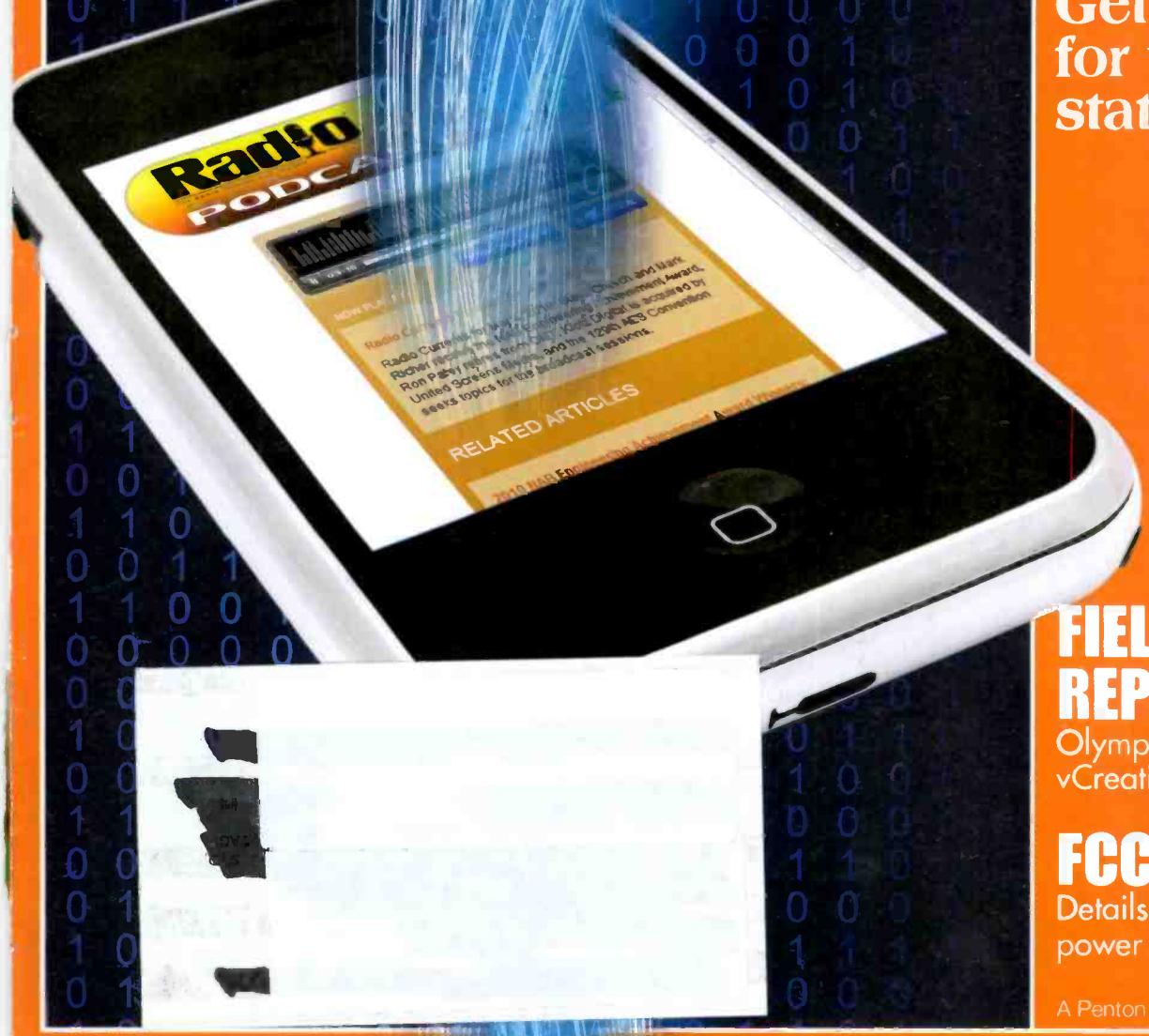
Radio®
THE RADIO TECHNOLOGY LEADER
April 2010
RadioMagOnline.com

Streaming to Mobile

Get that app for your station.



FIELD REPORTS

Olympus LS-11 & vCreative PPO

FCC UPDATE

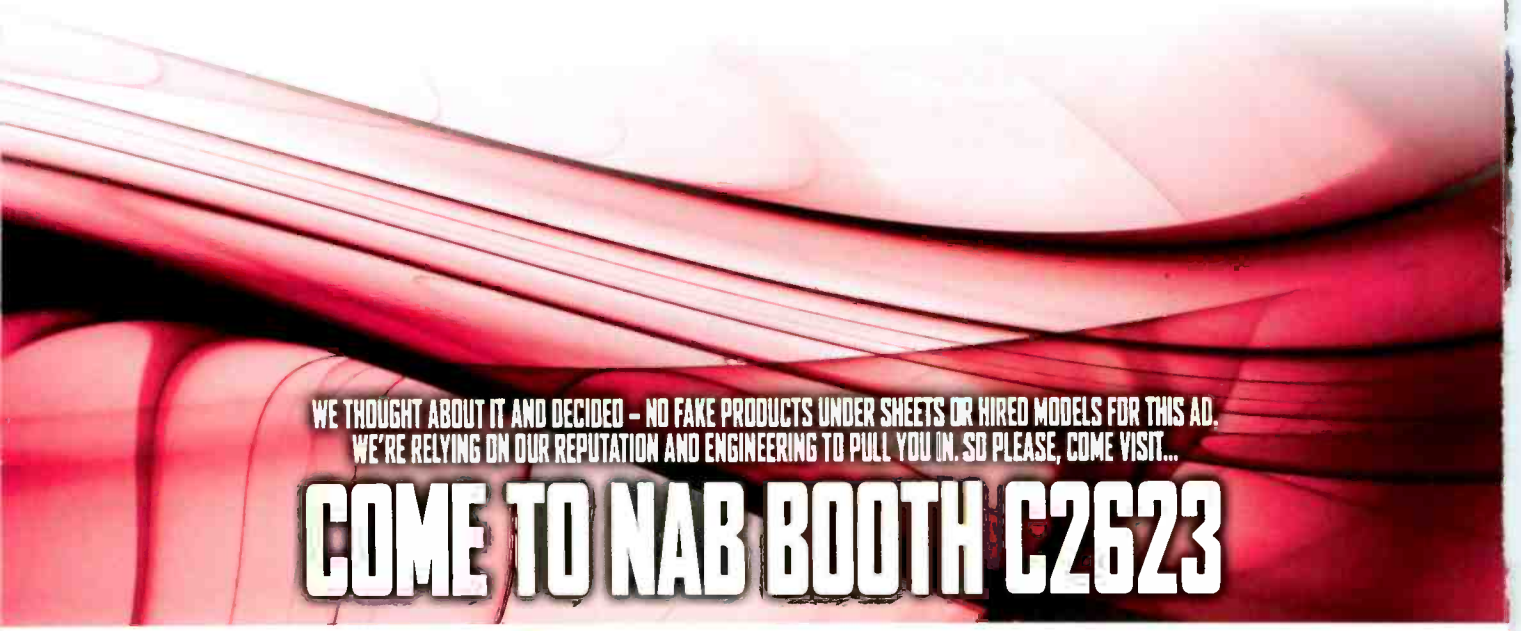
Details of the HD Radio power increase

A Penton Media Publication

THE OFFICIAL WHEATSTONE NON-TEASER NAB TEASER AD

THIS YEAR AT NAB WE'RE INTRODUCING SOME REALLY COOL NEW STUFF. SERIOUSLY COOL NEW STUFF. AND HONESTLY, AT THE TIME THIS AD IS BEING PUT TOGETHER WE'RE STILL TWEAKING IT. SO WHILE WE CAN'T SHOW IT TO YOU YET, WE HOPE YOU'LL BE FLOORED WHEN YOU DO SEE IT.
WE CAN SAY THAT IT WILL INCLUDE:

TWO NEW VORSIS PRODUCTS (OK, MAYBE 3)
A NEW AUDIOARTS PRODUCT
A WHEATSTONE RADIO PROJECT
WHEATSTONE WHEATNET-IP BLADES 2.0
A BREAKTHROUGH NEW DIGITAL MIX ENGINE



WE THOUGHT ABOUT IT AND DECIDED – NO FAKE PRODUCTS UNDER SHEETS OR HIRED MODELS FOR THIS AD.
WE'RE RELYING ON OUR REPUTATION AND ENGINEERING TO PULL YOU IN. SO PLEASE, COME VISIT...

COME TO NAB BOOTH C2623

AUDIOARTS Wheatstone VORSIS

phone 1.252.638-7000 | www.wheatstone.com | sales@wheatstone.com

When was the last time you touched something that looks this good?

The new iMediaTouch Version 4.0 is here.

Radio Automation ▸▸ Digital Logging ▸▸ Internet Solutions

Please come visit us at the 2010 NAB show in Las Vegas - Booth C1054

iMediaTouch

Contact our sales department today
at 888-665-0501 or via email at
sales@imediatouch.com

▸▸ Watch a video demo of
iMediaTouch 4.0 in action!
www.imediatouch.com

omt technologies

CONTENTS

ON THE COVER

We all know the relevance and importance of streaming to radio's future. If you're not on board yet, it's not too late. Find out how to get started on page 14. Cover design by Michael J. Knust.

Features

Columns

Departments

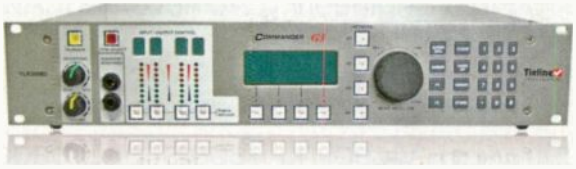
STL and Audio Distribution

$1,395

Bridge-IT

Low cost IP audio STLs and audio distribution

$2,550



2RU Commander G3 Rack Codec

IP, 3G, POTS, ISDN, X.21, satellite, STL and audio distribution

A Tieline Codec for every Occasion

Not sure which to choose? Visit www.tieline.com/videos

Remote Broadcasting and Newsgathering

$4,590

i-Mix G3

Commentary mixer codec with IP/3G, POTS, ISDN, X.21, GSM, satellite for live sports and events

$2,550

Commander G3

Audio over IP/3G, POTS, ISDN, X.21, GSM, Satellite for desktop and wireless remote broadcasting

NABSHOW 2010 OFFICIAL EXHIBITOR
Visit us at booth #C157

$400*

Report-IT Live

Make live broadcasts from your iPhone** to a studio Tieline Codec with the Report-IT Live APP

Available March 24th

Tieline®
www.tieline.com

800-950-0750

*Phone not included

**iPhone and App Store are trademarks and/or registered trademarks of Apple Inc., registered in the U.S. and other countries.

CONTENTS ONLINE

Currents Online

Selected headlines from the past month.


Church

2010 NAB Engineering Achievement Award Winners: Steve Church and Mark Richer

The awards, first established in 1959, are given to individuals for their significant contributions that have advanced the state of the art of broadcast engineering.

129th AES Accepting Papers for Broadcast Sessions

The broadcast and streaming sessions are part of the overall professional audio program. Send suggestions to broadcast@aes.org.

HD Radio EPG Project Releases Phase 2 Final Report

The report says that an EPG is a viable option for radio broadcasters in the United States.

CBS Radio Launches Quadcast HD Radio Station

Leading all-sports stations WFAN, WIP, and WJZ-FM will be multicast on WJFK-FM.


Trombley

Michigan Engineers Honored With MAB Carl E. Lee Broadcast Engineering Excellence Award

Ed Trombley and John Grover receive the honors.

John George Joins Broadcast Connection

Formerly with Harris, Dielectric and LBA Technology, George is also active in the South Carolina broadcast engineering community.

McNerney introduces House Companion Bill to S.2881

Jerry McNerney of California introduced the legislation, which was promoted by the SBE.

Site Features

NAB Insider Newsletter

Our pre-convention newsletter kicked off March 9. Be sure to get all your pre-show info on products and sessions each week leading up to the convention.

2010 NAB Show BEC Sessions

Our online session guide inlude ICS file links to make it easy to add the events to your calendar.

Digital Radio Update Twice a Month

Stay up to date with the source of digital audio broadcasting news and information. The coverage extends to DRM, satellite radio and more. Subscribe today.

Advertiser Links

Web links to the advertisers in the July issue.

Industry Events

The *Radio* magazine Industry Events section lists upcoming conventions and conferences.

WIDEORBIT

"

WIDEORBIT IS EASY TO USE

and our AEs can do so much without relying on other people. With WideOrbit, we better manage preempts and makegoods, including proactive notification to sales—and that results in cleaner billing."

MARY SCHIEFELBEIN
Traffic Coordinator, Midwest Communications

End-To-End Sales, Traffic, Automation, and Billing Software

WideOrbit provides the most modern, comprehensive solutions for managing your radio business from sales to traffic to automation and accounting. Our scalable, enterprise-wide solutions enable radio broadcasters to manage multiple stations, markets and groups from a single system.

WO AUTOMATION FOR RADIO 2.0

- The industry's most modern radio automation system
- Complete integration with *WO Traffic*, the fastest growing sales, traffic and billing software for radio
- Leader & Follower: effortless multistation and multicasting capabilities
- Formerly Google Radio Automation

SEE WIDEORBIT AT NAB SHOW 2010
NORTH HALL, BOOTH N5129

SCHEDULE AN ONSITE DEMO AT:
WWW.WIDEORBIT.COM/NABSHOW

For more information, please contact:
Mike Zinsmeister, Vice President, Sales
(O) +1.404.378.3381 | (M) +1.828.712.2343
mikez@wideorbit.com

WIDEORBIT

Embracing mobility

Radio by its nature is a mobile medium. And most radio listening is done in our most familiar mobile environment: The car. Being that a radio is a standard device in any car (Can you even imagine buying a car without a radio?) makes it easy to make radio mobile. However, once we leave the car, radio almost completely loses its mobile standing.

There is no lack of portable radio receivers, but with the proliferation of media players, I see very few people carrying a device that is only a radio receiver. Several media players offer a built-in radio receiver, which helps radio, although most users are listening to their own selections and not a radio station.

What makes radio such a good delivery mechanism? The broadcast model is very efficient. One transmitter feeds an unlimited number of receivers (listeners). The cost per listener decreases as the number of listeners increases because the terrestrial transmission system has a fixed cost and can feed an unlimited number of receivers.

But radio is facing a new challenge from Internet streaming. While streaming is not a new idea, it

continues to attract new users. Compared to terrestrial broadcasting, streaming is a less-efficient delivery method. There is a fixed cost for the system (like terrestrial), but there is usually a cost per listener as well. With this in mind, the current push to add radio receivers to cell phones makes sense, but it could be a short-term solution.

Some recent discussion has speculated that streaming will not spell the end for terrestrial transmissions. In general, I agree – given the current methods of streaming. We all know that technology is not static. Given time and consumer demand it can change quickly. Even with the current limitations of streaming, stations should not ignore streaming completely.

City-wide Wi-Fi or WiMAX doesn't exist everywhere yet, but that could change. We also don't know what other mass-use data paths may come. The FCC is currently trying to find ways to increase broadband access, and streaming could take advantage of that.

For radio stations, streaming should be viewed as yet another path to reach an audience. It may not be a large segment today, but it has potential for the future. It can be a way to distribute a main program channel. It can be used to send supplementary channels, like an HD Radio multicast. It can be used to send best-of programming from the main channel. It can be used to offer niche formats designed for a small audience. There are lots of potential uses of supplemental channels.

What's more important is to consider the future listener. While terrestrial radio seems ubiquitous today, I don't see the younger listeners rushing out to buy a new radio. They have cell phones and media players galore – and get new ones every few months. To this demographic, terrestrial radio is old school. If they have radio receivers in their devices, it's usually because it just happens to be there, not because it was a conscious decision to have one.

There are lots of existing streaming services available. Some carry a subscription fee, many are free. While streaming does not yet have the transmission efficiency, it has another advantage: It's a software-based player. Advances in codecs and players can be implemented with few challenges (or even interaction) for the listener. While a radio receiver could be software-based as well – especially if it is implemented in a mobile device – there are still hardware challenges involved.

Radio already knows how to create successful program streams. As consumer listening evolves and changes, so must radio. Streaming to mobile devices is just one consideration.

Chris Schaan

What's your opinion? Send it to radio@RadioMagOnline.com

Maximizing tower assets

By Kevin McNamara

As advertising revenues decrease, many broadcast owners are actively looking for other sources of income. Over the last 10 years there has been an increasing trend to lease available tower space on FM and AM towers (including rooftop assets). The growing cellular telephone industry has created the bulk of leasing opportunities, while paging and SMR services are now out of business. The bottom line is that there will always be opportunities to rent tower space. Here are some insider tips to keep in mind.

Build it and they will come ... NOT! I've been in the businesses for more than 20 years and one thing I will assure you: Having an existing tower or building a new tower doesn't ensure you will ever have a lease opportunity. Some of you are thinking, Well if my tower site is next to a busy road or population center, carriers will flock to it. Wrong. Wireless system operators, particularly wireless carriers, have very specific location criteria based on a number of factors: What is in the coverage footprint of the site, what sites are adjacent to it, how far your site is from their adjacent sites, amount of voice and data traffic that the site is predicted to handle (based on population density in the area), future growth in the area, amount of dropped calls in the area and the list goes on, but you get the idea.

Tower site management companies will not always bring you customers. Almost everyone with a tower or a rooftop that appears to be a potential lease opportunity has been approached by companies claiming they can lease and manage these assets for a fee. One of the claims is that they have relationships and aggressively market these to the carriers and other radio system operators. In many cases this may be true, but the reality is that the carrier will make contact with a tower owner directly through its site acquisition contractor, not the management company. Unless the management company brings other value to the deal, you are probably throwing away a large portion of the potential lease revenues.

Ground space is as important as tower space. It really doesn't matter how much additional structural capacity the tower/rooftop can handle if there isn't enough room to place the ground equipment. Wireless operators can mount equipment in a number of configurations; typically there should be room to place a concrete pad or shelter. The equipment can weigh a lot. If the site is in a flood plain, the tenant may elevate the shelter or build a steel platform. Space inside an existing building will also work if it is a proper size, can support the weight and grants 24/7 access. Equipment can also be mounted on rooftops if the building can structurally support the weight. Typically rooftop equipment installations require the construction of a steel platform attached directly to the building steel, necessitating penetrations through the roofing material. Keep in mind that most wireless carriers require 200 - 400 square feet of space to mount equipment.

Get rid of unused equipment on the tower or rooftop. Curb appeal creates a good first impression. Like home buyers, most site acquisition contractors find potential collocation candidates by driving around a specific area that has been identified by the wireless operator as a place it needs to have a site; this is called a search ring, usually a mile in diameter or less. Towers and rooftops that have excessive equipment may appear to have little opportunity for another tenant, possibly causing the site acquisition contractor to look for easier candidates. While you are clearing unused equipment off the tower have the tower company provide an updated map of the tower including antenna/transmission line types, elevation, mounting (which leg or face), any structural modifications, etc. Follow this with getting a full structural analysis (under the current structural code) performed by a qualified structural engineer; this will give you a baseline of what structural capacity is available. This should also be provided to anyone that inquires about leasing space. Tip: Even if your tower is at or near capacity, it is not unusual for wireless carriers to perform structural upgrades at their cost. I've had carriers spend more than $100,000 upgrading a tower that would cost $80,000 to replace. I've also had carriers extend existing or completely replace towers, and the owner keeps the new tower.

Understand the zoning requirements where the tower/rooftop is located. Most municipalities have ordinances specifically for communications towers and rooftop sites. In general, these ordinances were enacted only in the past 10 years. Any towers or rooftop installations built prior to those ordinances are grandfathered until a material change is made to the site. It is important to understand specifically how the ordinance affects the ability of a potential tenant to

locate on this asset. Consider that most broadcast transmitter sites were built many years ago on the cheap real estate outside of town. Now these same sites are surrounded by residential developments, commercial buildings and highways. Even adding new antennas to an old tower may invoke the need to get a variance or some other approval. Getting a variance typically requires at least a hearing before the appointed board and in most cases, that notifications are sent to all adjacent property owners; basically the same people who aren't happy there is a tower there in the first place. Tip: If a carrier wants to lease your site, it will assume all the expenses associated with the zoning/permitting process. A representative from the tower/rooftop ownership may also need to attend since application can only be made by the legal owner of the property. Keep in mind that some of these hearings draw a good amount of crowds and press coverage that may not reflect well on the owner.

Watch your current tenants. Many stations already have wireless tenants leasing space on assets. If you are responsible for managing these sites it is important that you have copies of the lease documents available. You should also be aware of any new changes – renewal, modifications or amendments to the lease. Understand the lease terms for the amount of antennas and transmission lines, size of antennas and transmission lines, ground equipment space and electrical requirements. Annually verify this information against what is actually on site. Tip: As wireless technology grows the carriers look for ways to add equipment while staying within the lease terms. For example, some leases do not specify an amount of transmission lines, just antennas. There are now panel antennas that use up to eight lines per panel, not very common but possible.

Beware of lease renegotiation letters. Most carriers are actively trying to renegotiate existing leases. They have contracted with one of a few companies that have been formed for the specific business of renegotiating wireless leases. The renegotiations come in the form of reduced rent, longer terms or one-time buyout (payment) in return of no additional rent over an extended period. These companies get paid on a percentage of the savings, similar to collection companies. Some threaten that the carrier is going to leave the site and you will get no more revenue. If you have received such a letter, find a consultant who has experience with wireless carriers before trying to negotiate; such consultants can provide a higher level of guidance in dealing with these companies and the carriers to keep the revenue flowing for a long time.

McNamara is president of Applied Wireless, Cape Coral, FL.

FCC approves
HD Radio power increase

By Harry Martin

In a long-awaited move, the FCC in February authorized IBOC digital FM radio a substantial increase in operating power. In so doing, the Commission brushed aside most of the interference concerns raised by non-HD Radio stations, particularly those operating on channels first adjacent to HD Radio stations. While the increased power authorizations will still be subject to a complaint process that could theoretically require a reduction in power in certain situations, that process has some procedural drawbacks that will likely make it difficult to use.

Background. The digital radio specs originally adopted by the FCC were designed by HD Radio's proponents, who assured the Commission that those specs would be sufficient to deliver a station's digital service to everybody who could receive the station's conventional analog signal. In industry parlance, digital coverage would "replicate" analog coverage. The crucial parameter was power: A station's digital ERP was set at one percent of its analog ERP (*i.e.*, 20 decibels below carrier, or -20dBc). But in practice HD Radio did not replicate analog service. HD Radio proponents thus began a long campaign for the power increase reflected in the FCC's February decision.

Dateline

For *noncommercial* radio stations in Michigan and Ohio, their biennial ownership report deadline is June 1. The deadline for submission of biennial ownership reports for commercial radio stations has been suspended pending a further redesign of Form 323.

June 1 is the deadline for radio stations licensed in the following states to place their Annual EEO Reports in their public files: Arizona, DC, Idaho, Maryland, Michigan, New Mexico, Nevada, Ohio, Utah, Virginia, West Virginia and Wyoming.

New power levels and STAs. Under the new rules, eligible stations will be permitted to increase their digital power by 6dB – meaning digital power can increase from the current maximum ERP of -20dBc to -14dBc. No prior approval will be required as long as the stations file a notification of the increase through CDBS within 10 days. While the revised power increase rule will not become effective until OMB has approved the new notification form, the Commission has announced that it will grant STAs for higher power (by up to 6dB) in the meantime, and has posted how-to STA instructions on its website.

Many eligible stations will be permitted to apply for even greater power increases than 6dB, *i.e.*, up to a total increase of 10dB over current levels – to -10dBc. Increasing power beyond the 6dB automatic increase will be based on a go/no go analysis designed specifically to protect potentially affected first-adjacent channel stations

Super-powered stations – e.g., Class B stations that operate with parameters that exceed the maximums for their class – will be limited to the currently permitted -20dBc level or 10dB below the maximum analog power that would be authorized for the class of the super-powered FM station adjusted for the station's HAAT, predicted in accordance with Section 73.211(b). And unlike non-super-powered facilities, super-powered stations will *not* be permitted to increase digital power without prior FCC approval.

Complaint procedures. The FCC's decision provides a formal complaint mechanism for first-adjacent channel stations that receive interference as a result of a neighboring station's digital power increase. If a station believes it is receiving interference within its protected contour from an HD Radio station operating with digital ERP in excess of -14dBc, the complainant must first attempt to work cooperatively with the interfering station to resolve the issue. That is done by progressively reducing the HD Radio station's digital operating power until a mutually agreeable power is reached. If cooperation is successful, the interfering station must simply notify the Commission of its new digital power.

If no amicable resolution is reached, the station receiving interference may file a complaint with the FCC. Such a complaint must be supported by at least six reports of on-going (*not* transitory) interference. Each report must include a map showing the location of the reported interference and a detailed description of the nature and extent of the interference at that location. Interference allegedly occurring *outside* the station's protected contour will *not* be considered. The complaint process requires power reductions by the interfering station until the matter is resolved by the FCC.

Martin is a member of Fletcher, Heald & Hildreth, PLC, Arlington, Virginia. E-mail: martin@fhhlaw.com

PROVEN, CONSISTENT, RELIABLE

For over 58 years broadcasters have relied on proven MYAT RF solutions. From rigid transmission line systems to filters to switches and combiners, we deliver performance on time, every time. Whether it is basic hardware or full-line integrated engineering solutions, MYAT designs and builds reliability into every product we make. And with our unmatched stock and inventory, we can assist with your immediate requirements and last minute needs.

FM Splitter/ Patch Panel | *Coaxial Transfer Switch* | *LPFM/IBOC Filter 3kW* | *LPFM/IBOC Filter 8kW* | *FM Constant Impedance Combiner* | *FM Switchless Combiner*

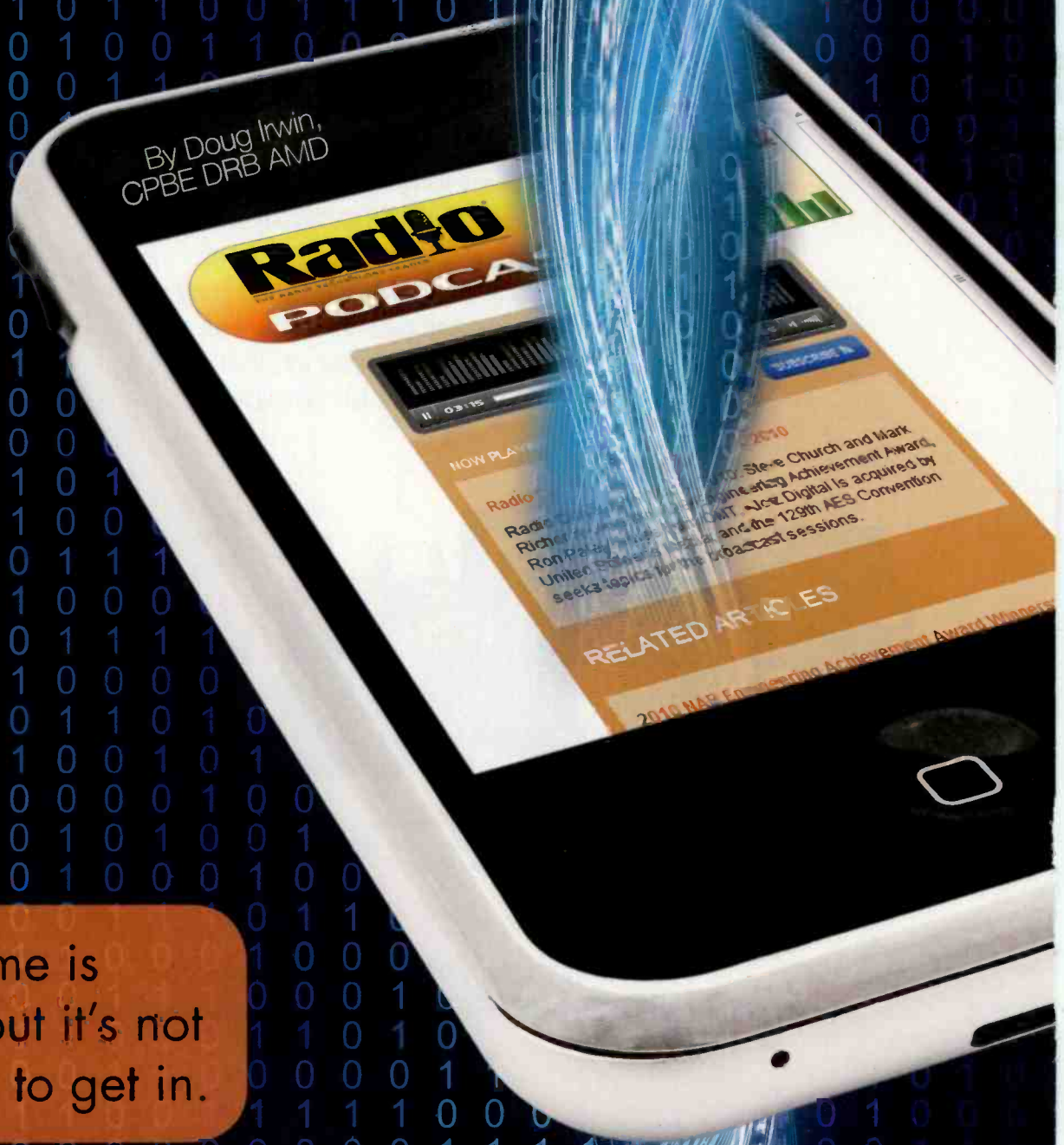
Learn why so many broadcasters rely on MYAT.

Call us at 1-201-767-5380 or log onto www.myat.com

MYAT, INC.

Streaming to Mobile Devices

By Doug Irwin, CPBE DRB AMD



The game is afoot, but it's not too late to get in.

It seems like only yesterday (it was actually more than a decade ago) that we plopped a 300-user license WME server at our local ISP and streamed audio to our more tech-savvy listeners who had some amount of trouble picking up the station over the air. There was no money to be made in it at the time; we looked at it as more of a listener service. Plus, it was a relatively new technology that we just thought was pretty cool.

Fast-forward to 2010: Streaming audio is now essentially a requirement for any radio station. The number of users receiving radio station audio streams is rapidly increasing. Bridge Ratings Service has recently concluded (based on its research) that more than 60 million people in the United States listen to some form of Internet radio during the course of a typical week. Perhaps more importantly, Bridge is predicting that number will rise to 77 million by the beginning of 2015. That's a 28 percent gain in 4 years – a prediction that we all have to take note of. Add to that, Gartner Research has recently predicted that the number of mobile Internet devices will exceed that of desktop devices as early as 2013.

If your station hasn't already done so, it's time to look into providing streaming for these mobile devices. Your competition is. The Pandoras of the world already are.

Choices, choices

When an end-user goes out to buy a phone he has many choices not only in the device itself but also in the network that it resides on. Probably the best known devices are the iPhone, the Blackberry series, and the Droid. (There are others of course). I'll refer to these simply as platforms.

Perhaps the biggest difference between "broadcasting" to mobile platforms, and over-the air transmission is that there are multiple ways to stream and they are specific to the platform type and network. For example:

Phone Type	Protocol	Lossy Codec	Data Rate
iPhone	http	MP4 (AAC)	64 or 40kp/s
Blackberry	http	MP4 (AAC)	64 or 40kp/s
Motorola Droid	rtsp	MP4 (AAC)	32kp/s
Flash encoder	rtmp	MP4 (AAC)	64 or 32kb/s

This table is obviously not complete; there are other types of phones, but this gives you an idea of what's available.

We OTA broadcasters have for years delivered a specific format (for FM, 15kHz audio bandwidth, ±75kHz deviation, 75µs emphasis), and receiver manufacturers made radios compatible with the standards. The game has changed now somewhat – we need to play by their rules. The bottom line is that you will have at least one and perhaps more computers generating streams targeted for the various available platforms.

There's an app for that

We've all heard that catchy little ditty now. Well, there is going to have to be an app for your station if you want to get in the game. Unless your company has the wherewithal to have its own application developers, then look to outside contractors to write the apps for you. (There is at least one company out there that will turn-key this for you – AirKast.) Once that gets done, and the app receives approval from the particular app store, your listeners can then be directed to the app store to download it.

With respect to a particular platform, you will work with an application developer in determining the protocol (such as http, rtsp or rtmp if using Adobe Flash). You will chose the data rate likely in conjunction with the network provider and network type (i.e., UMTS or CDMA2000 [EV-DO]). You will chose the lossy codec (such as AAC) based on what you want the stream to sound like to the end user. Once you come up with those specifications, you will then build your streaming encoder around them.

There are several different ways to accomplish this. The most obvious way is to assign the task to (yet another) CPU that lives at the radio station. This machine will have a piece of software that performs the encoding. One possible choice here is the Opticodec from Orban. The Opticodec can be used to generate streams using http or rtsp, compatible with Winamp/Shoutcast/Icecast, using

MP4/AAC or HE-AAC for the lossy codec. Multiple streams can be generated simultaneously on one CPU, and the number of (unicast) streams depends upon the CPU power. I should note also that the Opticodec comes coupled with the Orban PC1100, which not only plays the role of sound card, but audio processor as well (among other things). You can enter metadata into the Opticodec by means of a text file, serial connection or Ethernet.

AudioTX offers Webstream, a 1RU encoder that can play the role of stream generator. This device can encode up to six streams with different format/bit rate combinations. Two of the lossy codecs available are HE-AAC as well as MP4/AAC; and it's Winamp/Shoutcast/Icecast capable. Metadata access is via RS-232 or an IP text-based interface.

And speaking of metadata: This is information such as "now playing" that ultimately gets parsed out by the application on the user end. That way listeners can have the artist and title info, along with whatever else you happen to come up with when working with the app developer. There again, you may work with an outside service that gives you database access to album cover art – which you can also display along with the title information.

Streaming for everyone

Once the stream is generated, it is sent via IP unicast to the organization that makes it easily accessible for users over the Internet. You could plant your own server at an ISP and make use of the ISP's high-speed connection and peering with other ISPs, but that really isn't the way to go. It's important for the end-user to be attached to the best streaming source for his particular location so that the number of hops between the actual stream source (a replica of what you sent) and the end user is minimized. Let me explain.

When a connection is made from a mobile device and a source (a bank website for example), the amount of time that the communication takes isn't really important (unless of course it is monumentally slow). That communication is based on TCP, which is the connection-oriented, reliable transport method in IP. The source (the bank) is going to know from communications with the end user (you) that all the packets were received, and that they were all error-free. For this reason, it doesn't really matter how

Resources

AirKast
airkast.com
Akamai
www.akamai.com
AudioTX
www.audiotx.com
CDNetworks
www.us.cdnetworks.com
Limelight
www.limelightnetworks.com
Orban
www.orban.com

many "hops" (or routers) were transited over the Internet so that those packets could reach you and in return packets generated on your end could reach the bank. With more routers in the way, the likelihood of dropped packets increases, but since the transport is TCP, those errors are corrected.

With streaming audio, though, that is not the case. Most streaming audio uses UDP, which is the best-effort transport methodology for IP. Packets are given sequence numbers so that, should they arrive at the far end (the mobile device) out of order, they can be put back in the right order. Packets also don't necessarily arrive in a continuous stream; they may come in bursts. Those issues are dealt with by the device by buffering. If packets don't arrive soon enough, the buffer space will empty, leading to drop-outs in the audio. The more hops between the device and the source, the more likely that is to happen. Of course if packets are missing altogether, they can't be replaced. This would also lead to drop-outs in the audio.

The best way around these issues in general is to use a content delivery network. A CDN is basically a large network of servers that physically sit at important points of presence (POPs) where they can make effective peering connections with large last mile networks such as ATT, Verizon and Sprint. The servers on the CDNs own internal network are connected together on a private network with very high data rates (read Gb/s) and as such are not affected by the vagaries of the Internet in general. By constructing the network in this fashion, thousands of users can be served with very few hops in the way – this ultimately improving the system's performance and enhancing the user's experience. A few of the more well-known CDNs are Akamai, Limelight, and CDNetworks.

Putting it all together, end to end

Let's take a look now at how a connection is made end-to-end when an end-user clicks on your application.

For starters, part of what the application developer does is to code the unique URL you want to use for a particular stream. Obviously a different URL can be used on the basis of the platform type.

After this URL is resolved, a redirect server is reached. In addition to redirecting you to the yet another URL, this server likely takes note of the fact that you requested the service. (You've just become a statistic.) This second URL points you to the CDN.

At the CDN, your request reaches a DNS that does a few things:

- Reads the source of IP address of the requester
- Does a lookup of the owner of that IP address
- From that owner information, a reckoning is made of the location of the requester
- The DNS then decides which of its POPs is the best place to serve your content based on: The closest physical 'proximity; network congestion encountered reaching that POP; server usage at that POP; and load sharing.

Once the CDN's DNS comes up with an answer, it resolves the requested URL into an IP address for the user to attach to. The last mile connection is now made – via unicast. In the case of mobile devices, the physical layer is done via two radio links: one from the cell site to you, and of course the other from you back to the cell site.

The number of of smart phone users keeps increasing, and there's no end in sight. I for one don't believe streaming will ever supplant broadcast radio, but it is abundantly clear that streaming is growing in importance in our business. If you haven't already availed yourself to the new crop of Internet listeners, now is really the time. It's still early in the game, and definitely not too late to get in.

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

Connect and Drive It Home.

NEW! BlueDriver™ Gives You Hole-In-One Bluetooth® Wireless Wherever You Are!

Every remote is a challenge. Whether it's sports, a breaking news story or a natural disaster, you've got to be ready for anything. With BlueDriver, from JK Audio, you are prepared.

BlueDriver-F3: This is the business half of our popular BluePack. Plugged into the bottom of a mic, and paired to your cell phone, you get better than cell phone quality audio in a package that allows very quick setup and portability for live unfolding news coverage. Or...

Plugged into the output of a mixer, and paired to a cell phone, you've turned any mixer into a remote broadcast console or added redundancy to your existing remote transmission.

BlueDriver-M3: Plugged into the input of your mixer and paired to a cell phone, you can take callers into your broadcast, even during a live remote. Or take a call from your partner who is across town or out in the parking lot.

The uses for BlueDriver are virtually limitless. Next time you're covering a remote, make sure you're carrying a BlueDriver.

PLUG THE F3 ONTO YOUR MIC OR THE OUTPUT OF YOUR MIXER

PLUG THE M3 INTO ANY INPUT ON YOUR MIXER

BlueDriver F3 and BlueDriver M3 are used independently and sold separately

JK Audio
TOOLS FOR SUCCESSFUL BROADCASTS

See us at NAB booth C2010
jkaudio.com

JK Audio, Inc. Sandwich, IL 60548 USA • Toll Free: 800-552-8346 • Tel: 815-786-2929 • Fax: 815-786-8502 • info@jkaudio.com

NPR's Interview Room features a Lawo Crystal core and dual touch-screen monitors for the user interface.

NPR's Self-Sufficiency Initiative

By Roger Maycock

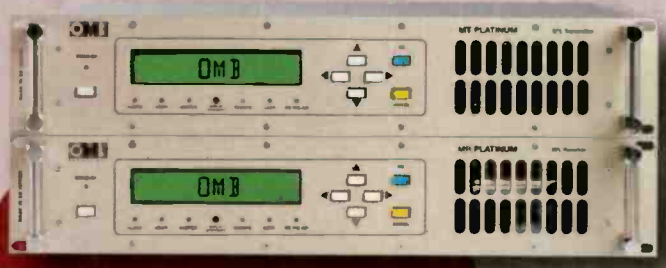
Lawo helps streamline NPR with virtual consoles and networking technology

As an internationally acclaimed producer and distributor of noncommercial news, talk and entertainment programming, NPR reaches a combined audience of 26.4 million listeners weekly. Member organizations operate 784 stations, and 117 public radio stations present NPR programming. In an effort to increase operating efficiencies while containing costs, NPR is in the midst of a dramatic multi-phase facility enhancement that places virtual console and audio networking technology at the forefront of the veritable radio station's operations. Designed to facilitate a high level of self operation for reporters and on-air talent, NPR deployed technology from Rastatt, Germany-based Lawo, with all sales and technical support coordinated through the company's North American offices in Toronto.

OMB
BROADCAST

FM TRANSMITTERS

All transmitter powers with the best quality price ratio



MT/MR PLATINUM >1GHz

is a high-performance Studio-to-Transmitter Link. It is made up of the 5W MT transmitter externally synthesized in 10MHz sub-bands with a step of 100KHz, and the MR double conversion receiver, that is externally synthesized, too. The MT is microprocessor controlled, and includes LCD display for the visualization of the most relevant transmission parameters (frequency (6-digit), forward and reflected power, moculation level), balanced Mono, Stereo (MPX). The MR receiver has the same visualization system as the transmitter. It includes balanced Mono and Stereo (MPX) outputs. Furthermore, the MT/MR Platinum STL includes a jumper in order to get a proper operation with digital signals.

EM 2000

is a 2000W FM transmitter made up of the EM 25 DIG exciter (or EM 20/30 exciter) and the AM 2000 FM amplifier. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules work independently thanks to a power combining structure that provides high isolation between them.

EM 10000

is a 10000W FM transmitter made up of the EM 250 COMPACT DIG exciter and three control units which combine the power of six AM 2000 FM amplifiers. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules works independently thanks to a power combining structure that provides high isolation between them.

www.omb.com

OMB AMERICA

factory and laboratories
phone. (305) 477-0973
(305) 477-0974
fax. (305) 477-0611
3100 NW 72nd. Ave. Unit 112
MIAMI, Florida 33122 USA

OMB EUROPA

departamento comercial
teléfono. 902-187878
fax. 902-187878
Avda. San Antonio, 41
CUARTE DE HUERVA
50410 Zaragoza, ESPAÑA

From september in:

fábrica y laboratorio
teléfono. 902-187878
fax. 902-187878
Pol. Ind. Centrovía C/Paraguay, 6
LA MUELA
50196 Zaragoza, ESPAÑA

NPR's Self-Sufficiency Initiative

Bud Aiello, NPR director of engineering technology, finishing a system change.

Dennis Byrnes, NPR engineering services manager, and Engineer Bob Butcher discus Lawo Crystal programming.

Equipment List

While the mixing/routing system is the heart of the installation, additional equipment is part of the NPR installation.

Belden wire and cable
Black Box Network Services
Servswitch ACU6001A
Cisco Systems ESW24
Dalet 5.1 audio production system
DB Engineering custom headphone control interface
Digigram 824, 924
Henry Engineering USB Match Plus
JBL Control 1+
Lawo Crystal, Nova 17, Nova 73
Neumann U87
Radio Design Labs STA-2
Sony MDR7506
Studio Technology studio cabinetry
Tascam PA-10
Telos Systems One
Tyco/Elo Touch Screen Monitors ET1515L

Equipment

To a large extent, the upgrade revolved around Lawo's Crystal console and core, a Nova 17 router core, a Nova 73 HD router with VSM software, and VisTool software. By taking advantage of VisTool's programming and configuration capabilities (the software provides support for touch-screen displays, thereby enabling users to circumvent the complexity of learning signal flow on more conventional audio mixing consoles), NPR and Lawo were able to create an environment where users are largely self-sufficient in conducting interviews and producing content. The various interview and reporting facilities now revolve around touch-screen displays or small LCD switch panels with a minimum number of controls to simplify common tasks such as source selection, signal routing, level control and related functions. This virtual console technology – in conjunction with Lawo's Nova 17 and Nova73 HD audio networking systems – is dramatically affecting NPR's day-to-day activities.

Bud Aiello, NPR's director of engineering technology, is responsible for the design, development and implementation of the new systems. After an extensive review of NPR's previous production model, Aiello and his team designed an environment that makes use of virtual console technology. An interview room, a tracking room, six "phoner" booths and a remote San Francisco booth are all integrated with two administrative stations – MCR (the master control room) and OPS (the news operations desk). Presently, the only rooms slated to have tactile, hardware-based faders are the newscast booths and production suites 3 and 4.

Interview Room

"Our first installed system is called the Interview Room," Aiello explains. "Though not an on-air facility, this room utilizes a Lawo Crystal core and dual touch-screen monitors for the user interface. There are no physical push buttons. Here, a show host or a reporter touches the on-screen icons for his and a subject's microphones, or selects a phone interview. He or she also has the resources of the master control routing switcher and can communicate with anyone in any of NPR's remote locations around the world via IP, ISDN, satellite or other means of remote access."

In addition to input and output routing from NPR's production system, the operator is able to title cuts and start recording. Through the virtual console, the mix, mix minuses, and various feeds to the headphones and production system occur. The system judiciously applies compression and gain control to maintain consistent levels and prevent downstream overloads. A second component of the Interview Room is a producer area for logistically complicated interviews. Here, the producer can sit adjacent to the Interview Room and control the mix with a second touch screen.

"The challenge with the Interview Room was the process of creating all the necessary mix minuses to make this facility viable without a sophisticated mixing console," Aiello says. "The individuals using this type of room typically are not skilled console operators. With our new virtual system, this issue has been addressed and, in the process, a high level of self sufficiency is implemented."

Tracking Room/phone booths

Like the Interview Room, NPR's Tracking Room also utilizes a Lawo Crystal core, but with a Lawo KSC.LCD14P2 LCD switch panel as the user interface instead of the touch screen. The KSC14 is a 19" 1RU panel equipped with 14 tri-color LCD buttons and dual rotary encoders. Here, a reporter or newscaster can sit down in front of a mic and record cuts into the produc-

more -14dB more -10dB

more of your bases covered

No one else builds single-cabinet, solid-state transmitters with power outputs of 6kW – 30kW in -14dB hybrid mode and 5kW - 21kW for -10dB. And only Nautel gives you an option for even more power in the same cabinet with HD Power Boost. That means more flexibility in planning for higher injection levels. Expect more; more engineers, more innovation, more -14db and -10dB power.

Learn more at www.nautel.com/-14db
Visit Nautel at NAB Booth # C2615

Making Digital Radio **Work.**

nautel
902.823.5131
www.nautel.com/expectmore/

NPR's Self-Sufficiency Initiative

John Ydsti, correspondent/host, conducts an ISDN interview in the Interview Room.

NPR Interview Room host screen shot

tion system. If he needs to track and answer questions from an interview, he can play back the interview from the production system and talk/track in time with the previously recorded material.

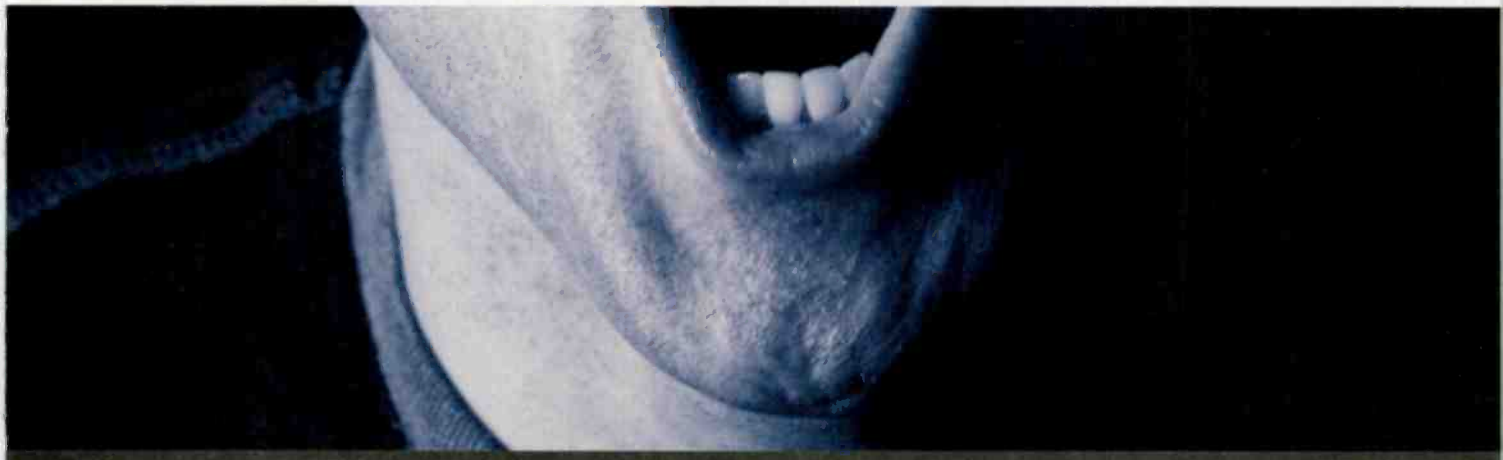
NPR originally had five "phoner" booths being overhauled to incorporate Lawo's virtual console technology. "Several of these rooms have ISDN hardware," Aiello notes. "They were built using technology that hasn't worked as simply as we had originally envisioned. The equipment has not been user-friendly and the reporters are not equipped to address such issues. By moving to the virtual console setup, these shortcomings will be resolved. Because of the efficiency of the virtual systems, we will have six booths in the new configuration."

Utilizing two Lawo Nova 17 core routers as the system engine, the phoner booths are each outfitted with Lawo's KSC14 switch panels as opposed to the touch screens. The Lawo KSC switch panel is used for the selection of microphone, master control feed, hybrid, and IFB to MCR or OPS. These booths are configured so a reporter can enter the room, dial the phone number of the guest, and bring them up on a telephone hybrid while directing the conversation into the production system via the Nova 17 router. All the MCR router sources are available, if needed.

"We chose the Lawo KSC14 panel because of its LCD display," Aiello says. "We now have dynamic identification of the buttons and we can have multiple levels appear on the panel. The buttons change color for each function and there are two rotary encoders that are used for headphone and monitor level control. There are also buttons identified as MCR and OPS – the two administrative locations in this system – that serve as intercom to the respective locations. Unlike the touch screens, this arrangement provides a tactile interface to the virtual console."

These systems are built on Lawo's Nova 17 digital routers for audio networking and are interconnected with MADI. Because of the routing capability within the Nova 17, these rooms are integrated into a common system and can easily include all the sources and destinations on the Master Control routing switcher.

SANITIZED FOR YOUR PROTECTION



SOME WORDS SHOULD BE OBSCENE AND NOT HEARD

Eventide Broadcast Delays are designed to keep profanity off your air, and angry listeners, embarrassed advertisers, and the FCC off your back. We invented the obscenity delay and have a solution for stations large and small that provides up to 80 seconds of the highest quality revenue and license-protecting delay.

Our new HD compatible BD600, 24-bit delay, comes standard with AES/EBU, and provides up to 80 seconds of memory — twice as much as other delays. There are fully adjustable Delay and Dump functions, and a Sneeze function which "edits" audio entering the delay, allowing the host to sneeze, cough, or make a short comment without being heard on air.

The BD600 offers two different methods of delay buildup and reduction: Eventide's catch-up and catch-down system, and an exclusive fast-entry-and-exit feature which allows starting a broadcast with the delay already built up to a safe amount and ending it with a rapid reduction of delay.

For HD, the BD600 offers MicroPrecision Delay™ mode which allows up to 10 seconds of delay to be adjusted in real time in 100 nanosecond increments. This is useful for synchronizing analog and digital signals while on-air, without audible artifacts, to maintain a seamless user experience.

Whatever your size, whatever your format, you can't expect to protect the integrity of your air and the foundation of your business without an Eventide Broadcast Delay in your rack.

Eventide®

HD COMPATIBLE

NPR's Self-Sufficiency Initiative

Robert Jackson, NPR tracking room engineer supervisor, checks the operation of the room.

The MCR and OPS both use Lawo's VisTool software to provide visual interfacing for the entire NPR system. Similarly, each station has VisTool oversight for the Interview, Tracking, all phoner booths, and the San Francisco booth via WAN-IP. This software enables the techs to have a picture of the virtual consoles on their display: all meters, knobs, etc. From these locations, technicians can make adjustments to connections and configure various room setups should users encounter difficulty. The technicians have the ability to route any source on the master control router to any designated station. The Lawo Nova 17 creates the mix minuses and mix, and sends the mix to the appropriate recorder or other destination.

"NPR's remote San Francisco booth is particularly noteworthy," Aiello explains. "The second system that we actually implemented was a field replacement for our production booth in the San Francisco office. I felt very confident with the Lawo systems – enough so, that we utilized a Crystal core, integrated it in a small cabinet along with an ISDN codec, a phone hybrid, and a KSC panel, programmed everything and shipped it to San Francisco. Upon its arrival, the booth retrofit was completed – including the connection to the NPR corporate IP network so that we can administer the system from Washington. As expected, it all worked flawlessly.

Phase two: automated rollovers and stream monitoring

As part of a planned second-phase facility enhancement, NPR is also on track to deploy a Lawo network audio/data routing system built around the company's Nova 73 HD large format router with L-S-B Virtual Studio Manager (VSM) software. Scheduled to be fully opera-

tional by Sept. 30, this is part of the Master Control Room application for centralized audio and streaming. The system will provide full apology, DSP, routing, and metering from multiple sources in Washington and other NPR content sources.

Under its current mode of operation, NPR in Washington provides show rollovers to the various time zones across the country from 7 a.m. to 10 p.m. daily to accommodate NPR's various programs. The new Lawo/VSM system will complete the automation of this programming operation. The blueprint calls for roughly 125 sources to be interconnected to this system, including the output of automation systems, live feeds for shows, backup feeds and a variety of additional feeds. Through the apology system in the VSM software, the automated system continuously monitors the primary feed routed to a specific output. If that feed ceases, there is a planned sequence of four backup levels that the system can choose from to maintain the feed's continuity to its defined destination.

"The purpose of this system will be to improve the level of continuous programming to member stations under total automation," Aiello says. "In addition to developing programming to member stations, we also develop several 24/7 automated streams for satellite delivery to Europe, Armed Forces Radio and TV, three channels for Sirius Satellite Radio, cable systems in Japan, and Radio Berlin, an FM broadcast frequency in Berlin, Germany programmed from Washington, DC. This new system will handle all of this with an initial capability of 48 automated streams."

Light at the end of the tunnel

Aiello comments on NPR's selection of Lawo audio and networking technology: "In August of 2009, we created a test project and invited several equipment manufacturers to present their solutions. Lawo was chosen because of the company's user interface design and its custom solution capabilities. We were very concerned about being able to operate in a manner that we deemed best for what we need to accomplish as opposed to trying to work within the constraints of a less-versatile or customizable environment. With Lawo's VisTool software, we can custom design the system and its user interface for simplicity and friendly ergonomic use. Lawo provided the best interface, flexible networking capabilities, the highest level of customization, and an extremely capable and mature product solution. Virtually all of the user traps associated with our previous equipment have been eliminated."

Maycock is the owner of Mountaincrest Communications, Downey, CA.

Dennis Byrnes and his Engineering Services Unit (ES), including Bob Butcher, Dennis Coll, plus the rest of ES team assembled the hardware, wired it and made it work. Shawn Fox provided guidance through the senior management level and production flow models.

Tips, tricks, hints and more

By Mike Kernen

Compressor replacement

We all know that coaxial transmission line and antenna pressurization are critically important. When I was recently summoned to a transmitter site, I discovered our compressor and dryer packaged system would only maintain about 2psi on the line. This is just less than it typically should be. I turned the nitrogen bottle on and removed the compressor from service. My initial inspection of the compressors revealed very little, although I noticed that they coasted to a stop when powered off – as if under no load. I pulled the cylinder head expecting to find a broken reed valve, but was surprised to see that the piston ring seal was torn. Inspection of the other compressor in the unit exposed another failed piston ring. Subsequent inspection of other compressor/dryer packaged units around our facilities turned up the same issue. Time for some rebuild kits, right?

The new compressor and refashioned drying system.

Unfortunately, the compressor units contained in the Andrew Dryline systems are made by a predecessor of Thomas Industries, which is in the process of moving and has allowed its parts inventories to dry up (no pun intended). Extensive searching proved these compressors to be rare and their parts even rarer. Rebuild kits from Andrew are priced somewhere north of $1,500 and include nearly every active part of the system. I clearly needed another solution.

My Andrew Dryline systems worked so well for so long they were all but forgotten. The Dryline works to lower the dew point inside the coax by first adding dried compressed air then slowly releasing it. Repeating this process ensures that the new dry air will absorb any latent moisture while being slowly released. Andrew has designed its systems to provide a dew point of nearly -40 F.

Ordering new systems from Andrew would be the simplest answer, but economic factors being what they are forced me to seek a more economical solution. I didn't need an entirely new system, I just needed a source of compressed air. I looked at alternative compressors.

Not just any compressor will do, of course. It must be an oil-free design so as to not mist oil into the airline. It must be priced affordably. The laboratory-grade compressors Andrew supply are super expensive and difficult to find. Air can accommodate more moisture as it is heated and air heats dramatically when it's compressed. So, the lab compressors also require an air-to-air intercooler because a tank does not buffer their output temperature.

I found the $389 DeWalt D55168 with its 120V oil-free, maintenance-free pump and its 15-gallon tank fit the need perfectly. The new compressor took its place next to the rack frame that formerly housed the Andrew units. I removed the compressor's stock quick release and fitted it with a MNPT-tubing connector. Next I needed to replicate the Andrew's drying system, which is made up of a small water separator, a coalescing filter, a pair of check valves and membrane dryer called a Cactus. I was able to source all of the needed parts from Grainger save for the Cactus, which I determined was reusable. I planned to replace the Cactus for good practice but found that it cost very nearly $1,000. Andrew also has fashioned a nifty evaporative continuous draining system for the water and coalescing filter, which I felt no need to duplicate because my new filter has an auto drain.

I re-used the Andrew controls system. It simply keeps the pressure within a user-definable window and provides alarms via contact closures if pressure goes outside limits, if the compressor runs for too long, or if there is excessive humidity in the system. Pressure is slowly relieved by means of the system's check valves that I harvested from our failed units. Rather than controlling the new DeWalt compressor I chose to let it cycle autonomously via its built-in pressure control, which keeps the tank between 180 and 210psi. The Andrew controller still connects to a solid-state relay, which now controls a three-way air valve. When energized, air flows from the tank. When de-energized pressure before the check valves is released and the auto-drain on the filters is allowed to open. I use the DeWalt's built-in regulator to supply about 100psi to the filter system.

With this system, the line breathes as it did with Andrew's Dryline system, but at a much more palatable cost. Simple, repairable and effective – total investment less than $750.

Kernen is the chief engineer of WCSX, WRIF and WMGC, Greater Media Detroit.

Do you have a tech tip?
Send it to us at
radio@RadioMagOnline.com
Submitted ideas maybe suitable to earn SBE recertification points.

If money is no object, this console is for you.

(It's also for those who live in the real world.)

Introducing iQ™. The brilliant new IP-Audio console from Axia.

AXIA
A TELOS COMPANY

AxiaAudio.com/iQ/

Pr*fan!ty DELAYS

Covering stations' assets

By Doug Irwin, CPBE DRB AMD

All broadcasters should be aware that nearly a year ago at the end of April 2009 the FCC effectively upheld its policy (from 2004) establishing heavy fines for TV and radio for the broadcasts of fleeting expletives. These fines are substantial – up to $325,000 per instance – and so it's clear this issue needs to be taken very seriously.

In response to the new fine structure, many audio equipment manufacturers introduced new delay units to their product lines, or updated versions of products already out there.

When delay units were first introduced, the audio quality through them was not that great and so for the most part, they were actually only inserted in the airchain when necessary (that is, for any show primarily based on spoken-word). The technology involved has come a long way in the last 20 years and so all the delay units I know of in use today are left on-line and in the airchain on a 24/7 basis.

NAB Sale Pricing!

WHY buy just a console when you can buy a console with FREE installation?

NOW buy a Radio Systems console and get a **FREE** StudioHub+® complete wiring package including all pre-made interconnection cables, 3 headphone amps AND an audio distribution amplifier.

OR instead of the complete StudioHub+ wiring package, take **$1,000.00** off the list price of any analog console and **$1,500.00** off the price of any Digital console.

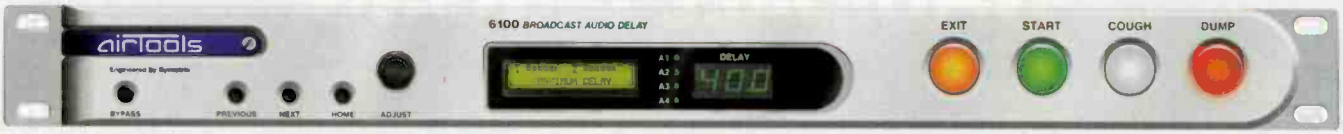
CALL Radio Systems or your favorite dealer today.

radio SYSTEMS

601 Heron Drive • Logan Township, NJ 08085
Phone: 856-467-8000 • Fax: 856-467-3044 • www.radiosystems.com

Eventide BD960

Sonifex RB-PD2



Airtools 6100

25-Seven Systems Program Delay Manager

Bel Digital Audio 5110E

The standard

Eventide has been making delay units as long as I can remember. They currently offer two different units, at different price points, and of course different levels of capability. The Eventide BD960 is a single rack unit device, analog in and analog out, with audio specs that allow you to insert it in the airchain on a full-time basis (two channels with +25dBm level capability, less than 0.008 percent THD and ±1dB flatness from 10Hz to 22kHz). It provides delay up to 8 seconds in length, with one-button control. A contact closure after the dump button is pressed can be used to play a filler – audio that goes out while the delay rebuilds. Alternately, the unit has the capability to store, in non-volatile RAM, an audio cut that can play during the delay rebuild.

If you need even more capability than the BD960, you could consider the BD600. This 1RU delay features analog inputs and outputs in addition to AES inputs and outputs, and can be set for up to 80 seconds of delay (4-second increments, from 4 seconds up to 20 seconds, and thereafter 10-second increments up to 80 seconds total). The user can program the length of the dumped segment. The

optional "extended" remote control capability allows the user to send serial data (RS-232) through the unit, with the data output being delayed. (This will be important if you are originating any kind of network show.)

More options

Several other manufacturers have introduced highly capable delay units. Sonifex is one of them. Its RB-PD2 is a stereo profanity delay that builds between 2 and 55 seconds of delay (at 32kHz sample rate and 16-bit word length). It has both analog and digital ins and outs (up to 48kHz sample rate with 24-bit word length). The unit's remote control includes eight inputs and six outputs; six of the outputs can be assigned to follow six of the inputs by the assigned delay time. These same inputs are user-configurable to allow remote control of the delay-build command, dump and delay-exit. The RB-PD2 has a built-in compact flash memory card, which can record audio directly from inputs of the unit. This allows the unit to playback an audio file while delay is being built back up after the dump feature is activated.

The Airtools 6100 (by Symetrix) is another 1RU delay that will provide up to 40 seconds of delay with 20kHz of audio bandwidth. The unit features AES ins and outs, along with balanced analog ins (+28dBu) and analog outs (+28dBu in to a bridging load of 100kΩ). This unit provides two features targeted toward network origination. First is the serial data (RS-232) delay. The serial data will be delayed by the same amount as the audio going through the box. Second is the TC89 offset delay. This allows the user to run TC89 time code data through the unit, with a user-programmed delay (in 0.5-second increments) so the studio clock can have a time offset that accounts for delays inherent in ISDN or satellite transmission.

25-Seven Systems is a relatively new player in this field. Its entry is known as the Program Delay Manager (A 2008 *Radio* Pick Hits winner). Like all of the delays discussed so far, it's a 1RU device. The standard PDM comes with both analog inputs and outputs along with AES inputs and outputs. (Another option is the Axia/Livewire version, with the inputs and outputs making use of IP.) The PDM comes standard with 90 seconds of delay built in, and it's expandable to 5 minutes worth. The system is controlled via the front panel, via GP I/O, RS-232 or via a Web browser. Configuration of the unit is done via the Web browser. Another feature of the PDM is called PD-alert. When the dump function is used, the unit will e-mail time stamped audio files to the PD (or GM or whomever chosen). One file is of the audio that got dumped and the other is the audio that made it to the air. The same audio files are archived in the unit.

Bel Digital Audio is another new entrant into the field. Its delay unit is the 5110E. Single rack unit, with delay of 2.5 to 40 seconds (adjustable in 2.5-second increments). Analog inputs and outputs, along with AES3 inputs and outputs, are standard. Bel also has a unit-specific remote control with the edit (or dump), delay-in and delay-out controls. Alternatively, the user can roll his own, connecting to the unit via a 15-pin D connector on the rear apron.

The typical delay unit available today has performance characteristics far beyond what was available 10 (or even five) years ago. Due to the potential penalties associated with letting fleeting expletives go out over the air, you really need to have a profanity delay safely ensconced in your air chain nowadays. It's probably one of the best equipment investments you can make, with a huge potential ROI.

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

2010 NAB SHOW PRODUCTS

IP console/routing system
Axia Audio
Booth C146

iQ: The iQ's package includes: a control surface, DSP-based mixing engine, audio I/O, machine-control logic, even a built-in Ethernet switch. Simply connect the control surface to the Core with a single cable, add audio inputs using CAT-5 cable, perform some fast Web-based configuration, and iQ is ready to broadcast. Simple networking lets users daisy-chain up to four iQ Cores without the need for an external Ethernet switch. Or, connect it to an existing Axia IP-audio network with a single Ethernet connection. IQ is fully customizable and scalable. Start with the eight-fader iQ main frame and add expansion frames with more faders and capabilities to suit your studio's needs. Add an optional backup power supply. Add more faders and programmable routing control panels – there's even a six-fader expansion frame with a built-in controller for the latest Telos talkshow systems.

216-241-7225; www.axiaaudio.com; inquiry@axiaaudio.com

Software application
Wheatstone
Booth C2623

PC-XY: Wheatstone's PC-XY software application is designed to provide complete XY control of a Wheatnet-IP source and destination matrix. The PC-XY application (sold with a site license) installs onto existing PCs; no additional hardware is required. Key features include: 8 programmable hot buttons for frequently needed sources and/or salvos, low overhead on the PC, plus configurable signal visibility. PC-XY is very useful for remote control of signal routing, and when coupled with the Wheatnet-IP audio driver makes a great source selection and monitoring tool.

252-638-7000; www.wheatstone.com; sales@wheatstone.com

The 2010 NAB Show is upon us, and we have some last looks at what will be shown this year. These are in addition to the full complement of produts in the March NAB Extra! You can also find more new convention products in the weekly NAB Insider e-mail newsletter.

And don't forget to look for the Pick Hits on Thursday at the convention. The original technology recognition taps the convention's best new products.

Audio processor
Audemat
Booth C751

Digiplexer 2/4 (1 Band): The latest addition to Audemat's Radio All in One range is the one-band version of the Digiplexer 2/4. The range delivers many savings and efficiencies by combining key functions such as audio processing, RBDS encoding, stereo encoding, audio back-up and I/O remote control into a single 1RU chassis. Recognizing that the majority of stations will perform their main audio processing operation at the studio site, the one-band unit has been specifically designed for transmitter site operation. Should a broadcaster's requirements change, the Digiplexer 2/4 can be upgraded from one-band to two- or four-band option by means of a software upgrade.

305-249-3110; www.audemat.com
contact@audemat.com

AES/EBU digital audio DA

ATI Group

Booth C1720

DDA-416/WC106: The Model DDA-416/WC106 is an integrated package containing four 1x4 AES/EBU digital audio distribution amplifiers and one 1x6 clock distribution amplifier. Operation of the unit is simple and straightforward, and it is housed in a rugged 2RU enclosure. All audio connections are made directly to the unit's built-in XLR and BNC connectors, and no special breakout cables are required. Signal routing is provided via rear panel accessible DIP switches.

856-626-3480; www.atiaudio.com; sales@atiaudio.com

Broadband switch

ERI-Electronics Research

Booth C2032

Motorized Coaxial Switch: This motorized coaxial switch (broadband 54MHz to 862Mhz) features a precision Geneva drive and operates on any VHF or UHF channel without tuning or modification. This makes it particularly suitable for switching multi-channel television systems and for use in N+1 transmitter systems.

812-925-6000; www.ERIinc.com; sales@ERIinc.com

Active PA speakers

Samson Technologies

Booth C1422

Auro D412, D415: Bridging the gap between fixed installation and portable applications, Samson's Auro active speaker systems are designed to encompass the key elements of power, portability and exceptional sound, the Auro D412 and D415 are lightweight, two-way active speakers that combine superior components and meticulous engineering. Both speakers provide 400W of output power and house a 1.34" compression driver. The D412 employs a 12" extended low-frequency driver while the D415 boasts a 15" low frequency driver for a little extra action on the bottom end. Two oversized carry handles and polypropylene construction make the Auro speakers portable and durable while a 1/4" line input, XLR mic input, volume control and two-band equalizer ensure professional sound capabilities and easy integration into a PA setup.

631-784-2200; www.samsontech.com; info@samsontech.com

Audio recorder/editor

VeriCorder Technology

Booth SU9506L

VC Audio Pro: VC Audio Pro is a multitrack sound editor for the iPhone platform. It allows reporters or podcasters to record, edit and send professional-quality audio news clips or full stories from an iPhone with the touch of a finger. Designed for broadcast and podcast applications, this software enables users to record and edit high-fidelity audio into a news story, and send it instantly over Wi-fi or a cellular connection. VC Audio Pro is now available on the App Store and it can also be customized for radio networks and fully integrated into newsroom, media asset management and playout systems.

250-448-4954; vericorder.com; info@vericorder.com

Read what our users say...

KJDL, Lubbock, TX

" I like (Xtreme) a lot! Once we got things together we never have any problems. (Xtreme) is a 9 out of 10 for usability. It didn't take me long to figure out, I picked up most of the major (features) in the first day. (The Xtreme) is user-friendly for all involved."

Jessie Walker, Program Director

DMS Broadcasting, San Francisco, CA

" When we started, we were jumping into something we knew nothing about! We called your tech support & within a day they had a solution. It was miraculous. They helped us get wired up & set up. (Tech Support) had a positive & upbeat attitude. They went above & beyond!"

David Trudrung, General Manager & Co-owner

WDHC, Berkley Springs, WV

" We are absolutely pleased. I especially like the game scheduling feature, it works great for Mountaineer West Virgnia University games. I rate it a 9 ½ because we can schedule 2 games simultaneously & flip flop when there are rain delays. It works great for sports talk!'

Mike Hurst, Engineer

KSVL, Yerington, NV

" I love (Xtreme)! We've been running (Xtreme) for a year & a half every single day & we give it a 10! It's easy to learn & use. Good support & it's dependable!"

George Lemait, Station Manager

KSMZ, Alexander, AR

" Xtreme has more flexibility, sounds better & has fewer problems then our stations running (other automation systems). It's easier to program & a 9 compared to other programs out there."

Scott Gray

and MANY more...

Join the hundreds...

... of others on air with Digilink-Xtreme, the best automation system in Radio. Full featured, it is easy to install, use, and maintain. Best of all, it is easy to buy. Choose from either the no contract $100 per month 'Solutions Program' from Arrakis Systems or buy 'Xtreme-Complete' outright for only $6,500 from Broadcast Supply Worldwide (BSW)

WHY PAY A FORTUNE
FOR AUTOMATION ?

Digilink-Xtreme

only $100 per month

support, training, upgrades

the best automation in Radio, period !

970-461-0730 ext 309

2010 NAB SHOW

Microphones clips
Hosa Technology
Booth SL2507

MHR-422, MHR-425: The new Hosa MHR-422 and MHR-425 microphone clips are offered in 22mm and 25mm diameters respectively. These two sizes will readily accept the overwhelming majority of microphones currently available. The MHR-422 is designed for use with dynamic mics while the MHR-425 is designed for wireless mics. They are threaded for U.S. compliance and will fit atop most any microphone stand sold in the United States. Additionally, a European adapter is included. Both models are RoHS compliant.

714-736-9270
www.hosatech.com
lee@hosatech.com

RBDS monitor
Pristine Systems
Booth C3032

RBDS Capture: RBDS Capture is a software plug-in that will monitor and capture RBDS data for black box digital audio logging, monitoring and alert software. It continuously displays and logs up to 16 channels of RBDS data (PS and RT) from FM broadcast stations. RBDS data normally includes station call letters, artist, title, sponsor and other content related messages. The "text alert" is a unique feature that constantly monitors all the RBDS data streams in search of user-defined words. An alert window will pop up and notify users whenever incoming text matches are found.

310-831-2234
www.pristinesys.com
sales@pristinesys.com

Sound card
Yellowtec
Booth C1451

PUC2: PUC2 is a professional USB-powered sound card with digital and analog audio interfaces. It combines failsafe installation with a new modular design. It still features PUC'n'Play technology while improving audio quality to deliver up to 24-bit/192kHz. AES-3 is the standard interface of every PUC2 soundcard. The modular design enables delivery of varying interfaces for the back. The analog line input/output module provides professional levels +15/+18dBu full scale. The microphone input module with 48V phantom power and up to 60dB gain dissolves the need for additional mic preamp equipment.

+49 2173-967 30
www.yellowtec.com
info@yellowtec.com

Web-enabled remote site control
Broadcast Tools
Booth C1451

Site Sentinel 16: Each metering (telemetry), status/logic, stereo silence sensor, temperature sensors, power failure input, along with all relays can be controlled and/or monitored over any IP network. Users can operate the product using a Web browser or Web-enabled mobile device, while e-mail notification may be configured to alert up to four recipients. It is equipped with 16, 12-bit resolution bi-polar 10V metering (telemetry) channels, along with four virtual channels. Each of the 16 optically isolated status/logic channels may be configured for 5 to 24Vdc wet or dry (contact closures) status/logic monitoring. The 16 raise and lower control channels are equipped with independent SPDT one-amp relays and may be controlled via any Web browser and/or user programmable event action (macro's) sequences.

877-250-5575
www.broadcasttools.com
bti@broadcasttools.com

IP network card
Harris
Booth N2502

Intraplex CM-30: The Intraplex CM-30 allows for the IP conversion of installed Intraplex T1/E1 STL frame products including the STL HD, AudioLink PLUS and Access Server. The module plugs into existing Intraplex multiplexer frames for immediate conversion to IP, providing a large installed base of Intraplex legacy STL users with a seamless and cost-effective upgrade path. It allows Intraplex customers to achieve bandwidth usage and reliability in transport equivalent to T1/E1 but with lower recurring costs. Signal quality and feature sets of existing T1/E1 systems are retained while migrating to lower-cost, high-performance IP networks. Built-in intelligence allows for field conversion in a matter of minutes. The CM-30 is compatible with existing interface cards for audio, voice and data traffic in Intraplex legacy systems. The module can accommodate up to 32 streams and connections in point-to-point unidirectional and bidirectional deployments; and point-to-multipoint unidirectional multicast scenarios.

800-622-0022; www.broadcast.harris.com broadcast@harris.com

STL codec
Tieline Technology
Booth C157

G5: Featuring automatic silence detection, optional dual redundant power supplies and audio network failover solutions, G5 is designed for continuous, solid connections over IP and a variety of other connection transports within broadcast networks. Single power supply versions are also available with optional on-board flash drive storage capability. All connections can be controlled and managed by a Web-based graphic user interface that provides full codec programming functionality and connection diagnostics, with complete remote control. G5 also interfaces with Tie Server, Tieline's Traversal Server system, which facilitates simple IP buddy list dialing of all networked IP codecs, much like Skype or ICQ contact management.

888-211-6989; www.tieline.com; sales@tieline.com

Audio meters
Sonifex
Booth C2739

Reference Monitor Meters: There are eight new Reference Monitor Meters, five rack-mounted and three freestanding, each offering high resolution metering of between one and four stereo audio sources. Each stereo source is auto-switching between either analog or digital AES/EBU format with sample rates up to 192kHz accepted. The level of each stereo source is displayed on a pair of bright, multi-colored bar graph meters, with a large choice of accurately modeled scales/responses to suit different applications and local preferences. Five separate LED phase meters indicate channel correlation or phase error conditions, and additional LEDs show digital input lock and audio level alarm status. On the rear panel, open-collector alarm outputs provide hardware indication of audio under-level or silence, audio over-level, sustained phase errors above 90 degrees and digital source lock. All Reference Monitor Meters operate from global mains voltages (85-264Vac, 47-63Hz) without adjustment.

207-773-2424; www.sonifex.co.uk
sales@sonifex.co.uk

Chassis connector
Neutrik
Booth C2336

USB/Firewire: This chassis connector design features a sealing ring and offers optional screen-to-chassis grounding for improved shielding effectiveness. Neutrik's complete USB/FireWire product line, which includes its 2.0 compliant USB A – USB B Reversible Adapters (NAUSB-W, NAUSB-W-B) and six-pole FireWire adapters (NA1394-6-W, NA1394-6-W-B), is available with either a nickel or black housing. Ideal for audio networking and the integration of computer-based equipment into audio systems, Neutrik's line of USB chassis connectors is designed with its universally accepted D-style housing. Through this latest product introduction, Neutrik offers a solution to the digital interface problems that are typically associated with audio/video networks, IT equipment and digital recording studios.

732-901-9488; www.neutrik.com
info@neutrikusa.com

Mic/line limiter
Musicam USA
Booth C11533

MLM: The Musicam USA MLM is a high quality limiter for microphone or mono line limiting applications. The limiter has a complex programmed dependent attack and release time system which is coupled with FET gain reduction to give a clean sound, free of the harshness often associated with VCA based designs.

732-739-5600; www.musicamusa.com; sales@musicamusa.com

Digital hybrid
JK Audio
Booth C2010

Universal Host: This desk-top digital hybrid provides talk-show-quality caller audio from most IP and PBX telephone systems. Universal Host sends mic and line level signals into a telephone while maintaining excellent separation between the voice and the caller. The stereo output jack on the back of the unit provides the send voice on the left channel and only the caller's voice on the right channel. The balanced XLR output jack contains only the caller's voice. The 16-bit USB audio codec allows stereo recording at up to 48kHz sampling rate. Play recordings from a computer directly into the phone system. Universal Host provides connections for a microphone, headphones and mixer. The Digital Signal Processor (DSP) continuously monitors both transmit and receive audio signals to deliver separation. This proprietary, dual-convergence echo canceller algorithm can achieve excellent separation without any setup, and without sending a noise burst down the line.

800-552-8346; www.jkaudio.com; info@jkaudio.com

POTS digital hybrids
Telos Systems
Booth C146

Nx1, Nx2: Available in either a single POTS (Nx1) or dual POTS (Nx2) configuration, Nx digital hybrids offer an expanded list of standard features and greater control over incoming caller audio. Each hybrid has its own AGC, noise gate and caller override dynamics, using carefully tuned DSP algorithms. Included in each hybrid is DDEQ (Digital Dynamic EQ), a multi-band equalizer that analyzes and adjusts received audio for smooth, consistent call quality. Each digital hybrid has an adaptive function that reduces the possibility of feedback in open-speaker applications. Each hybrid also has its own status symbols visual call management icon that clearly show line and caller status.

216-241-7225; www.telos-systems.com; telos-info@telos-systems.com

1kW FM transmitter
BW Broadcast
Booth C3034

TX1000: The TX1000 features high efficiency, an innovative cooling scheme and fault detection/protection circuitry for temperature and VSWR. Its architecture includes gold-clamp transistor technology, along with a slide-in power supply. The TX1000 complies with all applicable CE, FCC and EU regulations and has a universal power input.

866-376-1612; www.bwbroadcast.com; info@bwbroadcast.com

Audio processor
Orban
Booth C1657

Optimod-FM 8600: The 8600's dramatically improved peak limiter technology decreases distortion while increasing transient punch and high frequency power handling capacity. Compared to the FM-channel peak limiter in Optimod-FM 8500, the new peak limiter typically provides 2.5 to 3dB more power at high frequencies, which minimizes audible HF loss caused by pre-emphasis limiting. While this design offers about the same loudness as 8500 processing, its main goal is to make FM analog broadcasts more competitive with the cleanliness, punch and open high frequencies of the digital media against which FM analog transmissions now battle. In addition to the new clipper, the 8600 offers the same extensive feature set as the 8500. Except for the AGC, the analog FM and digital radio channels are independent and separately adjustable. The digital radio channel features a new peak limiter that uses some of the same new technology as the peak limiter in the FM analog processing channel.

480-403-8300; www.orban.com
sales@orban.com

Audio interface
Tascam
Booth SL1717

US-800: The US-800, a lightweight, multichannel recording interface for laptop users, offers eight inputs and four outputs for capturing dynamic multi-mic performances. Six XLR microphone inputs each have phantom power for attaching condenser microphones, and premium 192kHz/24-bit audio converters record every detail. The US-800 includes S/PDIF digital audio in and out as well as MIDI in and out for linking to a studio. The package is ideal for mobile or desktop recording.

323-726-0303; www.tascam.com
tascamlit@tascam.com

Intelligent Remote package
Digital Alert Systems
Booth C3651

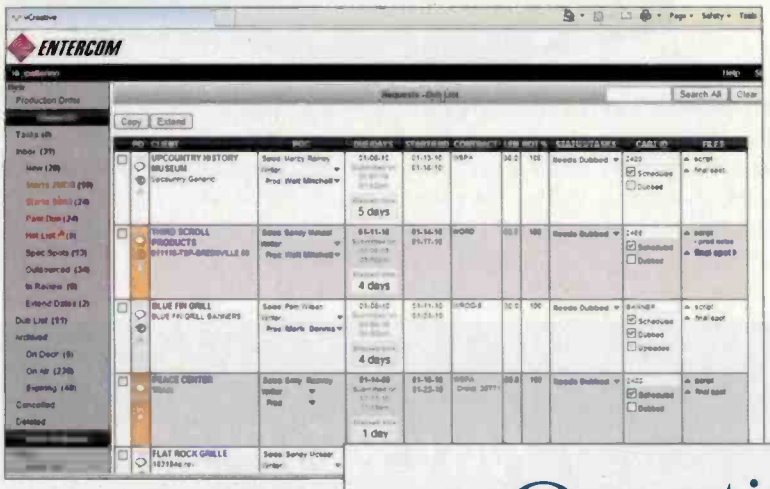
DASDEC-IR: For broadcasters who are multicasting more than one channel from just one location, DASDEC-IR offers a single platform for distributing and monitoring EAS messages on up to five stations – whether they originate from the same building, same state, or across the nation. By eliminating the need for an encoder/decoder set dedicated to each station, DASDEC-IR helps broadcasters conserve resources while ensuring that equipment upgrades and FCC regulation compliance are more simple and efficient than ever before. The system combines the DASDEC-II system with the company's MultiStation software to support simultaneous or sequential forwarding of emergency alerts to all channels. The capacity to select sequential forwarding gives broadcasters the ability to schedule the alert to air on each channel at an appropriate time, without interrupting critical programs.

585-765-2254
www.digitalalertsystems.com
info@digitalalertsystems.com

Software modules
Netia Digital Audio
Booth SU3502

Radio-Assist 8 Enhancements: CamDirector, a new Radio-Assist module, brings direct camera control and automated video switching to the company's Radio-Assist 8 suite of digital audio automation software. With this capability, radio broadcasters can create live, switched programs for broadcast, streaming or podcast. Using automatic voice detection, CamDirector enables complete automation of the production of in-studio interviews and special on-set events by triggering the switching of cameras according to the speaker and microphone currently in use. Radio Assist 8 also now incorporates Workflow Engine, designed to allow media companies to choreograph their own workflow easily. Workflow Engine facilitates and harmonizes exchanges between all existing applications found in a broadcast environment.

866-638-4222; www.netia.net
j.martin@netia.net



vCreative PPO

By John Pallarino

After 12 years of radio production sorting stacks and stacks of production job orders, I finally came to the conclusion that there has to be an easier and more streamlined way of doing it. There are on-air automation programs, traffic and sales programs, and even programs for promotions. After trying to create my own with Excel and still ending up with the same result, I came across a paperless production job order system on one of my resource networks. This program was able to take all those prod orders and compile them into a user-friendly database much like my e-mail. It's called Paperless Production Order System (PPO) from vCreative. Creators John and Jinny Laderer also had the same idea of making the radio production process more efficient and streamlined. It only took me one demo to see the potential this system had to offer my department.

Performance at a glance

Web-based production order system

Easy-to-use forms with required fields

Submits instantly to traffic and production

Submit orders anywhere, anytime

Tracks status of each order in real time

Monthly fee or barter arrangement

Eliminates make due expenses

Saves on consumables

PPO is designed to streamline the entire production job order process between AEs, traffic and production. The system is set up with an inbox, tasks, starts tomorrow, starts soon and so on. With a few easy clicks on the headers of each column orders can be sorted much like Excel.

The production order form itself is designed to be user friendly and has plenty of fields to input all the data the AE would use in a paper form. At first glance the form may seem overwhelming with all the fields but not all of them need to be filled it out. It is purposely designed to cater to every situation to give the AE an opportunity to put in as much information as he feels is needed. Because the system is not customized for only one station or cluster, it must be able to fulfill the needs of every station no matter how big or small.

Order

The order is split in seven collapsible cells that open when certain information is input into the designated fields, which helps guide users through the rest of the process. There are even required fields that must be completed to submit the order, which helps eliminate errors.

The system has some great interactive features:

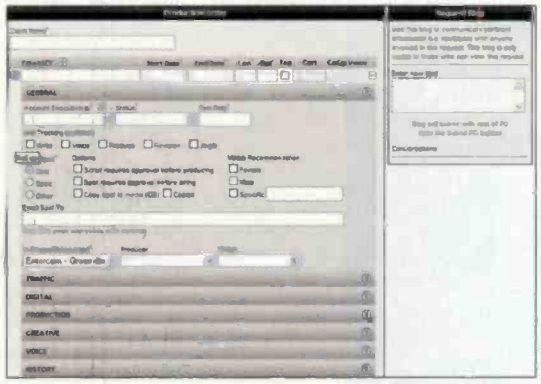
- Ability to upload scripts, prod notes, tag info and music beds
- Streaming audio of the final spot
- Access from any computer including a mobile phone
- Ability to store every spot uploaded on vCreative's own servers, allowing orders from years ago to be accessed with full search.
- Calendar
- Reports
- Out of office notification
- E-mail notification
- History of each order

There is no software to install and it's completely Web-based. The only setup involved on my end is adding users and some general system options. We have been running PPO for close to two years now and it has only experienced one or two hiccups, which were fixed in a matter of 20 to 30 minutes with one e-mail to John Laderer.

This leads me to another aspect of the system I really like: customer service. When I first started with the system I noticed some areas I liked and some areas I thought could use some tweaking. John was very willing to take the time and hear my thoughts, which led to many weeks of brainstorming and tweaks to get it not only to run for

my department, but current and future clients. To this date I can shoot John an e-mail with a suggestion and get a response the same day. This also goes for anybody who uses the system: Just click the feature request, fill out the form, hit submit and you're done!

Once the order is submitted the process can start on everyone who is involved. For example: After the AE fills out the order and submits it I can then assign a producer, assign it to the copy writer, traffic and continuity can enter it in the traffic system and assign it numbers, and the whole time the AE looks at his screen and sees the status. We used to have a problem with orders waiting to get processed, but now everyone involved can work on it at the same time, which means better efficiency.



The production order form is user-friendly.

Switching over

The only real struggle I dealt with was how to make the switch from our old paper system to PPO without an all-out revolution from the sales people. I selected a couple of sales people to be guinea pigs for two weeks. They gave me instant feedback. After all the adjustments were made, I rolled the system to the entire sales staff and never looked back.

PPO isn't a system that can stand alone like on-air automation; it requires everyone involved to his part and needs constant attention. Some production directors I have spoken with feel it can replace them and they would be out of a job. PPO doesn't voice or produce the spots, nor does it use some complicated formula to create and delegate the orders. Without someone at the helm steering and telling it what to do this system will simply sit there and do nothing. PPO is a very useful tool that benefits everyone using it and I predict that in the very near future it or systems similar will become an industry standard much like a DAW and Internet-based music libraries.

I think I can speak for everyone at our five-station cluster in saying that it has been one of the most useful and beneficial systems we use. It's interesting to look back and remember the days of piles of orders sitting on my desk and trying to make head or tails of them. I wonder how I was able to keep my sanity in this thing we call radio.

Pallarino is the creative director at Entercom Upstate, Greenville, SC.

Editor's note: Field Reports are an exclusive *Radio* magazine feature for radio broadcasters. Each report is prepared by well-qualified staff at a radio station, production facility or consulting company.

These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested.

It is the responsibility of *Radio* magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by *Radio* magazine.

Olympus LS-11

By Gil T. Wilson

When I first opened its box, I was impressed by this recorder's comfort. Out in the field recording live audio for newscasts or for the occasional station imaging featuring the man-on-the-street interviews, the bulk of a recorder can hinder a good interview. The Olympus LS-11 is a hand-held, thumb-friendly unit: It fits comfortably in the hand and most operations can be performed at thumb's reach, similar to cell phones and iPods.

As I explored the many features in this powerful recorder, I kept thinking, If only I had this when...

Performance at a glance

- 24-bit/96kHz linear recorder
- 8GB internal memory
- Accepts up to 32GB SD/SDHC card
- MP3, WMA and WAV audio file recording
- Built-in stereo mics and speakers
- Basic internal audio editing
- Includes Steinburg Cubase LE4

This would have been great to record live band performances. The stereo mics are positioned to provide the perfect stereo ambiance while still pulling in the live music and weeding out much of the crowd noise. The LS-11 even features a line-in jack to get that perfect soundboard mix. On the underside of the unit, there is a base for a screw-in tripod, similar to cameras, so the unit could be set and forgotten. The side has a thumb-wheel to adjust the record level for optimum sound.

The LS-11 would have been nice to have back when I was gathering actualities for newscasts. The two mounted microphones are conveniently located at the top of the machine, and set 90 degrees apart and could be used to get the voice of the interviewee as well as the interviewer with very little mic movement back and forth. It also has a mic jack should a mic be desired. I personally found the installed mics to be more than adequate for any recording. In fact, these mics and the LS-11 system seemed like a perfect sound vacuum, as in sucking in all sounds.

In use

The LS-11 definitely does not act like the condenser mic recorders of old. While it uses a low-noise/high-sensitivity mic system, it seems to seek out all sounds and record them, and does so in a smart manner. I can remember hours wasted of setting a recorder in a lecture hall where most of the sound I recorded was the buzz of fluorescent lights or background hiss. The LS-11 didn't once over-emphasize any sound, but instead recorded the same sounds you would hear in the same room. As a test for the capacity of the internal storage (8GB) I set the recorder and let it go for 8 hours. When I checked back I still had storage space available as well as battery power, but most importantly, every sound was captured with exceptional clarity and no annoying hiss or buzz.

Speaking of storage space, the LS-11 has 8GB of built-in storage, but also comes with a slot for an SD/SDHC card (up to 32GB). The unit supports a wide range of recording formats, linear PCM, MP3 and WMA. The format you choose determines the size of the files and your personal storage usage. I found the MP3 format perfect, which allowed more space for files.

The unit comes with a USB 2.0 connection so files can be retrieved easily and placed within any audio editing software. It comes packaged with Cubase LE4 music production software. The installation DVD-ROM also comes with a Cubase training video.

The LS-11 is a hand-held, thumb-friendly unit.

Audio files can be somewhat edited directly on the player by giving the user the ability to split files or delete parts of files. One of the features I found fun to use was reverb. While limited to on-the-player adding of reverb, I found myself recording man-on-the-street responses and playing them back as man-in-the-tunnel recordings. Just some extra to make the use of the Olympus LS-11 open to more imaginative uses, especially now that I have gotten over the If only I had this when phase and now moving to What else can I do with this recorder?

Some other aspects of the LS-11 worth mentioning are the visual aspects of the unit. The two mics come with foam wind guards that not only serve their purpose but give the unit a very professional look. The display screen is well-lit and easy-to-read and didn't have any icons that required a translation table. All the data displayed is straightforward.

All in all the Olympus LS-11 is perfect for anyone seeking a solid recording device for any professional use.

Olympus

P 888-553-4448

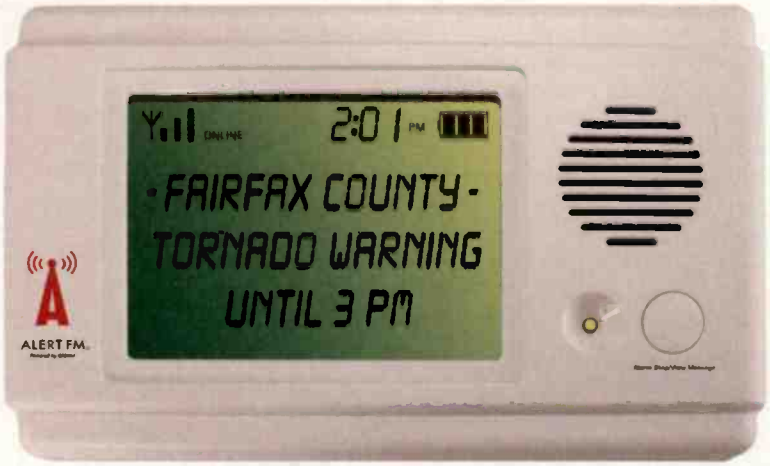
W www.olympusamerica.com

Wilson is an announcer, producer, webmaster and promotions guy at WAKO-AM/FM, Lawrenceville, IL.

Editor's note: Field Reports are an exclusive *Radio* magazine feature for radio broadcasters. Each report is prepared by well-qualified staff at a radio station, production facility or consulting company.

These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested.

It is the responsibility of *Radio* magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by *Radio* magazine.



Dedicated receivers like this wall-mount unit can provide FM-based emergency alerts.

GSS Alert FM

By Matthew Straeb

FM radio-based alert and messaging systems enable emergency management personnel to create and send radio data alerts and messages to targeted recipients. The single-point to multi-point messaging functionality utilizes the overlapping data signal of existing FM stations to provide redundant emergency notification capability. These systems can deliver emergency information through FM data subcarriers, SMS (text messaging) to mobile phones, and e-mail. They are a great complement to outdoor warning sirens or telephone-based mass notification systems whose performance can be adversely affected by clogging and power outages, which occur in emergencies. FM radio-based alert systems can distribute messages received countywide in less than 60 seconds.

Message origination and system administration is handled through a Web-based portal, which can be accessed via any secure Internet connection. The portal allows the users to create groups and subgroups based on geographic or organizational classification. Messages can be pre-scripted or canned as well as custom-made. The portal also features the history of all messages including the sender, specific content, time and date stamp, and destination. An automated data feed for National Weather Service warnings mean users can program their receivers to get these local weather warnings.

All FM radio-based alert systems servers are hosted in reputable, third-party data hosting centers and accessible by secure login. Data is backed up each night using a third-party data archiving service. These systems feature data communications using satellites in addition to terrestrial Internet, which allows for full system operations even if power is interrupted at the emergency operations center or at an FM transmitter. This satellite data transmission between the servers and the FM stations also adds a security layer to the system. The entire system is closed between the administrative portal, where the data is entered, and the receivers.

The FM chip

The FM chip is one key to interoperability. This single-to-multi-point radio broadcast system uses the Radio Broadcast Data System (RBDS) subcarrier datacasting, layered in need-to-know groupings based on an existing communication infrastructure – the country's nationwide FM broadcasting network. Targeted alerts and messages are delivered by satellite to FM transmission towers and can be received on Alert FM receivers and other mobile devices. Millions of Americans, including countless first-responders and public safety workers, have the potential to receive alerts and time critical information with the activation of the standard FM chip.

Most people are still surprised when cell networks cannot handle the extra load during emergencies.

Alerts can also be received on portable devices with FM receivers.

- Modular Operation in Op-X allows for a tiered system at a fraction of the cost of it's competitors.
- Each studio client is capable of accessing all Audio Server modules on the network.
- Remote voice-tracking allows for creation of content for remote studios also running Op-X.
- The revolutionary design of Op-X's clock builder turns the previous task of scheduling satellite programming into a few simple clicks.
- Share serial devices from any machine using the Op-X Serial Server.
- 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.

Op-X
RADIO AUTOMATION

AUTOMATION

SIMPLE • POWERFUL • REDUNDANT

Not since Axia audio-over-IP *was introduced to the broadcast industry have we at BGS been so excited! It is with great enthusiasm we'd like to invite you to take a look at the new Op-X Radio Automation delivery system for any single or multi-station cluster. Op-X's versatility allows it to operate seamlessly with either Axia IP-Audio networks or legacy audio consoles.*

Broadcasters General Store
352-622-7700
www.bgs.cc

The reality is that cell phone networks are switched (point-to-point) and were not designed to handle the loads put on them today. Even more alarming is the lack of awareness that wireless carriers have the potential to further safeguard individuals and communities with the activation of a standard FM receiver chip that exists in most cellular handsets today, which is capable of receiving personal alert messages from a standard FM radio tower used to listen to your favorite music. This capability can be used while not interfering with normal cell phone usage.

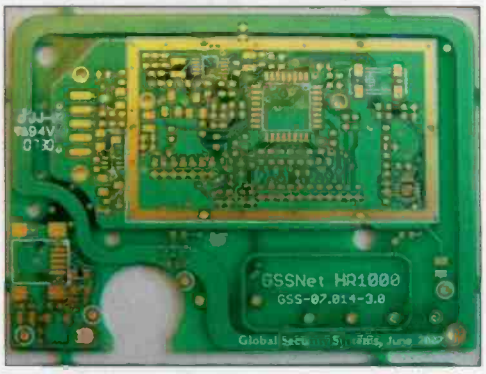
FM chips are readily available for insertion into cell phones and are used extensively outside the US. The consumers are offered easy access to FM stations and data via the open service business model adopted in Europe and Asia. This means the carriers provide the service and offer users a la carte services without tying them to a particular phone or cell service. This has resulted in more than 40 percent of the market using FM radio and receiving important data using the cell phone. Secondly, the technical barriers of battery drain and internal antennas have been overcome. The chips available provide signal sensitivity capable of tuning and receiving FM radio signals without external headset antennas. Coupled with tuning and battery-saving software, the tuner wakes and goes back to sleep. The same software is used in GPS receivers, NOAA weather data receivers, alert receivers, smoke detectors and other consumer devices to preserve battery life.

Currently, a FEMA study program is in place to provide global government adoption of the FM radio-based alert technology and applications into the Integrated Public Alert and Warning System Infrastructure. As part of this adoption, FM radio-based alert products will be added to the IPAWS qualified products list (as a message disseminator) and eligible for deployment across the United States.

Fixed and mobile

Today FM radio-based alert systems can feature fixed and/or mobile receivers. The receivers are programmable for up to 30 groups and services, have siren- and text-alert capabilities, and powered by a combination of battery and ac power. They are capable of receiving messages from any FM station on its network, so customers, may use their receivers anywhere there is GSS FM coverage. This feature is particularly beneficial during evacuations.

These systems can be fully CAP compliant, which will allow for full integration with third-party systems such as reverse 911 telephone systems or sirens. Many times a user will already have other notification technologies and he wants the new FM radio notification capability added to his existing system. This integration capability and open architecture allows these systems to be expanded into new applications in the future. They can also be activated via existing alert and warning systems.

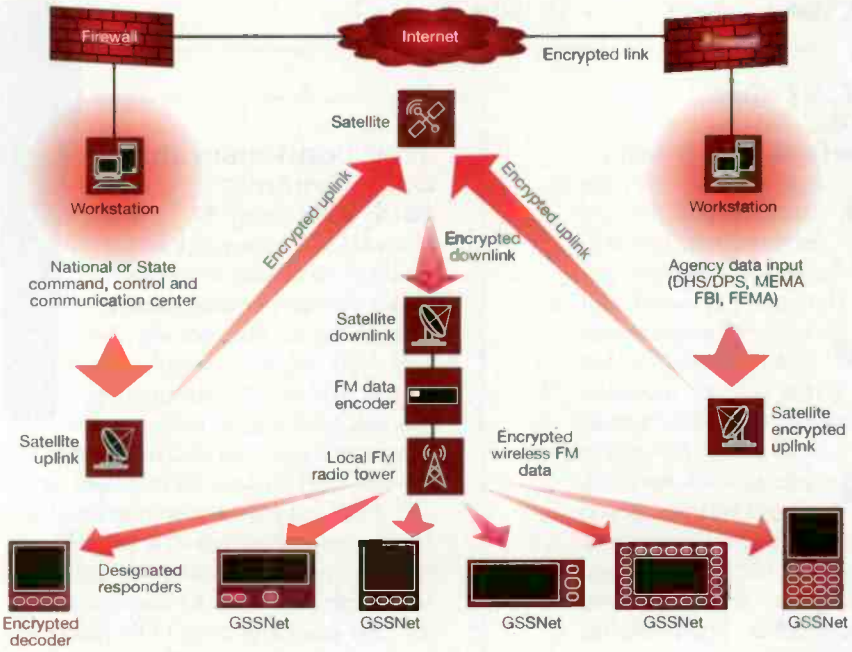


Board of FM receiver with internal antenna

An FM radio-based mobile receiver can receive alerts including NOAA weather warnings, homeland security notices, evacuation instructions, Amber Alerts or school closings.

Support groups

As emergency communication channels continue to receive scrutiny, the role of broadcasters will advance as the FM network infrastructure is considered to



FM radio-based alert system diagram

provide efficient and solid support for the vigorous delivery of time critical, life-saving messages.

Specifically, the Commercial Mobile Alert Services Advisory, born out of the Warning Alert Response Network Act (WARN Act) to facilitate the wireless devices such as cell phones to adopt alerting technologies. The Federal Communications Commission took a number of steps in facilitating the ability of consumers to receive emergency alerts through their wireless phones. In 2008, the Commission issued a series of orders adopting requirements for a Commercial Mobile Alert System (CMAS), a system by which commercial mobile service (CMS) providers may transmit emergency alerts to their subscribers.

A Consumer Electronics Association industry-working group (R6 WG16 Fixed and Mobile Alert Warning Devices) has been established to provide best practices and guidelines receive Common Alert Protocol (CAP) alert data and use on fixed and mobile consumer electronics devices.

As officials and the public consider alternatives to cellular voice calls, text messaging is frequently discussed as a safe alternative during emergencies. Text messaging, including applications based on Short Message Service protocol, is its own worst enemy during a perceived or real emergency. Network overload and inoperability are problematic, and there is a security issue due to the dependence on Internet connectivity to interconnect the communications channel.

The cell network infrastructure is vulnerable, connected to a maze of landline telephone switches, and encryption is not supported all the way to the wireless receiver. In comparison, FM radio-based alert systems use a dedicated satellite and secured channels so there is no possibility of public access to the network. In a crisis, these systems have a guaranteed channel that offers protective umbrella coverage for certified command and controlled messages to be delivered with a guaranteed source and encryption all the way to the receiver. Satellite coverage is essential to bridge the post-disaster communications breakdown that occurs after every significant hurricane or earthquake.

As broadcasters remain on the front lines of providing emergency information to their audiences, it is exciting for stations to be a part of the existing EAS, as well as new initiatives designed to provide a more comprehensive solution for emergency communication.

Straeb is executive vice president of Global Security Systems, Jackson, MS.

For an update on current FEMA IPAWS projects, visit www.fema.gov/emergency/ipaws/systemenhancements.shtm

by Erin Shipps, associate editor

Locking RCA cable
Perfect Path

PerfectLock: PerfectLock locking RCA cables are built to eliminate the problem of loose RCA cables. The cables feature a unique design that allows the outer body of the connector to turn and lock down on the port for increased retention. When turned clockwise, an active wedge inside the cable causes the outer ground shield to lock down on the port. This allows for a secure connection on RCA ports of any size with only a quarter turn and the cable is easily removed by turning it counterclockwise.

800-800-6652; www.perfectpath.com
perfectpath@ppc-online.com

True condenser mic
Beyerdynamic

TG-X 930: Using the capsule of the MC 930 true condenser microphone as a basis and featuring a specially compensated proximity effect in the cardioid capsule, the TG-X 930 achieves neutral transmission of even the subtlest vocal nuances, while a slight treble boost ensures an open and accurate sound. The stainless steel basket with multilayer gauze and additional inner basket provide protection against pop sounds. It is not only easy to clean, but also improves rear-attenuation and increases feedback reduction. In addition, the internal structure of the transducer system makes the microphone resilient to moisture-related problems.

800-293-4463; www.beyerdynamic-usa.com
info@beyerdynamic-usa.com

A19 LED bulbs
Ledtronics

DEC-A19-5X1W DecorLED Series: The DEC-A19-5X1W DecorLED Series comes with softly diffused, precision-domed lensing that directs light at a 95-degree beam, and is available in warm white (3000 Kelvin) and pure white (6000K). These A19-style LED bulbs offer long-term durability, low power consumption, environmental sustainability and money savings. They run on a flexible voltage range of 85-265Vac requiring no special adapters, and replace 40W to 50W incandescent bulbs while consuming less than 7W of power.

800-579-4875; www.ledtronics.com; webmaster@ledtronics.com

Router software
NTP Technology

RCCore: RCCore is a software application that handles configuration, control and supervision of all router modules in an NTP audio signal distribution system. RCCoreV3 can be used as a stand-alone controller within the NTP 635-300 router or run from standard PC hardware. It allows highly efficient control of the router's dual-backbone interface and supports the double LAN interface on 625-800 frames. It also forms a communication interface to NTP's VMC and BLISS control options and to third-party communication protocols. Features include remote access and log-in at expert-user level for system set-up, maintenance and database management.

+45 4453 1188; www.ntp.dk
ntp@ntp.dk

Radio
C. Crane Company

CCRadio-2: The CCRadio-2 has the same familiar look and layout as previous models of the CCRadio but with even better AM reception and the addition of the 2-Meter ham band. The boost in AM performance comes from the company's twin-coil ferrite am antenna and other improvements. After selecting a station, the radio evaluates the signal for several seconds and then locks in for the highest signal possible. The addition of the ham band may make the CCRadio-2 a life saver during an emergency. The CCRadio-2 can act like a simple radio scanner and search the five memories for ham operator communications.

800-522-8863; www.ccrane.com
customerservice@ccrane.com

Dynamic microphones
Blue Microphones

Encore Series: The Encore 100, 200 and 300 models are designed for any live application, from the rehearsal space and coffee shop to the auditorium and stadium. The 100 is a studio-grade dynamic microphone. The 200 adds Blue's Active Dynamic circuitry and output transformer, coupling the ruggedness and high SPL handling of a dynamic mic with the consistency and low noise of a phantom powered mic. The 300 is the flagship of the series and offers vocalists uncompromised performance featuring a hand-selected Blue Aria condenser capsule with a matched pre-amp and phantom power circuit, a tuned enclosure, and Blue's proprietary reinforced chassis, which controls airflow around the capsule for unparalleled vocal control and a natural, open sound, no matter how the artist holds the microphone.

818-879-5200
www.bluemic.com

Sales tool
Benmaradio

On D'mand: Never again will a salesperson leave money behind because a deal couldn't be closed without creative. Benmaradio creates copy live online with your salespeople and client. Then, it's backed with the fully produced spot, delivered before the end of business that day. The whole process is very simple. Text or call the toll free number and Benmaradio creates a virtual online meeting. Once copy is approved, production can be, in many cases, delivered in four hours or less.

877-751-6667; www.benmaradio.com; benmaradio@aol.com

User-controlled radio
Jelli

Jelli: A system to create 100 percent user-controlled radio, Jelli allows users to take over a radio station with their browsers. By empowering listeners to interact in a dynamic Web experience, the Jelli community chooses in real-time what should play next – not just over an Internet stream, but also on the airwaves. With Jelli, users join forces to create the on-air playlist with real-time voting and other features, interact and discuss what they are hearing with the rest of the listening community, and rate what's currently playing. The playlist is dynamic, and what plays next is determined by users seconds before it plays. The community can even vote to pull a song off-the-air, instantly, using one of the several unique features of Jelli.

www.jelli.net; feedback@jelli.net

Portable mixer
Allen & Heath

Zed-10: Part of the ZED range of USB-equipped mixers for live performance, recording and production, these mixers are simple, ultra compact, and built to a professional standard. ZED-10 and ZED-10FX feature two ultra high impedance discrete Class A FET (field effect transistor) inputs, which allow an instrument to be plugged directly into the mixer, emulating the valve/tube input circuitry commonly found on instrument combos or amplifiers. There is also a 26dB gain boost switch, which caters for instruments with very low output pickups. The ZED-10 can also manage up to four microphones and two stereo sources with MP3 player compatibility, provides separate two-track record outputs and a stereo playback input for two-track replay or interval music from a CD player, XLR main stereo outputs with inserts, comprehensive monitoring with headphones and separate monitor speaker outputs, 48V microphone phantom power, and DI level switching for sub mixing. There is also a USB send and return for PC or Mac recording, playback and effects.

800-431-2609; www.allen-heath.com/US

Studio mic
Neumann

TLM 102: The TLM 102 features a large-diaphragm capsule (cardioid) with a maximum sound pressure level of 144dB. Its most important applications are in the realm of vocals and speech; a slight boost above 6kHz provides for excellent presence of the voice in the overall mix. Up to 6kHz the frequency response is extremely linear. The capsule has an elastic suspension for the suppression of structure-borne noise. A pop screen integrated into the grille serves to suppress plosives in vocal and speech recording.

860-434-5220
www.neumannusa.com
neumlit@neumannusa.com

Mic to line level amplifier
Ocean Matrix

OMX-MIC2LINE: This dual-channel mic-to-line amplifier is for those jobs where a microphone signal must be interfaced with a line-level product. It is fitted with dual XLR professional input connectors and pots to continuously adjust the level from 0 to +8dB. The output connectors are 1/4" phone unbalanced with 1/4" phone to RCA jack adapters provided.

www.markertek.com
www.tecnec.com

Revenue application
Marketron

Revenue Builder: This enterprise application improves a station's ability to sell and manage comprehensive cross-media advertising campaigns. This application drives revenue growth by enabling radio organizations to manage all aspects of non-airtime advertising through a single, unified system that is fully integrated with the primary business operating system, Marketron Traffic. Revenue Builder delivers comprehensive functionality and workflow designed specifically for non-traditional and digital sales, including production workflow, inventory management and analysis, campaign-based invoicing and revenue reporting.

888-239-8878; www.marketron.com
sales@marketron.com

Studio monitors
Transaudio Group

ATC SCM11: The SCM11 two-way passive speaker incorporates ATC's Constrained Layer Damping (CLD) technology, which reduces third harmonic distortion between 100Hz and 3kHz, resulting in an extended, resonance-free axial frequency response, improved off-axis frequency response, and a significant increase in loudspeaker power response. The CLD technology is incorporated in the 5.9" mid/low frequency driver with 1.77" integral soft dome. The driver features a precision undercut bass pole, in-house, hand-wound precision flat wire coil, and a massive optimized motor assembly. The driver is paired with a new soft dome 0.98" neodymium high-frequency unit featuring a precision alloy ATC waveguide.

702-365-5155; www.transaudiogroup.com

UPGRADES and UPDATES

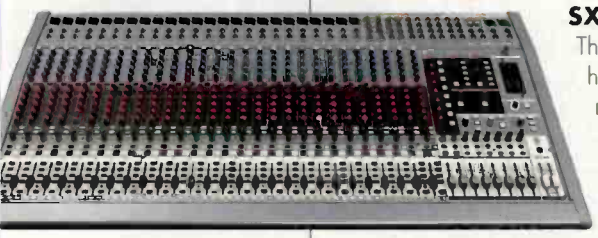
NPR affiliates will soon receive new **International Datacasting** satellite receivers with built-in **Axia** Livewire connections as part of a refurbishment of the **Public Radio Satellite System**. (www.intldata.ca, www.axiaaudio.com, www.prss.org)...**OMT Technologies** has released Imediatouch version 4.0 radio automation software including an advanced client graphical user interface and more than 25 feature enhancements. (www.imediatouch.com)...**Enco Systems** has released iDAD, a companion mobile application for the Enco DAD and Presenter audio automation studio systems, targeted at the iPhone and iPad. (www.enco.com) ■

Programming control package
Radio Workflow

Radio Workflow: This server-based project management product directs programming content efficiently and accurately through the station or network with a new level of transparency. Projects are viewable by all users and can be manipulated and controlled by those with correct operational permissions. The software gives sales staff, promotional staff, programming staff and production staff the opportunity to have collective input and control simultaneously, which assists in delivery of an efficient and accurate project, while allowing a safe environment for late alterations. It also empowers the people delivering the project in its infancy to create a much more developed shell and takes pressure off programmers who are no longer presented with a stack of forms and details.

radioworkflow.com; info@radioworkflow.com

Mixers
Behringer



SX4882, SX3282: These low-noise, high-headroom analog mixers feature an in-line concept with 24 independent mix-B input channels, all with individual two-band EQ, level, pan and mute. They also feature 24 Xenyx mic preamps with switchable +48V phantom power, neo-classic four-band EQ with two semi-parametric mid bands, eight subgroups with independent solo and routing functions to simultaneously feed 16 multi-track outputs, six aux sends per channel (all switchable pre/post fader), six multi-functional stereo aux returns featuring level and balance controls, solo and extensive routing functions and two BNC connectors for 12V gooseneck lights.

877-672-0816; www.behringer.com
support@behringer.de

Voltage regulator/ power conditioner
Furman Sound

P-2400 AR: The P-2400 AR is a 20A rack-mountable voltage regulator/power conditioner featuring Furman's newly refined true RMS voltage regulation technology. Utilizing an ultra-low noise, microprocessor-controlled, eight-tap toroidal auto-former with solid-state switching, it provides a consistent 120V output (±5V) from any input voltage ranging from 97V to 137V. Its technology is designed for quiet operation in critical listening and recording applications. The P-2400 AR is also a full-featured power conditioner featuring Furman's SMP/LiFT/EVS Technologies for professional-level protection and linear ac noise filtration. Convenience features include a switchable front-panel digital voltmeter/ammeter with color-coded voltage range indicator for comprehensive power monitoring, and a front-panel USB charger for personal media devices and cell phones.

707-763-1010; www.furmansound.com
info@furmansound.com

Noise suppressor
Waves

Waves WNS: The Waves WNS noise suppressor, is a real-time multi-band processor for broadband noise suppression on dialog tracks. Suitable for indoor and location dialog recordings containing constant or modulating environment noise, WNS delivers superior sound quality with minimal artifacts. WNS offers all the flexibility, portability, power and precision of software: true Pro Tools integration, multiple simultaneous instances, full recall and full automation. And because all processing takes place in the box, there's no loss in sound quality resulting from I/O conversion.

865-546-6115; www.waves.com

Radio software
Listener Driven Radio

Listener Driven Radio: Listener Driven Radio (LDR) is a new model for radio built on crowdsourcing that allows listeners to go online or use an iPhone and offer their input into what plays next on the radio station. LDR is constantly absorbing listener input, song votes and comments on music, and automatically adapting radio programming in real-time. The audience can control the station's on-air product within the parameters the program director creates.

www.listenerdrivenradio.com

Two-way powered loud speaker

Mackie

TH-15A: The TH-15A two-way powered loudspeaker delivers 400W of system power in a rugged design weighing 36lbs. It offers the power, portability and performance required of a compact PA. The TH-15A benefits from Mackie Active technology, which incorporates an active crossover and driver time and phase alignment for optimized system performance. The 15" woofer and 1" compression driver produce great overall sound and low-frequency response for a cabinet of this compact size. A user-adjustable three-band EQ with a sweepable mid lets the user flexibly EQ the system for the application at hand. This is a great feature for smaller setups that may not have a ton of outboard equipment.

800-898-3211; www.mackie.com
productinfo@mackie.com

Online radio and social networking

Radio Weave

Radio Weave: Combining social networking with personalized Internet radio, Radio Weave delivers an easy-to-use Web and mobile service that weaves customized public and private radio stations into a single audio steam. Upon registering for the free service, Radio Weave users can immediately begin listening to public or private content libraries and micro-channels including everything from national and local news, sports, weather and traffic reports to music, podcasts and other professional content. These libraries and micro-channels are then blended together into a single, personalized audio stream that can be controlled by a tuner. Radio Weave also allows users to produce and upload their own content, and comment and react to professional content by sharing their own audio and podcasts. Users can listen to their social media updates utilizing Radio Weave's text to speech engine to read their Twitter tweets and in the future, Facebook status updates and email messages as well.

radioweave.com; radioweave@matternow.com

Four-channel field mixer
Fostex

FM-4: The FM-4 includes balanced four-channel inputs (mic/line), two main outputs, and two sub outputs. Outputs feature high-quality custom transformers and can double as 1-4-channel direct out (post-fader). A highly visible organic EL display with high resolution metering offers both VU and peak level in addition to mixer parameter status and remaining battery capacity. Main output signals are tamable with on-board analog limiters that include threshold and ratio controls. Additional outputs include tape output and 2× aux outputs with channel select. Monitor return inputs are available for checking the audio from VTR or camera feeds. Headphone outs are on standard and mini plugs (in parallel) and are selectable from multiple sources and PFL.

800-7-FOSTEX; www.fostexinternational.com
sales@fostex.com

Playback software
Sonic Studio

Amarra MINI 1.0: A smaller, simpler version of the Amarra ultrafidelity music player, Amarra MINI sharesg the same Sonic Studio Engine (SSE) playback as the full version. It provides bit-perfect output of standard and hi-res audio files to an audio interface and DAC, supporting sample rates up to 96kHz. Amarra MINI features automatic hardware sample rate management, advanced dither and digital volume, and uses Itunes for compressed and rights managed music.

415-460-1201; www.sonicstudio.com; info@sonicstudio.com

Software for radio
Digital Juke Box

Public Inspection File: This file inspection software makes a nerve-racking experience a simple task. All documents are stored electronically, allowing the user to make a public inspection file (PIF) available on a website, maintain PIF files from one central location, turn an FCC inspection into a stress-free situation and save physical space. If it's on a computer, nobody can steal the original documents. They are always backed up, complete and in compliance. A 15-day fully functional demo is available on the company's website.

888-ONAIR-99; www.digitaljukebox.com
sales@digitaljukebox.com

Isolated USB interface
ARX Systems

USB I/O: The ARX USB I/O is a plug-and-play USB digital/analog pro audio interface that removes the need to use any existing sound card outputs. It features full transformer balanced inputs and outputs, providing the isolation required to eliminate earth loops/ground hum and other extraneous interaction noise and distortion. The USB I/O installs as a fully compatible generic USB audio device, requiring no special driver program installation. The front panel has left and right transformer balanced analog XLR input and output connectors that connect to any standard balanced analog inputs and outputs. On the rear panel there is a Type B USB connector, as well as a ground lift switch. A status LED on the rear panel indicates the USB I/O is connected and operating.

480-998-7140; www.arxamerica.com

RAID 5 redundant backup
Highly Reliable Systems

First RAID G2: First RAID G2TM is a standalone RAID 5 redundant backup system with autocopy removable media capability for off-site backup storage. This system directly attaches to a fileserver using a single eSATA or USB2.0 connection. Connect it to any eSATA host bus multi-drive capable adapter. The eSATA port does not need RAID functionality because the internal inline controllers handle the RAID. Duplicate backup automatically. First RAID's top four drives are configured as a RAID 5 array and the fifth bottom drive as a standalone drive to back up the RAID 5 array. Use the RAID volume for nearline back-up with automatic redundant protection. Then automatically or through host software, copy the RAID volume to the bottom volume and remove for off-site disaster recovery and storage.

877-384-6838; www.high-rely.com
sales@high-rely.com

Advanced Wattchman Monitor®/Alarm
For Analog and Digital Broadcasting

The Model 81094 is the first in a series of Internet/Intranet accesible Advanced Wattchman® Wattmeter/Alarm systems that will monitor both forward and reflected power in two transmission lines with only one controller. Unlike previously available systems that needed one controller for each transmission line, the Advanced Wattchman® will monitor two lines (4 ports). The front panel display shows power on both systems simultaneously. Operating conditions may also be displayed on a PC from any location on the Internet/Intranet.

It is designed to work with a series of specialized line sections from 7/8" to 6-1/8" and standard Coaxial Dynamics elements for either analog or digital applications.

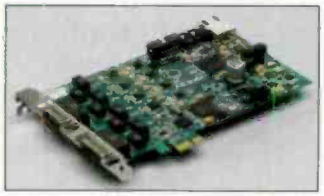
Coaxial Dynamics 6800 Lake Abram Drive • Middleburg Hts, OH 44130
Phone: 440-243-1100 **Toll Free:** 800-COAXIAL **Fax:** 440-243-1101
sales@coaxial.com • www.coaxial.com

Audio processor
AirTools

Multiband Processor 2m: The AirTools Multiband Processor 2m marshals the power and innovation of the company's DSP solutions to meet the very specific needs of broadcast professionals. The inclusion and easy configuration of every necessary DSP module optimizes broadcast audio for improvements in tone, intelligibility and intensity. Hardware implementation is robust, allowing for multiple audio connections across all of the most widely-used interconnect protocols, with minimum latency, wide dynamic range, extremely low distortion.

425-778-7728; airtoolsaudio.com
sales@symetrixaudio.com

PCI express card with AES/EBU
Lynx Studio Technology



AES16e-50: Multiple connectivity options are available on the AES16e-50 PCI Express Card from Lynx Studio Technology. In addition to offering 16 channels of 192kHz AES/EBU digital I/O via its two D-sub ports, it has 32 digital I/O channels using AES50 technology. AES50 provides a bi-directional, point-to-point connection for multi-channel audio and system control over a single CAT-5e or CAT-6 cable. The benefits include reliable high-bandwidth data transfers, low latency and low clock jitter. Complete networks can be built using routers with multiple AES50 ports.

714-545-4700; www.lynxstudio.com; sales@lynxstudio.com

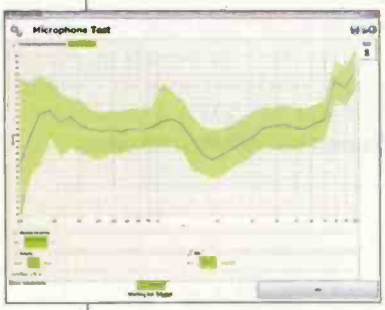
Audio streaming
Abacast

Mobile Streaming: Mobile phones are enabling a new generation of listeners to consume radio content on the go and in their cars. With Abacast mobile streaming stations can reach almost any smart-phone user, with support for the iPhone, Blackberry, Windows Mobile and more. Stations can generate revenue with built-in support for injected audio ads, banners, gateway audio or video ads, and click to buy. Streaming is up to 256kb/s and optimized formats include AAC, AAC Plus, HE-AAC, Flash audio and MP3.

360-834-5229; www.abacast.com; info@abacast.com

Microphone tester
NTI Audio

RT-Microphone: The RT-Microphone provides the essential set of measurements, paired with individual tolerances for the total quality control of individual microphone components or final products, such as mobile phones, vocal microphones or headsets. The typical test cycle time is less than three seconds. The system includes the high-speed RT-2M audio analyzer and a software platform. Further accessories, such as reference microphones, reference speaker and automation interfaces complete the test solution. It offers frequency response, sensitivity, distortion, signal-to-noise ratio and polarity.



503-684-7050; www.nti-audio.com
info@ntiam.com

Handheld bluetooth radio mic
BlueRadios

MobileMic: A portable Bluetooth handheld radio broadcast mic designed specifically for live broadcasting, MobileMic uses Bluetooth for wireless broadcasting on location. The mic connects to any Bluetooth-enabled cell phone.

303-957-1003; www.blueradios.com
sales@BlueRadios.com

Call screener
NeoGroupe

Neoscreener: This call management software interfaces to Telos 2x12 and 2101 systems, allowing for line control and even database lookup using Caller ID. Features include: Caller ID database lookup; automatic transfer/rejection of calls; first ring display of name, city, number of calls; call number history; complete line monitoring and control; chat function between studio and call screening room; and talent display.

603-203-1331; www.neogroupe.com
info@neogroupe.com

GALLERY

CLASSIFIEDS

HELP WANTED

RADIO BROADCAST TECHNICIAN
Maintenance (BBG-10-005)
LOCATION: Washington, DC

The Voice of America is seeking a full-time Radio Broadcast Maintenance Technician (RBT) to join our Radio Maintenance Service team in supporting radio broadcast facilities and other multi-media systems at VOA Headquarters in Washington, D. C.

MAJOR DUTIES:
- Troubleshoot, diagnose, repair, and perform preventative maintenance on all technical equipment in studio and production facilities, including portable audio and video multi-media devices.
- Install, construct, and provide design assistance, for new broadcast engineering projects or to upgrade existing broadcast systems and equipment.
- Prepare and process equipment and materials, and evaluate relevant equipment and tools for Radio Maintenance Service use.
- Preparation and timely delivery of required status information and reports including complete maintenance and operation logs, and documents.

QUALIFICATIONS REQUIRED:
Applicants must have technical experience in professional radio, television, and/or multi-media systems that clearly demonstrates the ability to troubleshoot and repair broadcast related equipment, including portable audio and video multi-media devices. The experience must have been progressively responsible and must clearly demonstrate the applicant's competence in troubleshooting and maintaining a diverse range of broadcast related equipment manufactured by a wide range of vendors in the broadcast industry.

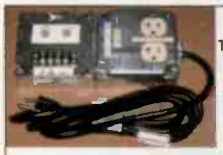
Details about this position and how to apply can be found at:
http://jobview.usajobs.gov/GetJob.aspx?JobID=85469772

You can mail or hand deliver your application materials to the address below:

International Broadcasting Bureau
ATTN Office of Personnel
330 Independence Ave., SW, Rm. 1543
Washington, DC 20237

If you have questions regarding this position (Radio Broadcast Technician – Maintenance announcement (BBG-10-005) please contact: Leslie Brown at (202) 382-7500.

FOR SALE



Radio®
THE RADIO TECHNOLOGY LEADER

www.RadioMagOnline.com • radio@penton.com

Editor – Chriss Scherer, CPBE CBNT, *chriss.scherer@penton.com*
Associate Editor – Erin Shipps, *erin.shipps@penton.com*
Senior Art Director – Michael J. Knust, *mike.knust@penton.com*
Senior Digital Content Specialist – Brad Erpelding, *brad.erpelding@penton.com*

Technical Consultants
contact them via radio@penton.com
Harry C. Martin, *Legal*
Kevin McNamara, CNE, *Computers and Networks*
Mark Krieger, CBT, *IBOC*
Jeremy Ruck, P.E., *RF and Transmission*
Russ Berger, *Broadcast Acoustics*

Contributors
Doug Irwin, CPBE AMD; Chris Wygal, CBRE; John Battison, P.E.

Group Publisher – Wayne Madden, *wayne.madden@penton.com*
Associate Publisher – Steven Bell, *steven.bell@penton.com*
Senior Marketing Manager – Kim Davidson, *kim.davidson@penton.com*
Marketing Coordinator – Crystal Shires, *crystal.shires@penton.com*
Vice President of Production – Lisa Parks, *lisa.parks@penton.com*
Senior Director of Production – Curt Pordes, *curt.pordes@penton.com*
Group Production Mgr. – Melissa Langstaff, *melissa.langstaff@penton.com*
Client Services Coordinator – Terra Maples, *terra.maples@penton.com*
Classified Ad Coordinator – Sarah Maxey, *sarah.maxey@penton.com*
Audience Marketing Director – Marie Evans, *marie.evans@penton.com*
Audience Marketing Manager – Kris Cunningham, *kristi.cunningham@penton.com*

MEMBER ORGANIZATIONS
Sustaining Member of:
• Audio Engineering Society • Society of Broadcast Engineers
Member: American Business Media, The Missouri Association of Publishers

A PENTON MEDIA PUBLICATION
Penton Media
Penton Media, Inc. • 249 West 17th Street • New York, NY 10011
Chief Executive Officer – Sharon Rowlands, *sharon.rowlands@penton.com*

SUBSCRIPTIONS: Free and controlled circulation to qualified subscribers. Non-qualified persons may subscribe at the following rates (Prices subject to change): USA and Canada, 1 year, $66.00, 2 years, $116.00, 3 years, $165.00. Outside the USA and Canada, 1 year, $83.00, 2 years, $149.00, 3 years, $215.00 surface mail (1 year, $127.00, 2 years, $237.00, 3 years, $347.00 airmail delivery). To subscribe or change your address, visit: www.radiomagonline.com and click on Subscribe. We can also be reached by email: radio@pbinews.com; Phone: 866-505-7173 or 847-763-9504 or write us at Radio magazine, PO Box 2100, Skokie, IL 60076-7800 USA. Back issues are available for $10 each by calling customer service.

POSTMASTER: Send address changes to Radio, P.O. Box 2100, Skokie, IL 60076-7800 USA.

ARCHIVES & MICROFORM: This magazine is available for research and retrieval of selected archived articles from leading electronic databases and online search services, including Factiva, LexisNexis, and Proquest. For microform availability, contact National Archive Publishing Company at 800-521-0600 or 734-761-4700, or search the Serials in Microform listings at napubco.com.

REPRINTS: Contact FosteReprints to purchase quality custom reprints or e-prints of articles appearing in this publication at 866-436-8366 (219-879-8366 outside the U.S. and Canada). Instant reprints and permissions may be purchased directly from our website; look for the RSiCopyright tag appended to the end of each article.

PHOTOCOPIES: Authorization to photocopy articles for internal corporate, personal, or instructional use may be obtained from the Copyright Clearance Center (CCC) at 978-750-8400. Obtain further information at copyright.com.

PRIVACY POLICY: Your privacy is a priority to us. For a detailed policy statement about privacy and information dissemination practices related to Penton Media, Inc. products, please visit our website at penton.com.

EDITORIAL and BUSINESS OFFICE: Penton Media, Inc. 9800 Metcalf, Overland Park, KS, 66212; 913-341-1300; RadioMagOnline.com, penton.com

List Rental Services
Marie Briganti
MeritDirect
Phone: 877-796-6947
E-mail: mbriganti@meritdirect.com

Editorial Reprints
Penton Reprints
Phone: 877-763-2303
Website: www.pentonreprints.com
E-mail: diane.mason@penton.com

Sales Offices

Associate Publisher
Steven Bell
Phone: 913-967-7221; Fax: 913-514-6848
E-mail: steven.bell@penton.com

Europe/UK
Richard Woolley
Phone: +44 1295 278 407
Fax: +44 1295 278 408
E-mail: richardwoolley@btclick.com

Classified Advertising
Julie Dahlstrom
Phone: 312-840-8436; Fax: 312-595-1983
E-mail: julie.dahlstrom@penton.com

Online Sales & Marketing
Angie Gates
Phone: 913-967-7516; Fax: 913-514-7516
E-mail: angie.gates@penton.com

Contributor Pro-file

Meet the professionals who write for *Radio* magazine.
This month:
Field Report, page 46.

Gil T. Wilson
Announcer, Producer, Webmaster
WAKO-AM
Lawrenceville, IL

Wilson spent six years in the Navy as an operations specialist before beginning his 25-plus-year career in broadcasting. His career has taken him from Carbondale, IL, to Kansas City and back to Illinois. He holds three degrees: a B.A. in radio/television broadcasting; a B.A. in theatre from Southern Illinois University - Carbondale; and an A.A.S. in electronics and computer technology. He also operates a voice work/production business via www.gilwilson.com

Radio Volume 16 Number 4 ISSN 1542-0620 is published monthly and mailed free to qualified recipients by Penton Media Inc 9800 Metcalf Overland Park KS 66212-2216 (www penton com) Canadian Post Publications Mail Agreement No 40612608 Canada return address Bleuchip International P O Box 25542 London ON N6C 6B2 Additional resources including subscription request forms and an editorial calendar are available online at www RadioMagOnline com To order single copies call 866-505-7173 or 402-505-7173

ADVERTISER INDEX

This index is a service to readers Every effort is made to ensure accuracy but *Radio* magazine cannot assume responsibility for errors or omissions

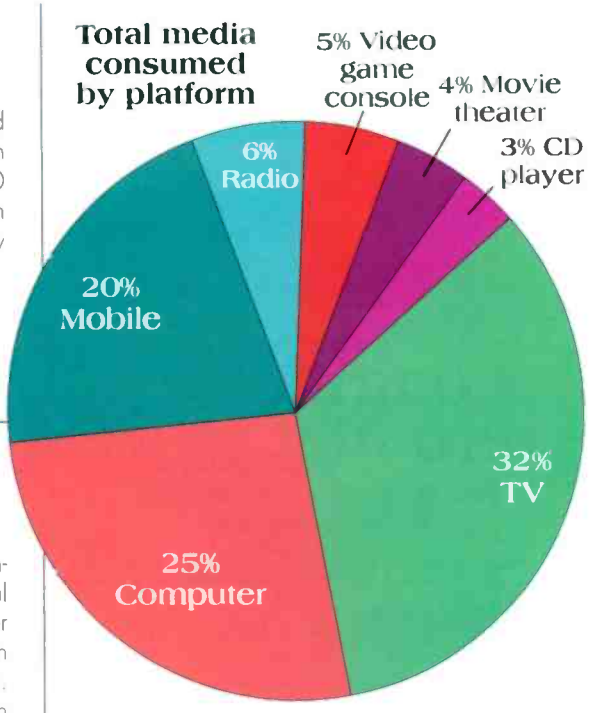
by Erin Shipps, associate editor

Sample and Hold Special

Media in the lives of 8- to 18-year-olds

A national survey by the Kaiser Family Foundation found that teens and children are spending more time with media, as nearly 24-hour access is available. Further, 20 percent of young people's media consumption occurs on mobile devices. Take a look at these statistics to see how radio, and similarly connected music and audio, fared against other media devices among 8- to 18-year-olds. To read the full report, download the pdf at www.kff.org/entmedia/mh012010pkg.cfm.

Total media consumed by platform

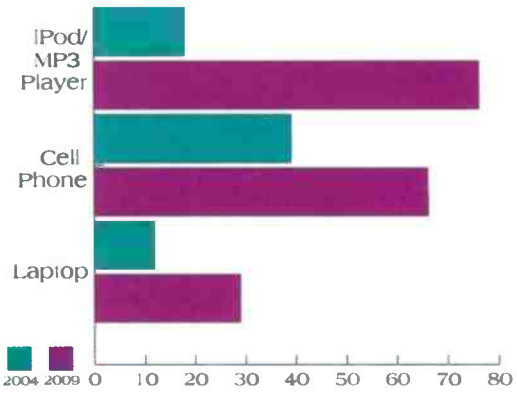


Changes in media usage 2004-2009 (in minutes/day)

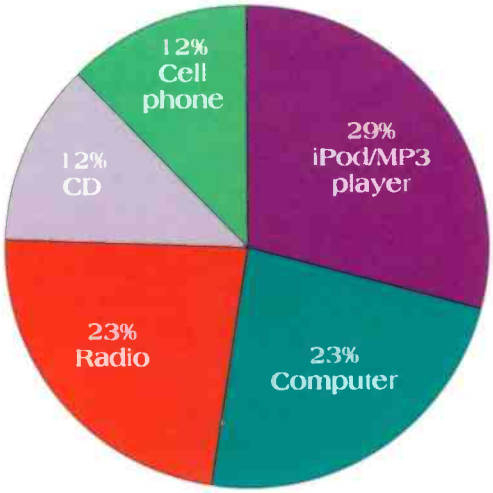
2:31

Amount of time in hours young people spent listening to music on a typical day in 2009. This number has jumped from 1:48 in 1999 and 1:44 in 2004. Total media exposer in 2009 was 10:45.

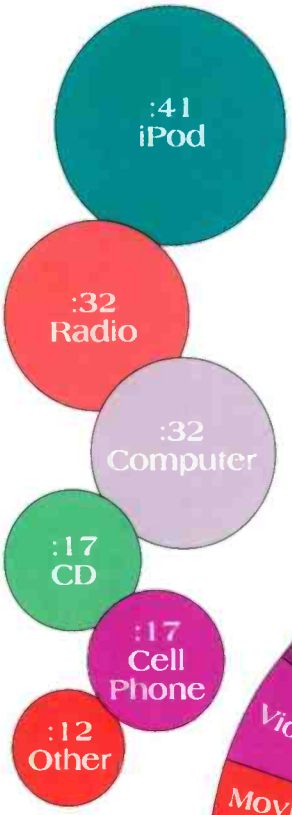
Mobile media ownership



Music listening by platform



Behind the stat

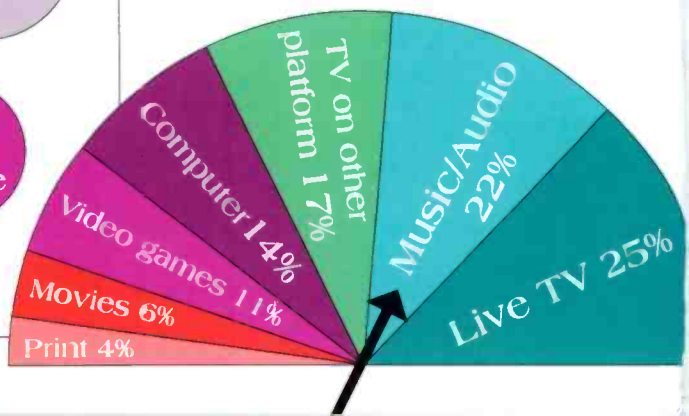


20%

of young people listened to radio on their computers in 2009. **81%** watched videos, **62%** downloaded music, **48%** watched TV shows and **36%** created their own character or pet.

Source: Generation M2: Media in the Lives of 8- to 18-Year-Olds, Kaiser Family Foundation.

Media Budget: Proportion of media time spent with:



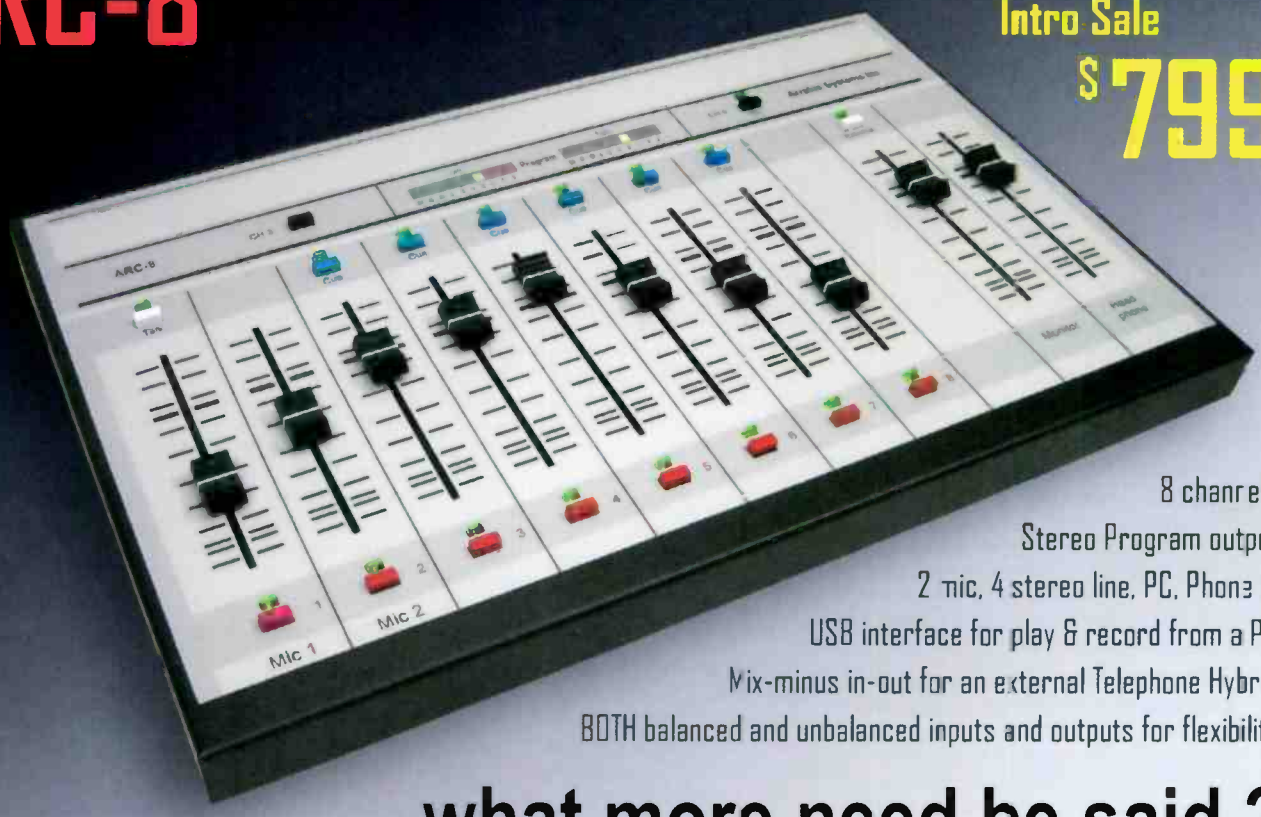
NEW

full featured, professional consoles at amazing prices from ARRAKIS

ARC-8

Intro Sale

$799



8 channels
Stereo Program output
2 mic, 4 stereo line, PC, Phone in
USB interface for play & record from a PC
Mix-minus in-out for an external Telephone Hybrid
BOTH balanced and unbalanced inputs and outputs for flexibility

...what more need be said ?

other members of the ARC family...

Sale

$1,599
ARC-10U

$3,495
ARC-15BP

$5,495
MARC-15-12

www.arrakis-systems.com 970.461.0730

FINALLY...FAILSAFE NETWORKED AOIP.

WHEATSTONE E-SERIES & WHEATNET-IP ARE YOUR BEST CHOICE BY A LONG SHOT.

When it comes to networking your facilities, there's only one best choice. Wheatstone. For years, we've been the network/control surface choice of top broadcasters. And with good reason – we care.

Wheatstone's Audio-Over-IP product is the best in the business. Here's why:

1. WheatNet-IP is easiest for a station to implement and configure. It is, hands down,the easiest in the industry. No need for Wheatstone to provide factory on-site assistance unless you really WANT us there. The manual and app notes will have you up, running and stable in less time than any other system.

2. WheatNet-IP is a natural for large facility multi-station networking (and for smaller facilities too!). It uses the IGMP features of Ethernet Layer 3 switches to identify a multicast packet, see which ports are requesting that packet, and send it only to those ports. Traffic control is maintained and system bandwidth is optimized.

3. Redundancy is critical. A typical WheatNet-IP installation has multiple levels of redundancy. Each BLADE holds the complete map of the entire system within its onboard memory – we call it distributed intelligence – a system with 50 BLADEs has 49 backups with failover in the event of a failure. Cisco Stackwise technology provides redundancy in the central core TOC switch. A WheatNet-IP/E-Series console studio complex can stand alone, even if the TOC goes down, with backup analog or digital program audio feeding a back end router independent of the core Gigabit infrastructure.

4. Modular is better. Why would you want to combine your switch, mix engine and I/O into one box? Beats us. With WheatNet-IP, you install only what you need, where you need it. We believe in not overselling.

5. Manufacturing quality is very important. Wheatstone is proud to have the best track record in the business for build-quality, reliability and intelligent functionality. With far more up-and-running installations than anyone else, this is where we really shine. An investment in WheatNet-IP and E-Series control surfaces today will reward you with a future-proof, failsafe networking/control environment that's infinitely updatable and in for the long run.

6. WheatNet-IP has an advantage. Take a look at your entire environment. Wheatstone is a perfect partner because we are always there, always innovating. Built into every WheatNet-IP BLADE are features others just didn't think of – handy utility mixers, silence detection, crosspoint routing control, headphone monitoring of any source, lots of logic GPIO, and comprehensive metering of audio I/O, not just signal-presence indicators. And, in the hugely unlikely event that a BLADE needs to be replaced, you just plug in a new one and enter the BLADE number. That's it.

7. Wheatstone is local. WheatNet-IP and the E-Series, just like ALL Wheatstone products, are designed, engineered and built from start to finish in our New Bern NC USA facility. Everyone who works on our products is 100% knowledgeable and immediately available. You can relax – like the famous insurance company, you actually ARE in good hands.

With WheatNet-IP, we think we've done our homework. In fact, we know we have. And we're happy to say that we've got the best product on the market. To learn more, and there's a LOT more, get us on the phone or visit us on the web. We'll be happy to meet with you and get you everything you need.

Wheatstone

Audio Networking—Simply Evolved

phone 1.252.638-7000 | www.wheatstone.com | sales@wheatstone.com