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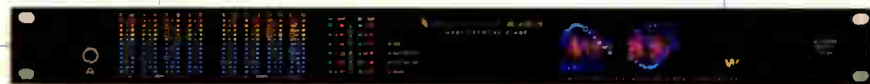
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Radio World Founded by Stevan B. Dana

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

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# Why I Joined the NWSA

Solid standards and a certification program are more important than ever right now

## COMMENTARY

BY SAM MATHENY

*The author is executive vice president and chief technology officer of the National Association of Broadcasters and a member of the National Wireless Safety Alliance Board of Governors.*



Sam Matheny, shown at the Empire State Building.

Most of us in the broadcast industry work in offices or studios that provide a convenient and safe environment. These facilities are climate-controlled, well-lit and often come with amenities and security guards. We go about our jobs day-to-day with an expectation that we are basically safe in our work environment, and at some level are able to take workplace safety for granted.

This does not apply to our tower workers, though. For these people the safety risks are much more stark.

Tower workers perform their tasks outdoors where they are subject to the weather; heat and cold, wind and rain, ice and snow. They do this strapped to a tower at elevations as high as 2,000 feet while handling antennas that can weigh over 10 tons. Maneuvering, installing

and maintaining this super-sized and cumbersome equipment is vital to the success of the broadcast industry, and safety can literally be the difference between life and death each day.

### CONTEXT: SHORTAGE

To help assure the safety of tower workers and encourage high-quality tower work, the National Wireless Safety Alliance was formed.

The NWSA is a relatively new organization devoted to offering national assessment and certification programs for tower workers, filling a long time need in the wireless industry. NAB strongly supports this effort, and I will be serving on its board of governors. We look forward to contributing through this group to



help assure the safety of those men and women who put and keep us on the air.

This is particularly important as we contemplate the completion of the incentive auction and the start of the spectrum repack.

The sheer volume of tall tower work could increase to unprecedented levels, with large numbers of tower climbs, antenna modifications and installations taking place under FCC-imposed time constraints. FCC simulations indicate that well over 1,000 stations could be required to make changes. And this isn't just a television issue, as many FM radio station antennas are co-located on towers with television antennas.

All of this will be happening in the context of shortage. There are too few tower crews to handle the work in too short of a time frame.

NAB commissioned DTC to study and report on this issue and they found there are less than two dozen crews that meet the qualification criteria to remove and install heavy antennas (up to 24,000 pounds) and associated rigid transmission lines, as well as the capacity and willingness to work outside of their geographic regions.

This shortage means new crews will need to be trained in an attempt to meet demand. Having solid standards and a certification program can help ensure that safety remains the highest priority, and that the incentive auction and repack proceed unmarred by safety risks, poor quality of installations and above all, loss of life.

Keeping safety at the top of the checklist in this process is paramount.

*Comment on this or any story to [radioworld@nbmedia.com](mailto:radioworld@nbmedia.com).*

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*"EAS Reform: A Q&A With Washington SECC's Clay Freinwald"* — We spoke this summer with Freinwald, a long-time emergency alerting participant and SECC chair, about state EAS plans, "point-multipoint distribution," social media alerting and more. See [radioworld.com/freinwald](http://radioworld.com/freinwald).



*"Plotting Public Radio's Future"* — "Radio's success is truly about what the audience thinks." Ernesto Aguilar of the National Federation of Community Broadcasters comments about the recent Public Radio Content Conference. See [radioworld.com/nfcb](http://radioworld.com/nfcb)



*"Assessing the ANSI/ASSE A10.48 Standard"* — Todd Schlekeway of the National Association of Tower Erectors says A10.48 is "a game changer ... as it has the distinction of being the first comprehensive standard encompassing the entire communication tower construction, service and maintenance industry." See [radioworld.com/ansi](http://radioworld.com/ansi)

*"Barix and LineQ Mourn Passing of Andy Stadheim"* — Stadheim died unexpectedly in October at age 43. His colleague Brian Galante wrote about the engineer and entrepreneur, at left in photo. See <http://tinyurl.com/lrw-stadheim>.



# NABA Focuses on Chips and Cyber

December event will explore growing security risks to broadcast operations

BY MICHAEL MCEWEN

*The author is director general of NABA.*

It has been a busy time for the North American Broadcasters Association, with two major projects dominating a full agenda of other issues and initiatives.

The first of these projects emanates from our Radio Committee's Working Group on FM Chips in Smartphones. Chaired by David Layer from the National Association of Broadcasters, this Working Group has been developing strategies to encourage all North American mobile carriers to enable the already-embedded FM chip in smartphones. The working group is also encouraging handset manufacturers who have not yet embedded FM chips in their devices to do so as soon as possible.

From NABA's perspective, these dual initiatives make perfect sense, both as a public service (as in times of emergency) and as a business opportunity, which an activated chip, alongside an app like NextRadio, provides for both the carrier and the broadcaster.

Additionally, this makes smartphones even more indispensable to the consumer. It's like a modern-day Walkman on steroids with millions of chip-enabled phones becoming portable radios, but with all the added features of the digital age.

## GET ON THE CHIP

In the process of this work, the NAB has undertaken market research in the U.S. on the penetration of chip-enabled smartphones.

The opportunity for NABA to partner with the NAB to get a better picture of the North American marketplace, by obtaining FM chip data from both Canada and Mexico, was just too good to pass up. We released our first results in September; they can be reviewed on our website at [tinyurl.com/rw-naba](http://tinyurl.com/rw-naba). (See graphic on facing page.)

The short summary of these results is that FM chip-enabled smartphone penetration in the U.S. and Canada is good, and in Mexico it is very good. This is an initiative that makes so much sense for all the stakeholders that we find it trou-

bling that some mobile telephone manufacturers and carriers resist the idea.

NABA has just sent a submission to the International Telecommunication Union Radiocommunication Sector (ITU-R) asking Study Group 6 (Broadcasting Service) to give a new opinion concerning the activation of radio receivers in smartphones in the context of a recent ITU Report on disaster coverage and emergency broadcasting. Specifically, we are proposing the following:

*"The opinion requests that associations of manufacturers of mobile telephones and tablets as well as service providers be contacted and encouraged to include and activate the radio functionality in their products along with the appropriate applications to facilitate broadcast reception."*

This submission is supported by our colleagues in the European Broadcasting Union, and we have shared the document with the World Broadcasting



## FROM THE EDITOR



*I've been seeking to build more and stronger relationships for Radio World with industry-leading broadcast organizations of all types. My goal is to assure that you have access to the broadest, deepest range of views, content and news about technology, infrastructure, regulation, history and the other subjects we love at RW.*

*One such is the North American Broadcasters Association; and my outreach coincided with an expanded focus at NABA recently on issues of interest to radio. So the relationship has been twice welcome.*

— Paul McLane

Unions. We are building support and momentum on a very solid foundation. You can see the ITU submission on our website at [www.nabanet.com](http://www.nabanet.com), click on ITU Submissions.

It is always dangerous to thank people, since you may miss someone; nonetheless, my thanks to the NAB's Lynn Claudy and David Layer, Paul Brenner from Emmis Communications

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OCTOBER 26, 2016

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and Charles Einolf from CBS for their leadership and work on this project and submission. "Stay tuned" for updated research results in the months ahead.

**HOSTILE LANDSCAPE**

The second major project for NABA is on cyber security, both in broadcast IT and broadcast operations. NABA's Risk Awareness & Continuity Committee formed a working group a few years ago to look at the issues, particularly in light of the Sony and TV5 Monde hacks.

Cyber attacks, including cyber crime, hacktivism, cyber espionage and cyber warfare, constitute an increasingly hostile threat landscape with millions of attacks per day. We need to address these growing threats doing damage to our systems and operations — in other words, mitigate and apply best practices.

A year ago, the Cyber Security Working Group issued a first document on what broadcasters require from vendors to secure their broadcast operations in the best possible way. Our U.K. partners, the Digital Production Partnership, adopted our requirements and added a few of their own, and at September's IBC in Amsterdam, DPP Chair Helen Stevens (CTO, ITV) and I presented these requirements to broadcast suppliers at an event organized by Ericsson.

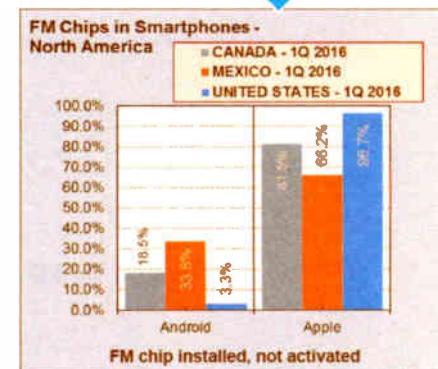
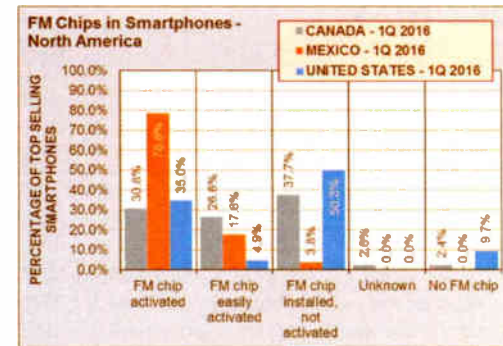
The requirements were well received and I think everyone understood that more work must be done, but at least a start has been made. The EBU now has a standing committee on cyber security, as does the Association of International Broadcasters. The issue is getting attention from the broadcast community around the world.

To that end, NABA is organizing what we think is the first Cyber Security Symposium for broadcasters, in New York City on Dec. 1, hosted by NBCUniversal. Here is a link to the draft agenda: <http://lbit.ly/2dFwiN8>

The important point to remember about cyber-security issues is that the threat will only escalate in the coming years. The industry is moving to all-IP collection, production and distribution, even to their linear platforms. As this happens, our broadcast operations become more vulnerable to threat agents intent on making a serious breach, something that our IT colleagues have understood for years. We need to refine our procedures and practices, understand what we can do, and mitigate what we can't do. This means refining our supplier requirements, increasing IT and IP training, and constantly sharing best practices.

The pace of change in technology in both radio and television is starting to reflect the pace of change reflected by Gordon Moore in 1965 when he coined Moore's Law, which has generally come to be interpreted as computing power doubling every 18 months to two years. And that's been going on for 50 years.

It's an exaggeration to say the pace is that fast in radio and television, but there is no question that advances in such areas as high-speed computing, storage, virtualization, etc., are spurring technological change in how we



**NABA is tracking the penetration of FM chips in smartphones for the North American market, working with the National Association of Broadcasters and using sales data compiled by research and consulting firm ABI Research.**

make and distribute programs with better quality to multiple platforms which, even a few years ago, couldn't have been envisaged to have come so far, so fast. And we're scrambling to keep up.

**Look for News Roundup on page 18**

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## DRONES

(continued from page 1)

for broadcasters to gather information and make it accessible to consumers.”

Drones have been popular for years, with many hobbyists taking up the pastime. Last year, in advance of the holiday season, the FAA required that any user of a drone of 0.55 pounds or more — recreational or commercial — must register it online. Since then, more than a half-million drones have been registered in a government database, according to the FAA.

When the FAA subsequently authorized commercial use, it unleashed an industry loaded with potential innovations, she said. Part 107 of the Federal Aviation Regulations, titled “Small Unmanned Aircraft Systems,” now allows a range of businesses, including radio broadcasters, to use unmanned aircraft that weigh under 55 pounds. Drones must remain within visual line of sight of the remote pilot, be used during daylight hours only and may not fly over any persons not directly participating in the operation.



Lisa Ellman, right, chair of Hogan Lovells' Unmanned Aircraft practice, talks with MSNBC's Andrea Mitchell about the FAA's requirement for drone operators to register their aircraft.

that there is sometimes a thin line between recreational flying and what the FAA could construe as commercial operation.

The maximum altitude for a drone is 400 feet. There is an exception that is crucial for broadcasters hoping to utilize drones for tower inspections: A drone can fly above 400 feet if operating within 400 feet of a tall structure, such as a broadcast tower.

Operators must pass a written FAA test and be at least 16 years of age. Ellman said broadcasters are likely to want to train members of their own staff to become drone operators.

### STREAMLINED PROCESS

Prior to the new commercial rules, a broadcaster had to go through a burdensome special exemption process to get a license to operate a drone for commercial purposes, Ellman said. Notably, the operator was required to hold a manned aircraft pilot's license.

“The new commercial drone process includes a remote pilot certificate specifically for UAS pilots, which makes a whole lot more sense. It takes some study, but there are online FAA study guides to help,” Ellman said. “As you can imagine, there has been a huge demand for people to sign up to take the test.”

Ellman, a former policymaker at the White House and Department of Justice in the Obama administration, said broadcasters should consider several factors before deploying a drone, including safety, airspace and privacy issues.

“There are a lot of things broadcasters want to be able to do. The key is to make sure you are following the rules to make sure you don't run afoul of the FAA. There are limitations, but radio broadcasters can petition the FAA for special use if they can prove their safety case, like flying at night or over people.” To operate directly over people, the FAA will require testing of the drone and data for approval, she said.

The broadcast engineering community is interested in the use of drones for infrastructure inspections, Ellman said, including broadcast towers.

“Use of drones will really increase efficiency for broadcasters and their tech departments,” particularly given the altitude exception around tall structures.

Ellman reminds drone hobbyists

“This is where the new law isn't very intuitive. For example, whether a flight is authorized or legal can be confusing. If you have a drone and you fly it near a tower site and take pictures, as soon as you use those photos to further the business interests of the radio stations or use those photos to enhance the radio station's website, that changes the intent,” Ellman said. “It then becomes a commercial operation and therefore is regulated under Part 107 — whereas the same flight, if you had just been flying for fun, would not be regulated under Part 107.”

She also has received questions from broadcasters about tethered drones. “Sometimes broadcasters just want to be able to put a camera up in the air — tethered drones are great for that purpose, and many of these tethers actually provide battery life to the drone, which is helpful,” she said. But she emphasized that tethered drones are regulated in the same way non-tethered ones are.

Privacy issues remain a hot topic for  
(continued on page 8)



Lisa Ellman is shown in a White House Oval Office photo with President Obama in 2014.

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## DRONES

(continued from page 6)

legal advocates and the general public. She said the drone industry has released a set of best practices that would make for a good review for broadcasters as well (see a PDF at [tinyurl.com/rw-drones](http://tinyurl.com/rw-drones)). The best practices recognize that newsgathering is strongly protected by the First Amendment. Nevertheless, they note that newsgatherers should operate under the ethics, rules and standards of their organization, and according to existing federal and state laws. And indeed, state and local governments are getting involved.

“While the federal government has been most focused on safety, the American public has been most focused on privacy. It’s become controversial. So you have states and localities that traditionally regulate local property rights and privacy matters. We’ve seen many cases of local ordinances being passed to limit drone use. So any radio station hoping to use a drone for any commer-

cial reason really needs to know what their local communities are doing in regards to drone regulations.” Ellman said.

What’s next?

The drone regulatory framework will keep moving forward, Ellman said, with stakeholders waiting for the FAA to weigh in on several key issues. Ellman believes the FAA will consider by the end of the year a new rule that will allow flying drones over people. Meanwhile, Amazon, FedEx and UPS continue to push for regulations that will further enable package delivery.

There are many possible technical applications for drones in the broadcast setting, Ellman said. She notes that drones could someday lift equipment to tower crews for tower maintenance, perform infrared camera inspections of transmission lines, hoist RF test equipment for aerial measurements and even touch up a spot of tower rust with spray paint at 300 feet.

The burst of U.S. drone activity will continue despite the cautious regulatory

## DRONE SHOW FLIES BACK INTO D.C.

Lisa Ellman will be a featured speaker at the National Drone Show, produced by Radio World’s parent company NewBay Media, in December.

Held Dec. 7–8 in the Walter E. Washington Convention Center and co-located with NewBay Media’s Government Video Expo, the National Drone Show offers video professionals two days of discussions and demos of UAV and video capture systems, management and delivery technologies and techniques.

Features include a Drone Flying Cage; a series of free sessions on the exhibit floor covering drone technologies and regulatory topics; and a day-long intensive educational program, the Advanced UAV Workshop, held Dec. 7. For information visit [www.nationaldroneshow.com](http://www.nationaldroneshow.com).

A highlight will be the first annual D.C. Drone Film Festival, celebrating the work of drone videographers. Entries will compete for cash and camera prizes. Enter at <https://filmfreeway.com/festival/DCDroneFilmFest>.



**NATIONAL  
DRONE SHOW**  
DECEMBER 7-8, 2016

approach by the FAA, she said.

“In addition, the Federal Communications Commission will have to settle some spectrum issues if we are ever to see thousands of drones in congested

skies over urban areas.”

*How are you using a drone? Email [radioworld@nbmedia.com](mailto:radioworld@nbmedia.com) with “Letter to the Editor: Drones” in the subject field.*

## KSTP

(continued from page 1)

For another, the station has not only a high-profile morning team but also an equally visible afternoon drive show. And KS95 is consistent; while adapting to changing musical tastes, it has maintained an adult contemporary format for decades, today playing what in 2016 we call hot AC.

### CONSISTENCY

That consistency is one key to the station’s success, says General Manager Dan Seeman. “We’re an upbeat, local, music station with entertaining personalities. The music gets [the listeners] there, and the

personalities keep them there.”

Seeman has been involved with Hubbard Broadcasting for more than a decade after coming over from the Minneapolis cluster of what was then Clear Channel. The Twin Cities constitute Nielsen’s market No. 16 and have a Metro 12+ population of 2.9 million people. Seeman ran two Hubbard talk stations there, KSTP(AM) and KTMV(FM), then joined KS95 five years ago; his duties have expanded since. In addition to the station GM, he is vice president and regional manager for Hubbard Radio’s 19 Minnesota stations.

Not only is KS95 local, its parent is too. Hubbard Broadcasting was founded by Stanley E. Hubbard in the mid-1920s. It has a notable presence today in cities like Chicago, Washington, Seattle and Phoenix; but it’s still family-owned and still maintains its corporate offices in St. Paul. That’s a plus, according to Seeman.

“The Hubbards are such visionary owners. They hire the right people, and they understand the importance of investing in their stations.” And because the home office is local, “We don’t have to check in with New York or the west coast. We’re able to seize the moment.”

When music legend and local resident Prince died suddenly in April, KS95 began playing his music non-stop throughout the afternoon. The station also posted Prince videos on its website, put up a series of digital billboards throughout the market and created a social media tribute, “Wear Purple for Prince,” encouraging listeners to wear purple on April 22, and to share their photos on the station’s Facebook page.

### CONNECTIONS

KS95 has a longstanding reputa-

tion as a station with entertaining personalities: From 1979 to 1994, the station featured one of the most popular morning duos in the Twin Cities, Knapp and Donuts. Knapp was then-program director (and veteran top-40 DJ) Chuck Knapp; his sidekick was Michael “Donuts” Douglas.

Their show’s energy and quirky humor made a positive impact on many listeners, including Leighton Peck, who grew up listening to Knapp and Donuts. He ultimately embarked on his own radio career, joining KS95 in 1991 as a part-time announcer and going on to become its music director. Today, Peck is KS95’s program director, a role he has held since 2001.

That kind of longevity is typical of KS95. Most of the on-air staff members know the Twin Cities inside and out; they are from the area or they’ve been with the station for a while.

For example, popular afternoon team Moon & Staci have been with the station since January 2003. (They were joined by Adam “Crisco” Zalusky in 2012.) Leighton Peck brought Moon and Staci together. Larry Moon had been working in Houston, while Staci was in St. Cloud, Minn., and Peck believed the two would make a good on-air team.

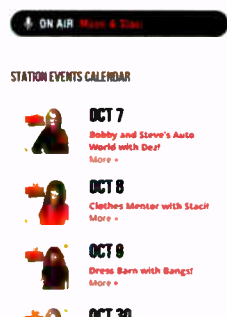
“Staci is fiery, she’s honest, funny and relatable,” says Peck. “Moon is a character; there’s always something going on in his life. Listeners see him as one of them, an everyman. He knows how to do radio, and he works very well with Staci.”

Listeners certainly agree: Not only does the afternoon show get consistently strong ratings, but in 2012, Moon and Staci won the NAB’s Marconi Award for Large Market Personality of the Year.

Equally popular is the station’s morning show, which until recently featured Ryan, Shannon and Fish. As a duo, Ryan and Shannon had been together since 2011; they won the Marconi Award for large-market personality in 2014. Fish was added in early 2015.

In July of this year, fans of KS95’s morning show were saddened to learn that Shannon was leaving to

(continued on page 10)



A Prince tribute, a pumpkin carving contest, Imagine Dragons and the afternoon team of Moon & Staci were featured on the station website in early October.



# The award winning combination



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**KSTP***(continued from page 8)*

move closer to her home. At this writing, Peck was in the process of selecting a new member for the morning team; while the search continues, fans of the show are enjoying “Bangs” — real name Tiffany Norton — a local stand-up comedian who has been heard on the morning show previously.

The station operates from studios at 3415 University Ave. in St. Paul, which is also the home office of the parent company. KS95 has about 40 employees, including part-timers and those who have other duties in the Hubbard cluster.

Seeman reports that the Minneapolis-St. Paul market has been generally flat for several years, though without providing specifics, he says the station is “outpacing the market.” Research firm BIA/Kelsey estimates that KSTP brought in \$15 million in over-the-air advertising in 2015, down slightly from the year prior; its 2015 revenue is about 10 percent of BIA/Kelsey’s total OTA radio revenue estimate for the market of \$146.7 million.

It has been another good year for KS95 ratings-wise, says the PD Leighton Peck. Citing Nielsen data, he said, “We have been No. 1 6-plus, adults 25–54 and women 25–54 6 a.m. to midnight since January.” He said the numbers were just as good last year. And while he expected there might be a slight ratings dip in the September Nielsen, he has been pleased at KS95’s performance throughout 2016, especially given how competitive the market is. (From a recent “topline” perspective: In Nielsen Topline Radio Ratings AQH Share for Persons 6+, Mon–Sun., 6 a.m. to Midnight, the station in September was second to iHeart’s CHR outlet KDWB(FM); it held the top spot the two months prior.)

This is a market with at least two dozen radio choices, licensed to entities like iHeartMedia, Cumulus, CBS, the University of Northwestern-St. Paul and Minnesota Public Radio, all of which have more than one signal on the dial. As for which station he perceives as his chief competition, Peck replies: “Anyone on the FM dial is my competition. This market is so compressed and there are so few [Portable People]



Last year’s “KS95 for Kids Radiothon” raised more than \$513,000 for Gillette Children’s Specialty Healthcare and the Children’s Cancer Research Fund.

Meters in the market that a change of one or two meters can make huge differences in rankings.”

**IN THE COMMUNITY**

As a music station, KS95 does not have a news department, but the announcers integrate the major stories of the day into their shows. The goal is to make sure the listeners have the information they need, especially on their way to and from work.

While the focus is on having fun and being entertaining, there is one thing the air staff doesn’t do, says Seeman; they don’t use humor that is crude or suggestive. With a target audience of women 25–54, “family-friendly” is an important aspect of the station’s brand.

Involvement in the community is something else KS95 is known for; whether it’s appearing at local festivals, fairs or charitable events, KS95 personalities maintain a visible presence. As a result of the station’s commitment to community service, the National Association of Broadcasters has given the station Crystal Awards in 2004, 2007 and 2014.

One good example of the station’s positive impact was “Clouds Choir for a Cause,” held in the rotunda at the Mall of America last December and hosted by the morning show team. Now part of the annual “KS95 for Kids Radiothon,” which began in 1999, the Clouds Choir honors the memory of Zach Sobiech, a local teen who died of bone cancer in 2013. More than 5,500 people gathered at the mall to sing “Clouds,” a song Zach wrote before he died, as well as singing Christmas carols. The event attracted local media coverage, and the KS95 for Kids Radiothon raised some \$513,000 for Gillette Children’s Specialty Healthcare and the Children’s Cancer Research Fund.

one of the best in the market. He said the signal “covers the metro, plus the all of the counties that surround the metro.” Keeping the station sounding good is Chief Engineer Mike Weber, who also handles the chief duties for KTMY(FM) “myTalk 107.1” as well as KSTP(AM) “1500 ESPN Twin Cities.”

Seeman seeks to pursue a robust multi-platform strategy.

“We have a dedicated social media department that makes sure that our brand and personalities reach our fans on Facebook, Twitter, Instagram and Snapchat,” he said. “Our streaming player and mobile app, which were developed by Hubbard’s corporate digital department, are the very best in the business and are interactive and gives listeners a chance to win great prizes by listening to the stream on any device, whether desktop or mobile.”

KS95 broadcasts HD Radio on 94.5.



Dave Bestler, Staci Matthews, Crisco, Dan Seeman and Moon (seated) celebrate the 2015 NAB Marconi Award for Large Market Station of the Year.

**“AWESOME MEDIUM”**

These days, radio may have more competition, but that doesn’t mean it’s no longer important.

“Radio has always had an inferiority complex,” says Dan Seeman. “But we’re an awesome medium ... There are many ways to consume audio content today, but we can connect listeners with the community. And they can hear it all for free.”

That connection between the station and its audience remains strong: KS95 does a lot of marketing and promotion, and listeners have many opportunities to interact with the personalities they hear on the air. KS95 also has the benefit of a powerful signal: The station is a Class C FM, with a 100 kW signal — according to Seeman,

Sister station 1500 ESPN is heard on its 94.5 HD2 channel; and the cluster just launched ESPN Deportes on 94.5 HD3.

In 2015, KS95 won the Marconi award for Large Market Station of the Year, and it recently celebrated its 50th anniversary. But while Seeman is pleased with his station’s accomplishments, he’s focused on the future. “We’re not looking back at the good old days. Our best years are still ahead.”

*Got a suggestion for this series? Email radioworld@nbmedia.com.*

*Donna L. Halper is a former broadcaster and radio consultant who spent more than three decades in radio. She is a professor of communication and media studies at Lesley University, Cambridge Mass.*

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# Construct a Cheap Stereo Audio Amplifier

Add a heat sink and troubleshooting features, and you're really in business

## WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

Charles S. "Buc" Fitch, P.E., is always searching for great deals in electronics. MCM ([www.mcmelectronics.com](http://www.mcmelectronics.com)) is one of his favorite sources for the items they put on sale.

Buc just finished a custom 12-watt-per-channel stereo 2RU audio amplifier, based on the German-made KEMO 12-watt amplifier "bricks" seen in Fig. 1. The 12-watt bricks usually sell for \$14.79 but were on sale for \$5. MCM sells an 18-watt version for just under \$15.

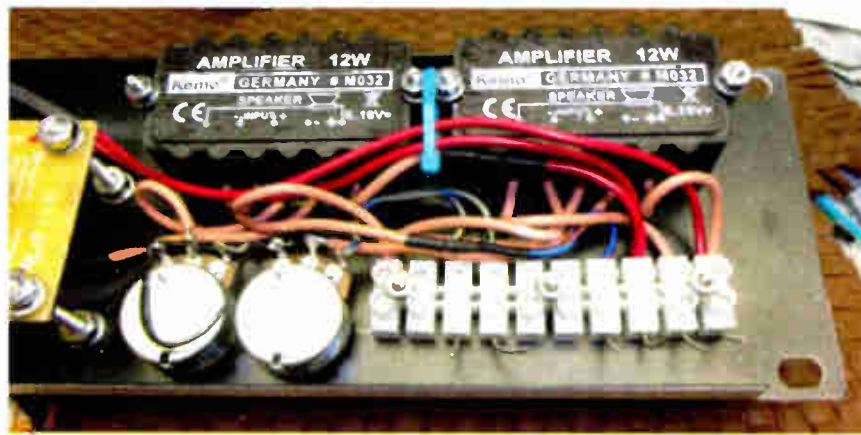


Fig. 1: The German-made amplifier "bricks" make a great utility audio amplifier.

All told, Buc spent about \$15 in new associated hardware; however, he was able to use up a lot of junk box parts — like the sexy fuse holder with the neon bulb in the cap, which lights when the fuse blows.

The performance of the unit is set by the manufacturer's limits for the power bricks. It is what it is, and the amplifier begins to distort at 12 watts. Surprisingly, the bricks have quite good gain, so Buc intends to run the pots at about 1/4 open with 0 dB monitor level into them.

The power transformer that Buc harvested from a paging system power supply has very low internal resistance, so the voltage drops very little under even full load. It can be seen in Fig. 2. Consequently the raw, filtered voltage is about 25 volts DC, meaning one can drop about 10 volts in the 15 V regulators.



Fig. 2: The power supply section of the amplifier project. Buc used a power transformer from a paging system.

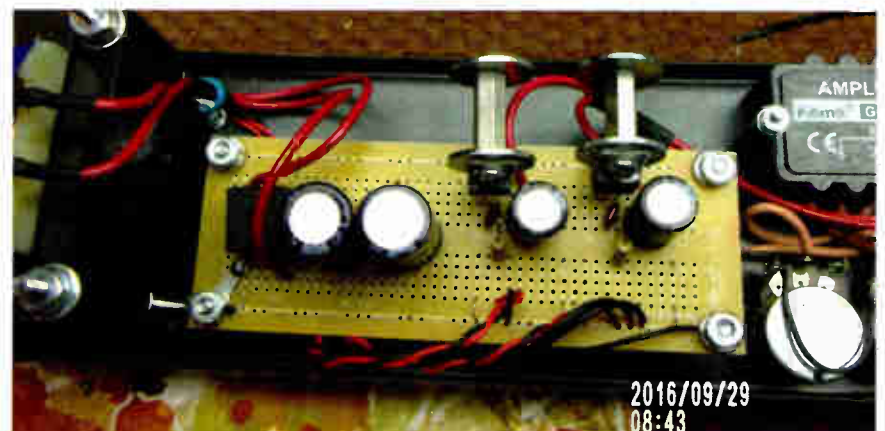


Fig. 3: In the middle of this figure, note the unique "Buc heat sink" consisting of bolts, washers and hexagonal standoff.

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Although good for a 1.5A, worst-case demand from each of these bricks is about 800 mA peak, the regulators run hot. For that reason, Buc installed one of those custom heat sinks on the heat rise side of each regulator, and after extended operation these got quite warm but not hot; see Fig. 3.

The heat sink is simple to construct. Buc used a couple of short bolts, washers and a hexagonal metal standoff.

Since the bricks are running at the upper end of voltage performance, Buc did not want the regulators to punch through and blow the bricks. Buc was motivated more by the hassle of changing the bricks than the cost, so as a precaution, he added 15-volt, 5-watt zener diodes on the output side of the regulators. If the voltage were to rise up to the supply rail of 25 volts, these zeners would clamp to 15 volts, and draw excessive current to ground and, in theory, blow the main fuse from overload. The zeners were added after the pictures were taken.

(continued on page 18)



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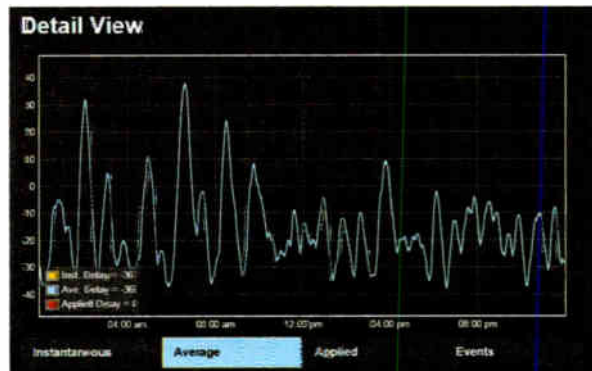
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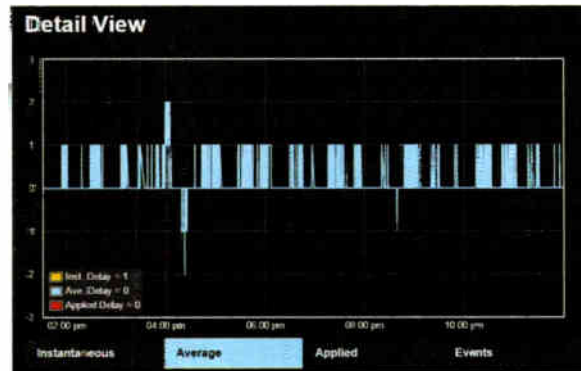
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# What's Next for Streaming Audio?

The competitive landscape shifts with the shutdowns of Rdio and Live365 and the introduction of new iHeartRadio services

BY JAMES CARELESS

In November of last year, streaming audio website Rdio.com declared bankruptcy, finding itself \$220 million in debt. According to the Hollywood Reporter, Rdio was losing about \$2 million a month when it decided to pull the plug.

The company "took in \$1.5 million per month" from its \$9.99 per month subscriptions, according to the Reporter, plus \$100,000–\$150,000 per month in ad sales. But it had to pay out nearly \$4 million in monthly operating expenses, "including payroll for 140 employees, royalty payments to rights owners and service maintenance costs."

Pandora subsequently bought "key assets" from Rdio for \$75 million; Rdio's online goodbye message described the company as now being "part of the Pandora team."

The site went silent Dec. 22, 2015.

In the wake of that development, Rdio partner/terrestrial broadcaster Cumulus Media was circumspect about the bankruptcy and its future plans for streaming audio: "While we have invested historically in apps and websites so our listeners can enjoy our programming anytime and anywhere, we will over time continue to evolve a holistic digital strategy that provides a differentiated solution for advertisers and listeners," said



Collin R. Jones, Cumulus Media's director of M&A, corporate development and strategy, in a statement prepared for Radio World. "Beyond this statement, the company has no additional related information to share at this time," wrote the Cumulus Media public relations representative who handled our request.

In January of this year, the venerable (since 1999) streaming audio service Live365 also shut down, again over money problems. In this case, Live365 couldn't afford to pay increased royalties set by the U.S. Copyright Royalty Board.

"There are always possibilities that we can come back in one form or another, but at this point in time,

Jan. 31, 2016 is the last day that Live365's streaming servers and website will be maintained and supported," the company stated in an email sent to subscribers and published on Betanews.com.

With the demise of these online services, some might argue that there's room for new players to enter the streaming audio market; as was reflected by news reports that Amazon was "prepping a Spotify-killer."

However, Radio World found streaming media market watchers skeptical of such optimism, and of the industry's economic viability in its current state.

## SHOW ME THE MONEY

The quote from the 1996 Tom Cruise movie "Jerry Maguire" was "Show me the money!" It has become a cliché but it sums up the problem facing streaming audio as a whole. After the payment of music royalties and other operating costs, the profits just aren't there, at least not yet.

"My understanding is that this sector is not making money," said James Cridland, who calls himself a "radio futurologist" and who is managing director of the media information site media.info.

"Spotify is now losing money; Deezer is continuing to lose money. Pandora is also losing money. Increasingly, I hear that audio is being seen as a toxic area for investors, which has some ramifications for broadcast radio."

Said Simon Cole, CEO of 7digital, a b2b digital music and radio services company, "Rdio's bankruptcy shows just how difficult and costly it is to get a music streaming service off the ground, especially if doing it all yourself. It's telling that the most valuable asset [sold] to Pandora was Rdio's content management plat-

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form,” rather than the company’s subscriber list or other intellectual assets.

**TOO MANY PLAYERS**

The loss of Rdio and Live365 left many players in the streaming audio space, including well-known majors like Pandora, Spotify and broadcaster-owned iHeartRadio, among other niche services. These known commodities are the ones most likely to survive, according to John December, editor/publisher of the media information website [www.December.com](http://www.December.com).

**Streaming media market watchers are skeptical of such optimism, and of the industry’s economic viability in its current state.**

“Streaming media sites that have been able to establish strong brand recognition can continue to grow audiences,” he said. “Sites that have confusing or difficult-to-use and difficult-to-understand interfaces seem to fall by the wayside.”

December expects the streaming media space to undergo consolidation as weaker players fail or are eaten up by their stronger rivals.

This view is shared by Simon Cole. “Our sector is definitely on the verge of consolidation, not only in terms of the direct-to-consumer companies, but also the B2B side of the industry.” He said last year saw a number of digital music players go bust or merge, and “further moves around the board are inevitable as some business models struggle more than others.”

**RADIO HAS THE EDGE – IF IT WANTS TO USE IT**

If there is a bright light in the gloom of streaming audio, it is that radio broadcasters are well-positioned to put together streaming audio companies or spin off services of their own.

“Broadcast radio has better music deals, in many cases, than pureplay [non-radio] online services,” said Cridland. “That was underlined in the recent Copyright Royalty Board U.S. decision to increase Pandora’s online music costs by 20 percent, but decrease broadcast radio’s.”

Broadcast radio also has significant marketing clout and is still a mass medium, he said. “iHeart’s relative suc-

cess in this field is partially due to that relentless marketing, and the way it has used iHeart as a unifying brand for its many disconnected broadcast brands,” Cridland said. “And finally, broadcast radio has actual human talent as well as access to music. Spotify and Apple have both made large acquisitions in terms of talent recently, but broadcast radio has much more.”

In October, iHeartMedia announced two paid versions of its iHeartRadio streaming services. They will launch in January, and many broadcasters will likely pay close attention to how

iHeartRadio Plus and iHeartRadio All Access are received by listeners.

Radio has one more ace up its sleeve: It is accustomed to programming content for listeners (the “lean-back” model of streaming audio), as compared to requiring listeners to do this for themselves (the “lean-forward” model).

“People who have been listening to radio for years want another easy-to-use lean-back experience,” said Cole. “Streaming services have not typically offered this, so the influence of radio on the new generation of digital music offerings opens up an exciting oppor-

tunity to reach this underserved audience.”

The big unknown is whether other broadcasters want to follow iHeartMedia and Cumulus Media’s leads and venture into online streaming competition against Pandora, Spotify and possibly a revamped Amazon service.

Cridland has his doubts. “The question for broadcast radio is whether they see much benefit in investing in an area which has proven itself to be difficult to raise profit from; when those broadcast radio groups are still repaying debt from consolidation,” he said.

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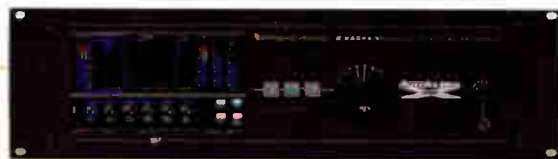
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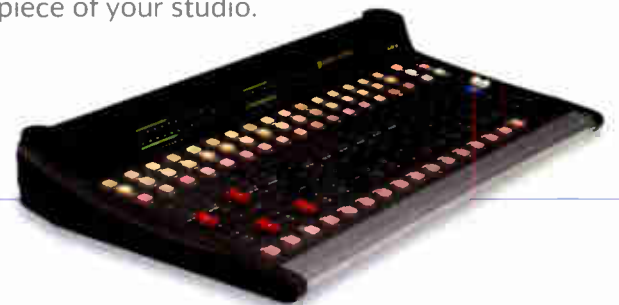
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## NEWSROUNDUP

**TRANSMITTER:** Equipment dealer SCMS was startled by a citation from the FCC telling it to stop marketing certain models of LPFM transmitters and power amps made by BW Broadcast, based in the United Kingdom. But after SCMS contacted the commission, President Bob Cauthen said, he received written assurance from the FCC that the central product model in the case, the 300-watt BW TX300V2, was in fact accepted for use by U.S. low-power FM broadcasters as long as operating within their legal ERP limits. "We are pleased that this FCC action was reversed," Cauthen wrote in an open letter to the industry. "SCMS has always followed the FCC rules and the law in general with the utmost respect and diligence." BW Broadcast CEO Scott Incz wrote a similar letter and said, "It appears that our company was subject to a malicious complaint."

**MAIN STUDIO:** We'll likely be hearing more discussion about changes to the main studio rule soon. Commissioner Michael O'Rielly spoke to a meeting of the Association of Federal Communications Consulting Engineers last month. While discussing AM revitalization efforts, he said that some important questions had been left to a Further Notice of Proposed Rulemaking. "For instance, I'd personally like to see us split off the relief for the main studio rule from the FNPRM so as to complete it before year's end, and you are likely to hear more from me on this soon," the Republican commissioner said.

**ACQUISITION:** Continuing to grow its profile in radio, DTS Inc. acquired Arctic Palm Technology Inc., a small Canadian software developer. Terms were not announced. "Arctic Palm has extensive experience in broadcast studio operations and services with deep knowledge in broadcast metadata and platform integration to develop customized media solutions software," it stated. "Arctic Palm has developed a number of solutions to support the broad range of HD Radio Advanced Services and most recently has been a critical partner in the Public Radio Satellite Services MetaPub initiative

to enhance the public radio listener experience." Stu Buck will come to DTS with the company he founded. A year ago DTS acquired HD Radio developer iBiquity Digital; recently came news that DTS itself would be acquired by Tessera Technologies. Chairman/CEO Jon Kirchner said Arctic Palm is a good fit because, as the auto industry works to build the digital dash, broadcasters need to enhance their service offerings.

**DRM:** The Digital Radio Mondiale Consortium planned its first live digital radio signal transmission to Cuba, the Caribbean region and parts of northern Latin America, maybe even Florida. The broadcast, planned for late October, was to coincide with a meeting of the General Assembly of the Caribbean Broadcasting Union in Havana, and was to come from the BBC via its Atlantic Relay station through the services of Babcock International. The transmission was to be in the 13 meter-band on 21720 kHz and would carry BBC World Ser-



## WORKBENCH

(Continued from page 12)

Buc added a neat troubleshooting feature as well. Obviously, each brick has its own 15-volt regulator, and the twin LEDs on the front-panel mirrors these. If the LED doesn't light, that section is dead. If the LED is overly bright, that regulator is in trouble. The LEDs can be seen in the upper right corner of Fig. 4, to the right of the fuse holder.

Buc notes a curious artifact of the brick design: the 15-volt DC supply is actually one leg of the speaker feed; therefore, the speakers have to float with neither side of the speaker lines attached or anywhere near a ground connection. The completed amplifier rear view is shown in Fig. 5.

And speaking of workbench parts, Duke Evans of KBBF(FM) wrote in to comment about the see-through, re-sealable plastic bags we told you about earlier. Art Reis had spotted these bags at Radio Shack and told us he found them helpful for storing small parts.

Duke finds that the bags do not have part numbers or descriptions on them — at least not at his local Radio Shack. This was a problem, because Duke was looking for a mini-fuse; there were

## STANDING WITH GIANTS

The Library of American Broadcasting inducted 10 media people as Giants of Broadcasting & Electronic Arts. From left: Paul Karpowicz, Steve Kroft, Tom Brokaw, Susan Stamberg, Dick Ebersol, Susan Lucci, Maria Bartiromo, Perry Sook, Tom Joyner. Also honored was the late Walt Disney.



vice programs in English. Multimedia features of DRM were to be demonstrated on radio receiver screens.

**MEATAPUB:** The Public Radio Satellite System prepped for a California disaster simulation in late October that would implement the technology behind its MetaPub service. A grant from the Corporation for Public Broadcasting made it possible for PRSS to allow six California public radio stations to deliver metadata-enhanced emergency messages during the Great California ShakeOut on Oct. 20. MetaPub is intended to enhance radio broadcast content by providing images, text, promotional materials and links. PRSS says its metadata is intended to bridge a gap between content producers and the

software that populates radio displays and streaming audio apps.

**GORMAN-REDLICH:** Manufacturer Gorman-Redlich expressed disappointment with the FCC's rejection of its EAS waiver request, which was decided just before the September national test. Founder Jim Gorman said the outcome was "to the disadvantage of numerous small-market stations whose budgets may not allow for upgrading their so-called 'legacy' Emergency Alert System equipment. Although Gorman-Redlich maintains support of our legacy EAS equipment, some other manufacturers do not; either because they have implemented a support 'sunset' for the equipment or because they have ceased business operations."



Fig. 4: Two LEDs, in the upper right corner, monitor condition of the regulators.



Fig 5: A rear view of the completed amplifier.

four fuses in the bag but no indication of the amperage. He could learn the amperage by opening the bag, putting on heavy-duty reading glasses and deciphering the fine print.

Art's point was that the resealing feature made the bags attractive for reuse to hold components, so be sure to identify them with a label in pen or

permanent marker.

By the way, KBBF describes itself as the nation's first bilingual public radio station in the United States. It serves 11 North Bay counties from Santa Rosa, Calif.

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# Nautel AUI Eases Remote Control

Townsquare Media appreciates reliability and many levels of control

## USERREPORT

BY JOHN HUNTLEY, CPBE, CE/IT  
Chief Engineer  
Townsquare Media

**ROCKFORD, ILL.** — When Townsquare Media purchased a Nautel NX5 for WROK(AM) at the end of last year, it joined another Nautel transmitter at our cluster. Both the NX5 and the J1000 have been highly reliable. I am pleased with the many levels of control and settings that are available through the AUI for the NX5 and a VS-1 recently added as an IPA to sister station WZOK's existing FM transmitter.

The NX5 can be controlled several ways. The front panel is a simple but limited interface. It has hard-wired but programmable command inputs and status indications as well as hard-wired analog metering for a traditional remote control. I prefer to use Nautel's Advanced User Interface, which in the NX5 is done exclusively via computer. I am told that the larger models have a front-panel touchscreen. There are many features available through the AUI that are not accessible through the front panel. Setup of the hard-wired command and status is best done using the AUI.

### KEEPING TABS

I keep an instance of the AUI open in a tab in Firefox on my work desktop. The AUI is browser-agnostic but requires Adobe Flash player to be viewed. This link allows me to see everything that is happening with the transmitter.

I particularly appreciate two real-time features. The first is the Smith Chart feature. It was extra valuable when we added a T-Mobile site onto one of the WROK(AM) towers a few months ago. It was an additional check on the work done by the consultant. I use the Smith Chart to verify the real-time match between the NX5 and the phaser.

The second feature is a real-time spectrum analyzer. I can see the effects of the changes to audio processing by viewing the real-time transmitted signal sampled at the output of the transmitter.

I also control the NX5 via a Burk ARC-16 and their Autopilot 2010 program. The NX5 was installed adjacent to the rack that has the computer for the Autopilot program. I have remote access to that computer and a browser with an instance of the AUI is nearly always kept active on it.

WROK alternates between the NX5 for the daytime directional pattern and the J1000 for a lower-power nighttime nondirectional signal. We let the Burk Autopilot change the pattern on a timed basis. Both the NX5 and the J1000 have capability of timed changes. Both are programmed for power changes on a timed basis. I use NTP (for accurate

SMS text multiple staff members of silence notifications. What is missing is a notification of the return of audio as well. Both the brand managers (formerly known as "program directors") and I are notified of silences in excess of 35 seconds. Even though the silence notifications are somewhat cryptic, both the operations manager and the VP of



time) in the NX5. The J1000 lacks NTP capability and I reset its internal clock quarterly. I have an inexpensive GPS-based NTP server on the local network. Setting the timed changes in power was much easier with the AUI than with the front panel of the J1000. I will admit that it only needed done once. I appreciate the feature.

I do have several ways to get to the NX5 remotely, but not via a smartphone. Nautel says they are working on that issue as part of their philosophy of "continuous improvement."

Nor do I access the NX5 directly via the internet. I have a son who works for Symantec, and he would abuse me verbally if I did that! Townsquare corporate IT will be deeply involved in any decision for direct access via the internet. Nautel has stressed the need for internet security for transmitters, noting that many people operate their systems without firewalls and/or they fail to change the passwords from defaults. This is simply a way of inviting hackers to take over their stations.

I use the silence alarm in the AUI to provide notification for the NX5 and also on a VS1 on WZOK(FM). The VS1 is installed as an exciter/PA in a BE FM20B. I have configured notifications in the AUIs to email and

revenue (manager) requested to know when silences happen. To know when programming returns would be very helpful for them (and me!). I have asked Nautel that this be considered as a feature in the next major firmware release.

The AUI home page is what I have open in a browser on my desktop computer. I should mention that I have two monitors on my desktop. Several items in the home page can be configured in real time. I have the Smith Chart zoomed in at 200 percent. I have changed the span of the real time spectrum analyzer to a narrower range that I prefer. I have the transmitter meters that I find valuable to me displayed on the home screen.

Nautel support recently worked with me to resolve an inability of the NX5 to add users to the notification. As these transmitters are controlled by embedded firmware, I have always known that it is only a matter of time until "bugs" arise. The problem has been resolved.

I appreciate Nautel's responsiveness to our requests; it's nice to have a manufacturer who listens and works with us on issues.

The only negative I have to mention is inherent in the embedded firmware nature of the transmitter. When I put a firmware update into the NX5, I plan on a minimum of 30 minutes of operation on another transmitter. The upgrade takes the necessary time to do it correctly. I have the capability at WROK of operating ND daytime at 1 kW during the firmware update. I am very thankful for the foresight of Norman Phillips, the VP of engineering to whom I reported. He is retiring shortly; his experience and encouragement have helped us all.

For information, contact Chuck Kelly or Wendell Lonergan at Nautel in Nova Scotia at (877) 662-8835 or visit [www.nautel.com](http://www.nautel.com).

## TECHUPDATE

### NTI DL1 MONITORS DIGITAL TRANSMISSION LINES

NTi Audio says that DL1 Digilyzer is a suitable companion for monitoring digital broadcast lines. Measuring and monitoring functions are combined. Digital audio level, carrier, sample rate, status bits and other parameters may be monitored. The DL1 includes a range of diagnostic and investigative tools within one battery-operated handheld device.

In particular, the DL1 includes a built-in event logger that can log and then locate intermittent problems in the digital audio data stream. Once connected to the digital transmission line, the Digilyzer continuously monitors and logs events appearing on the line during the monitoring period. Any errors or service degradation are captured in the data, which is logged, time-stamped and logically grouped. The log is a simple ASCII text file easily transferred to a PC via the optional USB connection and software. With this log users may document the quality of leased lines in regard to Quality of Service issues or costs.

For information, contact NTi Audio in Oregon at (503) 684-7050 or visit [www.nti-audio.com](http://www.nti-audio.com).



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# Sharpening Time Alignment With Belar

Reliability, consistency and stability keep long-time customer happy

## USERREPORT

BY JEFF DEPOLO  
Owner and Senior Engineer  
Broadcast Sciences LLC

**VALLEY FORGE, PA.** — Broadcast Sciences is a full-service engineering firm that provides an array of services to the broadcast and wireless communications industries. This includes everything from licensing to facility design and construction, as well as ongoing maintenance of studio and transmitter facilities for AM, FM and TV operations of any size.

In radio, one of the more interesting recent technical challenges to arise is the growing need for precise time-alignment between FM and HD Radio signals. The goal is to ensure a seamless transition between the digital and analog signal as listeners travel beyond the range of the HD Radio signal. If that HD/FM alignment is not maintained, the listener experience is jarring — and the complaints come pouring in.

### RELIABILITY

To address this important need, we gradually have standardized on the Belar FMHD-1 modulation monitor in new builds and existing facility upgrades. Additionally, we have begun exclusively to specify the Belar FMCS-1 all-in-one monitor for FM-only projects. Many of the existing facilities we service had, or still have, fully-functioning Belar analog modulation monitors installed 20 to 30 years ago. It's a testament to the reliability and longevity of Belar modulation monitors, and we are retiring these only to benefit from the latest features associated with the current generation of products, including HD Radio monitoring capabilities.

Belar has always been the industry standard for accuracy in modulation monitoring, and that still holds true with their digital equipment. Belar is our preferred vendor for HD Radio monitoring due to their consistency and accuracy when it comes to HD/FM time alignment and relative loudness monitoring. The FMHD-1 and FMCS-1 both have feature sets that surpass competitive monitors. These are important reasons we specify Belar products whenever possible.

The recently-introduced Automatic Delay Correction software in the FMHD-1 works well for FM/HD time-alignment. Due to the encoding delays associated with the HD audio, the FM audio has to be delayed by an equal amount (approximately 8 seconds) to ensure seamless blending. Due to timing imperfections and



transport issues, it is not unusual for the required delay to vary or "drift" over time.

Belar's architectural flexibility provides options on how corrections are applied to maintain precise time alignment. As opposed to making the adjustments "inside the box," the FMHD-1 communicates the required adjustments to an exporter or an audio processor with an internal delay line. The preference as to whether the delay is provided by the exporter or audio processor is often a function of the topology of the system, including where the exporter and audio processing are located.

Belar's WizWin software provides another valuable benefit: remote monitoring. Many of our transmitter sites are located on distant mountaintops, or comprise large regional networks with widely dispersed locations without a local studio. The WizWin software lets us log in to remotely monitor important parameters related to audio and RF performance, including time

alignment and audio level consistency for HD Radio, as well as analog parameters such as total modulation, RDS, and subcarrier injection levels.

Using WizWin, we can pinpoint quickly whether an issue is tied to a program delivery, transmitter or audio processing problem; and if a trip to the transmitter site is required. Additionally, we have alarm relays configured on each monitor, which are interfaced to the remote control systems for alarm notifications such as if the time alignment drifts outside a specified window, or if there is a total loss of HD carriers or audio.

One key differentiator is the fact that Belar uses the same interface for both local and remote monitoring. Many pieces of broadcast equipment provide a different interface in each instance, with a specific set of features available from the front panel, and a subset (or superset) of those features for remote monitoring that often have a completely different look and feel. Having an identical interface for both monitoring approaches is a nice change.

Belar regularly releases software and firmware upgrades that can be installed in the field without requiring hardware upgrades or modifications. We continue to receive improvements and useful new features added to the FMHD-1 especially. Based on these attributes, it's clear that Belar's customer service and technical innovation continues to excel, and will save us and our clients money in the long run.

For information, contact Mark Grant at Belar Electronics in Pennsylvania at (610) 687-5550 or visit [www.belar.com](http://www.belar.com).

## TECHUPDATE

### BROADCAST DEVICES IS IN CONTROL WITH THE SWP-300

The SWP-300 Series Site Controller from Broadcast Devices Inc. is a remote control solution that features a direct plug-in interface to popular RF motorized switches for transmitter changeover operations.

In addition the SWP-300 series controllers have direct interface capability to up to two BDI DPS-100D True RMS power meters. Parameters displayed on a DPS-100D power meter, including forward/reflected power, temperature, transmission line pressure and six general-purpose inputs, are converted for display on the SWP-300 with no scaling needed.



The SWP-300 series features a single-connector interface for control of two transmitters including TX on/off and interlock control. In addition to the direct control of two transmitters, the unit features 16 control outputs, eight status inputs and four analog inputs for legacy equipment. Also included are local interfaces for optional pushbutton control or for interface to other remote control systems.

The SWP-300 series have Ethernet interface and are SNMP-capable. Front-panel controls include master transmitter on/off and motorized switch control. Front-panel display of transmitter selected to air, forward and reflected power, temperature and transmission line pressure is available. The SWP-300 is furnished with the BDI Stack graphical user interface software package for use with Windows XP, 7, 8 and 10 operating systems. Included with the package is an Android operating system version of the BDI Stack GUI.

The company says that the SWP-300 is a low-cost solution for main or auxiliary transmitter sites and translator facilities, or as a secondary remote control where other systems require a backup.

The SWP-300 series are available in one- and two-RF switch models.

For information, contact Broadcast Devices in New York at (914) 737-5032 or visit [www.broadcast-devices.com](http://www.broadcast-devices.com).

## ABOUT BUYER'S GUIDE

Radio World publishes User Reports on products in various equipment classes throughout the year to help potential buyers understand why colleagues chose the equipment they did. A User Report is an unpaid testimonial by a user who has already purchased the gear. A Radio World Product Evaluation, by contrast, is a freelance article by a paid reviewer who typically receives a demo loaner. Do you have a story to tell? Write to [bmoss@nbmedia.com](mailto:bmoss@nbmedia.com).

**TECHUPDATES**

**2WCOM INTRODUCES A30 FOR FM MONITORING**

2wcom's A30 is the company's newest monitoring device and the successor to its A20.

Featuring additional power and flexibility, the system is equipped with two professional FM tuners capable of independent operation.



Operators can, for example, use the first tuner to monitor audio inputs (silence detection) while the second tuner monitors up to 30 broadcasting stations in scan mode. When in scan mode, the system lets operators configure station order and measurement time via a web interface. All data received is hidden, allowing the visualization of all stations, regardless of whether they are being monitored or were recently monitored.

According to 2wcom, the user-friendly A30 features a number of interfaces including an analog or digital audio input, MPX input, two analog or digital audio MPX outputs, relays, GPIs, SNMP and two parallel MP3 streams.

In addition, the A30 is capable of serving as a backup source and can loop through incoming external audio/MPX signals to its outputs via quality relays. It is able to measure the incoming external audio/MPX source and in the case of signal degradation, switch the output source to an internal FM tuner. If the signal degradation is no longer existent, the A30 automatically shifts back to the external audio/MPX source.

For more information, contact 2wcom in Germany at 011-49-461-6628300 or visit [www.2wcom.com](http://www.2wcom.com).

**NEW REMOTE CONTROL UNIT FROM WORLDCAST SYSTEMS**

The Audemat Control is a new, IP-enabled remote facility control unit from WorldCast Systems.

Highlighted for its ease of use and maintenance, it offers a large number of input and output connections in a 1RU enclosure and the ability to monitor 10 SNMP devices (more on request) as well as utilizing the company's ScriptEasy software for intelligent telemetry design.

A core feature is the number of connections it can support. It provides 64 digital inputs, 64 digital outputs and 24 analog inputs as well as four serial ports, two Ethernet ports and four USB ports. The unit offers I/O termination panels with screw terminal connectors to enable connection to real-world signals.

In addition, an audio input enables remote streaming of external audio and there is also an audio output for audio backup or an input loop. Alarms and notifications are offered via email, SNMP, voice/DTMF phone alert calls and, as an option, by SMS. The DTMF voice modem is extractible for maintenance, as is the SSD.

Critically, the IP-enabled Audemat Control unit includes ScriptEasy software as standard. ScriptEasy is a tool that enables extensive customization of a site's monitoring activities as well as defining automatic actions to be taken upon user-defined conditions. It incorporates the MasterView web-based application that allows a user to create their own customized user views for simple aggregation and display of relevant data as well as presenting action buttons to initiate common actions.

For information, contact Audemat/WorldCast Systems in Florida at (305) 249-3110 or visit [www.worldcastsystems.com](http://www.worldcastsystems.com).



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# Burk Gets It Done for Emmis in New York

ARC Plus provides multifaceted info on multiple installations

## USERREPORT

BY ALEX ROMAN  
Director of Integrated Technologies  
Emmis New York

**NEW YORK** — In a busy broadcast facility with multiple transmitter sites and a complex studio plant, a highly capable remote control system is a must to keep watch on every system. Automated alarms and centralized monitoring save time and provide an opportunity to correct problems before they cause outages.

At Emmis Communications in New York City, we depend on a large Burk Technology ARC Plus installation to monitor 12 transmitters at four sites and to provide control and alerting for the multiple levels of redundancy required in the number one market in the United States.

Our system consists of six ARC Plus chassis, 10 Plus-X IIU input units, 13 Plus-X ICRU relay units, 10 PlusConnect interfaces and one Plus-X EM32 environmental monitor.

We continually upgrade the system and have a policy of adding as much control and telemetry as possible at all sites to minimize trips to the transmitter for minor issues. We have one computer running a centralized AutoPilot installation with a master status screen giving an overview of all sites, along with drill-down pages for transmitters and other subsystems. Alarm thresholds, status alarms and email notifications are configured to keep the engineering team apprised of issues without creating nuisance alarms. Macros running on the units may alter thresholds or mute alarms based on operational conditions.

All of our sites are on our company WAN, with critical sites having redundant IP paths via microwave radio and landline connectivity. New equipment purchased is evaluated for network capability and purchased with any cards or modules needed to allow SNMP capability.

Recently we upgraded the ARC Plus and AutoPilot installation to implement the new Warp Engine polling service

along with the SNMP Plus module. Warp Engine allows us to select a subset of channels that will be reported at a drastically faster polling rate. We have used this to improve the update times on critical channels such as transmitter power outputs and AM antenna parameters so we can observe if there are transient events or instability that might not be visible at a slower polling rate.

We have become heavy users of SNMP for equipment management. As our traditional broadcast systems converge with enterprise information technology, we take advantage of the rich data provided by SNMP and reduce installation complexity by eliminating discrete logic and telemetry wiring.

An example of the usefulness of SNMP is in UPS systems. Every rack at our transmitter sites has a UPS and an auto-transfer PDU that serves to bypass the UPS in the event of failure. These devices provide a full-featured SNMP MIB that includes parameters such as line voltage, current and frequency on all inputs and outputs, battery charge, temperature and age, and fault alarms and warnings. I have seen more stations taken off the air by UPS failure than by any other



device. With SNMP we can proactively monitor the status of this equipment, plan battery replacements, along with tracking the last date of testing without having to log into a web interface on each unit regularly.

The broadcast equipment industry

has embraced SNMP on many newly-released products. Devices such as codecs, microwave STL radios, RF wattmeters and even the new Nielsen multichannel encoding monitor provide access via SNMP. A small amount of time spent working with the MIBs for these devices can eliminate a large amount of discrete logic wiring and hardware input/output devices, and provides information far more detailed than could be obtained in the past. The Burk SNMP Plus package allows the mapping of native Burk telemetry and status channels to SNMP OID values to permit the user to set thresholds and alarms based on that value as well as to map Burk command channels to SNMP SET commands. Burk still offers the PlusConnect line to provide easily-configured connectivity to SNMP-enabled transmitters and other major devices, but the new SNMP Plus option opens up the world of SNMP management to any device.

We are pleased with the Burk Technology system and the company's commitment

to routinely improve the product and have found it to be the ideal solution for our control and monitoring needs.

For information, contact Matt Leland at Burk Technology in Massachusetts at (978) 486-0086 or visit [www.burk.com](http://www.burk.com).

## TECHUPDATE

### WHEATSTONE READS THE AUDIO NETWORK

Wheatstone says that in today's connected world, getting a quick read of any audio source, destination or stream in the WheatNet-IP audio network is as simple as dropping in an app like the company's IP Meters GUI.

The IP-MTR64 Meters GUI lets users display an almost limitless array of metering and analysis for checking audio levels, signal density or even FFT readings at any point in the network.

Users determine how many in are in the "wall of meters" and where and what to meter: console inputs, mic outputs, the satellite receiver, studios, web streams, etc. A separate analysis window allows users to view one audio stream in a variety of informative ways including FFT, 3D plot, oscilloscope, energy vs. frequency and spectral dynamic range. Plus, meters can detect silence, so users can see if an audio stream has gone down and where.

The style of metering can be curved, horizontal or vertical bargraph, and for reading peak levels, average levels and peak over average levels. Set up one or two bright VU or PPM meters for instant loudness verification of on-air studios from across the room, for example, and add five or 10 or 30 side meters for checking levels of players and mics feeding those studios. Combined with Wheatstone's build-your-own control interface app, ScreenBuilder, this metering app can be used to monitor and help control signals and elements throughout the network.

For information, contact Wheatstone in North Carolina at (252) 638-7000 or visit [www.wheatstone.com](http://www.wheatstone.com).



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## TECHUPDATES

### INOVONICS INTRODUCES FM/HD-RADIO MONITOR/RECEIVER

The new Inovonics INOmini Model 639 FM/HD-Radio Monitor/Receiver replaces the popular 632 model, adding features and functionality while maintaining the compact INOmini package, the company says. It is available and shipping from stock.

Inovonics says that the INOmini 639 provides enhanced features needed for monitoring FM and HD Radio stations, and adds more processing power.

Additional features include simultaneous RDS and HD PAD data logging via USB and Windows software; improved FM RDS decoding; independently adjustable analog/AES output levels; adjustable alarm thresholds for low signal, audio loss and output polarity; additional signal metrics for SNR, multipath and HD level; always displays available HD programs; and displays additional HD PAD data such as slogan, FCC ID, album, transmit gain, and more. The 639 is field upgradeable for firmware updates via USB.

Inovonics adds that the 632 is no longer available for sale but warranty and repair services will be honored for the product. Inovonics products come with a three-year factory warranty and after-sales service.

For information, contact Inovonics in California at (831) 458-0552 or visit [www.inovonicsbroadcast.com](http://www.inovonicsbroadcast.com).



### DAVICOM RELEASES FIRMWARE AND DAVLINK SOFTWARE

Davicom has released firmware and software representing its third generation of SNMP-compatible software. Both the SNMP and built-in SNMP manager are upgraded.

The enhancements refine functionality of the unit's SNMP interface by adding decimal representation of readings, hexadecimal comparison of bit strings and octet strings as well as engine ID validation for the secure encrypted version of SNMP (V3).

Davicom's versatile unit-to-unit commands can now be used without SNMP community names. A unit can send smart commands to a remote unit by Ethernet, telephone or via a two-way radio link.

Besides SNMP enhancements, the firmware allows continued compatibility with Gmail's new authentication processes, ensuring access to Gmail servers for Davicom unit alarm transmissions.

The distance readings obtained by Davicom's DVLD lightning detector can now be used in math functions to create precise thresholds and prevent false alarms. The detector was a recipient of the Radio World "Best of Show" Award at the NAB Show in 2015.

For information, contact Davicom in Quebec at (418) 682-3380 or visit [www.davicom.com](http://www.davicom.com).

### DEVA BAND SCANNER 2 ANALYZES FM BAND, MORE

DEVA Broadcast says its Band Scanner 2 FM analyzer builds on the features its original Band Scanner. The Band Scanner 2 measures RF level, MPX deviation, left and right audio levels as well as RDS and pilot injection levels. During a campaign, the device stores measurements in a log file. Users can then convert them easily into KMZ format and visualize in Google Earth.

The system features MPX, pilot and RDS deviation meters; external composite MPX and RDS input; a built-in stereo decoder; 12-channel GPS receiver; RDS and RBDS decoder; RDS/RBDS group detector and analyzer; RDS/RBDS stream BER meter; and RDS/RBDS data logger

In addition, Band Scanner 2 lets operators visualize the playlists of competitor stations and subsequently save and export them in an Excel file. It also compares signal strength to competitors and other stations.

Band Scanner 2 features a pocket size USB-powered box and requires no external power supply.

For information, contact DEVA Broadcast in Bulgaria at 011-359-56-820027 or visit [www.devabroadcast.com](http://www.devabroadcast.com).



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**TECHUPDATES**

**AXEL'S WOLF WATCHES OUT FOR FM SIGNALS**

Axel Technology's Wolf Log24 is designed for FM signal monitoring. The system lets the broadcaster receive up to 32 channels via an internal FM tuner. Each RF tuner performs a complete analysis of RF, MPX, RDS, RDS data static-dynamic services, audio and audio streaming.



Users can access data, alarms, and audio remotely using PCs, tablets and smartphones, and the system's alarms are delivered to four different network management systems via SNMP and email.

The LCD front panel and LEDs allow snapshot viewing of the control parameters. Wolf Log24, which the company points out, is developed with the latest technology, offers 24/7 audio logging/recording and long-term archiving for content monitoring and history browsing. Wolf Log24 also records audio feeds coming from the built-in RF antenna input and stores data on the local SSD drive (usually 30/60/90 days as per law requirements), while the newest recordings automatically overwrite the oldest ones.

Additional features include embedded web server for management and supervision: SNMP V2, HTTP and FTP supported; signal analysis modules: RF, MPX, audio and RDS; and double Ethernet ports and USB interfaces.

For information, contact Axel Technology in Italy at 011-39-051-736-555 or visit [www.axeltechnology.com](http://www.axeltechnology.com).



**BW BROADCAST OFFERS SINGLE-BOX MONITOR**

BW Broadcast says that its latest release, the ModMon Encore, combines technology from its award-winning receivers with lab reference-grade audio processing to create a box capable of analyzing both FM and baseband signals.

ModMon Encore comes with two identical tuners, which allow comparison of two radio stations with instant DSP cross-fading. In addition to two DSP tuners, there are two multiplex inputs that enable audio processors to be compared. The front-panel LED metering provides modulation, measurements and comparison between the two sources.

The company says that anyone working with FM or MPX signal will find the product useful and easy to use. Receiving both RF modulation as well as FM signal in one unit makes it easier to make adjustments and prevent overmodulation. Features of ModMon Encore include FM, MPX and RDS decoding, metering and analysis; monitoring two FM frequencies and/or two MPX inputs simultaneously with one button analysis; "Always on" front-panel high-resolution LED meters offer full confidence metering of the FM and composite signals; and remote control with IP streaming (HTML5, FTP, Telnet, SNMP and RS-232) allowing for monitoring and control of the processor from anywhere in the world, even listening over an IP connection.

BW Broadcast describes the ModMon Encore as stylish and intuitive. It comes with a 10-year warranty.

For information, contact BW Broadcast at (888) 866-1612 or visit [www.bwbroadcast.com](http://www.bwbroadcast.com).

**UNITED STATES POSTAL SERVICE**  
**Statement of Ownership, Management, and Circulation**  
**(Requester Publications Only)**

1 Publication Title: **Radio World**  
 2 Publication Number: **3066**  
 3 Filing Date: **9/27/2016**

4 Issue Frequency: **Bi-Weekly with additional issues in February April June August October and December**  
 5 Number of Issues Published Annually: **32**  
 6 Annual Subscription Price: **Requester**

7 Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4)  
**NewBay Media L L C  
 28 East 28th Street 12th Floor  
 New York, NY 10016-7959**  
 Contact Person: **Kwentin Keenan**  
 Telephone: **703-852-4604**

8 Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer)  
**NewBay Media L L C  
 28 East 28th Street 12th Floor  
 New York, NY 10016-7959**

9 Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank)  
 Publisher (Name and complete mailing address):  
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PS Form 3526-R, July 2014 PSN 7530-09-000-8855

13 Publication Title: **Radio World**  
 14 Issue Date for Circulation Data Below: **September 28, 2016**

15 Extent and Nature of Circulation

|  |  | Average No. Copies Each Issue During Preceding 12 Months | No. Copies of Single Issue Published Nearest to Filing Date |
|--|--|--|---|
| a Total Number of Copies (Net press run)                                       |  | 5813   | 67  |
| b Legitimate Paid and/or Requested Distribution (By Mail and Outside the Mail) | (1) Outside-County Paid/Requested Mail Subscriptions Stated on PS Form 3541 (Include direct written recipient, telemarketing and internet requests from recipient paid subscriptions including normal rate subscriptions, employer requests, advertiser's proof copies and exchange copies.) | 5257   | 6006  |
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| f Total Distribution (Sum of 15c and 15e)                                      |  | 5681   | 65  |
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18 Signature and Title of Publisher, Business Manager, or Owner: **Executive Vice President, Video/Broadcast Division**  
 Date: **September 27, 2016**

I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties)

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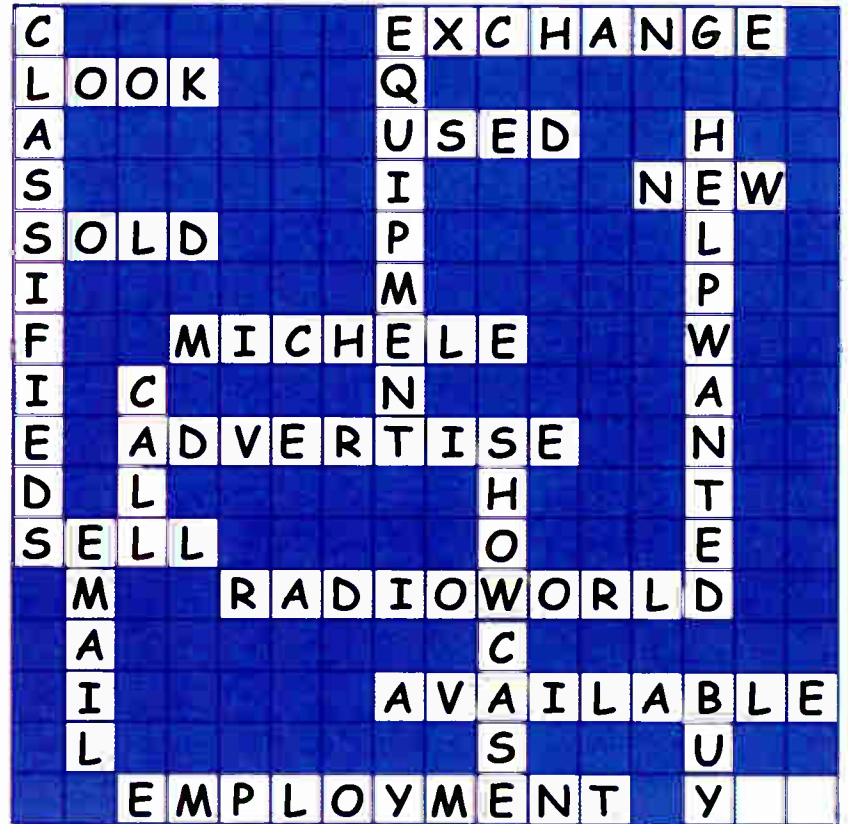
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READER'S FORUM

AM REVITALIZATION

Re: "Alliance Engineers: First Do No Harm," May 11 issue:

Jeff Littlejohn writes from the vantage point of working with owners of 50 kW clear-channel Class A stations. The commentary is written by the iHeartMedia lobby. It paints a drastic, one-sided story regarding interference. The AM Radio Preservation Alliance equates increases in power with increases in overall interference without offering to lower their own 50 kW flamethrowers and without mentioning that power lines are already interfering with Class A stations in these areas.

If, as they state, utility bills and interference are the real issues, clear-channel stations should take their own iHeartMedia-approved advice from the desk of Jeff Littlejohn and lower their power to 10 kW. This would clean up the AM band drastically. And save them a ton on their power bills.

The fact remains there is already environmental interference to Class A stations in these areas, between ultra-fringe contour areas 0.1 mV/m and 0.5 mV/m, and they are limited by physics and should be granted coverage protections only inside their actual, listenable coverage area of 0.5 mV/m as a Class A AM station. They do not require interference protection in ultra-fringe locations at a distance of 300 miles from their AM tower.

Our EAS network is not built on picking up barely listenable signals from 300 miles away; in fact, much of the EAS backbone is retransmitted by FM. Complaining that people are living in ultra-fringe areas should not negate the right of small 1,000 W AMs from upgrading to 5 kW to serve their rural markets.

A 50 kW flamethrower will never have relevance from a 300-mile distance and will never need a protected contour at their 0.05 mV/m contour. Truth being told, a balanced approach with some moderate power increases will greatly serve the AM band.

Please see our filing on the FCC's AM Revitalization NPRM at <http://tinyurl.com/h49sfqx> for more information.

Andrew Palmquist  
KKXX(AM)  
Butte Broadcasting Company Inc.  
Chico, Calif.

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ANALOG AND DIGITAL ARCHIVES

Re: "The Future of Digital Radio Archives," Aug. 3 issue:

I have a unique combination of analog and digital media storage: It is a collection of 7- and 12-inch vinyl and CDs!

Fig. 1 shows some of the various artists CDs and a rack of processing equipment I use to listen to the music. More devices are on shelving, not shown. Fig. 2 shows more CDs and a partial view of the 7-inch vinyl. Not visible is the 12-inch single and LP collection behind and to the left of the boxes. (Contrary to popular belief I do not collect reams of paper.)

Fig. 3 shows how one box can contain up to 150 CDs. The boxes contain CD singles. Full-length CDs are on shelving. Fig. 4 shows a small portion of additional 7-inch 45 RPM vinyl.

I made efficient use of the small amount of available space. The total number of CDs is approximately 15,000; I never counted the vinyl. The CDs are cataloged in a database on the computer. Bulky, yes. Modern, no.

Thomas G. Osenkowsky  
Brookfield, Conn.

The author is a Radio World contributor.



**READER'S FORUM**

**AM REVITALIZATION II**

Dave Dybas ("AM Revitalization Questions," RW Sept. 1) stated that he had "always wondered why the local Class D station had to shut off at sunset and allow a station 900 miles away to come booming in."

The answer lies with the laws of physics: that station 900 miles away will come booming in regardless, severely limiting the local Class D station's coverage, probably to only a few miles from the transmitter site.

Combine that with the nighttime interference on the same channel caused by dozens of other local Class Ds scattered about the country, and we would end up with the remaining AM band sounding just like the "graveyard channels" at 1230, 1240, 1340, 1400, 1450 and 1490 kHz, with no station having nighttime coverage beyond the immediate metropolitan area of its city of license or in some cases even reaching the city limits. It's not unheard of today to be able to see the lights on an AM tower beyond the nighttime range of the station.

One of the major problems with the band dates to the 1950s when the FCC mindlessly expanded the number of AM licensees while the fledgling FM band was allowed to remain all but fallow. Small and medium-sized towns with one or two AM stations back in the mid-1950s now have a half dozen or more radio stations, AM and FM combined. Most are struggling financially simply because there isn't enough radio advertising revenue to go around. Add to that the congestion on each of the AM channels, and it's easy to

see why the band appears to be in need of "revitalization."

The vast majority of radio listening these days is in the car; many American homes no longer even have a radio. Despite our increasingly mobile habits, it is often impossible to drive any substantial distance, particularly at night, and keep the same radio station tuned in for the entire trip, unless you happen to be in the earshot of one of the Class A AM blowtorches. That may explain why Joe Public is streaming music or playing CDs right now. Class A stations with quality programming and unlimited nighttime coverage would fill in a gap untouched by FM.

This opens the discussion to another major problem: programming content. I agree that it is wasteful use of spectrum to tune across the AM band at night and pick up the same talk show or other satellite feed on multiple frequencies from multiple distant cities. The public would be better served with fewer AM stations, greater protected coverage with the Class As and greater diversity of programming by all classes of stations.

Also, the FCC should make a greater effort to actually enforce existing Part 15 and Part 18 rules limiting interference from consumer and industrial electronic devices, power lines and other sources of harmful interference to radio reception, while taking measures to limit the importation of offending devices into the United States in the first place.

*Donald Chester  
AFIRF Consulting  
Woodlawn, Tenn.*

**MENDELSON AND FREQUENCY COORDINATION**

After reading Judith Zissman's story "NFL Frequency Coordination Is All Grown Up" (RW Sept. 1), I was put strongly in mind of my late friend Steve Mendelsohn, who from 1999–2011 was the Game Day Coordinator for the New York Jets.

He was the coordinator who uncovered the New England Patriots videotaping controversy in 2007, by detecting and locating the wireless camera that was transmitting coaches' signals from an unauthorized location. That story was mentioned a lot as background during Deflategate because it drew large fines for the Patriots' coach and the team itself, and made a lot more people aware of the duties of a GDC.

Steve also served as communications director for two Super Bowls and was the communications director for the New York City Marathon since its founding nearly 40 years ago, a somewhat daunting challenge since not only are there many competing RF sources surrounding the marathon, but they're all moving through an urban environment full of RF.

Steve famously described the GDC process as an effort to "park 230 cars in a parking lot built for about 100," and he loved that challenge. He was a man who lived broadcast and RF — as a coordinator, as a ham radio operator (N2ML), as a former U.S. Navy cryptologist and as a broadcast systems engineer at both CBS and ABC Television. Steve won an Emmy for his design of the telecommunications and satellite system that made ABC's January 2000 "Millennium Around the World" broadcast possible.

Steve left us in 2012 after a brave fight with pancreatic cancer.

*Scott Johnson, KS3J  
New Bern, N.C.*



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**5.0 meter motorized sat antenna CALL**

**Sizes: 1 to 5 meter sat antennas CALL**



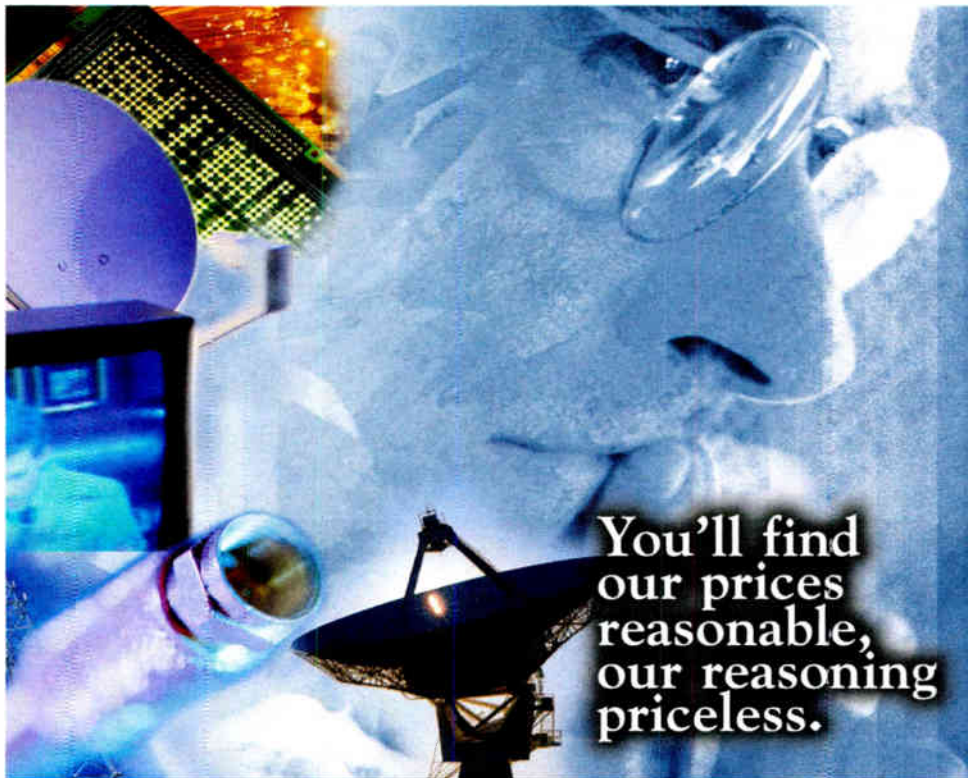
4.2m dish & galvanized mount  
Mount new dish on existing cement pad with basestand.



4.5m antenna with backside heater panels



High-wind rated antenna features massive steel mount. Pictured antenna resides in harsh environment of mountaintop overlooking Denver.



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

We can help you choose the best SATELLITE and FIBER OPTIC products to suit your needs. Our advice can help you get what you need, without paying for features you won't need. DAWNco high-gain satellite antennas will give you great reception, and our top-grade LNBs will optimize the reception quality of your finicky digital channels. Check out our web site, or give us a call today.



**DAWNco**

www.DAWNco.com • PHONE 248-391-9200 • EMAIL sales@DAWNco.com

**PREVENT SIGNAL OUTAGES IN WINTER**

Winter can be bad for reception of satellite signals. Snow and ice can pile onto your dish, which can cause a shift in the focal point and extra signal attenuation. Block the winter snow pile-up with DAWNco covers and heaters, and keep your signals strong.

**COVERsat** for protection under most conditions. Heavy vinyl cover is wrapped over the front face of your dish, to create a steep slippery surface that will prevent accumulation of ice & snow.

**COVERsat for 3.0m dish \$399 other sizes... CALL**



**HEATsat** completely stops snow outages. Electric HEATING system arrives as a kit for customer installation on a new or existing satellite antenna. Kit includes custom sized sheets of heater matting, plus sensors for precipitation and temp.

**HEATsat for 3.0m dish \$2400 other sizes... CALL**

**TOP-GRADE LNBs for C & Ku BAND**

Try our new generation of LNBs, and watch for improved EbNo readings on your digital satellite receivers. Mandatory upgrade for HD and 8PSK satellite channels. Best-specs for "gain compression" and "phase noise." Stability rating of ±2 KHz will prevent video picture tiling and signal outages when outdoor temps fluctuate.



**C band LNB, high grade \$219**

**C band LNB, best grade CALL**

**Ku band LNB, best grade CALL**

**LNB SIGNAL ROUTING TO SATELLITE RECEIVERS**

Signal wires from dish to receivers will converge on your new rack-mounted unit. When receivers are locked to one LNB, choose the splitter. When receivers need to switch between LNBs, choose the selector switch.

**SPLITTER: 2 LNBS each feed up to 5 receivers, #DIVINSUP CALL**

**INPUT SELECTOR: Up to 16 sat receivers can each select from four LNB inputs #SELECT-516R CALL**

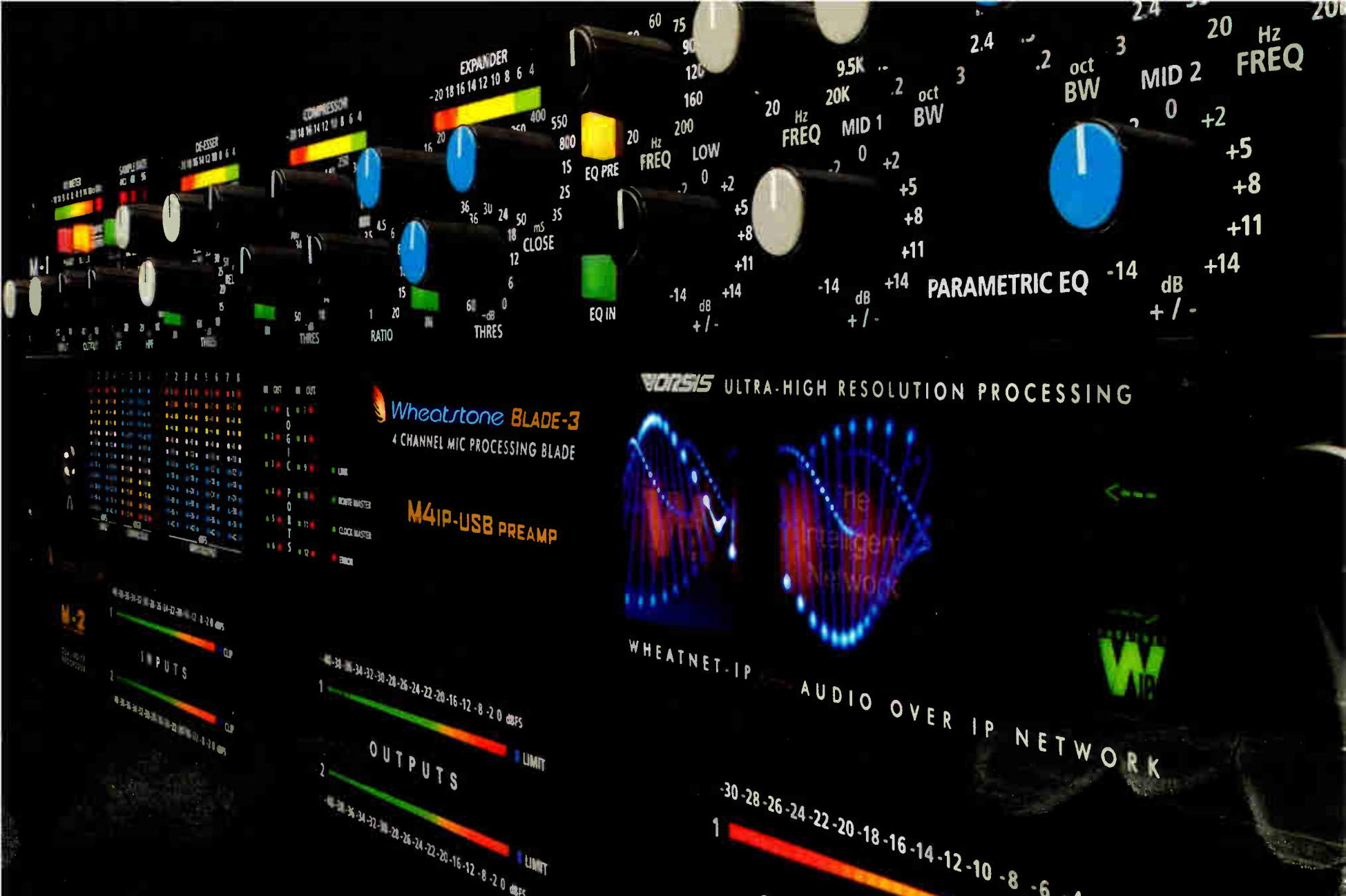


**SATELLITE RECEIVER & DECODER FOR MPEG2 & MPEG4**

All of the features you need for broadcast quality satellite reception. The D5500-IRD is a receiver and decoder for SATELLITE L band input, or IP input. Capable of decoding MPEG4 & MPEG2 with 4:2:0 profile. Compatible with DVBS or DVB-S2, and QPSK or 8PSK. Outputs are baseband A/V and ASI, plus SDI and HD-SDI. Cross convert utilizing a built-in format converter. Embedded 8 channel audio, and Dolby AC3.

**MPEG2/4 Satellite Receiver CALL**





## Make Them Sound Great

Push your talent's voice beyond the limits and dominate the airwaves

Wheatstone Voice/Mic processors give you everything you need to make voices grab listeners by the ears.

For our SQ (Super Quiet) mic pres, we emulated and hot-rodded legendary studio preamps to sound incredible for modern radio.

Our compressors, limiters, & EQs are maximized for vocal smoothness, allowing your talent to stand out on-the-air.

Wheatstone's Graphical User Interfaces give you deep, intuitive control to tweak our world-class presets and save those you create.

The result? Voices that can sound superhuman.

### Wheatstone M-Series Voice/Mic Processors

M-1: single channel with knobs and buttons • M-2: dual channel with multiband compression • M4-IP USB: four-channel networkable BLADE-3

Learn more at [wheatstone.com/superhuman-voices](http://wheatstone.com/superhuman-voices)

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World Radio History