

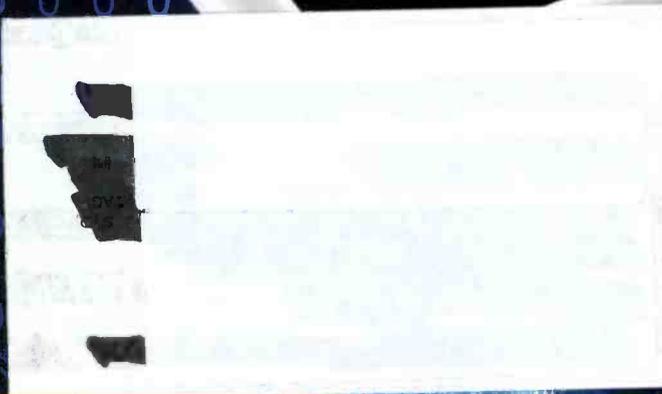
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CONTENTS

20



Features

- 14** Trends in Technology: Streaming to mobile
by Doug Irwin
It's not too late to get in the game
- 20** Facility Showcase: Lawo helps NPR
by Roger Maycock
Virtual consoles and networking technology
- 28** Tech Tips
by Mike Kernan
Replacing compressors
- 30** Profanity Delays
by Doug Irwin
Options for covering your station's assets
- 34** NAB New Products

10



Columns

- 8** Viewpoint
by Chriss Scherer
Embracing mobility
- 10** Managing Technology
by Kevin McNamara
Maximizing tower assets
- 12** FCC Update
by Harry C. Martin
FCC approves HD Radio power increase

46



Departments

- 6** Online
at www.RadioMagOnline.com
- 44** Field Report: vCreative PPO
by John Pallarino
- 46** Field Report: Olympus LS-11
by Gil Wilson
- 48** Applied Technology: GSS Alert FM
by Matthew Straeb
- 52** New Products
by Erin Shipp
- 69** Contributor Pro-File
Meet Gil Wilson
- 70** Sign Off
by Erin Shipp
How 8- to 18-year-olds use media

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.



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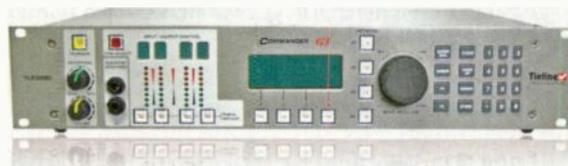
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Embracing mobility

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

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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 Schen

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

LIVE & LOCAL



Put Comrex On The Line
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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. Un-

less 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.

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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



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Streaming to Mobile Devices



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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 Panoras 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.

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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, ± 75 kHz deviation, 75 μ s 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 where-

withal 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

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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 PC 1100, 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 TRU 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

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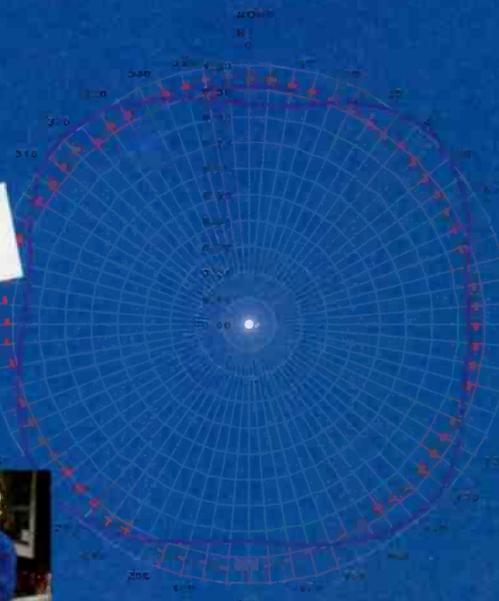
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many "hops" (or routers) were transited over the Internet so that those packets could reach you and in return packets generated on your end could reach the bank. With more routers in the way, the likelihood of dropped packets increases, but since the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



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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

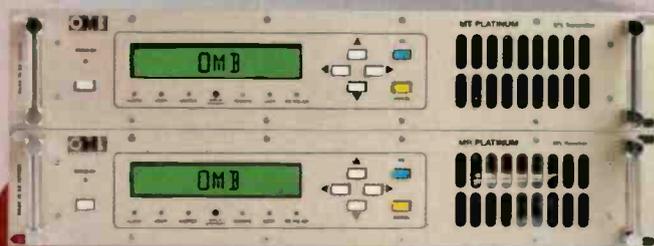
As an internationally acclaimed producer and distributor of noncommercial news, talk and entertainment programming, NPR reaches a combined audience of 26.4 million listeners weekly. Member organizations operate 784 stations, and 117 public radio stations present NPR programming. In an effort to increase 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.



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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 work independently thanks to a power combining structure that provides high isolation between them.

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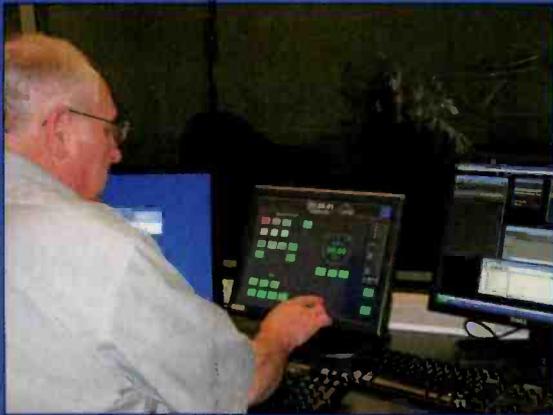
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NPR's Self-Sufficiency Initiative



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



Dennis Byrnes, NPR engineering services manager, and Engineer Bob Butcher discuss 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 headphones
 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.

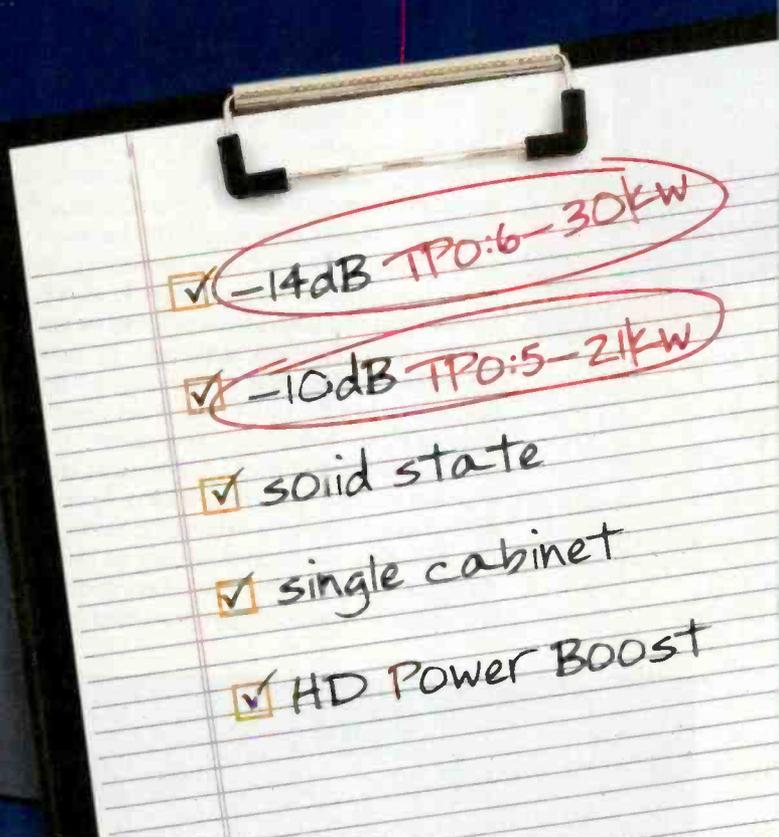
"The challenge with the Interview Room was the process of creating all the necessary mix minuses to make this facility viable without a sophisticated mixing console," Aiello says. "The individuals using this type of room typically are not skilled console operators. With our new virtual system, this issue 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-

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NPR's Self-Sufficiency Initiative



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

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



NPR Interview Room host screen shot

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 MAD1. 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.

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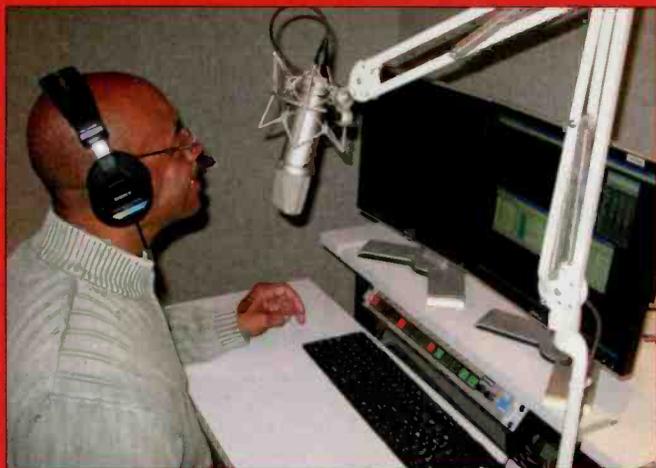
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NPR's Self-Sufficiency Initiative



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.

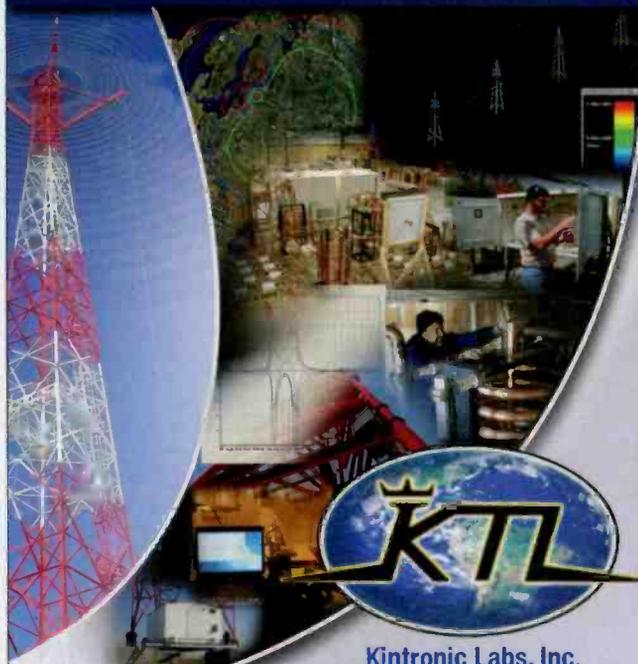
Phase two: automated rollovers and stream monitoring

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-

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Booth # 1332

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.

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Henry Engineering's new USB Matchbox II is the updated version of its previous three USB interface products, incorporating the most useful features of these award-winning legacy products. The USB Matchbox II uses the new phase-coherent version of Burr-Brown's USB audio codec. Careful design of the D-to-A reconstruction filters yields superb audiophile-grade performance with crystal-clear highs, solid bass, and no "digital grunge."

The USB Matchbox II has both analog and digital ports, with balanced line inputs and outputs, plus an AES/EBU digital output. The analog I/O levels are adjustable to accommodate a wide range of studio levels. The unit also has a front panel headphone output for critical monitoring of play audio. The list price of the USB Matchbox II is \$550, and is available from any Henry Engineering dealer.



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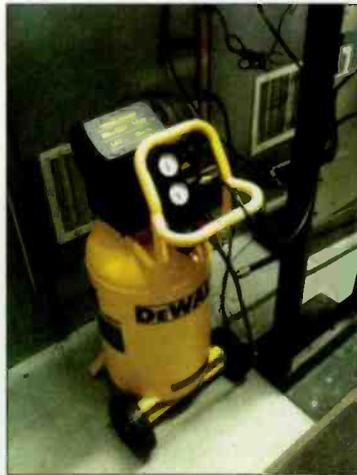
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Tips, tricks, hints and more

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.

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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.



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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 ± 1 dB 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

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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

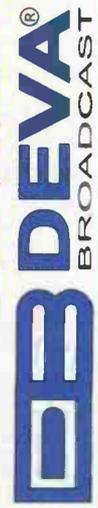


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IP console/routing system

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 products 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.

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Broadband switch

ERI-Electronics Research
Booth C2032

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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

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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.

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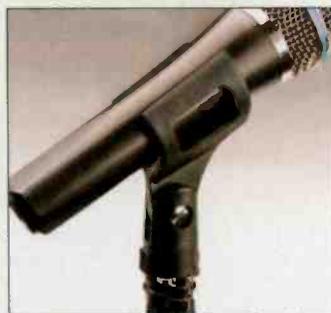
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Pristine Systems
Booth C3032

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STL codec

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Chassis connector
Neutrik
Booth C2336



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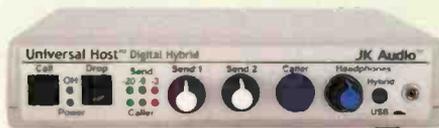
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Digital hybrid
JK Audio
Booth C2010

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1 kW FM transmitter **BW Broadcast** Booth C3034

TX1000: The TX1000 features high

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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.

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Audio interface **Tascam** Booth SL1717



US-800: The US-800, a light-weight, 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.

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Software modules
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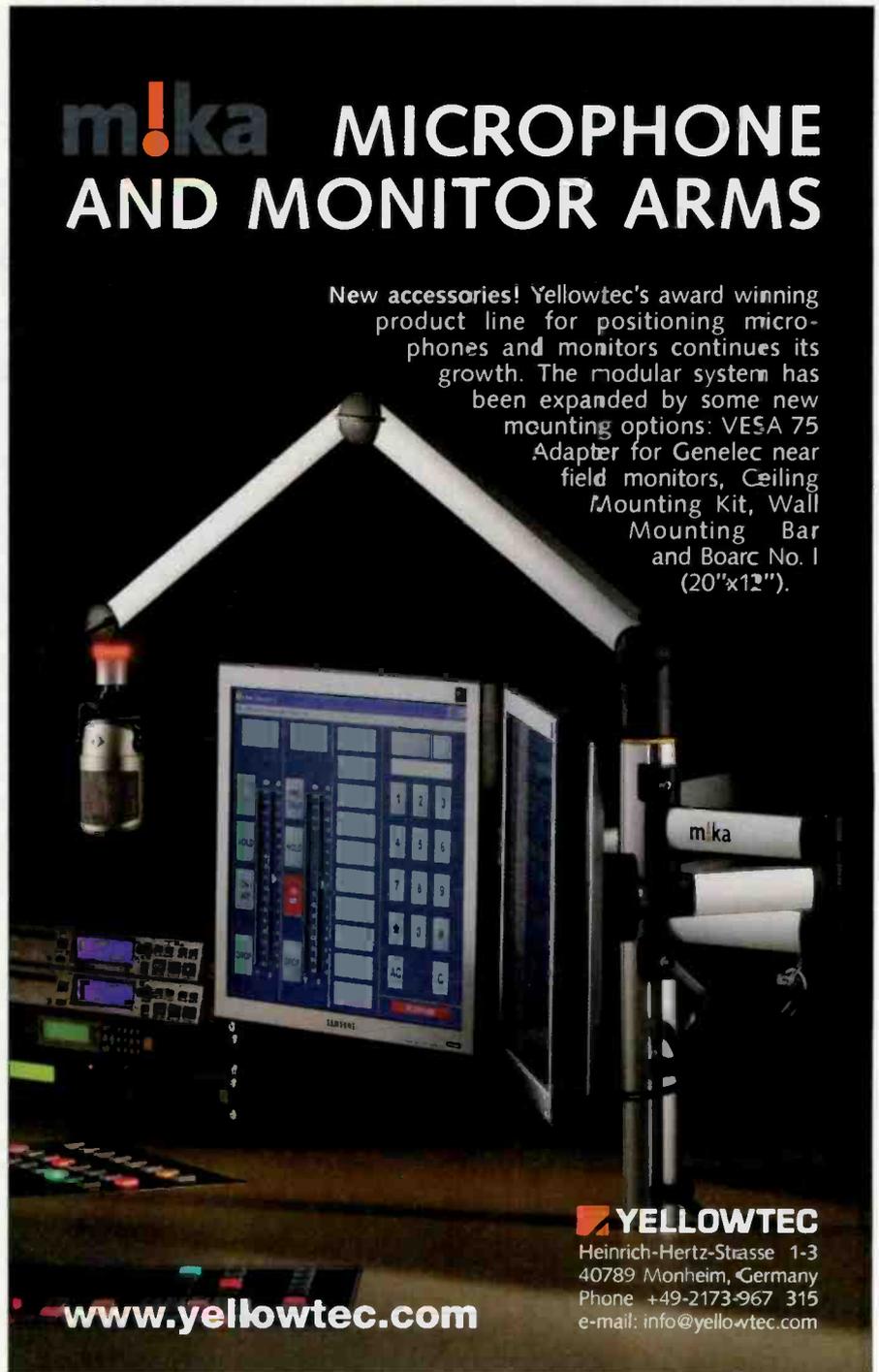
Radio-Assist 8 Enhancements: CamDirector, a new Radio-Assist module, brings direct camera control and automated video switching to the company's Radio-Assist 8 suite of digital audio automation software. With this capability, radio broadcasters can create live, switched programs for broadcast, streaming 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.

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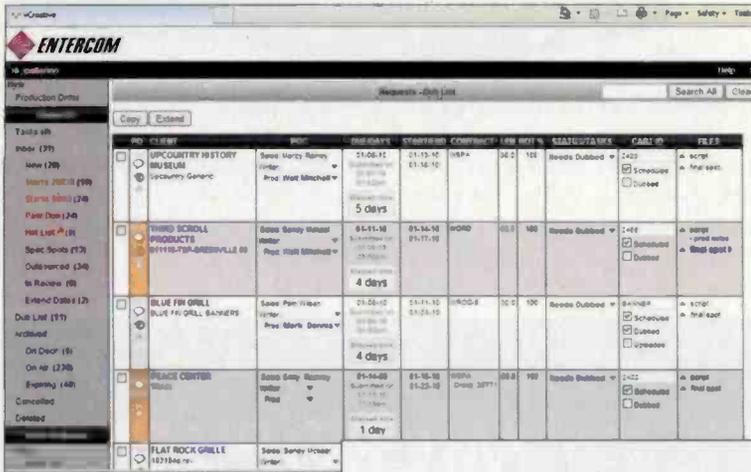
m!ka MICROPHONE AND MONITOR ARMS

New accessories! Yellowtec's award winning product line for positioning microphones and monitors continues its growth. The modular system has been expanded by some new mounting options: VESA 75 Adapter for Genelec near field monitors, Ceiling Mounting Kit, Wall Mounting Bar and Boarc No. 1 (20"x12").



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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

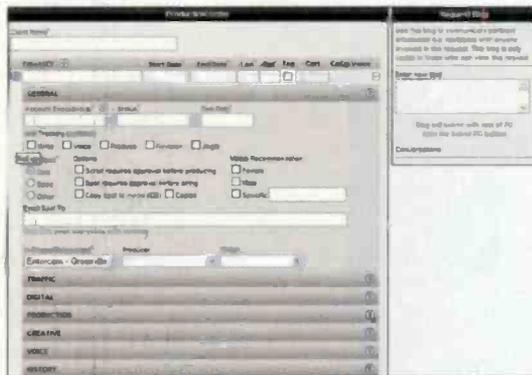
numbers, and the whole time the AE looks at his screen and sees the status. We used to have a problem with orders waiting to get processed, but now everyone involved can work on it at the same time, which means better efficiency.

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



The production order form is user-friendly.

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.

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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...

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.

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 Steinberg
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

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.

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

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Olympus

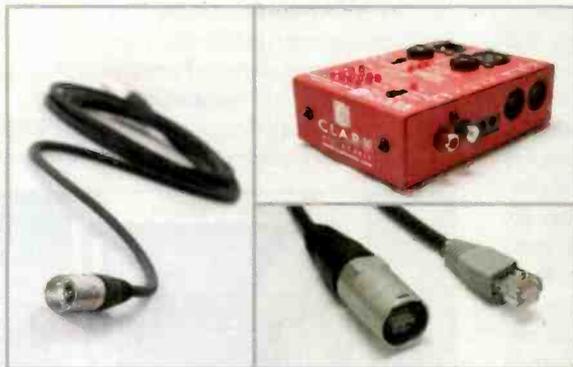
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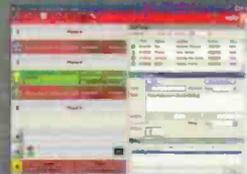
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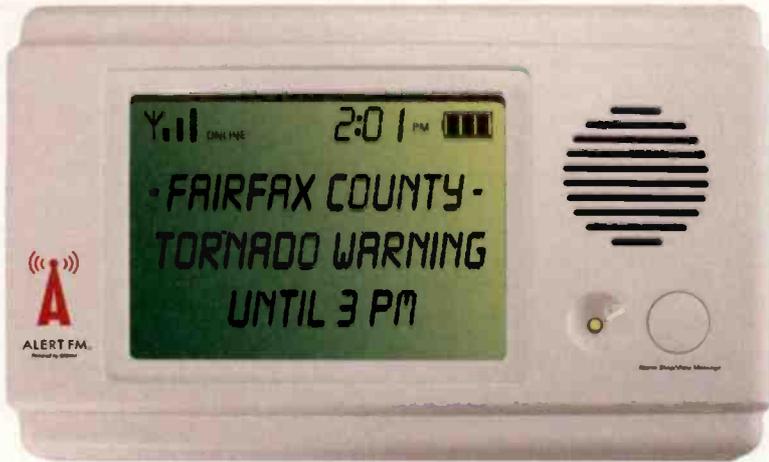


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BROADCAST BIONICS



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.

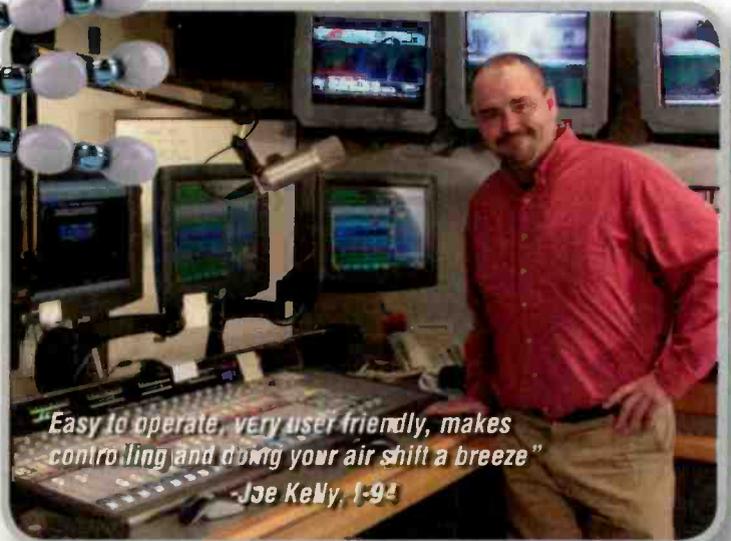
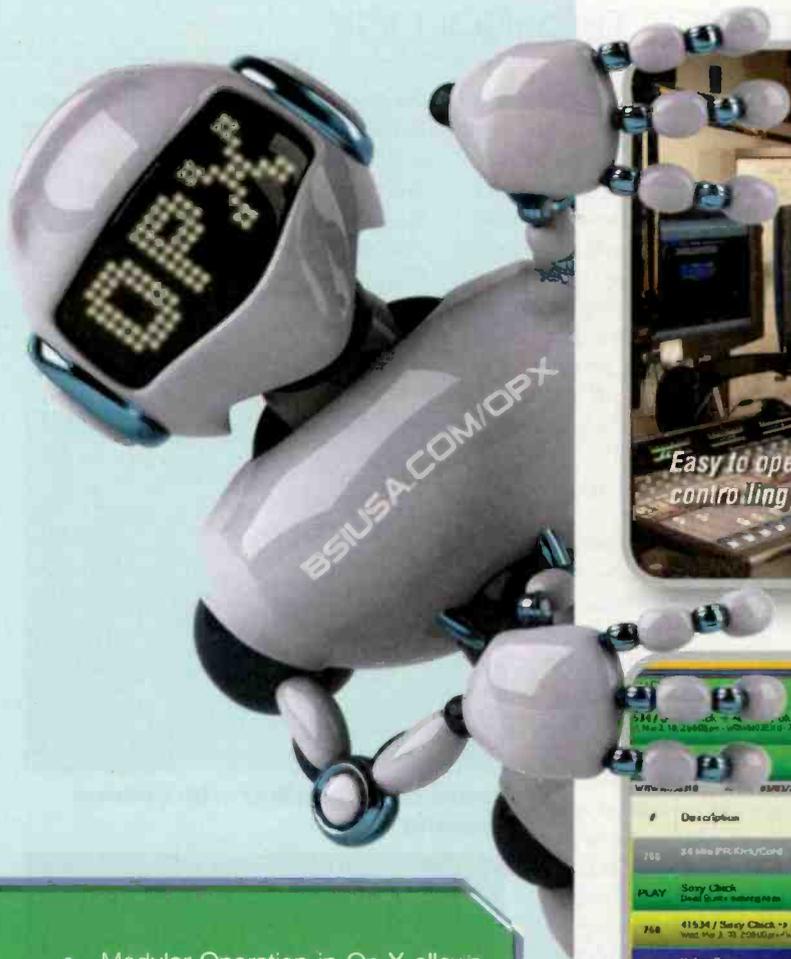
The FM chip

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.



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APPLIED TECHNOLOGY

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 IPAVVS 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



Board of FM receiver with internal antenna



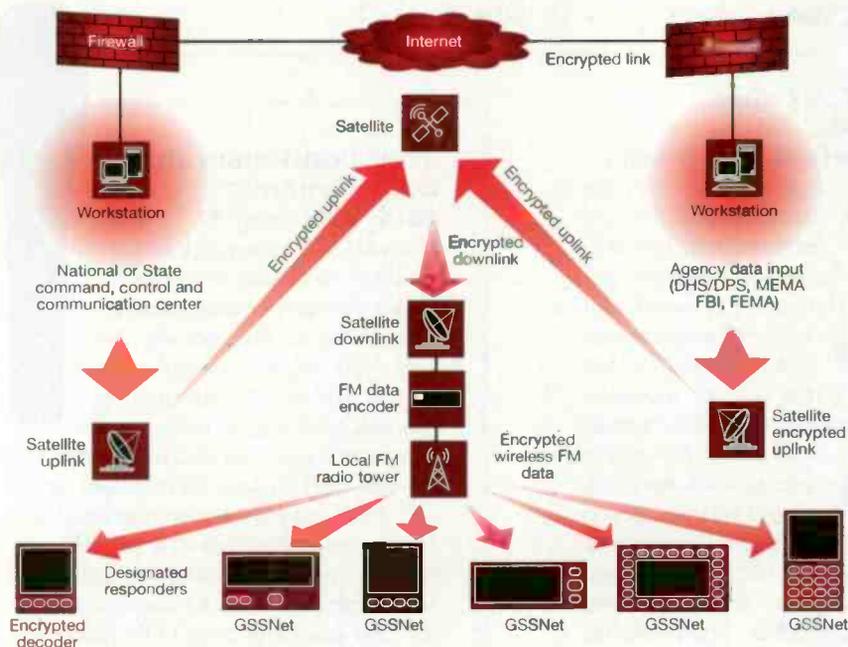
An FM radio-based mobile receiver can receive alerts including NOAA weather warnings, homeland security notices, evacuation instructions, Amber Alerts or school closings.

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.

Support groups

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

APPLIED TECHNOLOGY



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 WG 16 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

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by Erin Shipps, associate editor



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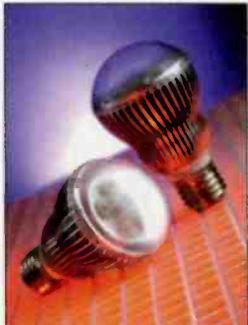
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CCRadio-2: The CCRadio-2 has the same familiar look and layout as previous models of the CCRadio but with even better AM reception and the addition of the 2-Meter ham band. The boost in AM performance comes from the company's twin-coil ferrite am antenna 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.

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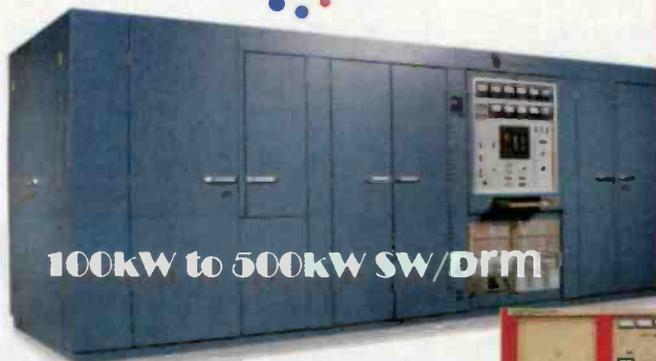
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Studio mic
Neumann

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

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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

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)

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.



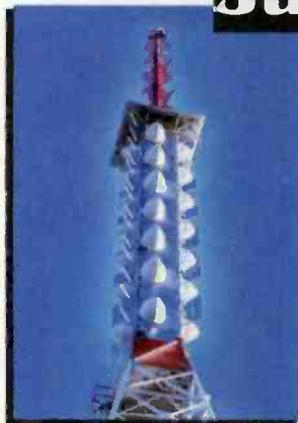
702-365-5155; www.transaudiogroup.com

Programming control package
Radio Workflow

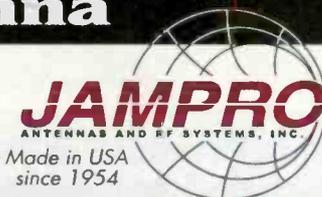
Radio Workflow: This server-based project management product directs programming content efficiently and accurately through the station or network with a new level of transparency. Projects are viewable by all users and can be manipulated and controlled by those with correct operational permissions. 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

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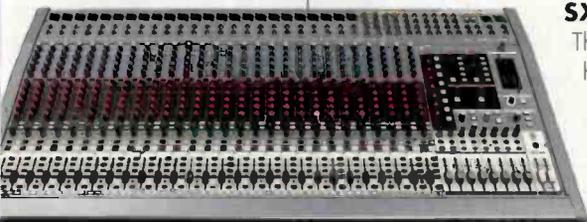
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877-672-0816; www.behringer.com
support@behringer.de

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Find the mic winner February issue

Congratulations to
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entries. He won a Samson
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display of the
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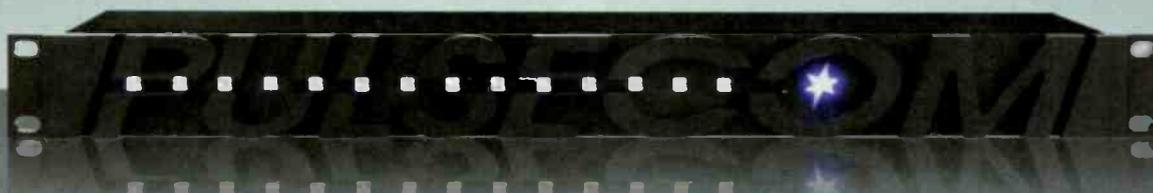
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radioweave.com; radioweave@matternow.com

Integration

[in-ti-grey'-shuhn] - noun

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Fostex



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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.

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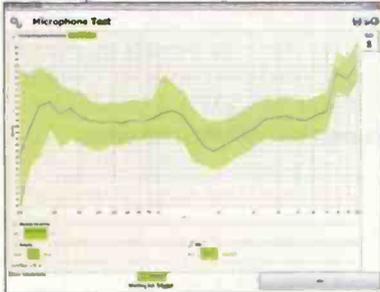


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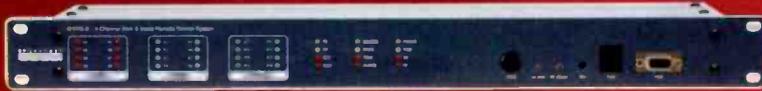
**303-957-1003; www.blueradios.com
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Call screener
NeoGroupe

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.

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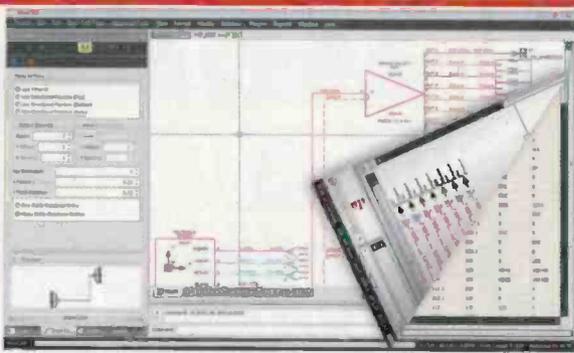
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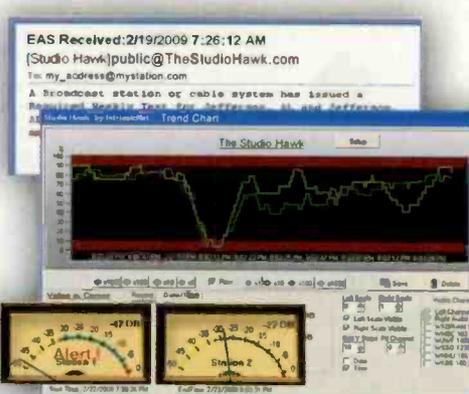
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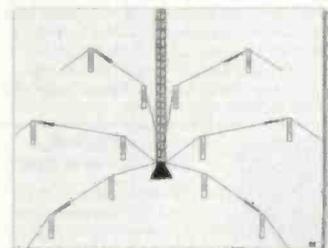
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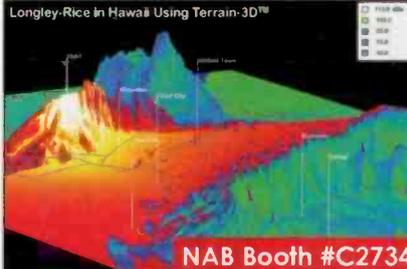
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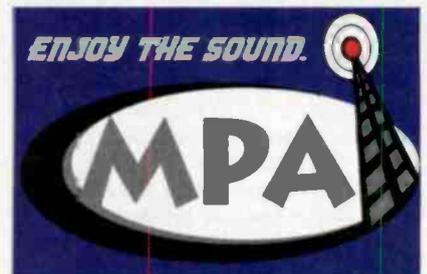
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Contributor Pro-file

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



Gil T. Wilson
Announcer,
Producer,
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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



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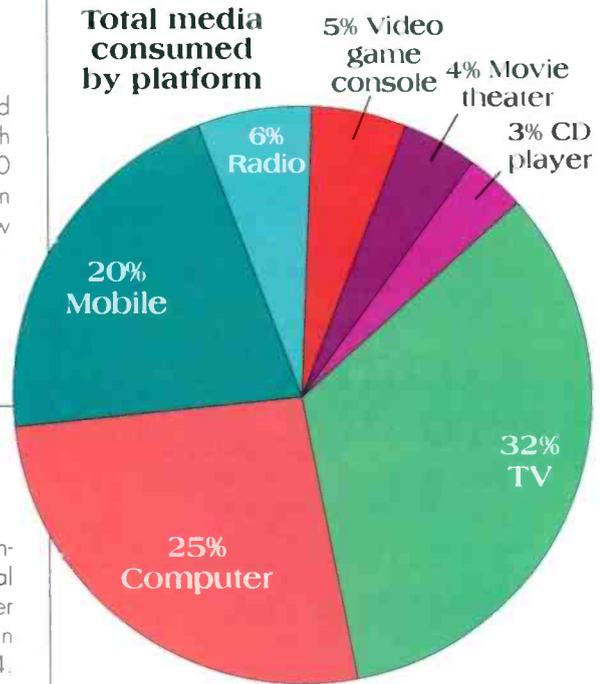
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by Erin Shipps, associate editor

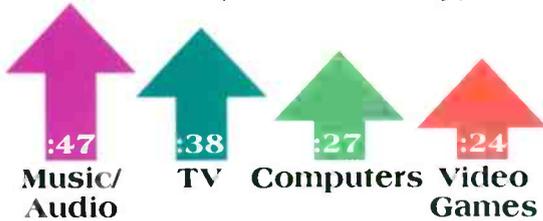
Sample and Hold Special

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.



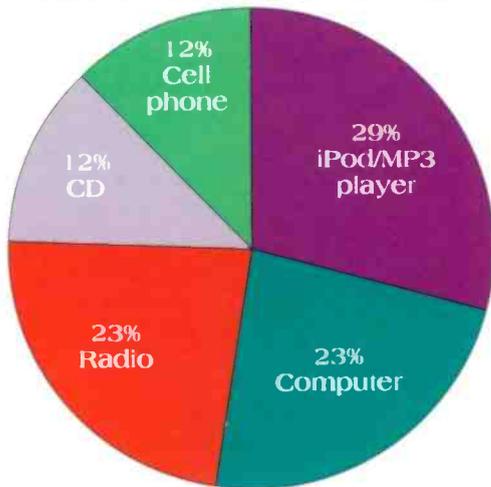
Changes in media usage 2004-2009 (in minutes/day)



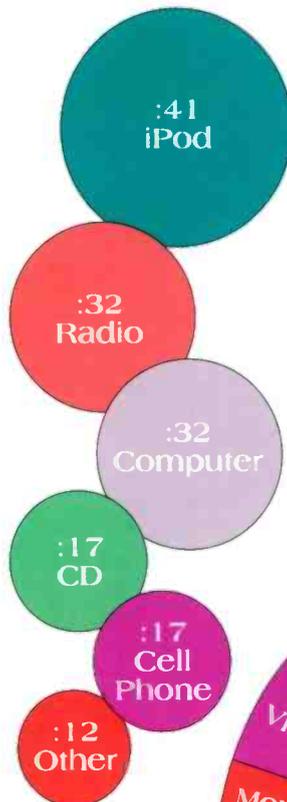
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Amount of time in hours young people spent listening to music on a typical day in 2009. This number has jumped from 1:48 in 1999 and 1:44 in 2004. Total media exposure in 2009 was 10:45.

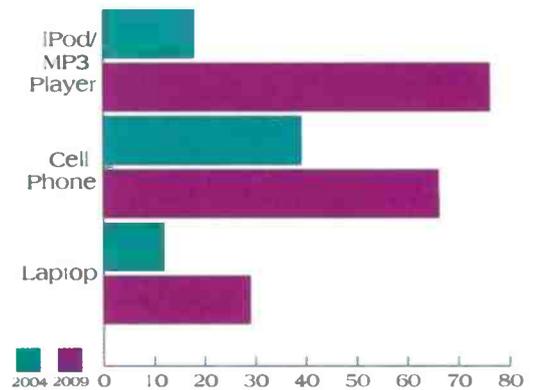
Music listening by platform



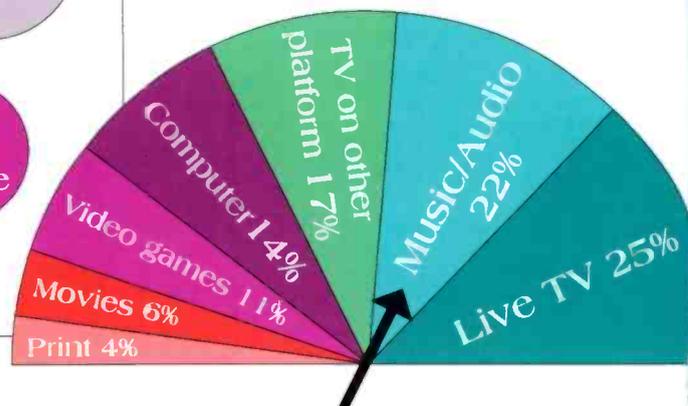
Behind the star



Mobile media ownership



Media Budget: Proportion of media time spent with:



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.

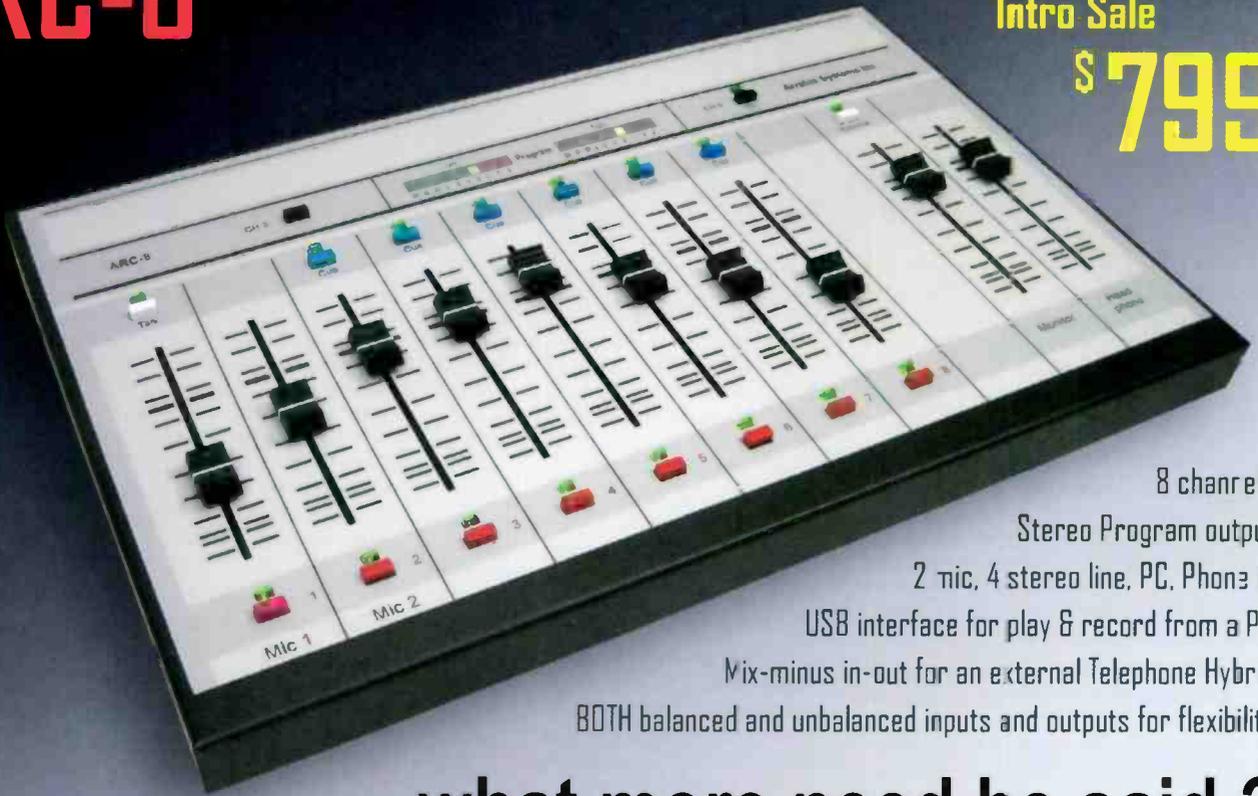
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2. WheatNet-IP is a natural for large facility multi-station networking (and for smaller facilities too!).

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.



Audio Networking—Simply Evolved

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