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“Wow, Wow!”

Rick Hunt, Vice President & Director of Radio Engineering, Entravision Communications Corporation

“Considering the LX-24’s attractive good looks, modularity, traditional console layout and functionality, I can’t wait to get my hands on one!”

Greg Landgraf, Senior Engineering Manager, Corus Radio Western Canada

“A high performance, reasonably priced, great looking console integrating common sense features such as overload indicators for meters and ergonomic controls. Very impressive and well thought out.”

Benjamin Brinitzer, Regional VP Engineering Clear Channel Media & Entertainment

“By far the most elegant and feature rich control surface on the market. The attention to detail and functionality is remarkable. Its architecture, such as “hot swappable” modular design, is a winner. A traditional meter bridge is appreciated by users and your millwork guy will appreciate the fact that it’s a table-top design.”

Kris Rodts, Director of Engineering, IT & Facilities, CKUA Radio Network

“Wheatstone’s innovation continues to make AoIP a viable product for professional broadcasting facilities. Just a few things that make the LX-24 stand out to me are the clear and decisive metering, individual fader modules, and “out of the box” thinking with faders for the headphone and monitor volume controls instead of rotary knobs.”

Phillip Vaughan, Chief Engineer KFROG, CBS Radio



“Leave it to the exquisite design talents of Gary Snow and the Wheatstone team to really hit the nail on the head. The LX-24 is not only the most functional, feature-laden IP based console for radio, it also raises the bar for the finest ergonomic radio command center on the planet.”

Tim Schwieger, President / CEO, BSW - Broadcast Supply Worldwide

“I didn’t think Wheatstone could improve upon the E-Series of consoles, but they have done it with the new LX-24. This is a beautiful, well designed console and the individual faders, integrated meters with overload indicators and low profile table-top design make this a must have for our facilities.”

Michael Cooney, Vice President of Engineering & CTO, Beasley Broadcast Group, Inc.

“Cool and sexy (I sound like Bruno from Dancing with the Stars). A great addition to the WheatNet-IP family.”

Norman Philips, Vice President of Engineering, Townsquare Media

“I am very impressed with the sleek new design that incorporates single channel-strip architecture, integrated metering and stereo cue speakers in a thin, sloping chassis that needs no cabinetry cut out. Well done.”

Erik Kuhlmann, Senior Vice President of Engineering, Clear Channel Media + Entertainment

“Wheatstone continues to hit balls out of the park and this year they did so again with the LX-24 control surface. This new product marries the best of the old (modular design architecture) with the new (Audio-over-IP). Continuing in that theme was a Wheatstone module that marries their bridge router system to the new “BLADE” audio-over-IP system. This has the potential to extend the life of bridge router facilities indefinitely.”

W.C. Alexander, CPBE, AMD, DRB, Director of Engineering, Crawford Broadcasting Company

“The LX caught my attention on the NAB Show floor. The look, form and function are unlike any other IP console available today. The easy-to-read buttons and displays are just second to none, not to mention the most bang for the buck. I can’t wait ‘til I have the opportunity to deploy my first LX.”

Anthony A. Gervasi, Jr., Sr. Vice President Engineering & Technology, Nassau Broadcasting



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Senate Confirms Clyburn for Second FCC Term

The Senate voted unanimously late Jan. 1, 2013, to confirm Mignon L. Clyburn for a second term at the Federal Communications Commission. Clyburn completed the term of Commissioner Jonathan Adelstein when he took a position at the Agriculture Department. Clyburn was nominated

as a member of the Federal Communications Commission on June 25, 2009, and sworn in August 3, 2009. Her term ran until June 30, 2012. Her new term is retroactive to July 1, 2012, and runs until June 30, 2017.

Commissioner Clyburn has received a number of honors and awards,

including being selected as the 2006 James C. Bonbright Honoree (awarded by the Southeastern Energy Conference, Terry College of Business at the University of Georgia) and receiving the 2007 Lincoln C. Jenkins Award for business and community contributions presented by the Columbia (SC) Urban League.



NIELSEN ACQUIRES ARBITRON

Nielsen Holdings has signed a definitive agreement to acquire Arbitron. The transaction has been approved by the boards of both companies and is subject to customary closing conditions, including regulatory review.

"U.S. consumers spend almost two hours a day with radio. It is and will continue to be a vibrant and important advertising medium," said Nielsen Chief Executive Officer David Calhoun.

With Arbitron assets, Nielsen intends to further expand its Watch segment's audience measurement across screens and forms of listening.



Dennis Sloatman has been hired as the director of engineering for the Clear Channel Los Angeles radio group.

He has worked in broadcasting for 43 years. He earned a bachelor of science in engineering at the University of Central Florida.

The National Association of Broadcasters is accepting entries for the 2013 NAB Crystal Radio Awards. Established in 1987, the Crystal Radio Awards recognize radio stations for their year-round commitment to service to their communities. Entries must be re-

ceived by Jan. 31, 2013. Finalists will be revealed on Feb. 25, 2013. Winners will be announced and the finalists will be honored at the NAB Radio Luncheon held April 9 during the 2013 NAB Show in Las Vegas.

Clear Channel Media and Entertainment will donate WDTW-AM Detroit to the Minority Media and Telecom Council (MMTC) through the MMTC-Clear Channel Ownership Diversity Initiative, an ongoing program to expand ownership, mentoring and training opportunities for minorities, women, and other underserved groups. The MMTC also uses the donation to drive revenue for the advocacy non-profit to fund its works.

Nautel Modernizes Maine Manufacturing Facility



Nautel held a ribbon-cutting ceremony to launch an extensive upgrade to the company's manufacturing facility in Bangor, ME. Updates to the facility include a new Trumpf TruPunch 3000 metal punch and a new 90-ton, eight-axis press brake.

"This plant has been in steady operation since it opened in 1975," said Nautel Director of Customer Service Kevin Rodgers, who is also one of Nautel's owners. "Over that time it has produced a large volume of transmitters for the US and international markets. Our ISO certified Bangor facility builds products of the highest quality."

Products made in Bangor include XR, NV and J1000 broadcast transmitters, navigational beacons and NOAA Weather Radio transmitters. Plant manager Charlie Drillen reports that the Bangor plant is also building the NX25 and NX50 AM.

Pictured are Nautel facility manager Charlie Drillen, Bangor, ME, Mayor Nelson Durgin, and Nautel owners Kevin Rodgers and George Wayne celebrating the ribbon cutting with the employees of Nautel Maine.



FIND THE MIC AND WIN!

Tell us where you think the mic icon is placed on this issue's cover and you could win Hosa HDC-800 headphones. Send your entry to radio@RadioMagOnline.com by Feb. 10, 2013. Be sure to include your guess, name, job title, company name, mailing address and phone number. No purchase necessary. For complete rules, go to RadioMagOnline.com





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Resolutions You Can't Break



We always joke about it, and we're often guilty ourselves: Make a resolution or two the evening of Dec. 31 and by Jan. 3 you've already broken it. The usual resolutions about eating better, exercising and losing weight come and go, but how about a resolution you can keep? Your personal well-being is important, but here are some resolutions I know you can fulfill.

Take a class. In our annual salary survey, a common response to the question "What would you do to improve your job?" relates to education and training. Many engineers say their employers won't provide or pay for classes or training in technology. I'm sure this is true in some cases, but it's also possible the training could be covered, but the question is never asked.

And if the classes aren't covered, why not take the class on your own? There are many outlets offering education for career advancement, including the SBE, community colleges and technical training centers. Find one that fits your needs and register.

Don't have the time to take a class? Make the time. We're all busy, but chances are you can carve some time somewhere and take the class.

And don't limit yourself to IT or broadcast-related technology. Learn a foreign language. Take a class in photography. Take a class in sales or management. Just take a class. Education is always worth it.

Protect your hearing. I'm fortunate that my hearing is still very good. I haven't always taken the best care of my ears. I've been to loud concerts. (Are there any quiet concerts?) I've worked around loud blowers. I play in several bands. In the last few years I have stepped up my efforts to protect my hearing going forward.

I've worn the foam earplugs to concerts for many years. I don't like how they affect the sound, but I would rather listen to a muffled band and protect myself than enjoy 90 minutes of music a few times. I have thought about getting custom ear plugs with a flatter response curve to reduce the entire spectrum evenly instead of just killing the highs and slightly reducing the lows. Custom-molded plugs are not cheap, but they last a long time. If you're serious about your hearing, look into a custom set. I often see exhibitors at the AES convention offering free molds, which reduces the cost.

I recently found a less-expensive alternative. I bought a pair of EP3 plugs from a company called Surefire. These tout a more linear reduction across the band. They also say they don't affect sound below 85dB, but kick in above that level. I keep a pair in my saxophone case now, because I always sit in front of the trumpets or trombones. They're not as linear as a custom set, but they are better than the foam plugs. I have also seen plugs from Earasers, but I have not tried them yet.

At least wear the foam plugs when you can. Keep your hearing as long as you can.

Be seen. Too often, a station engineer hides out in the shop or at the transmitter site. Returning to our salary survey, some responses said the engineer doesn't get the respect he deserves. There are many reasons why this could be, but one reason should not be because the engineer isn't part of the station team.

Walk through the station every day. Know all your coworkers, and know how what you do affects them. When possible, help them understand what they do also affects you.

Here's to a successful 2013. **0**

Chriss Scherer
Chriss Scherer | Editor

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

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



on-air feed as the trio traversed the winding roads of Perth. How did it all work out? Absolutely flawlessly – the show went on without as much as a speed bump!

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by Jeremy Ruck, PE

Testing Antennas with a Network Analyzer

No doubt one of the most revolutionary tools for the RF side of broadcasting was the advent of the network analyzer. Prior to its invention, measuring the response of an antenna system was more or less limited to using a bridge or vector voltmeter, a swept spectrum analyzer with return loss bridge, or the reflected power meter on the transmitter. Each of these methods had limitations that were ultimately eliminated with the network analyzer.

Using a bridge or vector voltmeter, while reasonably accurate at measured frequencies, was very time consuming. Graphical interpolation between the measurement frequencies often induced substantial error in the measured data, although this was less of an issue for FM antennas and shorter line runs. Spectrum analyzer methodologies are quicker and provide greater resolution and less error, but are unable to present the entire story. You may be able to determine that a problem exists; however, where that problem is located typically remains a mystery. Finally, using the reflected power meter to tune an antenna is an absolute no-no. While the transmitter meter is useful for noting changes, this methodology is wholly unsuitable for any meaningful adjustment, and can mistune the antenna substantially enough to result in a combustible failure.

ANALYZE THIS

Network analyzers come in two flavors: scalar and vector. The scalar network analyzer provides essentially the same information as a swept spectrum analyzer with a return loss bridge, and is thus not as robust a tool as its big brother the vector network analyzer or VNA. Vector analyzers measure both magnitude and phase of the response, from which all of the important other data formats can be mathematically calculated.

The basis of the calculations in the VNA is S-parameters. S-parameters work by characterizing a network, in this case an antenna or RF system, through the use of matched loads instead of open and/or short circuit conditions. It is much simpler to characterize a resistive load across a wide range of frequencies than it is to accurately represent a true open or short circuit condition. For broadcasting applications we typically are interested in the S11 and S12 cases. The S12 case arises when examining the insertion characteristics of filters or combiners, and is the response looking from port 1 through port 2 of the system. The S11 case is the response when the reflected signal at the input is compared to the incident signal, which is the measurement mode used when viewing what is seen by the transmitter.

The stock VNA will usually only provide information in the frequency domain. A plot in the frequency domain will have frequency on the horizontal or X axis and the magnitude of a particular quantity on the Y or vertical axis. So just off the shelf we can easily view formats such as VSWR, return loss, the linear magnitude of the reflection coefficient, and phase. When the magnitude and phase are combined, we are able to look at polar return loss and the Smith chart. These latter two formats will qualitatively indicate which end of the system a problem is occurring. Indeed with some experience this information can be gleaned from the Cartesian VSWR and return loss plots. The problem of course is where exactly in the system is the problem occurring?

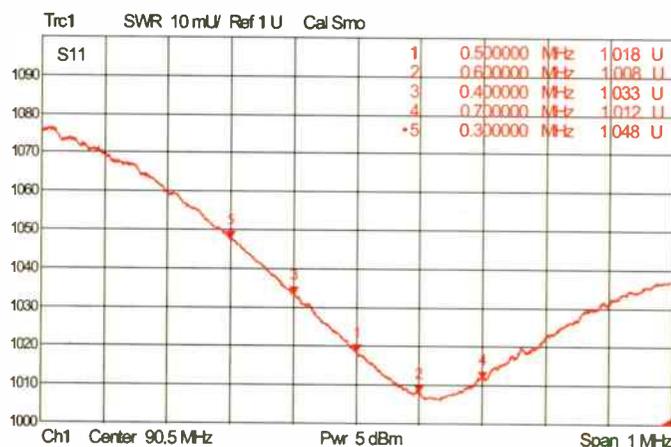


Figure 1. Frequency domain VSWR of an FM antenna.

The time domain option available on most modern vector analyzers solves this issue. In the time domain mode, the horizontal axis of Cartesian plots becomes time, while the vertical axis remains in terms of magnitude. Since it takes a finite amount of time for a signal to propagate through a transmission line, a particular “time” of interest is directly relatable to distance down the line. The time domain information is mathematically generated through the application of the inverse Fourier transform to the magnitude and phase acquired at each individual swept frequency. The result is that through the proper selection of measurement frequencies, an issue in a system can be located with very good accuracy.

To adequately depict the condition of an antenna system both the frequency and time domain must be considered. Frequency domain data provides a view of what the transmitter is actually seeing. The time domain data allows anomalies in the transmission line and the magnitude of the far end reflection, which was very important in analog television, to be quantified.

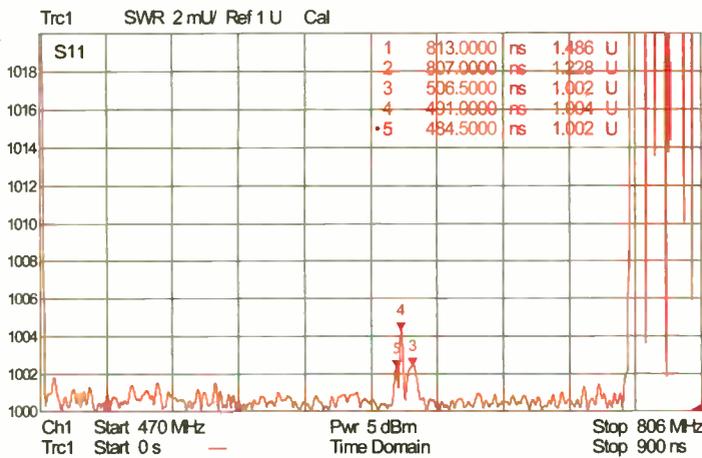


Figure 2. Wideband time domain VSWR of an FM antenna.

BEING ANALYZED

Since using a network analyzer is a mature process, there has been plenty of time to develop techniques to adequately characterize an antenna system. Both manufacturers and consulting engineers have contributed to this process. Although you will typically see variances in the plots presented, most operators familiar with an analyzer's use will tend to follow a certain pattern in the data they acquire.

When sweeping an FM system I will typically look at the VSWR and return loss across a 1MHz span centered on the carrier frequency as well as across the entire FM band. These techniques illustrate the system response

within the occupied bandwidth of the FM channel in detail as well as illustrate that the system truly has the minimum VSWR near the frequency of operation and not somewhere else in the band. The frequency domain plots are then rounded out with either a polar return loss or Smith chart across 1MHz to demonstrate a decent match is occurring at both ends of the system.

Following these measurements, I switch over to the time domain to illustrate the condition of the transmission line. Under this technique a transformed span of 100MHz width is utilized as is a wider span of around 350MHz. Both spans will illustrate the magnitude of reflections at connectors, while the wider span will actually illustrate deformations to line or in the case of rigid line the standoff insulators in a stick. Normally the VSWR at these locations should be 1.008 or less.

To wrap up, the plots illustrate a portion of the data acquired during the recent checkout of an FM antenna system. Figure 1 illustrates

the frequency domain VSWR of the antenna system across 1MHz centered on the frequency of operation. Figure 2 illustrates the wideband time domain VSWR of the system. Figure 1 illustrates that the carrier VSWR is 1.02, and demonstrates that within 500kHz either side of the carrier a value of 1.10 is not exceeded. It should be noted that the minimum VSWR lies a little above the carrier frequency, which is preferable in areas where antenna icing can occur. The time domain plot illustrates three small reflections near the midpoint of the transmission line. These anomalies are due to a slight deformation of the transmission line resulting from routing around an existing antenna. The maximum VSWR in this area of 1.004 is most acceptable, and is less than that which would typically result at the connection of two transmission line flanges. This plot does not illustrate regular repetitive flange reflections, which is consistent with the fact that the transmission line was semi-flexible coaxial cable.

The network analyzer is without a doubt one of the most elegant pieces of test equipment. It is undeniable that having your system initially and regularly swept is an expense. That expense is, however, good insurance, and will in the end be less costly than unscheduled system repairs. **Q**

Ruck is the principal engineer of Jeremy Ruck and Associates, Canton, IL.








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by Lee Petro

Marijuana and Trolls and Translators

Unless you live in Colorado or Washington, chances are you paid little attention to those states' ballot initiatives legalizing marijuana.

However, if you are a broadcaster in either state, or in those states with medical marijuana laws on the books, advertising relating to the distribution of marijuana may seem like a new revenue stream. But you might want to think again.

Currently, there are 18 states that permit the possession and use of marijuana in some form. In some states, the use of marijuana is limited by the amount that can be grown by an individual. In other states, "compassion centers" have been created where it is possible to purchase marijuana-infused products. Most recently, Colorado and Washington passed ballot initiatives that made the possession of small amounts of marijuana legal, without a requirement that the drug was being used for medicinal purposes.

The response by the federal government has been relatively consistent. On several occasions, the Department of Justice has sent letters to state agencies reaffirming the DOJ's position that marijuana is considered a Schedule 1 drug, and, until this is changed at the federal level, the DOJ will enforce its laws. On the other hand, in December 2012, President Obama indicated that the feds have bigger fish to fry and did not see enforcing the federal laws as a top priority. The question for broadcasters is whether they

should accept advertisements from entities advertising marijuana-related messages in those states where it is legal.

Broadcasters hold a license to use spectrum regulated and authorized by the federal government. In light of the DOJ's interpretation that the federal laws apply regardless of the state-based initiatives, it would appear that the prudent course for broadcasters would be to avoid taking these advertisements in the near future.

In fact, last year, the DOJ sent letters to media outlets in California that had aired advertisements of medical marijuana centers. More recently, in Washington, the DOJ reaffirmed that the state laws would not extend to federal lands (think Mt. Rainer National Park) or those places that receive federal funds (think Central Washington University, which receives millions in federal research funds).

In light of the upcoming renewal cycle for the western states, it would make sense for broadcasters to avoid the potential challenge to their renewal based on advertisement of a substance the federal government classifies with LSD and heroin.

BANISHING THE TROLLS

In the July 2012 edition, I discussed the pending patent dispute regarding Mission Abstract Data and the radio broadcast industry. Mission Abstract Data, now Digimedia, has been contacting radio broadcasters, alleging that stations were using a technology for which the company held a patent.

In response, the radio broadcasters had requested a re-examination

of the underlying patents, and the Patent Office subsequently rejected several claims. Following that initial action, the radio broadcasters sought further re-examination providing additional evidence they believed to undercut the patentability of Digimedia's technology.

In December 2012, the Patent Office issued two office actions, which essentially rejects the other claims for both patents. While Digimedia may seek reconsideration, these recent actions, along with those taken last summer, may be sufficient to undermine Digimedia's aggressive licensing approach.

FM TRANSLATOR FILING WINDOW

In April, I discussed the FCC's new approach to pending FM translator applications, and the need for applicants who filed numerous applications to select which ones they will prosecute. In December, the FCC tweaked its FM translator rules, increasing the nationwide limit from 50 to 70 stations, and the local cap from one to three stations, both under certain circumstances.

In light of these modifications, the FCC is ready to move forward and process long-pending FM translator applications. To that end, there will be a filing window from Jan. 10 to Jan. 25, 2013, during which parties subject to either the national or local cap will need to file specific showings for those applications they intend to prosecute. These showings must also make the showing that the application's grant would not preclude future LPFM licensing opportunities, as established by FCC in its March 2012 rulemaking. 

Petro is of counsel at Drinker Biddle & Reath, LLP. Email: lee.petro@dbr.com.

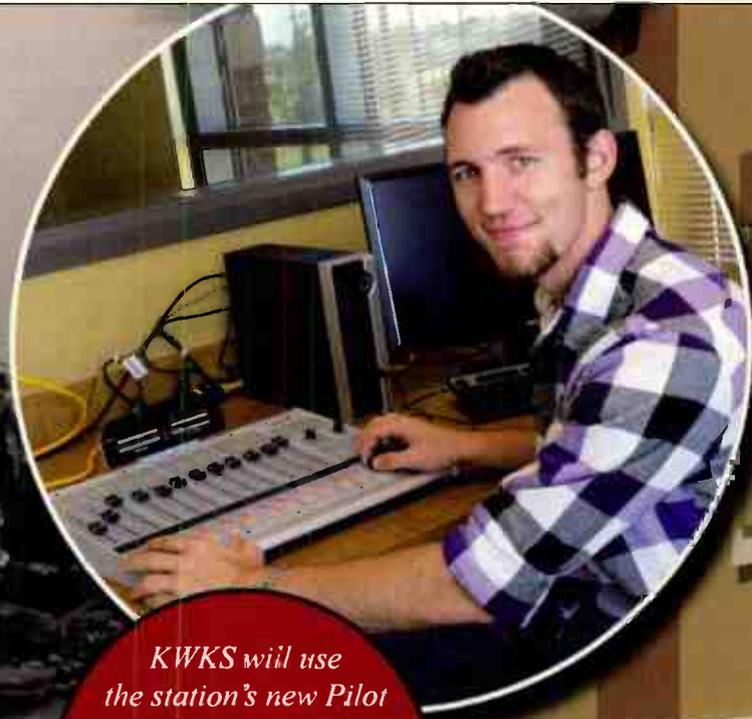


DATELINE

Jan. 15: Stations in Kansas, Nebraska and Oklahoma run last license renewal pre-filing announcements.

Feb. 1: Stations in Kansas, Nebraska, and Oklahoma file License Renewal Applications and EEO Program Reports, and noncommercial radio stations file Ownership Reports (323-E). Commence running license renewal post-filing announcements, continuing on Feb. 16, March 1 and 16.

From Devastation Comes New Opportunity



KWKS will use the station's new Pilot console to create internet radio programming and provide real-world training for high school students in the region.

The Media Center is proud to work alongside Logitek to lead the industry in modern technology and education.
- Grant Neuhold,
KWKS

On May 4, 2007, an EF5 tornado 1.5 miles wide leveled the town of Greensburg, Kansas. More than 95% of the buildings in the city were destroyed in the storm. As they began the arduous process of rebuilding their town, the people of Greensburg decided to build a modern, comprehensive media center to house the city library along with a new radio station and TV instruction studio. Now ready to go on-air, KWKS Media is offering video and audio instruction to regional students along with internet radio content.

Logitek is proud to be part of Greensburg's new media center and congratulates the city on its beautiful restoration and "can-do" spirit.

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The design initiative behind the LX-24 was to create the world's finest control surface. The result is a console that redefines the entire genre. The LX-24 is an intelligent surface that can store and recall all your settings. Its totally modular design lets you configure it exactly as you like - you can even hot-swap modules at any time without having to reconfigure.

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The LX-24 is advanced in ways that can make a HUGE difference in your capabilities. But it's also immediately familiar to anyone who has ever sat behind a board at a radio station. Use it to make your programming the best it can be. Just plug it into your WheatNet-IP Intelligent Network - with it, and the BLADES across the page, you can, dare we say it, rule the world.

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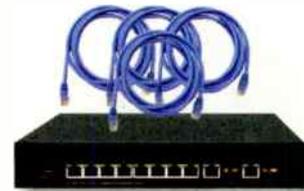
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WHAT TO DO WITH HD RADIO



If eight years ago (when HD Radio transmission facilities really started springing up around the country) you had asked “How will HD Radio fare in 2013?” the answer would likely have seemed more positive than what has, in fact, been achieved. We all know that. The multicast capability seemed like it was going to be the “killer app,” at least for a while. From the perspective of eight years away from the original installations, what can we say has become the most important use of HD Radio capability? Even up to 10 or 12 years ago, the capacity to add another program channel—essentially a whole other radio station—would seem fantastic to many radio station programmers; however, we all know because of various circumstances (which I won’t address) that capability (which I will refer to as jukebox) is not a selling point for HD Radio. What, then, are other things you can do with an HD Radio facility?

LEASING THE FACILITY

Superficially at least, the HD Radio multicast capability would seem to be a natural extension of the kinds of services previously served with SCA; I’m unaware of any organization making that change successfully though. However, there are broadcast organizations that use HD Radio multicast capacity to extend their network footprints. More than two years after I first wrote about them. Hum Desi radio is still on the air in New York (though it has moved to 97.1 HD2 from 98.7 HD2). Hum Desi bills itself as “The largest south Asian radio network in North America” and is broadcast in at least four other large markets: Los Angeles, Chicago, San Francisco and Washington.

There has been a trend over the last five or so years for non-commercial FM stations to double-up in their communities, buying another station, with the intention of placing a music format on one station, and a news format on the other: WNYC and WQXR in New York come to mind as one example. Alternatively though, some stations have placed one format on their analog transmission, while putting the other on a digital multicast. WWFM (Mercer County Community College) in Trenton, NJ, is a perfect example of a broadcast organization making use of HD Radio multicast capability to extend its reach in this fashion. WWFM is the flagship station of “The Classical Network” that can be heard in the western part of New Jersey and the eastern part Pennsylvania. However, it has extended its coverage area beyond the range of its own facilities by leasing multicast space on other stations. “The Classical Network” can be heard on the HD2 channel of WKCR in New York, and

(besides the jukebox)

By Doug Irwin, CPBE DRB AMD



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WKVP in Philadelphia. WWFM also has a jazz format known as JazzOn2 heard on the HD2 channel of three of Mercer's other stations: WWNJ, WWJ and WWCJ (as well as the HD2 of WWFM). I have previously written about the methodology used by Mercer for distribution of their programs.

Northwest Public Radio (based at Washington State University in Pullman, WA) provides yet another example of this type of network distribution. Its network extends as far east as Lewiston, ID, and as far northwest as Forks, WA. Some of its main (analog) channels carry the news service, while the same station's HD2 carries the classical service; some are the other way around, with classical on the main, and news on the HD2. Program distribution is via satellite; uplinking is in conjunction with Colorado Public Radio. The two program services are hauled between Pullman and Denver with T1 connectivity. Both are uplinked, and each NWPR site has a digital satellite receiver (from ICP) with local storage on-board, giving each site the ability to insert localized information, such as the station ID, and even local weather.



A Garmin GPS with HD Radio traffic data.

FEEDING FM TRANSLATORS

Stories about the use of HD Radio to feed FM translators have been in the industry news for about the last five years. A letter from the FCC to ROI Broadcasting from May of 2010 clearly states the commission's position on such use.

Probably the most interesting example of using HD Radio in this fashion is from Hochman Hawaii Media, in Honolulu. Hochman's KORL-FM (101.1) uses its digital transmission capacity to feed three translators: K268BE (101.5); K246BR (97.1) and K298BA (107.5). All three are at the 250W level, with a HAAT of 1,680'. Each has a different music format. Additionally, its station KPHI (1130 KHz) now appears on translator K244EO, another 250W facility.

The topic of FM translators (how to get a C.P.; how to develop a site; and finally, how to license one) is a topic of its own, but it would not be wise for a station, on the outside chance that it might be able to translate a multicast program to an FM channel, to build an HD Radio facility based on that reason alone. That would truly be the tail wagging the dog.

DATA TRANSMISSION: THE KILLER APP?

If you look at HD Radio objectively you see it basically as a means to

transmit data, and interestingly, where HD Radio seems to have won out is in its ability to disseminate data over a wide area (proportional to a stations power and coverage area obviously). Whereas the likes of Seiko (going back pretty far), Bonneville, and more recently Microsoft's MSN Direct (all of which used SCA) have come and gone, HD Radio is gaining traction most effectively in data transmission. Let's take a look at a couple of large organizations taking advantage of this capability.

The first one is the Broadcaster Traffic Consortium. The BTC is a group of 20 different broadcast companies, including Emmis, Entercom, Cox, Lincoln Financial Media, Beasley, Townsquare Media, NPR, and others. This joint venture is spearheaded by Paul Brenner, the CTO of Emmis Communications. The BTC's stated mission is to unify the radio industry for the delivery of nationwide HD Radio data services; to improve HD Radio system standards; to lead industry regulation and policy to support the advancement of HD Radio transmission; and finally, to build business value for HD Radio.

The BTC system begins with the collection of data by a given source such as Navteq. The system is a TCP-based client-server model with SaaS (software as a service) capability, fulfilling the server function for providing the data source. Nokia is the data aggregator for highly advanced, automated services for location-based data and commerce, traffic, weather, and map-related services. It automates the data collection and formatting for RDS-TMC (Traffic Message Channel), HD/TMC and HD/TPEG; those messages are then sent via the public Internet to member stations for broadcast. The BTC and Nokia have collaborated to build capability into the HD Radio Importer so they can operate more efficiently and consistently on the station side of operations.

According to Brenner, "[The] BTC has performed proof of concept capability of HD Radio data services with e-reader companies and automakers (independent of our efforts with Nokia). FM/HD broadcasting is a highly efficient and economical solution for delivering mass-market data to high volumes of consumer devices. We continue to look for opportunities to make HD Radio data services a business solution where perhaps, satellite or mobile broadband were the only two considerations."

The other large traffic distribution service is Total Traffic Network (which is a subsidiary of Clear Channel Media and Entertainment). TTN services more than 100 markets in the United States, Canada and Mexico, providing traffic data to more than 3,000 radio stations, in addition to 200 television affiliates.

The traffic information comes from 20+ local operations offices; the operations staff is trained in traffic data aggregation and use a combination of resources including (but not limited to) real-time flow data from several partners, DOT cameras and sensors, Aerial and Mobile traffic spotters, proprietary cameras, social media and traffic Tip Lines. All of that information is entered into TTN's software platform called TrafficNet. TrafficNet can be accessed via the Internet from any location, and has the ability to sort and filter the information by type, time, region and severity. This information can be classified primarily in two categories: flow alert data and speed data. Flow alert data typically defines an average speed across a linear segment of TMC locations in a particular direction at a given time. Speed data typically defines an average speed found at a single TMC location at a given time. TrafficNet collects congestion data from providers, translates the data into a common data schema, aggregates it temporally, spatially, and finally, generates a flow alert feed ready to be consumed by various applications.

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TrafficNet is, however, independent from the distribution means inside of Clear Channel. Servers at the CC facility in Cincinnati pull data from TrafficNet, format it for RDS-TMC, HD/TMC, as well as HD/TPEG, and send it to the targeted stations via the CC WAN. Once the messages arrive at a studio facility, they're forwarded over the LAN to the appropriate RDS encoders, and/or HD Radio importers.

HD-TMC gives stations a huge increase in the number of messages that can be transmitted with respect to RDS-TMC. TPEG messages allow for even greater granularity than TMC messages.

RESOURCES

Hum Desi Radio
humdesiradio.com

FCC Letter to ROI Broadcasting
hraunfoss.fcc.gov/edocs_public/attachment/DA-10-764A1.pdf

BTC
radiobtc.com

Navteq
navteq.com

TPEG
tisa.org/technologies/tpeg/

HD RADIO-BASED TRAFFIC INFORMATION

You may ask, "Are there receivers in the field that use this data?" The answer is yes. Garmin's Nuvi 3490 features Garmin Guidance 3.0, which gets its data via HD Radio. Kenwood makes at least two different units: the DNX6190HD and the DNX9990HD. JVC makes at least three after-market HD Radio receivers that receive and interpret traffic info: models KW-NT3HDT, KW-NT500HDT, and KW-NT800HDT. A company called Cydle offers its T43H with GPS and traffic supplied via HD Radio. Pioneer offers the AVIC-Z140BH.

The 2014 Outlander from Mitsubishi will be the first vehicle to have real-time traffic information integrated into its navigation system. This was just announced at the 2012 Los Angeles Auto Show.

It would be unrealistic to judge the success or failure of HD Radio simply based on the jukebox capability, which hasn't resonated with listeners—at least not yet. However, as you have read, there are other, less-well-known facets of HD Radio that make it viable. If you work for a station that is still on-the-fence with respect to HD Radio, I urge you to consider all of its capabilities while making your decision. 

Access this article at RadioMagOnline.com for links to mentioned articles. Irwin is transmission systems supervisor for Clear Channel NYC and chief engineer of WKTU, New York. Contact him at doug@dougirwin.net.



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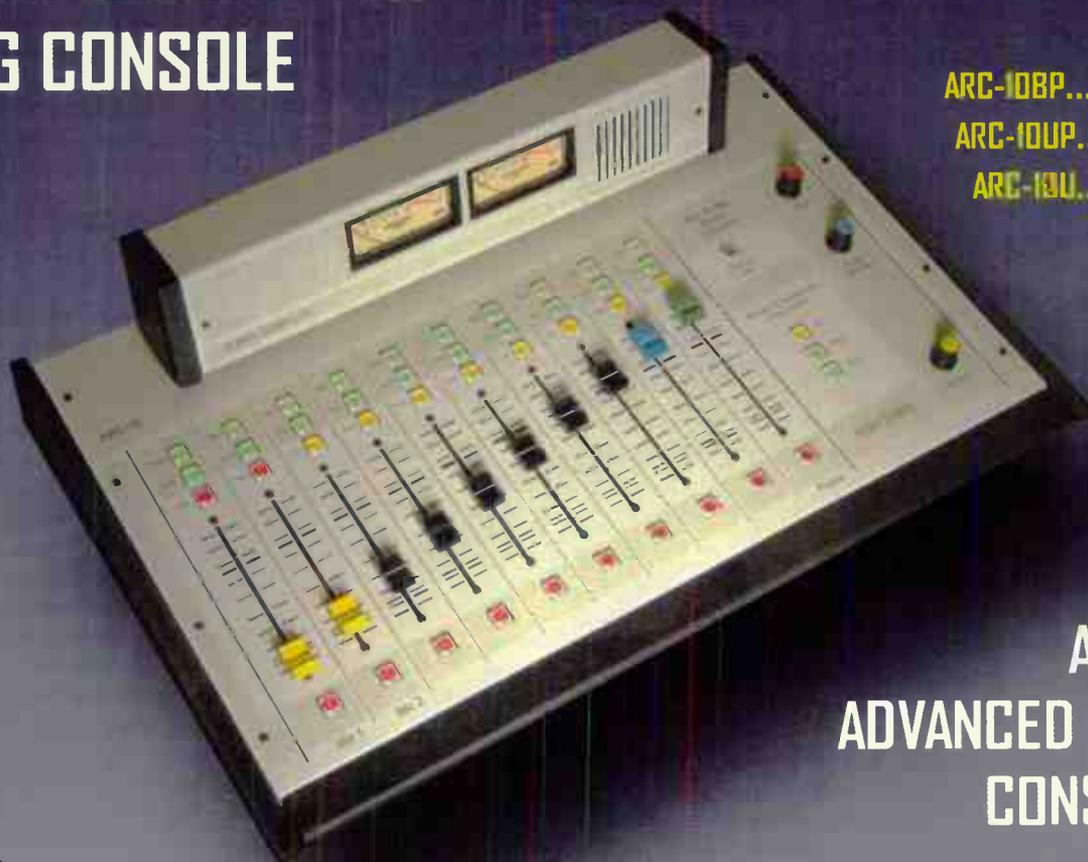
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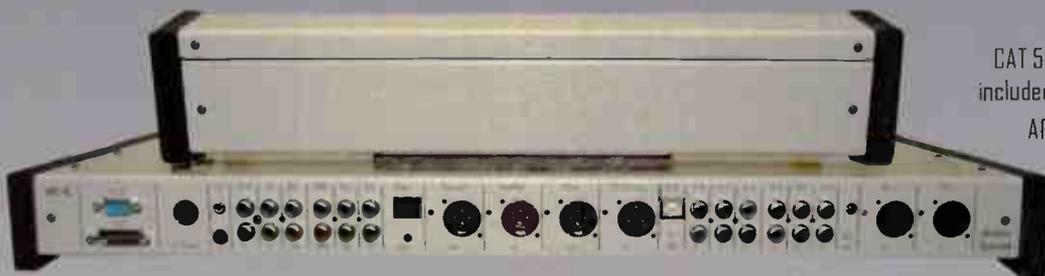


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The ARC-10UP with unbalanced inputs and PC sound card built in is displayed above. The ARC-10U has unbalanced inputs without a sound card. The ARC-10BP has balanced inputs with the PC USB sound card

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JENNiRADIO: For Kids, By Kids

KALY-AM 1240 in Albuquerque, NM, provides a home for the syndicated kids show.

By Max Smart



KALY-AM 1240 in Albuquerque, N.M., launched in December 2010 with the youngest radio station owner in the United States. At 14, when she took her JENNiRADIO - For Kids ... By Kids music format to air on KALY, Jennifer Smart already had eight years of experience as a nationally syndicated talk show host, first on the Family Tech Show, and then on the Smart Family Show and Online Tonight. Jennifer created the JENNiRADIO music format to reach tweens and teens, and with encouragement from industry veteran David H. Lawrence XVII and Bob Perry, decided to extend the format from its online home to a terrestrial broadcast station of her own.

After a nationwide search, we settled on a former Disney Radio station in Albuquerque, which offered the benefit of a good market rank (#68)

and convenient access to Los Angeles, where Jennifer does a lot of red carpet interviews with celebrities. Because the station had been dark for 10 months, we faced some challenges in getting it up and running again. Nevertheless, we bought it during the fall 2010, integrated the Disney equipment we had acquired with our own equipment, secured FCC approval by December, and finished up just two minutes shy of our Dec. 18 on-air deadline for JENNiRADIO.

THE FACILITIES

We didn't acquire a studio facility along with the station purchase, so we went with what we had: a hut standing in the middle of a field in northern Albuquerque. With some help from independent engineers, I built a station that would support not only Jennifer's production and

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Lily Massari 760-650-1427 Latin America
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broadcast work, but that of the Jennifer Smart Foundation's Find Your Voice program, which gives a voice to local kids by putting them on the air.

In the studio Jennifer uses E-V RE-20 mics, as well as Sennheiser MK4 studio condenser mics, along with a Behringer Powerplay Pro headphone amp. We have used PreSonus VXP voice processors for a long time, largely because we felt they dealt very well with the sing-songy quality of kids' voices and the extremes of quiet and loud we get while recording them. The processors don't have automatic gain control, but they have a de-esser, compressor, equalizer, limiter and expander, so we have been able to get the levels and control we needed, and to keep Jennifer's voice relatively level. We still love them today, though they're no longer made. She has used them since the beginning, and we still have four or five that, eventually, we'll need to replace.

We use iMediaTouch for automation, and it has worked well for us. Like the PreSonus units, this is a tool we've worked with for nearly a decade. We originally learned about it through David Lawrence,

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The Nautel transmitter was part of the station's equipment inventory.

and we saw it in action at CNET, which used iMediaTouch for a San Francisco Bay Area radio station it ran in the 2000s. I had friends working there, so once we got into the broadcast business ourselves, we knew that we'd have people who could give us a hand with the system. Being computer people, we also liked the look of it and thought it would look great with our studio décor.

Most labels are giving us AAC-encoded music now, and it doesn't make sense to go from compressed to decompressed and back. It's just too lossy, so we'll look for AAC support in iMediaTouch and other automation systems when the time comes to upgrade. We'd also like to take advantage of auto-ducking, not just because Jennifer does a lot of voice tracks, but also because visiting kids' voices can get lost when laid over a heavy song intro.

For a while we used the console that came with our Radio Disney purchase, but we quickly outgrew it and moved up to a 12-fader Audioarts Air-3 board. What we missed, however, were the inbound monitoring capabilities: the ability to monitor the production before the delay, after the delay, and the air feed. To accommodate the Air-3's single monitor input, we added a switch for all the monitoring.

When we installed the Air-3, all the inputs were RJ-45. With my background in computer science and networking, I'm not always familiar with conventional audio routes and wiring, but I can Ethernet all

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FACILITY SHOWCASE



The PreSonus VXP voice processors

day long. In fact, the evolution of broadcast standards to a foundation of CAT5 networking made the facility build fairly straightforward. The studio depends on CAT5 cable and RJ-45 connectors. As all the cables hub into the Air-3, rewiring is much easier.

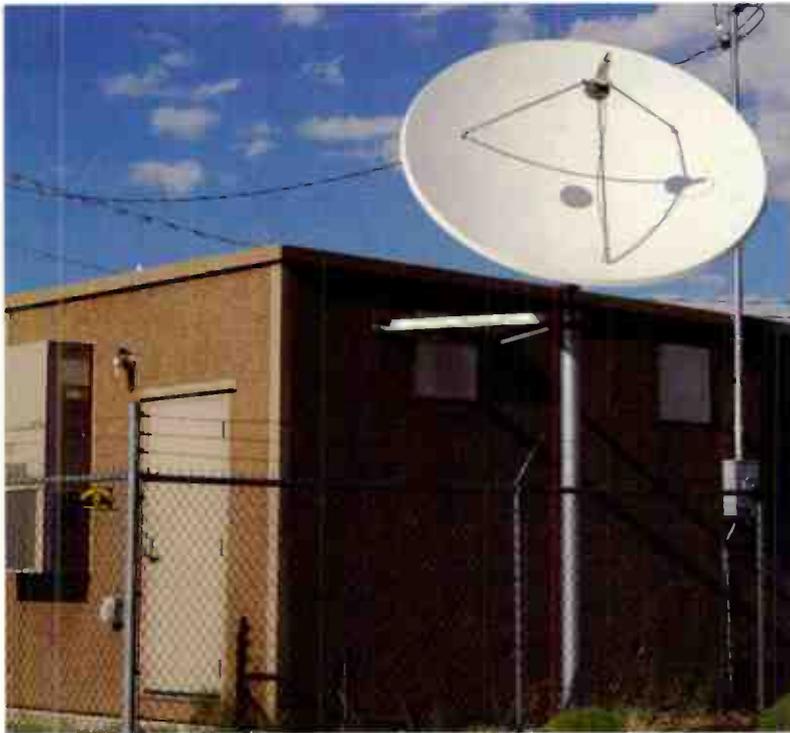
THE EQUIPMENT

We use an Eventide BD500 delay and a Digital Alert Systems EAS. Most of the equipment we got from Disney was in immaculate condition, even though some had been around a long time, but one thing we needed to upgrade was the EAS. We moved from an older unit, which had paper jams and illegible printouts, as well as incompatibility with changing government standards. We opted for a four-channel DASDEC-II radio encoder/decoder, which let us replace everything, including the external receivers, because it has integrated radios. Now, even if government requirements are a moving target, we can upgrade our EAS through a simple software update. That's what really attracted us to Digital Alert Systems and the DASDEC system. The ability to log in from anywhere on my iPad or iPhone to see what messages we received and to send the weekly test has an amazing benefit, especially with travel taking us away from the station so often.

Outgoing signals are fed through an Orban Optimod-AM 9200 digital audio processor and delivered to a 1kW Nautel ND1 AM transmitter. Though Disney had installed a Jazz 1000 for HD Radio, we went analog-only because we just liked the sound better. We generate all of our own programming right now, so we really don't use the dish and receiver we acquired from Disney. However, for a short time we carried nationally syndicated programming for overnights, and during that time we used an XDS receiver and our existing automation to control our satellite switching.

For our remote broadcasts, we tried one of the main IT transport companies and its inexpensive box, but we just could not get it to sound right for us. So, instead we bought two Mac mini systems, taking one with us and leaving the other back in Albuquerque, set to auto-answer. We run the systems' audio chat, the Mac minis negotiate the "call," and the local system puts us on the air. This way we get better quality and more reliable operation than we achieved with

The transmitter building and the (now) unused satellite dish.



other products that cost twice as much. We aren't using it 24/7, so it meets our needs well. For regular remotes with one or two people, we did look at Skype and iPhone/iPad clients, but we have a small staff, and the Mac mini auto-answer solution is sufficient—and simple, once it's set up the first time.

The studio we put together is relatively simple, yet it has helped Jennifer not only to meet the demand for tween/teen music and celebrity interviews, but also to raise the profile of her "Find Your Voice" program, which gives kids the chance to improve their communication skills and self-esteem by sharing their stories on the air. We plan to build on this success and expand the program through the construction of another studio in the Los Angeles area. **0**

Smart is the talent/technology manager for JenniRadio.

EQUIPMENT LIST

- Audioarts Air-3
- Behringer Powerplay Pro
- Digital Alert Systems DASDEC-II
- E-V RE-20
- Eventide BD500
- iMediaTouch
- Mac mini
- Nautel ND1
- Orban Optimod-AM 9200
- PreSonus VXP
- Sennheiser MK4

FACILITY FOCUS

Sennheiser MK4

The MK4 is Sennheiser's first large-diaphragm studio microphone. This true condenser microphone offers fine resolution and outstanding sound quality. It features a 1" true condenser capsule based on the acoustics of the famous Sennheiser e 965 high-end vocal mic, optimized for recording. The MK 4 comes in a full metal housing, is easy to handle and excellent value for money, making it an ideal choice for professional project studios and home recordists. Despite its affordable price, the MK 4 is made in Germany! Its transducer is manufactured in the same clean room as all high-end Sennheiser condenser capsules. Due to its affordable price the MK4 is



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by Doug Irwin
CPBE AMD

Fix it in a Pinch with On-hand Parts

It's easy to find yourself in a pinch sometimes—you need a part, or some device, and there just aren't any resources at hand (at least not immediately). Here are some ideas for using on-hand parts in some fashion other than what they were originally intended for.

The transformer trick: In this instance, all you have is a voltage send that corresponds to a status output, but what you really need are two pulses—one that happens when the voltage first comes on, and one that happens when the voltage goes off. See Figure 1. The basic idea is this: When you run a dc current through a transformer winding, two things happen. The first is that you generate an impulse voltage in the secondary winding when the current starts (magnetic field created). The second is that you generate another impulse in that same winding when the current ends—but opposite in polarity (magnetic field collapsing).

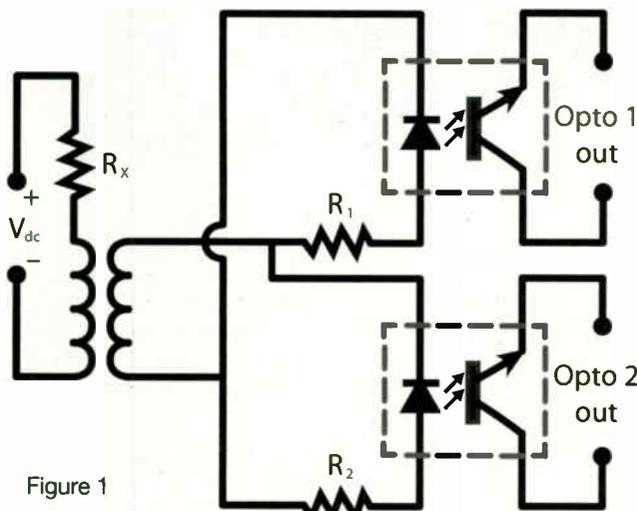


Figure 1

The pinch solution: Now in this pinch, you're going to also need two opto-isolators. Those are pretty common. (Steal two of out of some other equipment if your pinch is really urgent). Tie the inputs of both devices to the secondary of the transformer, but wire them in opposite polarity. One open collector will then activate when current starts to flow in primary, and the other will activate when the current stops. This will take a little bit of experimentation, by the way; limit the current flow through the primary with a resistor, getting just enough of an impulse to activate the optos. This could be one of those rare instances that you fire up the good old oscilloscope to see the generated impulses.

The diode trick: How many times have you needed a wall-lump dc power supply only to find some around that are too high in their output voltage? Clearly too high is better than too low but you can't just connect one that is too high to your device, because almost any device will have a voltage regulator supplying power to the circuit board, and those devices are only designed to dissipate so much power. If you run too high of a voltage in, the on-board regulator might immediately pop or it might burn up trying to regulate too high of an input voltage (from the wrong power lump) down to its working voltage.

The pinch solution: The voltage from the lump you found is too high. What do you do? Well, your friend the diode can come in very handy here.

See Figure 2. Now recall that each diode, when conducting, typically has a forward voltage drop of around 0.7Vdc. When you put them in series you of course multiply the number

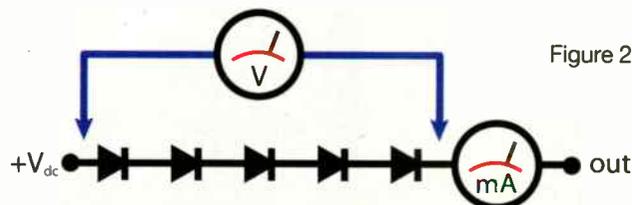


Figure 2

$$\text{voltage drop} \times \text{current flow} = P_w (\text{total})$$

$$\frac{P_w}{\# \text{ diodes}} < \text{diode power rating}$$

of diodes you found (let's say five) by 0.7Vdc for your total voltage drop. (When you solder five diodes together it qualifies as a kludge, but hey, this is a pinch, right?) When first implementing this trick, though, you'll need to quickly measure the current flow through the system, and then shut the device off. Do a quick calculation on the power dissipation. If you had 200mA of current flowing, then the power dissipated is 140mW per diode. Do a quick online check (hopefully your Internet access isn't what your trying to make work) and see if that falls inside the acceptable range for that particular diode. 1N400x type diodes can typically do at least 1W.

The extra op-amp trick: This one is just common sense but sometimes when in a pinch (in the middle of the night at some transmitter site) perhaps you wouldn't think of it. I had a microwave receiver die on me one time—of course at that transmitter site (in the middle of nowhere) I had no spares. Or did I?

The pinch solution: A quick consultation with the manual showed that the mux output and the composite output used the same IC. The station wasn't using the mux, so I opened the receiver, yanked that IC out of the mux circuit, and stuck it in the composite output circuit. Problem solved, parts ordered for the next visit. **Q**

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Tech tips may be suitable to earn SBE recertification credits. Send your tips to radio@RadioMagOnline.com.

Irwin is transmission systems supervisor for Clear Channel NYC and chief engineer of WKTU, New York. Contact him at doug@dougirwin.net.



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Deva Broadcast SmartGen Mini

by Barry Thomas, CPBE DRB CBNE

Deva Broadcast is a Bulgarian company that produces many RDS products gaining popularity in the United States. The hallmarks of its products so far have been their small size, powerful features and reasonable price. The SmartGen Mini fits well within this metric.

This scaled-down version of the full-sized SmartGen 5.0 is a full-featured RDS encoder for remote transmitter sites. Deva's comparison chart (devabroadcast.com/RDS) explains the most salient differences between the SmartGen 5.0 and the SmartGen Mini are front-panel control, LED display, and a GPI for enabling TA. The SmartGen Mini can be driven with ASCII or by the native language of RDS encoders, UECP. The encoder is programmed and controlled through the USB port or via IP (TCP, UDP) through a dedicated application. There is also an internal Web page where some of the basic functions can be managed, such as dynamic PS and group sequencing.

The Encoders Manager application (which runs on Windows) is designed to manage multiple encoders, such as with a station cluster, or in European terms, a national network.

Encoder characteristics are backed up in XML files, but individual encoder RDS data programming is saved as data sets, which allows a configuration to be propagated to multiple encoders. For those not fully versed in RDS, all the settings might seem a little overwhelming, but using the software makes it fairly easy to figure out. Settings within the application are divided among on-screen tabs: Hardware, Basic RDS, Advanced RDS, and an embedded console interface (no need use a separate telnet session).

PICK UP THE TAB

The Hardware tab is self-explanatory. The network settings and address, site name, and UECP Port speed/method is set on this page. The setting for loop through or sidechain mode is an easy drop-down selection (as opposed to a physical jumper).

On the Basic RDS tab, the PI code, static PS, the AF list and RT entries PTY selection can be set. There are a couple of nice tools on this page. One is the PI Code calculator. The NRSC-4A (RBDS) standard stipulates that a station's PI code be derived from the station call letters. By entering the call letters in the provided field, the SmartGen Mini software will automatically populate the PI field with the appropriate value. Another nice tool on this page is a mock-up of a Kenwood

KDC-DAB41U car radio. This helps to demonstrate the effect of RT or PS changes on a consumer display.

On the Advanced RDS tab, settings like injection level and phase, TA controls, and the encoder connection methods are set. There is actually a whole lot happening on this page. The Phase and Level can be changed by double-clicking on the values. Phase in degrees and level in millivolts (assumed to be P-P). By clicking the active check box, one of six reference levels/phase settings can be employed instantly. The SmartGen Mini has a way to address one of my pet peeves: Clock signal (CT). The NRSC RDS Usage Guideline (NRSC-G300) recommends that stations do not send CT in the RDS stream unless the encoder is provided with a synchronized clock reference. Unfortunately, some stations send this data but do not keep up with the clock setting on their encoder, so the displayed time is wrong. The SmartGen Mini provides the option not only to set or unset CT, but the encoder can be selected to sync its internal clock to an Internet time source. I'm not sure what servers the encoder polls, but I found the time to be accurate. It can also be set to sync its clock by the computer when connected with the encoder application.

The SmartGen Mini encoder has five native methods to connect, front panel USB, two ports

DEVA BROADCAST

855-428-7272
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of TCP and two ports of UDP. It seems apparent that the device is intended to exist on the public Internet receiving data or configuration from multiple sources without needless exposure to hacking. On the Advanced RDS tab the port IDs and access rights are set. With choosing access rights, a particular UDP port can be set to a non-standard IP Port ID, and access to any of the data and configuration settings can be enabled or disabled through the port.

RDS Programming gets a little more involved on the Advanced RDS tab. This is where multiple data sets are laid out; where the individual RDS data components are selected and repetition rates are scheduled. If ODA groups are being sent (i.e., traffic data or song tagging). There is a useful spinning wheel diagram that can show how repetition rates, time slots and delay times will affect the amount of useful data that is sent every 60 seconds.

Although UECP is the native communication protocol for RDS encoders, many,

including the SmartGen Mini can also accept ASCII text for a scrolling PS, RadioText or other data. Using its application, a port is configured to accept data for the appropriate part(s) of the RDS stream, then the system providing the data, such as a radio automation is set up to send the ASCII data to the correct IP/Port. Documentation on the acceptable syntax could be a bit more explicit, but with some trial and error I was able to get my automation system to send artist/title successfully.

IN THE DETAILS

There are a couple of caveats regarding the SmartGen Mini application. Keep track of the included CD; you will need it to install the USB driver. Some features like dynamic (scrolling) PS are easier to manage using the embedded Web page as opposed to the application.

Although the application is a powerful configuration tool, the most effective use of the SmartGen Mini is for feeding live data

over an IP or USB connection. The encoder can support RadioText+ and is fully compliant with the latest encoder communication standards UECP EBU SPB490 Version 7.05. The SmartGen Mini has the ability to parse incoming scrolling text into phrases reducing the chance that consumer radios will display partial or nonsense words.

Deva updates firmware and documentation very often as improvements happen. Even in the course of evaluating the SmartGen Mini, there were a couple of releases including an extremely helpful instruction manual on configuring the RDS encoder for RadioText+. It's important to keep checking back with the site for updates.

Overall the SmartGen Mini is an extremely useful and powerful RDS encoder in a small package. 

Thomas is vice president of engineering for Lincoln Financial Media, Atlanta.

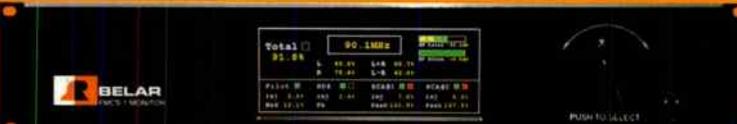
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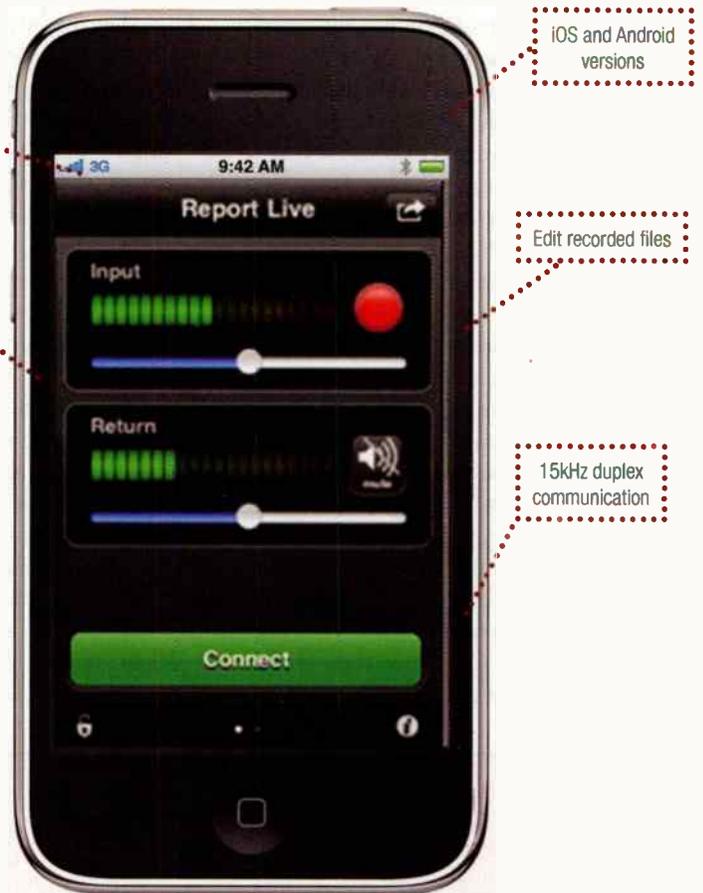
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Tieline Report-IT Enterprise Edition

by Mark Bohach



At WLOH we were looking for an inexpensive IP-based option to deliver high quality audio from virtually anywhere. Our previous positive experience with the Tieline Technology's Bridge-IT IP codec as a studio-to-transmitter link led us back to Tieline and the Report-IT Enterprise Edition for the iPhone.

Based on our previous IP remote experience, we developed our wish list of what we would like to accomplish. First, because non-technical people were going to be using it, we wanted a system that was easy to use. The field setup needed to be simple without the need to enter IP addresses and port assignments, or negotiate through firewalls to establish a connection. Since our announcers need to be able to hear audio from the studio, the system needed to be bi-directional with low latency. And cost was also a major consideration. We have looked

at other systems only to find the cost of entry was prohibitively high.

BUILDING A SYSTEM

The Tieline Report-IT system at WLOH is comprised of three components. At the studio end, we use a Tieline Bridge-IT IP codec. The remote "unit" is an Apple iPhone 4 with Tieline's Report-IT App installed. We purchased Tieline's Enterprise Edition, which allows us to install and use it on up to ten iPhones. We also purchased a Tieline Mic Adapter for iPhone. With sales tax and shipping, the entire system was assembled for approximately \$2,500.00.

Once your purchase is processed, Tieline supplies an administrator user name and password to access and set up the Tieline TieServer. This Tieline server acts as a middleman for routing the data to and from your remote location. From this administrator webpage, we give the studio codec a custom name and enter its

IP address and port assignments. This is also where individual users and their associated passwords are entered. There are also variables like the default bitrate that can be configured by the administrator.

The Tieline Report-IT App itself is downloaded from the Apple App store. According to Tieline, the app will run on any iPhone device. However the current Tieline Mic Adapter is specifically designed for the iPhone 4 and works on our 4S. We purchased a new iPhone 4 with Verizon 3G service. The Report-IT App will work either via the phone's 3G or over Wi-Fi if it is available.

Using the Report-IT App on our new iPhone was easy. Once launched, a user login dialog box opens. We enter the assigned user name and password and the Report-IT App verifies that we are a registered user. Once logged in, we just press the Connect button and within a few seconds we are connected to the studio.

TIELINE

317-845-8000
tieline.com
sales@tieline.com

PUTTING IT TO USE

The first remote broadcast we attempted with the Tieline Report-IT was a live sports talk show from the patio of a local restaurant. I fed a Mackie mixer into the Tieline Adapter's line input and fed the adaptor's headphone output to an external headphone amplifier.

We had a strong cell signal with four bars of 3G coverage. The App allows the bitrate to be adjusted up and down from a maximum of 64kb/s all the way down to 14.4kb/s. Since I was using 3G for this remote, I went for a middle ground of 33.6. The broadcast went flawlessly and the audio sounded quite good.

Since then, we have used the Tieline system for high school football broadcasts. We have had only one instance where we considered the audio to be unacceptable. The audio would be fine for a few minutes and then we would get stutters and dropouts. This was a football broadcast from a far-flung location where I later came to find out that the Verizon service was weak. As with all remote setups, pre-testing from each broadcast location is highly recommended.

IPHONE 4 MIC ADAPTOR

The Tieline Mic Adaptor was designed to be a standalone add-on device. It runs on two AAA batteries and provides an XLR balanced microphone input, an unbalanced line input and two headphone outputs. The headphone outputs have a mix of both send and return audio. There is also a mini-USB connector that can be used to power both the adaptor and the attached iPhone.

Having used the Tieline Report-IT for a variety of remote broadcasts over the past few months, I am pleased. With this system, we have the ability to have bi-directional high quality audio from many locations where we couldn't before. The latency seems to vary from about 0.25 second up to about one second which is certainly acceptable for real-time broadcasting. Given its relatively inexpensive cost, the Report-IT App should be a welcome addition to many stations for delivering remote broadcast options. 

The Report-IT Enterprise Edition application is also available for Android devices.

Bohach is co-owner and chief engineer of WLOH, Lancaster, OH.

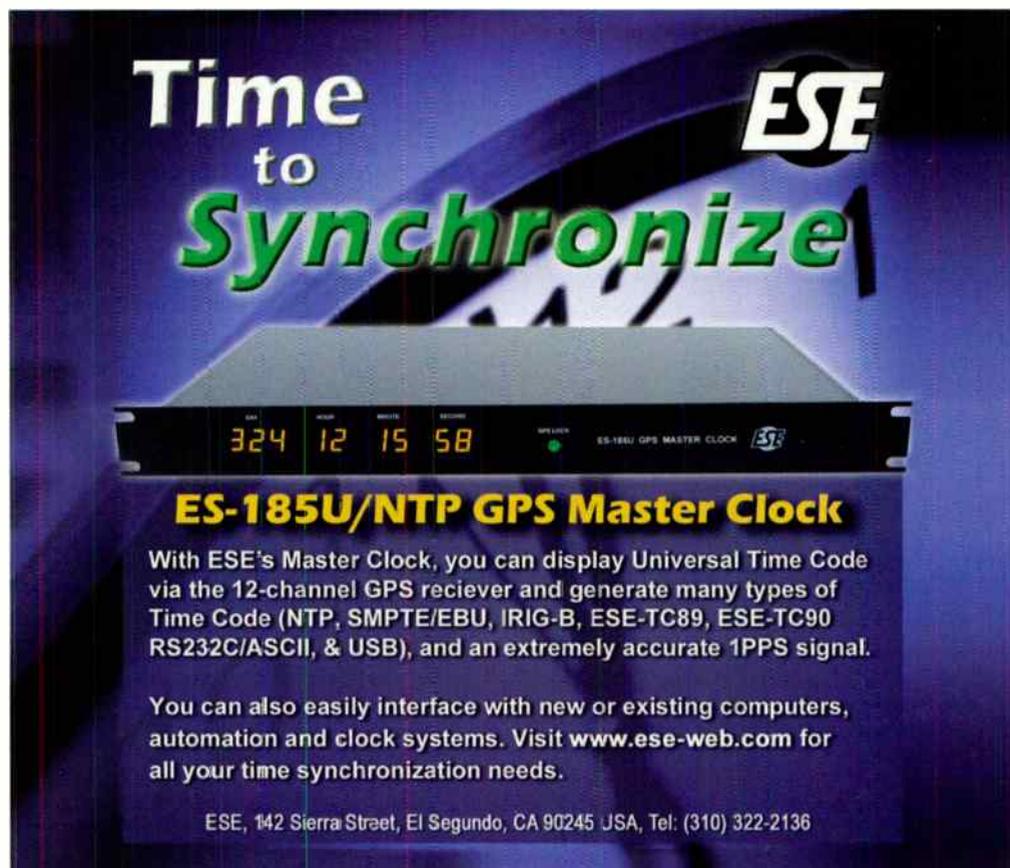


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Mics for Smartphones

by Chris Scherer, editor

The smartphone has become everyone's multi-tool. Recording and editing audio on one is common. But does the on-board mic provide the quality you really want? Reports to *Radio* magazine say the mics (there are three) on the iPhone 5 are good enough to be used on air. But if you don't like the on-board mic what can you do?

There are two basic options: Connect to the docking port (at least up to the iPhone 4) or use the TRRS mic/headphone jack. We found docking adapters for the iPhone, but with the redesigned

connector on the iPhone 5, some of these devices are useless. There are adapters to connect 4 and earlier jacks to the 5. And if you're not using an iPhone, your only real option is the TRRS jack.

For iPhone version 4 and earlier, there are stereo mics that clip to the connector, including the Tascam Ix2, Logitech LIC-iREC03P and Blue Mics Mikey. There are also adapter housings that provide mic jacks, including the Fostex AR-4i and Tieline MicAdapter.

The iPhone connector allowed a stereo connection, but the TRRS jack is a mono input. It appears

the TRRS jack is common regardless of the phone's manufacturer. With that in mind, we looked at ways to connect to the jack.

The 3.5mm jack has four connections: left and right audio out, mic in and a ground return. The extra ring on a TRRS shifts the ground from the sleeve to the second ring and uses the sleeve for the mic connection.

We found two options to connect a mic to the jack: a plug-in mic that sticks out of the phone or an adapter cable to connect a mic and sometimes a headset. 



IK Multimedia iRig Mic Cast

iRig Mic Cast is an ultra-compact portable voice recording microphone. It features a tight unidirectional pickup pattern that minimizes background noise making it ideal for single-source audio recording. In addition to an incredibly flat frequency response with zero tonal coloration, the iRig Mic Cast features a stereo mini-jack headphone output, mini-switch for two sensitivity settings, adjustable desktop stand, bumper-friendly mini-jack connector, and iRig Recorder and VocaLive apps. ikmultimedia.com

IK Multimedia IK iRig Pre

This microphone preamp allows any mic with an XLR connector to be connected to a smartphone. The adjustable thumb wheel gain control sets the level. The onboard 9V battery provides voltage for phantom-powered condenser microphones for at least for 15 hours of continuous use. The 3.5mm stereo headphone output allows for monitoring. A Velcro strip slot allows the unit to be mounted on a mic stand or other convenient spot. ikmultimedia.com



MicW i456

The i456 is a wide cardioid microphone for general purpose audio recording. The mic is 5.6cm long and has a frequency response of 20Hz to 20kHz. The source impedance is less than 2.2kΩ. The cardioid pattern has a sensitivity of -50dB. The electret mic is powered by the phone's jack. The company also manufactures the i436 precision mic, the i266 high-sensitivity mic and the iShotgun. mic-w.com



Vericorder XLR with Preamplifier

This adapter breaks out the 3.5mm TRRS phone jack to an XLR input and 3.5mm TRS headphone jack. The adapter includes a preamplifier with 6.1dB gain that is powered by the smartphone. Frequency response is 20Hz to 20kHz. The mic cable is about 2' long. The company also makes the Mini Mic, which plugs directly in the TRRS jack. vericorder.com



Roll your own

The TRRS plug connections are shown at right. Making an adapter cable is not difficult if you can find the plug. A basic adapter can be made to simply connect a mic with a TRRS to TRS or TRRS to XLR cable. Adding the TRS headphone jack is an option.

Many apps will not provide a confidence recording output when the mic is in use. Having the headphone jack saves you from having to unplug the mic and connect headphones between takes.

Some notes on the TRRS connector. In our research, we saw some reports that an iPhone may not always detect the attached mic when a

home-built adapter is used. One website suggested adding a 1kΩ resistor across pins 2 and 3 of the XLR connector.

There is a bias voltage on the TRRS jack. We also saw references to placing a capacitor in series with the mic connection, but we saw just as many posts saying it wasn't necessary because a dynamic mic will ignore the bias signal.



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audio-technica.com



DM Engineering | Handheld EAS remote control

Ultimate Mini-LP:

Featuring one-touch buttons, the Ultimate Mini will initiate an RWT, relay a pending alert or RMT, kill

a pending alert and clear its easy-to-read back-lit 20-character LCD sign that displays any alert received or sent, along with a flashing LED strobe that changes color with the severity of the message. The system includes a DB9 interface module that connects to available COM ports on the rear of the Sage Endec, and features terminal connections for a contact closure from an automation system or any other switch to initiate an RWT. Connection between the remote control and the interface module is by means of a 50i CAT5e cable that is provided. This cable may be extended up to several hundred feet if required. The Ultimate Mini-LP adds two functions: it initiates an RMT header and sends an RMT EOM for stations that initiate required monthly tests.

dmengineering.com

Acoustics First | Acoustical wall fabric

Sound Channels: Manufactured from 100 percent post-consumer recycled material, Sound Channels is applied directly to vertical surfaces, is easy to cut and installs like wall carpet. This absorptive wall fabric moderates speech frequencies in any application. Sound Channels is manufactured using Eco-fi fibers, a high-quality polyester fiber made from 100 percent certified recycled plastic bottles.

acousticsfirst.com

FSR | Poke-thru floor boxes

SmartFit Family: These easy-to-install, sturdy boxes, available in 6" and 8" sizes, present a high-capacity solution with an ultra-low profile design that eliminates the trip hazard frequently present in competitive products. The covers are available in three architectural finishes: brushed aluminum, brushed brass and black. The entire cover door swings open 180 degrees with two smaller cable access doors that fold down for cable egress while the cover door is secure. Each box features a variety of sub-plates that can be configured to allow the power, audio, video and data connections needed for nearly every application thus addressing the challenge of insufficient capacity.

fsrinc.com



Worldcast Systems | Multi-channel audio codec

1U Oslo: The 1U Oslo chassis offers channel density, supporting 16 channels of audio within a single unit of rack space. Fully DSP-based with dual power supplies and hot-swappable modules, the 1RU Oslo provides a solid and reliable base for mission-critical studio-to-studio and studio-to-transmitter links. Up to four audio-over-IP modules can be added. It can also deliver independently clocked IP audio streams, eliminating the issues of clock drift associated with streaming multiple channels over IP to a single decoder. The card can therefore decode any channel, in any audio format, from anywhere. The AoIP module can also generate many more streams per stereo or mono signal using multiple unicast or multicast technology.

aptcodecs.com

FastCap Manufacturing | Camera accessory

SuperMount: The SuperMount allows attaches any smartphone or compact camera to a tripod, monopod or the Fastcap iPole. The device is made of a durable plastic with non-marring rubber pads at all contact points. The clamp is spring loaded to hold any device securely from 1³/₄" to 3" wide.

fastcap.com



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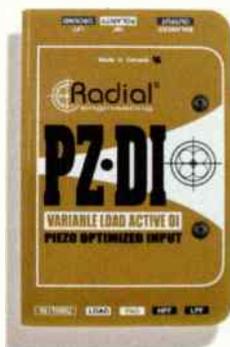
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NEW PRODUCTS

Lowell Manufacturing Company | Rackmount panel

ACR-1508-S-HW: This panel has eight 15A power outlets in the rear as well as a 6' non-metallic flexible conduit for secure connection to the power source. The flexible conduit can be trimmed to the exact length needed and is easy to route through tight spaces. The new hardwired panel measures 19"W x 9"D x 1.75"H and includes built-in surge protection. Two LED status indicators in front allow users to quickly confirm that power is flowing and surge protection is active. The model is ETL-listed.
lowellmfg.com



Radial Engineering | Orchestral acoustic direct box

PZ-DI: This direct box is designed to work with all types of acoustic and orchestral instruments optimizing the input impedance to match the pickup or transducer. The design begins with a three-position impedance selector switch to match load with the pickup. This includes a 220k Ω setting to warm up magnetic pickups, a 1M Ω setting to replicate a classic DI box and a super-high 10M Ω setting to eliminate the squawk and peaks that are common with piezo transducers. To eliminate resonance and modulation between instruments, a variable lo-cut filter dials out unwanted low frequencies. This also helps improve clarity for a better mix. Should the PZ-DI be called upon to interface a high output active bass or digital keyboard, simply engage the -15dB pad. A hi-cut filter can also be engaged to gently smooth out the over aggressive top-end produced by many active instruments.
radialeng.com

Behringer | USB mixers

Q Series: With configurations ranging from 5 to 24 inputs, the Q Series features Xenyx microphone preamps for ultra-low noise and high headroom operation. Neo-classic EQs allow gentle or drastic sound shaping for any input signal. Select models feature switchable phantom power plus dedicated wireless-ready integration for Behringer's upcoming ULM Series digital wireless microphones. The mixers also feature built-in USB/audio interfaces, one-knob mono channel compressors and Klark Teknik FX engines.
behringer.com



UPGRADES AND UPDATES

Ecreso has released transmitter software version 1.1.4. The update adds a Web interface and SNMP, an FM limiter and dynamic RDS support. (ecreso.com) ... **Tieline** has integrated the OPUS codec into its Report-IT and IP codecs. Tieline says it's the first major IP audio codec manufacturer to release OPUS and make it available to customers. (tieline.com) ■

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RADIO AUTOMATION SOFTWARE

NEWPRODUCTS

P Cube | FM bandpass filter

FM Filter: For power levels up to 2.5kW, this filter is of aluminum, brass, and copper construction, small in size and weight. Available as either a three or four section filter, it is temperature compensated and fully band tunable, and can be used as a stand-alone filter or as part of a combiner system. The filter can be tuned over the full FM band and also adjusted for narrower or wider filter response in the field, thus providing the correct filter response for the broadcaster.

pcube207.com



Audiofile Engineering | Audio editor

Triumph: Available as an app for Mac OS X, Triumph features single window and full screen support, a completely rewritten audio system and significantly improved arrangement and mastering features, all fully 64-bit. Edit audio with layers, an innovative way to create combinations of sounds. It saves time by keeping everything live and editable until the final product. FHX creates a more spacious, natural sound stage over headphones enabling an exceptional listening experience. Audiofile Engineering has teamed up with iZotope and now includes iZotope Restore and Restoration, and MBIT+ and 64-bit SRC options for disc burning in Triumph.

audiofile-engineering.com

Sony Creative Software | Digital audio workstation

Vegas Pro 12: Vegas Pro 12 adds dozens of feature enhancements, performance improvements and workflow innovations, significantly expanding the creative toolkit. Improvements include: Project Interchange with popular editing platforms including Adobe Premiere Pro CS6, Avid Pro Tools 10 and Apple Final Cut Pro 7; Expanded Edit mode, for fine-tuning the timing of a project using an interactive "A-B roll" paradigm; Color Match, for quickly matching the color characteristics of different video clips; and Smart Proxy editing, which automatically and dynamically replaces clips on the timeline with high-quality, edit-friendly HD proxies.

sonycreativesoftware.com

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L-com Global Connectivity | PoE injector with power supply

PSW4824-POE: The PSW4824-POE is a Power-over-Ethernet (PoE) injector/midspan with integral 48Vdc, 24W power supply. It provides 48Vdc power for multiple PoE-equipped devices by injecting dc power through the CAT-5 Ethernet cable. It is compatible with Access Points and other equipment supporting the IEEE standard PoE pinout and the 48Vdc power requirement. Since the PSW4824-POE is completely self-contained, a separate power supply and injector is not required. It can be plugged directly into a wall electrical outlet, eliminating the need for additional power cables.

l-com.com



Nugen Audio | True peak limiter

ISL: ISL is an intersample true-peak limiter that helps avoid distortion into sound when encoding audio files to compressed-audio formats. Music compressed using lossy codecs such as MP3 and AAC, are prone to introducing distortion if intersample peaks are present in the original uncompressed audio. ISL addresses intersample clipping directly and adheres to the ITU-B.S.1770 standard.

nugenaudio.com



Auralex Acoustics | Subwoofer isolator

SubDude-HT: A larger lower-profile version of Auralex's SubDude, the SubDude-HT floats a subwoofer,

yielding improved acoustical isolation. It features 3/4" velour-covered MDF with a 1" base of Auralex Platfoam as an isolation boundary to decouple the subwoofer from the floor. This type of isolation allows the sound to emanate directly from the subwoofer, reducing coloration/muddy sound, thereby creating a clearer, more accurate low frequency response with diminished structural vibrations. The SubDude-HT measures 22" W x 17" D x 1.75" H.

auralex.com

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Contacts:
Brian Clark
 bclark@kumotek.com
Mathew Fisher
 mfisher@kumotek.com



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NEWPRODUCTS



Rode | Handheld microphone

Reporter: Designed for handheld interview and presentation applications, the Reporter features an omnidirectional dynamic capsule designed to allow freedom of use, without the technique related issues typical of directional end-address microphones. Additionally its frequency response has been specially tailored for voice reproduction, to maximize intelligibility. The microphone features a durable die-cast aluminum alloy body coated in a discrete matte black anti-glare finish. A multi-layer mesh basket protects the microphone from environmental noise without the need for a foam wind screen.

rodemic.com

iZ Technology Corporation | Multi-track recorder

Radar 6: With Radar 6's new storage architecture, recording and moving files is fast and easy. You can record 24 tracks at 192kHz to a 64 or 128GB SD card and plug it directly into a laptop for use with a DAW, record and/or copy and deliver tracks in seconds on a USB 3.0 thumb drive, or record directly to Radar's high-speed solid-state drives. Features include: Classic 96 and Ultra Nyquist converters and Adrenaline DR technology; direct SATA recording for over 2x faster cueing editing and data transfers; 40 percent shorter and 14 pounds lighter than Radar V; full front panel controls; comprehensive editing; and control room ready.

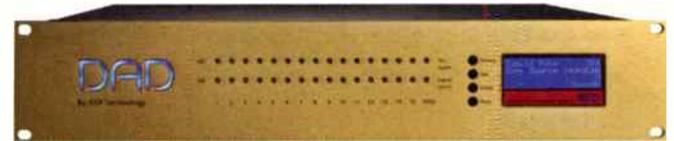
izcorp.com



NTP Technology | Audio AD/DA/DD converter

AX32: Housed in a compact 2RU chassis, the AX32 accommodates large multi-microphone arrays without a second processor. All 32 microphone feeds can be connected back to the control room along a single Cat-5 cable via fully transparent and uncompressed IP Ethernet. The AX32 is designed to integrate closely with Avid's ProTools|HDX multitrack capture/editing/mixing system. A versatile interface structure allows the AX32's processors to be assigned to any digital interface or patched between the interfaces on a channel-to-channel basis.

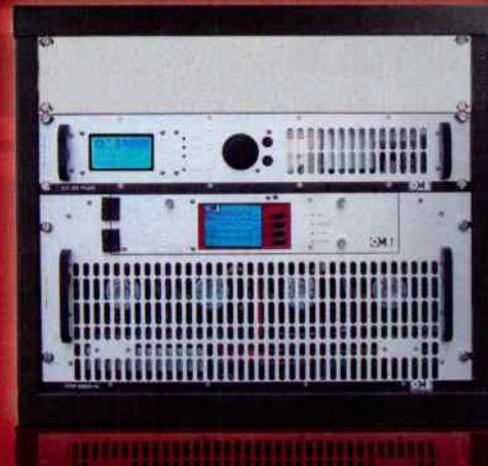
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Holophone | Supercardioid microphone

Super C: This handheld supercardioid condenser is the first in a new line of customizable performance mics. Combining ruggedness and low handling noise with ergonomic comfort, the mics deliver individuality with a design that allows the user to quickly customize the mic's appearance on the fly. Each microphone's casing, windscreen, and grille can be instantly changed to any of a wide range of custom colors.

holophone.com



Kaltman Creations | Antenna

Invisible Waves IWxCPA: The IWxCPA incorporates directional circular polarization (CP) technology for both receiving and transmitting pro-audio wireless applications. It is guaranteed to reduce interference, reduce drop outs, help eliminate swishing noise artifacts, improve RF signal to noise, and enhance reception of signals propagated through and around objects. The antenna features a low-visibility flat panel sign; the theatre black IWxCPA panel faces the performance area leaving only a 1.3" edge visible to the audience.

kaltmancreationsllc.com

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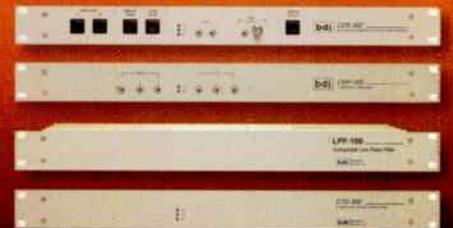


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| 10 KW | 1993 | Harris Platinum 10CD, solid-state |
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| 30 KW | 1988 | Harris FM30K |

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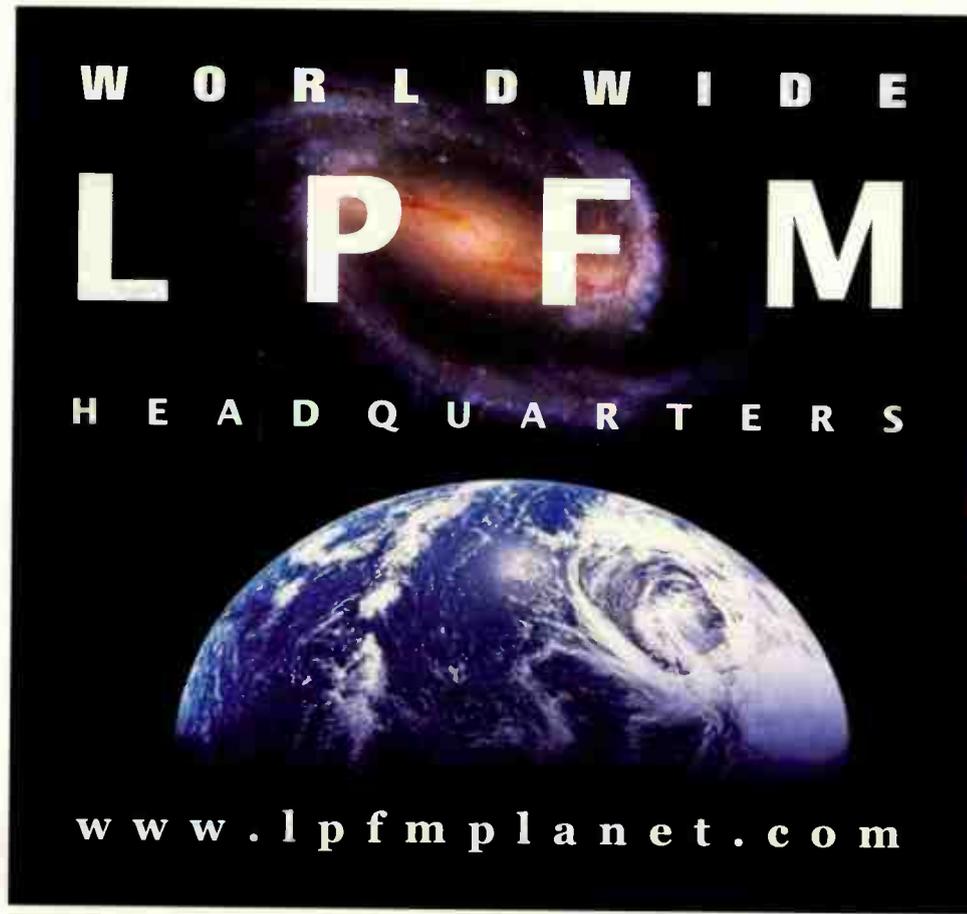
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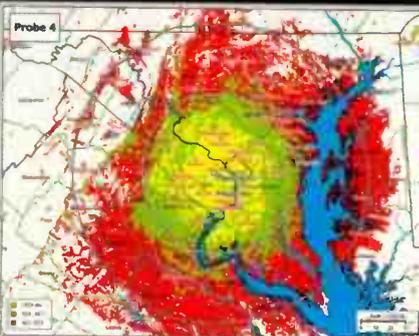
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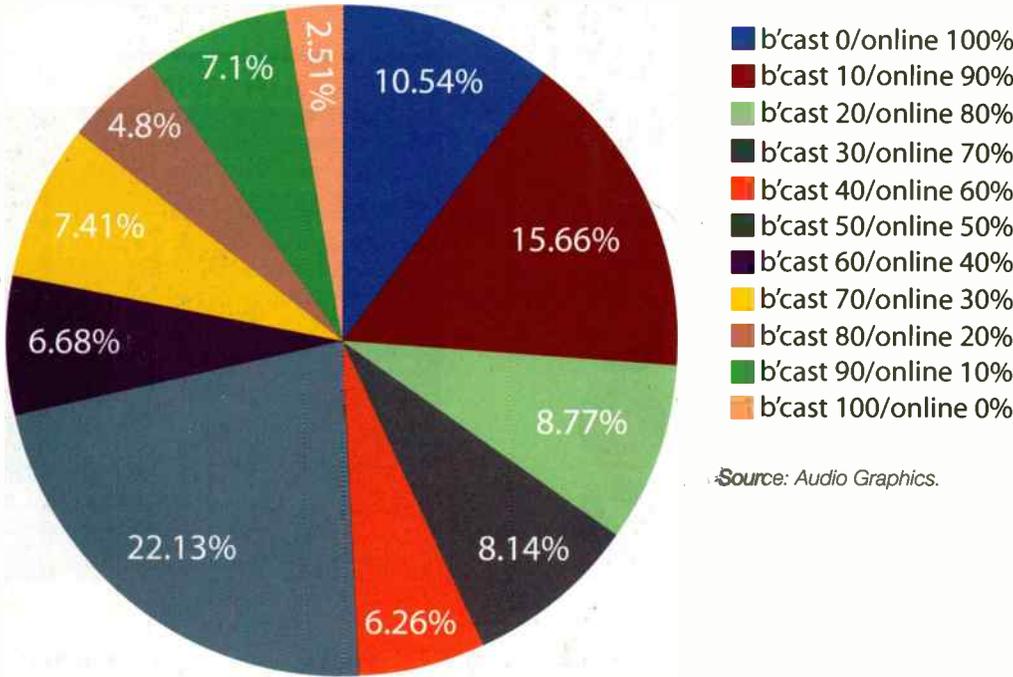
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| ESE | 35 | 310-322-2136 | www.esweb.com | | | | |
| Gorman Redlich | 47 | 740-593-3150 | www.gorman-redlich.com | | | | |
| Graham Studios | 25 | 866-481-6696 | www.graham-studios.com | | | | |
| Gretchken | 45 | 541-947-2602 | www.gretchken.com | | | | |
| Inovonics | 19 | 800-733-0552 | www.inovon.com | | | | |
| JBL | 17 | 818-894-8850 | www.jblpro.com | | | | |

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by Erin Shipps

Percent of Total Radio Listening/ Devoted to Broadcast/Online



Source: Audio Graphics.

70 YEARS

Bird Technologies, a pioneer in radio frequency (RF) communications, recently celebrated 70 years. Founded in 1942 by J. Raymond Bird, the company has nearly 50 patents under its wings and installations in more than 130 countries. From the historic Model 43 Thruline Directional Wattmeter, which put Bird on the RF communications map in the early 1950s, to its new 7020 Series Power Sensor. In many markets, Bird's 43 Wattmeter still remains the standard against which all other wattmeters are measured.

CELEBRATING 70 YEARS
Bird Technologies

Social Media Advertising

BIA/Kelsey forecasts U.S. social media ad revenues to reach \$9.2 billion in 2016, up from \$4.6 billion in 2012, representing a compound annual growth rate of 19.2 percent. According to the fall update to BIA/Kelsey's U.S. Local Media Forecast, the local segment of U.S. social media advertising revenues will grow from \$1.1 billion in 2012 to \$3 billion in 2016 (CAGR: 28 percent).

BIA/Kelsey defines social media advertising as money spent on advertising formats across social networks. Social display advertising will continue to account for a higher percentage of revenues, due in large part to Facebook's Marketplace Ads and YouTube's multiple display units (video, traditional banners). Spending on social display advertising will increase from \$3 billion in 2012 to \$5.4 billion in 2016 (CAGR: 15.2 percent), according to the forecast.

BIA/Kelsey expects robust growth during the forecast period from native social ad formats, which are emerging as viable display alternatives. The firm defines native social advertising as branded content integrated within a social network experience (e.g., the newsfeed or content stream). Spending on native social advertising will grow from \$1.5 billion in 2012 to \$3.9 billion in

2016 (CAGR: 26 percent). Growth will be driven by the higher premiums native social ad units command.

U.S. Total Social Media Advertising: 2012-2016

