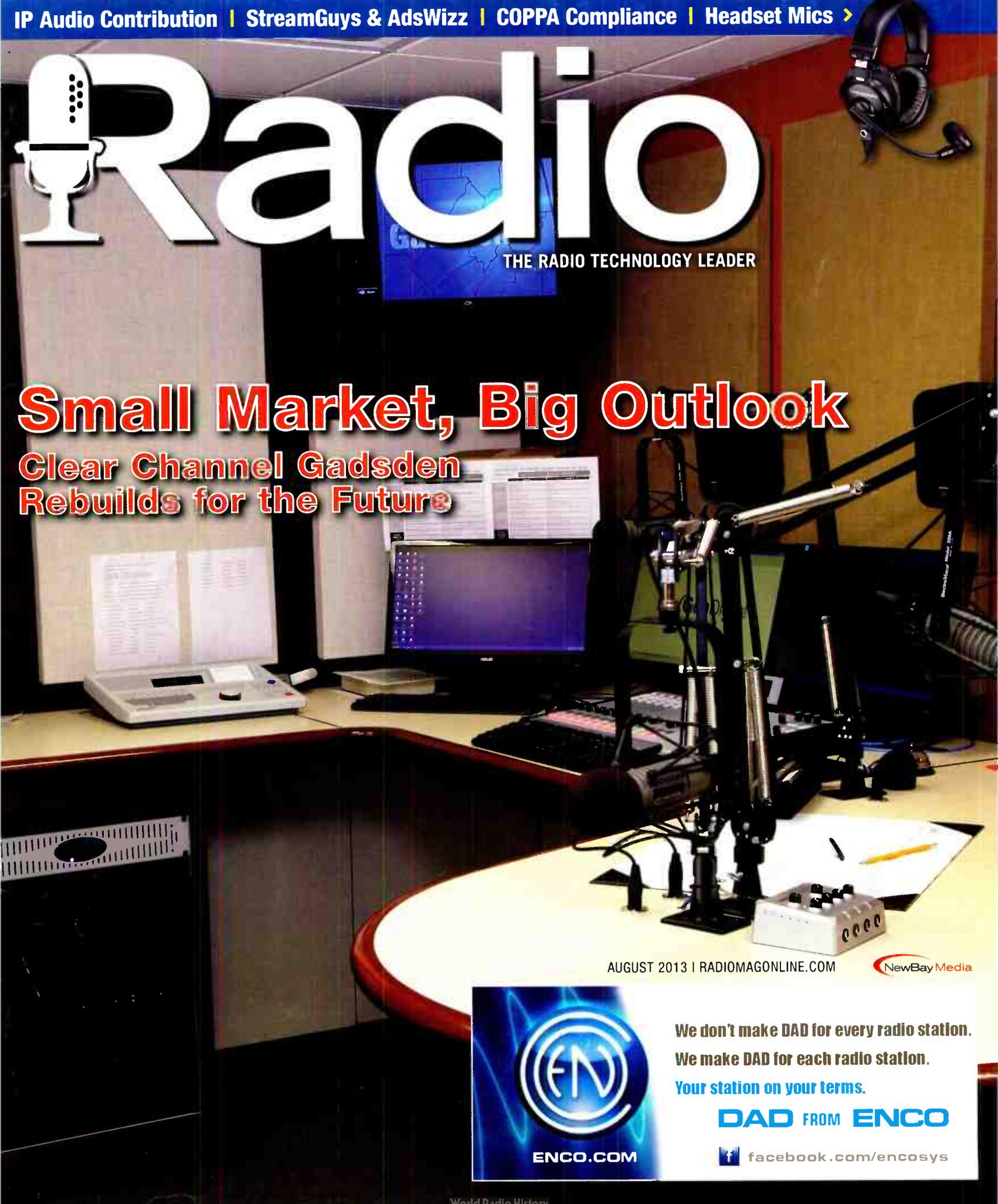


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TABLE OF CONTENTS



26

FEATURES

- 14 **Trends in Technology**
From there to hear: a recap of current Audio over IP technology
- 24 **Facility Showcase**
Small market stations WAAX-AM and WGMX-FM make big changes



COLUMNS

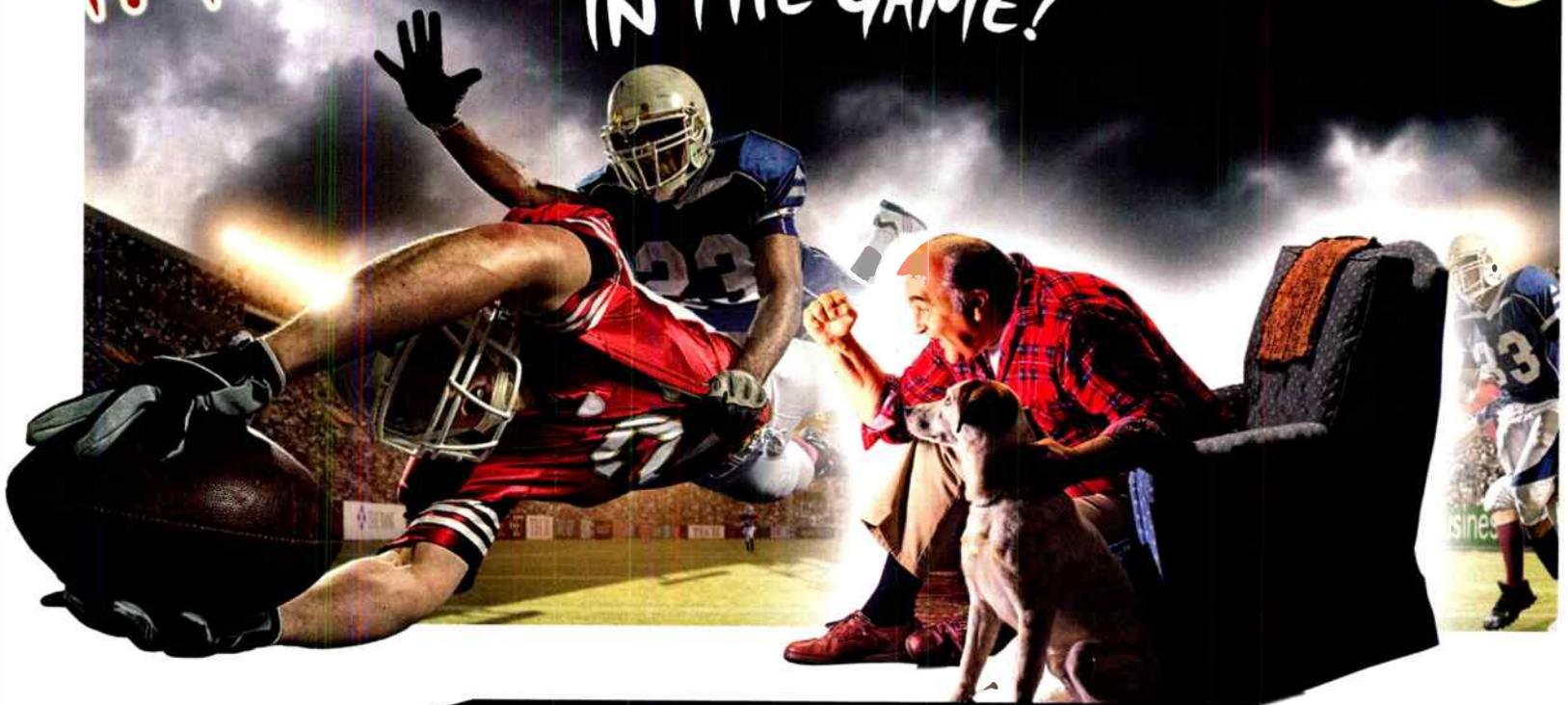
- 8 **Viewpoint**
Recognition by your peers is indeed the highest praise.
- 10 **Managing Technology**
A look at the history and technology of public safety radio and broadcast
- 12 **FCC Update**
COPPA-ing with new website collection rules
- 32 **Tech Tips**
Get elevation profiles more easily with Google Earth

DEPARTMENTS

- 34 **Field Report**
StreamGuys and AdsWizz
- 36 **Side By Side**
Headset mics
- 42 **Sign Off**
20 Years of *Radio* magazine



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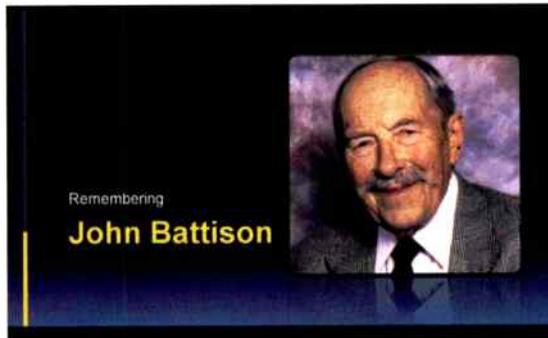
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SBE Announces 2013 National Award Winners

The Society of Broadcast Engineers announced the recipients of the 2013 SBE National Awards, which recognize excellence and achievement by individual members, SBE chapters and sustaining member companies.

Presented to a member who has excelled in his or her career while furthering the mission of the SBE, the Robert W. Flanders SBE Engineer of the Year is awarded to Edward J. Miller, CPBE of Broadview Heights, OH. Miller is an SBE fellow and life member, and member of Chapter 70 in Cleveland.

The recipient of the James C. Wulliman SBE Educator of the Year award is recognized for outstanding service and excellence in sharing knowledge through teaching other broadcast engineers. The winner of the award is Dennis Baldrige,



CPBE 8-VSB AMD DRB CBNT of Hillsboro, WI. Baldrige is a member of Chapter 24 in Madison.

The winner of the Best Technical Article, Book or Program, for his tribute to (SBE founder) John Battison, a PowerPoint presentation with his own narration, presented at the SBE National Awards Dinner in Denver, CO, in October 2012, is Christopher Scherer, CPBE CBNT. Scherer, of Overland

Park, KS, is editor of *Radio* magazine and a past national president of the SBE.

Vislink Broadcast is awarded the 2013 SBE Technology Award for its NewStream system, the industry's first CNG, ENG, SNG multi-mode mobile transmit system.

Chapter 70, Cleveland, OH, is also recognized with the Best SBE Chapter Newsletter award, and along with SBE Ohio chapters in Cincinnati, Columbus and Youngstown, receives the Best Regional

Conference or Convention for the 10th Annual SBE/OAB/SMPTE Fall Engineering Conference held in September 2012.

All the awards will be presented during the SBE National Awards Dinner on Oct. 30, 2013, at the SBE National Meeting in Indianapolis.

For more on the awards and their recipients, visit RadioMagOnline.com.



FCC Acting Chair Clyburn to Address Radio Show

Organizers of the Radio Show, jointly produced by the National Association of Broadcasters (NAB) and the Radio Advertising Bureau (RAB), announced that Federal Communications Commission (FCC) Acting Chairwoman Mignon Clyburn will give keynote remarks to Radio Show attendees on Wednesday, Sept. 18, 2013, following opening remarks by NAB President and CEO Gordon Smith and RAB President and CEO Erica Farber. The Radio Show will be held Sept. 18-20 in Orlando.

Minneapolis Station First to Air with All-Digital Chain Using Wheatstone Baseband192 Technology

Northern Lights' KTWN-FM (96.3) Minneapolis station became the first to broadcast from an all-digital air chain using Wheatstone Baseband192 technology. The station added a Wheatstone new AirAura X3 audio processor on July 25, clearing the last obstacle to a 100 percent digital air chain by using the processor's new Baseband192 interface.

Wheatstone Baseband192 is an open standard technology that eliminates the need for an analog composite interface between processing and transmission. Offering AES3 output into FM transmitters now equipped with a digital baseband input, the Baseband192 interface is available as a standard feature in Wheatstone AirAura X3, FM-531HD and VP-8IP audio processors.



Nautel recently partnered with Loyalist College, donating VS Series FM transmitters for use in the school's Broadcast Engineering Technology (BRET) Advanced Diploma program.

The National Recording Preservation Foundation (NRPFF) received a major contribution of \$200,000 from musician and NRPFF board member Jack White, and became operational.

NewBay Media announces a call for entries for the first

annual Product Innovation Awards, recognizing excellence in products serving the TV, pro video and broadcast/online radio markets. The deadline to nominate is Aug. 23, 2013.

To encourage critical conversations about mental

health, and let people know that help is available and effective, the NAB unveiled a new public service announcement campaign. The OK2TALK campaign includes television and radio ads in English and Spanish, and uses social media to promote talk.



National Association of Broadcasters President and CEO Gordon Smith will deliver the keynote address at the opening ceremony of SET 2013, on Aug. 20, in Sao Paulo, Brazil.

FIND THE MIC AND WIN!

Tell us where you think the mic icon is placed on this issue's cover and you could win Hosa USX-100 mic-to-USB interface. Send your entry to radio@RadioMagOnline.com by Sept. 10. Be sure to include your guess, name, job title, company name, mailing address and phone number. No purchase necessary. For complete rules, go to RadioMagOnline.com



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Being recognized for an accomplishment sometimes requires a little self-promotion, which is often an uncomfortable step to take. It can be hard to distinguish the line between a shameless plug and simply making others aware. But I often think of words my father told me: If you've done it, it's not bragging.

For the station engineer, the work we do is often a mystery to others at the station. But it's still important to show the value in your work to your supervisor and your peers. There's no need to put them to sleep with technobabble, but there are ways to make your accomplishments known.

I bring all this up because I recently received an honor that I'm quite proud of.

The Society of Broadcast Engineers (which as you likely know has been a significant part of my professional life) holds an annual awards program. Each year, the efforts of several SBE members are recognized for their service to their facilities, their markets, their chapters, the society and its members, and our industry. For 10 of the past 11 years, a *Radio* magazine article has been honored with the SBE Award for Best Technical Article, Book or Program by an SBE Member. I submitted some articles for the award this year as well, but I also submitted a video of the tribute I gave to SBE founder John Battison at the SBE 2012 National Meeting. John was my friend and colleague, as well as a contributor to *Radio* magazine, and he died in August 2012.

So when I received a phone call in mid-July to tell me that *Radio* magazine had not repeated its trend of winning, my initial disappointment was quickly replaced when I was told my tribute was chosen for the award.

My thanks go to the SBE Awards Committee for its decision. I will attend the SBE National Meeting in Indianapolis on Oct. 29 and 30, to accept the award. The video of the tribute to John Battison is on our YouTube Channel (see the Follow *Radio* magazine box below).

And I'm pleased to say I'm in some good company. The SBE also honored Edward J. Miller, CPBE, of Broadview Heights, OH, (Chapter 70) with the Robert W. Flanders SBE Engineer of the Year award, and Dennis C. Baldrige, CPBE 8-VSB AMD DRB CBNT, of Hillsboro, WI, (Chapter 24) with the James C. Wulliman Educator of the Year award.

Congratulations to all my fellow SBE member award recipients.

MORE ON AWARDS

NewBay Media, the publisher of *Radio* magazine, has launched a new awards program. The NewBay Media Product Innovation Award recognizes excellence in manufacturing of products to serve the TV, professional video and broadcast/online radio markets. The deadline to nominate is Aug. 23, 2013. Any company that has released new and/or upgraded hardware, software or other products for these markets since Jan. 1, 2012, may enter. The

awards are administered by NewBay publications *TV Technology*, *Digital Video*, *Creative Planet Network*, *Government Video*, *Video Edge*, *Radio World* and *Radio* magazine. Find a link to the awards FAQ and entry form at RadioMagOnline.com.

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Chris Scherer | Editor

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AWARD HISTORY

Radio magazine has received recognitions from the following organizations:

- > SBE Award for Best Technical Article, Book or Program by an SBE Member awarded to an article that appeared in *Radio* magazine: 2012, 2011, 2010, 2009, 2007, 2006, 2005, 2004, 2003, 1999
- > American Society of Business Publication Editors: 2011, 2005, 2000
- > The Missouri Association of Publications: 2011, 2010
- > Folio magazine: 2002

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by Kevin
McNamara

Public Safety and Radio Broadcasting

The use of radio stations to disseminate information to the general public can be traced back to 1951 when Conelrad (CONTROL of ELectronic RADiation) was implemented. The theory behind the system was pretty simple: Once activated, all stations were to shut down, except certain designated stations (one from each region), that would broadcast on either 640kHz or 1240kHz. The reason for this was to effectively jam the radio direction finders (RDF) of an attacking air force thus preventing it from locking on specific targets. Citizens knew where to tune their radios during such an activation by the triangles printed on the tuning dials.

In 1964, Conelrad was replaced by the Emergency Broadcast System (EBS). At the height of the Cold War, this method, formerly focused on providing mass notifications of national events, such as nuclear attacks, evolved into a means of providing alerts at the state and local levels. State-level plans were put into place, and unlike Conelrad, stations (now including FM and TV) were allowed to voluntarily participate in the alerting. This was good for a participating station because they would not be required to sign off and they could keep listeners (or viewers) tuned in. Of course if a station did not elect to participate, it would still be required to turn off.

By 1972, state plans were in place, which permitted not only state, but local agencies to activate the system. This marked the beginning of the meaningful relationship between public safety agencies and broadcasters.

CAP

In 1994, the FCC established the EAS (Emergency Alerting System), which utilizes a digital architecture that permits it to operate reliably in unmanned operations, such as cable head-ends.

The system is based on the same protocol used by the National Weather Service (NWS).

In May 2007, the Commission adopted a Second Report and Order in which it provided the groundwork for "Next Generation EAS" with four cornerstones:

- Maintain the existing EAS network;
- Utilize a common messaging protocol, the Common Alerting Protocol (CAP), to be implemented by all EAS participants following its adoption by FEMA;
- Incorporate new authentication and security requirements; and
- Foster the deployment of new, redundant EAS delivery systems, including satellite, Internet, and wire line networks. These new networks should support delivery of more targeted and detailed alert information to EAS Participants based on CAP to be developed by FEMA.

FEMA officially adopted the CAP version 1.2 on Sept. 30, 2010. According to FEMA the major advantages of CAP are:

CAP alerts are transmitted in digital format; therefore, there is no degradation of quality of the content that may be experienced with analog methods such as radio.

CAP alerts can be directly available to encoder/decoder equipment within seconds of their creation; therefore, delays or disruptions relating to station-to-station, over-the-air relay are reduced.

The Internet infrastructure has a high level of redundancy and reliability, and may

survive when other channels of communication do not.

In addition to EAS-required data, CAP alerts may carry rich information such as audio, video, geographical-location data, etc., that EAS participants may opt to use for supplemental information to provide to their audiences.

IPAWS

To create an integrated platform that can provide information, not only to broadcasters, but other media such as wireless broadband devices, satellite and Internet providers roadside electronic signage and siren warning systems, the Integrated Public Alert and Warning System (IPAWS) system was developed and managed by FEMA. IPAWS utilizes the Open Platform for Emergency Networks (OPEN) to move standards-based alert and information messages between alert and warning systems and is now known as IPAWS-OPEN.

Federal, state, territorial, tribal and local alerting authorities can use IPAWS and integrate local systems that use Common Alerting Protocol standards with the IPAWS infrastructure. IPAWS provides public safety officials with an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface.

State and local alerts may be inserted into EAS several ways:

- NWS transmits watches and warnings through the EAS via a complete EAS message on NWR. Many broadcast stations and cable systems purchased EAS equipment with receivers that can monitor NWR.
- Broadcasters and cable operators are permitted

to originate an EAS alert. Since civil and weather warnings should come from entities with the legal responsibility for public warnings, many EAS experts believe that this activity should be viewed as an emergency backup capability.

> A growing number of state and local emergency managers and law enforcement agencies have EAS equipment and enter EAS tests and warnings directly through broadcast stations and cable systems identified in EAS plans. In a few areas officials can originate EAS events through their local NWR station. Implementation procedures should be included in a state and local area EAS plan.

> State and local emergency managers may call the local NWS office or a broadcaster to request that an alert be issued according to procedures and authentication methods that should be in published local and state EAS plans.

IPAWS started live testing in 2011; however, as of this writing only 140 state and local agencies have completed the necessary

authentication steps to use IPAWS. Another 134 have applications pending and are awaiting approval.

The process for becoming authorized to use IPAWS is dictated by FEMA. A federal, state, territorial, tribal, or local alerting authority that applies for authorization to use IPAWS is designated as a Collaborative Operating Group (COG) by the IPAWS Program Management Office (PMO). There are currently numerous types of COGs affiliated with IPAWS varying in size, structure and governance styles. A COG may have members from multiple jurisdictions with each individual member account administered through its software system. To get the required authorization, the COG must:

- > Select IPAWS compatible software.
- > Apply for and execute a Memorandum of Agreement with FEMA. Once executed, a COG identification and digital certificate will be generated and implemented in IPAWS-OPEN. This information will also need to be provided to the

selected software developer, in order to properly configure the software to access the system.

- > Complete the IPAWS Web-based training. The course is online at: training.fema.gov/emiweb/is/courseoverview.aspx?code=is-247.a.
- > Upon completion of the course, specific permissions will be granted to the members identified in the application.

It is interesting to note that approximately 70 percent of all EAS activations are related to severe weather events that can now be initiated directly by the National Weather Service specifically to affected areas.

Down the road, look for IPAWS integration with federal, state and local agency radio systems. Currently there is a federal mandate to upgrade all of these systems to the IP-based P25 standard, which permits interoperability between all these different public safety agencies. 

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



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by Lee Petro

COPPA-ing with New Website Collection Rules

The Children Online Privacy Protection Act (COPPA) has been in effect since 2000, but recent changes to the rules implementing COPPA by the Federal Trade Commission (FTC) take into account changes in online data collection methods over the past decade.

By way of background, COPPA focuses on the collection of personal information from children under 13 years of age, and includes both commercial websites or online services that are directed to children under 13, or are general in nature, but which the operator has actual knowledge that it collects, uses or discloses personal information from children under 13.

If the website or online service falls within these parameters, then it must draft and post an online privacy policy regarding what information is collected; incorporate a parental consent function in order for the site to commence collecting information; obtain consent from the parent to collect the personal information, and give the parent the option of prohibiting third-party disclosure; provide parents the ability to access to the collected personal information; provide parents the opportunity to prevent future collection of personal information; provide parents the opportunity to request deletion of their child's personal information; and adopt reasonable procedures to secure and protect the collected personal information.

The new rules expand the scope of liability of websites and online services, both for the site's practices, and those to whom they grant permission to advertise. In addition, the new rules modify the parental consent process. With respect to the operator's liability, the FTC expanded its list of factors that it would use when determining whether a website is "directed" to children under the age of 13 to include following three criteria: it knowingly targets children under the age of 13 as its primary audience; based on the overall content of the website or online service, it is likely to attract children under the age of 13 as its primary audience; or based on the overall content of the website or online service, it is likely to attract an audience that includes a disproportionately large percentage of children under the age of 13 as compared to the percentage of such children in the general population.

If the site does not collect personal information from any visitor prior to requesting age information and/or prevents the collection, use, or disclosure of personal information from visitors who identify themselves as under age 13 without first obtaining verifiable parental consent, then the new rules will not apply.

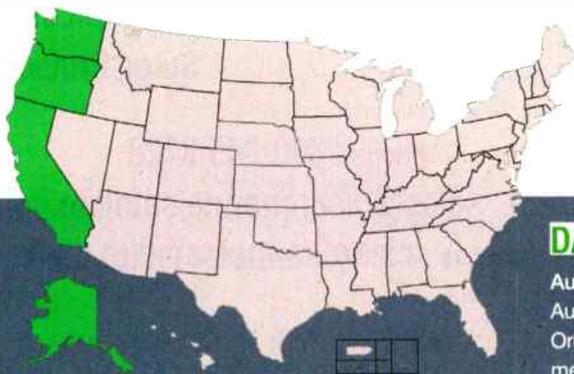
The new rules not only apply to the content the operator posts to its website, but also includes the plug-ins and advertising network that runs on the website as well. As a result, even if the website does not collect personal information, the rules will apply if a plug-in or ad network has actual knowledge that it is collecting personal information through a child-directed website or service.

Also expand is the definition of the types of personal information that will trigger liability. Now, the collection of geo-location information (sufficient to identify street name and name of a city or town), and photographs, videos or audio files which contains a child's image or voice are included, as well as persistent identifiers such as IP address or User IDs that automatically recognize a returning visitor.

In the event that a website does collect personal information from children under the age of 13, then it must obtain verifiable consent from the child's parent. If the personal information will be used for more than just internal purposes, then it will not be sufficient only to send the parent an email confirming their consent. Instead, there must be a second step whereby the parent confirms its consent. The FTC has provided a laundry list of examples, such as: signing and returning a consent form; use of a credit card which provides notification after each transaction; or requiring the parent to call a toll-free number or participate in a video chat.

If an operator believes that there is a chance that children under the age of 13 will visit its site, and the operator collects personal information, or permits other parties to collect personal information, it is strongly suggested that they consider conducting a comprehensive review of their procedures to ensure continued compliance. The fines issued at by the FTC start at \$16,000 per violation, and in light of the expanded definition of "directed to children", an operator might find itself in hot water faster than saying "Psy".

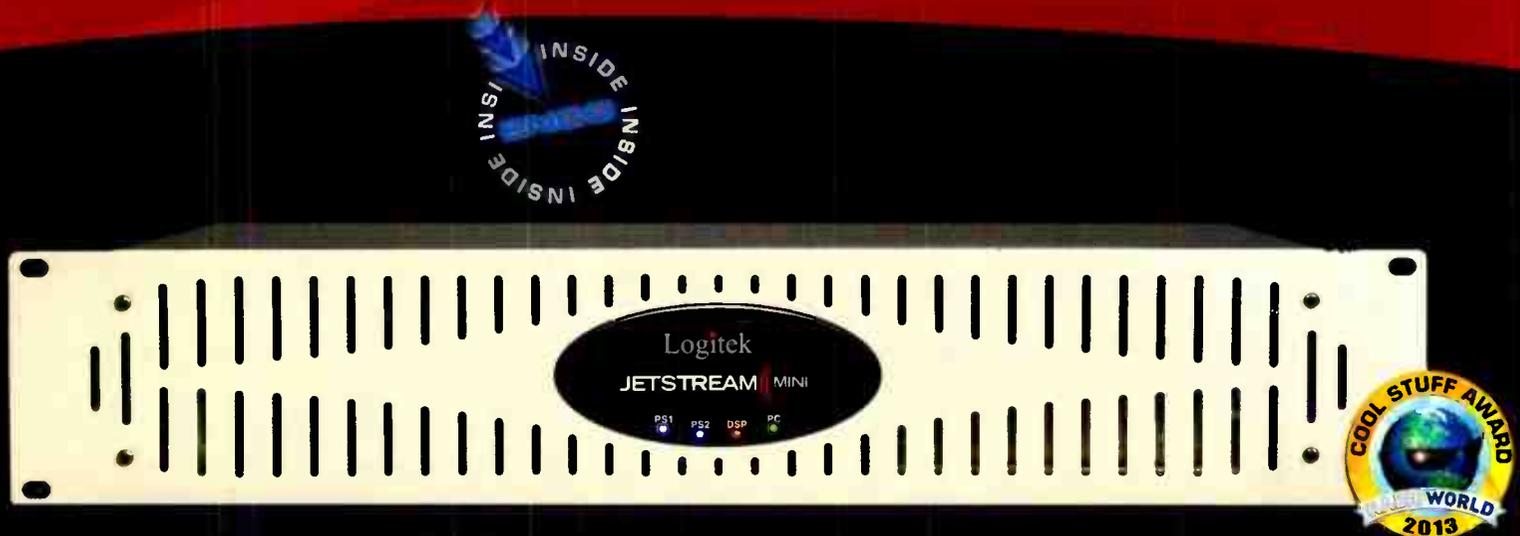
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DATeline

August: Stations in California continue running License Renewal Post-Filing Announcements August 16, Sept. 1 and 16. Stations in Alaska, American Samoa, Guam, Hawaii, Mariana Islands, Oregon, Saipan, and Washington commence running License Renewal Pre-Filing Announcements Aug. 16, Sept. 1 and 16.

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From There to Hear: Audio Over IP

Using IP for audio contribution is now the norm. Here's a recap of the current tech.

By Doug Irwin, CPBE DRB AMD



From time to time we review various products that are used to send program audio from point to point (or multipoint) via IP. Products evolve from year to year and new features get added, so it's worth seeing what's out there. Tieline has introduced a version of its Genie



Tieline Genie Distribution

codec known as Genie Distribution. What is special and unique about it is that it can become part of a WheatNet-IP studio facility. You can use Genie Distribution to connect two WheatNet-IP studio locations together, either via a private network or the public Internet, passing up to six channels of audio between endpoints. The device includes a purpose-built Tieline WheatNet audio card, and the rear panel provides a WheatNet LAN interface for connecting the codec directly to a WheatNet-IP network. After connecting it in that environment, the codec can deliver IP audio over LANs, WANs, the Internet, satellite IP, 3G, 4G, Wi-MAX and Wi-Fi.

Tieline's Toolbox, a browser-based GUI, is used to remotely control the device. If the Genie Distribution is

connected to the WheatNet-IP environment, it becomes a node, and routing of WheatNet-IP sources and destinations can be performed using Wheatstone's Navigator software.

The Genie Distribution is not limited to being part of a WheatNet-IP facility though; you can use it for stereo audio distribution for up to 50 individual multi-unicast endpoints; as an STL system, or for IP multicasting (over WAN that supports multicast). Genie Distribution is capable of 24-bit/96kHz low latency linear PCM audio, but it also features the E-apt-X algorithm, as well as LC-AAC, HE-AAC v1 and v2, Opus, MPEG Layer II, Tieline Music and MusicPLUS, G.722 and G.711 algorithms.

Genie supports both IPv4 and IPv6 (Dual Stack) protocols, and the user can also connect over IP with any SIP-enabled IP codec brand that supports the EBU N/ACIP tech 3326 standard.

Telos has long been a standard-bearer in IP codecs. Its latest product is the Z/IP One, a 1RU, full-duplex

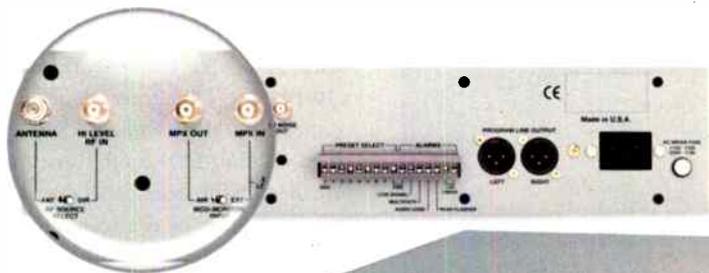


Telos Z/IP One

codec that can also fulfill a role as an endpoint in an AoIP studio network. Aside from the typical balanced audio inputs (+4dBu or mic level, switchable) it also has a built-in Livewire interface—thus allowing the Z/IP to become a source and destination in an Axia AoIP studio environment.

The Z/IP One has many interesting and useful features. In its role connecting point A to point B, the user can configure it to use linear PCM or any of the following codecs: AAC-ELD; AAC-HE; AAC-LD; MPEG layer 2; MPEG 4 AAC LC; MPEG 2 AAC LC; and finally G.711 or G.722. It conforms to N/ACIP standards including SIP 2.0; it has a 'push' mode for one-way connectivity, and it will even talk with a Zephyr Xstream.

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The Z/IP One comes with a Wi-Fi stick and thus allows connectivity via Wi-Fi, EVDO, and UMTS. Two Ethernet ports are standard, allowing control and streaming to be done via separate physical networks. Remote control and configuring are done via its embedded Web server. It includes RS-232, for passage of serial control or metadata; an 8-port GPIO is included as well, for purposes of end-to-end signaling.

company) “allows the system to perform well on the public Internet (using AAC compression modes).”

BRIC-Link is a small desktop package — two go side-by-side in a 1RU package. It’s a full-duplex codec, primarily meant to handle nailed-up connections over IP, whether transported over LAN, WAN, or the public Internet. BRIC incorporates a dynamic jitter buffer, increasing or decreasing its depth based on the network performance. For QoS networks, the buffer depth can be fixed.

BRIC-Link comes with professional level analog I/O on 1/4” TRS connectors, which can be switched to AES. The network connection is via a 10/100base-T Ethernet connector. Four GPIO connections, along with an RS-232 link, are provided via mini-DIN connectors. Audio levels are provided on the front panel via tri-color LEDs; these LEDs may be configured to show either the send or return levels. Another front-panel LED displays the Ethernet status.



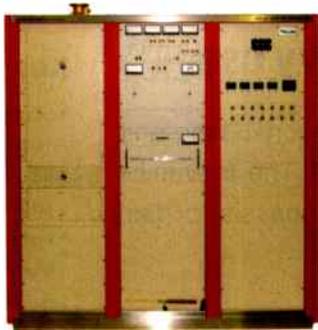
Comrex BRIC-Link

When I write about Comrex, typically it’s about the Access — but this time it’s all about the BRIC-Link. BRIC (Broadcast Reliable Internet Codec) is proprietary Comrex technology, which (according to the

BRIC-Link has its own built-in Web server, used to read connection status, to configure profiles for various connections, as well as for opening and closing said connections. Network diagnostics are available, as

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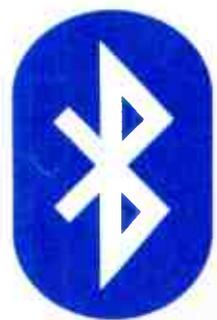
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are audio level meters. Initial configuration is done via a Windows-based setup utility run on the same network as the BRIC-Link; this same utility is used for applying software updates.

For audio transmission, BRIC-Link offers a stereo or mono linear mode, in addition to FLAC compression, as well as HE-AAC and HE-AACv2. When using AAC modes, BRIC-Link is capable of sending multiple one-way streams to other BRIC-Links, Comrex Access, or via IP-multicast (assuming network compatibility).

Another well-known maker of IP codecs is Musicam, and its Suprima has had some recent improvements. Suprima is a TRU, two-channel, full-duplex IP codec with some unique features. It has balanced analog inputs and outputs, as well as AES ins and outs (will sync externally or generate its own clock). It has a single Ethernet port used for control and the actual stream (TCP or UDP); control is done via its internal Web server. The Suprima also supports multicast over compatible networks. Seven GPIO connections



Musicam Suprima

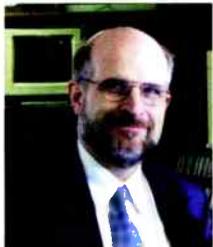
are included, and it will support an auxiliary data stream if operating in MPEG mode or standard Apt-X modes. The unit will support linear PCM and codecs supported are G.711, G.722, Musicam ISO MPEG1/2 L2, ISO MPEG1/2 L3, MPEG2/4 AAC-LC, MPEG4 AAC-

LD, MPEG4 AAC-HE, Standard and Enhanced Apt-x (64,128kb/s; mono, dual, j-stereo). It will also support Dolby E when the AES input is used, with the codec set in transparent mode.

The device has seen recent improvements to its network management, including better FEC, jitter and buffer control. Also, the Suprima has its own methodology for using two IP links, called Solid Stream. This feature permits two Suprimas to connect via two different IP data paths. Finally, the Suprima can pull down audio files from



WorldCast APT Horizon NextGen



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a USB stick, and play them out in the event that it detects an IP connection failure.

Another established player in IP codecs is Worldcast Systems, which took over the APT line of hardware codecs several years ago. It makes several IP codec products, but the one I chose to highlight is the Horizon NextGen (image on previous page). This is also a 1RU, two-channel, full-duplex codec that features dual-Ethernet connections on its rear apron, one of which can be used for a LAN connection while the other is used for the streaming output. IP transport is accomplished via RTP/UDP or SIP/SDP, and not surprisingly, Horizon NextGen is fully N/ACIP compliant. The device supports unicast, multiple-unicast and multi-cast (assuming a compatible network).

Audio inputs and outputs are accomplished via XLR connectors, analog or AES. Four optically coupled inputs, along with four relay outputs, are included for GPIO (DB15 connector).

In addition to linear PCM, the unit supports Enhanced Apt-x. As an option, you can include MPEG 4 HE-AAC versions 1 and 2.

Control can be done from the front panel LCD screen and keypad or via its network connection using the Worldcast Network management software, or simply via its embedded webserver. SNMP support is provided as well.

SureStream is the name of the Worldcast feature that allows the Horizon NextGen to make use of two IP links to the far end device, thus providing extra reliability, especially over the public Internet. If you intend to use an IP codec over a trunked system

TRENDS IN TECHNOLOGY

(i.e., multiple VLANs) you'll be interested to know that the Horizon NextGen supports VLAN tagging.



Barix Extreamer 500

Barix is a well-known name in IP codecs. Many are familiar with the Instreamer/Exstreamer pairs, but the company also makes codecs, such as the Exstreamer 500. This device comes with balanced analog inputs and outputs, four GPIO inputs and outputs, as well as a USB port for audio fail-over from a storage device. Algorithms available are MP3 (variable bit rate, between 8 and 320kb/s, and sample rates between 8 and 48kHz), PCM, and AAC-LC, HE-AAC, and HE-AAC v2.

Another brand of IP codecs that sees some use is AEQ. It makes several different units, but we'll look at the Phoenix Venus. This is a 1RU, full-duplex codec that will handle two stereo pairs (or four mono) simultaneously. The two AES ins/outs are available on DB15 connectors, with SRC, and will individually sync between 16 and 96kHz. Analog ins/outs

are available via XLR connectors. The unit has a single 10/100baseT Ethernet (RJ-45) port.

Phoenix Venus was designed to meet the N/ACIP EBU Tech3326 standard and includes the option of an adaptive buffer in order to absorb network jitter, DHCP allowing the automatic configuration of the IP Network parameters, and FEC and automatic reference clock adjustment in order to synchronize both ends of the communications link. Audio algorithms include G.711, G.722, PCM, MP2, and optionally AAC-LC



AEQ Phoenix Venus

and AAC-LD. The unit also includes AEQ-LD, which is AEQ's proprietary codec.

The delivery of audio from point A to point B via IP, whether over a LAN, a WAN, or the Internet, has become commonplace nowadays. While it may not be imminent, the demise of ISDN is certainly on the horizon, so now is the time (if you haven't already) to learn something about audio over IP. **0**

Irwin is RF engineer/project manager for Clear Channel Los Angeles. Contact him at doug@dougirwin.net.

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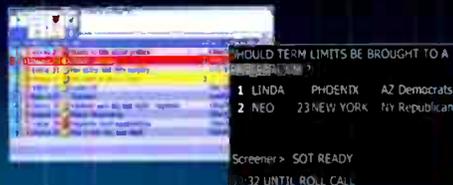
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Small Market Big Presence

Rebuilding on a budget can still make a showcase facility

By Chriss Scherer, editor

Clear Channel owns two stations in Gadsden, AL, which is about 60 miles northeast of Birmingham. These stations, WAAX-AM and WGMZ-FM, have an established presence in the community. And while this is one of the smallest markets for Clear Channel, it was still important to build a quality facility that served the stations' needs reliably and affordably.

The new studio operation for the stations is actually not a new building. In the late 1990s, Clear Channel bought a building in downtown Gadsden and moved the stations out of the studio building collocated with the AM transmitter. The downtown operation worked well for 15 years, but like any facility, the time had come to update the equipment.

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Consoles? Oh, yeah, we've got 'em, big, small and in-between. This is an Element: over 4,000 raving fans worldwide (so far). Sizes from 4 to 40 faders.

DESQ packs lots of power into a small package. (Like your Aunt Louise's rum balls.) Just 18" square.

iQ: a mid-sized console that can grow from 8 to 24 faders. Powerful, expandable... now, that's smart.

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Choosing an IP-Audio network? Some companies treat AoIP as if it were an RCA jack — nothing more than a way to get audio into a console. But Axia fans know that the network's real value comes when devices truly communicate.

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So when you choose your IP-Audio network, choose the one with all the connections. Axia: we make the net work.

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As costs were considered, Bob Newberry, market chief for the Birmingham, Tuscaloosa and Gadsden stations, wanted to build a studio facility that would ensure reliable and hopefully flexible service to the stations. With an eye to keeping costs under control, an idea was hatched: If the downtown studio building was sold, the money could fund the studio project. The facility at the transmitter was still there, and the building was in good shape.

The downtown studio building was listed for sale. With the real estate market making its slow comeback, it took 1.5 years for the realtor to find a buyer. Once a buyer stepped forward, the plans kicked in. This began in June 2012.

The building sale arrangements were finalized in August 2012. Work on the transmitter site building began in October and was completed in November. The stations moved in the middle of December 2012.

Having sat mostly vacant for 15 years, the transmitter site building needed some attention. The HVAC was replaced, and the entire building was painted inside and out. 15 years of basic groundskeeping was given a landscaper's touch. A studio generator was brought in, a Liebert UPS was installed and the building electrical system was rewired. Then the attention could turn to the studios and offices.

AT THE CENTER

At the heart of the operation are Logitek JetStreamMini audio-over-IP router frames. There are six frames in the facility: three in the technical operations center and one in each of the three studios. The two air studios also have Logitek ROC consoles, while production has a Logitek Pilot console. The AoIP system ties directly to the RCS NexGen automation system and the X-Digital Systems XDS satellite receivers.

While Gadsden is a small market, installing an AoIP system still made sense because of the scalability and routing flexibility. The reduction of wiring alone was appealing to Newberry, but being able to dynamically

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The WGMZ air studio.

Newberry notes that the JetStream interface to the XDS satellite receivers is a tremendous time saver. Rather than taking the relay outputs from the receiver, the cue port data is fed to the JetStream. The NexGen automation and JetStream know which show is on the air and which triggers to engage to go to break, to play an ID or joiner and rejoin. The old method of installing several audio switchers and creating diode steering matrices are now a memory for Newberry.

For studio furniture, Newberry chose Designcraft, which also built the studio furniture for the Birmingham studios several years ago. The furniture was built in Michigan, broken down, shipped and reassembled on-site.

In the offices, most of the existing office furniture was reused. New office chairs were part of the new purchases.

The Gadsden studios are connected

create IFB and mix-minus feeds, accept satellite triggers directly without wiring scads of relays, and making changes remotely have provided the stations with greater operational flexibility than they had before. There's no more need to run down the hall to flip a switch to change a feed.

Newberry also notes that most of the configuration changes, when they are needed, can be performed remotely. He and his staff take care of the three operations that stretch across 120 miles. Remote access saves time and money, and lets the Gadsden staff avoid the frustration of waiting for someone to drive in from Birmingham.

to the Birmingham facility via 6Mb/s MPLS. This link provides Gadsden with SIP phone service and access to the Clear Channel WAN. A Barix IP link provides an audio connection to share files between the two facilities. With the engineering office in Birmingham, this connection also provides flexible control of the remote systems in Gadsden via the IP link. Birmingham is also connected to Tuscaloosa via a T1. With the Asterisk IP phone system installed throughout the facilities' joined IP networks, all calls are routed internally and without long distance charges.

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FACILITYSHOWCASE



A closer look at the WGMZ air studio.

Total wiring to the three studios consists of eight CAT-5e cables per studio. This handles all IP audio streams, automation PC, Internet PC and telephone lines. One CAT-5 is all that is required to have all networked audio sources available in each studio.

Some studio equipment was reused from the previous facility, such as the E-V RE-20 mics. Newberry bought some new equipment, including new O.C. White mic booms, Symetrix 528E processors, JBL Control One speakers and Behringer power amps.

EQUIPMENT LIST

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- E-V RE-20
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- Liebert UPS
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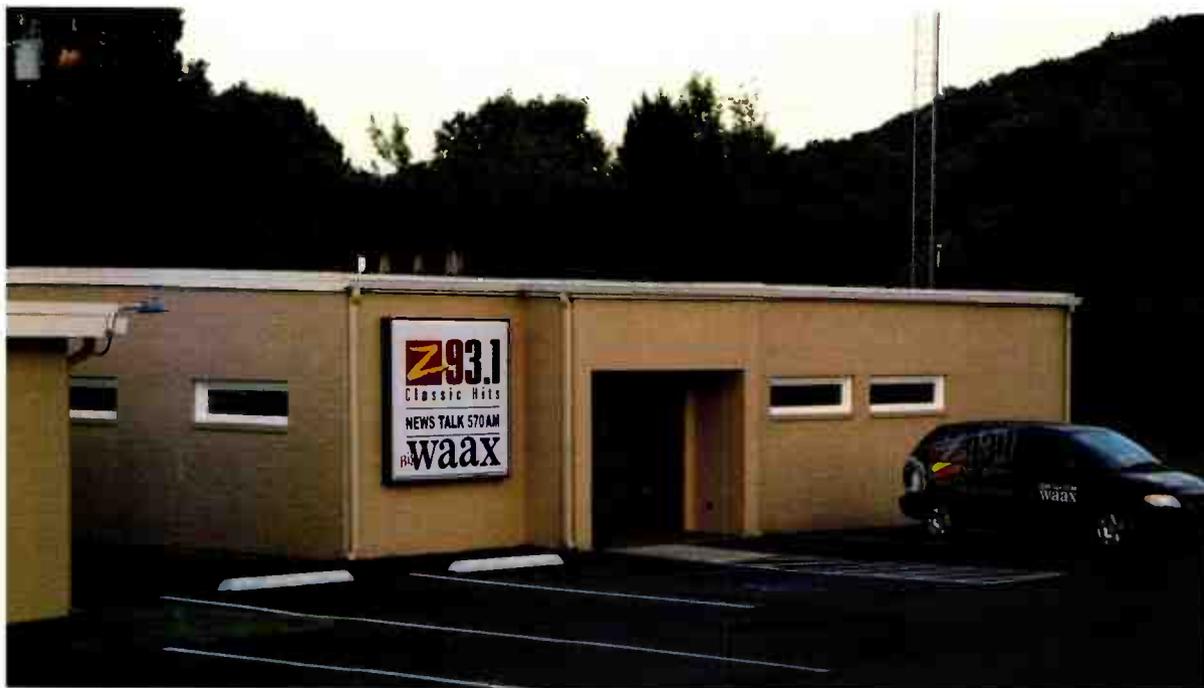
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The unassuming building exterior.

While he has never needed it, Newberry added some insurance to his studio plan. In a worst-case scenario, he wanted to be able to quickly connect a studio directly to the input of that station's STL. He uses SAS 16000 routers as his analog backup in case the need ever arises. The system has been tested and is ready to go, but Newberry doubts he'll ever need to use it.

The Clear Channel Gadsden operation shows that even a small market can benefit from an audio-over-IP infrastructure. The system is scalable, and it more importantly provides the routing flexibility to accommodate quick changes as well as the remote access when needed. 

Photos by Bob Newberry.

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by Doug Irwin
CPBE DRB AMD

Obtaining Elevation Profiles With Google Earth

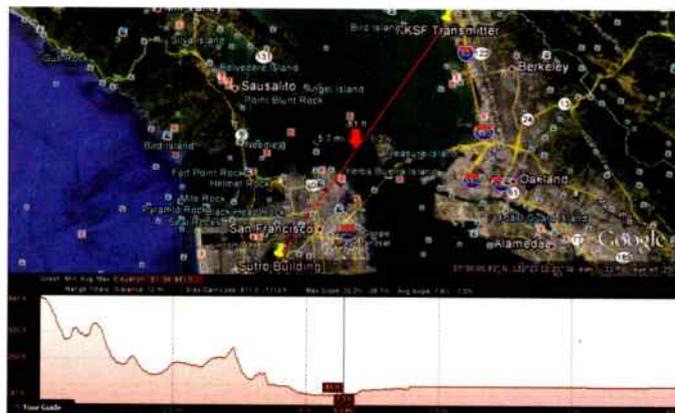
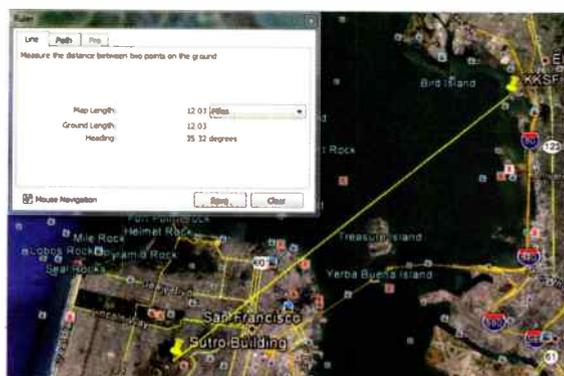
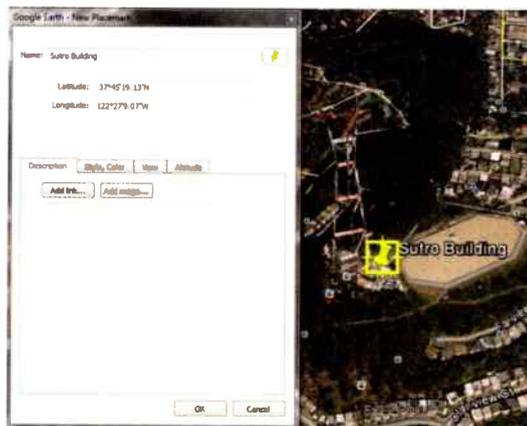
Have you put Google Earth (G-E) on your computer yet? I have been using it for a while now, and I've probably just scratched the surface in terms of its capabilities. There is one particular feature I want to share with you.

It used to be that you had to buy access to a 3-second database to run elevation profiles. However, with G-E, all you need is to find your start and end points. Now admittedly, I still use Google Maps to find coordinates of places occasionally. That's pretty straightforward — just open a browser, go to Google maps, expand the map (zoom in) and find the exact spot you are looking for. Then, right-click on the spot, highlight “what’s here,” and left-click on that. You’ll notice the coordinates are given to you in the search window box immediately above the map display. (You can copy and paste those in the search window for G-E.)

Google Earth is even easier than that though. After downloading it, and installing it on your computer, you’ll open the program, and then zoom in on the spot you are interested in.

Once you open G-E in the upper left hand corner you’ll see the yellow pushpin icon that G-E labels as add placemark. Left click on that; drag the pushpin symbol to exactly where you want it; then give it a name, and click OK (top image).

Keep in mind that the coordinates you are given are of WGS84 reference.



To find an elevation profile, you need a second point, of course. For this demonstration I picked an AM transmitter site that is across the San Francisco bay from Sutro Tower (map not shown).

Along the upper toolbar for G-E you’ll see an icon called show ruler and this is the tool we’re going to use to derive the elevation profile. Left click on that icon; then zoom way in on your starting point. (The closer you zoom in, the more accurate this elevation profile will be.) When you have your starting point, left click on it. Now zoom out (you’ll notice a yellow line tagged on your starting point) and find your point B; zoom way in (for accuracy) and then when you’re sure that you’re right on point B, left click again. This terminates the yellow (ruler) line (middle image).

After you click save you’ll be prompted to give this new path a name, which you must do to get the elevation profile. Once done, the path will be saved in the left column (places). In the upper left corner, find edit, then show elevation profile and click on that (bottom image).

This is the result. You’ll also find that you can move the red arrow around with your mouse, and the vertical line (shown right in the middle of the elevation profile) moves as well, showing you the elevation at that particular spot.

If you have another use for G-E (pertaining to broadcast engineering) I’d like to hear about it.

NAME THE PARTS

In the July issue, we swapped the identities of two photos: the resonator and trombone. The images are correct online.

Irwin is RF engineer/project manager for Clear Channel Los Angeles. Contact him at doug@dougirwin.net.

From the top: Add a placemark for your site; after selecting a second point of reference, measure the elevation; and save the elevation profile.

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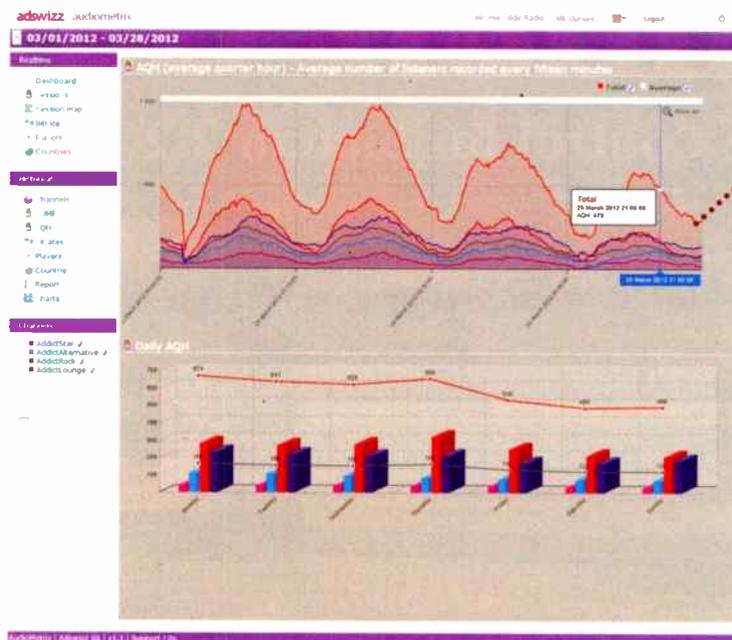
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StreamGuys and AdsWizz

by Alexander Bigill

Most of us in broadcast radio feel a connection to the medium that is beyond simple explanation. I'd argue that this is emphatically true for those of us serving in the public media space, where the diversity of programming and community-minded radio creates a special bond with our audiences.

Terrestrial, over-the-air transmission remains an important delivery vehicle for public and commercial broadcasters. The cautionary tales of radio's demise in the face of digital media are exaggerated: A recent audio report from the Pew Research Center confirms that most Americans own at least one AM/FM radio, and that terrestrial listening remains an influence.

That same report (stateofthemediamedia.org/2012/audio-how-far-will-digital-go/audio-by-the-numbers), however, also notes that radio's growth and momentum almost exclusively depend on digital streaming.

It should be no surprise to anyone that Internet-based media is more than a fad, and radio stations that embrace streaming media are essentially stating they refuse to be left behind. Consumers around the world have

assimilated more technology into their daily lives, and in the process the ratio of terrestrial versus online listeners has inevitably shifted. And it's certain that this shift will continue.

At the same time, radio of the 20th century provided us with certain time-tested techniques and quality standards that should not be ignored. I believe it's important that new technologies, techniques and delivery platforms serve as an addition rather than a replacement. In this way, online streaming becomes another avenue to deliver content without sacrificing the processes and quality that made the content valuable in the first place.

The ability to deliver broadcasts worldwide is certainly an important advantage. All Classical Portland, which this year celebrates its 30th anniversary as one of the few remaining pure-format classical radio stations, has had a streaming presence since the turn of the century.

My mission upon joining the station in 2011 was to evolve our streaming platform, which remained unchanged for 10-plus years, to a higher service tier. We switched to a new content delivery network (CDN), StreamGuys, to help us increase streaming listenership, and now offer eight continuous streams offering two levels of audio quality.

We have drawn more listeners by making the online listening experience as easy as possible. This way, the listener can forget the technology

is there and let the music be all that matters. Our programming decisions are meticulous and our hosts are knowledgeable, friendly and laid back — but online listeners will quickly tune out if the experience is choppy and underwhelming. CDN companies are instrumental in sustaining high levels of streaming reliability to increase online listener enjoyment.

LEVERAGING STREAMING PLATFORMS

This all sounds easy perhaps — and it's true that a radio station can get a stream off the ground with minimal costs and infrastructure. However, incorporating streaming media elegantly requires notable investments in equipment, services and talent. This means that new ways of generating revenue are also needed.

Ad insertion technologies offer perhaps the most attractive means of monetizing online and mobile streams, allowing us to prominently recognize our sponsors.

Those of us in community-supported media understand the rules of sponsorship differ from the advertising content of our commercial media peers. Still, there are benefits to embracing technologies that can help us in the public media generate revenue, and ultimately attract more listeners and members.

StreamGuys pointed us to AdsWizz following our inquiries on ad insertion services. Though still in the early stages of deployment,

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FIELDREPORT

we have successfully incorporated audio “pre-rolls” into our streams — essentially, short sponsor recognition clips (or requests for donations) targeted to our online audiences that play when the stream is launched.

Online streaming and other new Internet technologies can be fun and exciting, but sometimes that’s not enough of a reason to justify the expense. While we were ready to more directly monetize our streams, I had several trepidations before committing to ad insertion software. How much control would I have over the injections? Would it handle multiple audio formats, with StreamGuys supporting MP3 and AAC+ for our services? Will the administration interface be useful? How reliable will it be injecting, playing and

station might see from using a third-party ad network or agency. However, we expect pre-roll sales to ramp up in the near future based on early feedback, and the platform now in place will easily accommodate growth.

Analytics software from both companies is helping us strategize when and where that growth may take shape. StreamGuys offers a tool to directly compare weekly online listenership with our Arbitron reports for terrestrial listenership. Additionally, their SGReports software utilizes the Sawmill platform, which is analogous to Google Analytics and allows us to understand almost any combination of who, how, what and when our streams are accessed. AdsWizz sweetens the pot with stats on pre-roll impressions, with plenty of



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passing off pre-rolls to the live streams?

The last question was perhaps the most important: We hope that listeners will welcome our pre-rolls, but we certainly can't expect them to be forgiving if stream quality is disrupted.

WHERE IT'S AT

We've found that jumping into the shallow end of the pool with ad insertion technology has been worth the risk. The service itself has been reliable and hassle free. Listener enjoyment is our foremost concern, so I'm pleased that the transition from pre-roll to live stream is smooth and elegant.

We're admittedly using the service in a simplistic manner to start. We made the choice to only use in-house produced audio pre-rolls for the foreseeable future. All injections are 10 seconds or less, and only happen upon stream initiation. A simple point-and-click user interface makes it easy to add or change audio files as new ads enter the pre-roll rotation.

The use of in-house-only pre-rolls means we're not seeing the immediate tangible benefits a radio

options, metrics and filters that I'll use more as our injection platform grows.

Let's be honest — not many listeners enjoy pre-roll messages. However, the average online stream listener realizes that a 10-second message is often preferable to a subscription service. This is where services such as AdsWizz are helpful. If we, as content providers, are going to incorporate revenue-generating services, it might as well be easy to use and offer plenty of advanced customization options.

All Classical Portland stands apart from similar radio stations because the station's programming stays true to the vibe of Portland and the Pacific Northwest. We have a strong sense of place, we love the music we play, and we're passionate about sharing that with our neighbors and the rest of the world. I think ad insertion tools give us the best opportunity to directly monetize our streams while still keeping our online and mobile experience as attractive as possible for listeners. **0**

Bigbill is director of new media, All Classical Portland.

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Headset Mics

by Chriss Scherer, editor

The prime use of headset mics is likely for coverage of sporting events. With typically so much ambient noise and the announcers constantly moving, the headset provides the isolation needed to monitor the broadcast while the fixed mic location ensures consistent audio pickup. But these advantages can be beneficial when covering other events, such as a political convention, major news event or even a remote from a large venue.

We looked for models that offered circumaural

earpieces. By covering the ear, there is greater isolation from outside noise. We also liked headsets that allowed the mic boom to be placed at either side of the announcer's mouth. Doing this will reverse the left and right earpieces, so a stereo image will be reversed. If that's a problem, add a channel reverse adapter to the remote kit.

The types of mic pickup are flavors of a cardioid pattern. A classic cardioid has the best rear rejection, but the sides still have good pickup. As the patterns move to super- and hypercardioid, more

rear pickup creeps in as the side pickup is reduced. You may need to experiment with various patterns to decide which works best for your application.

Some models feature a muting function when the mic boom is moved to the top of the set or removed from the user's head. This may come in handy in some uses.

Take note of the connectors when buying a headset. Some break out to XLR and TRS, while others use a 4- or 5-pin XLR. Others may have no connectors at all. **0**

AKG HSD171

This closed, on-ear studio headset provides high noise isolation for loud environments. The headset combines the K171 MKII studio headphones with a rugged dynamic microphone. The flexible microphone arm mutes the microphone automatically as it is moved up. The headset also has a switch in the headband that mutes the audio when the headphones are taken off. The

cable connects to the headphones via a six-pin mini XLR connector. Also available is the HSC171, which features a condenser mic.

Headphones: 18Hz to 26kHz, 55Ω

Mic: 60Hz to 17kHz, hypercardioid, 600Ω

akg.com



Audio-Technica BPHS1

This rugged headset features closed-back around-the-ear ear to provide maximum comfort and ambient noise rejection. Neodymium magnets are used in the mic and headphone for higher output. The headset has a boom-mounted, dynamic microphone that can be positioned for use on either side of the mouth. The

3.3m detachable cable is terminated in a 3-pin XLR and 1/4" TRS for the mic and headphone. It includes three mic windscreens and a spare connector screw.

Headphones: 20Hz to 20kHz, 65Ω

Mic: 40Hz to 20kHz, cardioid, 560Ω

audio-technica.com

Beyer Dynamic DT 790

This headset combines the classic closed-design DT 770 PRO with the addition of a pivoting gooseneck microphone boom with a dynamic DT 290 element. Neutrik connectors are used throughout. The 1.5m cable has a 4-pin XLR or no connector to install your own. The microphone boom can be used at left or right side or can be moved into standby (upper) position. An optional limiter can be ordered to

protect a user's hearing during use. The threshold is specified when the headset is ordered. The DT 797 with a condenser cardioid microphone is also available.

Headphones: 5Hz to 30kHz, 80Ω

Mic: 40Hz to 12kHz, hypercardioid, 200Ω

beyerdynamic-usa.com



Sennheiser HMD280 Pro

The lightweight, ergonomic headphone attenuates ambient noise by 32dB via a closed-back, circumaural design is paired with a super-cardioid dynamic microphone mounted on a flexible, acoustically isolated boom. A single, coiled (1m to 3m) cable carries monitoring and talkback signals. The cable is

attached, but can be replaced in the field. The microphone boom can be rotated for use from either side of the mouth. The entire assembly collapses for transport. It includes a wind/pop filter.

Headphones: 8Hz to 25kHz, 64Ω (300Ω optional)

Mic: 50Hz to 13.5kHz, supercardioid, 200Ω

sennheiserusa.com

Shure BRH440M

This closed-back, circumaural headset with neodymium magnets offers sound isolation from background noise. The dynamic cardioid microphone is mounted on a boom that pivots 270 degrees for left or right side wear. A flip-up mute function deactivates the boom microphone when it is raised vertically away from the mouth. The single-side, detachable cable is unterminated to

allow the user to attach his own connectors. The user-replaceable cable, ear pads and windscreen are included.

Headphones: 15Hz to 27kHz, 300Ω

Mic: 50Hz to 15kHz, cardioid, 200Ω

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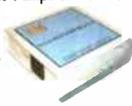
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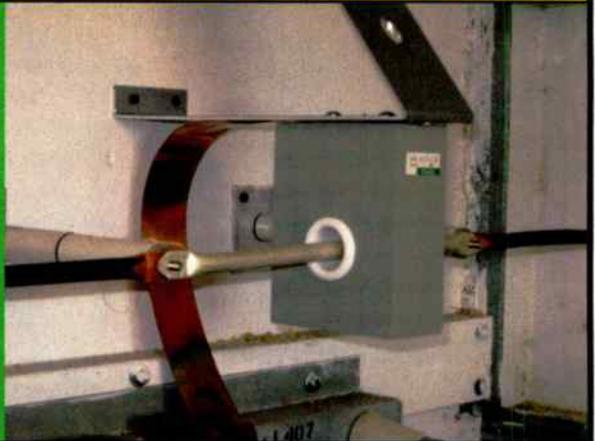
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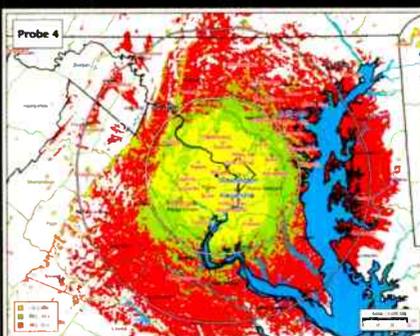
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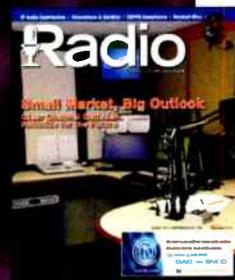
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20 years of *Radio* magazine

by Chriss Scherer, editor

The first issue of *Radio* magazine (originally titled *BE Radio*) was published in January 1994, but its roots go back much farther.

In 1959, Broadcast Engineering magazine was launched to cover the technology of radio and television. By 1994, it was realized that while the two services are related broadcast efforts, the needs of their specific audiences warranted splitting the content into two publications.

Radio magazine, now part of the NewBay Media group of publications, continues to cover the technology of radio broadcasting. Now in our 20th year, we'll look back at the first year of publication, which had six issues.

Here are some highlights from the November 1994 issue.

> Our cover story looked at ways radio could profit from new technology being developed. Computer-based programming operations and datacasting were the two primary areas of focus. In 1994, we were still learning to accept everything being recorded, stored, manipulated and played back from a computer. Today, it's hard to imagine doing it any other way. The datacasting aspect dealt with high-speed subcarriers on the analog channel with services

from Digital DJ (on 76kHz), Mitre (on 72kHz and Seiko (on 66.5kHz). The opening image (shown here) from that article showed one concept of the dashboard of the future that included navigation and other data displays fed from radio broadcast signals.

> Our second feature outlined the current state-of-the-art in satellite technology. While analog SCPC and MCPC were still quite common, digital transmission systems, including SEDAT, were being used. The article also presented several satellite downlink maintenance tips.

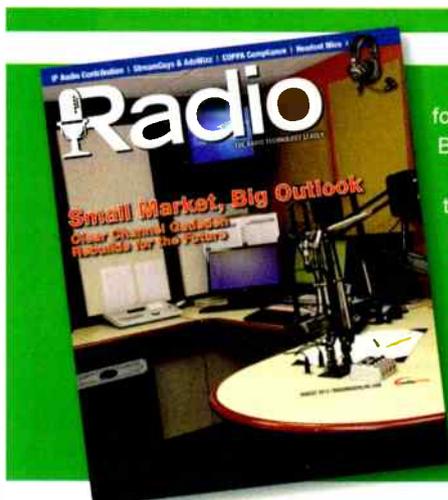
> Testing of the various digital radio broadcast systems were nearing completion at the NASA Lewis Research Center in Cleveland. We overviewed the parameters of the systems from AT&T (IBAC), AT&T/Amati (IBOC), TCE

(COFDM), USA

Digital Radio (IBOC, two FM systems and one AM system) and VOA/JPL (DBS on 2.3GHz). The systems were also being tested over the air. The AT&T had also been tested on-air in Princeton, NJ. USA Digital Radio provided mobile demonstrations of its system in Cincinnati and Chicago for NAB and NRSC members. Additional field tests were planned to be held in San Francisco in early 1995.

> New products from the World Media Expo included the Otari B-10 on-air console, Crown Broadcast's AirForce program automation system, the Denon DN-995R Mini-disc cart machine, Sony PRMD-74 recordable Mini-discs, the Eventide DSP3000B Ultra-Harmonizer effects processor, the RE America RE660/662 codec with Musicam, the Audioarts Engineering MR-40 production console and the Soundcraft RM100 on-air console.

> After six issues of the magazine being a supplement, it had been decided to launch *BE Radio* on its own. There was a teaser noting that something was coming in January. The first stand-alone issue of what is now *Radio* magazine was issued in January 1995. **Q**



THE NEXT 20 YEARS

Radio magazine has followed the progress and evolution of radio for the past 20 years, and we will continue to do so into the future. But there are questions about what radio will be like in the future.

Will radio continue to hold its place with consumers? Will the stand-alone listening appliance continue to be the primary device for consumer use? What does the future hold for radio on cell phones, HD Radio, Internet streaming and other forms of delivery? How long will it be until we carry a ubiquitous device that will automatically find your chosen content regardless of the delivery system?

We know you have your own views on these and other questions. Share them with us at radio@RadioMagOnline.com. ■

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