

# RADIOWORLD

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## New EAS Group Raises Alerts

### BWWG Says Many Next-Gen Warning Details Remain To Be Sorted Out

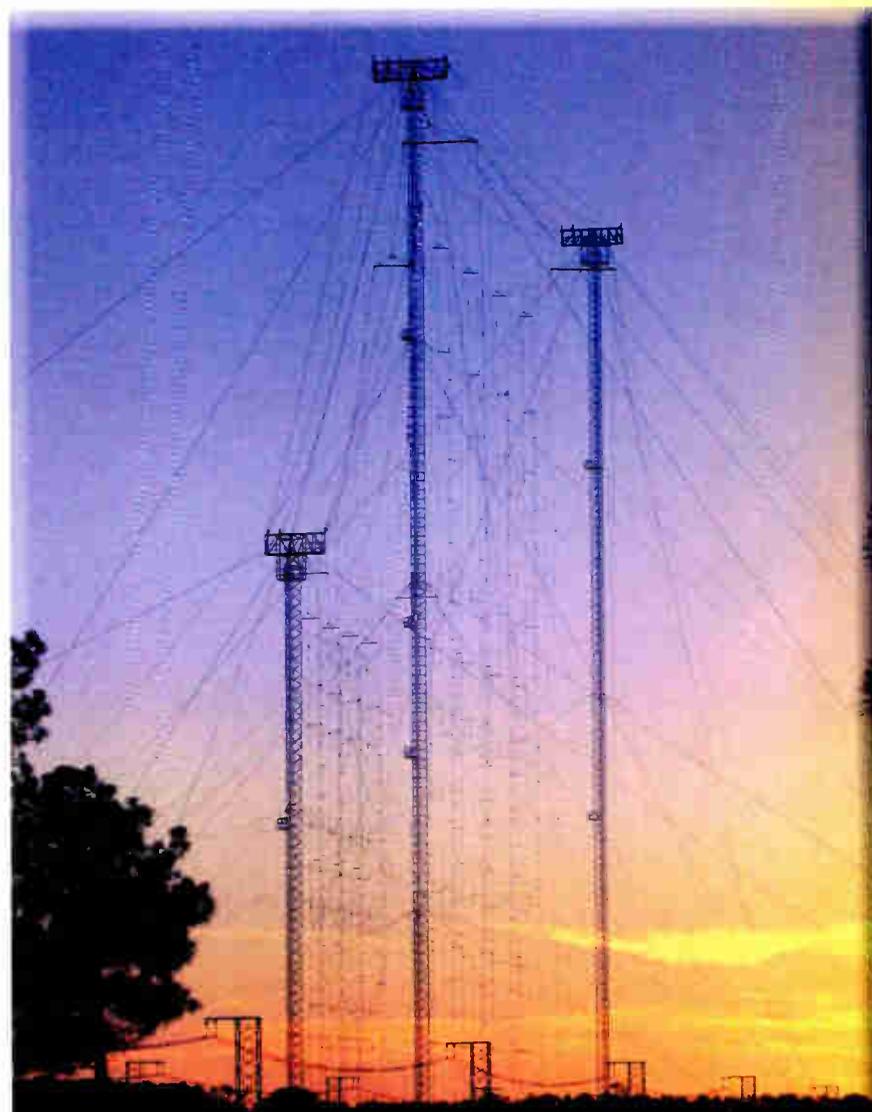
BY RANDY J. STINE

The preamble of the nation's next-generation emergency alert and public warning network has been written, metaphorically speaking. But a relatively new group of Emergency Alert System veterans is taking steps to make sure the final constitution includes input from the broadcast engineering community.

The Broadcast Warning Working Group has filed several petitions with the FCC and says it will be proactive once the commission proposes changes to Part 11 to include a new digital distribution format and complete the long-awaited overhaul of EAS.

Of special interest to the group is how the FCC finalizes its EAS rules

*(continued on page 5)*



## HF Broadcasting Lives On at VOA's Greenville Station

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Photo by James O'Neal

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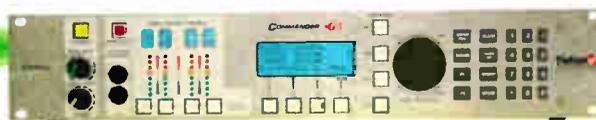


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# RadioText Plus Holds Promise

It Enables Stations to Tag Phone Numbers, Websites, Text Campaigns & Addresses

BY ALAN JURISON

In the Jan. 1 issue we discussed the RDS injection rate and pilot synchronization. Now let's focus on RadioText Plus.

## RADIODATA

If you've been following the industry news in the past two years, you probably have heard of RadioText Plus. RTplus and "RT+ Tagging." It's a technical name, but I think the concept holds great promise for the broadcasting industry.

RT+ is an additive data stream you can add to your RDS encoding that identifies the text that you are encoding in your RadioText (RT). Remember, as we discussed in the second article of this series, the RT is a 64-character description that you can change anytime.

iBiquity's HD Radio.

These types of tagging identify song information, unique song identifiers and unique "affiliate" identifiers to allow a radio station to get paid for a song that's downloaded. While these systems generally cost money to license and implement, RT+ is a free, open source



Fig. 1: iPhone Nano sixth and fifth generations, showing RT+



Fig. 2: Zune HD showing RT+ tags

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The RT frequently is used to display the station name, promotional/advertisement messages, program data and song title/artist/album data. Until the RT+ standard was developed, there was no way to know what that data was from a hardware standpoint, and this is important for song tagging.

There are multiple forms of "tagging" on the market these days. There are proprietary versions of song tagging for both RDS/RBDS on analog FM and

tagging standard that allows you to tag song information and a whole host of other items of interest that a radio might display via RDS.

### BRIDGING THE GAP

Let's take the following example of a possible RT:

93Q - Fireflies - OWL CITY - CD: Ocean Eyes

A human can look at the RT, see that it is a song title/artist/album, get a paper and pen, write it down and later search for this song. However, to do this electronically is more difficult. Sure, the receiver can save the RT. But when the time comes to download the song later, the unit wouldn't know which part of that line was the artist or the title.

The receiver might confuse the station's name or other items in the RT. In the example, what's the title of the song? 93Q? Fireflies? Owl City? The receiver doesn't know; and that's where RT+ becomes valuable.

Because the RT field is so flexible, the receiver can't make any assumptions. RT+ bridges the gap and essentially defines what each part of the RT actually is. It also can give radio stations an "MP3 player feel" by now showing title, artist and album on separate areas of the display, which makes for better readability for the listener.

While we've just started to hear about this standard in the past year in the United States, RT+ is not new. In 2005, a consortium of engineers in Europe designed the RT+ standard, and it's free of charge for use and implementation.

The standard has been improved over time, and in the past few years, several

(continued on page 8)

## GET THE MOST OUT OF RDS

This is the fifth in a series of articles. Read past stories at [www.rwonline.com/article/99554](http://www.rwonline.com/article/99554).

Past topics:

- Injection & Pilot Synchronization
- What You Need to Know
- RadioText Send Rate
- PS Scroll



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# Comprehensive Solution or Rich Fantasy?

A Consulting Engineer Muses About the Benefits of Refarming UHF

A consulting engineer wrote to me recently with some interesting ideas. He goes under the name Fred Martins; for professional reasons he could not share his real name, but I think his comments worth sharing, as I have before with those of other crystal ball gazers.

While it may seem premature to muse about broadcasting's next step — given the debt service that many stations face and the expensive digital transition TV recently made — it probably isn't too soon to dream of what might be, he writes.

"There is a convergence of major forces: the need for redistributing spectrum, the maturing of efficient modulation technologies, devices that have become smaller and moved farther away from open air and move faster, and the plain truth that radio and TV reception in today's buildings on today's devices is not great. And there are minor needs and wants: consolidation of towers, convergence of media, localism and right-sizing the services so they are viable and sustainable."

So Fred says: Let's consider what might be.

## START HERE

"Let's assume that there is some public good to be derived by having a healthy and diverse free broadcasting service where receivers work well in almost all of the places people can go, and in particular where they live. Let's also assume that there is a public good in a ubiquitous wireless network access that also works well enough to support the things we do for work and play."

"Refarming" spectrum, as opposed to reassigning it, it isn't new, of course. Fred

points out that a considerable re-farming of land mobile radio spectrum made way for cellular telephones. Refarming "beachfront" UHF spectrum similar to the cellular frequency reuse scheme would likewise be hugely efficient, he believes.

"Consider a four-cell scheme where every market has one-quarter of the current spectrum allocated to broadcast, and the other three-quarters goes to broadband. As you move from one market to another, which chunk or cell is used for

rural blocks all work in this world."

Each market has 54 MHz for broadcast, Fred writes. They would also have 162 MHz in every urban center for wireless broadband.

"In some mostly rural areas between markets, broadcast overlap and broadcast boosters might take that down to 108 MHz or even 54 MHz. Collocated cellular architecture for broadcast has a lot of advantages. The FCC once asked to recover 120 MHz, so this is better as it

## A reader spells out the reasons he thinks refarming UHF would be better than harvesting it for bandwidth.

broadcast and what others are available for broadband changes in the classic cellular reuse scheme, favoring the broadcast services first, and wireless broadband secondarily.

"Consider too that we consolidate those towers into one (and a disaster recovery spare), and deal with penetration issues; increase the power, change the modulation to a tiered scheme where small devices in rough places receive enough of a picture and sound, and big devices can go to HD and 3D levels with the less-robust enhancement bits.

"Distributed Antenna Systems (DAS) are needed to penetrate into the venues and transportation corridors broadcasters can't now touch, and contiguous UHF spectrum makes this affordable. Boosters, on-frequency and/or using underutilized

yields an additional 42 MHz in the urban settings where it is most needed. It would be nice if there was a little set-aside for wireless microphones and unlicensed low-power links, and we save the radio astronomy band." These are small problems that could be solved with the same refarming.

"The broadcast 54 MHz can be modulated in a number of ways, with a number of compression schemes, but let's stay true to the broadcasting objective and make it very robust, but recognize that there is also some purpose in high-quality/high-bit-rate services," Fred continues.

"Thus we do 1 bit/Hz kind of things mostly (payload, after heavy error correction) and we do mostly advanced codec kind of things with 300-500 kbps range for video; but some things not destined for the portable world are sent

FROM THE  
**EDITOR**



Paul McLane

at much higher bit rates and lower robustness, preferably as an 'enhancement' signal." Wire what sits still; use RF for what moves, he argues.

"Now, let's bring into the multiplex all of the radio in a market — AM, FM and HD and all of the community outlets we can make good use of — and run them at about 50 kilobits per second.

"Why? Because we can also solve a lot of radio's distribution issues as AM sinks in the noise, and FM gets blocked by buildings. Eventually, the old broadcast spectrum might find a better purpose, though garage door openers and Bluetooth probably aren't it."

This super-robust broadcast system can be configured as a market pleases, Fred believes. It would not be unreasonable to have 150 radio services and 40 SD TV services, all with maximum penetration to highly portable devices, and still have half the spectrum left for upping the basic bit rates or HD — or whatever.

"That 'whatever' surely means that the next generation of devices will support upgradable codecs, etc. 'Whatever' also means that broadcasters will still have some bandwidth for yet-unthought-of advanced services."

## HARD TO FACE

As a broadcaster, Fred's fundamental impulse is to save the spectrum for whatever we can come to do with it, because it is our future. "But I think I've been wrong," he said. "What I need is bandwidth that is *easily receivable* (not 'spec-

*(continued on page 10)*



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# WARNING

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to use FEMA's Integrated Alert Public Warning System and to distribute emergency messages via Common Alerting Protocol v1.2 — and, ultimately, how that will affect broadcasters.

In addition to helping develop "best practices" for the broadcast industry, the group has expressed some concerns about the timing of the proposed national EAS test and conformance testing of CAP-compliant EAS equipment by FEMA and the FCC. BWVG also seeks to be a resource for broadcasters who want to file comments with the FCC once the commission acts on Part 11.

The group formed in the fall of 2010 and consists of Rudman, vice-chair of the California EAS State Emergency Communications Committee; Adrienne Abbott, chair of the Nevada SECC; Clay Freinwald, chair of the Washington State SECC; Ann Arnold, president of the Texas Association of Broadcasters; Suzanne Goucher, president of the Maine Association of Broadcasters; engineer/blogger Barry Mishkind; and David Ostmo, director of operations for KABB/KMYS(TV) in San Antonio.

The group has an EAS wish list of sorts, with goals like clarifying how the Governor Must Carry message will work and developing a more streamlined way to adopt codes used by local EAS participants including emergency managers.

"There are so many technical pieces that have to fit together yet for [next-gen EAS] to work. The other members and I felt the need to address some of the issues others were not asking about," Rudman said. "Especially with the biggest piece to puzzle to come yet when the FCC issues its NPRM to overhaul and completely rewrite Part of 11 of the rules."

Still other questions need to be answered, according to the group.

BWVG was formed, according to its founders, because it perceives a lack of leadership in national EAS discussions by any broadcast engineering interest. Freinwald said he continues to support the Society of Broadcast Engineers though its EAS committee has refocused its efforts "on education and training at the station level."

SBE President Vincent Lopez responded that the society has always had an education emphasis and that at times the leaders of its EAS efforts "have engaged in a broader public warning conversation and even helped our industries make better decisions by their participation."

"At the October 2010 SBE Board of Directors meeting, SBE reaffirmed its commitment to be an important source

(continued on page 6)



KKOH(AM), Reno, Nev. is the Local Primary 1 station for the Western Nevada/Eastern California Operational Area. PD Dan Mason, left, is a member of the SECC. Here, he's supervising broadcast of an EAS RMT called in by a local public safety official. Former board op Roger 'Sgt. John' Clement is at right.

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## WARNING

(continued from page 5)

of EAS education and information for our members.” This is not a departure, he said, but rather, “a re-committal to the core mission of the SBE,” adding that SBE EAS Committee has been renamed the SBE EAS Education Committee.

### ‘FULLY ENGAGE’

Freinwald’s public warning experience includes 10 years as chair of SBE’s EAS committee. He said the new BWWG effort really is a call to action for all broadcaster engineers.

“If we don’t speak up as a group we’ll have no voice in what comes along. We must fully engage with FEMA and the FCC to get this done,” said Freinwald, whom Radio World recognized for contributions to the national EAS infrastructure with its Excellence in Engineering Award in 2007.

Alerting observers contacted for this article believe the FCC will address EAS equipment requirements and certification in the pending new Part 11 rules. It’s



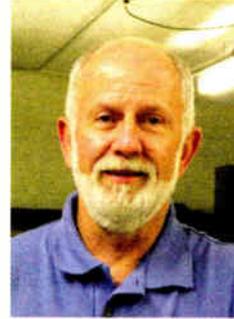
**Texas Association of Broadcasters President Ann Arnold is a member of the Broadcast Warning Working Group.**

unclear how the FCC will handle testing for both EAS protocol and CAP decoding.

“It could be a simple certification on the part of the manufacturer or possible submission to an authorized test lab facility for certification,” said Rudman.

EAS participants must adopt CAP-EAS technology by Sept. 30, 2011. Rudman said the timeline for broadcasters to implement the system is going to be tight, considering the FCC hasn’t yet proposed new Part 11 rules. Encoder/decoder manufacturer Sage Alerting Systems estimated in March that the number of broadcasters with CAP-ready hardware is 25 percent.

Separately, FEMA is evaluating EAS equipment to determine if each device can accept and process messages as specified by CAP v1.2 protocol in the IPAWS profile. While not specifically certifying EAS gear, FEMA will post test results to a database as part of the IPAWS



**Clay Freinwald. ‘We must fully engage with FEMA and the FCC to get this done.’**

Conformity Assessment Program on the Responders Knowledge Base website and hoped to do so in March.

The BWWG is concerned about the Governor Must Carry (GMC) message and specifically mentioned some of those issues in its 2010 FCC petition. The GMC message is a new, mandatory gubernatorial alert. Details are expected to be included when the FCC acts on Part 11.

### GUBERNATORIAL ALERT

“Will one governor’s activations in one state be mandatory for stations in neighboring states?” the group asked in its petition.

“What will be required of stations licensed to one state but with studios in another? Who will design the protocols for cross-border activations? Both FEMA and the FCC have apparently left details of these provisions up to volunteer state and local EAS committees.”

GMC, Freinwald said, is the wildcard in all of this. “How this gets done will determine whether broadcasters will be able to just add a CAP convertor to an existing EAS box. That is a tricky area because there is nothing in a

(continued on page 8)



Selected content from Radio World’s “The Leslie Report” by News Editor/Washington Bureau Chief Leslie Stimson.

## DCC TRIAL UNDER WAY; FCC EASES A RESTRICTION

The FCC says it’s okay for non-commercial AM stations in Alaska to install Dynamic Carrier Control with no further authorization; they need only to send in notification, according to Nautel. The commission will modify the license accordingly. Previously, those stations needed experimental authorization to use DCC.

Alaska Public Broadcasting Inc. filed the paperwork with the FCC seeking the permanent waiver.

For now, at least, the exception is only for non-com AMs in that state. Alaska Public Broadcasting has 11 AMs, and the FCC database shows only two additional non-com AMs in Alaska. There are 45 commercial AMs there, according to the commission’s records.

Nautel DOE Tim Hardy has been championing this technology, which uses carrier control algorithms in AM transmitters to save stations money on operating costs by reducing the carrier without reducing overall transmitter power. Hardy has published a paper with technical details at [www.nautel.com/articles/saving\\_power/](http://www.nautel.com/articles/saving_power/). The technique is recommended for high-power AM transmitters.

“This technology has been an option on our high-power AM transmitters (greater than 100 kW) since the mid-1990s,” said Hardy. He said several versions of the concept were developed in Europe in the 1980s to combat rising power costs. “We made it a standard part of our NX series transmitters, which are available at 25 and 50 kW in the U.S. DCC offers a tremendous power savings advantage for broadcasters willing to implement it.”

Alaska Public Broadcasting Inc. is testing two

versions of Dynamic Carrier Control: Dynamic Amplitude Modulation (DAM), commercialized by AEG Telefunken, and Amplitude Modulation Companding (AMC), tested by the BBC. Both systems are used in several countries. With DAM, the carrier is suppressed in relation to the modulation level. With AMC, the carrier is suppressed as modulation increases, according to the paper referenced earlier.

Alaska Public Broadcasting Inc. Director of Engineering Chuck Lakaytis said saving on power costs is a big deal anywhere, but especially in Alaska, where diesel fuel cost more than \$7 a gallon last summer.

Lakaytis earlier obtained experimental authorization to use DCC on two transmitters, KOTZ(AM) in Kotzebue and KDLG(AM) in Dillingham. In Kotzebue, the station is using the Dynamic Amplitude Modulation technique with a Harris DX-10 transmitter; those tests began in March. In Dillingham, KDLG is using a Nautel XR-12 transmitter; Nautel provided a special DCC system using Amplitude Modulation Companding from a modified digital exciter from its NX series.

In four months of operation, DCC is saving KDLG 27 to 30 percent a month on the site’s electric bill, according to Lakaytis. He estimated electricity costs at Dillingham at around 30 cents per kilowatt hour now, and as high as 48 cents per kilowatt hour.

Nautel believes DCC may have application in the rest of the United States if the FCC gives commercial and non-commercial AMs permission to use the technique. The FCC doesn’t allow DCC operation because DAM and AMC violate commission rules governing carrier shift and on maintaining licensed power levels.

While there’s no request in yet to the FCC to expand permission to use DCC, Lakaytis says his legal and consulting engineering experts believe after the commission sees that the technique works



istockphoto/frank Ramsport

and saves money for several stations for a year or so, someone would request a rule making to expand the use of DCC for AM use.

Hardy estimates that for the average high-powered AM transmitter, DCC would save 30 to 50 percent off power consumption for the transmitter itself. “It would be fairly easy to save \$20,000 a year if you have a 50 kW AM transmitter running 24/7, based on modest electricity rates of 10 cents per kilowatt hour.”

Lakaytis says KDLG has not experienced a decrease in audio quality or coverage since it began using DCC. He plans to expand DCC to five other Alaska Public Broadcasting AMs that have 10 kW transmitters, in Bethel, Barrow, McGrath, Valdez and Homer. KYUK(AM) Bethel and KBRW(AM) Barrow have Nautel transmitters and will use Nautel DCC equipment. KSKO(AM) McGrath, KCHU(AM), Valdez and KBBI(AM) Homer have Harris DX-10 transmitters and will use Harris DCC equipment.

So far, the technique is being used on analog AMs. Lakaytis is curious to see if DCC and HD can work together, he said.

He was scheduled to present a paper on how DCC is working in Alaska at the NAB Show; Nautel conducted a webinar on the topic which you can find at [www.nautel.com/webinars/](http://www.nautel.com/webinars/).

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## RDS RT+

(continued from page 3)

RT+ receivers have come to market in the United States. Microsoft Zune products first supported RT+ with a software upgrade. Since then, the Microsoft Zune HD supports RT+ for analog only, meaning non-HD Radio stations, and Apple added an FM tuner with RDS and RT+ support in its fifth- and sixth-generation Nano players.

Figs. 1 and 2 show Zune HD and iPod Nano using RT+ to parse a song's title/artist/album from the RT. The fifth-generation iPod gives you the ability to "tag" the song for later download by pressing and holding the center button. On the sixth generation you just touch and hold the "tag" icon on the bottom, left-hand portion of the screen.

The next time you connect your Nano to your computer and launch iTunes, you can view your tagged songs and buy them. The Zune HD has an icon at the bottom right-hand side of the screen with a shopping cart; click on that and it's added to your cart.

Because the Zune HD has built-in Wi-Fi (802.11) support, you can actually purchase that song and download it to your Zune HD immediately by going to the "Marketplace" software store from the Zune HD.

(Note that the Zune may be on its way out; Microsoft reportedly is set to abandon its player due to poor demand, though that had not been confirmed by the company at this writing.)

### THE FUTURE

The RT+ standard is future looking.

While today's available receivers in the United States support just artist/title/album tagging, there are some other promising things you can tag.

There are more than 60 content types available for use today. Fig. 3 shows a few I think hold the most promise. If broadcasters start widely tagging for some of these new features, hopefully receiver manufacturers will start supporting them.

To see the full list of content types available in the standard, see Annex P, Table P.2, Pages 155–156 of this document: [www.rds.org.uk/2010/RDS-Specification.htm](http://www.rds.org.uk/2010/RDS-Specification.htm). You must request a free password.

Title, artist and album are just the beginning of the things we can tag. Looking at the list available to us, we have the ability *today* to tag phone numbers, websites, text campaigns, addresses and times and dates. This is what the industry has been dreaming about *for years*.

Imagine being able to run an advertisement from a client, displaying their name, address, phone number and website. We can now encode these using

Code	RT+ Class	Description
1	Item.Title	Title of the item on the air; i.e. song title
2	Item.Album	Album of item on the air
4	Item.Artist	Artist of the item on the air
29	Info.URL	Link to a URL (web page)
31	Stationname.Short	Short name describing station
32	Stationname.Long	Long name describing station
36	Program.Host	Host of the current radio show
39	Program.HomePage	URL (web page) for radio station home page
41	Phone.Hotline	Telephone number of the radio station's hotline
42	Phone.Studio	Telephone number of the radio station's studio
43	Phone.Other	Other telephone number
44	SMS.Studio	SMS (Text Messaging) number for studio
45	SMS.Other	Other SMS (Text Messaging) number
46	Email.Hotline	E-mail address of the radio station's hotline
47	Email.Studio	E-mail address of the radio station's studio
48	Email.Other	Other e-mail address
59	Place	Address information for a location
60	Appointment	Date and time information for an event

**Fig. 3:** Here are content types from the RT+ standard that the author believes hold the most promise. 'If broadcasters start widely tagging for some of these new features, hopefully receiver manufacturers will start supporting them.'

## WARNING

(continued from page 6)

legacy EAS box to generate a GMC. The legacy boxes could all be rendered useless depending on how the language is written."

BWWG said states will have new roles and responsibilities with next-generation EAS. States will need to update their plans once the capability is introduced. Broadcasters will need to ensure their ability to accept such messages and get them on the air. The technical requirements for the mandatory governor's message will necessitate an integrated CAP-EAS encoder/decoder.

The group has expressed concern over the timing of an EAS national test, which could take place as early as this fall. The first Emergency Alert Notification live code activation will be designed to test radio stations' ability to forward the president's message.

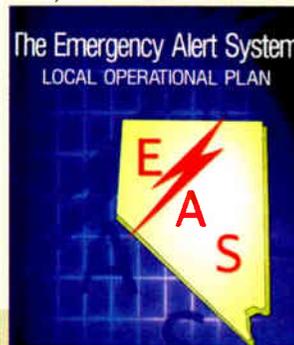
"Testing with CAP just barely in place could do more harm than good to the overall perception of EAS effectiveness on the heels of what is being presented as a major EAS upgrade," the group wrote in a recent FCC filing.

Organizing to present one voice to the commission on public warning issues is crucial, Abbott said. She said the goal of the group is to make sure the concept of next-generation EAS doesn't get lost in the implementation process and



**Group member Suzanne Goucher, president of the Maine Association of Broadcasters, is shown giving an EAS presentation in 2005. BWWG includes two state broadcast association presidents and three SECC leaders.**

Courtesy of Adrienne Abbott



**The Nevada Broadcasters Association paid for orange and blue binders that were printed up for the Western Nevada/Eastern California EAS plan and distributed to radio and TV stations covered by the plan as well as cable operators and emergency managers.**

that it works as intended.

"We aren't scientists or sociologists, but for years we have been the ones who have had the job of making sure EAS works. We're the folks who push the buttons, open the mics and tell people there is a big, bad problem coming and this is what they've got to do to stay alive," Abbott said.

"The process is on track — we're just not sure if the road is paved all the way to the end."

While CAP will lead to messaging over a variety of platforms, like cell phones and the Internet, BWWG believes broadcasters will always maintain the most crucial role in the system.

"The warning is the headline for the story or emergency. Then you have to deliver the information and that is what broadcasters always will do better than Twitter, reverse 911 or the cell phone," Rudman said.

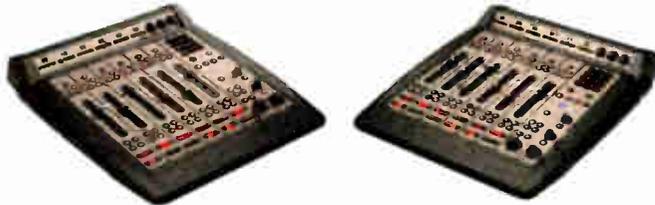
Interested parties can participate in BWWG's listserv at [eas.radiolists.net](mailto:eas.radiolists.net).

Comment on this or any story. Write to [radioworld@nbmedia.com](mailto:radioworld@nbmedia.com) with "Letter to the Editor" in the subject field.

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How long will this deal last? Frankly, we don't know. But you should probably snap it up before someone comes to their senses. Oh, and even though it's our "NAB Special," you don't have to come to NAB to get it — *just call us!*



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## NEWSROUNDUP

**AD DICTATES:** Stations now must certify they have a non-discrimination clause in advertising sales contracts, and the FCC has emphasized it intends to enforce the requirement. Minority Media and Telecommunications Council President/Executive Director David Honig estimated that such dictates drain about \$200 million a year from minority broadcasters.

**ADVISOR BILL:** The SBE continues lobbying Congress to authorize each FCC commissioner to add a professional assistant — an electrical engineer or a computer scientist — to his or her staff. SBE leaders including President Vinny Lopez visited a dozen congressional offices. Sens. Olympia Snowe,

R-Maine, and Mark Warner, D-Va., have introduced S. 611.

**PPM:** The Media Rating Council has accredited Arbitron's PPM for use in 11 more markets: Atlanta; Cincinnati; Cleveland; Kansas City; Milwaukee-Racine, Wis.; Philadelphia; Phoenix; Portland, Ore.; Salt Lake City-Ogden-Provo, Utah; St. Louis; and Tampa-St. Petersburg-Clearwater, Fla. Thirty-four PPM markets remain without MRC accreditation.

**'PHILLIES 24/7':** WOGL(FM) Philadelphia is dedicating an HD4 channel to the Phillies. The team and CBS Radio say it is the first HD Radio multicast station dedicated to a Major League Baseball team. Sister WPHT(AM) is the Phillies flagship.

## UHF

(continued from page 4)

trum' per se); our future might depend more on ubiquitous broadband and less on the spectrum we 'control.'"

He thinks broadcasters, like foresters, can over-produce and fragment revenue streams to the point that no matter how many operators they lay off or national automated services they create, they can't pay the bills. "I doubt anyone would disagree that even now there are allocations or stations that simply could never survive. It's difficult to do good broadcasting when even the best have their audience and revenue severely diluted.

"A little scarcity can be a powerful good. My point is that 54 MHz might well be all broadcasters can reasonably support with 'free' programming, and that is the deal, after all: free spectrum (add a transmitter to get to cheap bandwidth) in return for free programs and some community service. After all, we want to preserve the broadcasting social contract."

Paying for this are the broadband customers who will, over time, through their service providers, subsidize the new infrastructure and retire or upgrade those flat screens. "Of course, by time this happens, we'll all want 3D, and 62-inch 4K screens will likely cost less than four tanks of gas. One has to consider where the puck will be in five years. Instead of paying for transmitters, stations would pay for their portion of the bandwidth. It should be a wash if not a savings.

"The FCC might also see fit to turn some of this bandwidth over to communities and noncommercial and emergency signaling and communications. Public safety entities don't need broadcasters in this model for emergency communications; all they need is bandwidth and support at the device level. Rather than underwrite noncommercial and educational stations, their support can be the gift of free transmission.

"At the same time, states and localities might be given more input on how the resource is used. If broadcasting is local, then why is the federal government the sole regulator/administrator?"

"As a station, if you told me that for the next 10 years there would be no talk of spectrum fees; and I'm not expected to pay for the transition or even EAS; and I get fair price access to enough bandwidth to do adequately what I do now (or could do now); and all that was requested is that I be a broadcaster ... I'd take that deal."

Fred Martins knows this is a long shot, but he concludes that reforming the UHF "broadcast" band could make the business healthier, provide much better coverage, better serve community needs and wants, "fix a bunch of annoying problems, future-proof the broadcast franchise and give society wireless broadband perfect for growing next-generation broadcasting."

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# ‘I Found It in That Coffee Cup’

So, What the Heck Is It Anyway?

A couple of weeks ago, Hall Communications Vice President of Engineering Edd Monskie stopped in at the company’s AM station in Lancaster, Pa.

## WORKBENCH

by John Bisset

Read more Workbench articles online at [radioworld.com](http://radioworld.com)

That studio has an old coffee cup sitting around, as do so many stations, filled with dried-up pens, pencils with broken points, dry Sharpies, rulers, broken rubber bands, twisted paper clips and assorted other things.

There, among the detritus, Edd found the item shown in Fig. 1. Do you know what it is?

Edd does — but he has no idea how it ended up in that coffee cup or how long it had been there. The station has been at its current location since 1993 and has been fully computerized since it moved (a fact that gives you a hint). Read on for the answer.

Not all remote transmitter sites are equipped with running water and a sewage disposal system. Waterless or composting toilets can run on solar, 12 VDC or 120 VAC but cost \$1,600 and up. Most RV and marine units need a holding tank and some source of liquid.



Fig. 1: What is it?

So, as you outfit your facility with emergency supplies, what to do about waste?

Engineer Bob Meister of Hamden, Conn., found the Go Anywhere portable toilet, made by Cleanwaste ([www.cleanwaste.com](http://www.cleanwaste.com)). This collapsible, easy-to-assemble toilet is affordable and folds to the size of a small briefcase. For once-a-year emergencies, this might be worth having in your vehicle or at a remote site. Find it at outdoor suppliers like REI, or at Amazon.

WAIMIK, Bob Meister, can be reached at [waimik@comcast.net](mailto:waimik@comcast.net).

(continued on page 12)

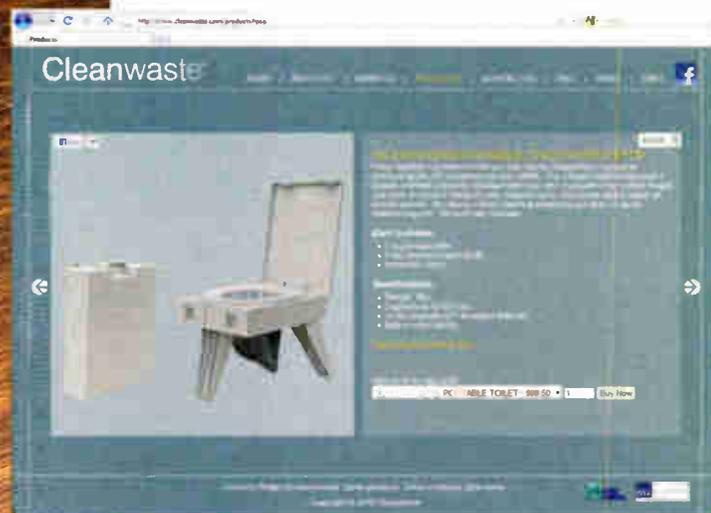


Fig. 2: Go, potty, go!

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## WORKBENCH

(continued from page 11)

**H**as the following ever happened to you?

When running premade Cat 5 cables, the lengths never end up exactly where you want them. The excess can be coiled up or looped, but where? Usually hanging down and running on the floor behind the rack. Sound familiar?

Gary Wachter, director of engineering for Service Broadcast Group of Grand Prairie, Texas, found a solution we all can use.

“Neat-Patch” is just that: neat. It has the standard wire management fingers in front and a vented storage box in the rear. The excess cables can be coiled up inside and the ends brought out to the network switch, patch panel or Logitek JetStream Mini engine (as pictured in Fig. 3). Open the panel and the cables are tucked neatly inside, as in Fig. 4.

There is room inside for other small devices or adapters that you would want to hide. Four large round openings in the box section can be punched out and fitted with rubber grommets for cable entry if you desire.

When you're finished dressing the cables, just snap on the cover panel, and everything is hidden.

Check out the Neat-Patch line at [www.neatpatch.com](http://www.neatpatch.com) for product description and distributors. Gary purchased it at an Altex Electronics store; visit [www.altex.com](http://www.altex.com).

Gary Wachter can be reached at [garyw@k104fm.com](mailto:garyw@k104fm.com).

**O**K, about the tool in Fig. 1. This was used to align the many heads of an IGM 48-tray Instacart automation system.

You'd put your head alignment cartridge on the removable tray and slip it in along with the tray, the tool resting on top of the test cart. You'd wiggle the tool to position the open end over the playback head, then manually start the tray playing while monitoring the output with a meter and scope. You'd twist the tool clockwise or counter-clockwise in short, snappy motions to try to find the peak of the high frequencies (and the proper phase, if you had a stereo Instacart).

While performing this procedure, you could not use the other 47 trays to

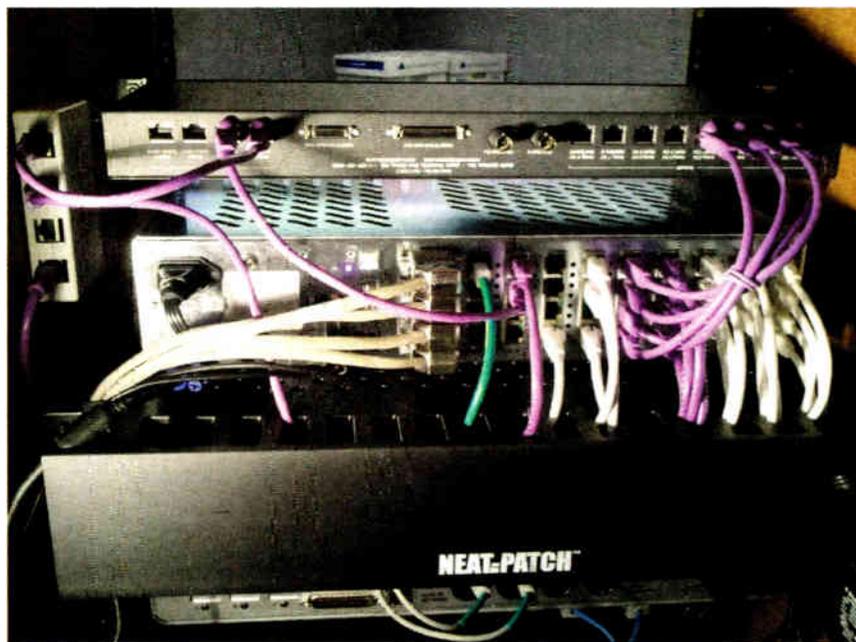


Fig. 3: Neat-Patch hides Cat-5 cable.

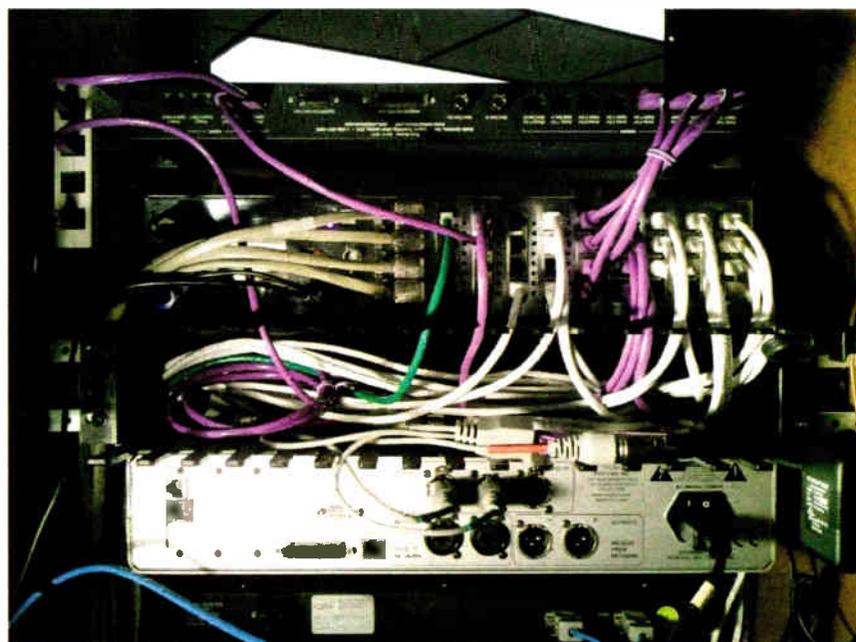


Fig. 4: The back door provides quick access.

play spots because there was only one stereo output for the entire 48-cart unit. You either changed programming to use your second Instacart — if you had one — or you came in overnight to do the alignment.

Fortunately, the system heads required alignment only about once a year, unless you got aggressive while cleaning heads and moved them a bit.

But Edd Monskie reminds us that the heads did have to be cleaned weekly, as with any heavily used cart system, or else they'd start missing stop and aux tones and might produce some pretty bad audio. A cart that didn't recue properly might fire off other carts that were programmed to play. *and* you might have a half dozen or more sources playing at once.

Sometimes the heads even came loose

and wobbled. That required removing the entire tray assembly, with the solenoid, out through the back to tighten up the head.

Usually by the time you had aligned half of the 48 individual heads, your hand was raw. Edd cut his engineering teeth on carousels at his first job in Michigan: he'd tape padding on the tool handle to preserve what flesh was left in his palm. The tool might look half like a pretzel by the time the job was done. This one is almost pristine; it shows only slight twisting.

Programming the system took some planning. Depending on the number of carousels available, your traffic department might have to make sure there was enough cue-up time to allow a carousel to eject a cart, rotate, pull the next tray in and be ready to play the

**C**lay Freinwald's recent column in the newsletter of SBE Chapter 124 brought smiles among the staff at Radio World.

He likes to offer tech tips. These should be made into a sign for posting in the shop at your station.

**1** You only need two tools in life: WD-40 and duct tape. If it doesn't move, but should, use WD-40. If it shouldn't move and does, use the duct tape.

**2** If you can't fix it with a hammer, it must be an electrical problem.

**3** Opportunities always look bigger coming than going.

**4** Junk is something you keep for years and throw away three weeks before you need it.

**5** Someone who thinks logically provides a nice contrast to the real world.

**6** Blessed are they who can laugh at themselves for they shall never run out of material.

Number 4 is my favorite. Send me your own rules to live by.

Write to [johnpbisset@gmail.com](mailto:johnpbisset@gmail.com).

next cart while the other carousels were playing. (Then some brain surgeon in production might complicate things by putting a 30-second spot on a 100-second cart.)

Edd later moved to Lancaster, where he found that the bookkeeper's office still had two old ATC Stack 55s on one wall. This system used one large, threaded shaft moving a full ATC playback deck — the same size as the later Gates Criterion 80 decks — up and down to one of 55 carts that could be loaded in. Each Stack 55 was a full 7-foot rack height and must have weighed several hundred pounds.

It's amazing what we used to work with. Edd, like many readers, could go on ... How about Scully 270 reel-to-reels? What's your favorite piece of nostalgia radio broadcast gear?

Edd Monskie can be reached at [emonskie@hallradio.com](mailto:emonskie@hallradio.com).

John Bisset marked his 40th year in radio in broadcasting recently. He works for Tieline Technology and is a past recipient of the SBE's Educator of the Year Award. Reach him at [johnpbisset@gmail.com](mailto:johnpbisset@gmail.com) or (603) 472-5282. Faxed submissions can be sent to (603) 472-4944.

Submissions for this column are encouraged and qualify for SBE recertification credit.

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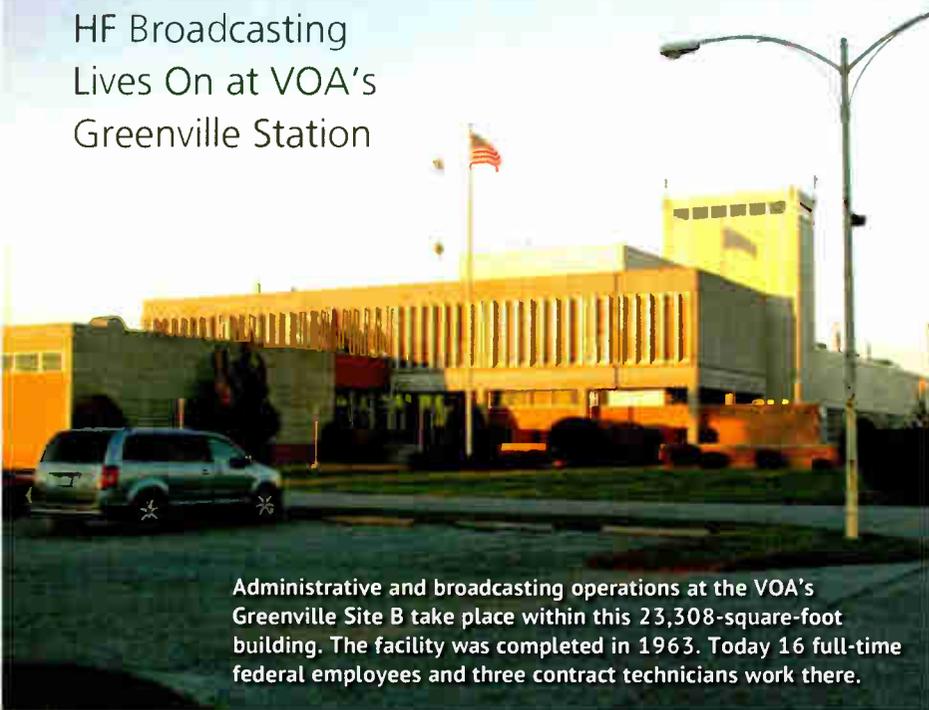
## AUDIO LOGGING



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# 48 Years Old and Still a Flamethrower

HF Broadcasting  
Lives On at VOA's  
Greenville Station



Administrative and broadcasting operations at the VOA's Greenville Site B take place within this 23,308-square-foot building. The facility was completed in 1963. Today 16 full-time federal employees and three contract technicians work there.

Photos by James O'Neal

the facility, the last U.S.-based shortwave broadcasting center, at an estimated cost savings of \$3 million per year.

When the station first took to the air in February 1963, it was one of three VOA facilities constructed here. The sites were designated "A," "B" and

"C," and ringed Greenville, forming a triangle with its vertices roughly 20 miles apart. In its heyday, the Greenville operation was the largest broadcasting site in the world.

Site C served as the operation's "receive" site and was linked to the VOA's Washington studios by both a dedicated interstate microwave system

*(continued on page 16)*



BY JAMES E. O'NEAL

**GREENVILLE, N.C.** — Radio World toured VOA's Greenville, N.C., facility recently. Photos from our visit are shown here.

Few would dispute that there has been a marked decline in shortwave broadcasting listenership since the end of the Cold War in 1991. Many former large-scale international broadcasters have cut schedules sharply, or have ended HF radio transmissions altogether.

While the International Broadcasting Bureau, which oversees Voice of America operations, has closed a number of its domestic and overseas transmitting facilities (relay stations) and moved into placement of programming on AM and FM outlets in countries where a VOA presence is desired, it still provides thousands of hours of programming for shortwave listeners every month.

At one time the government's domestic HF broadcasting activities involved several large shortwave transmitting plants located in Ohio, California and North Carolina. Today, only one remains; it's located here amid Carolina farm land and forests just a few miles from downtown Greenville. It's officially known as the Edward R. Murrow Transmitting Station and actively beams out programming in the international broadcasting spectrum on a daily basis.

Whether it will remain active much longer is in question. As part of a 2011 budget submission, the Broadcasting Board of Governors proposed closing



▲ Greenville Site B remains the single largest radio broadcasting plant in the United States. The transmitter building houses eight very large transmitters — all typically operate at 250 kW and two can provide 500 kW of HF energy if required. There's also a 50 kW unit kept for backup and testing purposes. It was most recently used for evaluating DRM performance in the HF bands.

▶ This switch gear funnels the large amount of commercial AC power to the facility's various transmitters. The station consumes approximately 1 million kilowatt hours of electricity each month.

▲ Greenville Transmitting Station Chief Engineer Macon Dail and Plant Supervisor Eric Kehew hosted our tour. They're seen at the control console for one of the Continental 500 kW units. The transmitters at Greenville come from several manufacturers, including AEG-Telefunken, Brown Boveri Corp., Continental and General Electric. The earliest date back nearly 50 years, having been installed when the station first went on the air.



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## VOA SITE B

(continued from page 14)

and AT&T Long Lines service. It distributed programming to transmitters located at the "A" and "B" sites, and also served as an administrative center. Equipment installed at "C" included a large number of HF antennas and diversity receivers for reception and relay of shortwave broadcasts from anywhere in the world.

That facility was closed and dismantled in the mid-1990s, with a consolidation of operations to the "A" and "B" transmission sites.

Site A was deactivated several years ago and placed in "mothball" status, leaving Site B as the only operational Greenville VOA facility.

Although its operations have been scaled back from the "glory days" of 40 or so years ago and its future has been put in question, Site B still ranks as the largest radio transmitter plant in this country and, at least for now, remains an active and impressive radio broadcasting facility.

► You don't cool tubes in a 500 kW transmitter by just blowing on them. A very large supply of chemically pure non-conductive cooling water must be circulated between transmitters and heat exchangers. These are some of the pumps, reservoirs and cooling lines installed at Greenville's Site B for that purpose.



Photos by James O'Neal



## Good enough?

With the increasing popularity of streaming websites, tinnny laptop speakers or poorly encoded MP3s...

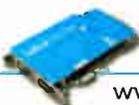
should audio quality no longer matter?

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▲ The conductors seen here provide an indication of the magnitude of voltages and currents encountered in the massive transmitters.

▼ This building is located behind the main transmitting plant and encloses a massive remotely-controlled high-power RF routing switcher for channeling transmitter outputs to various antennas.

Some 25 miles of heavy open-wire feeders connect the high-power RF routing switcher to the site's 38 transmitting antennas, which are spread across nearly 2,800 acres of North Carolina countryside.





◀ Other than the airing of recorded identifiers, all audio transmitted from Greenville is produced in Washington studios and delivered to the transmitting station via satellite. Audio feeds are monitored in this control room located between the plant's two transmitter corridors. At present, the station transmits some 2,300 hours of programming each month.

▶ Thousands of spare parts are available on-site to keep the VOA transmitters operational.



## We're Ready For CAP (so you can be, too)

SAGE DIGITAL ENDEC

11-30-11 09:26:41  
MENU NEXT 1056

Enter

▲

▼

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Incoming Alert

Outgoing Alert

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Automatic

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### New EAS Rules

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SAGE

▲ As seen on page 1, this high-band/low-band curtain antenna is one of many used to beam signals to Cuba, Latin America, Africa, the Middle East and Europe. It's one of 16 curtain arrays, which provide gains upwards of 20 dB over a reference dipole. Two of the curtains installed at the site are electrically-steerable through 48 degrees of azimuth. The VOA Greenville facility HF antenna inventory also includes 20 rhombics, two log-periodics and two dipoles.

# Sage Digital ENDEC Impresses

You Get Digital I/O, Network Capabilities, E-mail, Auto Scheduler — and No Paper

## PRODUCT EVALUATION

BY AMANDA ALEXANDER

The Digital ENDEC from Sage Alerting Systems has a sleek look, digital I/O, network capabilities, e-mail and FTP capabilities, online interface and automatic scheduler. Compared to what I am used to in an EAS unit, it is a much-needed improvement.

In an effort to gain early compliance with the new EAS/CAP rules, Crawford Broadcasting Co.'s Denver cluster recently received four Sage units.

My first impressions were good. They look crisp, the color is bold and they really stand out in our control rooms. I love the fact that there is no onboard printer or paper tape to mess with. The unit is 2 RU high and it has a small display with four buttons as the controls. Connecting it was no problem as everything was marked clearly. I was able quickly to transfer the connections from the old units to the new. I did run a new AES cable so we could connect the units up using their digital outputs, something we could not with the older units.

In addition to analog, the Sage units provide both digital inputs and outputs. This allowed us to remove one of the last analog sources in our otherwise all-digital studios.

This unit provides more features than I know what to do with, things I've never had on an EAS unit. While my experience is with our older TFT EAS 911 units, I suspect my comparison

applies to other legacy EAS equipment as well.

### NO PAPER RUNS

Most notable is the lack of an onboard printer and paper tape.

For so many years we have had to deal with printouts that come straight from the unit. It could be a hassle at times because a unit might malfunction or we could have several activations, usually weather

station log.

Having access to equipment via the Internet is something we are seeing more of each year. The Digital ENDEC now gives us this capability with our EAS equipment.

For years we have had to rely on board operators or engineers to babysit the EAS units to make sure a test was sent each week. We are all human and we make mistakes. There are times when a board op gets busy or has a lapse in memory and forgets to run the weekly test (RWT). It's part of my job to check



Jorge Carballo, at left, is the operations manager of 810 KLVZ.

before the end of each week to be sure the RWT has run.

I am usually busy from the time I walk in the door until the time I leave work; it's not always convenient to go into each control room to check on our four stations to make sure we have received and sent the required weekly and monthly tests.

To top it off, we have never been able to have our automation system take care of EAS tests for us so one is never missed. These units not only can be monitored from a distance with the click of a mouse, but can be used with an automation system.

We are unable to interface the Digital ENDEC via TCP/IP with our RCS NexGen digital media system; RCS and Sage are working on the drivers and code to make this work. Until then, we are able to rely on the unit itself to run the tests for us automatically with the built-in scheduler.

The scheduler allows for either a standard or randomized time each week to run a test. Although the schedule is randomized, you don't lose the ability to edit. If you choose not to interrupt paid programming or would rather run the test only when a board operator will be present, you can make that happen.

Another way to not interrupt a program element is to use the commercial tally the unit offers. You can use a hold-off feature to prevent activations

### PRODUCT CAPSULE

#### SAGE ALERTING SYSTEMS Digital ENDEC

##### Thumbs Up

- + Network allows more flexibility with monitoring
- + E-mail to allow engineers/managers to track tests
- + Automatic scheduler makes sure tests aren't missed due to board op error

##### Thumbs Down

- Amount of paper used when set up to print
- Password override not obvious

Price: \$2,695

For information contact Sage Alerting Systems in New York at (914) 872-4069 or visit [www.sagealertingsystems.com](http://www.sagealertingsystems.com)

and tests other than EAN/EAT from being aired during commercial breaks. This will only hold off an alert for 15 minutes, though.

### QUICK PROGRAMMING

Sage provides a free program with the unit, ENDECSetD, for programming and configuration via the Digital ENDEC's Web interface.

The program is run and options are set, then the configuration is saved to a file. I can then log as administrator into the Digital ENDEC's Web interface and upload the saved configuration file to the unit. Because it is a saved configuration file, it's easy to open up the file, change the settings to another station and save it under a new name for that station. This allows for quick programming of multiple stations in a single market.

ENDECSetD provides a tabbed menu system, which makes figuring out what to do fairly simple. In addition to setting up call sign, FIPS codes and the like, we are able to set up e-mail addresses to be notified or FTP sites for upload when alerts come through or are sent out. The alerts only include incoming tests that might be forwarded as well as any test sent out by the unit. You can also tell whom to send the e-mail to.

With FTP you have one choice of where to upload the report; with e-mail, you can put in as many recipients as you want. I have set up our operation managers with this so they can better keep track of the sent tests for their station, as well as myself. With no paper tape to look at, a weekly test could otherwise easily be forgotten. The e-mail notification provides a good backstop if used correctly.

(continued on page 22)

warnings, in one day (especially in the spring). This would cause a long paper run in the control rooms.

I am not big into the whole "green" movement, but one thing I have never enjoyed is wasting paper. I am now able to print out all the tests and activations for a week on a single piece of paper and include any discrepancies. I then use this piece of paper as part of the

At work in the rack.





Why do Axia consoles do phones best?  
(Hint: who's *your* daddy?)



Other consoles treat phones like an afterthought. But Axia's parent company is Telos, so phones are part of our DNA. Consider our Element AoIP console, and the Telos VX broadcast VoIP phone system. Both amazing on their own. But when you connect them — magic. Total integration, so talent can run complex talkshows without taking their hands off the board. Effortless. A dedicated hybrid for each caller, each assigned to its own fader, with automatic mix-minus and talkback. Painless hookup via CAT-5 — no extra I/O or logic connections required. An all-digital path for crystal-clear caller audio, even from cell phones. That's the Telos connection. And only Axia gets it. Axia: the console that talks Telos.



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there's not a single  
person in America,  
who's listened to  
the radio in the last  
10 years, who  
hasn't heard an  
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 **AUDIOARTS**



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There has been a rumor going around that WheatNet-IP Intelligent Network is more expensive. Really??? NOT SO! We're here to say categorically - WheatNet-IP Intelligent Network is NOT more expensive. Some of our components may cost a bit more but are way smarter, can do far more, and eliminate expenses that less intelligent networks still need. While it's easy for others to make selective comparisons, when you add up all the costs for your network, WheatNet-IP comes out to just about the same money as the other guys. No marketing mumbo jumbo about your labor or performance here - we're talking straight hardware comparisons. Go ahead - configure your network and see. Of course we DO out-perform them by up to a factor of ten. And we DO save you great googobs of money by giving you a system that configures, runs and heals itself... Still, do a full-network hardware comparison and check it out for yourself! Operators are standing by...



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## SAGE

(continued from page 18)

Along with these e-mails or uploads to an FTP site, you can set up the unit to print to a variety of Hewlett-Packard network printers or a local (USB) printer, so if you wish you can have the unit print after each test.

The Digital ENDEC is designed so that when you go to the IP address you set for it, it takes you to a Web interface for the unit. There are two levels of access: operator and administrator.

The main screen shows the alert status. If there is an alert pending you can send it or kill it from this screen. You can abort sending a message and you can send a weekly test. All this happens with a mouse click.

On this Web interface you can view the logs, see a visual representation of the audio levels of the incoming stations and listen to a stream of the inputs through a media player. You can also upload firmware updates, retrieve the settings from the unit saved in ENDECSetD or restore the new settings to the unit. To restore, you go into the downloaded program mentioned, save it to your local computer, and then from the Web interface you restore the settings, select the file to restore and upload it.

### IMPRESSIONS

There are several things I really like.

The lack of paper would have to be number one. The Web interface has proven to be helpful by allowing printing of all a week's tests and activations onto a single sheet of paper. The fact that I am able to monitor the stations' tests from a remote location, such as my home, helps me to better keep track of what has been done each week and what still needs to be done.

The e-mails I and our operation managers receive have proven to play a key role in keeping us from missing sending out a weekly test. All this has made preparing and checking the EAS logs less time-consuming. I also like the internal scheduler, and when the standards for CAP 1.2 take effect, I will



be able to switch over with a firmware update instead of going out and spending thousands of dollars on a unit that has the newer standard. This will ease any worry that comes with updates.

resents an added burden for the board operator to remember and may lead to botched tests.

(Asked about this, Harold Price of Sage replied by e-mail, "The admin-

see a way around this, but it still seems wasteful.

Compared to what I am used to in an EAS unit, the Sage Digital ENDEC is a much-needed improvement. The features added have already eased my monitoring of the units. No longer do I have to worry about a board op sending a test when needed. I am able to view the logs and if no test has been sent for the week I can remotely force one using the unit's Web interface. The fact that I can monitor all our units from a single computer allows me to breathe easier knowing if there is an issue, I will most likely be able to figure out the problem without leaving my desk.

While there are some improvements yet to be made, I firmly believe this is the unit to beat. The Sage Alerting Systems Digital ENDEC lists for \$2,695 and is available from various dealers.

*Amanda Alexander, CBT, is chief engineer of Crawford Broadcasting, Denver.*

## I love the fact that there is no onboard printer or paper tape to mess with.

There are a few things I do not particularly like about the unit.

Foremost is the password needed to send out a weekly test. On our older TFT units, operators just had to push a single button and the test would go out. While I realize the password is a security measure to guard against accidental activations, it should be an option that can be turned on or off as desired. In some installations the password rep-

istrator can remove the user password by setting the password length to 0 on the front panel, or by entering a blank field for user password in ENDECSetD. That will allow an operator to send weekly tests and to forward pending alerts without entering a password."

I also don't much like the waste of paper when the unit is set to print any test; it prints only two or three lines on an entire sheet of paper. I don't really

## TRUSTWORTHY, LOYAL AND ON THE AIR

Tade Sullivan, a Scouting district executive from Iowa, interviews Scouts from the United Kingdom.



Lars Lifrak, a Scouting volunteer and former sports broadcaster, hosted the QBSA Morning show, 5:30-9 a.m. during the Jamboree.



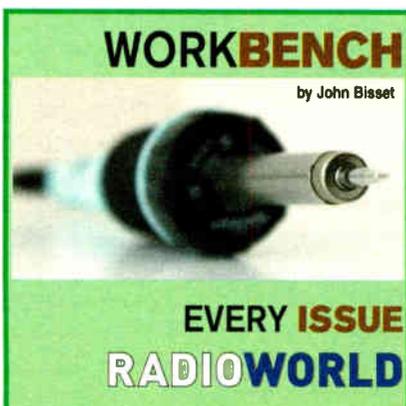
Planning is underway for the next National Scout Jamboree in 2013, and chances are good "The Eagle" will be there too.

Scouts attending the 2010 event could tune to "QBSA, 102.9 FM, The Eagle," a low-power FM operated under FCC special temporary authority to the Boy Scouts of America under call sign WB4XSA.

The station aired music, news and info for the 10-day event at Fort A.P. Hill in Virginia, which attracted almost 50,000 people celebrating the centennial of Scouting. Scouts had an opportunity to do their own 15-minute air shift, preceded by a brief training course.

Comrex Corp. provided Access portable and rackmount codecs, BRIC-Link IP codecs and consultation to help the organization improve its remote broadcasts and for live arena shows. Wheatstone, ENCO Systems, Symetrix and BSW provided equipment and supplies to equip the three-studio facility. Volunteer station staff included Chief Engineer Pete Boyce, president and owner of WNDA(TV/AM) in New Albany, Ind., and Assistant Chief Engineer Randy Greenly, staff engineer at Minnesota Public Radio.

Programming also was carried on the Jamboree home page, and the station took requests via the QBSA Facebook page.



# Drops jaws. Not audio.



Broadband Internet is everywhere. Which makes it ideal for live remotes.

Unfortunately, the internet is also notoriously erratic. Even if you're lucky enough to get a good connection, it might deteriorate during your show. So you dial back the bitrate, sacrificing sound quality to play it safe.

There is a better way.

Meet the amazing new Z/IP ONE codec.

Telos and Fraunhofer collaborated to develop a unique coding algorithm that adapts to changing network conditions on-the-fly.

If your connection quality drops, the Z/IP ONE uses error concealment, elastic buffers, and bitrate adjustments to keep audio flowing at maximum quality.

The Z/IP ONE now makes it possible to use the internet for great sounding remotes.

The convenience of the Internet.  
The sound of Telos.

AUDIO | NETWORKS  
[www.telos-systems.com](http://www.telos-systems.com)

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World Radio History

### STREAMING AUDIO

Hardware and software products for processing, encoding and streaming your audio content.

### AUDIO LOGGING

PC Software for archiving and logging all of your stations audio.

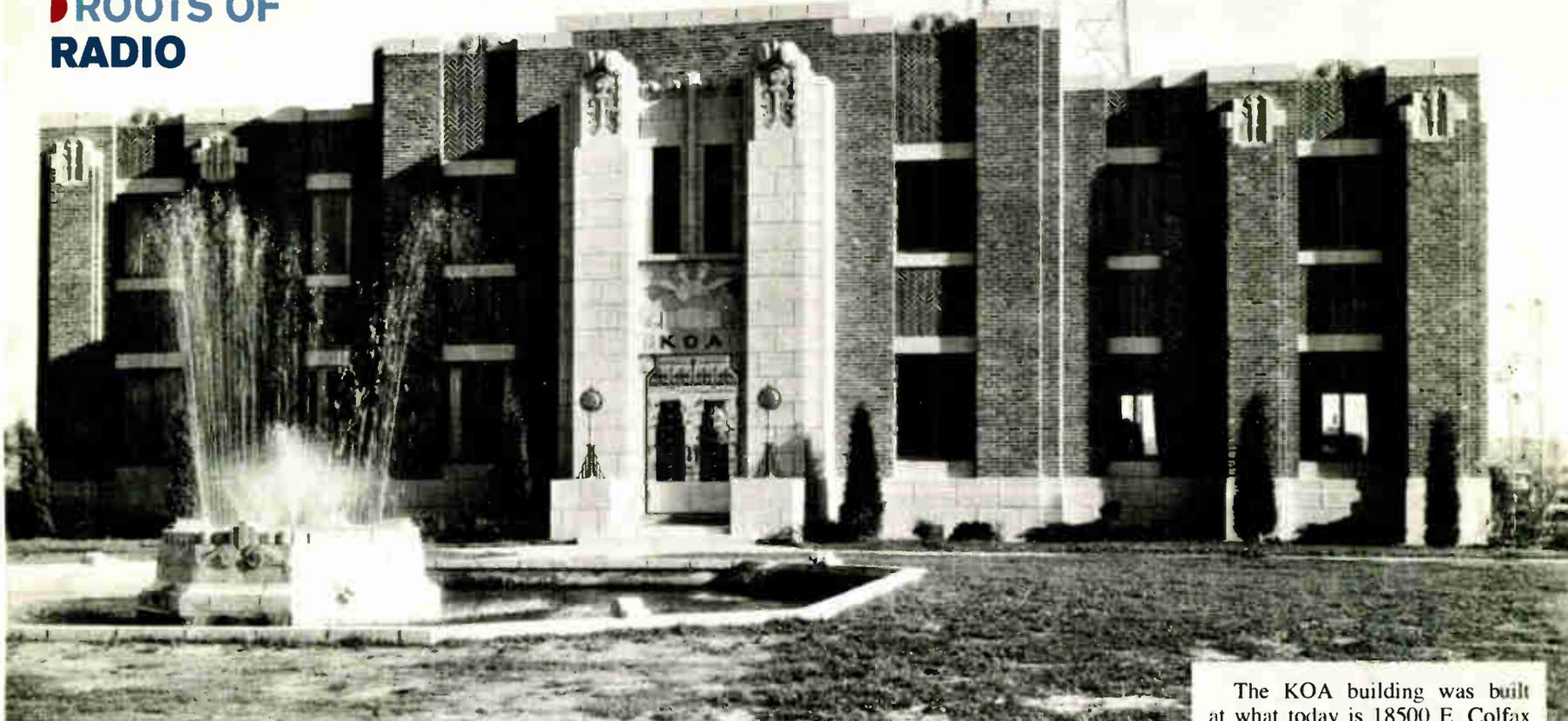
# A Fabulous Home for KOA

This is the beautiful home that General Electric built for KOA in Aurora, Colo., in 1932.

KOA was built by GE in 1924 as part of the company's three-station network planned to cover the United States (the other stations were WGY in Schenectady and KGO in Oakland). KOA went on the air at 930 kc with a power of 2,000 watts. That was increased to 5,000 the following year, then to 12,500 watts in 1927.

By 1934, KOA was an NBC owned-and-operated station, broadcasting with 50,000 watts on its 830 kc frequency.

## ROOTS OF RADIO



The KOA building was built at what today is 18500 E. Colfax Avenue. It housed the studios only for its first two years, but continued as the home of the KOA transmitter until 1959.

In the photo we can see the 475-foot tower, one of the highest self-supporting radio towers in the country at the time. We also can see the cooling pond that fed the heat exchanger, which cooled the transmitter tubes. Note the stylish details of the building, including the beautiful art deco door flanked by two decorative carbon microphones bearing the GE logo.

Today the building houses the Colorado Department of Transportation. It was designated a historic landmark by the City of Aurora in 2001.

*John Schneider is a lifelong radio history researcher. Write the author at [jschneid93@gmail.com](mailto:jschneid93@gmail.com). This is one in a series of photo features from his collection; discover more at the Roots of Radio tab under Columns at [radioworld.com](http://radioworld.com).*

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The DaySequerra Eclipse LBR4 Low Bitrate Loudness Processor is a four-stream AES stereo audio processor specifically designed for codecs used in HD Radio™, DAB and DRM digital radio systems.

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Public Radio  
Pop Latin  
R&B  
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# KPCW Goes Long for Football Remotes

Station Puts Barix Boxes and Reflector Service to the Test in Sports Coverage

BY MARIO HIEB

Many broadcasters have discovered the unique IP audio products manufactured by Switzerland-based Barix.

## FROM THE FIELD

I have used several in my day-to-day work and introduced them to colleagues.

I have used the Barix 100 Instreamer for radio streaming, and the Instreamer and Exstreamer to monitor an FM translator network 600 miles away. Recently, Barix made configuring its products easier with a Reflector service; now it has introduced a new product, the Barix 500 Exstreamer.

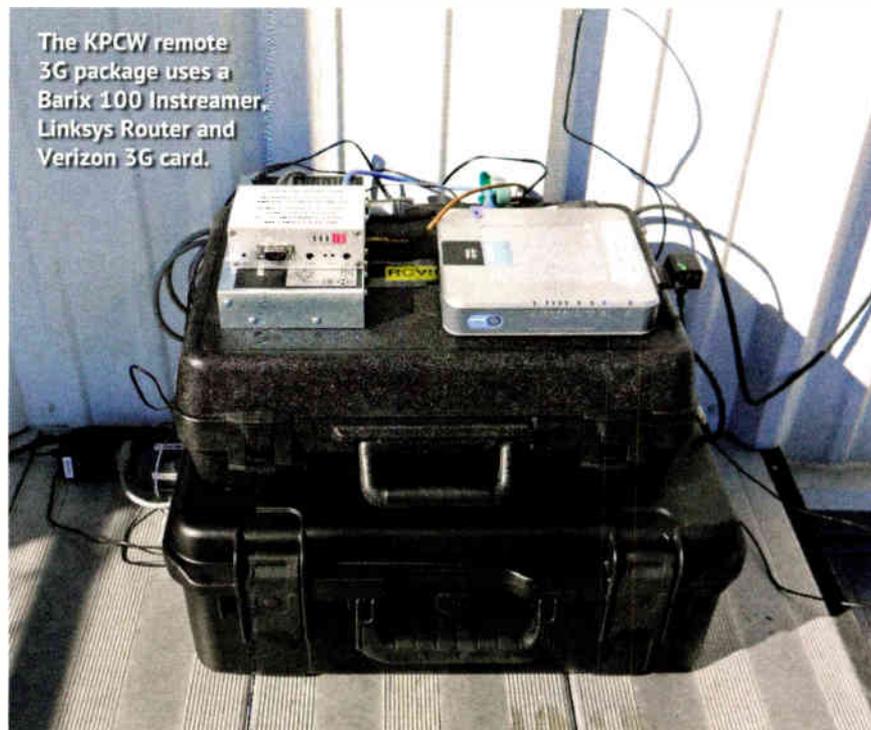
The Barix 500 has similarities to the Barix 1000, less the AES/EBU interface; it also comes with a lower price tag (\$595). Unlike other Exstreamer family products, the Exstreamer 500 and Exstreamer 1000 can both encode and decode audio streams. This makes the unit a versatile and powerful IP audio tool.

The Barix 500 features balanced stereo audio inputs and outputs. There is an audio stereo codec (encoder/decoder) for MP3, PCM linear and A-Law,  $\mu$ -law, 8 kHz–48 kHz sample rate support. IP communication is achieved with a 10/100 Mbps Ethernet interface. Another feature is a USB 1.1 interface for flash memory drives (FAT16/32 file system support). The power supply input accepts a range of voltages with low power consumption.

Other features include two independent serial ports, RS-232 and RS-485, IR decoding capability with optional serial port IR receiver and four contact closure inputs and four relay outputs.

Balanced audio is available on a nine-pin D-sub connector which, in our case, breaks out to XLR connectors. It would be nice if Barix could integrate the XLR connectors with the chassis. Also, power for the unit is via a Phoenix-type connector; again a less awkward connector might work better for remote use.

As expected, the quality of the audio transmitted by the 500 is a function of the speed of the Internet connection. Our tests were conducted using wired Internet, Wi-Fi, IP bridge and a 3G router. With good connectivity, we could achieve ISDN-quality audio in both directions. The Reflector service made connections easy. The user goes to



the Barix Reflector online site, registers and enters each unit's MAC address, encoder or decoder setting, buffer latency, audio quality and audio levels.

Unfortunately, only one direction of audio can currently be established with the Reflector service. Barix should modify the service to allow bidirectional transmission. (Ed.: Barix says it offers an upgraded bidirectional premium service, Barix STL Pro.)

The bidirectional feature could then be used for a mix-minus feed from the studio during a remote. It would be good to be able reduce the latency on the mix-minus feed, a sacrifice in audio quality would be an acceptable trade-off for me.

I am working on a project that will use a Barix Exstreamer 100 to feed a reserved-band translator station and an Instreamer 100 to provide a confidence feed of the translator off-air audio back to the studio. The Exstreamer will be fed by the same Instreamer we use for Internet streaming, thanks to the Barix Reflector.

To summarize, the Barix 500 is a versatile IP audio tool that will find its way into many applications, including remote broadcast. The unit is attractively priced and, when used with the Barix Reflector service, easy to set up.

### IN PRACTICE

So how did we put it to work? KPCW(FM) is a community FM

### PRODUCT CAPSULE

#### BARIX 500 EXSTREAMER Network Audio Encoder/Decoder

#### Thumbs Up

- + Encoder and decoder in one box
- + Balanced inputs and outputs
- + Simple to use, rock-solid in performance
- + Barix's Reflector Service

#### Thumbs Down

- Basic Reflector service is unidirectional

Price: \$595

For information, contact Andy Stadheim at Barix Technology in Minnesota at (866) 815-0866 or visit [www.barix.com](http://www.barix.com).

radio station located in scenic Park City, Utah. The staff is a mix of paid professionals and volunteers. The programming can best be described as "full-service eclectic."

Broadcast engineer Roger Crawford lives in Summit County near Park City

(continued on page 26)



The notice is out – a new EAS/CAP compliance deadline looms ahead. And the best way to keep your station in compliance is the DASDEC-II, flexible emergency messaging platform. Cover all your EAS and CAP requirements in one easy to use, easy to maintain, and surprisingly affordable package. Call 585-765-1155 today or visit [www.digitalalertsystems.com](http://www.digitalalertsystems.com). Don't delay - the deadline is just around that corner.

**Digital Alert Systems**

Your Partner on the Road to EAS & CAP compliance  
[www.digitalalertsystems.com](http://www.digitalalertsystems.com)

**MARKETPLACE**

**FREE SOUND:** No one loves free stuff more than radio folks, especially if it's good and useful stuff.



IK Multimedia has a basic version of its popular SampleTank sampler/virtual instrument program available for free. Even better, the free version comes with 500 MB of preloaded samples culled from the professional L and XL SampleTanks.

SampleTank Free offers a 16-part multi-timbral workspace. Up to five insert effects can be used per part. Also included are 33 DSP effects. It can import WAV, AIFF, SDII, Akai S-1000/3000 and Samplecell files. And it is compatible with VST, RTAS and AU plug-in formats, Windows or Mac OSX.

Info: [www.ikmultimedia.com](http://www.ikmultimedia.com)

**NAUTEL'S ORBAN:** Nautel's "Orban Inside" optional processing module for its VS transmitter line has received an upgrade.



New to the module is an automated bypass in the event of processor failure. Also new is real-time monitoring by the meters while they are being adjusted. And the exciter now provides ITU-R 412 spec multi-plex power limiting.

The module is derived from the Orban Optimod-FM 5500 processor.

Info: [www.nautel.com](http://www.nautel.com)

**ACCESS TO 4G:** Comrex recently announced a firmware update for its Access codecs. Version 2.8 of the firmware adds 4G compatibility. Comrex Technical Director Tom Hartnett said: "The 2.8 Beta release for Access will include support for Clear's 4G Mobile USB modem and Verizon's Pantech UML290 4G USB modem. Based on our initial testing and customer feedback, we feel these new 4G data services will significantly enhance our users' remote broadcast

experiences above and beyond that of existing 3G networks."

Info: [www.comrex.com](http://www.comrex.com)

**EQUINOXIAL CHANGES:** APT's Equinox IP/ISDN codec has undergone some reworking, under the hood and bodywork, to use an auto analogy. Rebranded the WorldCast Equinox to reflect the product line's change in ownership, the Equinox also has new features.



According to the company, the Equinox is now compatible with the ScriptEasy control programming language, a familiar feature with Audemat and Cresco products.

Also new is an embedded SD card for providing content in the event of audio silence. An embedded Web server and SNMP allow for advanced remote monitoring and management.

The Equinox earned a Radio World "Cool Stuff" Award in 2009.

Info: [www.aptcodescs.com](http://www.aptcodescs.com)

**BARIX**

(continued from page 25)

and loves remote broadcasts. He works as a senior video engineer for ESPN, travelling the country televising live sports events. But Roger's avocation is radio, and it was in radio in San Bernardino, Calif., that he started his broadcasting career.

Knowing this, we got him involved in volunteer work at KPCW. When not travelling for ESPN, he would work as a fill-in DJ or help out with engineering projects. Roger let it be known that he "loves remote broadcasts" and wanted to do something to improve the coverage of Park City High School football broadcasts.

We used a Marti RPU transmitter when the football team was at home, but on the road, the announcers would call the game via a cellphone interface. The away game audio quality was pretty bad and it was time for improvement. As KPCW's chief engineer, I didn't have the budget to follow the team and engineer their away games, but Roger jumped in to see what he could do.

The first thing Roger did was go to his basement equipment bone pile and put together a remote program mix and monitor kit. Next he pulled out his Barix Exstreamer 100 and Instreamer 100. I'd introduced Roger to these units and once hooked, he had to buy a pair to play with.

Roger's goal was unspoken: to do a network-quality broadcast from small-town Utah. He visited the football venues before the games, performing site surveys, checking for Internet connectivity, Marti paths, power drops, etc. He would arrive at the venues hours before the games to setup the gear and "fax" (facility check) the audio and mix-minus feeds to and from the studio.

He used the Barix 100 units on the road but wasn't always sure what he would find for an Internet connection at the stadiums. He then discovered that many of the away venues had Verizon 3G coverage,

**KEEP IT SIMPLE:** The parade of feature-filled, dirt-cheap handheld digital recorders continues. The latest is the DR-05 from TASCAM.

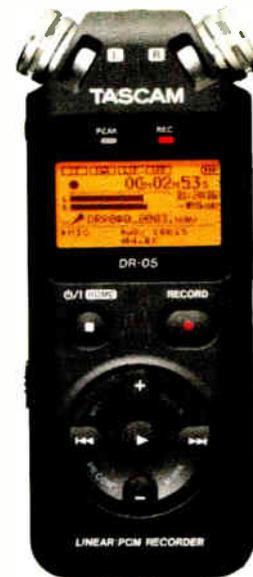
The DR-05 uses microSD (and microSDHC) cards for media. The dual top-mounted condenser mics are set in place but a cut above standard built-in mics. A 1/8-inch (3.5 mm) input allows for use of external microphones.

Recording formats are MP3 (32-320 kbps) and WAV (BWF), up to 24-bit/96 kHz. A limiter, low-cut filter and playback EQ curve are included. Basic clip editing functions and marking points are included. There's a two-second record buffer.

Operation and navigation is via thumb toggle.

A nice goodie is an onboard chromatic tuner. A USB port allows for offloading of files without removing the microSD card and for power and battery (twin AA) recharging. Price: \$99.

Info: [www.tascam.com](http://www.tascam.com)



so he borrowed my Linksys WRT54G3G-VN router and Verizon 3G card.

Once active, the Linksys router would provide Internet connectivity to the Barix Instreamer. The Barix Reflector would then automatically connect the Instreamer to a Barix Exstreamer back at the studio. At the studio, the Exstreamer converted the IP stream back to audio. It doesn't get much easier.

The quality of the audio depended on the quality of the Internet connection. Most of the time it was very good, but occasionally the audio stream would break up or "buffer" due to constraints with the 3G network.

Roger said he found it quite easy to use the Barix 100 and 500 boxes, especially with the Barix Reflector service.

"Mike Gerdes, program manager for KPCW commented that the quality on some of the games was as good as ISDN," he said. "The only limitation was only the speed of the Internet service available. Hopefully with the coming 4G wireless systems that won't be a problem anymore."

Through Barix's U.S. office, we were able to get a demo of the new Barix Exstreamer 500 unit. This unit is like having both an Instreamer and Exstreamer in the same box with balanced audio ins and outs to boot. Using the Barix 500 on the football remotes, we found that we could only configure one direction of the audio feed through the Barix Reflector service.

It would have been nice to use the other side of the 500 for mix-minus audio from the studio, as I mentioned.

I've always believed that radio is more interesting when it gets out of the studio and having the Barix product line makes that easier and affordable. With IP circuits ubiquitous, 3G showing up in more places and the introduction of the Barix Reflector service, there is now no excuse to not get out of the studio and go do that remote.

Mario Hieb, P.E. is a consulting engineer and chief engineer of KPCW, Park City, Utah.

# WHERE GREAT RADIO BEGINS

## The New Harris® Flexiva™ FM Transmitter

The Harris® Flexiva™ FM solid-state transmitter family provides today's broadcaster with a transmitter platform capable of analog and digital operation. Incorporating field-proven Harris technology, the Flexiva family of products delivers world-class performance, reliability and quality.

Flexiva is designed for low- and high-power requirements, up to 20 kW, while utilizing the most compact design on the market today. Flexiva continues the legacy of the highly successful line of Harris FM transmitters and combines innovative, new Quad-mode RF amplification and software-defined exciter technology to take FM transmission to the next level.

Featuring Harris PowerSmart® technology in its transmitter architecture, the Flexiva line offers unmatched efficiency that makes it ideal for all FM applications and delivers a dramatic increase in power density, lower operating costs, servicability and reduced cost of ownership over the life of the transmitter.

Learn more at [www.broadcast.harris.com](http://www.broadcast.harris.com) or (800) 622-0022.



**MARKETPLACE**

**WARM AND FUZZY:** Nomad Factory is out with Magnetic, a tape emulation DAW plug-in. Available as a Windows, Mac RTAS or VST plug-in,



Magnetic offers a solid range of features. Effects include reel speed, tape saturation, tape "color" (compression), limiting, high and low EQ.

Magnetic's nice GUI imitates a generic old, tube-style piece of audio equipment, complete with old-school black Bakelite knobs and a VU meter.

Truly grizzled veterans of reel-to-reel usage might ask, "Where are the wow and flutter controls? Crinkled or stretched tape or flaking oxide effects? Print-through, anyone?"

Price: \$199.

Info: [www.nomadfactory.com](http://www.nomadfactory.com)

**BEEFY CAT:** Wire and cable maker Gepco has released a series of heavy-duty Cat-5e cable. Aimed at portable and remote Ethernet patching duties, the CT504HD series has three types. The CT504HD is the basic type. CT504HDX has solid 24 AWG conductors rather than stranded conductors. A third variety is the CT4504HDX, a four-channel snake using the HDX cable.

All feature double jackets for added durability. The exterior jacket is a thermoplastic elastomer (TPE). Terminations are available in RJ-45

and Neutrik etherCON.

Joe Zajac, manager, Gepco brand product engineering and operations for General Cable said: "The concern among Cat-5e cable users in the professional audio/video industry has been that it isn't durable enough to handle the traditional wear and tear associated with the workload."

Info: [www.gepco.com](http://www.gepco.com)

**MISSING LINK:** As broadcast facility networking becomes indistinguishable from IT and these facilities find themselves networking more types of media devices to feed the Internet and mobile media, bottlenecks and choke points are bound to form.



For such contingencies interface/machine control equipment maker DNF Controls has released its AnyWhere Interface Box. The AIB features a plethora of input (event) formats and connectors along with outputs (action). The key is conversion.

A press release lists conversions: "GPI-to-GPO(s), GPI-to-serial, GPI-to-Ethernet and GPI-to-SNMP control; serial-to-GPO, Ethernet-to-GPO, and SNMP-to-GPO monitoring; and serial-to-Ethernet and serial-to-SNMP conversions; all of which are user-configurable."

The AIB is designed to be used by nontechnical personnel and can be operated via a Web browser. Configurations are stored in nonvolatile memory and can be stored in a computer for recall.

Info: [www.dnfcontrols.com](http://www.dnfcontrols.com)

**SILENCE FOR THE MASSES:**

Acoustic treatment maker Auralex has launched the SonoLite panel, marketed to musicians, home studio operators and others requiring easy and inexpensive acoustic treatment.



SonoLite measures 24 inches x 24 inches x 1 inch. Its interior is an Auralex StudiofoamPro acoustic panel. The exterior is a fabric wrapping. Available colors are black and beige. The Noise Coefficient Rating is 0.75.

Auralex Acoustics founder and President Eric Smith said: "SonoLite is an aesthetic and price point blend of Auralex's StudiofoamPro and ELITE ProPanels, combining the look of the ELITE ProPanel with StudiofoamPro's cost."

Price: \$24.99 per panel.

Info: [www.auralex.com](http://www.auralex.com)

**HANDY HI-FI:** A new app for Apple mobile devices (iPhone, iPod, iTouch, et al.) promises to collect together and stream higher-quality audio streams.

StreamS HiFi Radio by Modulation Index is a combination of aggregator and AAC decoder.

As an aggregator, StreamS catalogs and provides a listing of AAC- and HE-AAC-streaming outlets, including AM/FM broadcasters. According to the company its AAC decoder is top-of-the-line and will properly decode streams to their fullest fidelity.

Modulation Index President Greg Ogonowski (a familiar name via his "other" job at Orban) said, "This gives listeners the best fidelity possible and provides capabilities that are more than competitive to satellite and HD Radio, whether heard on earbuds, auto sound systems, or home stereos."

He continued: "Deployed mobile devices greatly outnumber other digital radios. Moreover, we have found that unlike cellular voice channels, the high-speed data-grade mobile channels used by this service are typically free from dropouts, noise bursts and unexpected disconnections. Thirty years serving the professional broadcast industry has taught us that radio networks are fanatical about the quality of their signal. By using a professional-grade decoder, we are able to meet these high expectations."

Price: \$4.99

Info: [www.indexcom.com/iphone](http://www.indexcom.com/iphone)

**PHONES FROM BEYER:**

"Handcrafted in Heilbronn" sounds like a nice starting point for a pair of headphones. Throw in something called "Tesla Technology," and you're describing the latest headphones from beyerdynamic, the DT 1350.



According to beyer, Tesla Technology is a reworking of the traditional neodymium magnet driver configuration by making the magnet into a ring. In beyer's view this should improve sound and make the driver more efficient as well.

The DT 1350 is an on-ear (supra-aural) design with swiveling cups (up to 90 degrees). The ear cushions are removable and the headband can be extended. Price: \$299.

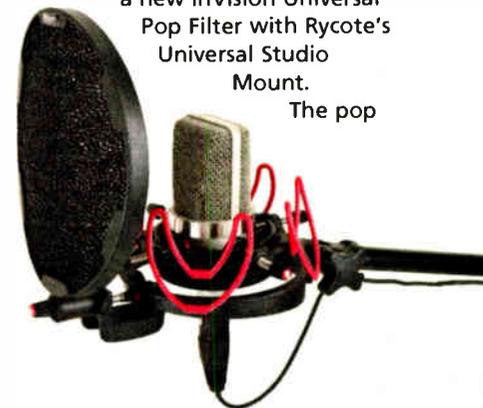
Info: [www.beyerdynamic.com](http://www.beyerdynamic.com)

**P-P-P-POP FILTER:** Pop filters sometimes are seen as one of those luxuries or indulgent frills that a true pro would never need (or would be embarrassed to be seen with). Then there are cases where they really do seem to do the trick.

For pop believers, Rycote has developed the InVision Studio Kit. This package, listing for \$149.99, combines

a new InVision Universal Pop Filter with Rycote's Universal Studio Mount.

The pop



filter uses an acoustic foam mesh that can be removed for replacement or cleaning. According to the company, the mesh can knock down pops by as much as 20 dB while not affecting higher frequencies. The framework is attached by a locking clamp so it can be removed as well and used on other mounts.

The USM uses Rycote's "Lyre" "non-elastic" suspension devices. These are designed to increase isolation and to not sag over time. The kit is designed to handle any microphone from 18 to 55 mm.

Info: [www.rycoteinvision.com](http://www.rycoteinvision.com)

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# With Chevy, Pandora Runs Deep

Personalized Web Music Service Is Part of MyLink System

BY JAMES CARELESS

Chalk up another victory for Pandora.com, the personalized Web music radio service that is cutting into commercial

## NEW MEDIA

radio's potential audience. In February, GM announced that 2012 Chevrolet Volt and Equinox models will have

recognition to control in-car devices, whether for controlling radios, answering phones or navigating." The MyLink voice recognition technology uses the Nuance operating system.

The reason GM decided to add Pandora is simple: Drivers are using it. This is why the automaker is also supporting the Pandora-like Stitcher Smart Radio in MyLink.

"These are mobile services that peo-

ple are using in their vehicles, so we want to make them as safe to use as possible," Kraatz says.

### STILL SMARTPHONE-LINKED

car buyers who don't want to settle for mass-market radio. They want to create their own individual stations and have access to them wherever they are."

MyLink makes Pandora appear to be a dashboard-accessed radio service. But despite appearances, accessing it is very much based on whatever smartphone the driver has along, and

grate mobile phone technology directly into any car's onboard entertainment system," says Kraatz. "Smartphones keep evolving, and we don't want to commit ourselves to a technology that may become obsolete in a year or two."

**Smartphones**  
keep evolving, and we don't want to commit ourselves to a technology that may become obsolete in a year or two.

- Tony Kraatz



Pandora controls integrated directly into their 7-inch dashboard touchscreens.

To access Pandora, the MyLink "infotainment" system must connect with a Pandora-loaded smartphone. When a Chevy driver wants to listen to Pandora, she will access the service with a few screen touches, just as she can access AM/FM or CDs.

"This is strategically very important for Pandora," says Jessica Steel, Pandora's EVP of business and corporate development.

She reiterated the company's recent themes: Nearly half of radio listening happens in the car; Pandora already has 80 million registered listeners; accessing Pandora on the road should be "as easy for them as tuning to FM radio."

### 'MASS MARKET' NO MORE?

General Motors' MyLink system is the company's answer to Ford Sync. Both are voice-recognition control systems that integrate the multifarious devices turning up in today's cars. These include onboard navigation and entertainment systems, plus MP3 players and smartphones brought in by drivers.

"The goal of GM and MyLink is to minimize driver distraction," says Tony Kraatz, MyLink's lead engineer. "We want people to keep their eyes on the road and their hands on the wheel. That is why we are using voice

whether it is subscribed to Pandora. If the phone is not Bluetooth-capable, or accessing the wireless Web, or subscribed to Pandora — or some combination of these three — the service will not work on MyLink.

"It just doesn't make sense to inte-

grate mobile phone technology directly into any car's onboard entertainment system," says Kraatz. "Smartphones keep evolving, and we don't want to commit ourselves to a technology that may become obsolete in a year or two."

Pandora certainly agrees. "Connecting via smartphone is the technology that makes the most sense today, and will likely make the most sense for the foreseeable future," says Steel. "Besides, being on smartphones, as opposed to in-car receivers, makes MyLink immediately relevant for our over 50 million smartphone listeners. We want to make Pandora available everywhere our listeners are, and we accomplish that really well by being on their mobile phones."

(continued on page 30)



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# How to Connect the Disconnected

Mena Says Social Media Can Help Religious Stations Reach Out

BY JAMES CARELESS

Christian broadcasters have a tendency to talk to the faithful, says Emmis Interactive Co-President Rey Mena.

## RELIGIOUS RADIO

“Yet it is those who have become ‘disconnected’ from their faith that these broadcasters need to reach. And social media sites such as Facebook provide an effective way to do so.”

Mena spoke on this topic at the recent National Religious Broadcasters convention. The methodology he described was applied to a religious context, but the thinking behind it can be extended to all types of “disconnected” groups.

“Sometimes people find themselves disconnected from their faith not by a deliberate choice they made to disconnect but by a gradual drifting away from their faith over time,” he said.

“For Christian broadcasters these folks represent the low-hanging fruit to growing their ministries.”

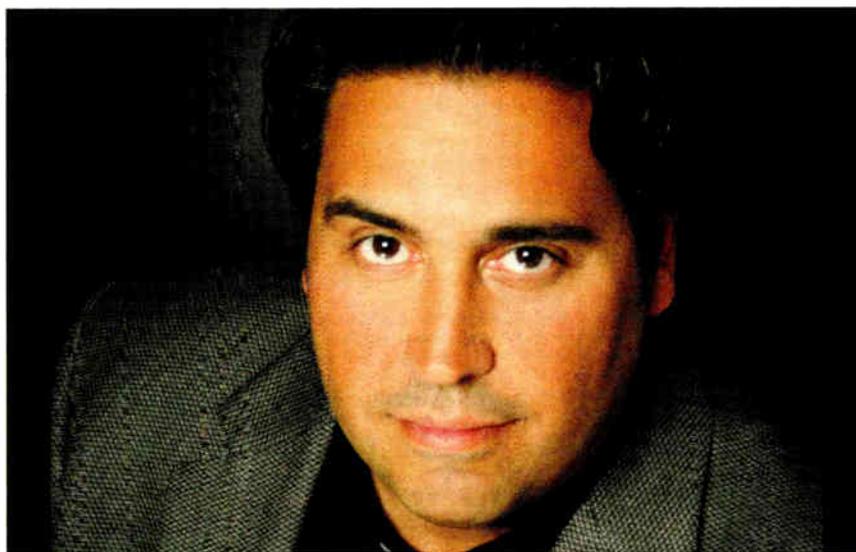
### IMPLICIT ENDORSEMENT

Today, millions of people post comments and links on Facebook to websites, articles and videos that they find personally interesting. In turn, “friends” with whom they are connected are alerted to these postings. Because they have some degree of common interests, such people are thus motivated to take a look at whatever has been posted.

“Posting something to Facebook is akin to giving it an implicit endorsement,” Mena says. “By putting it on your page, you are bringing it to the attention of your friends and saying, ‘Hey, this is worth your attention. I sure liked it or find it important enough to share.’”

“Therefore, Facebook provides Christian broadcasters with an amazing vehicle to empower their faithful to help reach the disconnected.”

In theory, a church with an evangelical bent could ask its members to start posting overtly Christian content to their Facebook pages. Based on the notion of



implicit endorsement, the friends of these people would then click on these links, and the message would thus be delivered to everyone, religious-minded or not.

In practice, such a bold-faced approach to evangelizing can backfire on churches or religious broadcasters,

**‘Posting something to Facebook is akin to giving it an implicit endorsement.’**

leaving them once again preaching to the faithful while alienating others.

Rey Mena’s solution to this age-old problem is subtlety.

“Rather than sending out a straightforward Christian message from beginning to end, it makes sense to develop content that is interesting and that has room for an appropriate Christian tie-in at the very end,” he advises.

“In this way, the disconnected will not become immediately put off, and remain open to what is being shared. And given that they do have Christian roots, they will be more open to reflecting upon the message sent and what it could awaken in them.”

Though Mena didn’t draw the analogy, the success of this approach might be seen on television in low-key TV ads from the Mormon Church that focus on widely-shared values. These close simply by saying who sponsored the content. The ads illustrate that disconnected audiences respond better if the

evangelical message is not front-loaded. Had the spots been formatted to open with the words “The Church of Jesus Christ of Latter-day Saints wants you to know that ...”, their appeal to a wide audience would have been limited.

Rey Mena’s point at NRB 2011 was to show Christian broadcasters new ways to reach a wider audience, by the subtle use of social media. But the message he delivered has larger implications.

By focusing on themes with broad appeal — amusing content, sports spectacles or just cute kittens doing adorable things — content providers can win

## CHEVY

(continued from page 29)

GM’s MyLink is just the latest in-car success for Pandora.

“Mercedes has launched a dealer accessory product called Media Interface Plus that allows Pandora to be controlled on their COMAND in-car entertainment system,” Steel says.

“Additionally, Mini has launched Pandora on Mini Connected, where the Pandora interface is presented in the Mini infotainment display. In the future, you will also be able to access Pandora on the Toyota Entune entertainment system and on select Hyundai vehicles, again via a smartphone.”

Clearly, Pandora is succeeding making inroads into traditional radio’s automotive territory. As it does so, drivers increasingly will demonstrate whether or not they prefer a Web-based service that provides customized music at the expense of local news, weather and traffic.

For radio broadcasters, the results of these decisions will — at best —

offer ideas for making radio better adapted to the 21st century. At worst, they may face the industry with a life-or-death competitive challenge, one not seen since broadcast television forced radio to radically change its content back in the 1950s.

“People are posting content to their personal Facebook pages,” he said. “This means that you can’t go after them as if you were approaching a business client. Keep the content personal and low-key — and make sure that it offers the primary value of entertainment first. That’s why people post items to share with their friends, after all.”

### EXPONENTIAL

According to Facebook, the average number of friends per user is 130, though granted, this number varies from person to person; some only have a few, others have amassed thousands.

But every time someone posts content to their Facebook page, the opportunity for it to be seen and then disseminated by other people is literally exponential.

“For Christian broadcasters, and indeed anyone wanting to get a message out, the possibility for reaching the disconnected through social media is huge,” Mena concludes. “So again, if you want to reach the disconnected, take a good, long look at social media — and then develop subtle content that will have the broad appeal necessary to do the job.”

National Association of Broadcasters Manager of Media Relations Zamir Ahmed isn’t ready to throw in the towel quite yet.

“Pandora offers a niche music source for listeners, but it can never replicate the lifeline free and local radio source enjoyed every week by more than 265 million listeners,” Ahmed says.

“Critics have written radio’s obituary for decades, but it is the ultimate survivor because it keeps audiences locally connected. Not only is radio an instrumental source of new music, it keeps listeners plugged into their community with news, sports, weather and traffic updates every day. And the beauty of radio is that it does all this for free.”

James Careless interviewed Pandora’s Tim Westergren in the April 6 issue.



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# Are Your Interns Wasting Their Time?

## Daily Work Flow Document Is a Key Element to a Successful Program

"Every afternoon when I walk through our stations, I see a group of interns sitting around doing nothing," the general manager lamented.

"It seems like we never have enough for the interns to do. And yesterday I even had a parent call to complain about his daughter's experience interning for us. I'm thinking about pulling the plug on the whole deal. What do you think?"

I don't just think, I know: Great internship programs at radio stations are rare.

The common issues are lack of structure, no clear leadership and poor screening of candidates. Station managers who can't or won't deal with these problems should eliminate their internship programs.

The smarter managers will read the rest of this article and then execute a plan to transform interns into highly productive members of the team. Let's start with the basics.

### GET IT IN WRITING

Never allow anyone to intern at your radio station without a paper trail indicating that they are obtaining educational credit from a bona fide institution. Without a valid educational connection, you are actually putting someone to work without pay, which may have consequences.

Although I have brought on a few high school students as interns, this should be an exception rather than common practice. Most kids under 17 are not mature enough to work in an entertainment workplace. This is something you have watch for with college students as well, but at least many of them are starting to think about trying to obtain real jobs. That in itself can make them more responsible.



(Stockphoto/Andrew Rich)

## PROMO POWER



Mark Lapidus

The program should begin with a group meeting, during which the leader goes over the job descriptions and other expectations such as dress, hours and behavior in the workplace.

Be very clear about your willingness to speak privately with any intern about issues. They need to know that your door is open in case a situation comes up that they are not mature enough to deal with on their own. Not surprisingly, I've had female interns complain about being harassed by male disc jockeys.

It's vital to provide fast and real resolution when you determine validity of claims. Most of the time, it's just a misunderstanding or someone overstepping boundaries. However, you should

## Those who teach also learn.

When you take recruitment seriously, you can obtain candidates who are a better fit.

Attend at least two college intern fairs per year; most events require only two hours. Spend five minutes individually with prospects who come to your booth.

Ask why they want to intern with your station and find out what they want to learn. If all you get is questions about free tickets and meeting celebrities, move on. Invite the best candidates to see you at the station for a tour and longer interview.

You should also run a year-round ad on your website asking for résumés. Screen them by looking for relevant content, good writing and experience that may be of use.

One person at the station should be in charge of your internship program. The head of the program must be an excellent organizer and in-person communicator who truly enjoys working with younger people. Due to time constraints, this person may have to ask others to help with interviewing, getting the paperwork done from the schools and organizing the interns.

### TODAY'S TASKS

Every program needs a solid job description of intern responsibilities. This should be modified to fit each department; create one description for a sales intern, another for a technical or programming intern.

know that if an intern feels uncomfortable coming to you or thinks that you won't take him or her seriously, you may find yourself dealing with parents, lawyers or both.

Now here's the most important key to success: Your intern program must have a daily work flow document.

The document lists tasks to be accomplished that day as well as longer-term assignments. All interns check the document for their assignments upon their arrival. If you feel you're unable to invest the time in creating and maintaining this work document, you should cut back on the number of interns or eliminate your program.

An office full of interns hanging out with no direction is, as my GM friend correctly surmised, a recipe for wasting a lot of people's time.

If you're short on office space, consider that not all interns have to be at your office to be useful. Those helping with your website may be able to work from home if they are sharp and reliable. Others who help at events can simply meet you at those activities.

Finally, remember that you owe your interns an educational experience. The good news for you is that those who teach also learn.

Mark Lapidus is president of Lapidus Media. Contact: marklapidus@verizon.net.

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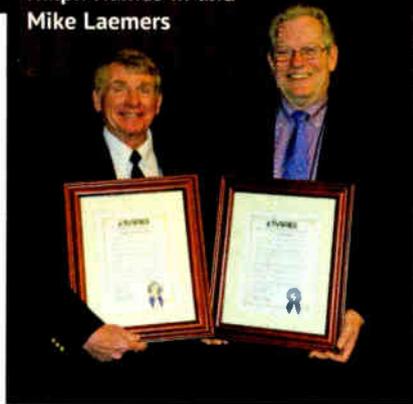
**Roy Baum** was elected chairman of the Kansas state EAS committee. Baum, chief engineer of WIBW(AM/FM) and Kansas Radio Networks, is based in Topeka. He replaces **Bill Nolan** of Broadcast Technical Associates in Wichita.

"Our current priority is to update our existing state plan, and to make it 'CAP-friendly,'" he told Radio World. "We are also meeting to create a new plan that brings the governor, state EOC, local emergency preparedness, National Weather Service and broadcasters together."

The **Michigan Association of Broadcasters** honored two men with its Carl E. Lee Broadcast Engineering Excellence Award. **Ralph Haines III** is co-owner of contract engineering firm Broadcast Engineer Services and of stations WGDN(AM/FM). **Mike Laemers** is director of engineering at TV stations WOOD, WOTV and WXSP in Grand Rapids.

The **Telos Alliance** promoted three. **Martin Sacks**, vice president of Axia Audio, becomes vice president and COO of the Telos Alliance. **Carol Hetman**, formerly business operations manager of Telos Systems, becomes VP/

Ralph Haines III and Mike Laemers



CFO of the parent. And **Kirk Harnack**, formerly executive director of international business development, Telos Systems, is now executive director of worldwide sales for the Telos, Omnia and Axia brands.

**Mary Beth Garber** was named **Katz Radio Group** executive vice president for radio analysis and insights. She is outgoing president of the **Southern California Broadcasters Association**.



Mary Beth Garber

**Clear Channel Radio** named **Kelly Kibler** market manager for the company's Dallas cluster



Marty Sacks

this winter. She joined **Clear Channel Radio** in 1997.

**Shaun Holly** recently was hired as the new operations manager for **Journal Broadcast Group's** Tucson radio stations.

**Studer** appointed **Rob Lewis** as sales director for the United States. He will be based on Harman's Northridge Campus and joined the international sales and customer service team headed by **Adrian Curtis**.

The **Interactive Advertising Bureau** announced the election of new members to its board. **Peter Naylor**, executive vice president, digital media sales, NBC Universal and three-term board member, also took over as the new vice chair of the board.

**Richard Surratt** was named **Arbitron's** chief financial officer, replacing **Sean Creamer**, who will focus on his duties as executive vice president, U.S. Media Services.

**Drew Korzeniewski** was promoted to VP of ad sales and general manager of the **Radio Disney Stations Group**.

**Bill Bungeroth** recently was named vice president/market manager for **Cumulus Media, San Francisco**. Florida-based **Heartland Broadcast-**



Rob Lewis



Casey Williams

**ing Corp.** named **Casey Williams** as its new station manager.

Williams' role will expand to include overseeing day-to-day operations for **WZZS(FM)** and **WZSP(FM)**. Her broadcast career began in radio sales at **Renda Communications** in nearby Ft. Myers. **Heartland Broadcasting** is owned by **Hal and Jan Kneller**.

**Univision Communications Inc.** named **Jose Valle** president of **Univision Radio**. Valle was vice president and general manager of **Univision Radio Los Angeles**, where he oversaw **KLVE(FM)**, **KSCA(FM)**, **KTNQ(AM)** and **KRCD/KRCV(FM)**.

**CBS Radio's Scott Herman**, executive vice president of operations, was named a recipient of the **Ellis Island Medal of Honor**.

Established by the **National Ethnic Coalition of Organizations**, the honor recognizes "distinguished American citizens and role models from different disciplines and backgrounds who are dedicated to community service, making positive contributions to society, and helping create a better world."

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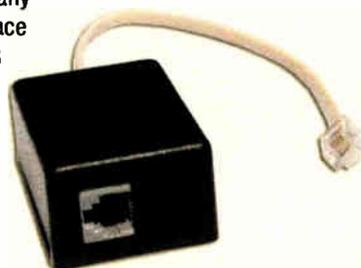
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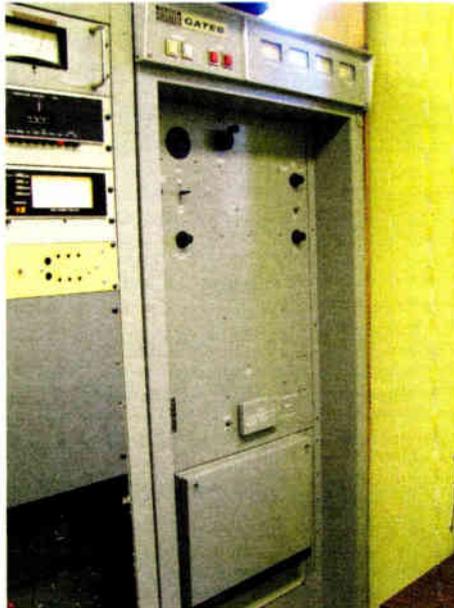
I read with great interest the recent article by Curt Yengst about the engineers at FM station WAWZ restoring their Gates transmitter as a backup unit ("Gates FM-10H3 Returns to Action," see [www.rwonline.com/article/109872](http://www.rwonline.com/article/109872)).

Here at WRST at the University of Wisconsin Oshkosh, we have a model FM-1H3. The difference is that in our case, it is our only transmitter and is in use 24/7.

Our transmitter (serial number 85929) was put into service in September 1973, replacing our original 10-watt Gates BFE-10B, which had been in use since the station went on the air in April 1966.

Some of the WAWZ experience mirrors our own, such as resorting to using a length of rubber hose and hose clamps to fix the shaft on the output loading control (great minds think alike!) and installing a Burk remote control unit (we have the VRC 2500).

About six years ago, a new BE FX-50 exciter was installed. When it failed this past summer and was sent off for repair, we reconnected the original TE-3 Statesman exciter and were pleased to see that it worked fine in the interim. To add to the vintage fun, we also have an Optimod 8000 stereo generator, which we had rebuilt a few years back. In 2009, new Belar



monitors replaced the original 1973 Belar units.

Our university is fortunate in that we have on staff two skilled broadcast engineers who do the weekly and monthly transmitter checks as well as routine maintenance (they perform the maintenance on all equipment in our radio-TV-film department). On occasion, we have also employed the services of a transmitter engineer with the Wisconsin Educational Communications Board.

We have found that the tetrode lasts about four years and then needs replacement. We also had an R15 resistor fail this year. Otherwise, the Gates hums along and provides reliable service. That's important in a curriculum-based and industry-oriented college radio setting like ours, where the goal is to have students focused on learning the fine points of radio broadcasting rather than having to deal with transmitter outages. The unit's reliability is also appreciated by Wisconsin Public Radio, since WRST carries their programming half-time.

When I accepted this position in 2008, an engineer acquaintance asked me what type of transmitter was in use here. Upon hearing my answer, he smiled and said, "It will still be working when you retire." Although it may be "practically an antique" to some, we are pleased with our Gates FM-1H3.

Attached is a photo of the transmitter in Oshkosh. Because of close quarters, we have removed the front door of the unit.

*Randall Davidson  
Director of Radio Services/WRST(FM)  
University of Wisconsin Oshkosh  
Oshkosh, Wis.*

NARY A BLIP

Curt, just a note to let you know how much I enjoyed your article on restoring the old Gates FM transmitter.

It brought back memories of when I worked for WCMQ in Miami. We had a modern solid-state AM transmitter but no backup, so I purchased a used Gates AM tube-type transmitter. I no longer remember the model number. It was huge by comparison with the solid-state transmitter. I spent several weeks at the transmitter going over every part and cleaning and/or replacing and making the old box look like new.

The only time that I remember using it on the air was during a hurricane. We leased space to another AM station and dplexed their signal along with ours onto our tower. During the hurricane, something changed in the antenna combiner that changed the antenna impedance to the solid-state transmitter and it folded back to nearly zero power. However, the old tube-type just played on.

Thanks for the memories.

*E. Glynn Walden  
Senior Vice President of Engineering  
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## TRANSLATOR

(continued from page 38)

### HUMBLY SUBMITTED

We need fresh ideas. Here are mine.

Many of these are radical, but they are designed to make you think more than to push any agenda.

**1.** *Create an incentive for HD Radio signals to carry LPFM stations.* Require or encourage full-service HD Radio stations capable of multicasting to retransmit the signals of prospective LPFM applicants or existing stations. Perhaps offer a reduction in iBiquity licensing costs for those that pledge to air a noncom or LPFM format.

**2.** *Establish a conversion path for translators to become LPFMs.* Since the technical regulation differences are shrinking quickly, let's allow owners to transfer an FM translator to a qualified LPFM applicant, for the cost of equipment and reasonable license acquisition costs. Compared to the expense involved for an LPFM applicant to obtain a permit, this would be a way to cooperate with a translator owner who acknowledges the validity of local content. No filing window is needed.

**3.** *Resurrect Class D.* These stations existed so schools and educational entities could train students and help them learn how to serve the public. Many old-school engineers were puzzled that an LPFM service was created when one already existed earlier.

**4.** *Allow additional local time on FM translators to give them a chance to prove their desire to serve the public.* Some people say translator owners do not care about the communities they cover; this is a gross misrepresentation. Many serve areas where large numbers of people want certain content. In fact, for some translator owners, local content has become as important as that of the originating station.

I propose a cap of 10 minutes per hour of unique local content on a translator, including up to two minutes of fundraising content.

**5.** *Create new public interest standards for LPFMs such as public file, EAS and staffing requirements, with more accountability on local content.* Just changing the definition of local content would be a good start. The difficulty is that most LPFMs have very limited resources — and “day jobs.” Whether it is possible for most LPFMs to generate local content in a way that significant numbers of local listeners will accept is questionable.

**6.** *Limit the size and scope of translator groups.* This will be unpopular among the largest translator group owners. So be it. In my view, the most effective local service is within a 350-mile radius. In this respect the 2x70 proposal has great merit. Since the FCC does not allow much content origination over a translator, content for a particular area or from a particular originating station will not have truly local or regional interests at heart.

**7.** *Eliminate spectrum auctions.* This will never happen, but the thought drives home that the broadcast world is a commercial one and, as such, cannot be dismissed or eliminated overnight without creating major financial havoc in communities and on a national scale. (It's fascinating that we may soon see the “public interest” spectrum of broadcast television “reverse-auctioned” to allow for a purely commercial venture — Internet access — to flourish. Is this in the public interest?)

**8.** *Base the FM translator application grant limits on cumulative population.* Distribute FM translator spectrum with no cap of 10 translators but limit the cumulative f(50,50) 60 dBu population total in a long-form proposal to, say, 1 million persons.

For example, if an applicant wanted 50 translators, the average population

for each translator would be 20,000 persons. If the applicant wanted 10 translators, it would get an average population of 100,000 per translator. If the applicant wanted one translator, the population cap would be 1 million.

This would be determined on a subsequently filed long-form application, and the translator applicant would have to comply in any settlement proceeding. The spirit of the 2x70 proposal would be preserved but translator grantees would be forced to operate fewer 2003-window translators, making room for LPFM stations in a subsequent window.

This would take the FCC out of the business of deciding who gets into a large city and why. To my knowledge, the largest FM translator in the country serves just over 1.5 million persons in its legal service contour. It would be difficult for a translator to serve more people than that.

There would be no population cap for

an LPFM station.

**9.** *Tighten the rules for FM translators to allow not more than one signal of a particular network or station to be allowed in any common area of a 60 dBu contour, regardless of the ownership.* It is a misuse of spectrum for identical signals to be carried in the same legal service area, regardless of the substance of the broadcast.

This change would also lend diversity without the FCC having to get into content regulation.

**10.** *Eliminate second- and third-adjacent-channel protection for FM translators, LPFMs and full-service stations operating under 100 watts.* If a second- or third-adjacent protection regulation is eliminated for LPFM, it should be eliminated for FM translators operating with a power level of 100 watts or under. The Mitre Report has already been generated and the FCC accepts its results.

**11.** *Loosen interference mitigation criteria for LPFM stations fielding interference complaints for second- and third-adjacent channels.* In my professional experience, most such complaints are trumped up. Modern radios have practically eliminated the need for these protections, while new mitigation rules make it easy

**We are fighting battles in self-interest within our ranks. NAB, NPR, REC, EMF, indies ... the list goes on.**

for an LPFM station to fall prey. A well-funded, full-service FM could bury an LPFM financially just by filing interference complaints, forcing the low-power FM to hire expensive professional technical and legal counsel to mitigate.

**12.** *Establish frequent filing windows with caps of participation.* This will drastically reduce the “pent up” demand for spectrum and reduce speculation and exploitation, if combined with other regulations. Many professionals believe the “Great Translator Invasion” happened because the FCC had not opened a filing window in a very long time. Some large groups that applied for translators saw an opportunity to be the gatekeeper of the distribution of translators for years to come. This alone indicates that the frequency of filing windows is flawed. (Interesting that the FCC still has not disposed of NCE translators filed for in 1997.)

**13.** *Increase the band size.* Proposals by consulting engineers to expand the spectrum to include Channel 5 and 6 make some sense, assuming receiver manufacturers will make new radios with these technical capabilities.

Remember the last time we tried this? I think the first station I converted to HD was 2004. Oh yeah, we are still trying seven years later.

**14.** *Consider a major multiplex (aggregate or SCPC) transmission of the existing FM band based on digital-only HD Radio transition, with an FCC/FTC mandate to force receiver manufacturers to include HD Radio in in-dash IP radios such as Wi-Fi, WiMax, LTE, 4G or other such device capable of receiving an IP audio stream.*

Set a date for analog shutdown and force radio receiver manufacturers (including those that make in-dash Internet receivers) to include HD Radio capability, but with more channels.

If the entire FM band were a digital multiplex, we could get many more audio streams into the same spectrum without the use of guard band-type interference protection.

This business of “protection” combined with digital and analog coexistence is incredibly spectrum-inefficient.

**15.** *Eliminate IF protections for FM translators, LPFM and full-service FM with less than 100 watts ERP.* The immediate impact would be to create more opportunities to LPFM in a regulatory practice that has favored translators for years.

### UNITE

Regardless of which proposal is adopted, if any, the broadcast community more broadly should work together.

One day, some bright engineer at Verizon or AT&T will find a use for our VHF-FM spectrum that would serve consumer demand for data much better than we can in our inefficient “broadcasting” way. Then we might be facing the fate predicted for broadcast television and LPTV.

We are fighting battles in self-interest within our ranks. NAB, NPR, REC, EMF, indies ... the list goes on. We might want to start making amends so that looming demands for spectrum do not produce a more sinister solution. None of us can fight that alone.

Meanwhile, translators and LPFMs should remember: You are both secondary services to the FCC, regardless of priority.

Robert H. Branch Jr., CPBE, is a broadcast technical consultant and ham (N4MUV).

What do you think? Comment to radioworld@nbmedia.com, with “Letter to the Editor” in the subject line.

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# If I Were King of the Spectrum ...

## 15 Fresh Ideas to Shake Up the Translator Priority Debate

### COMMENTARY

BY ROBERT H. BRANCH JR.

Any proposal affecting FM translator priorities must balance a variety of interests.

The FM spectrum is shared by many organizations that benefit from translators — even low-power FM stations (which may rebroadcast over translators, though not own them).

These interests include large commercial FM group owners; local or regional FM small-group ownership; NCE FM public broadcasting, funded by NPR and community support; NCE FM large church or religious organizations operating more than 50 broadcast properties; NCE FM small church or religious organizations operating smaller regional networks or single stations; NCE FM small "indie" non-religious entities; large commercial AM groups; "mom and pop" commercial AM broadcasting owned by small groups; and independent groups leasing full-service FM HD channels and broadcasting over FM translators.

The spectrum is not dominated by any single group, though some certainly share more of it than others.

The FCC should not make regulations to limit ownership on the sole basis that an FM translator is not in the public interest compared to a "local" LPFM voice.

REC Networks, Prometheus Radio Project and Media Access Project are the championing forces behind the LPFM service and its recent success. REC Networks is now touting a proposal it calls "2x70." Broadcasters and prospective LPFM licensees should read it. The proposal likely would change the way the FCC allocates spectrum to translators and LPFM stations. It has significant merit but is fraught with legal and technical problems.

#### LACK OF ACCOUNTABILITY

REC says LPFM has a right to service and should have priority over translators where there is little or no LPFM presence. The group also argues that pending applications for translators should be processed in such a way that the FCC prioritizes LPFM against different categories of FM translators according to number of signals owned and proposed translator use.

Its proposal further states that financial speculation on construction permits should be discouraged across all FM ownership lines, including translators. And it says LPFM provides a unique service to the community not found

elsewhere on the dial.

Most in the LPFM community, I suspect, would agree with these statements. However, there are other ways of looking at the dial.

Recent posts on an LPFM Internet list discussed whether an LPFM manager could be supported by a salary from the proceeds of an LPFM station. It's fascinating that while other FM broadcast operators are *required* to have management and staff presence, LPFM is not.

Further, while full-service radio requires a main studio within a given area so that the public has a place to go to influence content, LPFM does not have this restriction. While full-service broadcasters are required to maintain a public inspection file, LPFMs do not.

With regard to public interest standards, LPFM stations largely are unaccountable to the public; this was deliberate, in order not to burden stations with "undue regulation." The regulation from which LPFM operators are exempt is the one with the most teeth: accountability to the public in a license renewal proceeding.

Why? Is there a lack of listener support for LPFM? Are the signals just too small to cover major markets? Do LPFM owners want additional influence without the same public responsibility as full-service radio?

I do not, for a moment, imply that the broadcast industry is without its skeletons. LPFM, in general, has taken hold because of the travesty of justice created by FM's evolution from public trust into commodity; massive speculation in translators in the 2003 filing window; and the public's lack of access to broadcast spectrum.

#### PRACTICAL CONCERNS

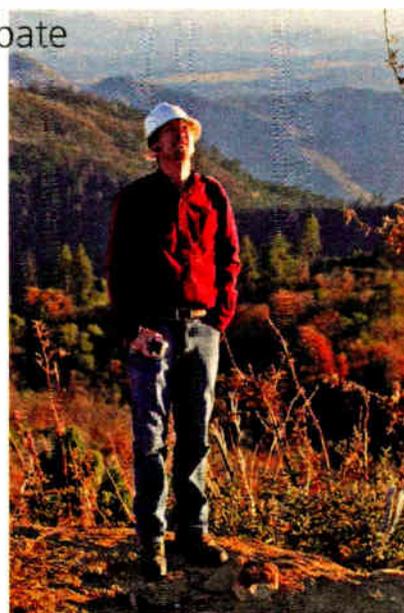
So what is to be done?

First let's look at some legal, procedural and technical problems with the 2x70 proposal.

It suggests that FM translator applications filed in 2003 should be subjected to technical scrutiny. While the engineer in me says "You da man," the legal mind says "Really?"

These "applications" are not applications but "expressions of interest." They cannot be granted on their face. They require companion "long-form" applications that must be technically compliant.

The FCC knows that nothing technical can be judged on the basis of pending "short-form" applications. REC, by forcing the issue, likely will facilitate additional gaming of the system by translator applicants. As Vince Lombardi once said, you must be 15 minutes ahead of your opponent. When



The author is shown at a job site in southern California. A broadcast engineer since 1989, he has managed radio projects in all 50 states and six other countries.

you reveal strategy, you let the other guy set the tone for the confrontation.

Also, the 2x70 proposal identifies a criterion to move an LPFM and translators into an area based on pre-existing LPFM service.

Remember that most FCC applications are minor changes to move to another tower and cover a different area. I assume that the LPFM and translator study that forms the basis for the 2x70 proposal cannot predict what the long-form translator applications will look like. This invalidates the study.

The study also may overlook translators that will be blocked on given frequencies by full-service station changes filed since 2003. Whether these translator applicants will be given a chance to submit an engineering amendment for a frequency change in a long-form application is unknown.

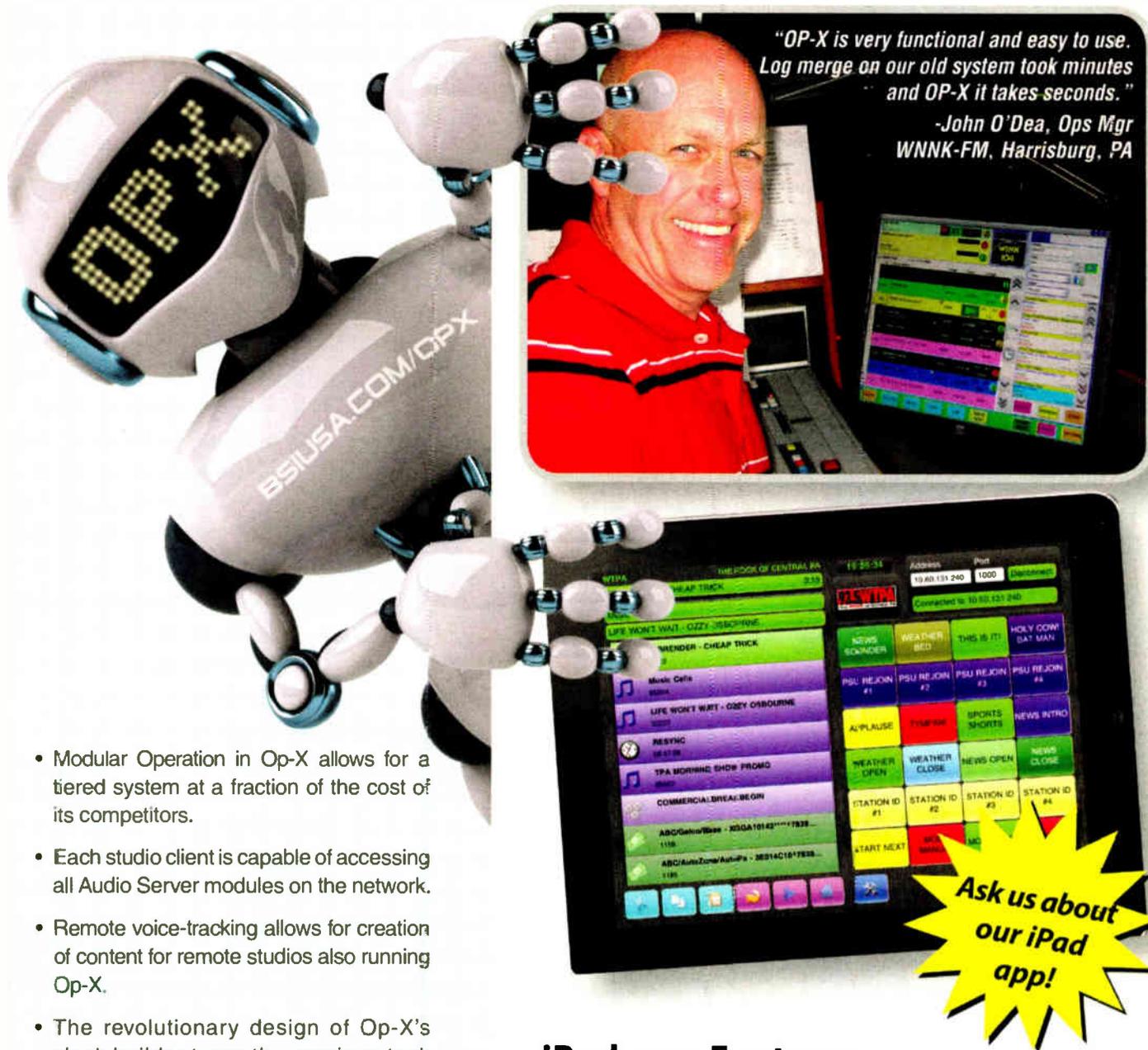
Further, REC Networks argues that LPFMs are needed in large cities, aka "urbanized areas."

In the top 50 markets, as translator owners know, it is difficult to succeed with a single low-power signal. The LPFM community unwittingly has joined other broadcasters in vying for highly coveted spectrum in areas of high population density. It would be disingenuous for prospective LPFM licensees to say they are serving a "local community" when the FCC has defined that community as part of a larger city. The LPFM station would never be able to cover an area of that size, unless the playing field were leveled to allow all service to treat these areas in the same way, which is unlikely.

(continued on page 37)

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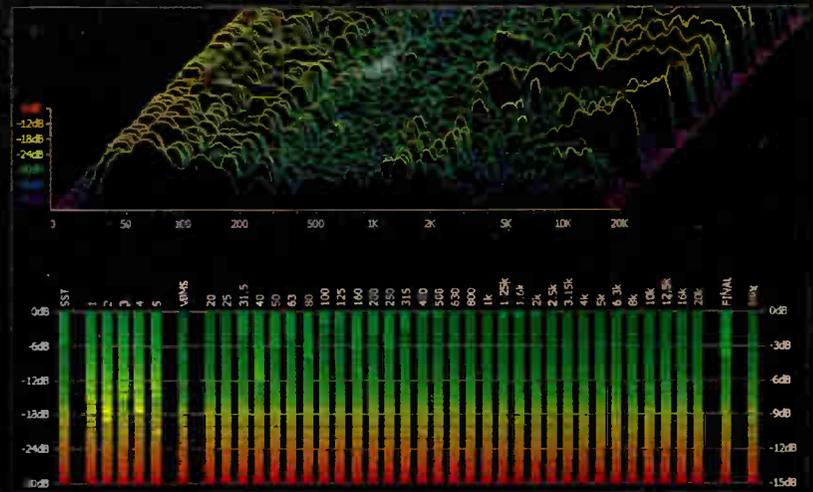
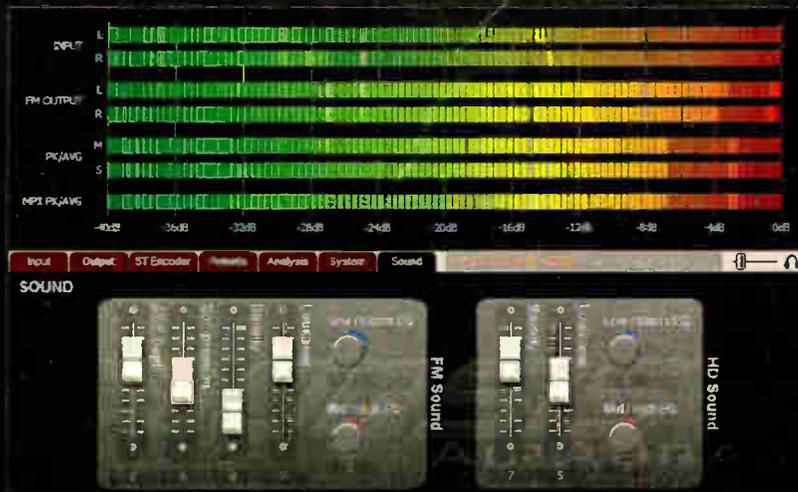
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"I can say that the Vorsis processor does NOT sound like the "O"ther guys! It sounds far better and has a very unique 'signature'. I really, really like how this processor sounds! Every other station in the market sounds like crunched up FM radio while our station is loud now and yet it still has "life" with CD quality dynamics and punch."

"I've listened to the station since the first few days after the format flip (which was a month ago yesterday), and the one thing I notice most is that the new Vorsis processor's audio quality is always terrific, regardless of the source material."

"If the Vorsis that I heard while you were testing processors last night is your final air chain (it was) it might just be the cleanest and best sounding FM I've heard since...well, forever. Great work!"

"Thanks for a great sounding box that makes us sound bigger than the so called big stations!"

"Your Sweet Spot Technology AGC has the most invisible gain correction that I have EVER heard in ANY on air processor. Listeners have been calling to compliment us on the improvement in our on air sound."

"We've used your product close to a year now and it's just out of this world. When we put the Vorsis box online our audience noticed the difference instantly and started calling asking questions like 'What's going on? What did you all do? Your sound is clear, crisp, and bright and the audio sound level is great now!!!"

"The music sounds great, and this box can be tweaked to anyone's preference. There is a lot to discover in this machine....but our single biggest achievement has been achieving the clearest, cleanest 'voice' I have ever heard come from an FM processor."

"I am extremely impressed with the unit's capabilities and how well it performs with our NPR talk/Classical format."

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"What an amazing difference in sound quality!!! This is a brand new FM station and comparing it to the other new station in town using the Other brand of processor our client is louder, cleaner, and even legal. Wheatstone definitely has a winner here with Vorsis."

"This is a great sound and we are so, so pleased with our new Vorsis on-air processor. You just threw down the gauntlet to the processing industry with this new unit! Nobody can match a sound this loud, this clean, and this unique! Now everybody gets to chase after us for a while. Thanks Vorsis!!"

"Our signal used to virtually disappear in downtown New York when we went on night pattern because of the extremely high level of man-made noise. Now when we're on night pattern our coverage in downtown is actually better than when we are on day pattern, the other brand of audio processor and a 10X higher powered transmitter! We're buying a second one to put on our daytime transmitter!"

"You have to be kidding! I have NEVER heard FM audio sound this good, this detailed, this smooth, this clean, and this loud (how did you do it??). Very nice work!"

"Love the box!!! Overall the sound of the station is vastly improved. It's loud, wide and clear."

"I guess the only word for Vorsis is 'WOW.' It's got some great bottom end, and it's more transparent than any processor I've heard."

"The AGC/Compressor/SST combination is simply amazing. We play classical CDs. Older classical CDs were mastered at a much lower level than current ones. Announcers don't compensate and never will. Your processor is able deal with what amounts to probably 40-45dB (or more) "average" level variations and hold them perfectly in the sweet spot with virtually no squashing, pumping, sucking, or other usually audible artifacts of such wide range level control. In short it does its job perfectly every time."

"This box sounds much better than any other processor I have ever tried. Ever!"

"I love classic rock and it's the program format on the station that I own. No other processor that I've tried (and I think I've tried them all!) sounds as good on this format. We're nice and loud and still cleaner than the other stations in the market. We were surprised to hear the intentional dynamics of songs actually get on the air - other processors just flatten them out or turn them into a sea of mush. For the first time ever we're also hearing subtle nuances in songs that we used to think we knew every single note of. What an amazing air sound! No.... What an amazing processor!!"

"The SST algorithm is the least audible of ANY processor I have ever had experience with. I'm not sure how you did it or exactly how it works but its automatic "leveling" is excellent - no pre-processing whatsoever is necessary with SST."

"The high end of this processor is very open sounding - there is no fake "sparkle" with the HF EQ either. Perfectly clean and natural sound. And did I mention LOUD?"

"Your equalizers are actually useful and unlike other processors do not grunge-up the sound merely by enabling them."

"Finally! A processor that deals effectively and transparently with overly-sibilant announcers and audio levels that usually go all over the place! (I especially love the tweak-able band thresholds!!)"

"Why haven't the other audio processor companies been able to make an AM box that sounds this good? I can't think of a positive superlative that is big enough to describe how pleased I am with our AM sound now. Our coverage seems to have increased by quite a bit too!!"

"Our multipath is Gone! GONE! As an engineer I have difficulty believing a processor can make this much difference in apparent coverage area but the listening is the proof. We've had several listeners call and comment that their reception has greatly improved and even I've noticed vast improvements when driving through what were previously horribly multi-path prone areas. I'm not sure why, but it sure does work!!"

"This box has great metering and excellent analytical tools - you get good visual indication of everything that is happening inside."

"The unit's stability has been flawless, not even a tiny glitch. We have it set up to time-sync and it works great. The scheduler-based (and SILENT!!) preset switching is perfect! Unit sounds very accurate sonically and is very easy to set-up."

"We are now VERY unique in our audio. Compared to other stations in the market, we are as loud yet maintain legal modulation (at least 4 stations in our market run with 130%+ modulation). We're not "squashed" sounding at all and if you compare us with the other stations (all formats) we're clearly a dynamic and clean stand-out signal on the dial now."

NOTE: We aren't naming names because everyone who is reaping the rewards of sounding better appreciates their anonymity (with respect to the competition). We won't blow your cover, either.