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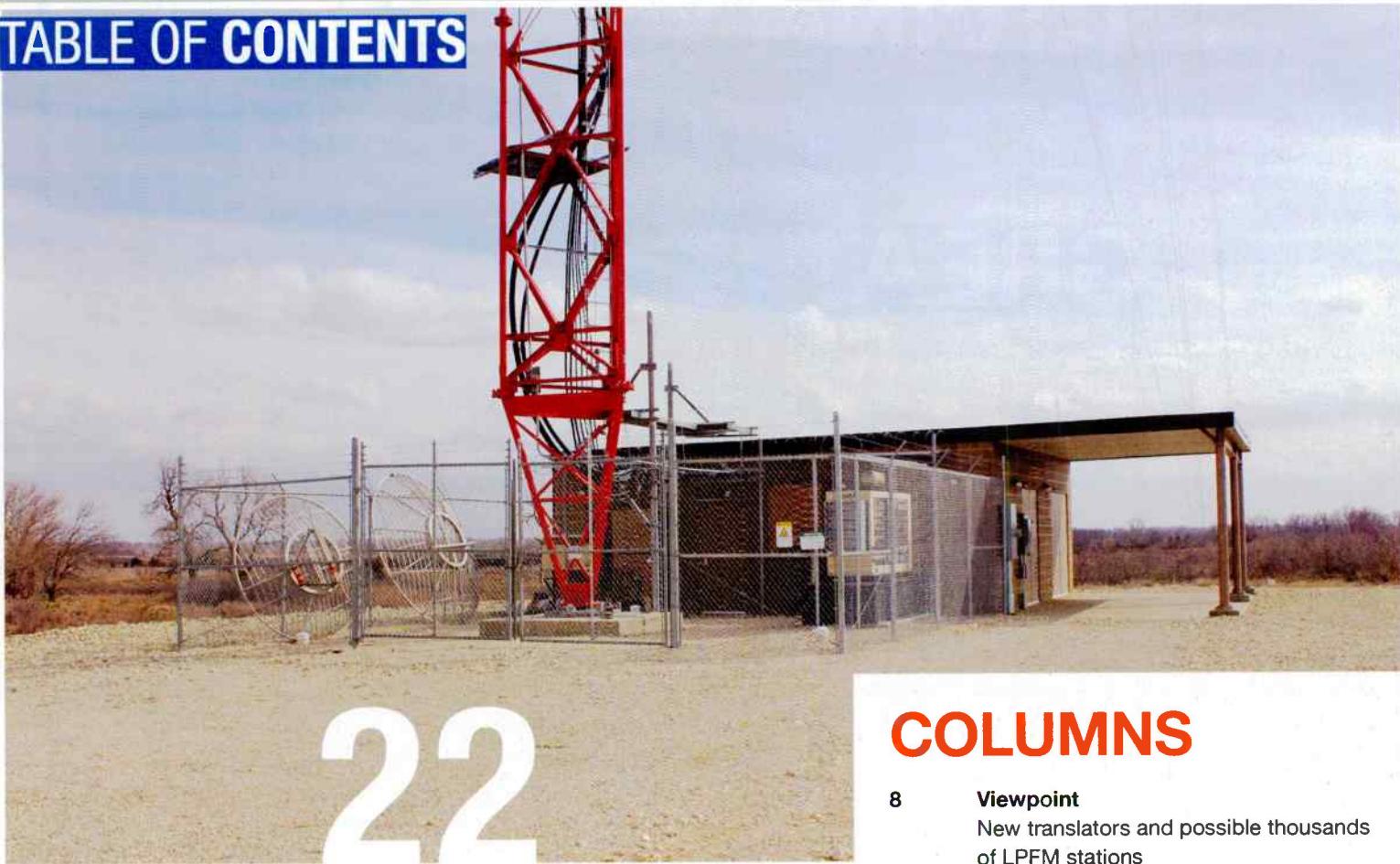


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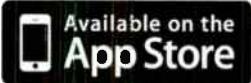
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"Freakonomics" Author to Keynote 2012 NAB Show



Award-winning author, journalist and radio and TV personality Stephen J. Dubner will deliver the keynote address during the 2012 NAB Show opening session on April 16. Dubner is the co-author of the international bestsellers "Freakonomics" and "SuperFreakonomics."

Known for his realistic yet innovative views, Dubner will share his insight on today's media ecosystem, which is undergoing massive changes in strategies, players, technologies and expectations. Through forceful storytelling and wry insight, Dubner shows how economics is, at root, the study of incentives – that is,

how people get what they want, or need, especially when other people want or need the same thing. Dubner will discuss how this incentive system is reflected in the economics of today's media and entertainment business.

Originally published in the U.S. in 2005, "Freakonomics" became a cultural phenomenon, spawning multiple media platforms.

Also at the opening session, NAB President and CEO Gordon Smith will deliver the State of the Industry Address followed by the presentation of the NAB Distinguished Service Award to The E.W. Scripps Company.

FCC Publishes Fifth R&O on EAS

The Federal Communication Commission's Fifth Report and Order on EAS (EB Docket No. 04-296) has been published in the Federal Register, making the new rules active in 30 days. Likewise, this opens the window for petitions to be filed on the rules.

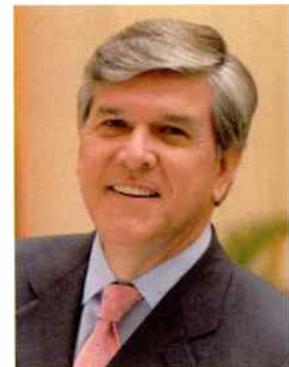
On April 21, 2012, stations using text-to-speech (TTS) must disable that function on CAP EAS devices unless a waiver is obtained.

Sage Alerting has already noted that its IPAWS update will be released in April 2012. Other EAS manufacturers will likely release updates as well now that the rules have been published.

NAB Extends President/CEO Gordon Smith Contract

Gordon H. Smith, president and CEO of the National Association of Broadcasters, has agreed to a five-year contract extension. Smith joined the NAB in November 2009. He is a former two-term U.S. Senator from Oregon (1996-2008) and was a successful entrepreneur before launching his career in politics.

During his tenure in the U.S. Senate, Smith's committee assignments included the Senate Commerce Committee, the panel that oversees broadcast-related legislation. He also served on the Senate Energy and Natural Resources Committee, the Senate Finance Committee, and the Senate Foreign Relations Committee. He was respected as a pragmatic lawmaker able to successfully reach across party lines. Smith's role on the Commerce Committee and as the Chairman of a Senate High Tech Task Force helped foster his interest in new media and new technology issues.



Awards

Michigan Engineers David Gale, staff engineer at Cornerstone University Radio, and Michael Winsky, chief engineer of WILX-TV, Lansing, were honored with 2012 MAB Engineering Excellence Awards.

Mayah joins the list of Axia partners including Nautel and AudioScience.

Tieline has integrated Genie IP Audio Codecs with Wheatnet IP. The partnership allows the codecs to broadcast IP audio between remotely located Wheatnet IP studios.

Nautel has expanded its customer service team to include efforts in the Middle East and North America.

30 Years

RF Specialties Group is celebrating 30 years. To celebrate, RF Specialties is having a party on April 17 at the 2012 NAB Show from 5 p.m. until 9 p.m. in the Las Vegas Hotel (formerly Hilton) Conference Rooms 13 and 14.

NPR Labs Releases Online Station Mapping Tool

The mapping tool is designed to guide station planning efforts to gauge and improve broadcast reception and develop new services including construction of new FM and television stations and translators.



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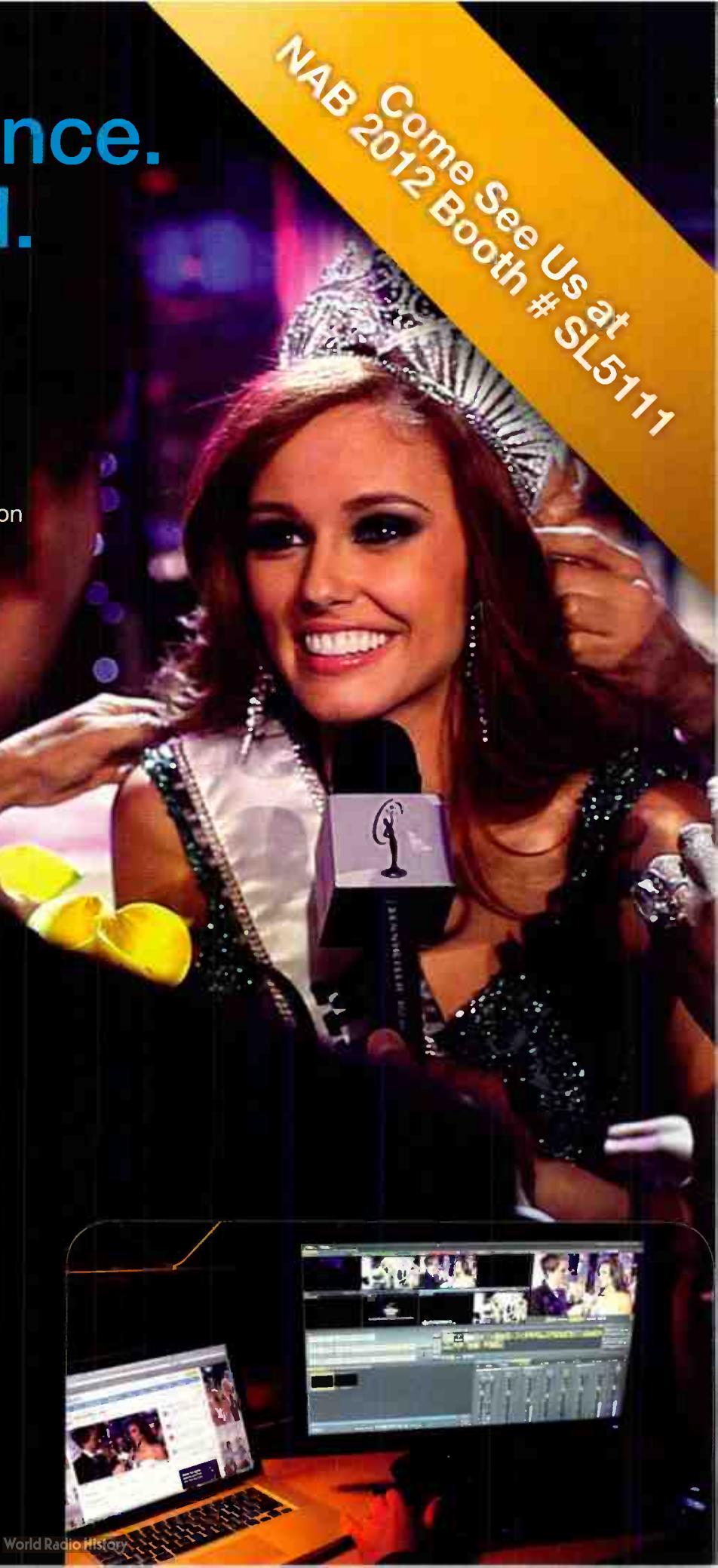
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New Translators and Possibly Thousands of LPFM Stations



The seemingly never-ending debate on LPFM and translators has finally been given some clarity. After the Local Community Radio Act (LCRA) was passed, the FCC needed to get its rules in order to be in accordance with the law. In March, the FCC passed two report and order actions and a further notice of proposed rulemaking to do just that.

Low-power FM has been somewhat crippled since its inception more than a decade ago, primarily by adjacent-channel interference protections and ownership restrictions. The LCRA removed the third-adjacent protection criteria, which

LPFM supporter Prometheus Radio Project had been seeking in its efforts to grow LPFM service. The FCC actions provide more LPFM growth opportunities, but they also give translators a boost, including long-awaited action on the more than 6,500 pending translator applications filed in 2003.

Lee Petro's FCC Update column in this issue goes into some of the specifics of the FCC decision, but there are some points to consider.

The FCC's idea to introduce "floors" to determine LPFM spectrum availability in a market has merit in that it provides something other than random chance to determine LPFM opportunities. And the spectrum-limited market definition to better qualify (or disqualify) translator apps improves the chances for the LPFM side to find channels, albeit with the potential for some translator apps to be dismissed.

One major change is the the FCC added a translator application cap of 50 (up from 10) for those who filed in 2003, but restricts applications to one per market in markets defined as spectrum limited. Applicants will have a window to whittle their applications down to meet these restrictions.

Another benefit for the translator licensees: AM stations can now rebroadcast on FM translators. While AM listening, with a few exceptions, is on a steady decline, allowing AM stations to retransmit on FM injects some life into the service. Translators won't save AM in the long run, but they can help the short term.

The second order brings the Commission's rules in line with the LCRA by, among other things, eliminating the third-adjacent channel protection. That channel protection had always been a stretch of reality. Full-power stations will rarely receive interference from the pee shooter LPFMs. This step alone will open the door to possibly thousands of LPFM stations.

The further notice of proposed rulemaking ponders the interference complaint process and the eligibility and ownership of LPFM stations to extend to native nations. In addition, the FCC seeks to ensure LPFM groups maintain their eligibility status after the construction permit is issued. Native nations are a natural candidate for a successful LPFM service, and LPFM is an ideal way to provide a community voice to an already a tight-knit community. Ensuring the ongoing eligibility to operate an LPFM service is also a logical action to avoid those who would take advantage of the rules.

The agency seeks comment on eliminating the 10W LPFM service and creating a 250W LPFM service. 10W propagates well in the open, but it just does not penetrate buildings well. 250W can cover a small urban area, and the power is still rather low compared to most full-power facilities. Some interference without third-adjacent protection may occur, but probably not much.

While the FCC hasn't solved all the LPFM and translator issues, it has at least taken some action to get things rolling again. ☺

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Chris Scherer | Editor

EDITORIAL

Editor: Chriss Scherer, CPBE CBNT
cscherer@radiomagonline.com
 Senior Associate Editor: Erin Shipp
eshipps@radiomagonline.com

TECHNICAL CONSULTANTS

Contact them via radio@radiomagonline.com
 Kevin McNamara, Computers and Networks
 Jeremy Ruck, P.E., RF and Transmission
 Lee Petro, Legal
 Russ Berger, Broadcast Acoustics
 Doug Irwin, CPBE DRB AMD, IBOC

CONTRIBUTORS

Doug Irwin, CPBE DRB AMD
 Chris Wygal, CBRE

CORPORATE

President and CEO: Steve Palm
 Chief Financial Officer: Paul Mastronardi
 Controller: Jack Lieckie
 Group Circulation Director: Denise Robbins
 Vice President of Web Development: Joe Ferrick

VIDEO/BROADCAST GROUP

Executive Vice President: Carmel King
 Vice President of Sales/Group Publisher: Eric Trabb

ADMINISTRATION AND PRODUCTION

Editorial Director: Paul J. McLane
 Production Director: Davis White
 Production Publication Coordinators:
 Karen Lee, Carolina Schierholz
 Advertising Coordinator: Caroline Freeland

CIRCULATION

Associate Circulation Director,
 Audience Development: Tracey Dwyer
 Circulation Manager: Kwentin Keenan
 Circulation Coordinator: Michele Fornille

ADVERTISING SALES REPRESENTATIVES

Associate Publisher, U.S. Sales: Steven Bell
sbell@radiomagonline.com | 212-378-0400 x519
 Southern Europe, Africa, Middle East: Rafaella Calabrese
rcalabrese@broadcast.it | +39 02 9288 4940
 UK, Ireland, Central and Northern Europe: Graham Kirk
gkirk@audiomedia.com | +44 1480 461555
 Japan: Eiji Yoshikawa
callems@world.odn.ne.jp | +81 3 3327 5759
 Asia-Pacific: Wengong Wang
wwg@imaschina.com | +86 755 83862930/40/50

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World Radio History



by Kevin
McNamara

Revenue From HD Radio

While pondering the subject for this column, my reaction was probably not unlike the majority of readers. After the initial round of laughter, I thought, "Are you serious?" Now I can hear owners and operators reading this pounding on their desk and yelling, "You idiot, our HD1 'Swahili hits' channel is wildly successful!" Yeah, I get it, calm down.

Being the eternal optimist, however, and loving a good challenge, I thought to myself, why not get a little crazy and offer an idea that could actually make HD Radio relevant, while possibly pumping up the revenue stream.

WHAT ARE WE WORKING WITH?

As a starting point let's step back and consider what HD Radio actually brings to the table, in terms of "real world" capabilities.

First, IBOC can only broadcast in one direction. In the network world, we use terms like "unidirectional" or "simplex" to describe when data is restricted to flow in a single direction. Typically this is something addressed in the data link layer of the OSI stack and is implemented for reasons that might include simple command/control functions or to achieve certain security objectives. In the broadcast environment, however, that's all you have. To make it sound desirable we call it datacasting.

Second, let's face it; there are some pretty severe bandwidth limitations with HD Radio. OK if we wanted to go pure digital there is about 300kb/s available for streaming; not too shabby. The problem is that we still need that analog main program channel, so now you are left with one, two or three additional channels that are limited to 24-, 32- or 48kb/s, depending on the number of channels and their configuration. In contrast most Internet streaming music services typically use data rates of 32-, 64- or 128kb/s (sometimes higher). Generally, the higher the data rate, the better

the quality, depending of course on the specific encoding method used. The good news is that IBOC is a true datacasting system, and as such, the bandwidth requirements do not change with the number of users connected. In comparison, even the slowest wireless mobile technologies can deliver around 3Mb/s (downstream) while newer 4G systems could provide upwards of 300Mb/s (downstream) throughputs.

Last, from a terrestrial coverage perspective, the coverage area is limited to the licensed contour of the station. In reality it is smaller than that covered by the main program channel.

Given this reality, it is unlikely that these channels will ever be able to effectively compete with a streaming radio service delivered, for instance, over a wireless network to an automobile.

WHERE'S THE MONEY? WHERE ARE THE PEOPLE?

There is no question that local ad dollars are shifting from traditional into digital media sectors. A recent report by BIA-Kelsey indicates a steady increase in spending for digital media (+13.6 percent), while dollars spent in traditional media decreases (-1.7 percent) over the period from 2010-2015. The fact is that it is not just revenue shifting to digital media, the listeners are as well. According to Arbitron "The weekly online radio audience has doubled every five years since 2001 and the online radio audience now reaches an estimated 57 million people age 12 and older per week." A recent report from Edison Research indicates that In-car time spent listening is still dominated by terrestrial broadcast but has slipped from 76 percent in 2003 to 62 percent in 2011. That same report also indicates that 84 percent of in-car listeners still use



traditional AM/FM radios, but only 2 percent use HD Radio. Pretty much every other type of listening falls between these two groups.

WHERE ARE THE OPPORTUNITIES?

In looking at the research, one must wonder why there is still such a large disparity between traditional analog and HD Radio listener percentages, in fact the amount of HD Radio listeners are far below those using almost every other type of media, including the cassette player. A recent study from Pew research indicates only 7 percent of people are "very interested" in getting HD Radio. This is pretty much flat over the past few years.

In my humble opinion, what this all seems to indicate is that radio, in general, is quickly loosing relevance with other media choices. Certainly many believe consolidation in the industry has all but destroyed what made radio dominant in the first place: localism. Because a station plays 5 minutes of local news and traffic certain hours each day doesn't make it local. Radio has allowed

itself to no longer be seen as the community station. Even news formats, which have historically ranked high AQH shares (nationally) in the past, have sunk near the bottom of the pile. Again I think this is largely due to a decoupling of the stations presence in the communities within its coverage area.

The crazy part of this is that the one thing that terrestrial radio (including IBOC) can offer over all of the other media platforms is localism; plain and simple.

Consider that, in the past, radio did another thing better than any other media: create hype. It developed morning and afternoon drive shows, built franchises around the personalities and made them bigger than life. There was genuine excitement and support from the community when there was a remote or other event. Now every station is scripting off someone's "brilliant" formula with shows named "X and Y" (fill in the blank) in the morning. Or how about giving the station a

name like Jack or Alice and it's any wonder why people are leaving?

THE PROPOSITION

Let's get back to the fundamentals that worked years ago, serving the community. How about instead of putting some regurgitated music channel on the multicast channels, utilize them for providing public access to the communities within the stations service area. What I am suggesting here is not necessarily selling time to local businesses, rather giving time (and perhaps equipment and resources) to the communities to broadcast local events, particularly high school sports events or anything else that has relevant interest to the residents of that area. Provide expanded local news, traffic and weather tailored specifically to the communities. What does the station get? The right to sell advertisement time to local (and national) businesses. What local business wouldn't want exclusive access to the very audience the station serves?

I think the secondary benefit is that, if this is done correctly and there is a proper amount of "hype" about this new station, which will ultimately drive sales of new receivers almost instantly as most people will not want to be without the station.

Would I also put this content on my streaming site? Absolutely not...make this content special and exclusive to the local HD Radio audience.

I can see that in certain markets, particularly in areas where high school sports are huge, the additional multicast channels could be used to broadcast different games, sort of like ESPN.

There it is, I am sure there are programmers that could take this idea and improve the concept, but it is a concept that would work if done properly and I think has the potential to generate a significant amount of revenue. ☺

McNamara is president of McNamara Associates, Cape Coral, FL.

On-air light image courtesy of Sandies.

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by Lee Petro

FCC Acts on LPFM & Translator Rules

Last month, the FCC released two Orders and a Further Notice of Proposed Rulemaking relating to the adoption of rules for low-power FM (LPFM) stations and FM translator stations. These steps were taken to implement the Local Community Radio Act of 2011 (LCRA), which directed the Commission to deal with long-pending FM translator applications (filed in the FCC's last filing window for new translators, in 2003), and provide opportunities for new LPFM stations to be licensed to local communities.

As was discussed in the August 2011 column, the Commission has more than 6,500 pending FM translator applications filed in the 2003 filing window. The Commission proposed rules in July 2011 that would protect spectrum in urban areas so that it could be licensed for LPFM use, and proposed a cap on the number of pending FM translators one entity could prosecute.

In the Orders, the Commission mostly adopted the proposed rules. First, the Commission adopted its proposal to use LPFM channel "floors" to measure whether there was available spectrum for LPFM use. Specifically, the Commission stated it would deem a market to have spectrum available if there are:

- > eight open LPFM channels in the top 20 radio markets;

- > seven open LPFM channels in markets 21-50;
- > six open LPFM channels in markets 51-100; and
- > five open LPFM channels in markets 101-150.

In the "spectrum limited" markets, the Commission will require FM translator applicants to amend their applications to eliminate any preclusive effects that would limit the licensing of LPFM stations in the market. If an applicant is successful, the Commission will then complete processing of its application. If the applicant cannot eliminate the preclusive effects, or fails to amend its application, the Bureau will dismiss the application.

The Commission also announced that it would institute a cap of 50 applications for any entity that filed applications in the 2003 window, and further restricted entities to only one application in those markets where the Commission determined that spectrum is limited. The Commission directed the Media Bureau to open a 60-90 day window to permit entities with pending applications to select the applications they wish to have the Commission process. Subsequently, the Commission will process applications in the "spectrum available" markets and release a public notice of the mutually exclusive applications. These applicants will have an opportunity to reach settlement agreements and make minor changes to

eliminate engineering conflicts. Also, the Commission now will allow all FM

translators, including those licensed following the 2003 window, to rebroadcast AM stations.

In the second Order, the Commission took steps to implement the Local Community Radio Act requirement to eliminate FCC rules that were inconsistent with the LCRA, including the third-adjacent channel and Radio Reading Service protections.

Finally, the Commission issued a Further Notice of Proposed Rulemaking that seeks comment on several issues relating to the interference complaint process and the eligibility and ownership of LPFM stations. In particular, the Commission is seeking comment on extending eligibility for LPFM stations to the native nations, and whether to afford them additional credit during the comparative process for mutually exclusive applications.

The Commission is also proposing to tweak the comparative criteria to ensure that parties receiving credit for being local to the community maintain their eligibility status after the construction permit authorization is granted, and to give additional credit to applicants pledging to provide local programming service.

The Commission also sought comment on whether to eliminate the LPFM service that was limited to 10W operation, and instead adopt rules to create a LP-250 service that would permit LPFM stations to operate with 250W at 30 meter HAAT. One possibility would be for the Commission to impose

geographic restrictions so that these LPFM services would be restricted from the main community in the top 100 markets. Another proposal was to permit exiting LPFM stations to upgrade their facilities to 250W upon a demonstration that they had been providing local service. ☐

DATELINE

April 16, May 1 and 16: Stations in Michigan and Ohio continue running License Renewal Pre-Filing Announcements. Stations in Indiana, Kentucky and Tennessee continue running License Renewal Post-Filing Announcements.

June 1: Stations in Michigan and Ohio file License Renewal Application and EEO Program Report. Commence running License Renewal Post-Filing Announcements. Noncommercial radio stations in Michigan and Ohio file their Biennial Ownership Report (FCC 323-E).

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

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The New Mobile Broadcast

Today's remotes use handheld devices, small portables and other road case must-haves

By Doug Irwin, CPBE DRB AMD



Before ISDN, remote broadcasts involved quite a bit of work. With ISDN, they were considerably easier. Now with access to the public Internet just about everywhere, carrying out a remote is easier than ever. Last month we talked about STL over IP (nailed-up connections). This month we're shifting gears and focusing on temporary connections. We're going to cover hand-held devices, then small portables, and finally we'll look at devices you'd put in a road case or remote truck.

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USING A MOBILE PHONE APP

The first "device" we'll look at is simply an app from Comrex that works on specific Android phones. It's called ARC (Access Reporter Codec). Yes, the phone you may already have is the hardware you need for a remote. Like other Android apps, this one works via the touchscreen; it allows you to use 3G, 4G or Wi-Fi to connect to an Access or Comrex Bric-link (running firmware 2.7.1 or higher). The codec is G.722, which according to Comrex provides 7kHz of full-duplex, low-delay audio. ARC has two modes of operation: registered, which uses a SIP account on each end, and unregistered, which can simply use an IP address to connect to an Access or Bric-Link. Comrex has a list of Android phones that work, but recommends the Google Nexus 1. In any case, the phone has to be running Android version 2.1 and must contain a processor running at least 1GHz.

Now if you are totally committed to the iPhone you can still use Comrex for remotes at the far end. Comrex recommends using a SIP softphone client for iPhone called Media5 Fone. (This is a third-party app not written by Comrex.) With this app, you'll need two SIP accounts because Media5 Fone only works in registered mode. Again, you'll need to be running version 2.7.1 or better on your Access or Bric-link on the far end.

Tieline has a neat application for iPhone called Report-IT, and it can be used in one of two ways. You can record an interview with the microphone in the iPhone itself, and then trim heads and tails via its touchscreen display, or you can edit using a compatible app. You can then upload the file to an FTP server, using WAV or AAC-LD formats (20kHz of bandwidth). Your studio then retrieves the file from the fileserver for playback. Alternatively, live remotes using the mic in the iPhone, can be delivered via 3G or Wi-Fi. Another option is to use the Tieline Mic Adapter for iPhone4. This connects an outboard microphone and headphones to the iPhone. According to Tieline, live remotes will have 15kHz of audio bandwidth, and of course you'll need a compatible Tieline codec at the far end.

For Android devotees, there is some good news: There will be an Android version of Report-IT coming out soon, with the same features already discussed. Tieline expects to have the app available for download in time for the 2012 NAB Show.

AEQ also has an app called Phoenix Lite that allows the user to establish a full-duplex audio connection between an AEQ Phoenix (located back at the studio) or other N/ACIP compatible codecs, and an iPhone (and



Comrex ARC



Tieline Report-IT with
Mic Adapter



Musicam Road
Warrior LC

soon Android). It comes with a wide variety of algorithms: M2, AAC, AAC-HE, AAC-HEV2, G.711, G.722, and ULCC, running on speeds between 44.1 and 384kb/s. It also simultaneous records and plays audio, and can playback files in the midst of live audio transmission (the classic wrap-around).

USING A SMALL PORTABLE CODEC

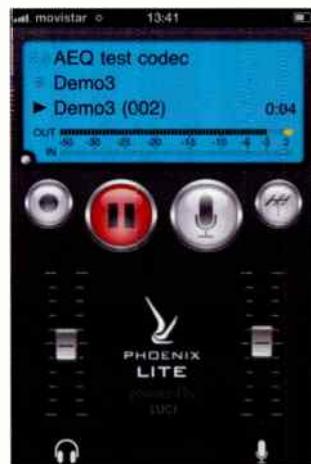
Many of the same players that made equipment based on POTS codecs are now making replacements for that legacy equipment – replacing the phone line part with Ethernet, Wi-Fi, or cell network connections.

Perhaps you're just warming up to the idea of IP for remotes, and you're not ready to give up ISDN just yet; in that case you might consider the Road Warrior from Musicam. Not only does the Road Warrior have an Ethernet port, but a built-in ISDN terminal adaptor as well. IP and ISDN can be used simultaneously if desired. This device supports MPEG1/2 LayerII/III, G711/G722, PCM, AAC (optional), and Apt-x (optional). Road Warrior comes in two versions: LC, which has two mic/line inputs and another line level in; or the XL, which has

four mic/line level inputs. Both have line-level balanced auxiliary outs in addition to headphone outs: two for LX, four for XL. The XL has a USB port for a 3G modem. The IP codec has a test tool that allows the user to check the bandwidth, delay and jitter in the

IP connection, so that the user can optimize the streaming parameters, such as the jitter buffer depth, and frame size. While the setup can be saved as a pre-set, the device is completely configurable via its built-in Web interface as well. The studio end of this link would be another Musicam device, such as the Suprima.

Another brand that is becoming familiar to more and more broadcast engineers is Barix. While Barix sells separate encoders and decoders (Instreamer and Exstreamer respectively) they also offer a full-duplex unit known as the Exstreamer 1000. This device features both analog and AES ins/outs along with contact closures (four relays in both directions). You would make use of the Exstreamer 1000 with a separate mixing system; so if you have a tried and true remote mixer that you can't live without, this may be the way to go. It's important to note that



AEQ Phoenix Lite



Barix Exstreamer 1000

ROC YOUR WORLD



The new ROC console from Logitek

When Logitek introduced its first ROC console back in the 1990s, it marked a revolution in audio console design. One of the industry's first router-based digital consoles, the original ROC boasted simple wiring and access to multiple sources at each fader.

Over the years, the router-plus-console Networked Audio concept has become the standard in console architecture. Although the original ROC was retired years ago, Logitek has continued to develop systems for both TDM and AoIP audio networking. The new ROC takes the best of the original design and pairs it with the latest technology and styling.

Available in multiples of 6 faders (up to 24), the ROC is housed in an attractive tabletop enclosure. Durable Penny

& Gles faders, OLED source indication and intuitive controls make the ROC a natural for on-air, production rooms or even in temporary studio setups. Two monitor feeds, front panel headphone connection and user-assignable softkeys will please even your fussiest operators.

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Comrex Access Portable

The configuration of the device must be done with a Web browser, so make sure you have something that can run a browser while you are in the field.

Comrex has a long history in this category and the Access portable, while not a new product, continues getting new features added as time goes along. It's a full-duplex codec, with one line/mic level input, and a headphone mixer built-in. While it has an integral Ethernet connector, it also has a cardbus slot and a USB port that will fit various specific modems that will communicate via POTS, Wi-Fi (802.11b, g or n), Wimax, 3G and 4G (LTE). On the far end you would have another Access, either a portable or a

rack mount unit. (If you use the POTS modem, Access is backward-compatible with legacy Comrex POTS codecs (except for Hotline).) By the way, when using that cardbus slot or USB port, you can make use of the Ethernet connection for Internet sharing. Network interfaces can be set for static IP addresses or set to use DHCP. The Access portable also has a built-in Web browser, so that you can log-in to access points as necessary. Access comes with the Comrex BRIC algorithms, and MPEG4/AAC algorithms. Another option is the five-channel mixer, which plugs in to the side of the Access portable, and gives you an additional five mic/line level inputs, and an additional five headphone outputs as well.

Another option for a small, portable remote device is the Tieline G3 Commander field unit. This device has two mic/line level inputs along with a single unbalanced input (RCA connector); it has two balanced outputs, and one unbalanced (RCA) out. It has built-in headphone mixing, with the separate headphone outputs. Via plug-in modules that go in to an expansion slot, you can communicate (in a full-duplex fashion) via IP, 3G, ISDN, X.21, and even BGAN (for satellite uplinking). IP interfaces can be configured for static IP or DHCP. A new plug-in module just being introduced is for 4G (USB style) modems. The far-end device back at your studio HQ would be another Tieline Commander. The Commander comes with the Tieline Music and MusicPlus algorithms in addition to G.711, G.722 and MPEG layer II. According to Tieline, the MusicPlus algorithm will provide 20kHz of stereo audio capability with data rates as low as 96kb/s. You also get the free Tieline Toolbox PC software configuration and control software, offering configuration, audio routing and input control of your local and remote codec.

While considering different manufacturers for a field unit, you may want to take a look at Scoopy from AETA. This device has three mic/line

inputs (with built-in limiters); two headphone outs and two line outs. As with the other devices we've talked about, it has multiple interfaces: Ethernet, ISDN and POTS. It has an integrated antenna for GSM, or UMTS, or 3g+, and it also has a card expansion slot, and a USB port for other modems such as WiMax or 4G/LTE. It will communicate with other devices via G.711 or G.722, and its N/ACIP compliant. (Typically on the far end you would have another AETA codec, such as the Scoop 4+.) Other algorithms are MPEG layer 2, AAC, CELP and 4SB ADPCM. Last but not least, you can do recording and simple editing right on the device itself.

**AETA Audio Systems
Scoopy**



Telos Systems Z/IP One

balanced inputs and two balanced (analog) outputs. For communications, it has two integral Ethernet



Tieline Commander G3

connections; one can be used for streaming, while the other is used for control purposes with its built-in Web browser (it can also be configured via its front panel.) The codec supports Livewire. Additionally the unit is supplied with a Wi-Fi stick, and you can plug a 3G modem in to its USB port. A feature that Telos calls ACT (agile connection technology) senses network conditions and dynamically adapts the codec performance to provide the best audio. There is an 8-bit parallel GPIO port for signaling and control, along with an RS-232 channel. The Z/IP One has a large set of codecs available: AAC-ELD, AAC-HE, AAC-LD, MPEG Layer 2, MPEG 4 AAC LC, MPEG 2 AAC LC, G.711, G.722 and linear PCM. On the far end, you would have another Z/IP One.

Worldcast (APT) has a line of IP codecs, and the one we'll look at is the Horizon NextGen. This is a single rack-unit, full-duplex codec, two channels in and out, available via line-level balanced or AES-3. (Another Worldcast codec would be on the far end.) It has two integral Ethernet ports; one can be used for streaming, and the other for control



WorldCast Systems APT WorldCast Horizon NextGen

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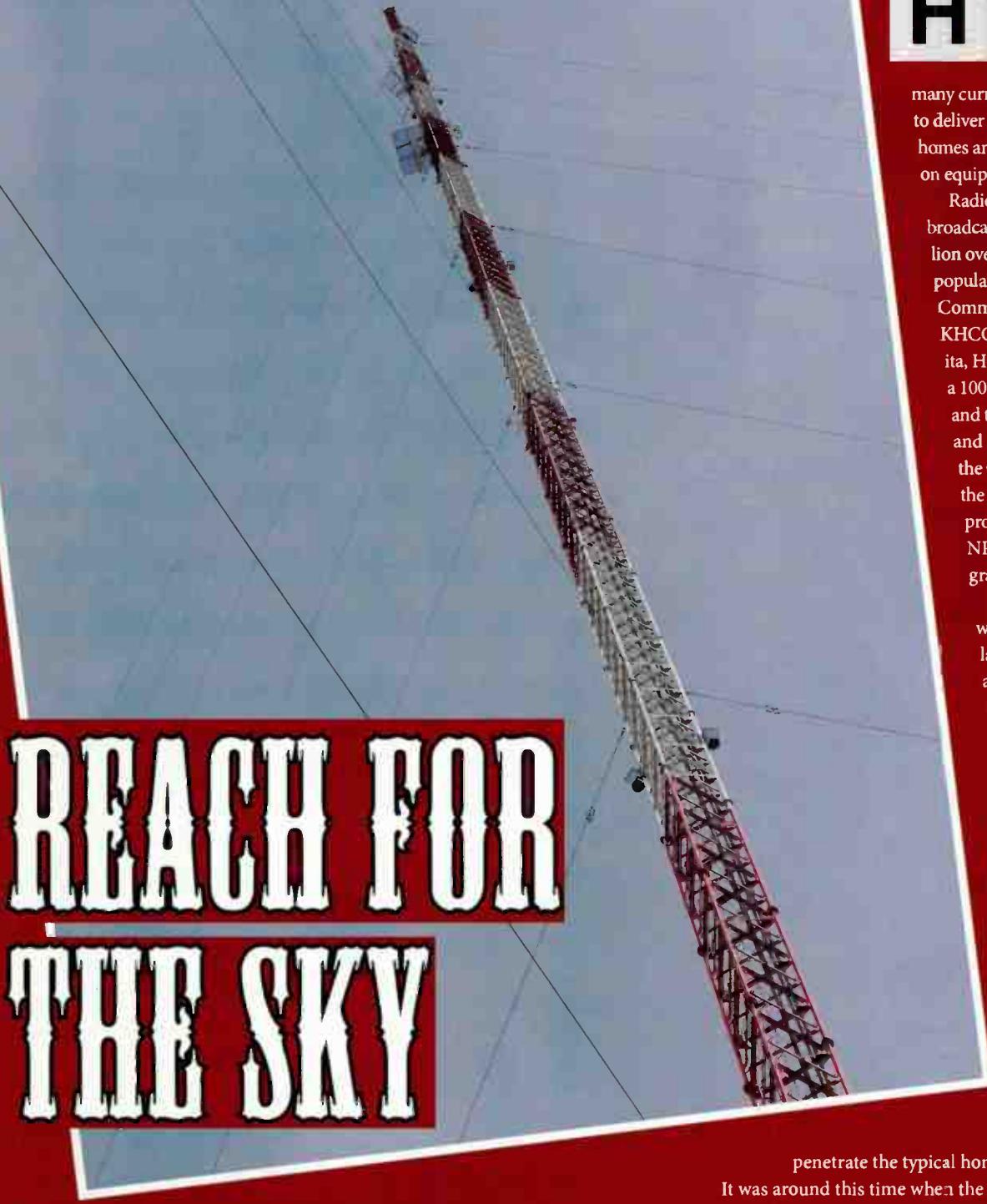
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FACILITY SHOWCASE



REACH FOR THE SKY

Radio Kansas evolves its transmission strategy to elevate HD Radio sidebands

By Ric Jung

H

D Radio offers the most intriguing possibilities of any U.S. industry development for radio broadcast-

ing in many years. The challenge for many current HD Radio broadcasters has been to deliver an acceptable digital signal to autos, homes and offices without spending a fortune on equipment upgrades and higher power bills.

Radio Kansas is a three-station network broadcasting public radio to almost one million over-the-air listeners – nearly half the population of Kansas. Owned by Hutchinson Community College, the network comprises KHCC-FM, a 100kW station serving Wichita, Hutchinson and Newton; KHCD-FM, a 100kW station serving Salina, Manhattan and the north-central portion of the state; and KHCT-FM, a 50kW station serving the Great Bend and Hays communities to the west. All three stations air the same programming, including the premier NPR news programs and locally programmed classical music.

Radio Kansas went on the air with HD Radio in 2006, and recently launched an HD2 channel offering a jazz format. Active promotion has been restrained due to reception limitations at the standard -20dBc level. While mobile reception on the prairie is fine, building penetration has been more challenging.

This became instantly clear during a member event where listeners were invited into a local café to hear KHCD's new HD Radio signal. We realized there was a problem with -20dBc when we couldn't pick up enough of a signal to demonstrate the radio. As a result, HD Radio promotion to Radio Kansas listeners was put on hiatus until we were certain that signals could

penetrate the typical home and office building.

It was around this time when the industry began discussing elevated sidebands of up to -10dBc to significantly increase HD Radio output power. We quickly developed a plan to upgrade all three transmission facilities to support elevated sideband levels.

The tower is an ERI 1300' stick including the 135' lambda cantilever section with 12-bay ERI rototiller on top. There are two 10' 950MHz grid dishes around 950' feeding KHCT and KHCD. Lower down are the 950MHz and 5GHz studio links.

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FACILITY SHOWCASE



KHCT: Exciter rack with Harris FlexStar, backup Orban Optimod 8100 and TTC 8090X Exciter, Belar IBOC monitor, Bird BPM wattmeters and the two transmitters: Z6HD+ and HPX20

Beyond all this, the existing transmitter could not accommodate the increased power levels with the current combining configuration. At KHCC, to use the legacy FM transmitter with the existing Harris Z16HD+ transmitter, the Z would need to provide 2kW of analog and 6kW of digital with the current 4.7dB combiner to make -10dBc. This is beyond its capacity.

With these options exhausted, a decision was made to re-engineer the split-level combining system and purchase HPX models to operate with the existing Z-Series models – a unique variation on the split-level method that essentially uses the same theory and connection patterns. The objective was to have one transmitter operate in the highly efficient Class C mode. The resulting architecture assigned the Z-Series models to this FM-only duty and assigned the new HPX transmitters to FM+HD in the Class AB mode.

Together, via 6dB ERI combiners, the systems deliver the required elevated digital signals to the existing antennas. For example, the KHCC system runs the HPX40 at 13,230W of FM power and 1,670W of HD Radio power. Combined with the Z16HD+ at 7,000W of FM power through a 6dB combiner, the resulting TPO is 20kW analog and 1,252W digital – equal to the full-licensed FM power and -12dBc HD Radio power. This combination minimizes transmitter power consumption, reject load power and cooling requirements.

HD+FM ARCHITECTURE

The three transmitter sites almost form a perfect triangle, with distances of about 90 miles between each tower. The delivery architecture



KHCC: RF plumbing that provides split-level combining in the ERI IBOX M-3 AND, with MCI 61304 switches, allows the station to bypass the combiner and put the Z16HD+ directly to air in any mode, FM or FM+HD for maintenance of HPX40. The old BE20B and HPX40 are also switchable.

from studio to transmitter sites is also a bit unusual, employing two-hop microwave paths from the flagship site (KHCC) to the distant tower sites.

At the studios, the main program audio comes from the main studio console; automation delivers HD2 program audio. Both are processed with Aphex Compellers for mild control and limiting. A Moseley StarLink microwave STL system carries the main program AES audio to the KHCC site, with a Harris Intraplex STL running over a 5.7GHz radio carrying HD2 program audio and high-speed data. Main program audio feeds an Omnia.6 on-air audio processor at the transmitter site, while the HD2 audio is fed directly to a Harris FlexStar HDE100 Importer.

Our HD Radio architecture uses a single Harris HDE100 Exporter for all three stations. The main program audio from the Omnia hits the Exporter, which outputs delayed FM audio and creates the UDP signal consisting of HD1, HD2 and associated program data (PSD). The UDP signal is distributed to the local and distant excitors through a Cisco switch and the data channel on the StarLink-based microwave radios. The main FM program audio remains in the AES format and is distributed similarly.

The FlexStar exciter is an amazing piece of machinery considering the way it simultaneously drives two transmitters. In the old split-level setup, the exciter's main 55W output fed the legacy, FM-only transmitters. The auxiliary 10mW output handed off to a FlexStar BoostPro amplifier mounted in the Z transmitter. This was a nice textbook setup for additional power that worked very well.

The enhanced split-level configuration changed things around. The main 55W exciter output now feeds the Z-Series transmitters at each

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site, while the 10mW output feeds a BoostPro in each HPX.

The BoostPro is essentially a highly intelligent second power amplifier for the exciter. The reason for the change rests on the Flexstar exciter's output port limitations that allow FM+HD from the auxiliary spigot when FM-only is selected on the main 55W output. The HPX and BoostPro have not yet been used together in the field, so specially-designed BoostPro configurations allow the HPX to recognize the Boost-Pro correctly as an exciter power amplifier – making Radio Kansas the first broadcaster to use the two components together.

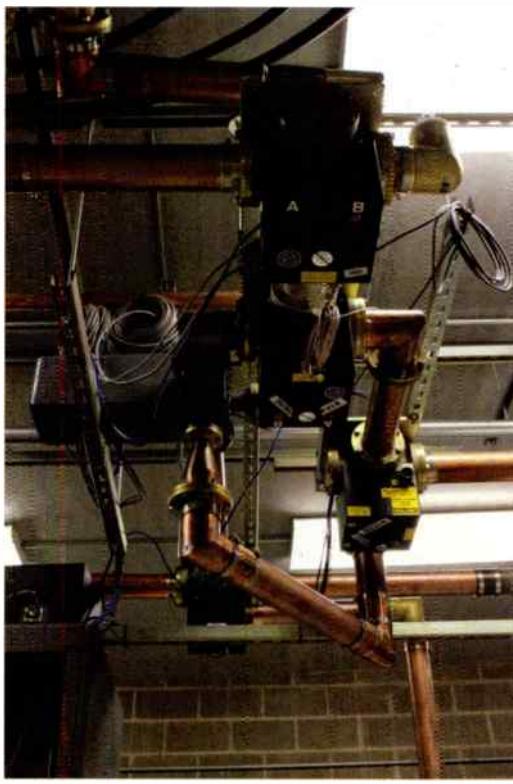
Overall, the FlexStar and BoostPro are very intelligent in their interactions with the transmitters, able to accommodate complicated, multi-mode switching on the fly and maintain power levels through integrated automatic power control (APC). Harris Real-Time Adaptive Correction technology, in correlation with the exciters, has been instrumental in flattening out sidebands to very low levels and keeping the signals within mask compliance. We experimented with upsetting the transmitter linearity by adjusting plate tuning/loading and adjusting bias and screen voltages. On queue, the system kicked in to smooth out the sidebands and minimize residual distortion products.

TRANSMITTER CHOICE

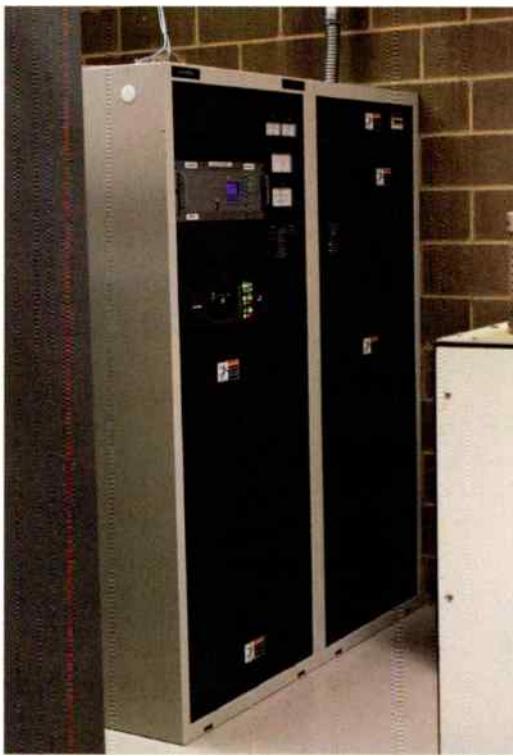
The choice to go with Harris really started in 2006 upon purchasing the FlexStar system and the Z-Series transmitters. Switching to another manufacturer would have been difficult as two of the three legacy FM transmitters we needed to use were from Harris. Our experience with Harris transmitters and Harris customer support was great, and it was important that this complex system be single-sourced.

So, why the HPX? Frankly, it was a gamble to consider a tube transmitter in the world of HD Radio, but the cost of putting two high-power solid-state transmitters side-by-side to supply the elevated digital signals would have been off the charts.

We also had reservations about whether a solid-state transmitter would be cheaper in the long run. Our final opinion was



KHCC: Another angle on the RF plumbing



KHCC: HPX40 that will be partitioned off from the room to allow ventilation of the cavity from behind. This will cut cooling requirements drastically.

that a high-power tube might actually be less expensive for total cost of ownership. Harris explained that unheard-of tube linearity was achievable through careful bias and screen voltage selection. Factory tests proved they could achieve our digital injection values while maintaining HD Radio mask compliance.

It was also important to provide enough headroom in the FM+HD transmitter to move to other digital modes. The HPX40 at KHCC, for example, was effective as it had enough headroom to accommodate the extended service modes if and when we move beyond the MP1 service mode.

Reliability of operation was also key. Radio Kansas goes dark from midnight to 5 a.m. each day. Davicom MacPlus remote control systems shut down the transmitters each night at midnight with the filaments turning off 15 minutes later. Each morning, the filaments begin warming up at 4:45, and the transmitter plates kick on about 10 minutes later. This all happens automatically and dependably, even during the coldest winter nights.

Internally, the HPX transmitter layout is clean and simple. The power supply and cavity are accessible and easy to maintain. All controller cards are grouped in the front. The transmitters are sophisticated with multi-mode operation, adding new functions and adjustments beyond the standard Class C FM transmitter. This sophistication required study and experimentation to understand the interaction of the various parameters and cavity linearity.

Other changes were minimal. Davicom and Bird systems cleanly handle the remote control and onsite power readings, respectively, making meter and status readings available on demand. ERI 6dB mBoxM3 combiners connect and mix the two transmitters. The HPX transmitters and ERI combiners were added to existing RF plumbing using non-pressurized elbows, couplers and an additional 20' length of 3-1/8" non-flanged transmission line. No new transmission lines were required for the towers.

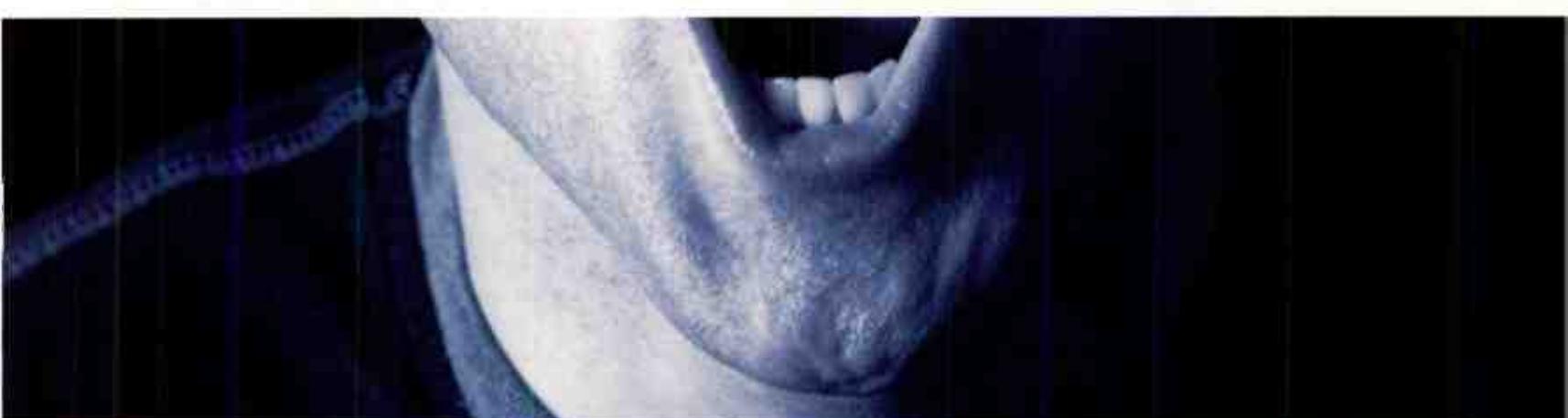
KEEPING COSTS LOW

The main concern about moving to elevated digital sidebands was that utility bills would go through the roof, not just from increased transmitter power requirements but also from



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HD COMPATIBLE

FACILITY SHOWCASE



KHCC's building includes spare 950MHz antennas and an 80kW diesel generator.

new HVAC demands. We evaluated how efficient, or inefficient, our existing closed air conditioning systems would operate in the new setup.

Summer days in Kansas often exceed 100 degrees, topping out near 115. The HPX transmitters, being FM+HD and the highest power units in our systems, also generate the most heat. We opted to step

back several decades and build partitions over the HPX transmitters that would create a plenum at the rear, leaving the front side air-conditioned and the back side ventilated with outside air. This ensures that the brains of the transmitter remain cool without requiring an additional 8 to 10 tons of cooling. This design will significantly reduce utility bills.

The KHCC and KHCD HVAC designs are identical. We positioned the backs of these transmitters into spaces resembling oversized closets, with fans hung on outside building walls. The filtered intake fan near the floor runs at about 2,000 CFM, bringing in outside air and pressurizing the space. A 1,500 CFM exhaust fan high on the outside wall and above the drop ceiling sucks hot air from the transmitter exhaust to the outside.

Radio Kansas is currently testing the extended coverage to mobile radios, the increased building penetration for indoor radios and the behavior of portable radios in both mobile and indoor environments. Initial tests appear promising. With the new systems up and running and operating well, our hope is that the tests prove that elevated sideband levels effectively improve our HD Radio coverage and allow us to freely promote HD Radio services to our listeners. 

Jung is director of engineering at Radio Kansas, Hutchinson, KS.

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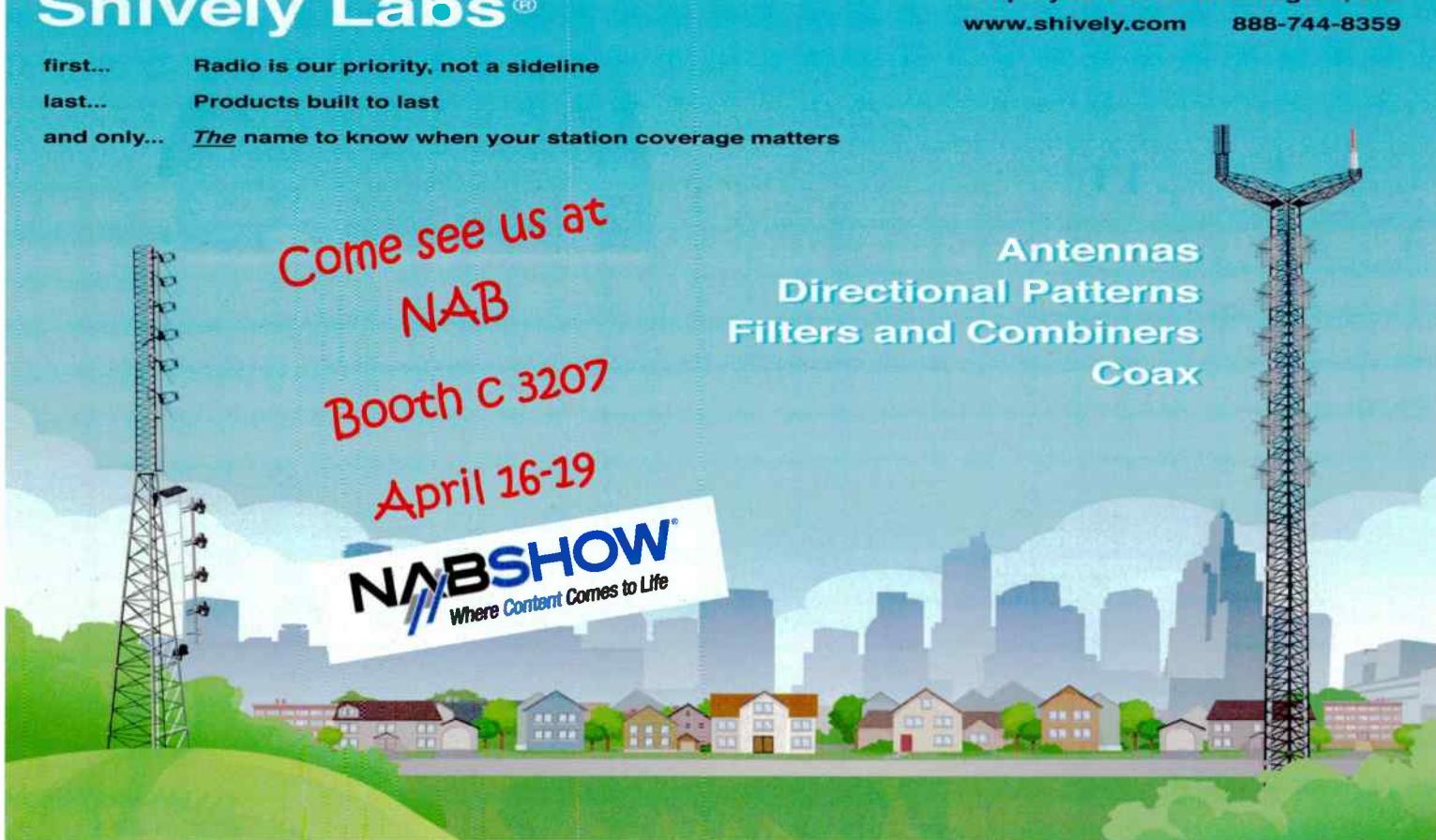
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The Fast-Changing Media Landscape

The multiplatform tracking movement

By Marlee Rosen

Broadcasters, agencies and media planners want to manage different kinds of data across multiple devices. The media industry has grown up with single sources – Arbitron for radio; comScore and AdsWizz for digital; Nielsen for the U.S., BARB for the U.K., etc. Today the media landscape has become very disjointed and too wide-ranging to let any single source of data do all the work.

In today's rapidly evolving media world, the measurement business encompasses two varied game changers. On one side, you have the companies that gather the numbers on every channel; on the other side you have the digital service providers, the management software and cross channel analysis technologies. The latter are touting their holistic interfaces, sophisticated planning tools, and analytics software that enable planners the ability to integrate all the varied data sources into one all-encompassing view.

THE MEASUREMENT LANDSCAPE

Measurement obviously is only as good as its ability to understand the media universe that it's measuring. Broadcasters and media planners alike have come to understand there is a lot more to measurement than numbers. AdsWizz, which provides the digital audio industry's CDNs, ad networks, advertisers, and online audio publishers with ad serving and audience measurement technologies, has invested a lot in understanding how and what technology is being used in digital radio with regards to how the different parts fit together as a whole to provide a holistic, overarching view.

Rich Broadcasting, a fairly new broadcast group specializing in small-market radio is led by 30-year-veteran of the radio business, Richard Mecham. During the establishment of its broadcast group, the company was early to leverage technologies from AdsWizz and Liquid Compass. In a recent interview with the head of Rich Broadcasting, Josh Tielor, it became quickly clear that the company's vision is to use the latest in digital audio technology and measurement capabilities to service the Rocky Mountain region.

Rich Broadcasting wants to make the most of real-time, actionable analytics on its digital listenership. Advanced metrics within the AdsWizz platform provide detailed analysis of listener figures. Content providers can assess their ROI using the insight gathered from audience habits in which the content providers can report these figures to sponsors and supporters. Viewer and listener analysis is the first step to intelligently monetizing streaming media. Today the solution powers advertising in a number of forms: pre-roll, post-roll, mid-roll, overlay interactive overlay and RSS scroller. It enables broadcasters to replace FM adverts with Internet adverts (national or local) and target advertising on the basis of time and day of the week, location, player or device, demographics or any other user data. It also facilitates contextual advertising, based on events within the stream.

Nielsen and Arbitron, popular radio measurement services, are looking at terrestrial or satellite radio, and are taking into consideration Pandora. It used to be that digital media planners had apples-to-oranges comparisons when trying to include Pandora as part of radio budgets. Now with up and coming players like AdsWizz and Target Spot, the game is shifting. Arbitron's recent endeavors show commitment to next gen online ratings solutions that this time around will allow both traditional radio stations and pure-play Internet companies the ability to measure listeners in. Additionally, session-based measurement is finally offering more than just estimates.

THE ANALYSTS' PREDICTIONS

According to Frost and Sullivan Research Analyst Krishna Jayaramant, "If measurement doesn't keep up with the different modes that each media channel takes, then something's amiss. The onus of fixing this situation will have to involve Arbitron and Nielsen and any other measurement service as well as the technologies that help media planners make use of the data that other businesses have gathered."

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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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"Due to the popularity of smartphones, service providers are providing radio as smartphone apps."

Now that there are two radio sectors – the old terrestrial kind and the new digital one – measurement service companies need to make good on their responsibility to digital radio. What that entails is a paradigm shift including the measuring of both segments of radio and doing it equally well.

To compete with the likes of Nielsen in the multi-screen sphere, analysts agree that Arbitron will have to strengthen its Internet measurement capabilities and to a lesser degree, mobile. For Arbitron, we have started to see the measurement evolution for radio starting with its purchase of Zokem, a mobile audience measurement and analytics firm, and then

shortly afterwards in October 2011, the announcement of a partnership with AdsWizz. The idea behind it was to tap into the streaming audio measurement business. The objective was to collect streaming audio listening data by using server-based metrics and process the server-

based streaming log file for its planned digital radio service. Three years prior, Arbitron quietly got out of the streaming radio ratings business and ended its relationship with comScore. AdsWizz, the new contender in the United States, will be processing for radio broadcast and digital music service customers' server-based streaming log files for digital radio services and provide standard reporting metrics for over the air and digital streaming audiences. Once Arbitron has enough streaming data to work with, it will be better informed to make decisions about combining Web listening with radio PPM and diary data.

CROSS-PLATFORM SOLUTIONS

The new mantra is cross-platform data. Cross-platform solutions provide an opportunity to develop a second significant revenue stream. Both

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stations and advertisers want cross-platform measurement in order to measure and reach all listeners using all devices. According to Paul Krainski, Arbitron SVP of digital media and analytics, "It's all about audio consumption, not just radio versus digital." He cited at a recent Arbitron customer conference that some 89 percent of those who listen online also listen to over-the-air radio.

The industry is gearing up for better approaches to measuring the increasing Internet radio consumption especially with the increase of usage across several industry verticals (automotive, smart appliances, consumer electronics, etc.). For instance, just within the last two years, the Internet era and in-vehicle connectivity concepts have made their way to Internet radio. Pandora and Last.fm are some of the Internet radio providers who have been prominent players in this area. Similarly, due to the popularity of smartphones, service providers are providing radio as smartphone apps. According to Frost and Sullivan, Pandora has 100 million registered users and 36 million active monthly users. Partnerships with Ford, BMW, Mercedes Benz, and Scion have pulled Pandora out of its box and into spotlight and there is no turning back.

AdsWizz President Alexis van de Wyer agrees that while next gen audio technologies are enhancing and personalizing the radio experience, next gen ad serving and measurement technologies are enabling advertisers to reach their target demographics more effectively through personalizing the

ads as well. Nowadays, Web radio audiences consume through Internet-enabled devices and have created new opportunities for broadcasters, agencies and advertising networks to monetize their online radio audiences.

MONETIZING AUDIENCES

Companies are beginning to tap into how they can better monetize their audiences, give advertisers new powerful ways to interact with consumers and provide more effective ad strategies to reach multi-platform consumers. ESPN for instance had Arbitron create custom measurement of all listening and viewing on all platforms. Arbitron is using online measurement with AdsWizz. According to Glenn Enoch, vice president of Integrated Research for ESPN, "We want to know how many people listen and view ESPN, how often they do so and for how long. The more key audio listening data we can gather, the better."

Slacker Radio, rivaling Pandora with its highly personalized radio services, gives us another example of a leading company looking to further monetize its audience through video advertising partnered with ad manager YuMe. Slacker Radio will use an ad serving platform to insert ads across multiple devices and will sell its own ads. Today banner ads appear on Slacker, which also operates a free of charge model as well as a fully loaded subscription model. With video cost per mile running strong against premium content and a large audience that creates a great



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SPECIAL FEATURE

monetizing opportunity, video ads are a natural for Slacker as long as it can balance user experience considerations.

Ooyala Technology, well known for its online video technology has partnered with Adap.tv and AdsWizz to expand opportunities for its clients to monetize content, integrated its video technology into ESPN's website partners with the sports media behemoth's streaming video content. ESPN has been able to step up its load times and increase playback quality. Sports broadcasters can now better utilize internal resources by streamlining the management of their videos and related data. Ooyala provides a real-time analytics engine, with detailed per-video and per-user reporting for on-demand and live video streaming, as well as integrations with payment systems so there is the ability to launch both paid and ad-supported video business models.

ESPN has generally lagged behind its big media competitors in terms of its utilization of social media, so the fact that Ooyala enables visitors to easily share videos via Facebook and Twitter from within the player has been a tremendous social boost for ESPN.

MARKET TRENDS

According to Red Bee Media CTO Brian Levy's predictions, the next few years will evolve in the many ways such as going from using many screens to having one integrated screen. There will be enhanced personalization going from the electronics program guides (EPG) set by the industry to a more personal EPG where the user is in charge, and lastly greater interactivity that will enable all sorts of new ways for the consumer to interact with the material. He also expects there will be a larger convergence of media. Expect new value chains and logistics providers to emerge. "It will be an ecosystem where partnerships are essential, and where technology simplification – creating an outstanding user experience and customer interaction and evolution – are the important elements of success," Levy said.

For the future, expect to see more strategic media technology partnerships embraced that will make Internet radio even more accessible to



Slacker Radio features highly personalized radio services including an ad serving platform, banner ads and video ads.

advertisers by dealing with various issues such as scheduling, customer service and performance reporting. Advances in performance reporting capabilities (i.e. data describing click-through rates on banner display ads that have been synced to the audio message) will allow broadcasters to set up multiple radio channels and deliver ads across one or all of them, targeting audiences by demographic characteristics. Technology enhancement offerings are expanding with online video, social networking and mobile functionality. □

Rosen is a market research analyst with Rosen Associates, Westborough, MA.

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Omnia.9
BY LEIF CLAESSEN

Home

Input 1 Input 2 Input 3 FM Studio Proc HD1 System

HD2 HD3 Streaming 1 Streaming 2 Streaming 3 Monitor Out

CPU Load: 41 %

Speaker Volume: -4.5 dB

Processing -FM - Input 1

Speaker Output - L+R

MPX Output - Multiples

MPX Out - MPX

Menu

1 2 3 4 5 6

Input AGC Multiband VE2 Post MB MP2 L/R

Dynamics MultibandExp

MPX Output - Multiples

Speaker Output - L+R

MPX Out - MPX

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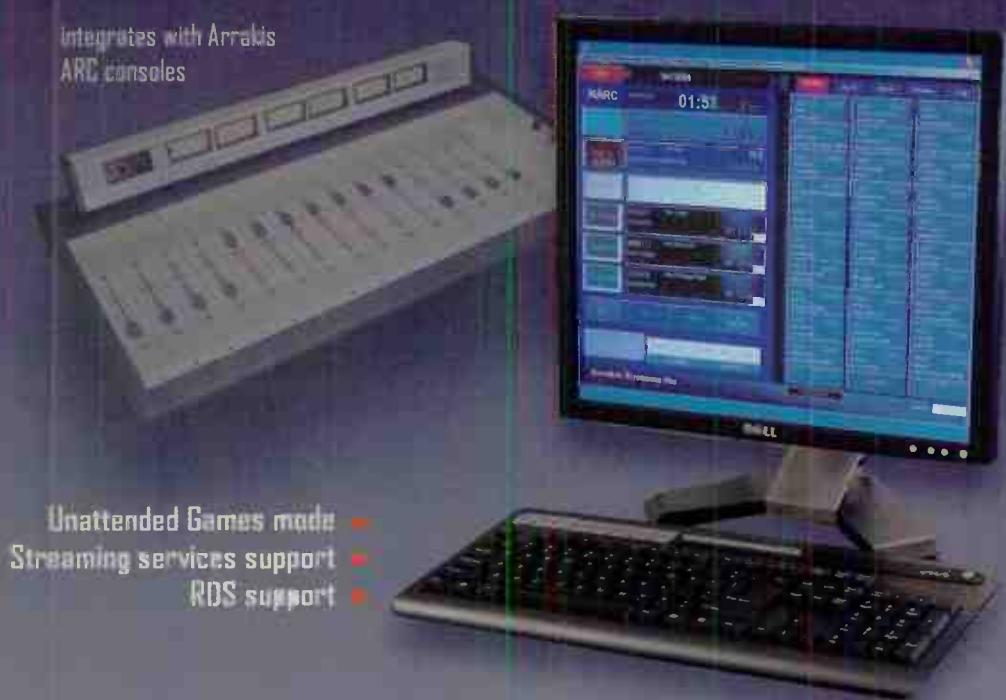
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by Doug Irwin
CPBE DRB AMD

Convenient Power With Diode Combining

I am just finishing a new transmitter facility at the Empire State Building and there were a couple of times that I needed power supplies to keep various relays energized (like remote interlocks) or to signal a coaxial relay to move. I'm for keeping things simple and minimizing the actual number of items that are plugged in (especially if a blown fuse can take the station off). Many times there are already power supplies built in to equipment with the right voltage and plenty of current source capability. Why not use those? And it seems to make even more sense when there are multiple power supplies just sitting there waiting to be used.

Here's a specific example. I needed to energize a relay through an interlock chain that included the coaxial relay and the combiner interlock from the 85th floor combiner room. I had three power supplies already built and powered inside the two transmitters (main and backup). The main is a Nautel NV20, and it has a +15V power supply that can source 600ma. Likewise, our backup (a BE FM10B) has two +15V power supplies, each of which has a usable output. By diode-combining those from the BE, and further diode-combining their output with that of the Nautel, I have a rock-solid power source to energize my interlock relay. Figure 1 shows what was done in detail; it's nothing complicated. The idea is actually simplification.

Another example is used for our Dielectric coaxial relays. This facility has two stations (WWPR and WLTW) so of course there are two relays. Each needs a voltage send to activate the relay, so I needed a voltage source for that. Using the power source already shown in Figure 1 seemed like having too many eggs

in one basket, so I opted to add special power supplies this time. I used one per station, and again, diode-combined, so that if one fails, the other can still handle both stations.

These power supplies rarely get used; so how does one know if they are still working or not? It would be bad if I went to use one and found it dead. Well, the solution there is simple: We send a sample of its voltage output to our remote control. If the remote control senses a loss in that voltage, it emails me. That sample comes out ahead of the diode-combining, so that potential failures are isolated from one another. Figure 2 shows this.

I added a couple of UPSs to our racks and anyone who has used a UPS for any period of time knows that they sometimes fail. There is little worse than having your transmitter rack go dark because the UPS failed. Our five stations at ESB share the LAN and our air chains come over that LAN; four pieces of equipment are shared for these purposes. Two of the four have dual ac inputs. That's handy, because one can plug in to raw power and the other in to UPS power. However, the other two only have a single ac power input. Both of them run on -48Vdc as well. I wanted each of those to be powered from raw and UPS power. This is where diode-combining came in again. Of course this time, the diodes are turned around, as shown in Figure 3. I used two outboard -48Vdc supplies combined. The output powers the devices. One -48Vdc power supply plugs in to raw ac, and the other in to UPS power.

Problem solved. ☺

WE NEED YOUR TIPS

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 WKUT, New York. Contact him at doug@dougirwin.net.

Figure 1

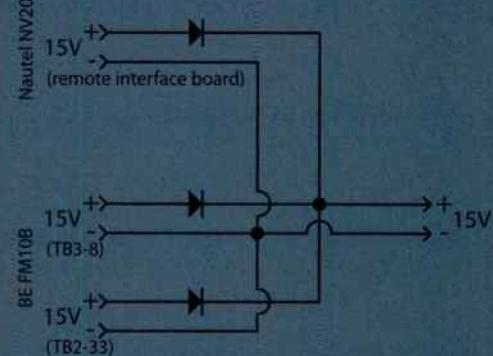


Figure 2

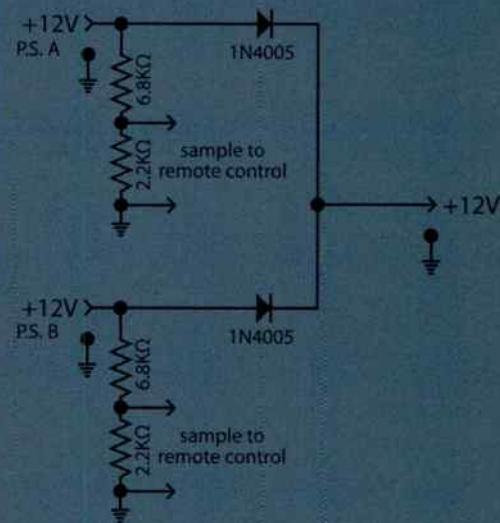
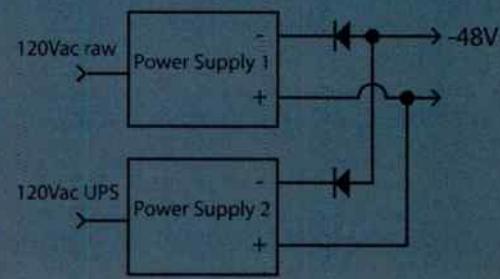


Figure 3



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Mix minus in-out for an external Telephone hybrid

Multimillion operation switches with long life LED lamps

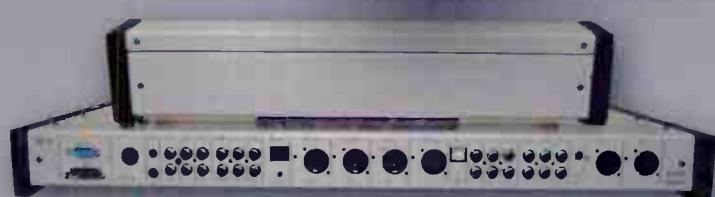


ARC-10U... \$1,599

ARC-10UP... \$1,999

ARC-10BP... \$2,495

The ARC-10UP with unbalanced inputs and PC sound card is displayed. 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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World Radio History

Inovonics INOmini 632

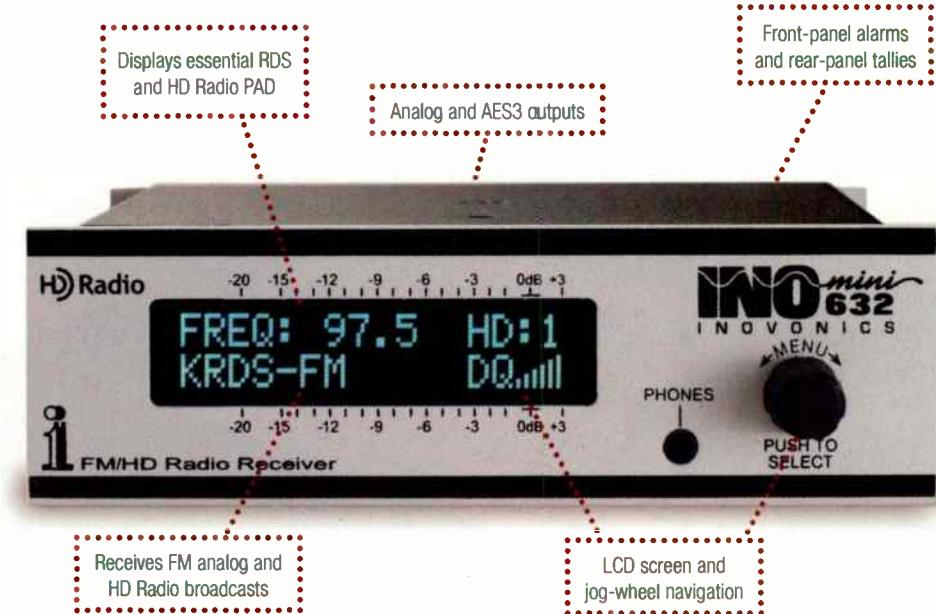
by Barry Thomas, CPBE CBNT

One surprisingly challenging issue with operating HD Radio technology, especially using FM HD Radio multicast channels, is cost-effective and professional monitoring. There are elaborate devices, modulation monitors and test equipment that poll, sample and test HD Radio signals but there's been a great need for inexpensive, straightforward monitoring of the station's digital signals.

The need for this sort of monitoring made for one of the most anticipated products from the *Radio* magazine Pick Hits of the 2011 NAB Show: The Inovonics INOmini 632 FM and FM/HD Radio monitor/receiver. Although the unit was shown in the spring, Ibisquity certification took a little longer than expected. The reason is apparently related to some of the most useful and important features of the receiver.

The INOmini form factor is 1RU by 1/3 rack space width. The 632 is specifically designed to monitor FM HD Radio in professional radio station environments. The unit can demodulate analog and decode HD Radio (including multicast) channels. The front-panel display is a selectable readout showing frequency, channel, signal strength, left and right audio meters, RDS (PI, PS, PTY, RT and even RT+!) or HD Radio PAD (name, type, lname, artist, title). The audio output uses XLR males for analog and AES/EBU, and a 4-pin Phoenix connector with one ground and three open-collector alarm outputs that indicate carrier loss, digital loss and audio loss.

The 632 is powered using an external supply. Using the parallel



power jacks and a supplied dc jumper, up to three units can be daisy chained to help manage wall-wart congestion in equipment racks.

OPEN THE BOX

When I received the unit I did what just about any engineer would do: I opened the box, plugged it in and connected an antenna and a set of headphones. In fact even the manual anticipated that reaction:

"If, like most of us, you've allowed youthful enthusiasm to override methodical procedure, you've either already figured out the 632 receiver menu for yourself, or you are ready to throw this unit under the wheels of a passing locomotive."

This unit isn't coming close to a CSX line any time soon. As thoroughly articulated in the user's manual, the 632 is extremely simple to understand and operate. There's a single knob for navigation and control. Turn the knob to move a flashing cursor, press the knob to select, turn the knob to adjust, and then press again to set/exit.

Receiver mode can be manually selected and "forced": analog stereo (blend or no blend), analog mono, HD-1, HD-2, or HD-3 all the way (theoretically) to HD-8. Considering that a very common implementation of FM HD Radio with multicast uses three digital channels, (HD-1 to HD-3), the INOmini size makes it so all an FM station's digital on-air channels can be monitored in a single rack space (and with a single power plug, but more on that later).

For a small monitor, the 632 display can show an impressive amount of information. The normal, idle display shows the frequency, mode (FM:M/S, HD-1 ... HD-8), RBDS PI Code (raw

and decoded per NRSC-4 specifications) when in analog mode and or name field on HD Radio mode. The small signal strength meter changes to a DQ (digital quality) meter in HD Radio mode.

When an alarm condition occurs such as the station losing the HD Radio signal, audio failure or carrier failure, the front panel flashes Low Signal, Audio Loss or HD Loss, and also triggers the appropriate alarm outputs on the rear panel. Even if the alarm outputs are not used, the flashing front panel should attract the attention of a passing engineer. Pressing the front panel knob mutes the display but the rear panel alarm remains triggered and will do so until the alarm condition is cleared (digital carrier, audio or analog carrier restored).

BEYOND HD RADIO

Although the device isn't specifically an RBDS or HD Radio PAD data analysis tool, the most common and visible RBDS Data and HD Radio PAD fields can be manually selected and displayed. If, for example you are tweaking RBDS transmission percentages, field padding, repetition rates, individual fields can be cleared and redisplayed. In FM analog mode, the PI code display even seems to clear and redisplay each time the receiver decodes the transmission. Even Radiotext + fields are displayed and there are similar pages for the similar HD Radio PAD fields (name, type, artist, title). These features are a big improvement over waiting for consumer RDS or HD Radio display time-outs and display refreshes. As stations get more sophisticated in how their HD Radio PAD and RBDS data is used, this can become a very useful feature for spot checks.

INOVONICS

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The carrier loss alarm trigger level is set immediately below the signal strength meter on the same display page. The audio loss (silence sense) alarm can be disabled or a delay can be set from 1-120 seconds. There's no adjustment for HD loss but the alarm will trigger if HD Radio mode is selected and after a delay of a few seconds after loss of digital signal.

Many of us have anticipated the release of the 632 ever since it was awarded a *Radio* magazine Pick Hit, but sale of the unit was pending certification by iBiquity. What made certification difficult was that certain features critical to HD Radio's success on a consumer level are actually limitations for professional equipment. Fortunately the 632 was licensed by iBiquity in January 2012 under a "limited certification" because of the following variances, specified in the unit's documentation:

> The Inovonics 632 displays only four characters of call sign (not all six characters as defined in the requirements.)

> The Inovonics 632 displays only 39 characters of artist (not 64 characters as defined in the certification requirements supporting the ID3v2.3 standard.)

> The Inovonics 632 displays only 39 characters of title (not 64 characters as defined in the certification requirements supporting the ID3v2.3 standard.)

In addition the 632 is inhibited from blending to analog. This means the 632 is actually a real, honest-to-goodness air monitor for the digital channels. The receiver can be set to avoid the typical consumer analog stereo blend.

I've excerpted the user's manual a couple of times. The excellent technical writing is worth recognition. For such a simple, easy-to-use device, the user's manual is exceptionally complete and accurate. For all this I thank Inovonics.

There are two items I would like to see added. The selection between FM and HD modes is done from the idle display, however the FM stereo/monoblend/no-blend selection is done a

few pages away in the menus. It would be useful for the initial mode selection to be in one place: FM auto, mono, stereo, HD-1, etc., even if the blend setting were in a different menu location.

I would also like to see IP integration. Either an internal network connection or an optional, add-on device that would echo the alarm functions using SNMP, maybe even an email or SMS client to send alarms.

It's likely that either of my desired features may not be possible within the reasonable price point offered for the monitor. The features above in no way detract from an otherwise excellent monitoring product for analog but especially for FM HD Radio channels.

For the use of cost-effective, dedicated HD Radio monitoring, the INOmini 632 is a problem-solver that I expect will become a fixture at stations nationwide very soon. □

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



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Nautel NV40

by Jim Stitt

WYSO is a 50kW non-commercial FM station licensed to Antioch University in Yellow Springs, OH. WYSO serves the Dayton/Springfield, OH, metro providing NPR and a variety of other public radio programming to more than 1 million people. This station has undergone many improvements and upgrades since first going on the air in 1958 as a 10W student station. That history of growth to meet the needs of the public radio audience and fulfill the mission of the University's outreach is culminating this year in two major projects – the construction of new state-of-the art studios, and a new transmitter and antenna that will increase power to improve coverage and maximize the potential audience.

I embarked on the power increase project when a detailed study of the directional antenna pattern revealed the opportunity to increase the coverage area contours toward major population centers. During this time, the Corporation for Public Broadcasting announced that grants would be available to increase IBOC facilities. WYSO broadcasts in digital and continues to explore methods to utilize the capabilities for multiple audio channels and associated data, so increasing the digital coverage was another objective. Studies completed by John Kean and NPR Labs suggested that an IBOC sideband level of -14dBc would come close to achieving coverage parity with the

analog signal without causing objectionable interference to either adjacent stations or our own analog



signal. Our own studies verified that WYSO could utilize IBOC levels of at least -14dBc, so we now had yet another reason to proceed.

The search commenced for a suitable new transmitter that would be able to produce the required power output at -14dBc in MP3 mode and also be compatible with the many limitations of our transmitter site. The first major site limitation was tower capacity at our leased antenna site, which only allowed a two-bay antenna. With what the directional antenna gain would likely be following range proof measurements, we could need as much as 30kW TPO to make our 50kW ERP goal. The second major limitation was the absence of three-phase power. The current transmitter utilized a Phasemaster to convert from single phase, but that is a compromise in efficiency and results in higher utility costs, as well as creating a potential reliability issue with another single point of failure. In fact, the Phasemaster had a history of two failures resulting in outages. A solid-state transmitter with switching power supplies could resolve that issue.

HOMEWORK

My initial research was taking place in 2010 at a time when several transmitter equipment manufacturers were responding to the market demand for reliable solid state, lower cost, high power transmitters with smaller footprints by developing or enhancing new lines of high power solid state FM transmitters with elevated IBOC capability. Ability to bring a product to market in a timely fashion became yet another issue.

The Nautel NV40 turned out to be the only product on the market that would produce the required 30kW TPO at -14dBc IBOC level in MP3 mode, was also solid-state and was capable of operating from single-phase power with switching power supplies. Achieving that power level was possible due in part to its Power Boost peak to average power reduction (PAPR) technology that was proven during independent tests last year conducted by NPR Labs. Additional IBOC gains would also be possible in the future by utilizing asymmetrical sideband capability. The adaptive

pre-correction maintains spectral compliance without external filters.

Another important requirement was compatibility with the legacy IBOC transmitter equipment. We wanted to retain the current transmitter as an auxiliary and be able to utilize the same common STL. Nautel demonstrated on site that their Exporter and Reliable HD Transport system was indeed compatible with both their exciter and our legacy equipment. Check that box.

The NV40 had met all of WYSO's basic requirements, but the evaluation wasn't complete. This transmitter acquisition was likely going to have to last the station for many years, so product support is critical. Tech support is available 24/7/365 on the phone, and on-site service available if required.

So after extensive evaluations, I selected the Nautel NV-40 for this client's application and the order was placed. Delivery this past fall was made on schedule, and the crew placed the

cabinet exactly where we wanted it. I had anticipated a few issues with purchasing or delivery from Canada, but there were none. Installation was straightforward with no surprises. They even supplied a special conduit transition box to accommodate the large ac feed cables. The only complaint I had was limited access to the connections on the rear of the exciter(s). An interface panel for external connections would be a better solution.

The start-up and commissioning were uneventful, except for the inordinate amount of fun we had playing with – I mean working with the AUI. Gary Liebisch from Nautel stopped in to assist with the Reliable HD Transport setup and ensure all was well. The Advanced User Interface (AUI) is awesome. Instrument-grade RF and audio spectrum analyzers are built-in. So even though we used test equipment to initially verify proper operation, it is reassuring to know the display is an accurate instrument for future diagnoses and

verifying mask compliance. The AUI is 100 percent remote accessible with any Web-enabled device, including shared screen support with Nautel's engineers and email notification. Add conventional integration with the Burk remote control via the phone line, we have complete control and monitoring redundancy. And speaking of backup and redundancy, each module has its own IPA and dedicated power supplies, so there is no single point of failure. The transmitter can run with several failed modules, and they are hot swappable for seamless maintenance.

I am extremely satisfied with the Nautel NV40. There have been no problems to report, and the station is looking forward to better coverage with lower utility bills compliments of the 0.99 power factor. 0

Stitt is the president of JMS & Associates, a consulting and contract engineering firm in Cincinnati.



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USB Audio Interfaces

It used to be that getting audio in and out of a computer was more magic and wizardry than computer science. Today, every device has some audio capability. The quality of the stock on-board

hardware is not always the best, and it's limited to a single connection. For installed systems, a professional sound card can provide the needed quality and features. But for portable use, a peripheral device is the simplest way to enhance the audio I/O while still keeping the setup compact.

While investigating options, we found plenty of USB-capable devices. We found some Firewire devices as well, but given the proliferation of USB on portable computers,

we stuck with that connection. We also looked for interfaces that had at least a mic and a line input. Most have more, including digital I/O. We also chose units that were powered by the USB connection without needing an external power supply.

While these interfaces have a natural use in field production, we also found them to be useful in small editing setups, such as new work stations and even some production setups. □



Model	Lexicon Alpha	Digigram Cancun 222-Mic	Alesis iO2 Express	M-Audio MobilePre	Roland Tri-Capture
Inputs					
Mic	1x XLR	2x XLR*	2x XLR	2x Combo*	1x XLR
Line	2x 1/4" TRS	2x XLR*	2x 1/4" TRS	2x 1/4" TRS	2x RCA
Digital	-	1x AES3	-	-	-
Other	Hi-Z 1/4" TS	-	MIDI, Inserts	Hi-Z 2x Combo*	Hi-Z 1/4" TS
Phantom Power	N	Y	Y	Y	Y
Outputs					
Line	2x 1/4" TRS, 2x RCA	2x XLR	2x 1/4" TRS	2x 1/4" TRS	2x 1/4" TRS
Digital	-	1x AES3	-	-	-
Headphone	3.5mm	6.35mm	1/4"	1/4"	1/4"
Sampling Rates (kHz)	44.1, 48	32, 44.1, 48, 88.2, 96, 192	up to 48	44.1, 48	44.1, 48, 96
Bit Depth	24	8, 16, 20, 24	16, 24	16, 24	16, 24
Level Controls	Ch. 1/Inst, Ch. 2/Mic, Monitor Mix, Output Level	Assignable Level Control, Headphone Level	Ch. 1 Gain, Ch. 2 Gain, Monitor Mix, Main Level, Headphone Level	Ch. 1 Gain, Ch. 2 Gain, Headphone, Line Out	Ch. 1, Ch. 2, Ch. 3, Headphone
Connections	Panel	Dongle	Panel	Panel	Panel
Metering	Peak LEDs	LED Bar Meters	LED Bar Meter	LED Signal and Clip	LED Signal and Peak, LED Bar
Power Source	USB connection				
OS	Windows or Mac				
Dimensions (in)	6.75 x 6.5 x 1.6	10 x 3.8 x 1	6.2 x 5 x 2	9.5 x 7.7 x 2.2	6.75 x 5.3 x 1.6
Weight (oz)	17.6	15.85	12.8	28.8	12
Extras	Cubase LE 5	-	Cubase LE	Pro Tools SE	Cakewalk Sonar X1 LE
List Price	\$100	\$790	\$200	\$179	\$159
URL	lexiconpro.com	digigram.com	alesis.com	m-audio.com	rolandus.com

* Connection is shared, mic or line

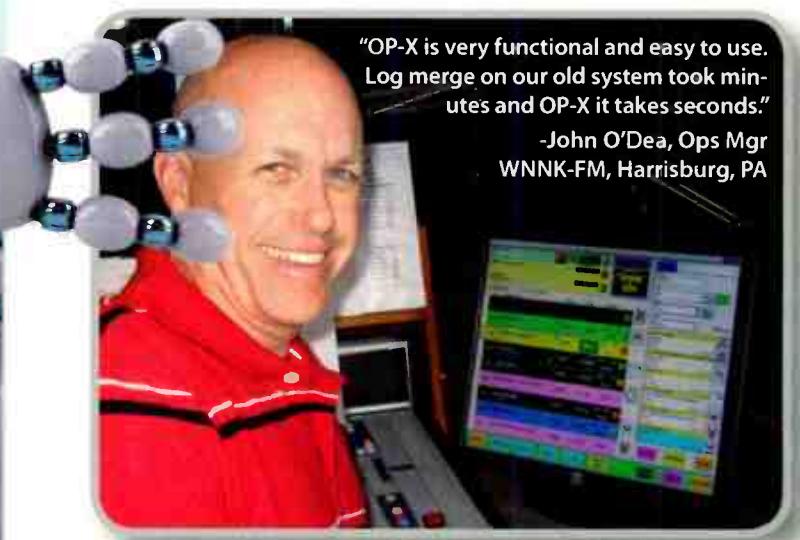
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- Importing logs now gets its own module that takes confusion out of the process.
- Engineers will enjoy Op-X because it's easy to install, maintain, and has automatic backup features.



iPad app Features

- Live show real-time control from almost anywhere
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- Run macro command from hot buttons
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NAB New Products



Automation system | ENCO Systems

ENCO1: ENCO1 is a completely virtualized automation system environment. Replace 50 or more rack units of equipment with two servers and a network switch. Reduce long-term operating expenses and short-term integration costs. Gain new levels of redundancy and flexibility with this cutting edge technology. enco.com



Radio automation | Netia Digital Audio

Radio-Assist 8.1: Radio-Assist 8.1 offers the same streamlined end-to-end multimedia production, broadcast, and publication workflows, as well as two significant new features: an integrated music scheduling application and video editing capability from within a single user interface. With music management tools integrated into its FederAll playlist preparation module, users will be able to automate playlist generation according to preset criteria, business policies, and a wide

range of intelligent options for sequencing music. The video editing tool complements the software's Snippet and Snippet+ audio editing tools. This enhancement addresses the growing demand for radio broadcasters to provide video via their online portals. This simple and easy-to-use editing tool is available through the same GUI as the Snippet tool.

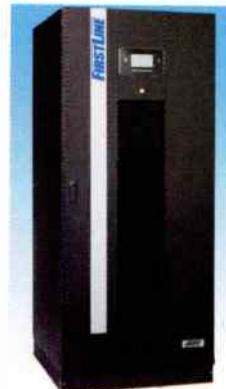
netia.net

160-250kVA UPS | Staco Energy Products

Firstline P Addition: The latest addition for 160-250kVA applications was developed in direct response to customer requests for a higher kVA UPS to the native 480Vac product family, and it allows the company to offer total small- and medium-sized power solutions. These online, double-conversion units boast efficiencies of up to 98 percent, while delivering maximum availability and flexibility. Up to eight FirstLine P units can be run in parallel. They are ideal for IT, especially to protect transmitter excitors and HD Radio coders, monitoring, remote control and

Emergency Alert Systems, links to remote programming sources via digital telephony, satellite, etc., as well as office computers, stand-alone computers and computer networks for audio playback, program scheduling and more.

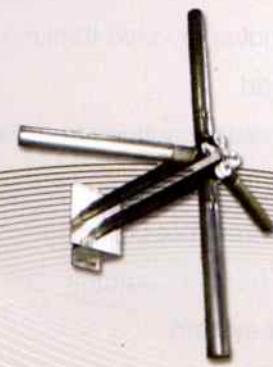
stacoenergy.com



Audio distribution amplifiers | RDL (Radio Design Labs)

RU-ADA4D, RU-ADA8D: The RU-ADA4D 2x4 or 1x8 and the RU-ADA8D 2x8 or 1x16 audio distribution amplifiers offer significant enhancements over their predecessors. The RU-ADA4D is produced in a durable, all-metal, 1/3 rack width MAX Rack-up enclosure and wiring connections are now made on detachable terminal blocks rather than screw terminals. Other improvements include redesigned front and rear panel graphics, separate input and output level trimmers, dual-LED VU metering, switch-selectable stereo/mono mode, exceptional low-noise and common-mode rejection performance. The RU-ADA4D and RU-ADA8D maintain the tradition of excellent headroom, very low distortion, exceptional crosstalk isolation and wide flat frequency response. rdl.net.com

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The more you saw, the more convinced you were that IP consoles made sense for your station. Problem was, you had small spaces to work in. Some behemoth board that looks like a '78 Oldsmobile just wouldn't fit. But there was no way you'd settle for some cheap plastic PA mixer that looked like a refugee from the church basement. "Wouldn't it be great," you thought, "if someone made an IP console that didn't take up a whole room?"

Then you saw the new RAQ and DESQ consoles from Axia, and your problems were solved. With the power and features of a big console, but minus the ginormous space requirements. RAQ will drop right into those turrets in your news station's bullpen —

the reporters can send their finished stories right to the studio. And DESQ is perfect for the auxiliary production rooms.

But what sealed the deal was finding out you could run two RAQ or DESQ consoles with just one Axia QOR.16 mixing engine — you know, the one with all of the audio I/O, the power supply and the Ethernet switch built in. That brought the cost down so low that when you told your GM the price, he actually didn't swear at you (for once). Make another decision like this, and you might just be changing the sign on your door from "Chief Engineer" to "Genius."

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Modulation Analyzer addition | WorldCast Systems

RF Generator: With the addition of the RF Generator, the Modulation Analyzer now provides all the tools necessary for commissioning and testing an FM transmitter in a 3RU chassis. This combination simulates any FM signal and then feeds it into the comprehensive test suite. Broadcasters can ensure that all transmitters in a network comply with regulations and they can also perform regular evaluations in order to optimize the performance of each transmitter. Measurement and analysis features on the Modulation Analyzer platform include a digital FM demodulator, RF spectrum analyzer, oscilloscope, dual channel audio generator, distortion meter as well as MPX and RDS analyzers.

audemat.com

A photograph of the Acoustics First booth at the NAB show. The booth has a large red arrow graphic on the left and a yellow banner with the text "Let Us Help You Create A Sound Environment No Matter Where You Are" and the website "www.AcousticsFirst.com". In the center, there are several acoustic panels on the wall and a desk with equipment. A QR code is visible in the bottom right corner of the photo.

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VX VoIP system | Telos Systems

VSet 1, VSet 6: The family of VX products has expanded, with the introduction of VSet6 and VSet1. Like their big brother the VSet12, the six-line VSet6 and single-line VSet1 phone-sets have a big, bright LCD color display with exclusive Telos Status Symbols to keep talent informed of line and caller status. When used with VX Producer call screening software, the VSet display also delivers detailed information such as Caller ID, time ringing-in or on-hold, and even screener comments from the VX Producer software application. All VSet phones are powered by PoE (Power over Ethernet) from a Telos-approved switch, a PoE port on an Axia console engine, or from the power injector included with each unit.

telos-systems.com

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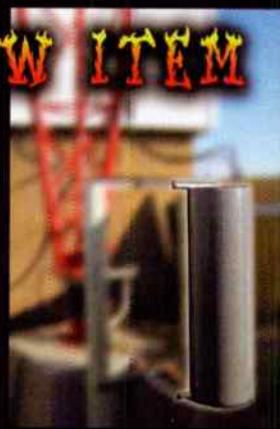


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NAB New Products



Console | Audioarts Engineering

Air-4: The Air-4 has four microphone preamps built in. This allows the use of a host microphone and three guest microphones with the Air-4 without the use of any external mic preamps. The other key features include remote start logic for each fader, dual program busses with balanced outputs and USB connectivity. The console has 12 faders plus a phone fader designed for use with a hybrid. An automatic mix-minus is provided. All audio connections are via RJ-45 connectors to keep your wiring simple and inexpensive. The USB connection is patchable to any input fader, and internally dipswitchable to send from either program bus.

wheatstone.com

Low-power exciter | Harris

Flexiva Exciter: The new Flexiva Low-Power family of transmitters includes a 50 and 150W exciter/transmitter. It is designed to integrate with the Flexiva HP family as either an internal or external exciter. The heart of the LP line is the direct-to-channel, digital modulator with all of the popular features and performance of the Flexstar exciter in a more cost-effective package. Initially, the Flexiva will be offered as an FM-only exciter with upgrade-options for HD Radio, DRM, Audio over IP and USB audio playback, as well as other options for internal GPS, single frequency networking and Orban Inside audio processing.

broadcast.harris.com



ARC Plus adapter | Burk Technology

Plus-X GSC Adapter: Upgrading from the GSC3000, VRC2500 or VRC2000 to the ARC Plus is now faster and more affordable than ever. The GSC Adapter connects directly to existing GSC/VRC Command Relay and Wiring Interface panels, linking them to a new or existing ARC Plus remote control over the LAN, WAN or Internet. The Plus-X GSC adapter also eliminates the need to purchase additional I/O capability at a substantial cost savings. Furthermore, a single ARC Plus can replace multiple GSC/VRC systems, making larger upgrade projects substantially more cost effective. GSC/VRC users upgrading to the ARC Plus will benefit from the many advantages of Burk's current generation system, including native IP connectivity, built-in Web interface, onboard automatic functions, email alerts, and much more.

burk.com

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Power supply | Digital Alert Systems

NoNOISE-PS: This professional-grade no-noise power supply option for the Dasdec-I and Dasdec-II emergency alert systems (EAS) is ideal for Dasdec units housed and accessed in quiet environments, such as radio studios. The power supply offers new and existing Dasdec users a simple, cost-effective way to ensure noiseless operation. The power supply is an external brick supply that replaces the Dasdec systems' currently installed power supply with a connector panel. Unlike external power supplies, the NoNOISE-PS is engineered for use in mission-critical applications. It can be added to any new Dasdec system at time of order, and current Dasdec users can have their existing units retrofitted at the Digital Alert Systems' Lyndenville, NY, factory.

digitalalerts.com

Exciter | Aphex Systems

EX.BB 500: Aphex engineers have designed the EX.BB 500 to provide the same performance audio professionals have come to expect from the much-celebrated Aphex



Aural Exciter - improved detail and clarity in the higher frequencies while providing more spaciousness in the overall mix. Adding the sonic depth of the proven Big Bottom, with its dynamic low frequency punch, improved detail and the much-exalted thickness, this compact 500 Series product delivers all of the critical performance demanded, while fitting racks from API, Radial, A Designs, Empirical Labs and Tonelux. Providing engineers and artists with unlimited flexibility to add and subtract Exciter channels as needed, this powerful and portable 500 module brings even more Aphex impact to studios and stages.

aphex.com

Audio processor | Omnia Audio

Omnia.9 FM+HD: Omnia.9 features separate processing cores for FM and HD-1 and (optional) HD-2 and HD-3. It also supports encoding to MP3, MP2, AAC, HE-AAC (including RTSP/3G for streaming to mobile phones), Ogg Vorbis and WMA Pro formats. A 7" touchscreen front panel, full remote control, on-screen keyboard, dynamically updatable RDS encoder, selectable SSB (single sideband) stereo encoder, and adjustable dynamic bass clipping are part of the toolkit. The Omnia.9 FM+HD includes all of the features of the original -- such as undo distortion management, composite embedder and streaming/encoding capability -- but is designed for those who wish to only process and stream one program source for analog and HD Radio.

omniaaudio.com

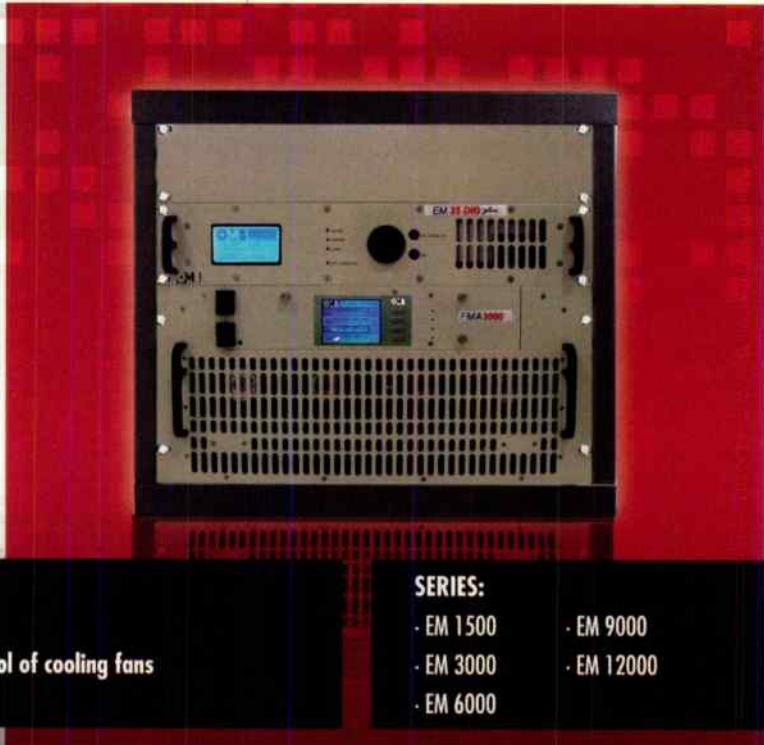
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NAB New Products

Headphones | Audio-Technica

ATH-MW50H: ATH-M50WH professional studio monitor headphones are a stylish all-white version of A-T's ATH-M50 headphones. Based on input from end users looking for an alternative to the ATH-M50's standard all-black color scheme, the ATH-M50WH headphones offer the exact same comfort and superior audio quality for professional monitoring and mixing as their standard counterparts.

audio-technica.com



RS-232C isolation and distribution amplifiers | ESE

ES-250, ES-251: The main purpose of the ES-250 and ES-251 are to improve the distribution capabilities of RS-232C or provide isolation between users of RS-232C. Three 1x8 amplifier circuits allow the incoming signal to be distributed via 24 outputs. The units receive RS-232C and buffer the signal so that each of the 24 outputs can drive a single user at a distance of up to 50' (per output). All inputs and outputs for the ES-250 are via rear mounted terminal block connectors; the ES-251 inputs and outputs are via rear mounted 9-pin D-sub connectors.

ese-web.com

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Audio processor | Vorsis

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vorsis.com

Broadcast field mixer | JK Audio

RemoteMix 3.5: JK Audio introduces RemoteMix 3.5, a three-channel field mixer and headphone amplifier. More than just a field mixer, this is a universal communications interface. The mixer features a phone line hybrid and keypad, a PBX handset interface, and both wired and wireless cell phone interfaces. These parts were designed to work together, saving setup time in the field. RemoteMix 3.5 is perfect for sports remotes. Use it as a phone line hybrid, calling into a studio talk show hybrid. Use it as a front-end mixer for POTS, ISDN, IP or smartphone codec.

jkaudio.com

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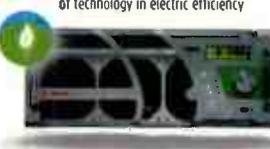
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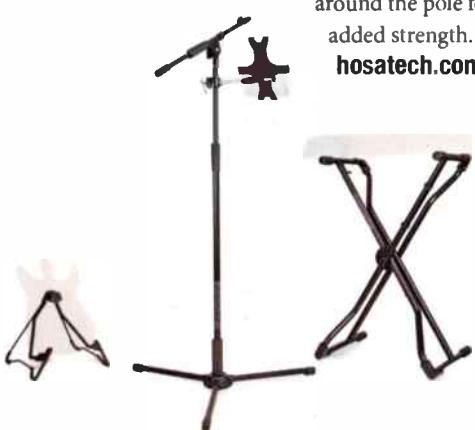
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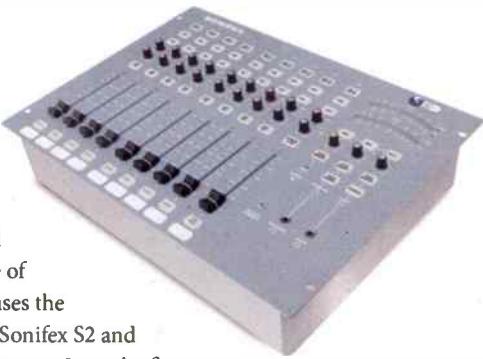
Goby Labs Stands: Incorporating ruggedized metal construction designed for years of use, Goby Labs' new product line includes two microphone stands, a keyboard stand, two guitar stands, and a Tablet Frame for iPad. The mic stands feature die-cast components, including thick-walled, zinc alloy handles and metal-on-metal threaded components. The center-mass boom design features a mid-point, all-metal, locking grip for enhanced boom balance and an easy-to-turn pivot lock with integrated cord retention. Featuring universal iPad compatibility, the GBX-300 Tablet Frame for iPad featuring frame-change technology holds any iPad on all four sides for extra security. With its patent-pending pole lock that facilitates support on mic stands, music stands, and other tubular surfaces, the system features a counter-locking arm that engages as the clamp is tightened on a pole.

forming a closed loop around the pole for added strength.
hosatech.com



On-air mixer | Sonifex

S0 Radio Broadcast Mixer: The S0 Radio Broadcast Mixer is a high quality, yet simple-to-operate radio broadcast console. It's easy to understand and has an uncomplicated and intuitive front panel layout ensuring that the unit appeals to novices and broadcast professionals alike, while offering a range of user configurable options for flexible operation. It uses the same high quality circuitry and components as the Sonifex S2 and S1 mixers to provide an audio experience second to none. It can be fitted flush into a desktop or can be rack-mounted directly using the front panel mounting holes.
sonifex.co.uk



Ceiling and wall acoustic system | Pinta Acoustic/Sonex

Sonex AFS: This acoustic plaster ceiling and wall system can be directly applied to a solid substrate and consists of a thin fiberglass mesh laminated to Class 1 fire-rated Willtec open-cell melamine-based foam panels, offered in a variety of thicknesses. Joints between panels are taped and finished, then two coats of Phonstop PA85 plaster are trowel-applied to create a smooth, porous surface. Sound energy travels through the finish and is absorbed into the Willtec core. Features include a smooth, seamless monolithic appearance, excellent sound absorption, flexibility and resiliency, large, lightweight panels, low VOC, better indoor air quality and high light reflectance.
pinta-acoustic.com

Handheld recorder | Olympus

LS-100: The LS-100 features two internal 90-degree directional stereo condenser microphones that capture lower-bass frequencies and louder sound with less clipping, two 1/4" XLR/standard phone combination inputs and multi-tracking with two-channel simultaneous recording and eight-channel playback. It also features uncompressed 24-bit/96kHz linear PCM digital recording. Frequency response is 20Hz to 20kHz and its microphones support sound pressure levels down to 140dB. A switchable low-cut filter enables users to eliminate low-frequency sound at two different settings: 100Hz or 300Hz. Up to eight tracks are at users' disposal.
olympusamerica.com



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NEW PRODUCTS

Recording console/DAW | Focusrite Audio Engineering

Control 2802: Control 2802 is a small-format analog recording console and a DAW control surface in one. It forms both the digital control nerve center and the analog heart of the modern professional project studio. Control 2802 includes eight Class-A microphone preamps, a mixer handling up to 32 simultaneous inputs, and a master bus compressor featuring parallel compression. Control every major digital audio workstation with the Control 2802. Dual Layer Control Technology lets users flip from analog fader layer to DAW layer in an instant, accessing fully integrated control of DAW faders, auxes, plug-ins, automation, project navigation, etc. Its motorized 100mm analog and DAW control faders can both be fully automated. Easily adjust DAW channel auxes, inserts and groups within Pro Tools, Logic, Cubase and Nuendo via a HUI interface focusrite.com



DPS-100D True RMS Digital RF Power Meter

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SAGE

Recording interface | Alesis

iO4: This four-channel USB device for Mac and PC-based systems enables users to record and monitor up to eight channels of audio in 16-bit mode or four channels in 24-bit mode. The iO4 has four input channels, each having an XLR microphone input, a 1/4" TRS insert for external effects units and a 1/4" TS jack that works with line-level sources and can accommodate direct connection of guitars. The iO4 features discrete-design preamplifiers and 48V phantom power on each of its four input channels as well for use with virtually all microphones and audio sources.

alesis.com

Large-diaphragm mic suspension | Rycote Microphone Windshields

InVision USM VB: The InVision VB will hold the broadest large-diaphragm models from 55mm to 70mm. It offers a durable design based on Rycote's patented W-shaped Lyre mounts, and provides protection from unwanted vibrations, reducing noise by up to 12dB when compared to traditional elasticated mounts. Most microphones can be mounted in seconds or removed thanks to the USM's universal four-screw locking system.

rycote.com



NEW PRODUCTS

Audio upmix and downmix processor | Soundfield Research

X-1: For 5.1 to stereo upmix and downmix transmission, X-1 is housed in a compact 1RU hardware box. The X-1 utilizes the same upmix algorithm as established in SoundField's UPM-1 upmix processor. The X-1 allows upmix and downmix processes to run simultaneously while inserted on user configurable input and output channels. It is also possible to insert the downmix process im-



mediately after the upmix process for downmix quality control purposes. The unit is equipped with a full complement of AES digital inputs and outputs on BNC, and all metadata parameters of both the upmix and downmix processes are accessible via either USB or Ethernet through a dedicated PC application. The parameters can either be adjusted in real-time or stored for standalone use. Further control of pre-sets is also possible through a user configurable GPIO port. Two fully redundant power supplies and hard bypass audio are featured for full redundancy.

soundfield.com

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BSW catalog
that Dad's
hiding under
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Active subwoofers | Neumann

KH 810, KH 870: The KH 810 and KH 870 both feature Neumann's 7.1 High Definition Bass Manager technology, which complements high-definition video with the most accurate sound reproduction possible. The KH 810 can be used either as a subwoofer dedicated to reproducing the LFE channel, or as a means of providing low frequency extension with an increased maximum SPL. Its response range is from 18Hz to 300Hz, but the electronics will pass up beyond 20kHz for system daisy chains. Eight

electronically balanced analog XLR inputs ensure flexible interconnectivity. Four-mode LFE channel processing guarantees maximum compatibility across all formats, while 4th order crossovers and flexible acoustic controls allow for seamless system integration.

neumannusa.com

Fence System | Acoustical Solutions

Acoustiwood: This noise barrier fence and lightweight wall system is an economical lightweight wooden post-and-panel system developed specifically to reduce noise levels. Panels are available in three standard sizes. A variety of finishes can be applied. The fence system carries an STC rating of 31 and NRC rating of 1.00. By applying value engineering for individual projects, the AcoustiWood panels can be reconfigured to meet higher or lower STC requirements.

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NEW PRODUCTS

Table microphone box | FSR

T3-MJ+: This mini table box, available in a variety of models, accommodates a wide range of tables and lecterns for any applications requiring a gooseneck mic. The T3-MJ+ is available in black, brass and aluminum. The basic model offers improved noise isolation and features a built-in, acoustically isolated microphone connector to accommodate mics with 3-pin XLR plugs of a diameter of 1" or less and provides superior shock and vibration damping. T3-MJ+1B and T3-MJ+2B offer one or two additional buttons and are custom assembled with momentary or maintain type switches with a variety of switch caps and bi-color LEDs. T3-MJ+1BM and T3-MJ+2BM models feature an internally pre-wired built in mute feature.

fsrinc.com



Desktop

iPad stand | IK Multimedia

iKlip Studio: An adjustable iPad desktop stand, iKlip Studio holds an iPad firmly on studio desks or other surfaces. Apps like synthesizers, beat-pads and other controllers can be played energetically on the multi-touch screen with no risk of the device moving or sliding. Its flexible orientation allows it to tilt its position from a very low-profile angle to near-vertical positioning. iKlip Studio is made of lightweight, shock-resistant thermoplastic. Rubber foot pads grip the desktop and prevent unwanted sliding. Its support tray also fits most cases for ultra-quick positioning of an iPad of any generation.

ikmultimedia.com

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FIND THE MIC WINNER FEBRUARY ISSUE

Congratulations to

Jason J. Ornellas

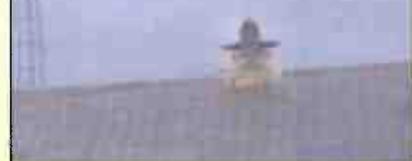
WDHA-FM/WMTR-AM,
Cedar Knolls, NJ

He has won a Hosa USX-100
mic-to-USB interface from
Hosa Technology.



www.hosatech.com

The mic icon was part of the
roof exhaust vent.



The winner is drawn from the correct entries for the issue. No purchase necessary. For complete rules go to RadioMagOnline.com.

Acoustical system | Acoustics First

PhaseFOAM: The PhaseFOAM system allows you to configure the sound and room design using the key components contained in these two simple acoustic foam kits. Box A includes 16 pieces of 1' x 1' x 2" thick high density wedge pattern acoustical foam used to absorb sound, prevent phase cancellations, and design visual interest. Box B contains two pair of Triangle Traps. The design of the bass trap allows for various corner configurations and installation direct to a wall or ceiling to provide low frequency sound absorption anywhere in the room.

acousticsfirst.com

**Remote control | DM Engineering**

IFB Controller: Simplify remotes by adding the IFB Controller for instant communications with a remote site. There is no complicated wiring or an additional mic-line amplifier required, it's all built in to the IFB Controller. Installation is simple, just loop a control room microphone and mix-minus bus audio through the XLR connectors on the rear of the controller. The output can be connected directly to a codec. Insertion of the IFB Controller in the mic chain will not affect the operation or sound of the control room mic in any way, and the controller does not alter use of phantom power. It can also be used at a remote site or sporting event when you need to talk to the talent on the field without going into the play-by-play or color earphones. Simply install it inline with the program audio going to the IFB transmitter for the field talent.

dmengineering.com

Digital audio workstation |**PreSonus Audio Electronics**

Studio One v2: Version 2 of this DAW offers more than 100 new features and enhancements. Integrated Melodyne pitch correction allows the user to hear edits in context and render audio in place. Select an audio event and press Q to quantize using transient detection and editing, and drag and drop groove extraction to and from any audio in seconds. Single and multitrack comping is faster with no tool switching, automated crossfading between takes, and simple auditioning holding Alt and clicking on a take. Studio One's browser offers quick access to instruments, effects, sounds, files, and more. Search any location with v2. Organize related tracks and work with them as a group with folder tracks. Group and bus folder tracks with the click of a button. Edit multiple MIDI tracks simultaneously. Native effects plug-ins now include Ampire XT with new amp models, cabinet-modeling section and effects section, and OpenAIR convolution reverb delivers realistic reverberation. New mastering features include DDP export, PQ editing and higher-quality sample-rate conversion.

presonus.com

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NEW PRODUCTS



Display Port KVM switchers | Gefen

4x1 DP KVM, 8x1 DP KVM: These KVM switchers connect up to four or eight computers to the same

monitor and keyboard/mouse connection. This streamlines the desktop and eliminates the need for too many devices that can crowd the workspace while increasing productivity and performance. The 4x1 DisplayPort KVM Switcher comes equipped with four DisplayPort inputs (8x1 DisplayPort KVM Switcher comes with eight) with USB 2.0 and audio. One DisplayPort output delivers resolutions up to 2560x1600. The USB output drives any keyboard/mouse combination while the audio output supports L/R speakers. Users switch between all four computers by IR remote, front panel selector or RS-232 connection.

gefen.com



Real to real audio tape warmer plug-in | Nomad Factory

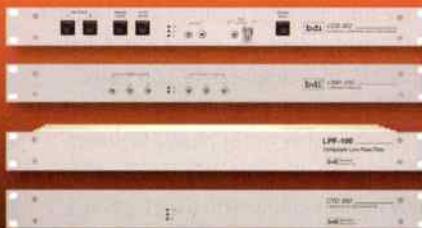
Magnetic II: A realistic "Real to Real" audio tape warming effect plug-in, Magnetic II gives audio tracks a vintage tape sound. This effect can inject sterile audio with the warmth and character of classic tube circuitry and analog tape saturation. The plug-in features pure analog reel-to-reel tape speeds, tape/tube saturation and tape color effects, as well as a dedicated vintage style EQ and a built-in boost mastering section. Magnetic II offers nine new tape models featuring the authentic sound of famous vintage tape machines such as Otari MX-80/MTR-90, Studer A80MkII and more. Use it on individual tracks or create a filtered cassette AM-radio effect on a vocal.

nomadfactory.com

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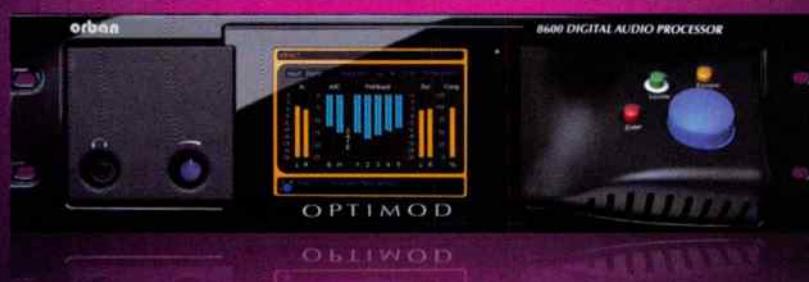
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Extender | L-com Global Connectivity

LCVX-VGA UTP VGA: The LCVX-VGA UTP VGA extender utilizes standard CAT-5 or CAT-6 UTP cabling to transmit analog video up to 150m. Features durable metal case, the equalizer selector offers optimal video signal tuning, and resolution is 1024x768.

l-com.com

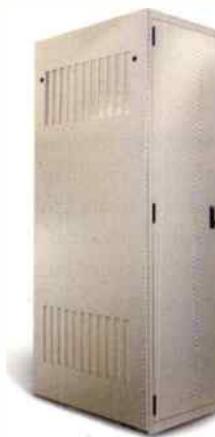
Balanced/unbalanced line level converter | MCM Electronics

Model 555-8485: The MCM Custom Audio Model 555-8485 Line Level Converter is an essential interface in sound systems that utilize a combination of professional audio equipment, with PCs, laptops and portable MP3 players. The 555-8454 incorporates four independent low noise audio amplifier circuits, to provide two stereo audio channels. Channel 1 accepts L/R RCA unbalanced consumer line level inputs, electronically balances the signal, amplifies it to pro-sound line level, and supplies it to two male XLR output connections. Channel 2 accepts L/R XLR balanced inputs, electronically converts them to two unbalanced channels, and provides attenuated signal to L/R RCA outputs.
mcmelectronics.com

A/V to twister pair receiver/transmitter | Altinex

TP115-201/202: Transmit video (computer or component), stereo audio (analog or digital), RS-232, and IR signals over a single twisted pair-type (CAT-5) cable with the Altinex TP115-201/202 transmitter/receiver. Take advantage of existing cable infrastructure while providing an effective means of distributing these signals up to 300'. The transmitter provides buffered local outputs with the same format as the input. When a local monitor is connected, the TP115-201 passes the EDID (Extended Display Identification Data) data from the monitor to the computer video source; otherwise Altinex' built-in EDID data is passed to the video source. The TP115-201 and TP115-202 support analog audio with RGBHV video and optical/digital audio with YPbPr component video. The receiver accepts the twisted pair signal from the transmitter and decodes the video, audio, and control signals for output to a projector, display, amplifier, speakers, etc.

altinex.com



Rack enclosures | Crenlo

Emcor G-Series: With a 2,000lb static load capacity and a wide range of available accessories and modular configuration options, the G-Series provides strength and versatility in an economical package. The fully welded frame of the G-Series utilizes 14- and 16-gauge steel. The series is available in both 19" and 24" panel widths. Depths include 26.31", 31.56" and 36.87". The G-Series has vertical panel openings (VPOs) ranging from 30U to 45U.

crenlo.com

Basic RBDS/RDS encoder | Deva Broadcast

SmartGen Micro: The SmartGem Micro is able to transmit basic RDS information such as the Program Service name (PS), Program Identification (PI), Alternative Frequencies (AF), and Program Type (PTY). Decoder information and music/speech flag are also supported. USB connectivity makes it easy to program the non-volatile memory using any PC and the supplied Windows software. After programming, the unit may be disconnected and reinstalled at the transmitter site. Though it is not capable of dynamic messaging with song titles, SmartGen Micro will identify a station by format, display a station's street name, and continuously transmit any station promo or advertising message to listeners.

devabroadcast.com

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NEW PRODUCTS

Drawer case | Grundorf

Tour 8 Series: Featuring four compartments on the inside of the front door plus four drawers for organizing accessories, the Tour 8 drawer case keeps its contents safe and secure. The case can be equipped with foam inserts to securely house microphones. Optional locking latches are available to create a fully lockable environment. The drawers slide smoothly on sturdy steel glides. Constructed using $3/8$ " plywood with a durable high impact resistant ABS laminated finish, the edges are finished with double-edged aluminum extrusion and the lid-to-body seal is made with an interlocking aluminum tongue and groove valance system to provide a tight fit. The case is available in red, black, blue and gray.

grundorf.com



Half-rack systems | Middle Atlantic Products

HRF Series: The new HRF Series half racks incorporate the dimensions of the proposed standard-feature a low profile design and compact dimensions. An offset cable tie area keeps overall width to 10-5/8". The racks also feature a strong welded frame that enables equipment to be pre-loaded and transported to the installation site. Initial models are available in 8- and 12-space usable racking height configurations with available mounting shelves that include a pattern of holes and slots that accommodate any device-mounting pattern. The line of complementary accessories for the Half Rack Series also includes a high-static pressure blower to exhaust heat, as well as blank and vented panels to complete the installation.

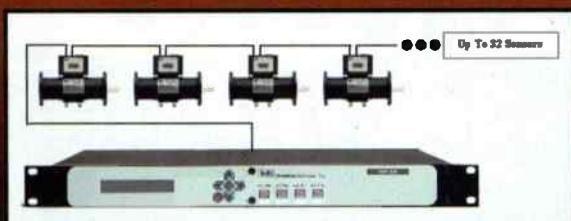
middleatlantic.com

UPGRADES AND UPDATES

Orban has posted v2.0 of its free Lcudness Meter software. The new version adds Mac functionality and compliance with ITU and EBU specs. (orban.com) ... **NTi** has released Projector 2.0 for the XL2. The software allows the XL2 screen to be viewed on a PC. (nti-audio.com) ... **Worldcast Systems** has added APT SureStream to the Oslo and Horizon codecs, which uses re-sequencing technology to stream high-quality audio and recover from lost data packets. (aptcodecs.com) ■

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- Monitor all critical RF parameters of any master antenna system
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- Proprietary 3 Strike reflected power protection algorithm
- All critical RF monitor points interconnect for convenient display
- Local Remote Display of all critical parameters through a single internet connection



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Material: Aluminum Outer Copper Inner (CTA series)
or Brass outer Copper Inner (CTB series)

Available sizes:

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Type N to 7/8"
Type 7/16" DIN to 1-5/8"
Type 7/16" DIN to 7/8"
Each adapter comes with removable bullet

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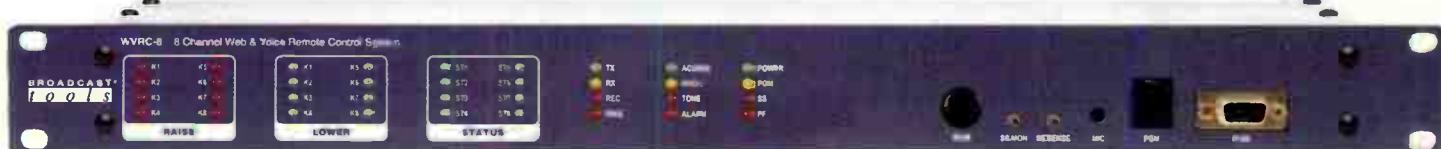
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NEW PRODUCTS

Wireless mic system | AKG

DMS 70: The DMS 70 operates with 24-bit 48kHz transmission in the license-free 2.4GHz ISM band. The entire package includes: AKG's DSR 70 Quattro or DSR 70 Dual Receiver, DPT 70 Digital Pocket Transmitter and DHT 70 Digital Handheld Transmitter, available with D5 acoustics or DHT 70 Perception with standard supercardioid capsule. The DSR 70 Quattro includes a rack mount kit, power supply and other accessories. DMS 70 systems are fully compatible and feature bidirectional communication between the transmitter and receiver. The dynamic frequency selection provides intelligent operation in the crowded 2.4GHz band, enabled by digital diversity from receiver and transmitter side.

akg.com



DYNAMAX MX SERIES

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ON AIR
MODEL 340



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SANDIES

ON AIR
MODEL 343

Audio converters | Key Digital

HD Spider Series: HD Spider Series model KD-DAXAA converts two-channel PCM digital audio or Toslink digital audio to analog L/R audio. It supports 32, 44.1, 48, and 96kHz sampling rates, and features auto selection of input source.



KD-AAXDA is suited for converting analog L/R audio to PCM digital audio and Toslink digital audio. It features simultaneous output of both digital audio connections, supports 48kHz output sampling rate, uncompressed two-channel PCM digital audio output. Both models feature format conversion that enables integration with audio amplifiers, distributed audio systems and AV receivers.

keydigital.com



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Microphone shock mount | Royer Labs

RSM-SS1 Sling-Shock: The RSM-SS1 Sling-Shock features an innovative approach that does away with elastic bands, rubber bungee cords or synthetic bushings. The adjustable microphone grip allows for a secure hold with flexible microphone positioning, and its cotton-lined interior protects a microphone's finish. It fits 1" diameter cylindrical microphones. Future models will accommodate a wide variety of microphone body sizes.

royerlabs.com





SkimmerPlus

Skimming, Logging and Air Checks with ease.

SkimmerPlus Features

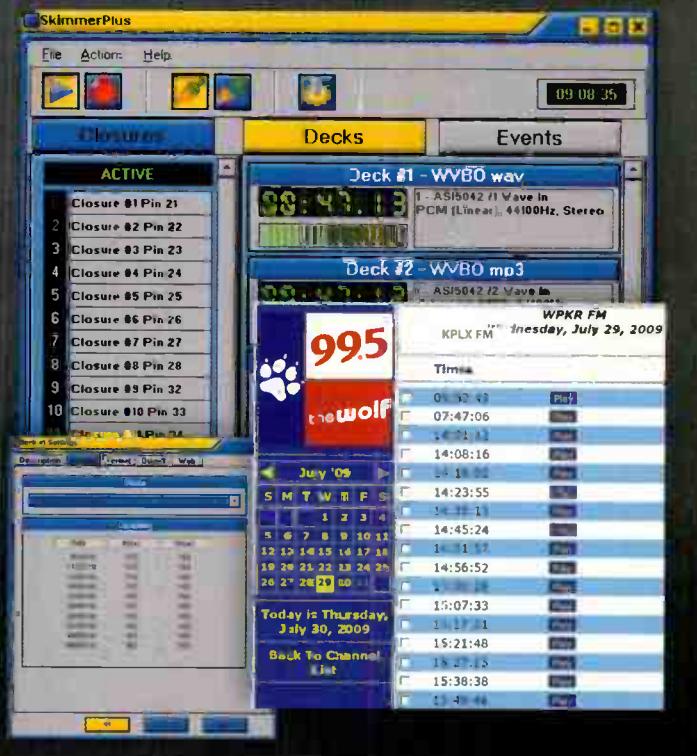
- Creates high-quality and highly compressed files simultaneously
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- Automatically manage hard drive space
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- Create and save event logs for fully customizable unattended recording
- Control over record break points for long-term recording
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Web Server Features

- Access mic checks from the Internet with Web Interface
- Emailing of ftp links or audio files from Web Interface
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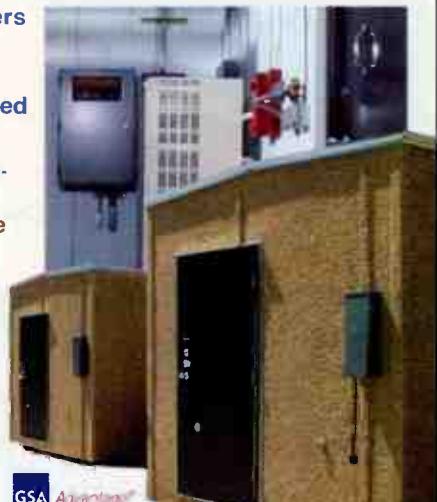
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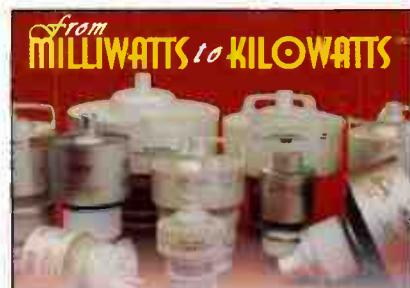
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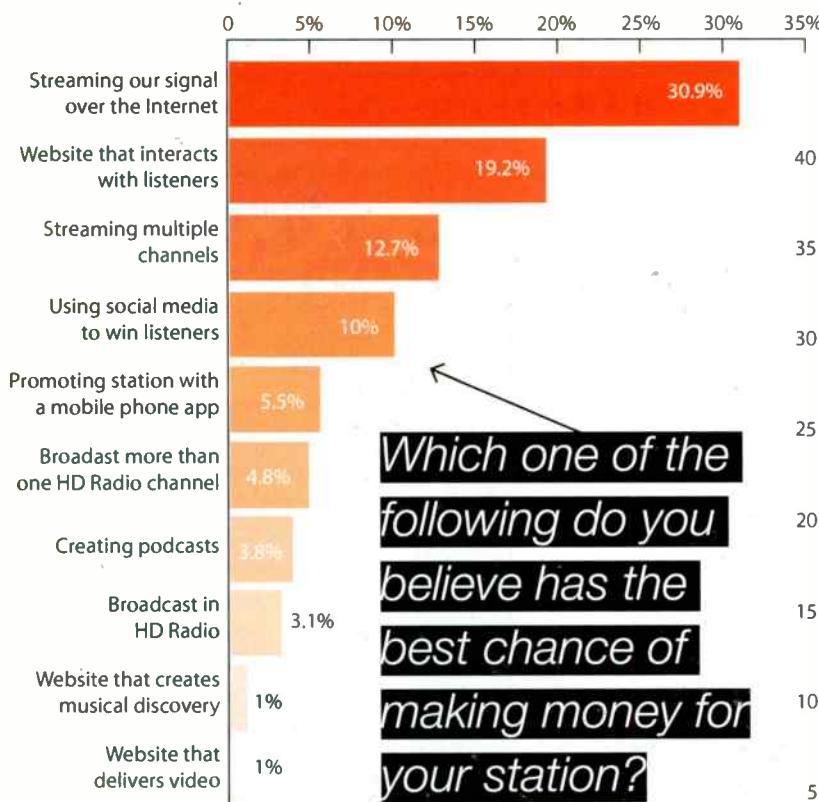
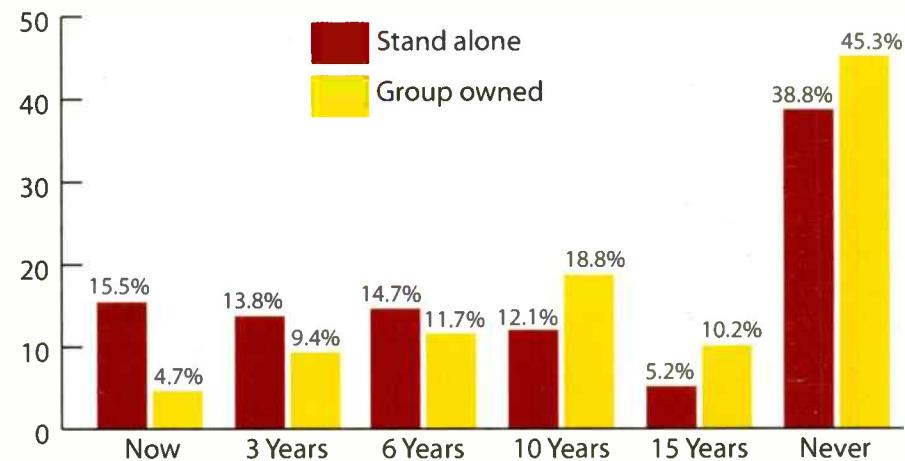
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The Case for Audio Quality and Audio Processing in Streaming Radio

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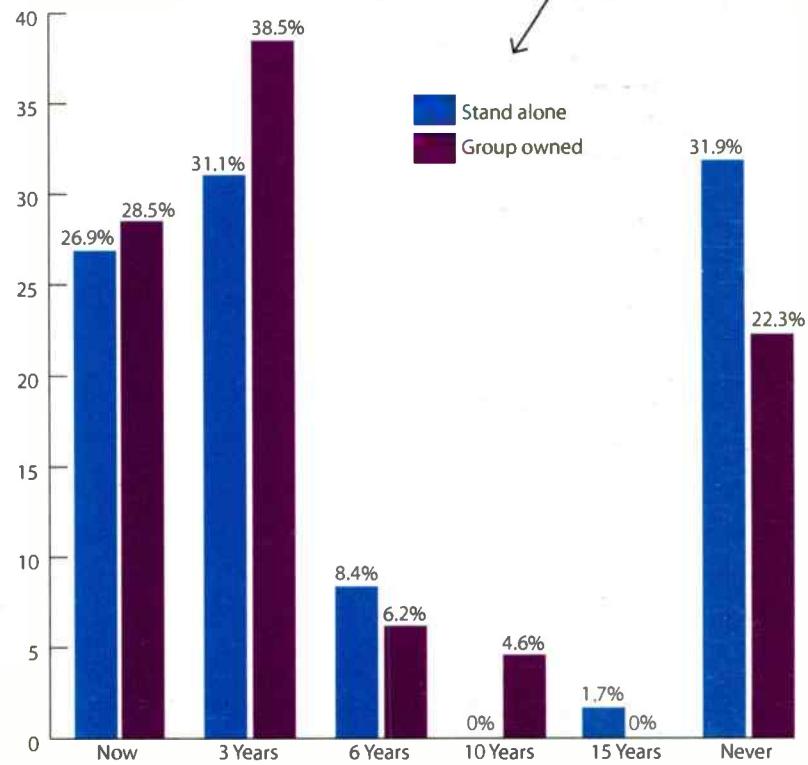
Wheatstone Corporation recently released a report on the changing role of audio processing in the radio industry. Based on two studies conducted by Alethea Research, (sponsored by Wheatstone Corporation), the report discusses how and why stations can profitably coexist with the Internet.

When will you have more listeners from your Internet stream than your RF signal?



Which one of the following do you believe has the best chance of making money for your station?

When will the streaming of your station's signal enable you to charge (more) for advertising?



Source: Alethea Research/Wheatstone. For full reports, visit: wheatstone-radio.com/landing/aletheawheatstone-radio-study.html

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