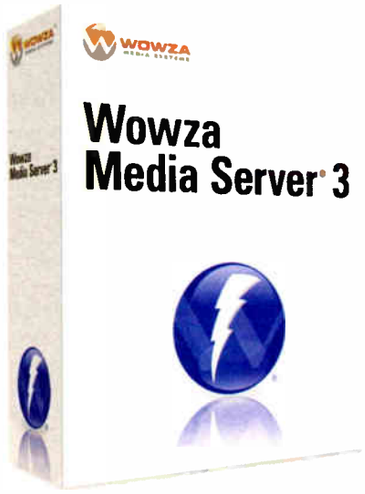
Overall, this is an affordable device that hovers near the price of a satellite receiver, while offering a quick and easy setup process.

We have had exceptional technical support from Andrew Thomson, our service manager. It is rare to receive such a level of strong and dedicated support.

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

TECHUPDATES

WOWZA INTRODUCES WOWZA MEDIA SERVER 3



Wowza Media Server 3 is a software platform for streaming live and on-demand audio or video to multiple clients and devices simultaneously.

The company positions it as a scalable foundation for "any-screen-done-right" media delivery, allowing stations and other media to implement revenue-enhancing features cost-effectively.

To complement the platform, Wowza has introduced several software components.

Wowza Transcoder uses commodity hardware to transform incoming live streams from encoders and other live sources into multiple audio/video stream sets for adaptive bitrate delivery using Flash RTMP and HTTP Dynamic Streaming, Apple HLS and Silverlight Smooth Streaming. It also can be used for non-adaptive streaming via RTSP, MPEG-TS or any supported transport protocol.

The Wowza Network DVR AddOn is a live-stream cache that stores content for "any-screen" playout. Wowza nDVR enables licensees to deliver live linear streams as time-shifted services and supports "trick-play" features such as live-stream pause, rewind and resume.

Compared to client-specific nDVR implementations, the company says, Wowza Network DVR minimizes network storage requirements and streamlines workflow.

The Wowza DRM AddOn offers integration with third-party digital rights management (DRM) platforms and on-the-fly live and VOD content encryption to enable streaming of premium content to viewers.

Wowza's unified streaming platform was introduced in 2007; it is used by some 80,000 licensees. The Wowza Media Server 3 iteration is designed to support revenue-generating services for destinations such as computers, tablets, phones, set-top boxes, media players and game consoles.

For information, contact Wowza in Colorado at (720) 222-4744 or visit www.wowzamedia.com.

CALL IN STUDIO: A VIRTUAL HYBRID

Call In Studio allows broadcasters to accept and manage live calls from listeners using a virtual, cloud-based telephone number.

Engineers connect to Call In Studio through a phone call and Web interface; it can accept and manage up to 35 simultaneous callers on hold. The company says no additional equipment is required and there's no need for multiple leased lines.

Screeners can screen calls from any location. Features include customizable telephone prompts and a private PIN-protected guest line to bypass call queues. The user can make outbound calls to guests, dynamically scale the number of "lines" into a show and track the number of busy signals thrown when lines are "full."

Offline features include voicemail, message playback or busy signal.

Pricing is $12 per month for a toll-free call-in number; $6 per month for a local number. Toll-free calls are $0.06 per minute; local calls are $0.03 per minute. Phone numbers are portable; the user can port a number in or buy a number from the company and port it out.

For information, contact Call In Studio in California at (818) 574-5784 or visit www.callinstudio.com.

World Radio History

TECHUPDATES

LUCI LIVE TAKES CODEC ANYWHERE

Netherlands-based Technica Del Arte offers the Luci Live app, which transforms a laptop, smartphone or iPhone/iPad into a mobile Internet broadcasting source.

The professional HD application enables studio-quality news content to be broadcast live via laptop or mobile phone from anywhere. It is used by the BBC, ABC, ESPN, Radio Netherlands Worldwide and Sirius XM.

Luci Live offers two-way, broadcast-quality audio streaming to a range of professional IP codecs, allowing recording and playback of prerecorded WAV files during a live broadcast.

The application supports a number of output codecs including MPEG II (48 kHz sample rate, 32–384 kbps, mono or stereo), HE-AAC (48 kHz sample rate, 24–64 kbps, mono or stereo) and 24-bit ULCC audio codec (44.1–48 kHz sample rate).

Launched in 2008 on the Windows platform, Luci Live has been updated to the latest IP technology and standards, with versions for iPhone and Mac OS X launched in 2010 and 2011. Android and other platforms will soon be supported by Luci technology.

For information, contact Technica Del Arte in the Netherlands at 011-31-43-321-9499 or visit www.luci.eu.

APT SURESTREAM AIMS TO SAVE MONEY

Launched at the 2011 NAB Show, APT's SureStream technology, according to the company, enables broadcasters to obtain the audio quality and link reliability traditionally associated with T1 and ISDN links using inexpensive public Internet connections such as ADSL, wireless 3G and 4G, LAN, WAN and Wi-Fi. It earned a Radio World "Cool Stuff" Award this spring.

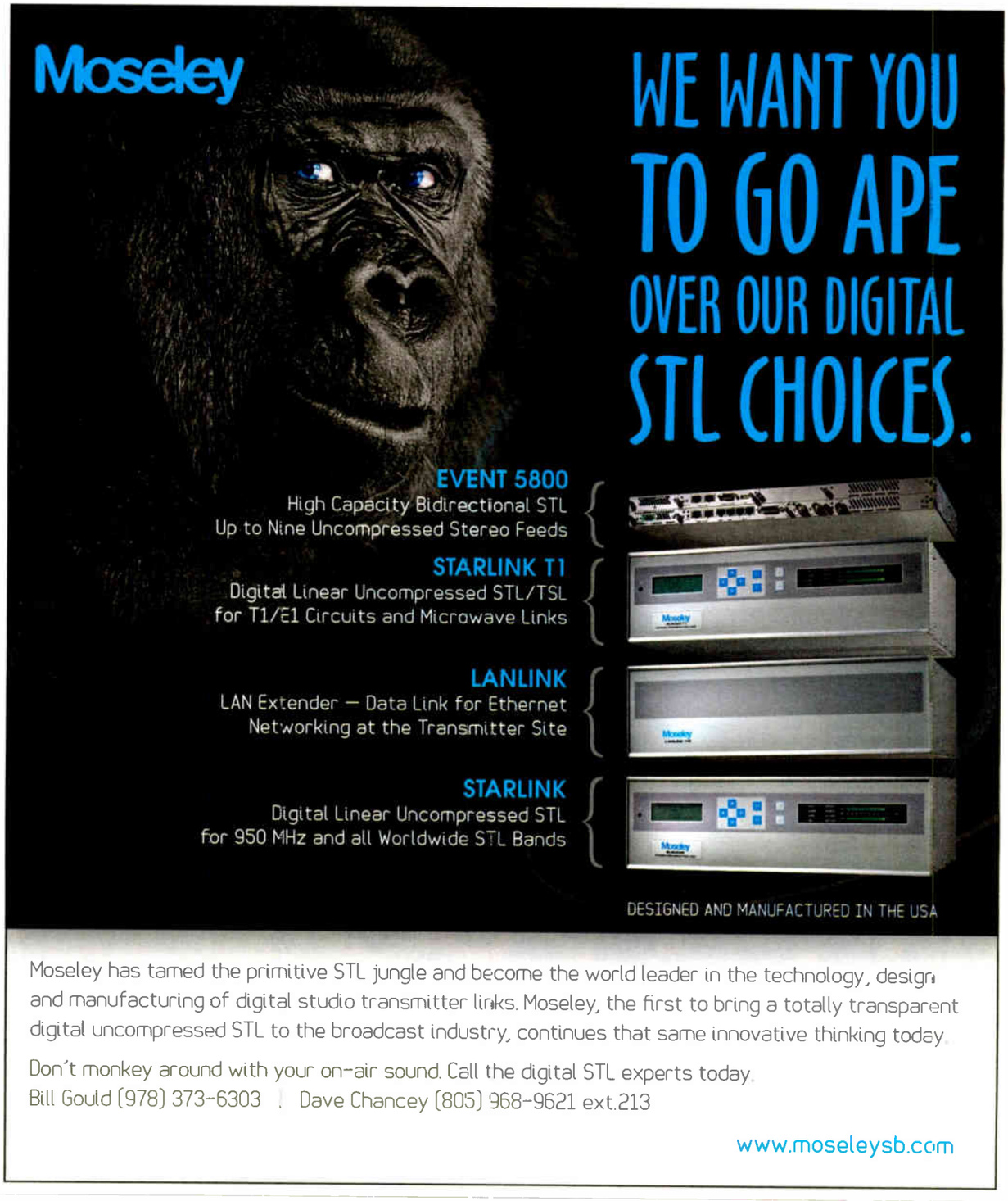
SURESTREAM

Using complex packet resequencing methods, SureStream works in a manner different than those of traditional packet sequencing schemes, where audio quality is scaled back to allow for bandwidth and network issues. According to APT, SureStream ensures there is no compromise to the continuity or quality of the audio stream. THD remains unaffected even in the presence of a large number of dropped packets and loss-of-connection events.

The technology is available on APT's flagship WorldNet Oslo, a multichannel audio codec, and will be included in the WorldCast Horizon NextGen stereo IP audio codec due for release this summer.

The technology was used in tests by Cumulus Media between Indianapolis and Atlanta. With a WorldNet Oslo in each location, four streams of Enhanced apt-X providing 15 kHz FM stereo audio were sent over two separate providers over a period of a week. Though each component stream was subject to loss-of-connection events equivalent to about five hours downtime during this period, the SureStream output remained 100 percent unaffected, WorldCast said.

For information, contact APT/WorldCast in Florida at (305) 249-3110 or visit www.aptcodecs.com.



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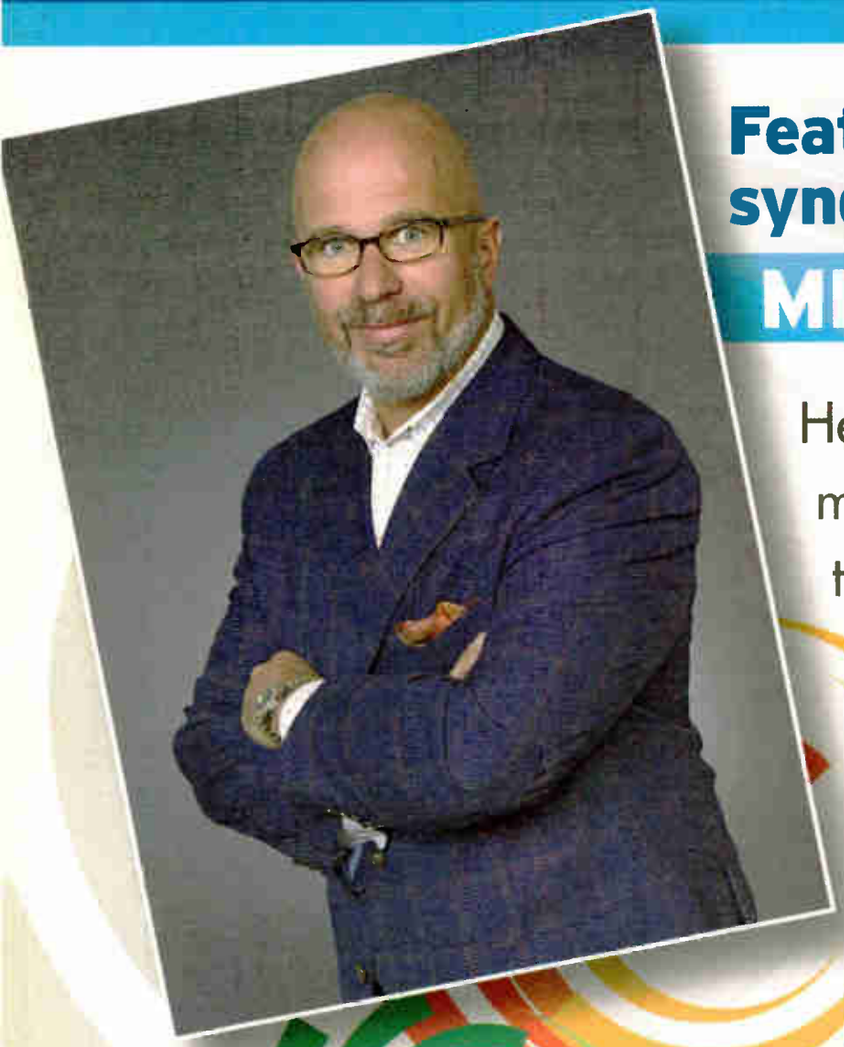

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World Radio History

JK Audio's Universal Host Goes North

Telephone Interface Aids Quebec's Le FM 98 at the Studio, on the Road

USERREPORT

BY BRUNO PELLTIER
Owner
Transitron

SAGUENAY, QUEBEC — Le FM 98 is a radio broadcaster in Saguenay, 130 miles north of Quebec City in Quebec. The station provides news and regional programming for the region.

Large portions of the programming include phone interviews that need to be prerecorded in the newsroom. Standard taps in the telephone systems were no longer satisfactory. Furthermore, the entire phone system will be replaced by a VoIP phone system in the future. So they were looking for a platform-independent system for the four news production positions in the newsroom.

My company, Transitron, is a radio and audio equipment contractor in the region. Le FM 98 contacted us and after much research we were leaning toward one of the JK Audio phone interfaces, with the ability to connect between the telephone handset and the phone base. That approach had the advantage of giving Le FM 98 an interface that works with their current phone system as well as with their planned VoIP system.

We settled upon JK Audio's Universal Host. The Universal Host provided excellent audio quality, separation and echo cancellation for both the recording and the caller by using built-in digital signal processing (DSP). The unit interfaced easily with Le FM 98's newsroom mixers. Operation is straightforward. Internal and external options selectors allow it to interface with almost anything.

An interesting feature of the USB interface is the capability to record the announcer on one track while recording the caller on another.

On a few occasions when Le FM 98 has needed to do broadcast remotes while the IP-based remote systems were occupied, they have been able to count on the JK Audio Universal Host's built-in microphone preamp and headset amplifier. The USB audio interface made for easy interfacing with a laptop so staffers could play back prerecorded parts or record the actual interview.

One interesting feature of the USB interface is the capability to record the announcer on one track while recording the caller on another. When combined via an audio editor on the laptop we can correct level and cellphone problems.

The JK Audio Universal Host is a versatile and useful unit. The price point is right and the users like it. We know what to look for in the future.

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

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World Radio History

Money Pit Says 'Bye, Bye, ISDN'

Comrex IP Codecs Deliver on Sound With Simple Setup for Syndicated Show

USERREPORT

BY TOM KRAEUTLER
Host
"The Money Pit"

OAKHURST, N.J. — Over 10 years, my nationally syndicated home improvement radio show, "The Money Pit," has grown significantly and now is carried on approximately 275 stations as well as XM Sirius Satellite Radio.

We've done this despite some geographical challenges. I am based in New Jersey while my radio partner, Leslie Segrete, is a few hours away in Long Island, and the show is produced in Ohio.

Like many radio broadcasters, over the years we've depended on the availability of ISDN to connect our three locations and provide a means of high-quality audio transmission.

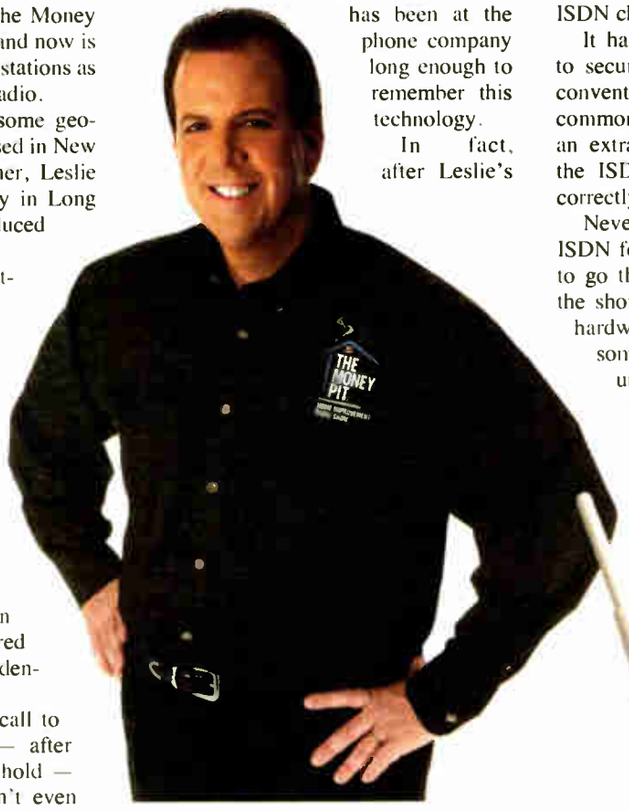
ISDN CHALLENGES

Lately we've had increasingly frequent ISDN challenges. As Radio World readers may know, when ISDN goes down, an enormous effort may be required to get the phone company to identify and fix the problem.

First there's the required call to "customer service," where — after you've spent 30 minutes on hold — the person who answers can't even spell ISDN, let alone has any clue how to fix it.

Next there's the equally ill-equipped tech sent to try to fix your problem, with of course no tool that vaguely fits the diagnostic requirements.

Finally the call gets ramped up to a point where you might find somebody who has been at the phone company long enough to remember this technology.



In fact, after Leslie's lines went down, she ultimately reached somebody who handles ISDN lines for the military. Besides broadcasters, the army is apparently the only regular ISDN customer anymore.

Broadcasting from our home studios is challenging enough. Heading out for a remote broadcast from a trade show or other big event further amps up the ISDN challenges.

It has become increasingly difficult to secure service at locations such as convention centers, where once it was commonplace. Sometimes I'd even plan an extra day to make absolutely sure the ISDN was installed and working correctly.

Nevertheless, having depended on ISDN for so long, I was a bit reluctant to go the IP route, given the reach of the show and my investment in ISDN hardware over the years. But after some recent significant service failures by ISDN service providers, I was very much ready to put ISDN technology in my rear-view mirror.

LIVE FROM K.C.

While I'm certainly no stranger to Comrex, having used their POTS and ISDN codecs over the years and owning several of each, the promise of IP seemed a bit too good to be true. But after following the development of this technology, it was clear Comrex had emerged as the dominant leader in this area.

As a broadcaster specializing in home improvement and not IT, I needed a solution that provided an easy way for our studio, Leslie and me to connect from our various locations without complicated setup or configuration. I found that and more in the latest improvement to the Comrex Access IP codec system.

Access provides that level of simplicity while taking advantage of the new 4G wireless technology that is rolling out across the U.S.

By using the Comrex BRIC Traversal Server (or BRIC-TS), Comrex Access units can "see" each other once they are connected to an IP connection. This meant that Leslie could plug her Access into her home studio Internet connection, and I could do the same from my studio. A green star icon would appear on the screen of our Access portable units, which we would select and connect. Very simple.

Even more impressive is that Access codecs now support 4G modems from several providers in the United States, making it easy to connect in locations where ISDN was not possible.

We purchased our Access codecs just in time for a remote from the Kansas City convention center. Within seconds of booting the unit, it found the wireless signal and connected to the studio with a touch of the screen. Using the optional mixer, we were able to connect and produce up to a six-mic show flawlessly.

Overall, our experience has been relatively painless. The sound is just as good as what we had with ISDN. The biggest improvement is not having to deal with the tremendous hassle of ISDN and the simplicity of connecting from just about anywhere over IP.

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

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2wcom Supports RMF Group

Reliable Audio Transmission Via Satellite With DSR01 DVB Receiver

USERREPORT

BY MICHAL NIEPIELSKI
Chief Engineer
Grupa RMF

WARSAW, POLAND — RMF Maxxx radio station, part of the Grupa RMF radio group, is a spinoff of RMF FM, the most popular radio station in Poland. RMF Maxxx's programming is aimed at younger listeners. RMF Maxxx is distributed throughout the country via 31 transmitters, mainly in large cities.

Programming is sent to those transmitters via Intelsat satellite. For this purpose, we use two multiplexed DVB-S2 signals, providing eight channels of MPEG Layer II audio for uplink. At the downlinks we use the 2wcom DSR01 DVB satellite receiver. Such an audio transmission system helps save approximately 40 percent in satellite bandwidth and is much more cost-effective compared to a similar system based on our former satellite solution.

A useful option implemented in the DSR01 DVB satellite receiver is the ability to configure and deliver backup audio over the Internet. This is helpful because a large number of our transmitters can be reached remotely via TCP/IP, so we are able to use the DSR01 "backup via IP" feature in case of outages caused by weather conditions as well as damage to the down-converter. This option works perfectly in combination with a Shoutcast audio stream server. There are many ways to define conditions that trigger the backup audio, e.g. when the RF signal exceeds a user-defined value, when signal-to-noise ratio falls below a specified level or when audio is muted longer than a defined time.

Another useful feature of 2wcom's DSR01 DVB satellite receiver is the ability to use definable SNMP traps, which can be forwarded to selected personnel at predetermined conditions. This allows us to connect the DSR01 receivers to our integrated monitoring system.

In addition we have been very happy with 2wcom's customer support. They are helpful and eager to solve any problems.

For information, contact Jens-Peter Polleit at 2wcom in Germany at 011-49-461-662830-28 or visit www.2wcom.com.

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TECHUPDATE

DIGIGRAM OFFERS IQOYA *LINK/LE

Digigram's two-channel Iqoya *Link/LE device is a cost-effective, trimmed-down version of its flagship IP audio codec, the Iqoya *Link.

The manufacturer points out the decode-only approach, simplified ergonomics and features targeted at unattended transmitter sites.

In addition to the usual set of audio formats (MPEG II and MP3, PCM linear, G.711/.722), the *Link/LE ships with an extensive AAC codec package (decode-only) standard. Enhanced apt-X decoding is available as an optional codec pack.

The *Link/LE is built on the Iqoya hardware platform, combined with FluidIP, Digigram's IP audio codec engine with the capability to send and receive IP streams simultaneously on two separate RJ-45 ports.

Should anything happen to the main IP audio stream, a secondary IP stream (RTP/UDP or Shoutcast), backup is provided by the analog or AES audio input or playlists stored on an SD card to guarantee air time. The user picks two of these backups and rearranges the failover sequence as desired. The capability is standard. Also of note is the unit's energy efficiency, with a power consumption below 15W.

Iqoya *Link/LE trades controls and ergonomics (front-panel keypad and LCD) found on the Iqoya *Link for a simpler, HTML-based interface accessible from anywhere.

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

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TECHUPDATES

MAYAH DOUBLES UP IP CODEC

The C1190/91 codecs from Mayah Communications have been designed to answer the need for more redundancy and functionality on the IP side.

The half-rack units are bidirectional, support a full range of audio coding formats (G.711, G.722, MPEG Layer II, MP3, AAC, AAC-ELD, linear with apt-X and Eapt-X optional) and offer two Ethernet interfaces to simultaneously stream audio identical on both interfaces or to split control and audio to two different interfaces.

In addition the 90/91 devices support extended slots on the rear panel for optional available plug-in cards, such as POTS, UMTS/3G or storage cards for USB or SD.

For information, contact Mayah Communications in Washington at (360) 618-1474 or visit www.mayah.com.

TELOS VX ADDS HD VOICE

According to Telos Systems, its VX was the world's first VoIP broadcast talk show system. Using IP audio technology, the VX allows users to move and share telephone lines between studios as needed. Scalable and configurable, VX can handle up to 30 active calls across 20 studios, but, the says manufacturer, it is cost-effective too for single stations with more modest talk shows.

The VX connects to POTS and ISDN phone lines and also to modern SIP trunking services, enabling high-fidelity caller audio for talk segments. Native support for the G.722 audio codec, sometimes called HD Audio, allows stations with SIP trunking to receive 7 kHz audio from callers on 3G or 4G networks utilizing SIP clients such as iPhone's Acrobits app, or Sipdroid for Android phones.

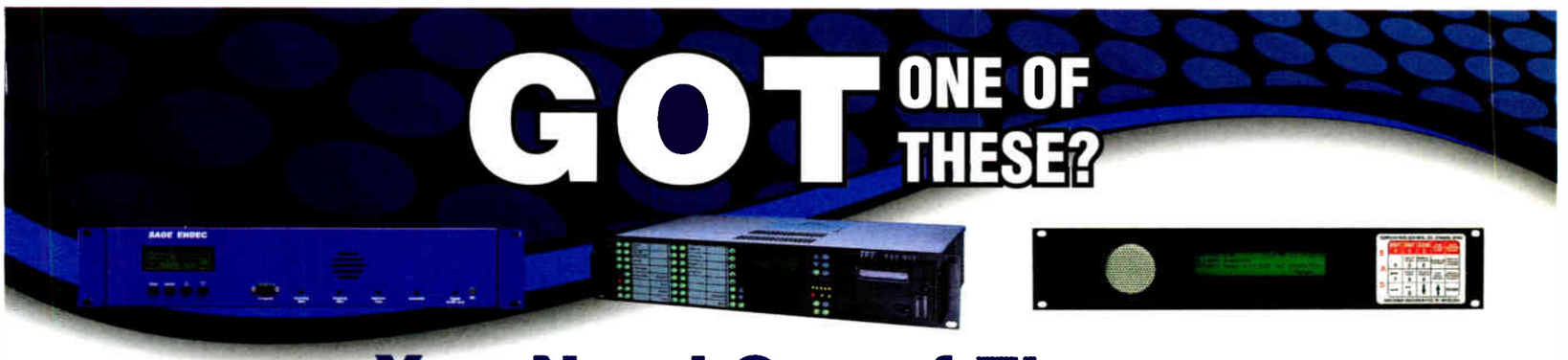
According to Telos, G.722 uses about the same amount of bandwidth as G.711 but samples audio at 16 kHz, double that of G.711. The result is better speech quality from callers using cellphones with SIP clients. VX supports G.711 A-Law and μ-Law codecs too for compatibility with the PBXs and gateways.

Product Manager Joe Talbot said some VX clients are using G.722 with "wideband" SIP phones from companies like Polycom, Aastra and Grandstream to get high-quality news, traffic and weather from news bureaus or off-site talent, without the cost of ISDN.

"The combination of VX, G.722 and SIP equals low-bandwidth, low-delay, high-quality phones, from nearly anywhere," he said.

VX has processing tools such as the Telos Digital Dynamic EQ, Smart AGC and a three-band adaptive spectral processor. Send audio gets sweetened courtesy of an AGC/limiter, frequency shifter and Fraunhofer's Advanced Echo Cancellation routines that eliminate echo and feedback in open-mic environments. VX connects to Livewire networks via Ethernet, and to standard studio systems via analog or AES audio interfaces.

For information, contact Telos Systems in Ohio at (216) 920-1813 or visit www.telos-systems.com.



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TECHUPDATES

MOSELEY RINCON IS A SOFTWARE-DEFINED AUDIO TRANSPORTER

According to Moseley Broadcast, its Rincon is the first audio transport device of its kind to offer multichannel audio over different types of transport networks simultaneously. That means the user can send one to four programs over a mixture of T1 networks, IP connections of various bandwidths or radio links.

Rincon operates in a number of station topologies, point-to-point unidirectional, point-to-point bidirectional, and point-to-multipoint multicast.

Features include programmable failover to a backup audio source and an SD card slot or USB memory stick for 100 hours of emergency audio playout in case of a catastrophic interruption. Formats handled include linear uncompressed, MPEG Layer II and MP3, AAC-LC, AAC-LD, G.711, G.722. Rincon auto-negotiates between units to enable connection.

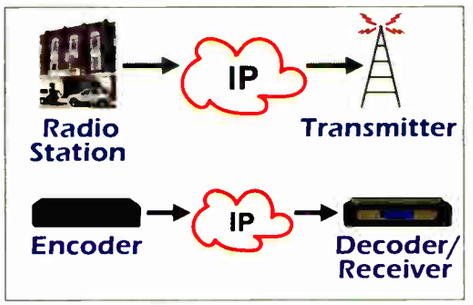
Rincon contains an Ethernet switch for QoS, allowing packet priority, VLANS, bandwidth management and rate limiting. Robustness is achieved with user-programmable forward error correction, adaptive jitter buffers and error concealment.

Rincon can be controlled via a GUI on a browser or a smartphone. It is housed in a 1RU chassis with standard 19-inch rack mount.

Moseley says that Rincon's ability to leverage low-cost network choices and its low purchase price gives broadcasters excellent return on investment.

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

DVEO PIPES IN AUDIO



Designed for STL applications, DVEO's Audio Pipe is a matched pair consisting of an audio encoder and decoder that deliver high-quality audio via IP with little delay to FM transmitters, satellites and cable head-ends.

According to DVEO, the system uses the Ogg Vorbis royalty-free codec, an audio compression format comparable to AAC+, in better audio quality than MP3 with less bandwidth, the company says. The Audio Pipe encoder and decoder are compatible with icecast; the decoder is compatible with Shoutcast and Windows Media.

The Audio Pipe is equipped with XLR inputs and outputs. In addition to playing audio, it can be used for store & forward duties using a memory card for local storage. Features include buffer management and fallback to memory card for playing audio during network failure.

The system fits in half of a rack unit with optional accessory rack-mount kit.

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

SONIFEX DHY-03 USES DSP

Sonifex offers two telephone hybrids, the analog-based HY-03 range, offering 30 dB typical rejection, and the DSP-based DHY-03 unit with a rejection ratio of 70 to 80 dB.

The DHY-03 has impedance matching between the central exchange and the hybrid. It can cope with impedances from many foreign exchanges and some digital exchanges and can detect and match to the line impedance that it is connected to.

Two echo cancellation routines run using internal memory allowing echo cancellation to 127 µsec and improved distortion of other mixed signals. This improves the hybrid's ability to take calls on mobile phones, or where there are other delays, such as satellite and conference calls.

The system is able to perform local acoustic echo cancellation.

The DHY-03 has a balanced mic/line input and a balanced line output from and to the mixer, with input and output gain adjustment from and to the telephone line, respectively, along with input and output metering of these signals. Users can switch from local to remote line hold either by using the front-panel pushbutton, by serial connection or by using a GPI remote input, usually connected to the on-air mixer.

It also has serial control of dialing and of the configuration parameters, so it can be configured specifically for your needs, with free-of-charge control software available on the Sonifex website.

For information, contact Sonifex/Independent Audio in Maine at (207) 773-2424 or visit www.independentaudio.com or www.sonifex.co.uk.

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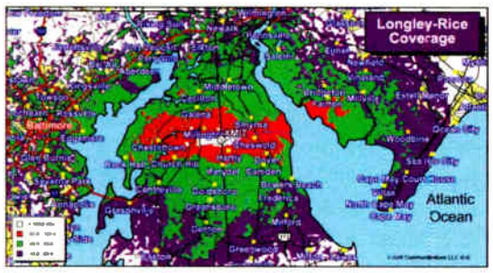

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I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR, KSFX, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc, I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

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

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

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

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World Radio History

LPFM

(continued from page 46)

Advocates from inside and outside the Beltway visited and called every U.S. Senate office time after time to ask senators if they were blocking the bill. When senators wouldn't tell us, their constituents took to the line. Every week we'd discover another community leader in Alabama, Florida, Wyoming or elsewhere that personally knew their senator and could speak from experience as to why having LPFM in town would save lives and build communities. And every time a senator was outed as a blocker of the bill, constituents would convince that person to drop their block and stand with their own communities.

News reports described the NAB as isolating itself from congressional allies by continuing the fight to kill new LPFM stations — why would a big lobby spend precious political capital on community radio? LPFM supporters and stations from Seattle to Illinois to Massachusetts descended with circus gear and hula hoops at the NAB's headquarters in D.C., demanding that the NAB stop making the legislative process a circus, and to stop making LPFM jump through hoops!

Some of the lead bill sponsors, Sens. Maria Cantwell and John McCain and Reps. Mike Doyle and Lee Terry, sat the NAB down and told them to stop fighting LPFM expansion. The sponsors negotiated a deal with the big broadcasters ensuring that big stations would be protected from any low-power interference, and suddenly — in the last moments of the 111th Congress — the Local Community Radio Act was passed!

Now we have a chance to get thousands more LPFM radio stations in big cities and smaller communities nationwide.

I'll always remember the tireless efforts of longtime LPFM hopefuls such as media educator Frank Bluestein, who led elected officials in his home of Germantown, Tenn., including the mayor, to push conservative senators to become supporters and sometimes leading advocates for LPFM across Tennessee. I'll always be humbled by the selfless leadership that existing LPFM stations took to help others struggle for their chance to get on air — almost always on their own dime and their own time.

Now they've done what few others have ever done — passed legislation to build community infrastructure meant for people, rather than big companies. But their work, and ours, is not done.

CONTINUE THE STRUGGLE

In the next few years, sooner rather than later, the FCC will open up a window for communities to apply for free, 100-watt, low-power FM local community radio stations.

First, the FCC needs to take the new law that Congress passed and turn it into rules for how that window will work, and how and where we'll get the chance to apply. We weren't able to pass the Local Community Radio Act unscathed — big broadcasters negotiated to get amendments attached that could make it harder for groups to get on air — and in July the FCC will look at whether or not to implement the spirit of the law or give hard-won community spaces away to translator stations that rebroadcast distant signals.

It is our responsibility to continue the struggle, and many of us have already spoken out to defend the law we won in December. We also must get communities ready to apply for stations and work at the FCC to make sure that they permit as many stations as possible.

As I write this and reflect on what our movement has won, I know that the lessons we've learned — where we succeeded and where we were challenged — reflect many other movements' histories and can inform other battles in telecommunications and beyond. We talked about these lessons at the National Conference for Media Reform and will talk about them again at the Allied Media Conference — reflecting on this and other movement struggles is just as important as the LPFM struggle, training us to win even more for our communities in the future.

After more than eight years working on and off with Prometheus, I'm excited to be bringing what I've learned struggling with them to new technologies — I'm now working in my home city of Philadelphia and elsewhere to help communities build access to the Internet that they haven't had before.

The fact that we've won such a huge victory in expanding LPFM should broaden our vision of what owning our own media can mean. I imagine community media centers where our kids, moms, elders and friends can learn Internet skills and literacy; broadcast to their neighbors; create community news for Web, radio and TV; and build power to affect politics and culture locally and beyond. The movement we've built to make this possible now has to do the hard work to actually make it happen — and I can't wait to do that beautiful work with all of you.

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World Radio History

OPINION

LPFM: A Dream That Never Died

Lessons Learned From the Fight for Low-Power FM Radio

COMMENTARY

BY HANNAH SASSAMAN

The author is a field analyst with the New America Foundation's Open Technology Initiative, a board member at Allied Media Projects and a longtime organizer at Prometheus Radio Project. She prepared these remarks for the Allied Media Conference in June. They appeared on the website of the New America Foundation.

It was a dream that never died — thousands of groups across the United States fighting for their own community radio stations. Now, after 10 years of struggle, the movement to expand community radio can celebrate a big victory with the bipartisan passage of the Local Community Radio Act. And hundreds if not thousands of communities across America can get ready to own their own pieces of the FM dial: their own local radio stations.

Even before 2000, community groups disgusted by lack of access to the media — a vital tool to support local music and culture, as well as to engage in vital policy debates — took to the airwaves without a license. From housing projects broadcasting in Springfield, Ill., to the hills of Berkeley, Calif., hundreds of groups went on the air using low-power stations, offering voices to youths, activists, pastors, immigrants and many others. But the Federal Communications Commission could have shut these stations down at any time.

Some groups, including my longtime fellow organizers at the Prometheus Radio Project, threw down the gauntlet and said that it was high time for the FCC to legalize low-power FM radio. The commission established the service with widespread support.

But in the middle of the first — and so far only — window that groups had to apply for LPFM stations back in 2000, the National Association of Broadcasters, joined by National Public Radio, stopped the service in its tracks, limiting LPFM to America's most rural areas by pushing Congress to pass the Radio Broadcasting Preservation Act of 2000. Claiming that new community radio stations would cause technical interference — static on the dial — if placed too close to full-power stations in big communities, the law restricted LPFM to small towns, and with the stroke of a pen thousands of stations lost the right to get licenses and LPFM was limited to rural areas only.

Big cities were out of luck until the FCC could prove that there was plenty of room on the FM dial for low-power stations in the cities that wanted them. The FCC came out with an independent study proving that in 2003 — but big broadcasters kept whining that new radio stations anywhere close to them would cause static on the dial.

NO TECHNICAL PROBLEM

Then something incredible happened — the diverse movement fighting to expand low-power FM radio grew even larger and with patience and perseverance started to make the big broadcasters look increasingly greedy for keeping communities off the air.

Low-power FM stations made national news in 2005 after they saved lives in Louisiana, Mississippi and elsewhere in the Gulf of Mexico after Hurricane Katrina. Bipartisan legislators listened closely to engineers who volunteered to keep WQRZ(LP) of Bay St. Louis, Miss., on the air — the only station that was able to stay up to serve Hancock County, a region devastated by both Katrina and Rita. The station became so vital for public safety and for families looking for hope and healing that the Emergency Operations Center for all of Hancock set up shop with WQRZ.

Similar stories and a coalition that grew to include pastors, emergency responders, justice organizers and local politicians forced Congress to drop the party line that LPFM was a technical problem. Legislators such as Rep. Mike Doyle, a Pittsburgh Democrat who was beginning to demonstrate great leadership on telecommunications issues, were joined by people including Rep. Lee Terry, who had heard from Baptist church leaders and former YMCA directors that Omaha, Neb., needed low-power radio now.

Legislative volunteers in ironed secondhand khakis and shoes researched legislative districts and helped legislators support low-power service because it really mattered, and racked up more than a hundred cosponsors on a bill aimed to bring community radio back to the cities. Self-trained engineers and radio enthusiasts went to the FCC both in D.C. and at field hearings around the country, bringing hundreds of people along who needed the FCC to stand up to Congress; to fight for a diverse, representative media; and to expand the service they'd created.

UNFAILING BELIEF

The breaking point was 2010. President Barack Obama had become an LPFM cosponsor during his last months as a senator, and an emboldened Commerce Committee and then the full House of Representatives finally passed the bill to expand LPFM, despite the increasingly isolated NAB's objections. And longtime LPFM supporters, such as Sen. Patrick Leahy, were telling reporters that passing the bill to expand LPFM was only a matter of time.

But the NAB wasn't ready to give up the fight just yet. As the Senate moved to expand LPFM, the NAB, led by former Oregon Sen. Gordon Smith, started organizing old friends in the Senate to use secret holds to block the LPFM radio bill. Time was against us — would the bill die in the Senate? Would LPFM supporters have to start again, in a new Congress hostile to potential new community voices on the left, right and center?

It's still hard to believe that we won, but I know that we did because of the passion, clarity and unfailing belief of supporters nationwide.

(continued on page 45)

CORRECTION

RDS

In some editions of Radio World, the July 1 article "Experts Explore RDS Today" misstated the allowable increase in total modulation when operating with FM subcarriers. FCC rules allow stations to increase total modulation 0.5 percent for each 1.0 percent of FM subcarrier injection, up to 110 percent maximum.

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Email: radioworld@nbmedia.com
Website: www.radioworld.com
Telephone: (703) 852-4600
Business Fax: (703) 852-4582
Editorial Fax: (703) 852-4585

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SUBSCRIPTIONS
Radio World, P.O. Box 282, Lowell, MA 01853
TELEPHONE: 888-266-5828 (USA only 8:30 a.m.–5 p.m. EST)
978-667-0352 (Outside the US) FAX: 978-671-0460
WEBSITE: www.myRWNews.com
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T: 212-378-0400, ext. 511 | F: 866-572-6156
SOUTHERN EUROPE, AFRICA, MIDDLE EAST:
Raffaella Calabrese, rcalabrese@broadcast.it
T: +39-02-9288-4940 | F: +39-02-7004-36999
UK & IRELAND, CENTRAL & NORTHERN EUROPE:
Graham Kirk, g.kirk@audiomedia.com
T: +44-1480-461555 | F: +44-1480-461550
JAPAN: Eiji Yoshikawa, callems@world.odn.ne.jp
T: +81-3-3327-5759 | F: +81-3-3322-7933
ASIA-PACIFIC: Wengong Wang, wwg@imaschina.com
T: +86-755-83862930/40/50 | F: +86-755-83862920
CLASSIFIEDS: David Carson, dcarson@nbmedia.com
T: 212-378-0400, ext. 511 | F: 866-572-6156

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