NAB SHOW PREVIEW SPECIAL ISSUE

NewBay Media

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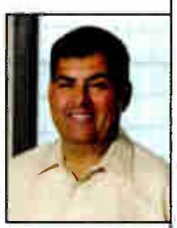

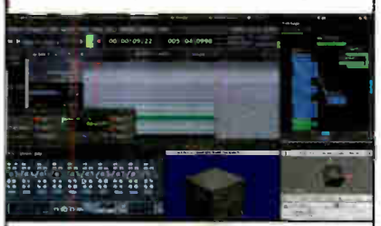

NABSHOW
Where Content Comes to Life

Weller Scouts Spectrum for NAB

"Everyone's looking for spectrum everywhere, and broadcasters are a particularly juicy target"

NEWSMAKER

WASHINGTON — Robert Weller calls radio his first love. His father hosted a show on KRE(AM) in Berkeley, Calif., in the 1950s, and Bob was hooked.

One of his first paying jobs was at an AM/FM combo, the former KDFC/KIBE, also in Berkeley. He used a Q-tip to clean the cart machine heads for the classical-music stations.

Weller was named as vice president for spectrum policy at the National Association of Broadcasters last summer. Although he's an engineer, Weller works in the NAB's legal and regulatory department, not far from the technology folks one floor above at the association's headquarters. At the spring NAB Show, Weller will participate in a Broadcast Engineering Conference panel concerning RF safety.

A native of Alameda Island, Calif., Weller holds a bachelor's degree in electrical engineering and computer science from the University of California, Berkeley, and a master's in electromagnetics from George Washington University. Weller is a Registered Professional Engineer in California and Colorado.

He has had two stints at the Federal Communications Commission; in the first, he worked as a radio inspector in the San Francisco Field Office, starting in 1984, and as director of its Denver District Office. He later rejoined the agency's Office of Engineering and Technology in 1997 as chief of technical analysis. In between, he worked at engineering consulting firm Hammett & Edison, where he conducted broadcast systems engineering, emerging technologies, due diligence and FCC rulemakings and applications.

He spoke with Radio World News Editor/Washington Bureau Chief Leslie Stimson.

***RW:** What is your job at NAB?*
Weller: My main responsibility is to ensure that broadcasters' spectrum

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On Mt. Wilson, History for Sale

page 14

John H. Poole's descendants have put a tower site on iconic Mount Wilson up for sale. The Poole building is seen here amidst the Mount Alta structures.

Photo by Scott Fybush

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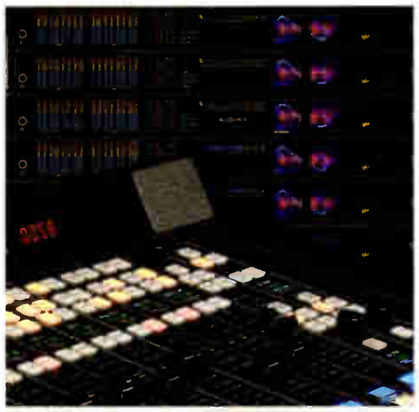

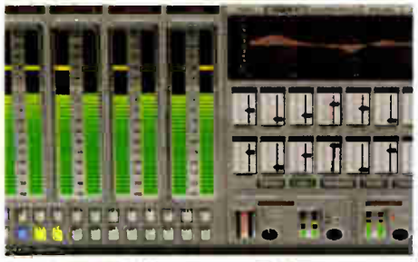

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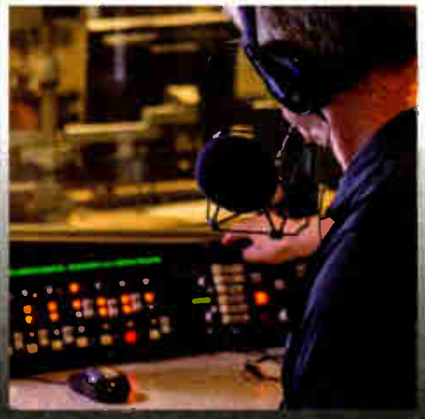

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BIG Spells Out Its Show Plans

Cauthen says members have saved on cost of trade show exhibits so far

The Broadcast Industry Group is achieving at least one of its original goals: saving money on trade show exhibits.

BIG formed last summer after organizers brainstormed a way to consolidate certain operations among a half-dozen manufacturers and streamline expenses. Founding companies are Orban, SCMS, Jampro, DaySequerra, StreamGuys and BW Broadcast.

Each continues to be owned and operated independently, said Bob Cauthen, president of SCMS; each is an equal partner within the consortium.

The group's plans for this year's spring convention are limited by the fact that exhibit plans need to be made a year in advance, Cauthen said.

"When BIG was formed it was too late to participate in the spring NAB Show as a group. We do plan on holding customer receptions this year and a consolidated booth at future NAB Shows," Cauthen said. Each company will have its own exhibit space this year. "However, there will be signage in each booth regarding the BIG consortium."

The group will conduct two invite-only off-site receptions, including a "broadcast engineer reception that typically attracts the top 70 to 80 broadcast engineers and DOEs in the industry," he said. BIG also will host a reception for prospective Latin American customers.

Cauthen said BIG is in discussions with convention organizers about its exhibit plans for 2016.

BIG is in discussions with NAB about 2016 exhibit plans.

The group — the members of which sell generally complimentary products and services — has been active at state broadcaster and SBE conventions so far this year, Cauthen said. BIG had a united presence in one booth at the National Religious Broadcasters convention in Nashville, Tenn., in February.

"NRB was very successful for us. I think we had the best booth traffic over the four days, since we were located just inside the main entrance with numerous technologies all at one location" Cauthen said.

BIG features technology, equipment and services for radio, TV and Internet broadcasting, according to the group's press release for NRB.

The group told Radio World earlier that it hopes to eventually consolidate sales, marketing and promotions. Cauthen said the consortium's next step will most likely be a joint advertising campaign.

"So far consolidation of the six companies has consisted of exhibits at trade show," Cauthen said. "We have realized savings from that consolidation through lower exhibition fees."

Cauthen said more broadcast equipment companies could join BIG if they fit within the group's criteria.

"We are currently discussing the addition of more qualified companies to BIG. There are numerous candidates that would fit," Cauthen said. "Everyone already in the group would have to agree to any additions."

"One of the main areas BIG will focus expansion on is in international broadcast conventions and shows," Cauthen said. "The cost for those far exceeds the domestic conventions for a number of reasons. That is where the consortium can really help us make a bigger impact."

Cauthen told Radio World previously he expects more consortiums, mergers and acquisitions within the equipment manufacturer sector.

— Randy J. Stine

NEWSROUNDUP

LVCC: The Las Vegas Convention Center is poised to expand again, by taking over the space now occupied by the Riviera Hotel and Casino. The Las Vegas Visitors and Convention Authority purchased the hotel and casino in a multi-million dollar deal and will take over the property in several months. The Riviera will be demolished and the LVCC will expand a total of 1.8 million square feet, in both exhibit and meeting space. The work will be completed in two phases, with some of the work involving renovating the current facility over a five- to 10-year period.

ENFORCEMENT: The FCC commissioners are considering a proposal to close or reduce assets at approximately half of its Enforcement Bureau field offices. According to a memo (shared by outside sources with Radio World) from the FCC's Enforcement Bureau Chief Travis LeBlanc and Managing Director Jon Wilkins to the bureau staff, the current field office model was adopted 20 years ago "and increasing resource limitations require a fresh look at this operating model." The FCC would reduce the number of field agents from 63 to 33 and reduce the number of director positions from 21 to five under the plan. The number of field offices would shrink from 24 to eight. The field offices to remain open would be in or near New York City, Columbia, Md., Chicago, Atlanta, Miami, Dallas, Los Angeles and San Francisco. Some markets would have "pre-positioned equipment" with an emphasis "on population/spectrum use density," according to the memo, including Kansas City, Denver, Salt Lake City, Phoenix, Seattle, San Juan, Anchorage, Honolulu and Billings, Mont.

A commission spokesman confirmed the plan has been sent to the eighth floor but said the details may change.

REACTION: NAB Executive Vice President of Communications Dennis Wharton characterized the Enforcement Bureau development, above, as "potentially troubling, particularly as the FCC begins encouraging spectrum sharing among different types of communications services. Having a robust interference enforcement presence in FCC field offices is critical to ensuring that consumers receive the services that they expect," he told Radio World.

Broadcast engineers who contacted RW worry about the effect that closing some field offices would have on the agency's effort to track down pirates; agents have special moveable, direction-finding equipment for that. That gear "is probably going to be missing from some markets. I don't know what their plan is to tamp [pirate activity] down if that equipment is taken away," said one broadcast source in a market slated for field office closure.

World Radio History

FROM THE EDITOR

Scott Herman is a lifer at what's now CBS Radio, having worked his way up from an entry-level newsroom job at New York's 1010 WINS(AM) to his current dual posts as executive vice president, operations for the entire company as well as market manager for CBS Radio's seven New York City stations.

He spoke to Radio World's Scott Fybush about how he sees the business changing, how he sees it staying the same and what he'll be discussing when he appears on a panel as part of the NAB Show's Broadcast Management Conference. The session "Radio's Lunch and Learn: Vision and Leadership — Getting the Buy-In," is scheduled for Monday, April 13 at noon.

Also in this issue we sample the tech treats of the Broadcast Engineering Conference, starting on page 18.

— Paul McLane

Herman Talks Radio's Future, Leadership

Radio "lifer" grew up within the company and has watched the medium evolve

BY SCOTT FYBUSH

RW: *You've spent almost 40 years in the business of all-news radio. How has evolving technology changed the way your stations do news?*

Herman: Most of it is in the delivery of content, in that we're still local; we still want to deliver great content with great talent. That hasn't changed. I think what's changed is how people are consuming the products, and we want to go where our listeners are.

So from a technological standpoint, I think it's probably the different devices. We have play.it, which is our podcasting platform, and we produce news; we produce sports; we produce self-help; we run the gamut in content in our podcasting, and I think that's an important place for us, as well as *radio.com*, which is the home of all our live streaming.

So I think what we've learned over the years is we can't just expect listeners to put on the radio. We have to supply our content on different devices, so they can take us wherever they go and consume it how they want to consume it when they want to consume it.

RW: *How does it change things behind the scenes from an operational point of view when you have one audience expecting a linear product that's live and nonstop and another taking it in bits and pieces over a station app or podcasts?*

Herman: News stories and news storytelling is all about picking the right stories and great storytelling, and I don't think that part has changed at all. Obviously, the live streams match up as an exact vertical to what we're doing on the air, while the podcasting might be "playing the hits."

It might be us taking a longer view and putting it in a format that's easier for people to consume when they want it, say taking a presidential news conference and speech and being able to consume it when they want it.

The overall sound on the air? I don't think that's changed dramatically. I think we're always updating and reviewing what listeners want. When you look at sports, 35, 37 years ago when I got into this, there was a need to deliver every score, every day. We now realize that people are getting their scores from

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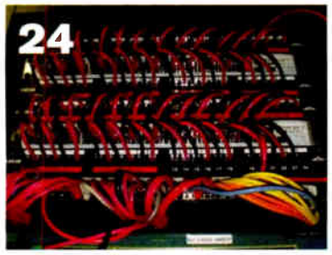

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different places, different websites, and we don't need to deliver 25, 30 scores from football or hockey every morning.

But it's about using what radio does best, which is, "What's current? What's happened since the morning paper? What's happened since they last checked into their smartphones?" They're now driving their car, what information do they need? I think that's where we've changed a little bit, we've recognized the fact that people have gotten a lot of the information already before they've gotten in the car, what do we need to do to be unique and different with information?

RW: *Your Washington-market station, WNEW(FM), has been in the news recently. After three years of 24/7 news, it's added evening and overnight talk programming to its format. Is it still possible these days to establish a brand like WNEW and to get it to stick in the face of all these different choices?*

Herman: I think it is. 1010 WINS is celebrating its 50th anniversary last year, and it took the New York City blackout to really establish that station. Back then, you didn't have TV news on as much as it is today, you didn't have cable news, you didn't have the Web, so clearly it's harder today.

But we're happy with how WNEW has gone. We knew when we started the project that it would take time. We knew that (Hubbard all-news) WTOP was entrenched in the capital, so we went with a different approach. We went with a format that was more traditionally like the old Westinghouse stations. We concentrated as much on the Beltway (suburbs) and Baltimore because we thought that might be an underserved audience.

And I think what we're recognizing now is that we can still live up to our all-news promise being all news 5 a.m. until 8 p.m., but we could also branch out and do longer form news and talk programming in the evenings, as well as carrying some play by play sports. That's a model that's different in each market. In Washington, WTOP defined all-news, but for years that included play-by-play sports and longer-form programming, as well.

RW: *In other markets where CBS stations are more established, what's the value that comes with brands that have been in the marketplace for almost a century, in some cases?*

Herman: We have the best brands in the news business, and with those brands come trust and credibility. People can get their time from a million different places, but when WINS says "WINS newstime," you will change your watch if your watch says something different. There are not many formats with that kind of credibility. You can hear someone tell you a news story, but until you hear it on WBZ in Boston or KNX in Los Angeles or KCBS in San Francisco, it's just not reality, because you haven't heard it from a trusted name, a trusted brand. That's the advantage of being CBS Radio. We've been doing this so long that we have that credibility, and we haven't lost that trust the listener has in us.

> **"We have to supply our content** on different devices, so they can take us wherever they go and consume it how they want to consume it when they want to consume it."

RW: *All-news radio traditionally relies on attracting listeners as they age into its demographic, becoming parents and homeowners. Is that still happening in today's fragmented media landscape?*

Herman: In some cases we've experimented with all-news being on FM, and that's a play market by market based on your signal and the terrain. It's not just automatic that putting your signal on FM is a victory. Fortunately for us, a lot of people come to the AM band for our news and sports stations.

But I think when you're on FM, the audience automatically gets a little bit younger. We have seen that, and clearly when they reach the 35-year-old part of the 25–54 demographic, they really do find the format.

RW: *Will you still be doing radio on the AM dial in a decade or two?*

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HERMAN

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Herman: I've seen so many technologies go by the wayside. When I was growing up, I listened to cassettes and 8-track tapes in my car. A lot of those things have gone away, but radio continues to flourish. Ninety-two to 93 percent of the population still listens to free over-the-air radio, and I just don't see that changing.

***RW:** Does it worry you when you look around at the overall trends of the industry and see other broadcasters struggling with debt load and cutting staffing levels?*

Herman: Everybody has to do what they have to do. We're very lucky at CBS because from the top of the company all the way down, content is a very important part of what we do. From Leslie Moonves all the way down, local programming, content that people want to see and hear is the paramount of what our company lives on. Even when we bring new stations into the fold, such as new acquisitions in Miami and Philadelphia, they quickly become part of what we do at CBS because so many people are there to carry the message to them.

I would love the entire radio industry to be strong. I think that that's good for all of us, but I'm very focused on running our radio stations with what we need to do to stay on top.

> **"I would love** the entire radio industry to be strong. I think that that's good for all of us, but I'm very focused on running our radio stations with what we need to do to stay on top."

I think what will continue to evolve is the technology and the devices they listen to it on. We still hope for a day when every phone will have a mobile FM chip in there and people will be able to use their phone as a transistor radio the way we did when we were growing up. I think we've made great strides with that as an industry. And I think HD Radio has been a great help. It's another way we've been able to put AM signals on the FM band because of multicasting. So I do think radio will continue to flourish even 25, 30 years from now.

***RW:** What about that all-news staple, "traffic and weather together?"*

Herman: One thing that's never gone away is traffic and weather! I think there will always be traffic. I look at my commute from New Jersey to New York every day and every five years I have to leave 15 minutes earlier because traffic has gotten worse. I don't think traffic will ever go away, and I don't think weather will ever go away, at least from our northeast stations. They're staples that are always going to be with us.

***RW:** You'll be talking about leadership at the NAB Show. What are your leadership philosophies?*

Herman: We're a very bottom up company, to some degree. Our stations are all locally programmed. Our program directors are extremely important; our sales management and leadership in the local markets is very important. We depend on them to a large degree to carry that message and lead the troops in our local markets, so its not so much Dan Mason or me or Michael Weiss, our head of sales, talking from the pulpit down. A lot of the execution of the playbook is left up to the local markets, as I think it should be.

The most enjoyable part of my job is the people. It's easy to look at CBS and the great history of the company and the formats and brands, but the people at these stations —I love the fact that I get to hand out service awards to people that have been with us 15, 20, 25 years, and that happens so often in our company.

I love watching people grow. I'm an example of someone who grew through the station. I started as a desk assistant at 1010 WINS in 1978 making $3.85 an hour, and I've never left the company.

Comment on this or any story. Email radioworld@nbmedia.com *with Letter to the Editor in the subject line.*

NEWSROUNDUP

ONLINE/PODCASTING: Online audio consumption in-car is growing, and podcasting is increasingly becoming mainstream, according to the latest Infinite Dial study from Edison Research and Triton Digital. Fifty-three percent of Americans ages 12 and up listen to online radio monthly; and 44 percent, or 119 million, listen weekly. Smartphone listening is growing in particular; it's up to 73 percent for device owners now, compared to 66 percent a year ago. More than half (54 percent) of Internet audio users say that Pandora is the service they listen to most often, followed by iHeartRadio (11 percent), Spotify (10 percent) and iTunes Radio (8 percent).

Nearly 90 million Americans, or about one-third of the country, have listened to a podcast. Monthly audio podcast consumption grew from some 39 million monthly users in 2014 to about 46 million in 2015.

IN-CAR: Other portions of the Infinite Dial study concerned in-car audio use. Online radio consumption in-car has more than doubled in the last two years, from 14 percent to 21 percent. Overall, AM/FM in-car is still the most used audio source (at 81 percent). The CD player is 55 percent and MP3 player/owned music is 38 percent.

Some 71 percent of Americans now own a smartphone, and 73 percent of those owners use it to listen to radio online. In the car, 35 percent of those device owners tether that device to the dash to listen to online audio. That's compared to 26 percent a year ago and 6 percent in 2010.

MARTÍ: Radio and TV Martí could become independent of the U.S. government, if a plan proposed by the White House passes Congress. The change is part of the federal budget proposal, and if approved, would be part of the U.S. effort to restore diplomatic relations with Cuba. Martí is part of the U.S. overseas civilian broadcasters governed by the Broadcasting Board of Governors. A BBG spokeswoman said the idea is to give Martí more flexibility in contracting, acquisitions and administration.

RIVET RADIO: HearHere Radio has renamed itself Rivet Radio to reflect its ability to build multiplatform, customized mobile and in-car streams. The growing company creates news updates and special interest pieces in its newsroom as well as through partnerships with media companies like American Public Media and Crain's Business.

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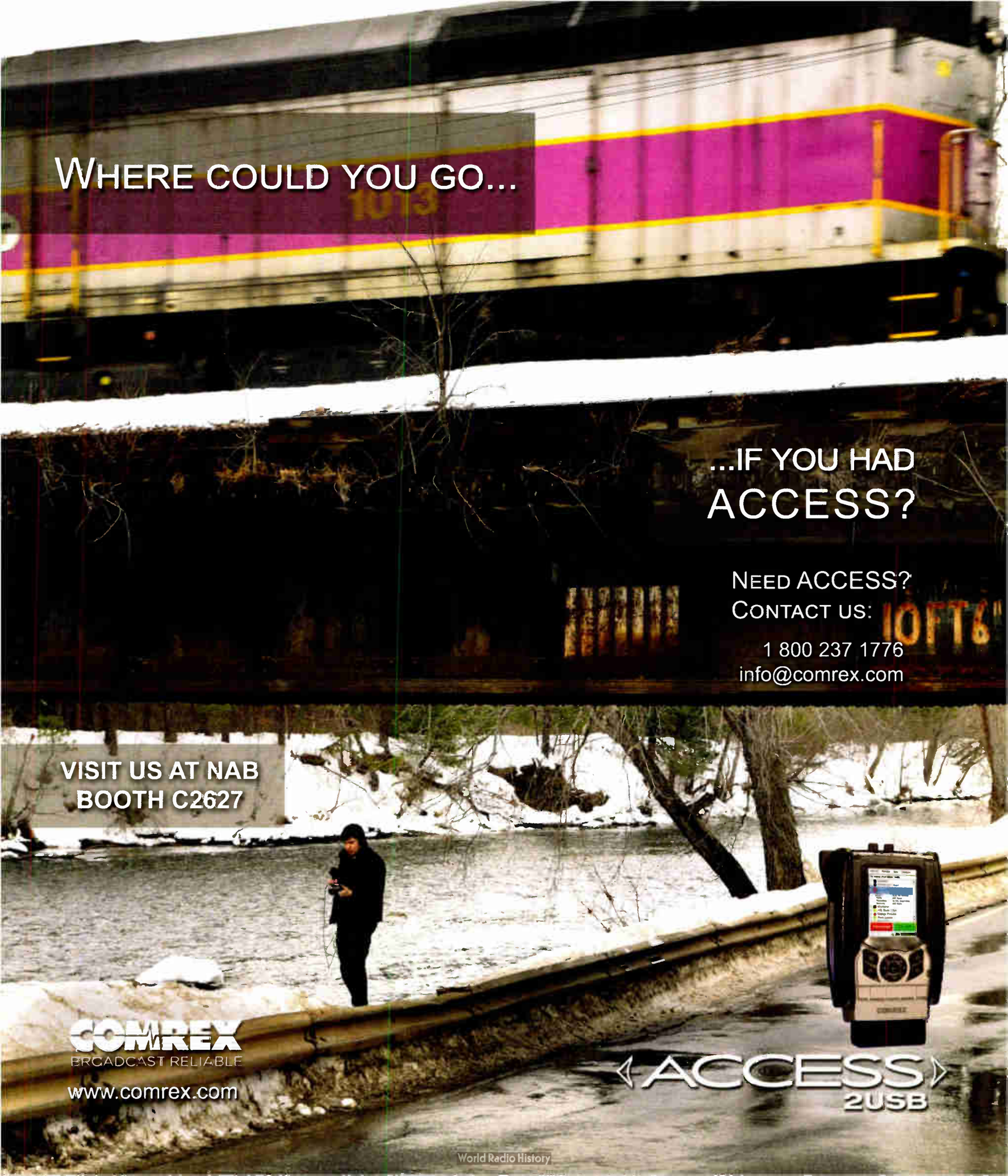

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WELLER

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rights are fully protected. That includes protecting not only the channels that are used to deliver programming to listeners and viewers, but also protecting the myriad auxiliary services that use spectrum to gather and distribute source material like ENG and wireless mics.

***RW:** Which is related to the current debate over the use of RPU spectrum.*
Weller: Exactly. I'm working with the Defense Department on some of that sharing as well.

***RW:** How does what you do affect radio?*
Weller: Everyone's looking for spectrum everywhere, and broadcasters are a particularly juicy target. You can bet that AM and FM broadcast spectrum and broadcast auxiliary spectrum are being looked at. NAB monitors the FCC and other agencies, looking for proposals that could impact our radio members.

One specific thing NAB is involved with is supporting enabling the FM tuners that are already in most cellphones. For example, in the iPhone, the FM tuner is an integrated part of the Bluetooth package. Apart from entertainment, radio broadcast is uniquely qualified to provide a lifeline to emergency information. That's a lifeline that doesn't rely on congestion and failure-prone infrastructure of cell sites. So getting those FM tuners activated is very important in terms of public safety.

My involvement would be to take a look at what would be the impact from the consumer experience.

***RW:** You'll talk about RF safety in Las Vegas.*
Weller: Philosophically, I'll say I'm very interested in RF safety and have been for a long time. I serve on what's called ICES, the International Committee on Electromagnetic Safety. Its function is to review the scientific literature as it's published to look for indications that could impact public safety and workplace safety with regard to electromagnetic energy. They develop standards to limit human exposure to electromagnetic energy to safe levels. They also develop standards to assist industry, including broadcasting, in ensuring a safe workplace or safe public. My particular involvement now is we're looking at things like access restriction and appropriate signage in workplace environments.

***RW:** Does this have to do with the revised tower rules the commission passed last year?*
Weller: That's right. That was an FCC proceeding that started in 2003. I was hired in 2007. One of my goals during my last stint at the FCC was to get that proceeding across the finish line. I'm proud to say at least part of it got across the finish line; there's a Further Notice as well. But it took five years to get it there.

Weller is former chief of technical analysis for the Federal Communications Commission.

***RW:** What are most important things to know about RF safety? Over the years, engineers have told me management has cut back on staff and that this plays out when an engineer has to go to the transmitter at night, often alone.*
Weller: Broadcast employees, especially the engineer and technicians who work around high-power transmitting gear, can get into hazardous situations when they work on live equipment. But my experience has been they're very aware of those hazards, including RF exposure. I would add that tower climbing and transmitter work are two things that should *not* normally be done alone, although I've done both of them myself. Sometimes, frankly, it's difficult to avoid that.

The two most important things are to be informed and to be careful. Don't work on live, high-power equipment; and don't climb a tower, or direct somebody else to climb a tower, without understanding the RF environment on that tower.

***RW:** What did you do as chief of technical analysis for the FCC?*
Weller: The Technical Analysis Branch is part of the FCC's Office of Engineering & Technology. When people ask me what I did, my response was something like: "I was involved with all of the numbers that the FCC produces that were not preceded by a dollar sign."

When you talk about frequencies and coverage and interference protection — all those sorts of numbers are in the FCC rules. ...

In terms of specific tasks, we talked about RF safety. The Technical Analysis Branch ... is a group of subject matter experts with diverse experience in engineering, computer programming, networks, physics, biology and mathematics. The group studies technical problems from a theoretical perspective, unlike the FCC laboratory, which studies sometimes the same or similar problems from an empirical perspective.

My job was to manage these theoretical experts to develop policy options, mostly related to spectrum management.

***RW:** Speaking of the lab, I went to the anechoic chamber when it opened at the FCC lab in Columbia, Md., when Michael Powell was chairman.*
Weller: That's where they confirm that the theory matches the product, or that the product matches the theory. The product, or the service, is just an idea in somebody's head. So the Technical Analysis Branch has to play out, using mathematical models, how that service or that product might interact with legacy users like broadcasters. Once the product is actually built — an example might be a whitespace device — then it gets taken out to the lab, and the engineers and technicians out there do lots of different tests to make sure that the theory matches the experience.

***RW:** In addressing the AM noise floor issue, some in the radio engineering community have proposed that AMs migrate to TV analog Channels 5 and 6. Do you have a personal opinion on this?*
Weller: The NAB board has discussed this in some detail, and I'm personally aware of those proposals. It's true that at present, the low-band VHF TV channels, including 5 and 6, are among the most lightly-used of all the TV channels. But I can also say that if the incentive auction is as successful as the FCC hopes, Channels 2 through 6 may see a resurgence, with lots of low-power TV and [TV] translator operations being relocated there. If that happens, it will become difficult to move forward and reallocate those channels for audio use.

***RW:** Do you work on HD Radio issues?*
Weller: NAB just completed a number of field tests of all-digital IBOC on AM. The technology group is still looking at the data, and there's a presentation at the NAB Show about that. One of the

(continued on page 10)

World Radio History

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Broadcast Codec News

NAB Special Release

March / April 2015

Crawford Broadcasting Jettisons Satellite in Favor of Tieline IP

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Cris Alexander with a Genie Distribution WheatNet-IP Codec

By Cris Alexander, Director of Engineering, Crawford Broadcasting Company.

Crawford Broadcasting is present in eleven different major US markets from coast-to-coast. Programming content ranges from public affairs, to political and Christian talk, as well as music programs in several different formats.

For years we have used satellite distribution for intra-company network programming, through uplinks in Detroit, Buffalo, Denver, Dallas, St. Louis and Los Angeles. In the fall of 2014 we moved most of this distribution to the internet using Tieline codecs.

Tieline's John Lackness showed me the Genie Distribution codec at NAB 2014. Our satellite space-segment contract was soon to run out and we were seeking a reliable, less expensive means of distributing programming. Since we already had Bridge-IT codecs in many of our markets, the Genie Distribution was a natural fit for us.

The WheatNet enabled Genies are located in our Denver and Detroit hubs where we have WheatNet-IP infrastructure. These are the only two locations where we originate/distribute company-wide programming elements. Other markets use Bridge-IT codecs for point-to-point transmission.

Tieline's WheatNet capability made the Genie Distribution codecs particularly attractive for us. Installation was, quite literally, plug and play.

Audio I/O routing is all performed within the WheatNet-IP environment. This is important in a network hub when one program may be fed out of one studio/station and another program may be fed out of another. It is a huge improvement over what we had been doing and offers:

- No audio connections
- Superior audio quality
- No A/D or D/A conversion
- No sample rate conversion

Customizing the Setup

We appreciate the ability to create custom "programs" within the Genie. One program we may need to send to markets A, B and C. Another program may need to go only to markets C, D and E. We can create custom connection programs that deliver only the connections we require. This preserves bandwidth at both the distribution point and end points and is something we could never do with satellite.

(Continued on Page 2)

WIN A CODEC BUNDLE AT NAB2015

See page 2 for Competition details...

Tieline's Bridge-IT XTRA Codec

Tieline's Report-IT Smartphone App

What's inside?

Pg 2 • Enhanced Bridge-IT and Bridge-IT XTRA features with new Firmware
• Codec Bundle Competition
Pg 3 • Save Thousands with Genie and Merlin Codecs...
• Rockin' Remotes with the i-Mix G3
Pg 4 • Flying Solo with Bridge-IT

www.tieline.com

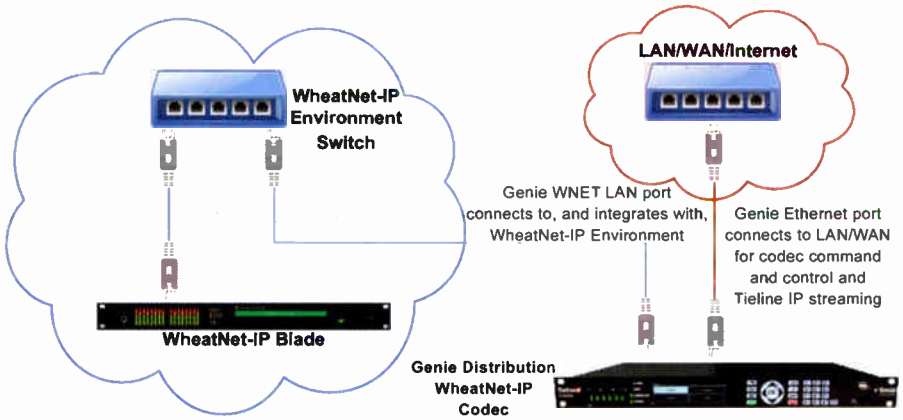
World Radio History

(Continued from Page 1)

We also like to remotely activate and deactivate programs with contact closures. This allows us to use Wheatstone's scheduler to route, activate and deactivate programs as needed.

IP is the New King...

Universal availability is the best part about broadcasting over IP. We can send a feed from anywhere with IP connectivity, to anywhere with IP connectivity (with some qualifiers of course).



Integrating with the WheatNet-IP environment (Genie Distribution with WheatNet-IP product pictured)

We only connect over IP and integrate both DSL and cable, plus some locations have fiber available. In Denver and Detroit we use Comcast cable internet for the Genie Distribution networks. In some locations we have a main and failover DSL with the failover mechanism handled by firewalls.

Generally speaking, reliability is quite good. In fact, the cable internet services we have are probably more reliable than some of the expensive point-to-point T1 circuits that we used in the past, and that is reflected in the IP connections.

We use the Tieline Music PLUS algorithm in stereo at 256 kbps with 48 kHz sampling. The quality is excellent and it surpasses the quality of the 128 kbps MPEG satellite transmissions we replaced.

We use some of our Bridge-IT codecs in backup STL applications. These replace the ISDN-based backups we have used for years. We employ solid-state switching in most cases (using RDL audio-controlled relays and the like) to switch the audio between primary and backup STL feeds.

We also began using Tieline codecs for remote broadcasts in 2012, using the Bridge-IT codecs and the Report-IT Live app. This opened up a whole new world of possible venues for us; locations where ISDN service was not available, but where we could get Wi-Fi, 3G or 4G service. It also made it possible for talent to run their own remotes without sending out a technical person.

Several of our talent and clients have also purchased their own Bridge-IT codecs and many have the Report-IT Live app.

In summary, all our engineers love Tieline products. They are easy to install, set up and use. They love the flexibility and suite of options.

Enhanced Bridge-IT Features

Tieline Bridge-IT and Bridge-IT XTRA IP audio codecs now ship with a range of value adding new features and enhancements which improve codec configuration and control. The new firmware release v2.14.xx delivers:

- A significantly improved web-graphical user interface with new features.
- The Opus algorithm as standard in Bridge-IT and Bridge-IT XTRA.
- AAC-LD and AAC-ELD as standard in Bridge-IT XTRA.
- AAC-LD and AAC-ELD in the AAC license pack for Bridge-IT.
- AES input monitoring and enhanced headphone monitoring settings.
- Data support for connections with Commander and i-Mix G3 codecs.
- Support for sessionless IP connections.
- 3 levels of user 'lock' functionality.

Existing owners can upgrade their codec with a free download via http://www.tieline.com/Support/Latest-Firmware.

Tieline's Bridge-IT XTRA Codec

Win Bridge-IT XTRA & Report-IT

Visit our Booth at NAB2015 and you could win your own Bridge-IT XTRA IP codec and a Free Report-IT 10 pack subscription. Go live anywhere, anytime conveniently with nothing more than a cell phone.

How To Enter:

1. Visit our Booth (#C2761) at NAB2015
2. Drop your business card into the draw
3. Competition will be drawn on Wednesday 15th at 12pm. Winner will notified by SMS or Phone.

Terms & Conditions:

1. Dealers and Tieline staff ineligible
2. Report-IT Free for 1st year only (Subscription fees apply for 2nd year onwards)
3. Report-IT account valid for winner only
4. Prize is not redeemable for cash

World Radio History

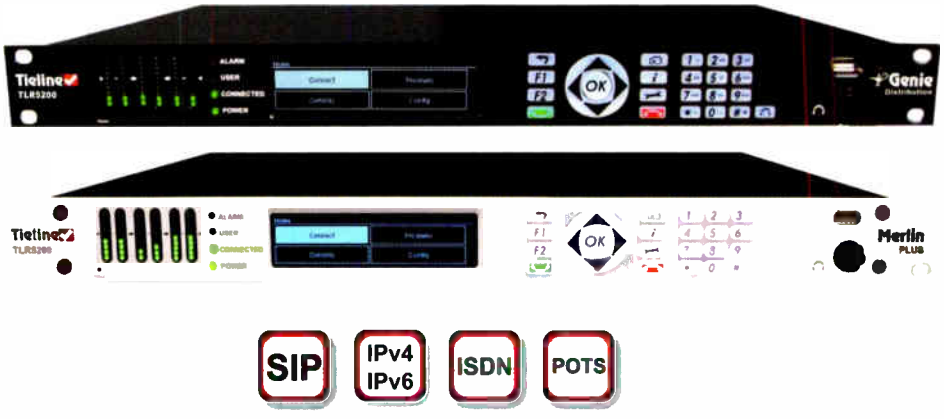
Save Thousands with Genie and Merlin Codecs...

On a daily basis US networks ask us for solutions which allow them to transition from ISDN to IP codecs, mainly because ISDN infrastructure is being phased out in many regions. At the same time, engineers are also realizing they can save big money on network costs, by transitioning out of shrinking ISDN networks and expensive satellite links into affordable IP connections instead. In some cases the capital cost of new codecs can be recouped in just months!

Flexible codec solutions allow engineers to continue supporting ISDN where required and transition into IP over time. The Merlin and Genie families of IP codecs are ideal for this purpose as they support connections over IP, as well as ISDN and POTS via optional plug-in modules.

Genie and Merlin codecs also include SmartStream PLUS redundant IP streaming software, which is rapidly becoming the industry standard for broadcasting over the public internet. SmartStream PLUS has revolutionised IP broadcasting and delivers rock solid STL-grade audio quality using inexpensive unmanaged IP networks like the internet for STLs, audio distribution and remotes.

Contact Tieline today for a free demo or to discuss the options available to you.



Rockin' Remotes with the i-Mix G3

By Mike Capps, Director-Broadcasting, Round Rock Express, AAA affiliate of the Texas Rangers Baseball Club

Hello from Texas!

Eleven years ago, when the Round Rock Express Baseball Club made the jump from the AA Texas League and its eight clubs, to the 16 team, spread from Washington state to Tennessee Pacific Coast League, it also made a technical jump in terms of radio broadcast equipment.

Instead of POTS-only codecs, & seemingly nightly connection nightmares in the Texas League resulting from shaky phone connections, we upgraded to the much more reliable ISDN technology demanded in the Pacific Coast League.

Not knowing much about what type of codec would be needed, I consulted friends within the PCL, none of whom at that time used the unit I settled on, the Tieline i-Mix G3.

After speaking with my fellow broadcasters, and discovering their codec preferences, and examining those, I found them all wanting in various ways. What sold me on Tieline after talking to the experts in the Indianapolis home office, were the following:

1. Its operational simplicity
2. Its POTS backup capability (which, by the way, we have only had to use a handful of times throughout the eleven seasons we have used ISDN).
3. The ease in dealing with the manufacturers and engineers at Tieline who are extremely collegial
4. The final and perhaps the most important factor - its compact size, I can carry my G3 and stow it in the overhead compartment in any airplane. I place it in a small backpack, complete with headphones, microphones, and cabling. That's antithetical to my counterparts who must ship their gear in airplane cargo holds due to the huge carrying cases those codecs demand. I simply did not want to put my gear through airline baggage loading acrobatics.

Now, we face the next challenge - moving away from ISDN technology to IP. Already, I have had my G3 retrofitted for IP and have ordered a new IP receive unit for our flagship radio station. I stuck with the G3 because, again, it features POTS backup, which I hope we will not have to use.

And finally, I have encouraged the other 15 broadcasters in our league to make the switch to the Tieline i-Mix G3. Here's hoping they do. They will not be disappointed.

Tieline's i-Mix G3 Codec

World Radio History

Flying Solo with Bridge-IT

My name is John DeRosa and I'm a consultant engineer for KHNS as DeRosa Consulting LLC. I've been an engineer of many flavors in my career, including a long stint as a software engineer. However, broadcast engineering over the last 5 years has brought me back to my roots.

KHNS is a public radio station that broadcasts 25 two-hour live DJ shows a week catering to various musical tastes, NPR and PRI content, independent productions, Alaska-specific content and local news. All our DJ shows are hosted by local, talented volunteers in both the main and remote studios.

Before we purchased Tieline Bridge-IT codecs around 2 years ago, we transported our audio from the remote studio in Skagway to the main studio in Haines via three transmitters, three receivers, and six antennas. The sound was poor and the maintenance was high, including yearly brush cutting. Replacing all that with the pair of Bridge-IT codecs gave us great sound and reduced maintenance, which is extremely important given that access to the remote studio is by plane, ferry or a 7 hour drive (on a good day).

When we first installed the Bridge-IT codecs, we were broadcasting about 5 two-hour shows a week from our remote studio. These shows were limited to office hours because a staff person had to be in the main studio control room in Haines to get the remote DJ on the air.

Subsequently, I came up with a system using the functionality of the Bridge-IT, our control board and other 3rd party hardware, to allow remote DJs in Skagway to get on the air without a staff member in the Haines studio. This provides the opportunity to expand our remote programming to include early morning, late night, and weekend shows.

John DeRosa with the Bridge-IT Codec

To "fly solo" we're using one codec relay at the remote studio and two codec relays at the main studio. From the DJ's perspective, all they need to do is press the 'dial' button on the codec's front panel to get connected. After the two codecs connect the announcer simply flips the "DJ Switch" to 'on' and they are on the air!

After that it's smooth sailing. During some two hour shows there is a 5 minute news break at the top of the hour. To facilitate this, the remote announcer toggles the DJ switch to 'off', so that the automation at the main studio can broadcast the news break. Then they toggle the DJ switch to 'on' to resume and go live again after the news break.

We're using a standard DSL connection in our Skagway studio and encode using Tieline's low latency MusicPLUS in mono at 96kbps and the sound quality is excellent.

By connecting automatically to the main control room our remote DJ's are available for more shows, the remote community is better served, and the workload is reduced in the main studio.

Our DJs are excited about the opportunity this provides to expand programming from the remote studio. In addition to music programs, this now allows us to add a local magazine program specific to Skagway, which will alternate with the Haines version. It also allows us to move into morning news hosting from Skagway.

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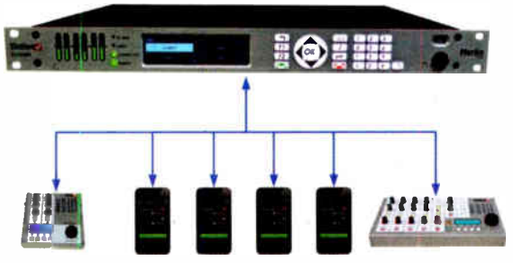

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World Radio History

WELLER

(continued from page 8)

things that came out of those tests is that theory doesn't necessarily match the experience in terms of interference susceptibility.

Presently, the FCC's allocation rules don't deal with all-digital AM. So, if this is something that the industry thinks needs to move forward, then part of my responsibility would be to come up with the best way to approach the necessary rule changes. But we're not there yet.

RW: You began your FCC career as a station inspector in the San Francisco area. Please share any funny stories from those days.

Weller: I spent nine years in the FCC's field organization. I've had guns pointed at me. I've interviewed inmates in prison. FCC agents carry a badge, and there's definitely a law enforcement aspect to some of the work.

At one point the FCC had an enforcement boat that I equipped for direction-finding. I grew up on an island [Alameda in San Francisco Bay] and learned to sail when I was very young. I volunteered for this marine enforcement project.

The boat was a planning-hull souped-up bass fishing boat that had been seized by the Drug Enforcement Agency. It went really fast, but unfortunately, it was not well-suited for the choppy waters of San Francisco Bay. So we had to poke along at some pretty slow speeds. One of the first things that we used it for was to work with the Fish and Game agents to locate poachers.

Because were in this unmarked bass boat, the poachers didn't suspect anything when we would come alongside. So we could give their locations and other information to the fish cops, who would then come in and do the actual bust.

The only requirement was that the Fish and Game Office, in addition to charging them with poaching, had to tack on "operating a radio without a license."

RW: A marine radio?

Weller: What they were poaching, apparently, was roe — caviar. They didn't want to use marine radios because too many people have them and there would be too many people listening in. They used illegal frequencies and that's what brought in the federal charge of operating a radio without a license.

I did some undercover work, which was a lot of fun. ...

Back in the early 1990s there were not a lot of standardized personal computers available because the FCC rules required every model had to be tested, which was a very expensive process. People would build grey-market computers and sell them. We busted one guy so many times that we finally got a warrant to seize his inventory. We invited one of the local TV stations to film the bust.

I posed as a black-market satellite TV dealer who could hook you up with free HBO. We did a sting operation where we worked with HBO to shut off the illegal de-scrambler boxes. Then the person who had bought this illegal satellite box would bring it in to the store, and then we'd threaten them with prosecution for piracy unless they turned in their box.

And back when 900 dial-a-porn was a thing, one of my jobs at the FCC was to call those numbers and record and transcribe the call to make sure that minors couldn't access the obscene content. The FCC had an unblocked line installed in a special room. All I can say is there must have been a lot of money in 900 dial-a-porn, because it was weeks and weeks of calling these numbers and recording them and transcribing all the stuff. ...

RW: What did you do at Hammett & Edison?

Weller: I spent 15 years at Hammett & Edison consulting engineers. I was able to learn under both Mr. [Robert] Hammett and Mr. [Edward] Edison, both NAB Engineering Achievement Award winners, as well as from other engineers who had designed many AM, FM and television stations. It really opened my eyes about why stations are designed the way they are, why certain FCC rules exist at all, why they're written the way they are, and which rules can be used to a client's advantage.

RW: Do you still work with the Motorcycle Safety Foundation and enjoy riding?

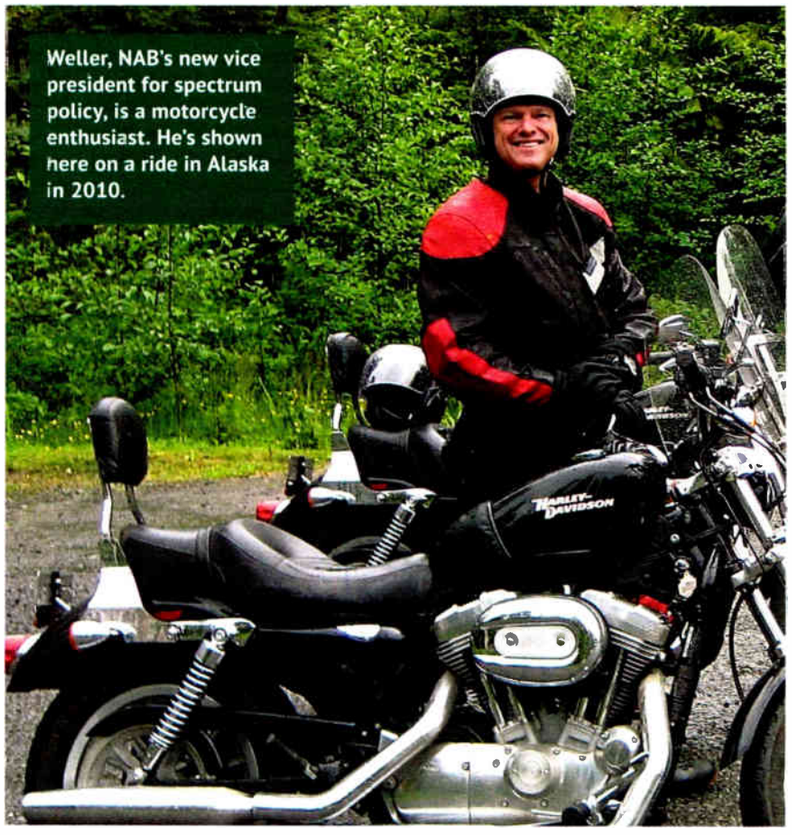
Weller: I've been riding motorcycles since I was old enough that my mother could no longer tell me "no." But it can be a dangerous hobby. A lot of people, including myself, start to ride with no training, thinking it's like riding a bicycle. That's not a good idea, especially if you're riding on the street.

I took a Motorcycle Safety Foundation course, initially to get a discount on my insurance. But I felt like I learned so much from the course that I wanted the opportunity to share what I learned with others. I became a riding instructor. I did that for a number of years. However, it's a very demanding job physically and it takes up a lot of weekends so I haven't been coaching for a couple of years.

RW: Do you still find time to ride occasionally?

Weller: Not very often. My wife and I are "green." We don't own a car or a motorcycle. My son owns one and sometimes when I feel the urge I'll hop on his bike.

Comment on this or any story. Email radioworld@nbmedia.com.

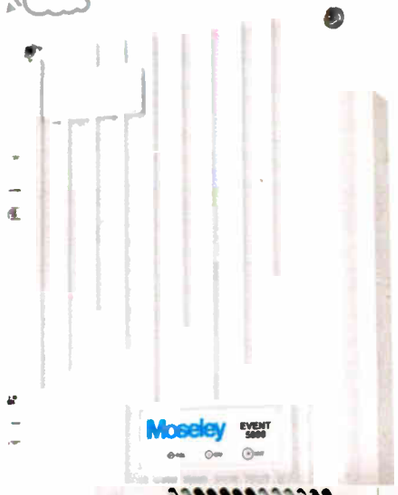


Weller, NAB's new vice president for spectrum policy, is a motorcycle enthusiast. He's shown here on a ride in Alaska in 2010.

World Radio History

HIGH CAPACITY
EVENT STUDIO TRANSMITTER LINKS

outdoor unit



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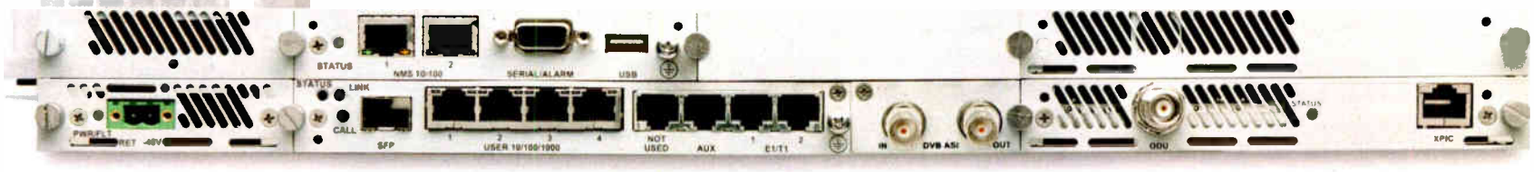

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Offer IP transmitter control, surveillance security, and site monitoring to reduce downtime, and protect valuable station assets while saving travel time to the site.

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From the transmitter site, offers backup of business records and programming content to get you back on the air quickly in the event of a studio outage.

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World Radio History

Why Does That Receiver Hum?

Because it doesn't know the words? Guess again. John Hutson found out

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

Continental Electronics' John Hutson adds to our recent tube discussion.

He was trying to get hum out of the audio in an old "boat anchor" receiver that used a 12AX7 as the audio driver. He knew he had a mechanical issue because wiggling the tube would cause a static noise and the hum level would change. Different tubes acted the same way.

John sprayed Caig Labs' DeoxIT cleaner on the tube pins, and he plugged and unplugged the tube a few times, but heard no improvement.

The next step was to wiggle the tube socket terminals under the chassis with a plastic alignment tool. *All* the terminals had the "problem" so John resoldered a few that didn't look good. Still, he had no luck resolving the problem.

Next came the ohmmeter to check for bad resistors or leaky capacitors. Everything checked out fine.

John then turned the unit on and started to check voltages. While checking one pin, his probe slipped off the tube socket terminal and hit the metal mounting ring of the socket. The hum stopped momentarily.

Here's what had happened: The tube socket had four ground lugs around its bracket that were used to make the ground connections for the resistors and a capacitor that went from various pin terminals to ground. The tube socket was attached to the chassis with rivets. The rivets had loosened over time, and there was rust between the tube socket and the chassis.

Fig. 1: "How Not to Mount an Antenna 101."

A simple wire added from one of the socket ground lugs to the ground lug of an adjacent terminal strip solved the problem.

The hat's off to you, John, for your persistence in solving this problem, although I wouldn't have expected anything less from a member of the Continental service team. Thanks for taking us through an organized and effective troubleshooting process.

Directors of engineering come across interesting situations in their travels. Saga DOE Tom Atkins sends along Fig. 1, a case in point.

While traveling in North Carolina recently, he glanced out his car window and saw this tower/tree combination. It was on the side of a mountain. Do you think the tree right in front of the bays may add some directional properties — especially when the tree ices up?

That's another reason to inspect your tower/antenna sites regularly.

Recall our suggestion about lying on an ironing board to help gain access to certain hard-to-reach components under a transmitter's power amplifier.

Radio Bob wrote to take us to task for this:

"Really hate that ironing board idea. Understand the necessity, but they're not built to hold the weight of a person laying on them. Wonder what's worse? Being stiff after sitting on the floor and being a contortionist to access what

(continued on page 16)

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World Radio History

Los Angeles Tower Site Is Full of History

BY SCOTT FYBUSH

There's plenty of premium real estate for sale at any given time high in the hills above Los Angeles. But one particular listing literally *towers* a mile above the rest: After more than 60 years, the family of broadcasting pioneer John H. Poole is selling a tower site he built from the ground up, way back in 1953, atop California's iconic Mount Wilson.

"This is really the end of an era," said Robert Heymann, director of Media Services Group, the brokerage firm handling the listing.

Tucked into a 6,000-square-foot piece of land on Mount Alta, the central portion of the Mount Wilson tower farm, the Poole property includes a transmitter building, four tower structures and a long, fascinating history.

SEEKING HEIGHT

Born in 1917, Poole took an early interest in radio. An amateur operator at age 14, he served as a radioman in the Merchant Marine; he later spent World War II in the Army Signal Corps. After the war, he owned radio stations in Santa Maria and Pasadena, Calif., then went offshore to put KBIG (740 kHz) on the air from Catalina Island in 1952.

By then, Poole was fascinated with television, in particular the unexplored landscape of the UHF dial. In 1952, he put an experimental signal on the air from Signal Hill in Long Beach. As soon as the FCC was ready to issue commercial construction permits at the end of 1952, Poole was in line, and the CP he received Dec. 10, 1952, for KPIK on Channel 22 was among the first the commission issued.

To have any hope of rivaling the signal coverage of the big VHF stations in Los Angeles, Poole had to be up where they were, and that meant moving Channel 22 from Long Beach up to Mount Wilson. Over a few months in 1953, Poole built a three-story transmitter building and a self-supporting tower, ordered one of GE's first UHF transmitters and found tenants for his new broadcast site. By August, KTHE(TV), Channel 28, was on the air from the ground floor Poole site as the first educational TV station on the West Coast, and the International Ladies Garment Workers Union followed suit on the second floor with its new KFMV(FM) on 94.7.

You can make a case that Mount Wilson is the premier broadcasting site in all of America.

– Robert Heymann

Poole's own Channel 22, renamed KBIC(TV), put its transmitter up on the third floor, topped by an attic with big south-facing windows where microwave dishes could aim down into the valley at in-city studio locations. KBIC never built a studio, though; once Poole put his UHF signal on the air with a test pattern, that was all it ever broadcast. With seven commercial VHF stations already in the market and no requirement that TV sets be able to receive UHF, KBIC couldn't compete commercially. By 1960, it had sold its transmitter to a start-up station in Walla Walla, Wash., but that station also failed and the transmitter ended up back on Mount Wilson.

FM ADOPTER

The 1960s were kinder to Channel 22. After Poole sold the license in 1963, it returned to the air as KIIX(TV), targeting the African-American community in Los Angeles, then was sold again to the owners of KPOL radio. They moved their KPOL(FM) on 93.9MHz to the Poole site, bringing more FM there. Another sale of Channel 22 later in the 1960s gave it the calls it has today, KWHY(TV).

The first station to broadcast live stock reports, many decades before CNBC, KWHY eventually added subscription TV service and then became a Spanish-language independent station. Today's Channel 22 still operates from the original transmitter room and tower that Poole built back in 1953.

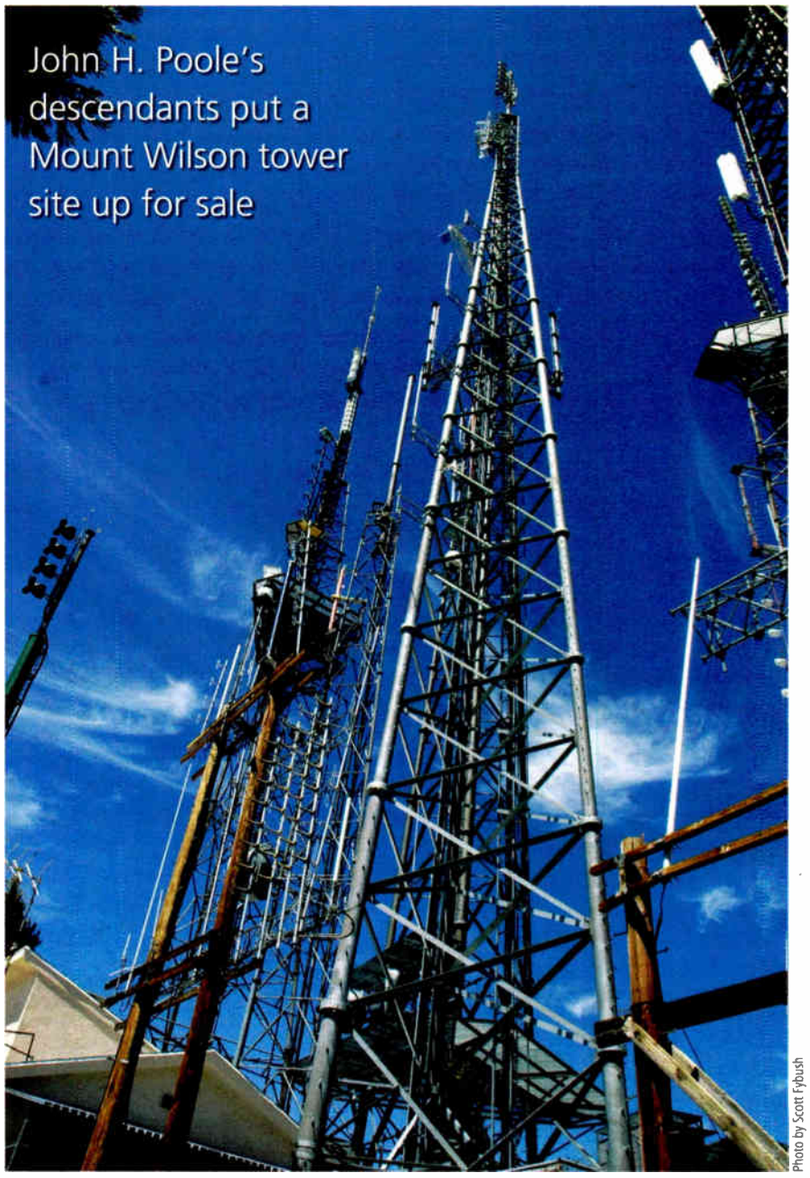
Poole was more than just a UHF pioneer. He was an early adopter of FM as well, and his tower site on Mount Wilson has been home to FM signals from the beginning.

While 94.7 (now KTWV) moved out after being sold to Metromedia, which owned its own Mount Wilson site, Poole put his own FM signal on the air in 1959, KBIG(FM) 104.3. True to its callsign, "K-BIG" quickly became a major player in the market, with ratings eclipsing its AM sister out on Catalina Island. Poole exited station ownership in 1974, selling KBIG to Bonneville and turning his attention away from broadcasting toward a new venture as a winemaker. He kept the site on Mount Wilson, though, along with its tenants.

Today, those tenants include main transmitter sites for KWHY(TV), KBIG(FM), now owned by iHeart Media, and Grupo Radio Centro's KXOS(FM) on 93.9, the descendant of the old KPOL(FM). Channel 22 still sits on the original Poole tower, which also hosts an auxiliary antenna for KXOS(FM); the original KBIG(FM) tower was replaced in 2005 by a new tower at the same location that's now home to both KBIG and KXOS.

There's also the "green tower," a monopole that carries an auxiliary

(continued on page 16)



The Poole towers rise among the forest of transmission facilities in the Mount Alta central section of the Mount Wilson tower farm.

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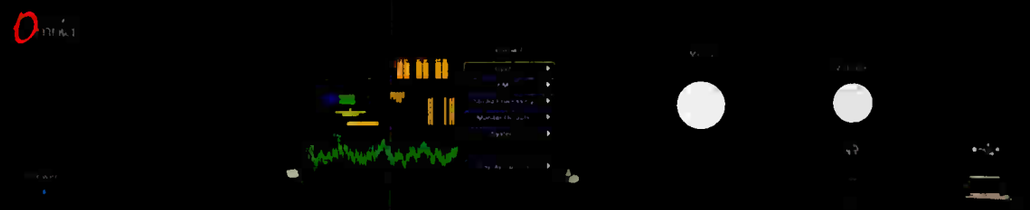

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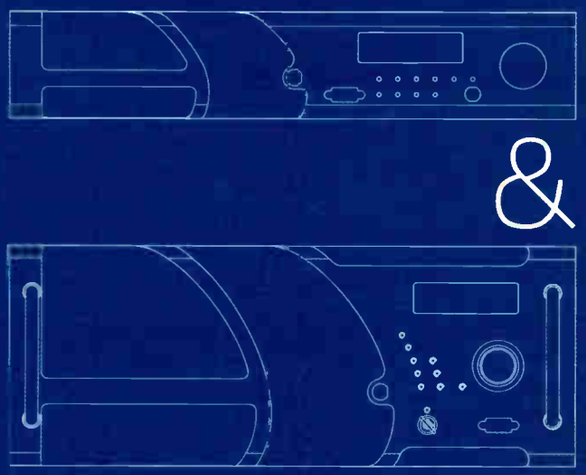

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LA TOWER

(continued from page 14)

antenna for KBIG and will soon also be an auxiliary site for iHeart's KYSR(FM) on 98.7, and a wooden H-pole lattice structure that carries two-way antennas. Heymann says the site still has capacity available for additional broadcast and non-broadcast users.

After John H. Poole's death at age 86 in 2003, the tower site stayed in the hands of family-owned Poole Properties Inc., until now. Meanwhile, other tower sites on the mountain have changed hands in larger group deals, most notably CBS Corp.'s sale of many of its towers to Richland Towers and the subsequent purchase of Richland by American Tower.

"You can make a case that Mount Wilson is the premier broadcasting site in all of America," Heymann said, since it's the primary TV and FM site serving the top-billing radio and TV market nationwide.

The sale of the site comes at a time when "vertical real estate" is a red-hot market.

"For public companies, the investing community views these types of companies as having tremendous growth potential," Heymann said. "That gives the public companies the opportunity to acquire cash flowing assets and have them create value for shareholders."

The Los Angeles Business Journal reports that the Poole property could sell for between $5 million and $10 million.

WORKBENCH

(continued from page 12)

you need, or the injury when that damn board buckles in the middle and ... you're involuntarily and instantly placed in a contorted position (and your head is cracked against metal or protruding parts)? The ironing board idea is a bad idea waiting to happen."

The problem with sitting on the floor is not so much about being stiff, but rather twisting yourself to obtain visual and manual access to components. A plank or, in this case, an ironing board, may make access easier.

Certainly, though, assess your ironing board first for your weight and size. I pulled out my ironing board and noted the metal sides are supported and rolled, to avoid buckling; see Fig. 2.

Friend Weller is chief engineer for Utah Public Radio. He sends a few more eagle-eye comments about the mystery radio station photo we published in the Feb. 1 edition of Workbench.

As we noted, "Saturday, October 7" tells us that the year was 1967 or 1972. Friend notes a blue/green MGM record label. If so, the date was no earlier than 1968.

The cheap plastic headphone lying on the console is another giveaway, indicating that this was perhaps the early '70s, because 1960s "cans" were still kind of big and clunky.

The Tapecasters and the Ampex reel-to-reel appear to be of a more recent vintage, perhaps the early 1970s.

If the scan was of a higher quality there might be chance of picking something off the program log, a record label or the memo on the glass.

Also, Kitchen's Field is the name of the football field at New Albany's high school.

Fig. 2: Most ironing boards have adequate reinforcements to support a body. But it's still smart to check.

Friend writes if he were a gambling man, he'd identify the station as WNAU, New Albany, Miss. Perhaps this was their production room in 1972, or it may have been the control room.

WNAU signed on the air on June 1, 1955.

Contribute to Workbench. You'll help your fellow engineers and qualify for SBE recertification credit. Send Workbench tips to johnpbisset@gmail.com. *Fax to (603) 472-4944.*

Author John Bisset has spent 45 years in the broadcasting industry and is still learning. He handles West Coast sales for the Telos Alliance. He is SBE certified and a past recipient of the SBE's Educator of the Year Award.

World Radio History

SATELLITE SIGNAL LEVEL METER AND SAT IDENTIFIER

Our TURBO-S2 meter makes satellite antenna aiming fast and easy. Now you can perfectly peak all your dishes, to achieve maximum performance and reliable reception of "finicky" new digital channels. The unit powers the LNB for convenient work at the dish site. The TURBO-S2 shows the name of each satellite, plus displays key signal quality specs for all

MPEG2/MPEG4/DVBS/DVBS2/QPSK/8PSK channels. Adjust to perfection when viewing readouts for carrier-to-noise (C/N), signal quality (EbNo), and Bit Error Rate (BER). This USA-built unit comes with English speaking tech support, and our customers widely praise the unit for its features and reliability.

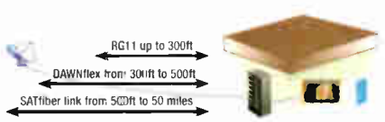
SURGE SUPPRESSOR FOR LIGHTING NEAR SATELLITE ANTENNA

Place "LNB-Zap-Stop" in the coaxial cable line that runs from the dish, to the satellite receivers. Think of it as an "insurance policy" to protect expensive indoor equipment from lightning hits. Transient

Suppressing Diode technology works to block high voltage lightning surges. The lightning protection units can take multiple hits, with no need for reseting or replacing.

CHOOSE THE BEST LNB SIGNAL CABLE

On long satellite signal cable runs, avoid using "noisy" amplifiers, so that you maintain the maximum C/N performance that your dish can deliver. Choose DAWNflex low-loss coaxial cable for dish-to receiver distances from 300 to 500 feet. This flexible cable passes satellite L band signals with very little loss. It is flooded for direct burial, and the quad shielded design



offers the best protection from signal ingress. Choose the SATfiber link for dish-to-receiver distances from 500 feet to 50 miles. Eliminate long distance signal attenuation, and lightning surge problems, when you install SingleMode fiber running out to the dish. Place our SATfiber Transmitter and Receiver units on both ends of the fiber, and pass 45 to 2800 Mhz with perfect quality. Call DAWNco to hear about our easy-install fiber, and for help choosing the best SATfiber system for your needs.

HD GRADE LNB AMPLIFIERS ARE NEEDED FOR NEW SAT CHANNELS

Several networks have made the switch to DAWNco's new "L series" of C and Ku band LNB amplifiers, to accommodate the "finicky" nature of new HD satellite receivers. This new generation of LNB has improved specs that can make a real difference in the reception of high-definition and 8PSK satellite channels. These new LNBs feature best-in-industry specs for "1dB gain compression point" and "phase noise." Internal circuitry has been completely redesigned for reduced power draw, so that indoor receivers and power supplies will never be overtaxed. In order to prevent video picture tiling and signal outages, when outdoor temperatures fluctuate, DAWNco's best LNBs feature a highly stable +/- 2 Khz rating. Make sure to upgrade to the new DAWNco "L series" LNBs, and watch for improved EbNo readings on your digital satellite receivers.

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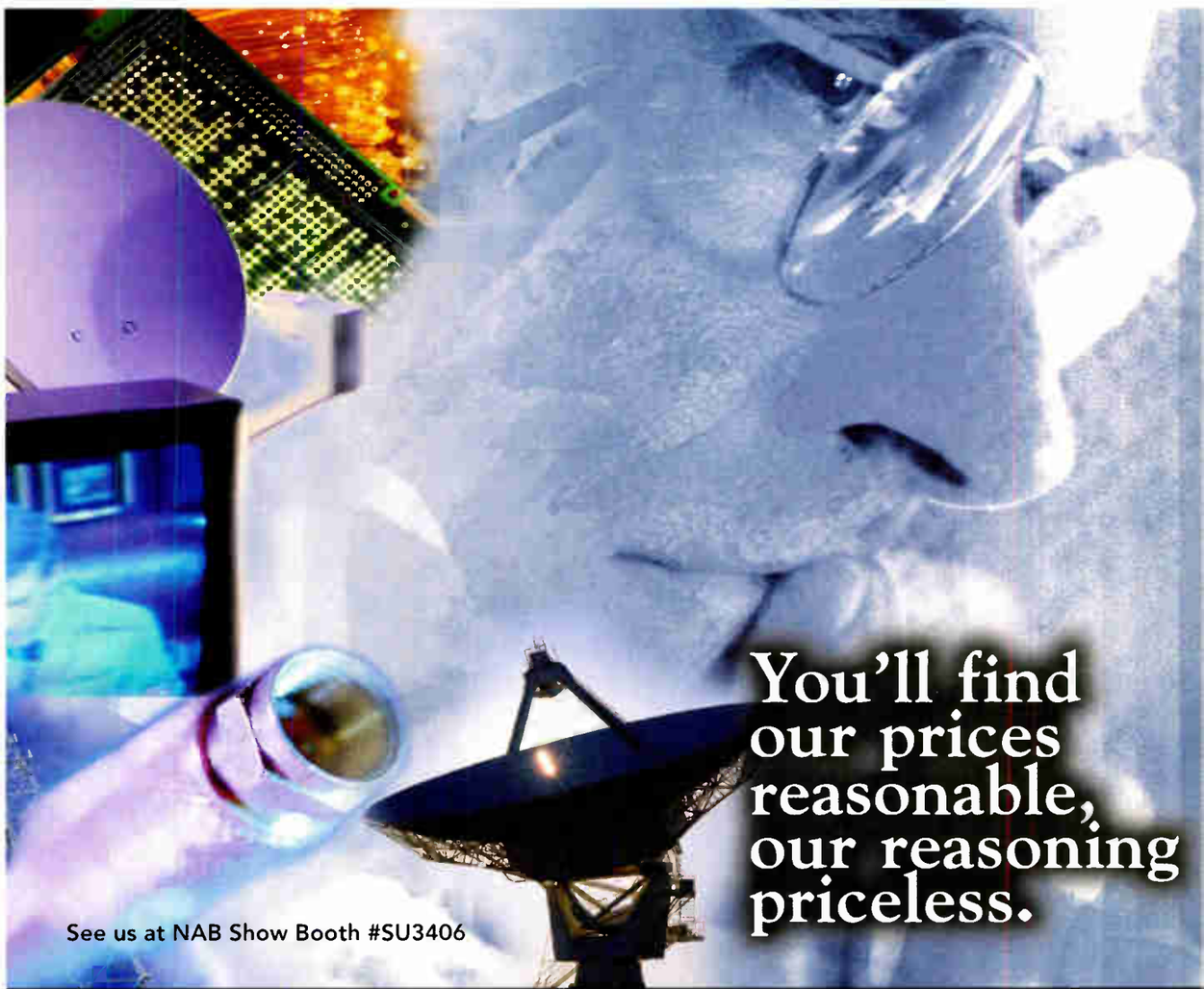
Bigger is better, when you consider satellite antennas for optimum MPEG4 satellite channel reception. The 4.2m is the largest and highest gain dish that still mounts on a single pipe. The unique aluminum reflector can be delivered in 1-piece on a special factory truck, for fast installation, or in an 8-petal configuration for easy-carry to a rooftop location. Call DAWNco for help choosing the most cost effective satellite antenna to improve your satellite reception.



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World Radio History

Tech Sessions Bridge Old and New

Highlights include streaming, drones, AM boot camp and lots of AoIP

Headed for Sin City? In this article, we offer a sampling of engineering sessions of interest; in the ensuing pages, we explore a few presentations in more depth and provide an exhibitor list of companies serving the radio/audio space.

Photo by Jim Peck

Stephen Lockwood, Dan Ryson, Jeff Littlejohn and Martin Stabbert compare notes on the floor. Note that on the first day of the show, the exhibits will open an hour later this year (see page 36).

WEEKEND

"Tutorial: Router Configuration" — On Saturday morning of the NAB Show, Wayne Pecena, director of engineering for Texas A&M University/KAMU, will talk about routers, the heart of IP networks.

Pecena is the most recent recipient of Radio World's Excellence in Engineering Award. Find out why by listening to this three-hour session, the first element in an all-day SBE Ennes Workshop exploring various aspects of the all-IP facility.

Sam Matheny

Broadcast Engineering Keynote — Sam Matheny will lay it on the line for engineers on Sunday morning. He's executive vice president and chief technology officer of the NAB.

This will be his first keynote to a spring show since he succeeded Kevin Gage. Matheny is former VP of policy and innovation at Capitol Broadcasting Co. and was a principal in several of its media ventures including general manager at News Over Wireless; manager of Digital Cinema at Microspace Communications; and VP/GM at DTV Plus. To read Radio World's interview with him last fall, see *www.radioworld.com/matheny*.

"The Curious Behavior of Consumer FM Receivers During Hyper-modulation" — Also on Sunday, Jeff Keith of Wheatstone explores the question of how much modulation headroom today's radio receivers actually have. He promises to give test findings on more than 30 radio receivers; he finds that today's radio receiver has very little headroom in the IF and stereo demodulator chip for additional modulation. To read a recent interview about this, see *www.radioworld.com/keith*.

"NAB Labs All-Digital AM Field Test Project" — David Layer of NAB will update attendees about the testing process on Sunday.

IF YOU GO

Where: Las Vegas Convention Center is the main venue, although meetings and other events also take place at several others.

When: April 11–16

Who: Last year's show drew an estimated 98,000 communications and entertainment professionals, according to organizers.

How: *www.nabshow.com*

How Much: Various registration packages are available, starting at $150 for a "Session Three-Pack" plus exhibits pass to a $1,449 "Smart Pass" that "gives you access to just about everything NAB Show has to offer."

NABSHOW Where Content Comes to Life

"Field Trial Results of AM Transmitter Carrier Synchronization" — Steve Smith and Tom King of Kintronic Labs say that such synchronization using GPS timing reference hardware "has the potential to markedly increase the effective coverage of co-channel AM stations with overlapping contours by eliminating beat frequencies and the associated noise artifacts that serve to make the reception in the fringe areas unlistenable." They also will speak a bit later Sunday about "smart AM receivers."

BEC Reception — Sunday afternoon at 5:30.

MONDAY

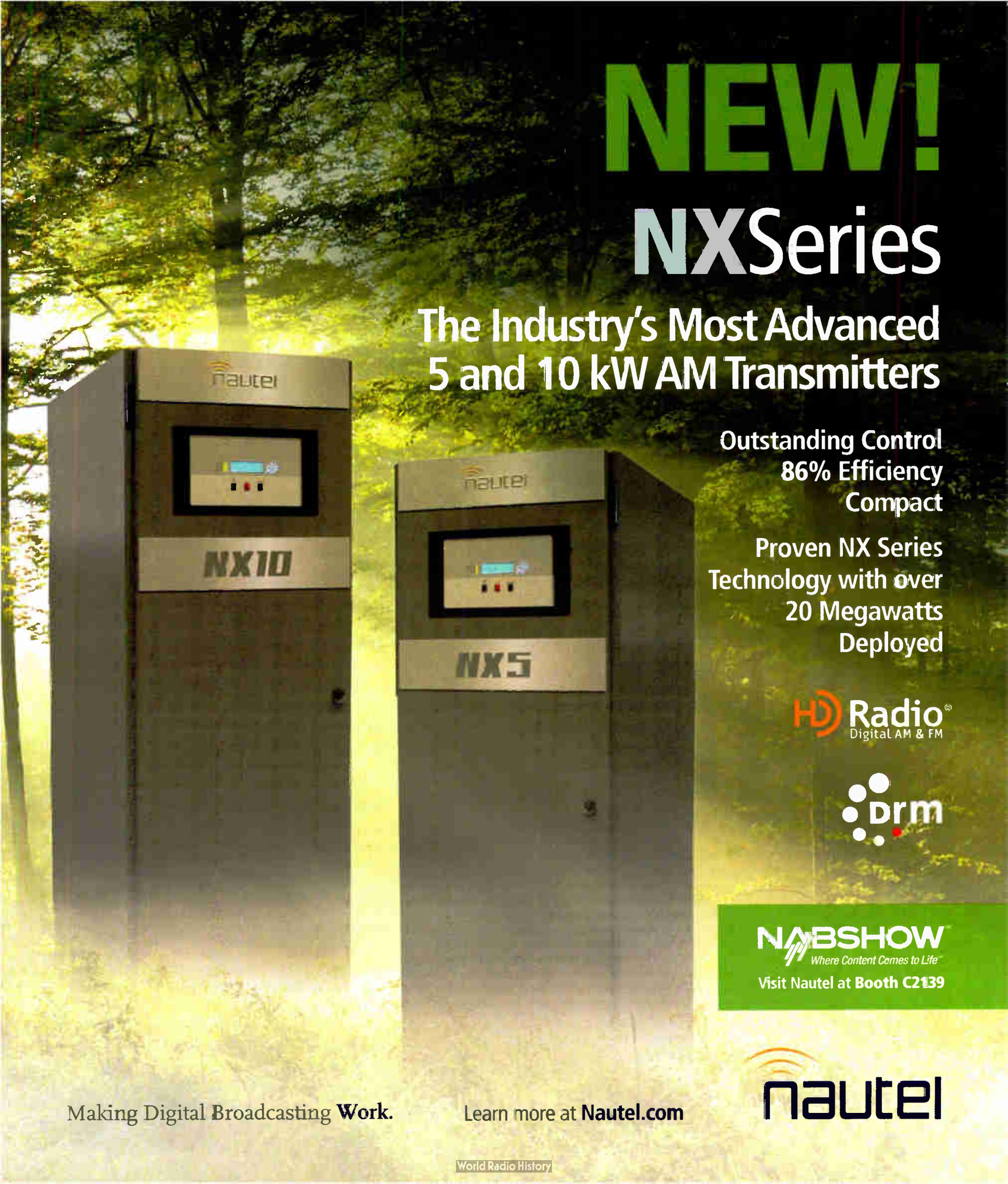
"AM Radio Boot Camp" — A Who's Who of AM radio technical experts will explore fundamentals and issues surrounding the senior band. Topics include leasing revenue, all-digital operation, MoM and safety.

"UAVs in Broadcast" — This is a batch of presentations, and much of the talk will focus on how TV stations use drones; but it's a question that affects other broadcasters too. And — let's face it — drones are cool. (There will also be an aerial robotics and drone pavilion in the South Upper Hall of the LVCC.)

"Emergency Alert Text Messages via Radio" — Steve Johnston gives a Monday afternoon talk about sending such text messages and how Wisconsin Public Radio did it.

(continued on page 20)

World Radio History



World Radio History

BEC

(continued from page 18)

"Preliminary Findings From Preparations for The IPAWS National Test" — Al Kenyon, IPAWS engineer with FEMA, gives a talk about the next national test. "Local test exercises added new insight into how the EAS pathway actually works in the real world when alerts are originated through IPAWS OPEN," according to a summary. "Presentation will include audio/video capture file playback." Monday afternoon.

"IEEE BTS Tutorial: RF Radiation Exposure Safety Standards, Practices and Regulations" — This late afternoon group of sessions is led by Eric Wandel of Wavepoint Research. Experts talk about FCC policies, exposure problems and other, excuse the phrase, hot topics.

Photo by Mary Ellen Dawley

Behind the scenes at the Broadcast Engineering Conference last year are John Marino, David Layer, Janet Elliott and Rich Johnson.

Last year's show featured a talk about RF facilities atop the Empire State Building. This year, a Saturday session highlights the new One World Trade Center.

Photo by Jim Peck

TUESDAY

"Personal Broadcast Platforms, Loudness and Hearing Loss" — Tuesday morning, Thomas Lund of TC Electronic will talk about early hearing loss caused by personal media players, and how "loudness wars" can play into this topic. Lund convened a work group that looked at improved measurement of SPL in such players. "The paper is facts-based without reference to any commercially available equipment," according to a summary.

"Foolproof Aiming of Large Parabolic Dishes" — Randy Woods is director of engineering for Z88.3 Radio, WPOZ(FM) in Orlando, Fla. "The typical method of sweeping the X and Y axis for max level is a good way to get a sub-optimal link," according to his summary. He describes a two-hour process that can address this problem; it applies to radio STL (950 MHz) scenarios as well as more modern, 6 GHz or higher, IP-based data links. His presentation is Tuesday morning.

"Network Security for Broadcast Media Streaming" — Keyur and Junius Kim of GatesAir have a Tuesday morning session. They talk denial-of-service attacks, compromise of the management plane, eavesdropping and hijacking of media streams, and describe counter measures.

"Using Real-Time Web Audio to Replace Telephone Call-ins On Air" — Tom Hartnett of Comrex discusses WebRTC, which is built into modern browsers; he says it offers stations a way to make any computer sound like a studio microphone. "We will also explore free apps that are available to turn the mobile phone into a high-quality broadcast platform." Tuesday afternoon.

"The Audio Cloud: Decreasing Cost and Improving Reliability of Audio Links for Broadcast" — Kevin Campbell of WorldCast Systems describes a kind of audio "cloud" suitable for various audio transport applications. Topics include redundant streaming, packet forwarding, distributed intelligence and relocating the multicast or multiple unicast functionality away from the source encoder.

SBE Membership Meeting — Tuesday at 6 p.m.

WEDNESDAY

"Digital Strategies Exchange for Radio (DSX4r)" — This is a daylong program within the Broadcast Management Conference that focuses on new technologies affecting radio broadcasting and provides recommendations for non-technical managers. Topics include sales, metrics, content, the digital dash and NextRadio.

"Hurricane Preparedness in a City Below Sea Level 10 Years After Katrina" — At an NAB Show in 2005, Joseph Pollet of Entercom Communications discussed preparedness. That was four months before Katrina. "I will recap my original 2005 presentation and further elaborate on what worked and what did not work during the storm, and its immediate aftermath, as well as the associated short and long term recovery efforts of New Orleans and New Orleans area broadcasters, all as observed through the eyes of a first-hand witness and lifelong resident."

"RF Boot Camp" — Garrison Cavell, president of Cavell, Mertz & Associates, leads a daylong, comprehensive discussion about RF in the broadcast system, covering FM, AM and TV issues.

Technology Luncheon — John McAfee headlines Wednesday's lunch, which will also feature presentation of the NAB Engineering Achievement Award to Tom King and Richard Friedel. (We'll have more about King's career next issue.) The Service to Broadcast Engineering Award goes to Ray Conover. NAB will also present its first Digital Leadership Award, "to an individual or group that has had a significant role in enabling a traditional broadcast business to succeed on digital platforms."

Amateur Radio Operators Reception — The tradition continues.

THURSDAY

NRSC Update — Leaders of the National Radio Systems Committee and its subgroups will update show attendees on the NRSC's activities.

"Enhancing Broadcast with TagStation: Delivering Content to NextRadio, HD Radio and Connected Car Receivers" — This talk is by Mike Englebrecht, director of network operations for TagStation and NextRadio. "This paper will discuss the key elements broadcasters need to know about integrating metadata services into radio playout systems and will demonstrate best practices in managing and presenting metadata in advanced receivers using TagStation, a commercially available metadata service."

The above is a sampling; for the full track of Broadcast Engineering and Broadcast Management Conferences, see *www.nabshow.com*.

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World Radio History

Is Radio Ready for Ubuntu?

RFA's adoption of Linux began with system admins and spread much further

RADIO IT MANAGEMENT

BY TOM VERNON

In the early 1990s, it seemed that the major PC operating systems had pretty well marked their territories. Creative endeavors went with Macintosh; business and finance adopted Windows; Linux was embraced by the computer geeks.

But are those boundaries cast in stone? Andrew (A.J.) Janitscheck, director of program operations and support for Radio Free Asia, thinks it might be time for radio stations to do a rethink.

His NAB Show presentation "Ubuntu — Radio Ready" describes RFA's adoption of Linux, which began with system administrators and spread much further. Today, the RFA studios and broadcast network are powered by Ubuntu and Ubuntu Studio.

NEGLECTED

Radio Free Asia began using Linux in its Washington headquarters more than a decade ago. Over the years, flavors Red Hat, Suse and Debian have been used. Despite RFA's success with Linux, it remains largely neglected by much of the broadcasting community. Janitscheck said there are some barriers to adoption.

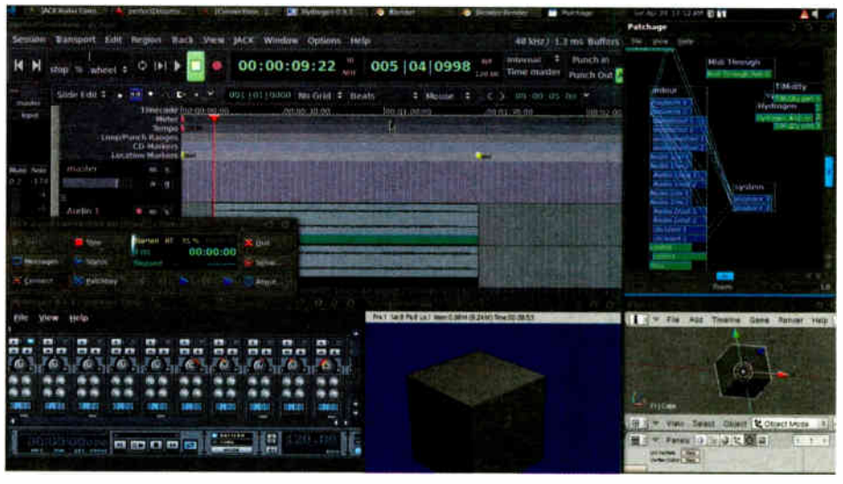
"When you go to a store like Best-Buy, your options are Windows, Mac or Chrome OS. They sell what is popular. Linux can be downloaded for free, but it's easier for users to just stick with what is preloaded on a machine." He adds there is also the psychological factor of staying in one's comfort zone and resisting change.

That said, there are some real advantages to Linux and Ubuntu.

"For RFA and other broadcasters with limited funds, Ubuntu enables us to extend the working life of our PCs. Because it is a more compact and efficient operating system, it can easily run on machines which would not be able to handle the latest release of Windows."

Audacity is a multi-track audio editor and recorder for Windows and Mac OS X as well as Linux machines. The user interface has been translated into various languages. Audacity can be used for Timer Record and Sound Activated Recording features. Users may also dub over existing tracks to create multi-track recordings. A variety of editing, accessibility and special effects features are available.

Reduced operating costs for Linux and open source software are not the only advantage.



Ubuntu Studio 9.10 is shown multitasking with JACK Audio Connection Kit: Qt GUI Interface 0.3.4, Ardour 2.8.2, Patchage 0.2.3, Hydrogen 0.9.3, Blender 4.29a.

This efficiency also results in quicker startup and shutdown times.

There is also no shortage of free, open source software to run on Ubuntu machines. RFA uses Ubuntu Studio in its edit suites. It is a derivative of Ubuntu, and has been optimized for audio and multimedia applications. It comes preinstalled with a selection of common free multimedia applications, configured for best performance in Ubuntu Studio.

Some of the audio applications include JACK, a low-latency capable audio and MIDI server designed for pro audio use. It enables JACK-capable applications to connect to each other. Ardour is a digital audio workstation suitable for recording, mixing and mastering. Also available in the Ubuntu Studio suite are sequencers and synthesizers, virtual guitar amps and audio programming environments.

Rivendell Open Source Radio Automation is a radio broadcast automation package that enables the acquisition, management, scheduling and playout of audio content. Features include support for PCM and MPEG audio encoding, full voicetracking and log customization, as well as support for a variety of third-party software and hardware. Rivendell uses components like the GNU/Linux Operating System, the AudioScience HPI Driver Architecture and the MySQL Database Engine.

"Broadcast operations is an environment that demands zero downtime," said Janitschek. "Linux has a reputation as one of the most stable operating systems. Ubuntu is also very efficient in issuing upgrades and patches." He said security is another plus. Since updating, RFA has had no more malware attacks.

The footprint for Linux at RFA has spread from the system administrators' desks to the editing suites and master control. Still, there are some areas in Radio Free Asia where Windows 7 holds steadfast. "This includes the office cubicles, finance and HR departments," Janitschek said.

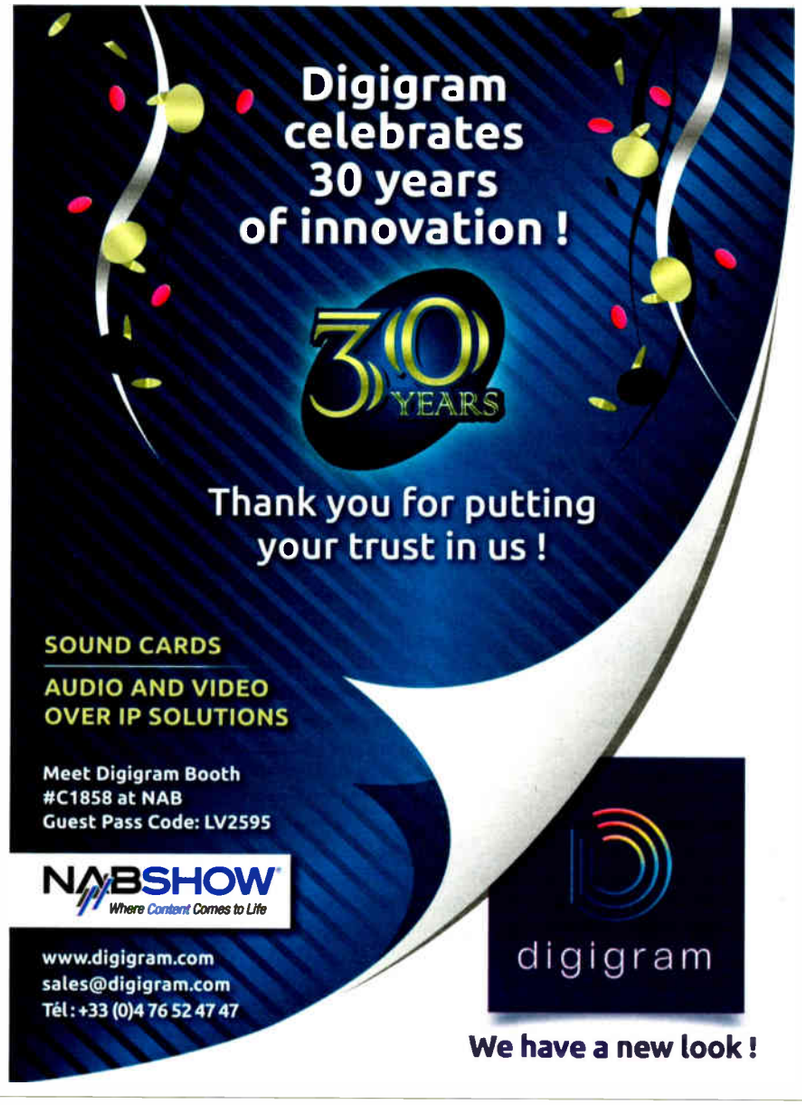
MAINSTREAM?

RFA is not the only broadcast facility that has switched to Ubuntu. KRUU, a community radio station in Fairfield, Iowa, and Global Radio's stations in the United Kingdom are Ubuntu-powered.

An urban legend that continues to surround Linux is that you need to be a computer geek to use it. "Not true." says Janitschek. "All you need is to be curious and know how to use a search engine. There are countless blogs about how to use Linux, and most of the answers are right there."

According to Janitschek, Ubuntu-powered devices are becoming mainstreamed. A recent CNET article

(continued on page 25)



World Radio History

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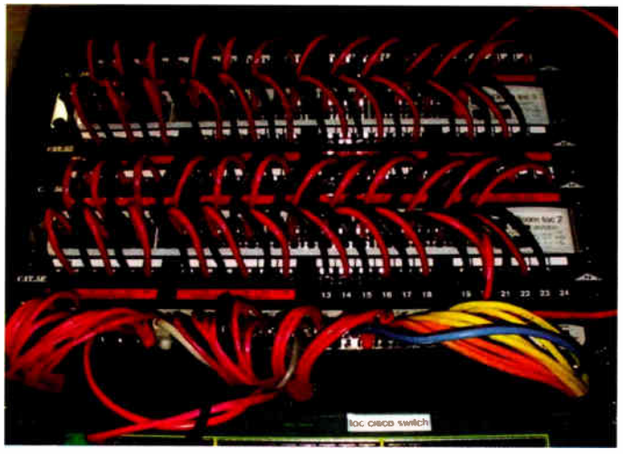
World Radio History

Q&A: Thomas and IP Radio

A Saturday morning session will explore "The All-IP Radio Station." Barry Thomas is director of engineering for Wilks Broadcast Group.

RW: Why should attendees come?
Thomas: Almost all radio engineers have experience with parts of their stations that are based on IP networks, but fully-IP facilities are becoming commonplace. Exposure and understanding of all of the ways IP technology is implemented is becoming not just desirable but a critical job skill for broadcast engineers.

RW: What is the most important thing engineers should know right now, but often do not, about IP in radio stations?
Thomas: The *all*-IP-based radio station is no longer a concept but the state of the industry. Careful design is extremely important to keep networks healthy and speedy.



"Careful design is extremely important to keep networks healthy and speedy," Thomas said.

RW: A theme of the past couple of years has been "interoperability." Where does that stand?
Thomas: Radio facilities are an excellent example of "interoperability." Not all functions within a radio station should coexist on the same IP network, however. The challenges are still the "points of contact" between radio station functional networks. There are still challenges but it's becoming much easier.

RW: Anything else engineers should know?
Thomas: For many reasons, radio has blazed the trail toward an all-IP station. One reason is the increased interopability, but ease and speed of installation, standardization of skill sets are also important factors, all of which will be part of this important Ennes workshop.

Attendance at an Ennes session is an incredible educational opportunity offered as part of the BEC. Of course participation in the Ennes workshop is an excellent to earn SBE recertification credit.

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World Radio History

NewBay Media at NAB Show

Radio World and its sister publications are not just covering the show but also participating in it.

Radio World/NewBay Media booth — Stop by and see us in booth C6648.

"Building a Reliable Transmitter Site" — Doug Irwin will speak to the Nautel User's Group on Sunday morning.

Irwin is the new technical editor of RW sister publication Radio magazine; by day he is RF engineer/project manager for iHeartMedia's Los Angeles station cluster. (The user's group event is not part of the NAB Show; register via *nautel.com*.)

"Television's Transition to an All-IP Future — Why It's a Big Deal" — Deborah McAdams, executive editor

of RW's sister publication TV Technology, moderates a Tuesday morning Super Session about major changes in television production and distribution.

"Digital Strategies Exchange for Radio" — Radio World Editor in Chief Paul McLane participates in a Journalists' Panel as part of this Wednesday morning session, which is presented by NAB Labs. The day-long program is part of the Broadcast Management Conference.

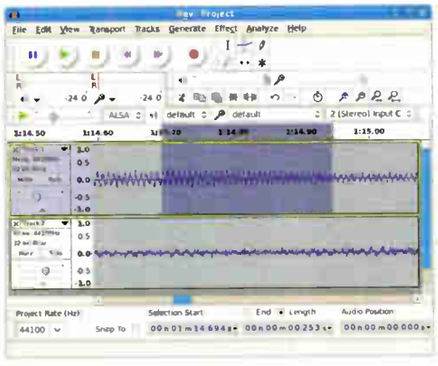
"RF Boot Camp" — John Bisset, author of Radio World's popular Workbench column, is a salesman for the Telos Alliance and a featured speaker in Wednesday's RF Boot Camp.

Also speaking at the show are numerous engineers whose work has appeared in RW's pages, including Cris Alexander, Alan Jurison and Dan Mansergh.

UBUNTU

(continued from page 22)

describes BQ Aquaris E4.5 Ubuntu Edition, the first Ubuntu Phone. It has been released in Europe and is being offered as an alternative to the iPhone, Android or Windows Phone. Janitscheck hopes broadcast equipment manufacturers will do more to develop Linux versions of their software. "Almost all broadcast software runs exclusively on Windows."



Audacity from Sourceforge runs on several platforms, including Linux. It is used in the edit suites at Radio Free Asia.

Despite RFA's successes, Janitschek acknowledges that Ubuntu is not a universal answer for everybody.

"While there is a lot of great software for Ubuntu, there are some gaps. For example, programs that handle payroll and accounting are not readily available. There is the psychological issue of resistance to change and trying new things. Even with a decision to commit, it takes an investment of time and willingness to self-educate yourself about open source software, and an an entirely different way of doing things."

Janitschek reflects on his own three-year journey into Ubuntu. "I won't say that I never use Windows, but in my personal and professional work, I spend about 95 percent of my time on Ubuntu."

The session "Ubuntu — Radio Ready" will be presented Tuesday afternoon of the NAB Show Broadcast Engineering Conference.

World Radio History

Q&A: Breithaupt and Switches

Wheatstone Corp. Research and Development Engineer Dave Breithaupt will speak at the NAB Show about Ethernet switches as used in IP audio networks.

RW: *You subtitled your talk "Stranger in a (Very) Strange Land." Why, what is strange about it?*

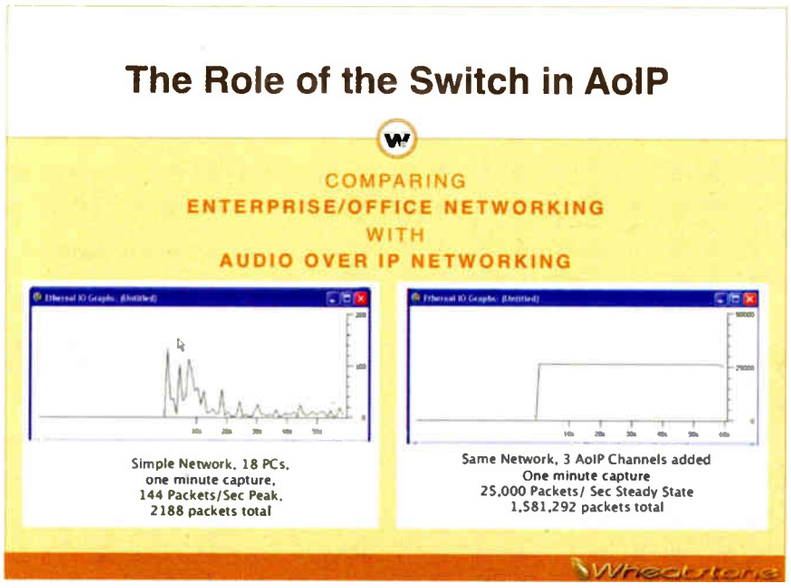
Breithaupt: In a broadcast facility, the mics, consoles and other broadcast equipment are very much at home. We design these products specifically for broadcast use. They're built to endure in a 24 hour, continuously operating broadcast environment. Broadcasters are comfortable with these products. They know how to use them, install them and maintain them.

But the switch comes from this other world — the IT world — and suddenly broadcasters are dropping a switch into the middle of all that broadcast equipment. There are some very real considerations when you merge these two worlds.

Setting up an IP audio network isn't at all like setting up any other Ethernet network. You need to carefully consider the role of the switch.

RW: *Why is the switch so important?*

Breithaupt: In the world of IP audio, the switch *is* the routing system. Signals are switched and dispatched by the switch itself, under the control of the IP audio protocol that's in use. The stability and reliability of the system as a whole are a direct function of the switches used.



This slide from Breithaupt's presentation shows differences in traffic between a typical office network and a typical small AoIP network.

RW: *Obviously details of your presentation are beyond the scope of this interview; but can you list some tips on what to look for in a switch for AoIP, for the kind of streaming our readers must do?*

Breithaupt: The switch needs to be as solid and reliable as possible. The switch fabric should be robust and of sufficient capacity to handle the sustained high data rates present on an IP audio network. If the system is large, the switches used should be capable of maintaining large multicast group tables to provide sufficient IP audio paths for the system's signals. And it must be managed so that its operating parameters can be optimally set.

RW: *What's the difference between managed and unmanaged switches?*

Breithaupt: Unmanaged switches are the sort of switches you'd buy off-the-shelf at an office supply store. They often have low capacity; and while they're reliable enough for use in a small or home office, they are generally of low capacity and quality. They have no configuration or controls to speak of; they're simply plug-and-go. In general, they have no place in the demanding world of audio over IP.

Managed switches offer the engineer an interface by which he can configure the switch — for example, to set it up with multiple VLANs, or set up multicast operation, or enable or disable certain features, and often they also have facilities for monitoring and evaluating network operation.

RW: *Briefly, how successful has our industry become at mitigating packet losses?*

Breithaupt: The use of reliable, fast Gigabit Ethernet networks has given us sufficient network capacity to avoid lost packets.

Audio over IP is not at all like general enterprise or office networking.

RW: *What is the impact of AES67 on switch selection?*

Breithaupt: There is, for all practical purposes, no impact. AES67 has no specific requirements for a switch.

RW: *What is the most common error that engineers make in this area?*

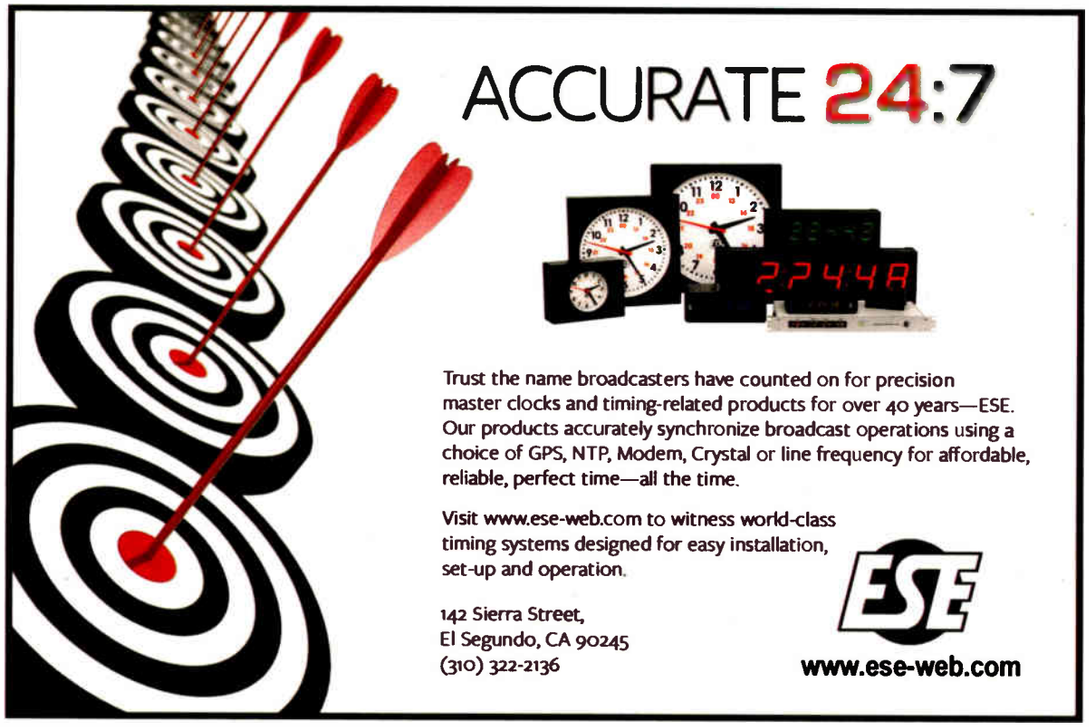
Breithaupt: Allowing the station's IT department to maintain control over switches used in the audio over IP environment. General IT engineers have no concept of AoIP's nature or requirements and will often cause problems when trying to treat these switches as standard enterprise network components. Also, going cheap is a common pitfall. Since switches are so important, skimping here is a bad choice.

RW: *So: Who* should *handle the station's switches? The IT guys or the audio guys?*

Breithaupt: As above. Engineering, *not* IT. Audio over IP is not at all like general enterprise or office networking.

RW: *Anything else engineering readers should know?*

Breithaupt: Careful management, not just of switches but of network infrastructure in general, is the best way of ensuring a reliable, high-capacity AoIP network. It's also important to keep AoIP networks isolated from general enterprise or business networks, via VLAN or preferably via physical separation. If VLANs are used, the configuration must be under the control of the IP audio engineer, not the IT guy!



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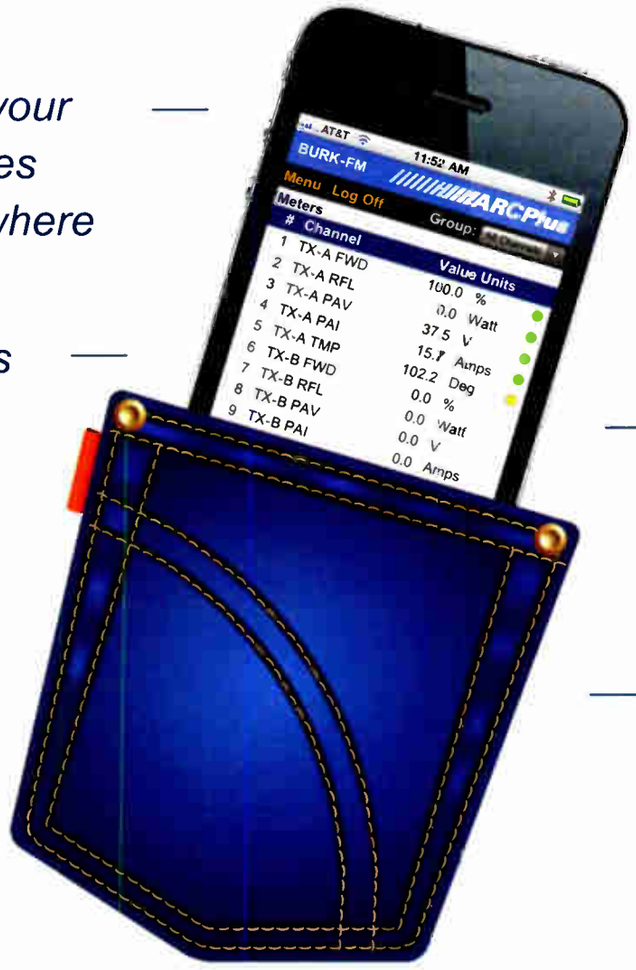

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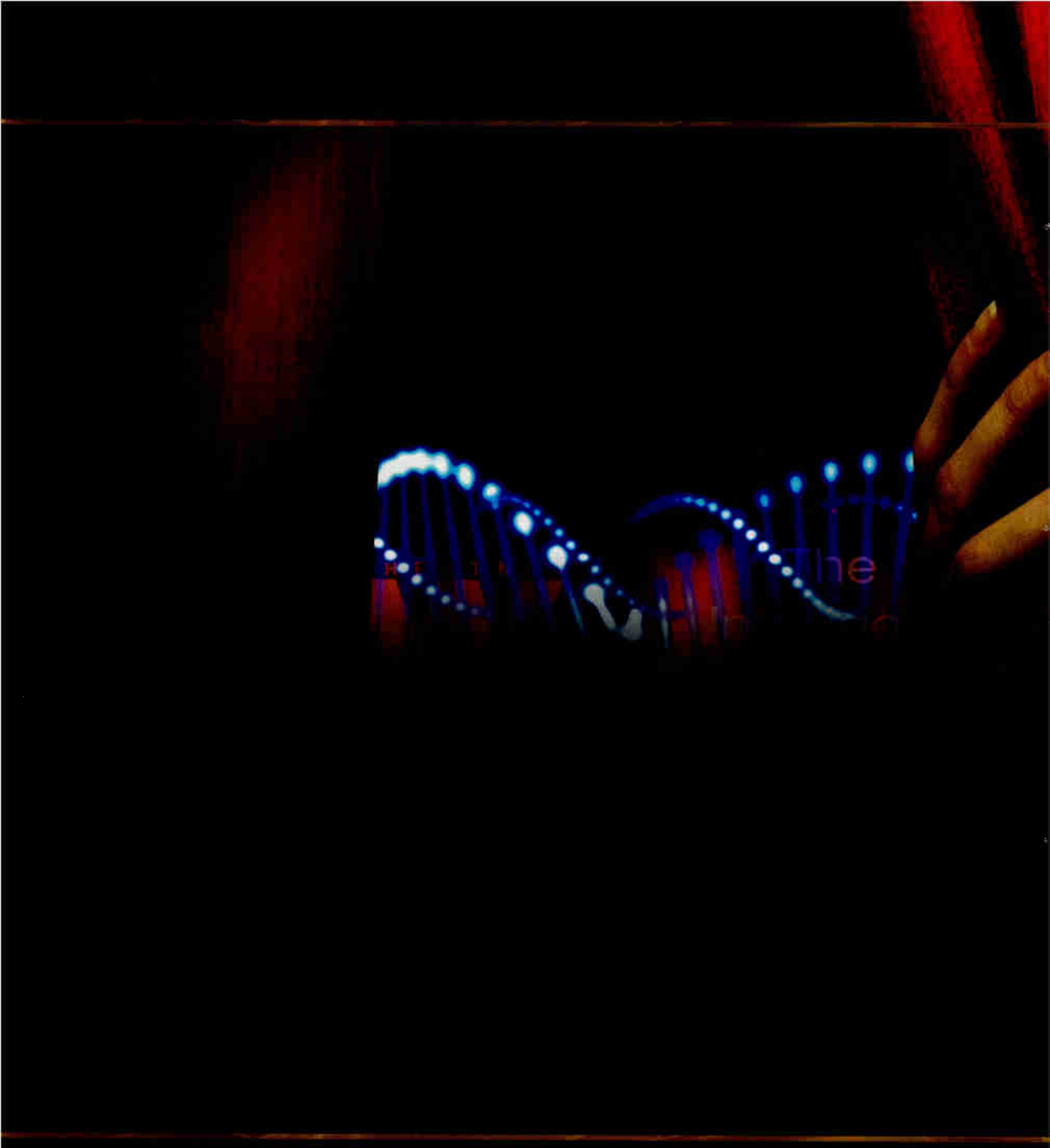

Wheatstone

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World Radio History

Q&A: Gross and AES67

The Saturday afternoon NAB Show session "Implementing AES67: Audio Over IP in the Station and Studio" is part of the SBE Ennes Workshop at the Broadcast Engineering Conference. Kevin Gross is a media network consultant with AVA Networks.

***RW:** We've heard a lot about AES67 over the past couple of years. Why is this topic important this year?*

Gross: AES67 is now in early stages of adoption. Manufacturers are releasing conformant products. The Media Network Alliance (*http://medianetworkingalliance.com/*) has been formed to support adoption. There has always been strong support for standards-based solutions in the broadcast industry. We'd like the industry to understand that AES67 is not just a technology improvement. The interoperability afforded by AES67 creates a larger ecosystem for network audio.

***RW:** Can you give us four or five bullet points to help summarize main points you hope readers might take away?*

Gross: We did not intend for AES67 to be another media networking system. We intended it to be an interoperability standard that could connect existing network systems. My presentation will include a progress report on how we're doing with this.

Media Networking Alliance

In summary, we've seen moves by Lawo, Telos, QSC, Audinate, Wheatstone, Reidel and others that indicate that an industry convergence on AES67 is happening.

AES67 can be seen as a framework for real-time media networking. It ties in with ACIP, SMPTE 2022, SMPTE 2059, AVB, internet telephony and, of course, IP networking.

AES67 concepts can be used for video networking.

And RFC 7272 solves the lip sync problem for media networking.

***RW:** What actual interoperability opportunities have been created by the standard?*

Gross: The AES67 development community conducted a plugfest in October 2014. We had participation from 10 companies and 15 products and a high degree of interoperability was demonstrated. A complete report on the plugfest is available at *http://tinyurl.com/aesplug*.

***RW:** How do engineers make connections using AES67?*

Gross: AES67 uses the same techniques and protocols for making connection as are used in Internet telephony and VoIP. These include SDP, SIP and RTP. These are proven solutions, which are well supported in the IT community. AES67 is an interoperability standard and so is focused on how product engineers ensure their devices can talk to one another. AES67 is an under-the-hood technology and so does not describe how connections are made from a user's perspective. This gives manufacturers room to innovate [and] differentiate themselves from other equipment vendors while still being able to interoperate with them.

***RW:** What type of network infrastructure is required to support these connections?*

Gross: AES67 works over standard IP networks. To assure adequate real-time performance it requires configuration of the QoS capability that is already present in all enterprise and most SOHO network equipment.

***RW:** With AES67 in place, what questions should engineers be asking next about their infrastructure planning?*

Gross: For highly accurate synchronization, support for IEEE 1588-2008 in network equipment is desirable. SMPTE is developing a network synchronization scheme based on IEEE 1588. We worked with the SMPTE standards organization during AES67 development to ensure AES67 would readily interoperate with this.

An adequate audio distribution infrastructure for many applications can be built with run-of-the mill 1 gigabit Ethernet equipment. For larger installations and for video, deploying 10-gigabit or even 40- or 100-gigabit Ethernet at key points may be desirable.

> **We'd like the industry to understand** that AES67 is not just a technology improvement.
>
> – Kevin Gross

I've tested network equipment from all major vendors and have not found any AES67-specific incompatibility issues with any equipment.

***RW:** Anything else engineering readers should know?*

Gross: The industry is clearly converging on IP networking as the preferred media distribution infrastructure. Standards-based approaches have the clear long-term advantage. These trends were clear before we started AES67 development. The existence of the AES67 standard and AES67 compliant products gives this trend rails to ride on.

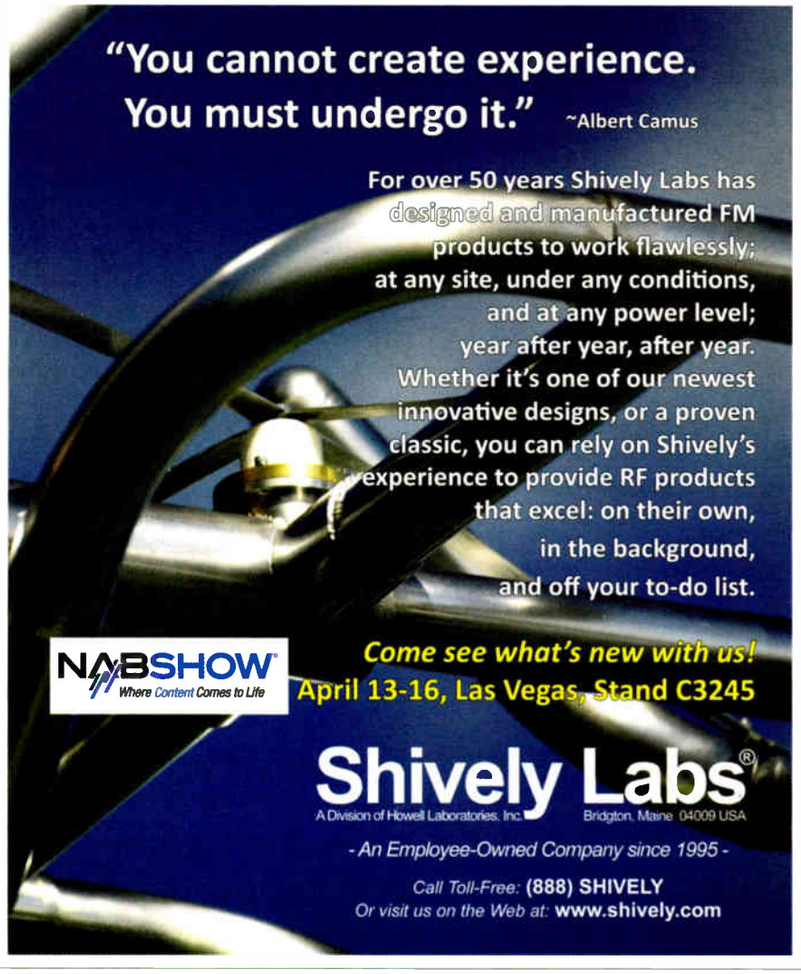
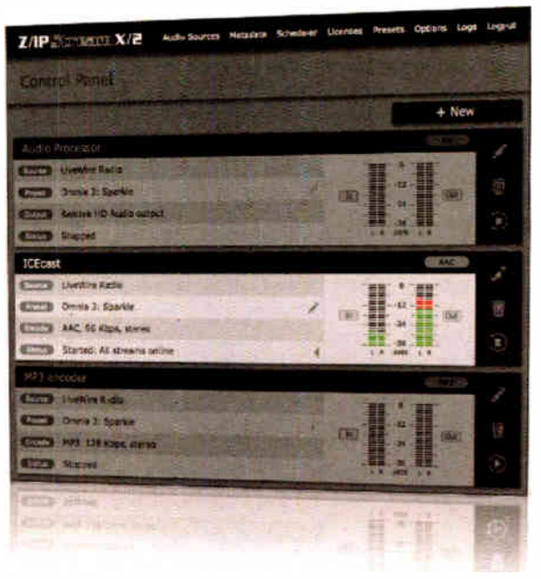


Photo by Jim Peck

Members of Team Moseley pose for the Radio World lens at the 2014 show. Last year's show drew 1,726 exhibitors. From left: Dan Barnett, Sunik Naik, Matt Coon, Julissa Velastegui, Dave Chancey and Bill Gould.

World Radio History



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World Radio History

So How's Your PPM?

Convention attendees will get a look at a recently introduced "confidence" product

BY MICHAEL LECLAIR

Radio is a highly competitive business in which success is measured by numbers. In the largest radio markets, the Portable People Meter is how those numbers are derived.

The importance of PPM can't be overstated. Indeed, some radio engineers joke that if a PPM encoder were to break they might as well turn the transmitter off; advertisers will never know if anyone is listening anyway. Radio stations invest in backup encoders and even specialized monitors to ensure their encoding is always working, and their engineers jump to repair it when something goes wrong.

In spite of its importance, or perhaps because of it, the PPM watermarking technology developed by Arbitron and deployed by successor Nielsen has remained something of a mystery since its introduction in 2007. In the minds of some station personnel a lingering doubt remained: Are all stations really created equal when it comes to PPM? Or are there some aspects of certain voices or formats that don't measure as well as others?

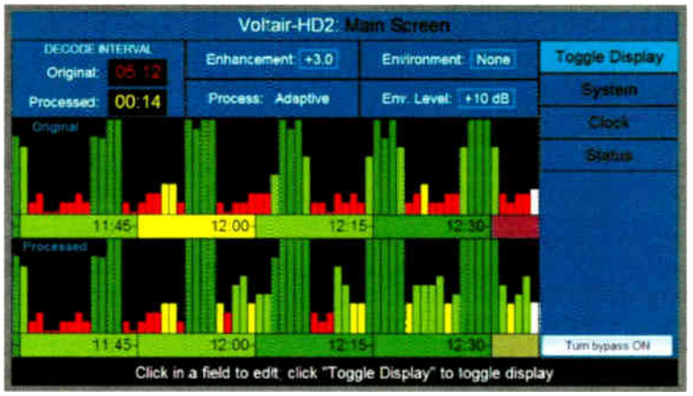
LOCATION MATTERS

Manufacturer 25-Seven Systems is promising some answers with a PPM-related product that it will exhibit at the NAB Show. In conjunction, its parent, the Telos Alliance, will give two presentations about the effects of processing and program audio on the PPM system for ratings measurement.

On Sunday, Cornelius Gould will present "Processing Smarter, Not Harder, for Today's Rating Wars." This will describe the technology behind the PPM measurement system and how choice of program audio and the way it is processed can affect its operation.

On Tuesday, Dr. Barry Blesser will present "Monitoring for Ratings: Putting Yourself in Your Listeners' Ears." He will explore effects of ambient environments on the effectiveness of the decoding operation of the PPM monitors and how this can be measured with the new confidence monitor, called the Voltair.

Company officials say its new product was prompted by reaction to a Blesser white paper in 2009 that questioned certain aspects of PPM. According to Blesser, the system doesn't always respond equally when presented with various kinds of program audio due to how the PPM watermark is created. Certain kinds of music or voice do not effectively mask the watermark signals, resulting in lower amounts of coding depending on format or voice talent. "The publication of that paper had the effect of bringing to light a number of people in the radio industry who had questions about the PPM system," according to Blesser.



The Voltair promises to monitor PPM coding efficiency in real time.

A Radio World news story at the time reported that he had based his work only on publicly available documents and that he encouraged Arbitron to release more technical information about PPM. Arbitron did not reply to RW's request for comment in 2009. (At the time Blesser was also a columnist for Radio World Engineering Extra, which was not involved in this product or his research.)

CONTENT MATTERS

Geoff Steadman, president of 25-Seven, said that the company's acquisition by the Telos Alliance allowed it resources to pursue development of a device that could answer questions about PPM encoding. He said the research led to the conclusion that, when it comes to

World Radio History

Smith: OEMs "On Board" With HD Radio

Milford Smith is vice president of radio engineering for Greater Media and chairman of the National Radio Systems Committee; he will moderate the Sunday "Radio Technology Forum" in the Broadcast Engineering Conference.

RW: *Digital radio continues to be a lightning rod, at least for some; and you've got three sessions on the topic. Tell us why.*

Smith: After a long and difficult gestation period, OEM auto manufacturers are now fully onboard with HD Radio, and the number of vehicles so equipped is increasing exponentially, with virtually every manufacturer now committed. Any broadcaster who was hesitant to embrace HD Radio due to a perceived lack of receivers needs to reexamine their stance.

The three sessions noted deal with very different topics but all are pertinent to those employing or considering HD Radio technology.

In "–10 dB IBOC at Combined Transmission Sites," John Schadler of Dielectric addresses the not-so-obvious results of combining multiple high-power digital signals into a common transmission system. There are definitely some things to be aware of when entering into such a situation.

In the paper "Field Trials of AM Transmitter Carrier Synchronization," Dr. Steve Smith presents for the first time hard data on the results of "locking" nearby co-channel AM carriers to a GPS for exact frequency synchronization. Significant improvements in co-channel interference are claimed.

In "IBOC Broadcast Systems Architecture Technology Options and Assessment," Philip Schmid of Nautel discusses the rapidly evolving technology of HD Radio, particularly improvements in the current generation of importers, exporters and exciters both as to the evolution in the physical architecture as well as significant electronic improvements in both reliability and over all transmitter efficiency.

Topics of the forum also include loudness, AM multiplexing and a "teardown" of FM in smartphones. Read more of this interview at www.radioworld.com/forum2015.

watermarking for PPM, not all content is the same.

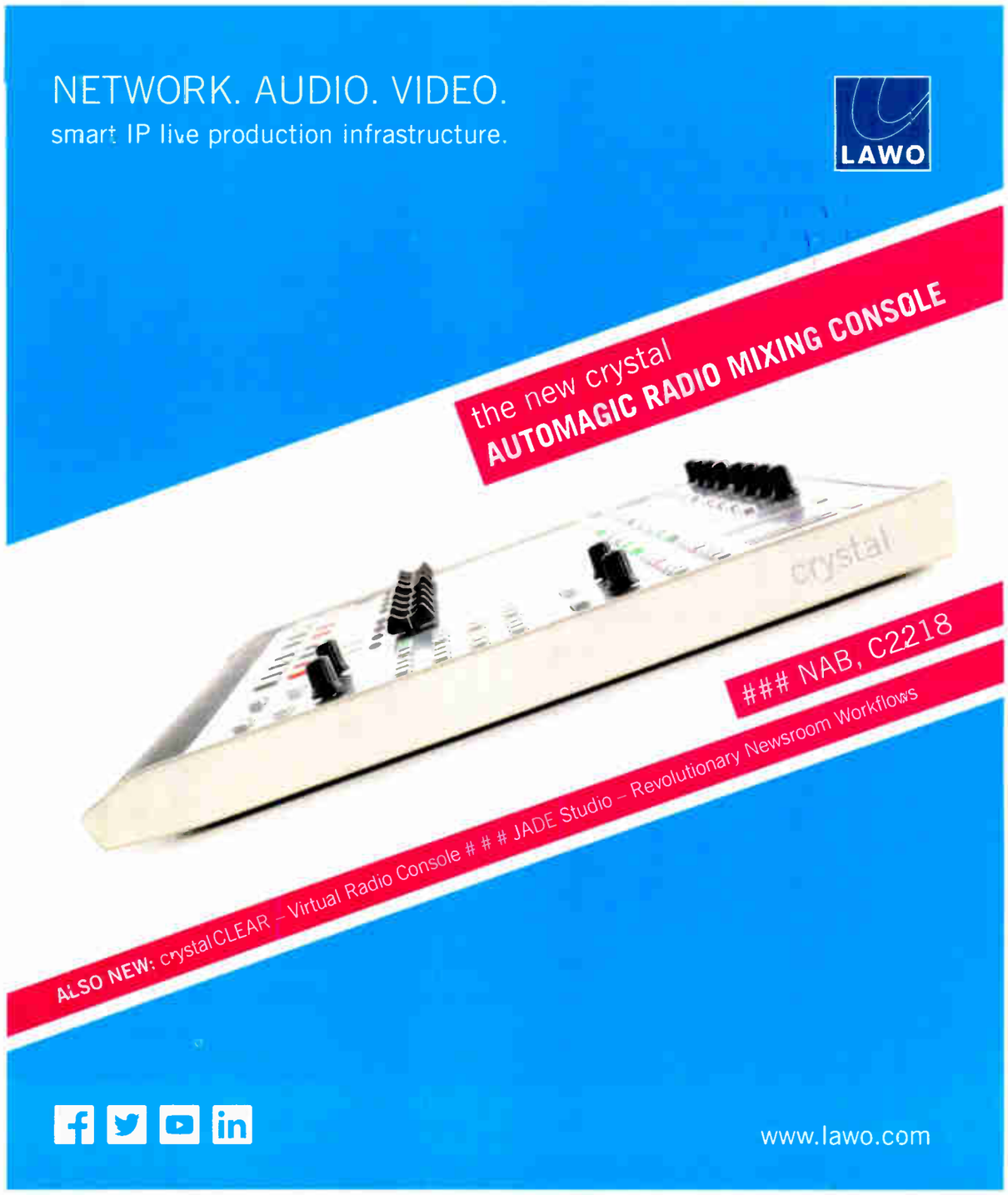
"We came up with audio samples that were highly resistant to watermarking when compared to others. Whether you were listening in a car on the highway or in a quiet living room could also make a big difference," said Steadman. This led to investigation of whether there were ways to process audio that would potentially improve watermarking efficiency. "It turned out there were ways to pre-process program audio in such a way as to improve the coding efficiency seen by the Nielsen monitors."

Initial beta tests were conducted on-air in some markets, beginning in March of last year, and the manufacturer reported positive feedback, followed by more trials; the Voltair went on sale to stations in September.

In its marketing material, the company says this new product monitors and analyzes the robustness of PPM encoding; provides visibility into how a listener's environment may influence watermark decoding; provides audio signal processing to "enhance the detectability of the PPM watermark codes within the context of your programming objectives"; and lets programmers make more informed decisions "to address potential weaknesses in either encoding or decoding."

Nielsen officials declined comment for this story.

Michael LeClair is chief engineer of WBUR Boston University and former technical editor of Radio World Engineering Extra.



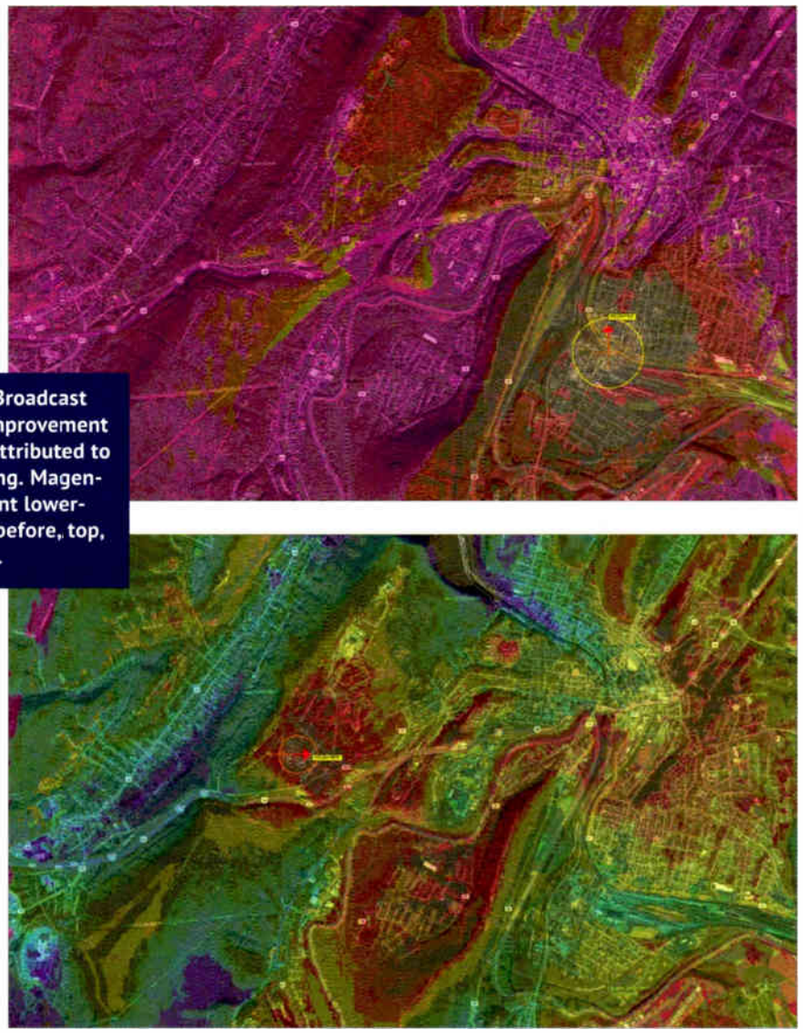
World Radio History

Q&A: Kneller and Boosters

Hal Kneller is vice president of sales and business development for GeoBroadcast Solutions. He will give a Sunday morning presentation called "New Technologies in FM On-Channel Boosters" in the Broadcast Engineering Conference.

RW: Why should attendees come to hear this?

Kneller: Anyone with an FM station who has coverage challenges within their protected contour may wish to attend. The coverage may be limited due to any one of several factors such as terrain, multipath, rim-shot, inability to locate the transmitter at the best site due to spacing, etc. Or it could be just another part of the coverage area away from the city of license which may suffer but offers great upside potential for listeners and revenue.



Images from GeoBroadcast Solutions show improvement to an FM signal, attributed to use of MaxxCasting. Magenta shades represent lower-quality coverage before, top, and after, bottom.

RW: What's unique about the GeoBroadcast Solutions system that serves this niche?

Kneller: Considering the amount of R&D which GeoBroadcast has put into the system including focus group listening tests, it is far superior to most prior attempts at on-channel boosters particularly when there is less than 100 percent terrain isolation. GBS has learned how to mitigate interference between the main transmitter and the booster transmitters, called MaxxCasting nodes. Implementation is made easier by software which has been honed to predict (and control) interference. Another part of the success is based upon proprietary formulae for height, distance, ERP, location and antenna directivity.

RW: We're told that you'll discuss successful field installations done within the past year. Tell us briefly about one.

Kneller: We will discuss several, but one pair which has been operational since earlier this year is in Cumberland, Md. (WZDN and WQZK), which were briefly highlighted by Radio World (*http://tinyurl.com/geonab*). In this case, the customer had installed his own booster solution due to partial terrain blockage but was not happy with its performance due to self-interference. The GBS design solved that issue for them. And there are several other systems in various stages of implementation at this time in various types of terrain.

GBS has learned how to mitigate interference between the main transmitter and the booster transmitters, called MaxxCasting nodes.

– Hal Kneller

RW: Many readers know GeoBroadcast through its proposed ZoneCasting system. What is the status of that effort?

Kneller: At the present time, GBS is working on a ZoneCasting deployment in a large Midwest market with a major broadcaster. At a meeting held at the FCC, it was determined that some additional mobile measurements should be taken and data reported to both the commission and the NAB engineering committee. The test document proposal is currently in the hands of those individuals and assuming they are in agreement on our proposed criteria, this should move forward very shortly. This is unique in that the system design is a hybrid of MaxxCasting and ZoneCasting. Some of the nodes will remain on with the main transmitter in a full simulcast/synchronized mode enhancing signal while others will operate independently in a zone to provide localized content.

RW: Anything else engineers should know?

Kneller: We will discuss some of the fundamental concepts of why MaxxCasting is superior technology for boosters and demonstrate with the case studies.

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This is a selection of exhibitors of interest at the 2015 NAB Show. Highlights are paid for by exhibitors; information is from the companies. Check on-site program for changes and full list. Booths preceded by C are in the Central Hall, N is North Hall, SL is South Lower, SU is South Upper, OE is Outdoor-Equipment, MR is Meeting Room, L is Lobby.

Exhibit Hours

Monday, April 13: 10 a.m. – 6 p.m. *
Tuesday, April 14: 9 a.m. – 6 p.m.
Wednesday, April 15: 9 a.m. – 6 p.m.
Thursday, April 16: 9 a.m. – 2 p.m.

**Note that Monday exhibits open an hour later than in the past.*

25-Seven Systems **C549**
Featured: Voltair signal processor to monitor and enhance PPM encoded audio. Provides real-time monitoring/analysis of the robustness of your encoding across your program content. PPM is a registered mark of The Nielsen Company.

360 Systems **N6038**

42NETMEDIA LTD. **C8948**
Featured: 42NET - Player i — The core module of all stations, the reliable and beating heart of the whole system! Individual customizable setup, User In Center way of thinking results in seamless broadcast and studio workflow. This makes 42NET Player the smartest and most convenient automation software in your radio that you will ever need! 42NET X-Link PRO Audio IP codec — A bleeding-edge audio IP codec to establish minimum latency connection to entertain your audience in real time! Outstanding reliability combined with superior quality and integration with 42NET makes X-link IP codec the best offer on the market, as there are no hidden costs of setup and continuous operation. 42NET StationCheck — Unique and individual solution, for logging and creating archive material. As recording is possible from one or more individual sources into any distinct folder with various quality settings for all channels, there is no limit in creating your archive database any more. For free copy, visit our website today! 42NET Streamer — Brand new, innovative and smart application for audio streaming! Its robust layout, integrated statistics window and stability combined with individual VST plugin insertion for each channel give this unique and gap-filling solution huge success in the industry. Be part of it immediately, and register for your free copy now! 42NET ShowScheduler — 42NET comes with a precise, full-scale integrated music scheduler module which is outstanding in the broadcast industry. Compatibility with Discogs database, collecting metadata and album art is easier than ever. All the features that you may require is included, forget the problem of always repeating songs and boring music selections!
Established Products: 42NET – Player i, 42NET – Surfer, 42NET – AdminTools, 42NET – AudioLogger, 42NET – Booster, 42NET – FolderScanner, 42NET–Mlink, 42NET–Reporter, 42NET – SimpleCLX, 42NET – MultiPlayer, 42NET – ShowScheduler, 42NET – Streamer, 42NET – MusicID, 42NET – Sync, 42NET – NewMedia, 42NET – Commercials
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Email: marton.szenasi@42netmedia.com
Website: www.42netmedia.com

Acoustical Solutions **C3405**
Featured: Panel Connector Clips are a simple, turnkey solution for open-space acoustical issues. Turn doublesided acoustic panels into a variety of partition arrangements for improved sound quality and decreased bleed through during recording and production.

AEQ SA **C3747**
Featured: Forum IP — Digital audio mixing console with up to 20 fader channels. Redesigned control surface features new softer switches, additional programmable keys and rearranged controls for the monitoring section. Dante AoIP multichannel networking is provided for a maximum of up to 64 I/O Channels. Also: Phoenix ALIO dual-channel, portable IP codec.

AETA-Audio Systems **SU6318**

Aldena Telecomunicazioni **C460**
Featured: EMLAB antenna design and coverage software to design/manage complex array radiation patterns and calculate coverage area prediction up to a complete network. Identify health safety EM risk and facilitate EM resolutions. Also: DAB antennas available for medium/high power along with high-performance RF accessories.

Altronic Research Inc. **C2150**

American Tower Corp. **C1062**

World Radio History

Ampegon C8850
Featured: Enhanced shortwave transmitter product line with major technical advances in the control system, the motor drive tuning system and measurement acquisition system.

Anton/Bauer Inc. C6025

Arctic Palm Technology Inc. C162
Featured: NetCaster provides radio networks with tools to schedule and target informational, promotional and commercial messages to their Center Stage Live stations. Events are automatically posted to RDS\RBDS encoders, HD Radio, website, streams, logged and audit files returned to the network without any manual processes at the local station.

Armstrong Transmitter C7046

Arrakis Systems C3252
Featured: Digilink-HD saves the user time and money, without compromise. Whether you want to connect with eight or more studios from a single computer, or throw together a quick, brilliant sounding voice track that gives you a dynamic live sound. Starting at only $200 per month. Also: MARC-15 is a feature-laden, professional analog console for on air radio, production and news applications. The modular design allows the console to be configured to the studio's needs. The 15 channels with up to 30 source inputs meets even the largest studio's needs. Also: ARC-8 with Bluetooth; New Wave automation powerful software for broadcast radio and especially Internet radio applications.

ARRL The National Association for Amateur Radio L1

Associated Press/AP ENPS SL7606

Association for Unmanned Vehicle Systems International (AUVSI) SU13505

Audinate Inc. SU621E1

Audioarts Engineering C755
Featured: New digital audio console
Established Products: Digital and analog audio mixing consoles, both standalone and networked, for regular broadcast and LPFM

AudioScience Inc. C2263

Audio-Technica U.S. Inc. C1745

Avid Technology SU902

AVP Mfg. & Supply C5349

AVT Audio Video Technologies GmbH C8934
Featured: With the IP audio codec Magic ACip3 and the Magic THipPro talkshow system, AVT provides an integrated solution, offering the Magic THipPro ACconnect upgrade. Only one management software is required to control both telephone hybrid system and audio codecs.

Axel Technology SL3929

Axia Audio C549
Featured: Fusion Modular AoIP Mixing Console features capabilities refined from a decade of AoIP experience: four program and four auxiliary mixing buses, voice dynamics and EQ, automatic mix-minus, integrated IFB/Talkback. Virtual Mixer technology, with 16 five-channel VMixers, extends mixing capacity. Anodized metal surfaces feature rub-proof laser-etched markings and high-resolution OLED displays. Also: AES67-compliant xNodes: compact, self-configuring AoIP interfaces. Two half-rack xNodes fit in 1RU. AES67 compliant, xNodes receive and generate AES67 streams. Analog, AES, Microphone, GPIO, SDI models available plus Mixed Signal xNode with Mic, Analog, AES and GPIO. Dual redundant Ethernet ports; redundant power uses AC and power-over-Ethernet.

Azden Corp. C2260

B&H Photo, Video, Pro Audio C11016

Barix/LineQ C6346
Featured: SoundScape for private radio networks brings together integrated audio distribution, remote device management, dynamic contact scheduling, system-wide reporting/monitoring and multi-format audio playout. Exstreamer SoundScape IP audio players achieve greater playout efficiency through exceptional internal memory, minimizing network resources required for live streaming. Also: IPAM 302 Module for OEM partners is Barix's board-level technology for its latest-generation encoders and two-way audio devices.

Beat The Traffic SL13117

Belar Electronics Lab C2452
Featured: Automatic Delay Correction is a software-defined feature that consistently adjusts time alignment in HD Radio and analog FM signals, eliminating the roughly eight-second delay between the two programs. Belar's Automatic Delay Correction feeds the adjustment back toward the front of the air chain instead of within the modulation moni-

World Radio History

tor. Also: Advanced Monitoring Software visually captures modulation activity associated with AM/FM/HD Radio signals over a specific time period. Via front panel or remote connection, broadcasters receive advanced visual clarity of metering and measurements using various graphs and displays to better comprehend readings, relying on historical data instead of instantaneous snapshots.

Belden **SL206**

Broadcast Bionics **C760**
Featured: Formed in 1992, Broadcast Bionics has pioneered the use of hard disk systems and broadcast IT solution and since has grown into a leading Broadcast IT solutions provider.

Broadcast Concepts Inc. **C8349**

Broadcast Depot **C1633**
Featured: AVRA is the evolution of radio. By adding video server capabilities, a new world of opportunities appears for broadcasters, audiences and clients. Let your audience continue listening and now viewing your radio station anywhere with any device at any time.

BROADCAST ELECTRONICS **C150**
Featured: STX 10 — The STX 10 10 kW FM transmitter has been intelligently designed to offer the perfect combination of audio quality, reliability, redundancy, serviceability and efficiency in an amazingly compact design. No other 10 kW transmitter can match the design, feature set and BE tradition of providing the best value. Also: AudioVAULT 10.40 includes a completely reimagined satellite solution. Never before has it been so easy to implement and manage satellite programming. Also included is direct integration with MusicMaster's Nexus system. This means you can receive MusicMaster song recommendations directly in AudioVAULT. AudioVAULT can auto-fill with MusicMaster approved songs and more. Also: Commotion Beacons can be utilized by radio stations and their advertisers to send information to listeners' mobile phones as they walk into range of a mobile beacon. Beacons can provide coupons, contesting or product information as well as statistical information back to the business and radio station.
Established Products: AudioVAULT FleX, Xpresso, Commotion, The Radio Experience, Marti, STX, Commotion, News Boss, Stirlitz Media Logger, AM & FM transmitters
Mr. Tom Beck, VP of Sales
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Quincy, IL 62305
217-224-9600
Fax: 217-224-9607
Email: tombeck@bdcast.com
Website: bdcast.com

Veteran film/TV audio engineer Fred Ginsburg gives a workshop at the Audio-Technica booth in 2014.
Photo by Jim Peck

Broadcasters General Store **C2355**
Featured: Since 1979, Broadcasters General Store has supplied equipment to the broadcast industry ranging from legendary stations to the smallest facilities. Whether it's a complete studio rebuild or a handful of connectors, BGS takes care of everything. Family owned since inception and now being run by the second generation of the Shute family.

Broadcast Microwave Services Inc. **C10721**

BROADCAST PIX **SL5625**
Intro: Introducing Flint Portable, the only mobile production system with Fluent Control that automates workflow, includes powerful performance tools and gives users complete command over all show elements. Includes built-in touch-screen, CG, clips, DVEs, Keyers, ClearKey, etc. Experience macro pixpad, camera, and slo-mo control. Easily create exciting live video anywhere. Also: Version 4.5 for Mica and Granite, Version 3.5 for Flint switchers includes PixPlay the integrated slo-mo control option that works with Hyperdecks or Ki Pro systems. Also includes Show Copy that allows users to export and import entire prepackaged shows. Plus new standard embed analog audio. Also: Fluent Control -- Every Broadcast Pix switcher features our patented Fluent workflow giving users seamless control and integration of all live video production elements. This includes cameras, files, effects and more. Fluent Control simplifies content management and automates video show production allowing anyone to create exciting live video.
Established Products: VOX Visual Radio
Sarah Madio Steve Ellis, Marketing Manager
3 Federal Street
Billerica, MA 01821
978-600-1100
866-914-9484
Fax: 978-663-2811
Email: info@broadcastpix.com
Website: www.broadcastpix.com

Broadcast Software International **C1761**
Featured: Thousands of broadcasters rely on BSI every day for their radio automation software, playout and multi-channel logging/skimming solutions. Developed and supported in the United States by a dedicated team of broadcast professionals, our software has helped BSI become one of the leading suppliers of small, medium and multistation markets with distributors in every continent.

Broadcast Supply Worldwide **C1123**

BURK TECHNOLOGY **C1045**
Established Products: ARC Plus Touch is the industry's most powerful transmitter remote control, with touch screen, web, mobile and dial-up access to hundreds of sites. Also: ARC Solo is a powerful yet simple transmitter remote control in a self-contained unit for small installations. Also: Climate Guard and Plus-X EM-32 are environmental monitors that detect potentially dangerous shifts in temperature and humidity before failures can occur. Also: AutoPilot is a customizable graphical management system for your entire operation.
Mr Matt Leland, Director of Sales
7 Beaver Brook Road
Littleton, MA 01460
978-486-0086
Email: sales@burk.com
Website: www.burk.com

Burli Software Inc. **C2034**

BW Broadcast **C1333**
Featured: V2 Transmitters offer intuitive controls, the best remote control app and quick change parts help take the stress out of your life. Moving into higher power? Check out the new 2.5 kW. Also: FM translators solve your translator site problems in one box. You no longer need to buy a separate transmitter and receiver. Also: FM Audio Processors — Disproving the myth that you have to spend big if you want create a sound that will make your station stand out on the dial. Also: AM Audio Processors, RDS Encoders.

Calrec Audio **C2755**

Canare **C10718**

Clark Wire & Cable **C9908**

Coast to Coast Tower Service Inc. **C1637**

Coaxial Dynamics **C2160**

Comrex **C2627**
Featured: BRIC-Link II is a new platform for the development of utility-based future IP products. With revamped internal hardware, added XLR connectors (for analog and AES3 audio), Gigabit Ethernet and a front-panel headphone jack, BRIC-Link II is an important revision of Comrex's staple IP codec. Also: Access 4.0 will provide users the ability to utilize multiple IP streams at once while broadcasting. Instead of using only one network at a time during a broadcast, Access 4.0 can utilize multiple data channels simultaneously to create a more robust and stable connection.

Continental Electronics Corp. **C1755**

CPI **C1855**

Crown Broadcast IREC **C7049**
Featured: E-Series transmitters are high-quality, full-featured FM transmitters available from 100 W to 5 kW with new 10 kW available Q4 of 2015. Type certified for use in LPFM the E-Series feature a digital exciter, TCP/IP interface, Dynamic RDS and audio back up with optional 10-year warranty available. Also: The RFBA-1 offers three built-in tuners able to receive any AM/FM/WR band they are set to with one receiver capable of composite output for translator applications or all three may be used for EAS monitoring. Optional modulation analyzer option offers more flexibility.

Dalet Digital Media Systems **SL4525**

Dan Dugan Sound Design Inc. **C6049**
Featured: With MADI I/O (both optical and copper), the Model M provides 32 channels of Dugan automixing at 96 kHz or 64 channels at 48 kHz. Dugan Speech System, Music System and Gain Limiting technologies are supported. A scene memory can record and recall operating settings, globally or by group. Also: Featuring Dante I/O (primary and secondary), the Model N provides 32 channels of Dugan auto-mixing at 96 kHz or 64 channels at 48 kHz. Dugan Speech System, Music System and Gain Limiting technologies are all supported. A scene memory can record and recall all operating settings, either globally or by group. Also: The Model K keyboard is a physical interface for all networkable Dugan products.

DataPath **N4809**

Davicom **C2561**
Featured: DVLD-1 Lightning Detector Receiver gives warning of lightning activity in the vicinity of a transmission site. It uses a sophisticated algorithm to estimate distance to a lightning strike and reject potential man-made signals. The DVLD-1 connects to Davicom units through a four-wire interface. Also: BKB-1 Brand B Interface Harness allows for easy replacement of Brand B remote controls by Davicom DV units. Also: Inovonics 531N

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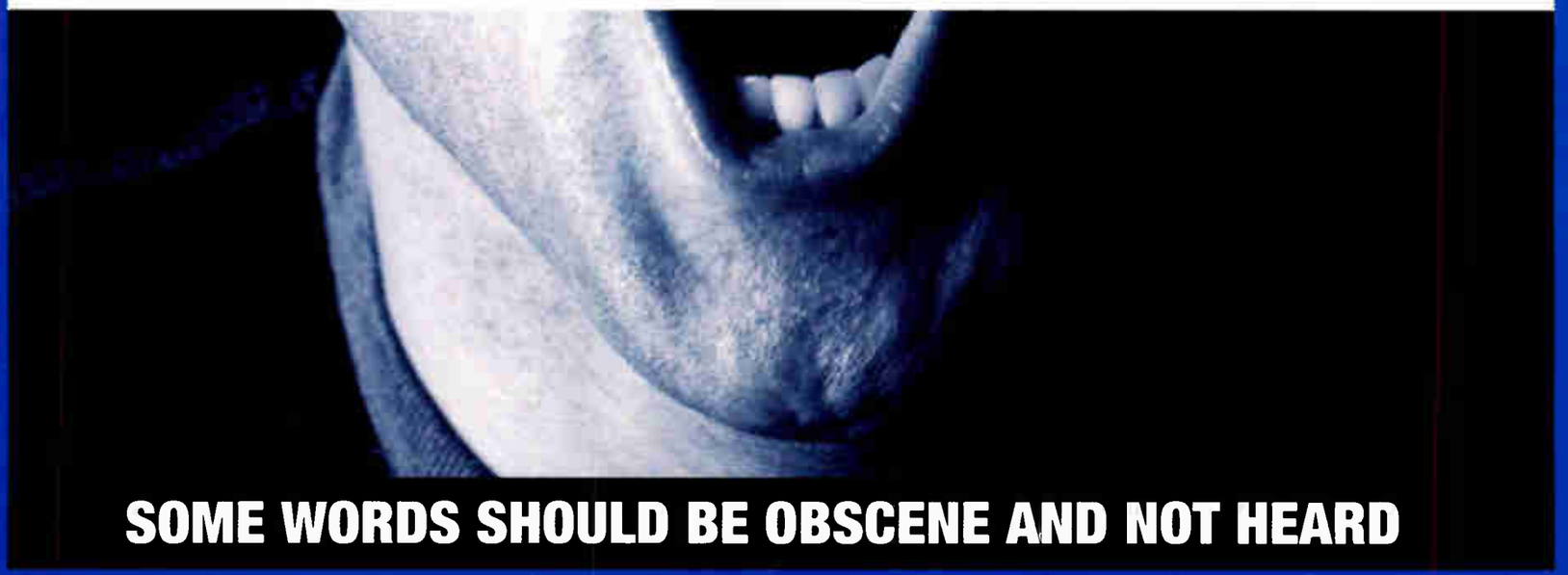

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Eventide Broadcast Delays are designed to keep profanity off your air, and angry listeners, embarrassed advertisers, and the FCC off your back. We invented the obscenity delay and have a solution for stations large and small that provides up to 80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

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

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

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

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

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Eventide is a registered trademark and MicroPrecision Delay is a trademark of Eventide Inc. ©2005 Eventide Inc.

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Interface — Thanks to Davicom's SNMP manager, a configuration and workspace have been designed to interface with Inovonics' 531N SNMP-capable Modulation Analyzer. The interface is free from the Davicom website. Also: DavNet NOC Software Version 5.56 incorporates such features as support for alarm forwarding by secure email with encryption and authentication, polling alarm generation and changes to Map Icon colors.

DAVID Systems GmbH **C8333**

DAWNco **SU3406**
Featured: Our newest LNBs will improve reception when using "finicky" new satellite receivers. Our C and Ku Band LNBs have solid specs for stability, and for 1 dB gain compression. Our improved LNBs can boost EbNo readings on new DVB-S2 and MPEG4 satellite receivers. Low 250ma power draw. Also: Reliable satellite reception is achieved with our jumbo 5.0-meter high-gain antenna. This big dish will produce the best C/N performance for your "finicky" new digital channels. Also: DAWNflex cable for satellite antenna signal cable runs that are over 300 feet long.

DaySequerra **N4707**
Featured: The M4DDC diversity delay control is a purpose-built, 1 RU, standalone AM or FM solution and runs DaySequerra's proprietary TimeLock algorithm to automatically maintain perfect time and audio level alignment of the HD Radio analog and digital audio streams. Also: The DaySequerra Neustar2 digital radio processor is a two-stream AES stereo audio processor, designed to improve the audio performance of low bit rate HD Radio multicasts, DAB and DRM broadcasts. Featuring loudness measurement and look-ahead gain correction to make audio level adjustments transparent to your audience. Also: Our new M2HDSP upgrade path allows HD Radio stations to keep their older M2.0X and M2.2R units up-to-date with new DSP-based hardware and the most recent iBiquity firmware. Your M2HDSP ships back to you complete with a full three-year warranty.

DB Elettronica Telecomunicazioni **C2449**

Delta Meccanica s.r.l **C2133**

DEVA BROADCAST

DEVA BROADCAST **C1336**
Featured: DB3010 FM radio and IP audio confidence monitor is a tool to simultaneously monitor FM and Internet stream of a radio station to ensure perfect performance and remote monitoring. It has a sensitive and highly selective built-in DSP-based tuner and RDS/RBDS decoder. Ensuring full-fidelity program monitoring, the DB3010 is the perfect asset for any radio station. Also: The B3011 FM/HD Radio and IP Audio Confidence Monitoring Receiver is a solution for receiving and monitoring FM/HD Radio and Internet radio streams. It can be set to work in two modes: FM and Internet radio stream monitoring mode and HD Radio and Internet radio stream monitoring mode. DB3011 is the solution for any station with HD Radio transmission.
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Website: www.devabroadcast.com

Dialight Corp. **C12031**

Dielectric LLC **C2445**
Featured: DCR-T antenna is available in 1–8 bays with an input power up to 8 kW. Each array is field-tunable and be optimized anywhere on the FM band. Suitable for emergency application where a lightweight, low-power, frequency-agile antenna is required. Available with radomes.

DiGiCo UK Limited **C1339**

Digigram **C1858**
Featured: Ravenna/AES67 connectivity for the Iqoya range of audio over IP (AoIP) codecs, which now allow users to get audio programs from an in-studio Ravenna network and subsequently encode and stream them over IP to transmitter sites via a WAN in compliance with EBU ACIP. Also: Web-based Iqoya *Cloud, which can be hosted privately on any virtual machine or operated as SaaS in the cloud, enables structured management and seamless operation of all deployed audio over IP remote live contribution codecs. The application synchronizes assets to dramatically simplify deployment and operation of the full codec fleet. Also: The LX-IP Ravenna PCIe sound card.

Digital Alert Systems **N4816**
Featured: DASDEC-II from Digital Alert Systems provides a flexible platform for emergency alert and CAP management in An integrated package. Tight integration with both serial and IP communication protocols suits any station's equipment interfacing requirements. The DASDEC-II system can be used as a drop-in enhancement for any existing EAS encoder/decoder set.

Digital JukeBox — DJBRadio **C763**

Digital Nirvana **SU8813**
Featured: Media Management Platform, Version 2.0 incorporates an expanded social media publishing function, virtual download and radio program monitoring and recording.

DoubleRadius Inc. **C2563**

DPA Microphones **C6046**

DSC Laboratories **C5113**

Econco **C1855**
Featured: Rebuilt power tubes for transmitters.

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Electro-Voice **C6908**

Elenos **C2151**
Featured: Avatar transmitter network system control can manage large networks of transmitters having similar characteristics, to optimize output power and energy costs. Avatar can predict faults and solve any problem for any network with the correct priority, saving time and money thanks to a detailed overview of the network. Also: The E10000 cannot be beat in terms of compactness, efficiency and weight. In 4 RU it can supply 10 kW of RF power in the range 87.5–108 MHz with an efficiency of 70 percent. Also: Indium FM transmitters.

ENCO Systems Inc. **C145**
Featured: DAD — Complete audio playout, automation and control system for radio. Manage your audio content and metadata from anywhere with ENCO Web tools and integrated remote voice tracking. Mobile apps can provide smartphone control of your ENCO DAD automation system with audio uploading functionality for field reporting and remote voice tracking from an iPad. Also: ENCO1 is a fault-tolerant virtualized solution designed around a unique specification for the radio automation environment. It increases reliability, reduces operating expenses and decreases your automation system's footprint, all while lowering a facility's total cost of ownership.

ERI-Electronics Research Inc. **C3255**
Featured: 788 Series AllPass Diplexer allows FM stations to operate at digital power levels up to –10 dBc with high efficiency and minimum group delay. The ideal method for hybrid HD Radio with high power analog transmitter power and elevated digital injection levels. Power handling capability increased to 54 kW analog plus 10 percent HD Radio.

ESE **C7306**
Featured: The ES-150U is a master clock switcher that monitors ESE and SMPTE/EBU timecodes. Master clock switchers are used with a primary master clock ("A") and a secondary master clock ("B"), they provide a convenient way of switching to the secondary master clock if a problem develops with the primary master clock. Also: The ES-71 converts SMPTE/EBU LTC code or ESE Time Code to a USB interface. The device is powered by the USB interface and is intended for computer time synchronization. The unit features four modes of operation, which may be selected by DIP switch or by software. Also: The ES-217/BNC and ES-246/BNC are products for distributing timecode throughout a master clock system to equipment that accepts SMPTE-LTC timecode. The ES-217/BNC provides 1x4 distribution housed in a small die-cast box. The ES-246/BNC offers a quad 1x6 configuration in a single RU. All inputs/outputs are supplied on BNC connectors.

Established Products: Master clocks, remote clock displays, NTP products, frequency standard, SMPTE/EBU timecode, timecode converters, digital clocks and timers, distribution amplifiers, video and audio products, time control systems

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Eventide Inc. **C2848**

FEMA Integrated Public Alert and Warning Systems (IPAWS) **C2631**

FirstCom Music **SL4621**

Fraunhofer IIS **SU3714**

GatesAir **C3107**
Featured: VMXpress IP provides an audio over IP gateway to GatesAir networked consoles, allowing systems to expand by adding Ravenna and AES67-compliant devices. New systems can be designed for with robust GatesAir networking while enabling interoperability for AES67 and Ravenna devices. VMXpress IP also supports further interoperability with GatesAir IP Link codecs. Also: Intraplex LiveLook is a real-time interactive monitoring solution for GatesAir IP Link codecs, with time-based graphical analysis of network statistics. Detailed network visibility helps broadcasters measure burst packets and performance-related measurements that affect IP signal transport, with data mining algorithms to automate packet analysis, all while highlighting optimal error mitigation techniques. Also: IP Link software enhancements include dynamic jitter buffer adjustment for improved transport reliability for those network connections by vary-

the PERFECT PAIR

GSelector® Zetta®

Great Radio Starts with the Perfect Pair

GSelector is the latest music scheduling system from the company that invented music scheduling. Zetta is the latest automation playback system from the people who have more automation systems on air in the world than any other company.

With both, you get real-time reconciliation, ability to add a song once – time-saving integration and of course, one support department. Harness the power of automatic asset distribution, potent rights management, Mscore and Mediabase integration. And did we mention they look stunning? What a perfect pair: GSelector and Zetta - simply the best.

We feel so confident about how well the perfect pair play together we have a special limited time offer for you.

go with Zetta & get GSelector *FREE

* Purchase a new Zetta automation system before April 30 2015 and receive one (1) free year of GSelector music scheduling. For more details go to gselector.com/free

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T-shirts just make people happy.

Photo by Jim Peck

ing, continually measuring and adjusting network jitter to eliminate audio packets drops and minimize playout delay. Additionally, includes dynamic compensation for network diversity delay bolsters reliability for multiple network connections.

Genelec Inc. C3258

Gepco/General Cable C6916

Glensound C1139

Gorman-Redlich Mfg. Co. C1122

HD Radio C545

Heil Sound Ltd. N7206

HENRY ENGINEERING C3058

Featured: The AES Digital DA 2X4 is a zero-latency distribution system for AES digital audio streams. Produces four AES output "clones" of either an AES or S/PDIF input. Bit-accurate, does not alter data or add any delay. All AES I/Os are individually transformer isolated. S/PDIF inputs are converted to AES standards. Built-in AC power supply. Also: The AES D2A digital to analog converter is a reference-grade D-to-A converter accepts any standard sample rate from 32 to 192 kHz with up to 24-bit depth. Ultralinear L/C output filtering produces superb audio. Buffered headphone output for critical monitoring. The built-in toroid-linear power supply is triple-regulated for true professional output levels with liberal headroom.
Established Products: USB Matchbox II, Matchbox HD, Superelay, TwinMatch, SixMix, Talent Pod, Sports Pod, MultiPhones, MiniPod, MultiPort, PatchboxII, AutoSwitch, StereoMixer, LogiConverter, USDA 2X4, PowerClamp

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IABM N8225

IEEE Broadcast Technology Society L29

Featured: RF Radiation Exposure Safety Standards, Practices and Regulations Tutorial; also, the society is offering 2015 NAB Show attendees a 50 percent discount on IEEE membership plus an additional discounted price of $7.50 to join BTS. IEEE membership includes attendance to local events and activities, discounted membership to individual societies, and a wide range of educational opportunities including conferences and presentations.

Independent Audio Inc. C3139

INOVONICS INC. C3248

Featured: The Justin 808 HD delay processor time-aligns FM and HD Radio audio from

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NOW WILL SIMULTANEOUSLY DECODE & DISPLAY
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- Adjustable RF Mask for High Power/Asymmetrical HD Sidebands
- Metering of Analog Total, Pilot, L, R, L+R, & L−R
- Metering of HD L/R/L+R/L−R Audio Streams
- Time Alignment Cross Correlations Analysis ±16384 Samples, ±375ms
- HD Control and Status Information
- HD SIS and PAD Data
- BER (bit error rate) Measurements
- User Assignable Email, Relay & Display Alarms
- RJ-45 Ethernet Interface with Remote PC Software

THE ALL NEW FM SOLUTION
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All-in-One FM Modulation Monitor
Now includes Peak Weighting!

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- Full Metering of Analog Peak and RMS Values
- RDS Injection and Full Data Decoding
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- RF, Composite and Audio FFT Spectrum Analysis
- User Assignable Email, Relay & Display Alarms
- RJ-45 Ethernet Interface with Remote PC Software

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off-air reception. It is accurate to ±1 sample. It also corrects for FM/HD phase errors and matches FM and HD RMS audio levels. Remote Web interface, alarm tallies, email and SMS message support, SNMP support. Easy installation, auto setup. Also: Simon 614 Multi-Stream Monitor can simultaneously monitor four independent audio Web streams including metadata, with full-featured remote Web interface. Alarm tallies for audio and stream loss plus email and SMS error messaging and SNMP support. Works with both lossy and lossless codecs, supports multiple network and encapsulation formats. Also: 531N FM Modulation Analyzer with Networking — The industry-standard FM mod-monitor with all-new features, including a complete Web interface for remote monitoring and control. Featuring SNMP support, email and SMS error messaging with data logging, FFT and other graphic signal displays. Also: INOmini 635 FM/RDS SiteStreamer is a compact FM receiver that streams the off-air signal to any location. Analog line inputs also let you monitor audio feeds directly. Full Web interface plus SNMP support; sends email and SMS error messages and logs signal metrics. Also: The INOmini 636 NOAA Weather Receiver tunes all Weather Band frequencies and provides balanced analog and AES digital audio outputs. Alarm tallies for low RF, audio loss and 1050 Hz alert.
Established Products: Audio processors, AM/FM/RDS modulation monitors, translator and confidence monitors, RDS encoders/decoders
Ben Barber, CEO
5805 Hwy. 9
Felton, CA 95018
831-458-0552
800-733-0552
Email: sales@inovonicsbroadcast.com
Website: www.inovonicsbroadcast.com

Intelsat **SU3110**

International Datacasting Corp. **SU3202**

International Tower Lighting **C1133**

iZotope **SL4330**
Featured: RX 4 — iZotope will showcase new post-centric tools designed to handle the challenges of creating consistent and compliant levels, stems and surround channels for the first time. iZotope will also demonstrate its RX 4 application with RX Connect for streamlined workflows between popular video and audio editing applications.

Jampro Antennas Inc. **C1055**
Featured: The Java broadband log periodic FM Band II antenna is useful for high-gain directional applications. It is available for any standard FM channel (87.5 to 107.9 MHz) and built to withstand extreme conditions. Custom directional azimuth pattern and FCC certification is available on a full-scale test range to conform to customer's requirements. Also: JCPB broadband FM antenna is a broadband version of the Penetrator. This sidemount antenna is available with radomes for durability. Each bay consists of a Penetrator-style radiating element supported by galvanized steel mounting brackets.

JK Audio **C2324**
Featured: RMx4 field mixer is more than a typical field mixer. This battery-/AC-powered portable audio mixer combines four mic inputs, each with switchable phantom power, with four headphone/IFB outputs suitable for loud environments. Also: The RMx5 field mixer combines a low-noise mic mixer, headphone amplifier and USB codec in a rugged, field-tested design. This battery-/AC-powered portable audio mixer features five input channels and four independent headphone/IFB outputs. RMx5 provides numerous additional inputs and outputs including a 24-bit USB codec and AES/EBU output. Also: CellTap 4c wireless phone audio tap connects between your cellphone and headset. This passive device provides a mic-level output of your voice and the caller's voice on separate channels. Capture both sides of the conversation with your audio recorder. Works with most smartphones that use a four-conductor 3.5 mm headset.

Junger Audio GmbH **C2333**

Kathrein USA Inc. **C1445**

Kintronic Labs Inc. **C2358**
Featured: Providing the highest-quality broadcast products in a cost effective and timely manner while serving our customers with honesty and integrity.

In 2015, The National Association of Broadcasters named Thomas F. King as a recipient of NAB Engineering Achievement Award.

Klotz AIS GmbH **C8733**

Lawo AG **C2218**
Featured: mc²36 is Lawo's new all-in-one mixing desk with natively integrated Ravenna technology provides a comprehensive feature set that covers broadcast, theater, house of worship, live and install applications. The mc² Compact I/O is a convenient and cost-efficient way to expand the mc²36's connectivity and to provide a distant stagebox solution in addition to the on-board I/O.

World Radio History

Lectrosonics Inc. C3744
Established Products: Digital hybrid wireless microphones, encrypted digital wireless microphones, IFB systems

Linear Acoustic - The Telos Alliance C549

Logitek Electronic Systems C1048
Featured: JetStream Plus Dense-Node AoIP platform; JetStream Mini Dense-Node AoIP platform; Artisan console; Mosaic console; ROC console; Pilot console; studio and routing accessories

Magnum Towers Inc. C1443

Masterclock Inc. C5046

Merging Technologies C3239

Minnetonka Audio Software Inc. SU10410

Moseley Associates Inc. C155
Featured: We design, manufacture and market digital transmission systems for radio and television broadcast and for diversified telecommunication industries.

Museum of Broadcast Technology L2

MusicMaster C2145

Myat Inc. C2653
Featured: Transmission line systems, filters, power and channel combiners, and components. We deliver performance and reliability to your facility, and we back it with expertise and support that are unmatched in the industry.

Myers N7919
Featured: Myers is upgrading its technology to expand the capabilities of the ProTrack Broadcast Management System. The new HTML5 front-end will deliver added functionality and intuitiveness. Myers will debut a behind-the-scenes look at the NAB Show.

NAB Labs Futures Park N8933

NABEF NU1

National Association of Tower Erectors C1114

Nautel C2139
Featured: There's a smaller footprint 30 kW transmitter in the GV Series for digital/analog FM. The GV30 joins the GV Series offering IBOC performance and efficiency as well as new instrumentation and capabilities: digital efficiency; HD spectrum/efficiency optimizer; separate controller "back up" user interface; site control functionality; low mains operation down to 90V (at 1/3 TPO); dynamic RDS scrolling; and oscilloscope instrumentation. The NX5 and NX10 transmitters join the NX Series for 5 kW–2 MW AM/MW transmitters. NX Series for AM/MW transmission is now available with 5 kW and 10 kW outputs and the advanced user interface, instrumentation and linearity that NX customers have come to expect. GV Series offers high IBOC power and efficiency, an HD spectrum/efficiency optimizer, dynamic RDS scrolling and oscilloscope instrumentation. Also featured are MER instrumentation; HD PowerBoost (patented hybrid peak/crest reduction); asymmetrical HD sideband capabilities; HD reliable transport; and built-in instrumentation with remote access for optimal HD Radio signal.

Netia C1759
Featured: The Media Assist Suite software unites the functionality of radio broadcast automation and media management products with a SQL database to provide a multimedia asset management system with a full complement of production tools. Users can manage all types of content, in any format, on any platform, from anywhere, at any time.

Neutrik USA Inc. C7216

NewBay Media LLC C6648

NextRadio C8049

NKK Switches N4716

Photo by Jim Peck

All-digital modulation on the AM band is likely to be a topic of discussion again. Shown last year are Milford Smith of Greater Media, Sam Caputa of Emmis, David Layer of NAB and Gary Kline of Cumulus. Layer presented largely positive results from experimental all-digital AM sites.

NPR Labs N9031

NPR Satellite Services SU3407

O.C.White C7749

OMB Sistemas Electronicos C2920

Omnia Audio C549
Featured: Omnia.7 FM processor features "Undo" technology that re-creates peaks lost in poorly mastered tracks. Psychoacoustic Controlled Distortion Masking Clipper removes virtually all distortion detectable by the human ear. Z/IPStream X/2 is third-generation audio streaming software from Telos, with audio processing tools from Omnia and Adaptive Streaming technology that processes and encodes streaming audio for multiple platforms and bit-rates simultaneously. Fraunhofer IIS codecs. Omnia.9 now includes processing for AM/FM standard, optional separate processing for HD1, HD2, HD3, processing and encoding for Internet streaming, RDS, and possible "Dual Path" model with processing for two separate programming paths.

Omnirax Furniture Company C1837
Featured: Collaborative ergonomics for the 21st century. Expert custom and production furniture solutions made in the USA since 1985.

OMT Technologies C162
Featured: Solutions for the broadcast media industry across North America and internationally. Core products include the iMediaTouch Radio Automation System and radio's number one selling digital logger, iMediaLogger.

Orad Hi-Tec Systems SL6317, SL6321
Established Products: Radio/TV automation of radio shows

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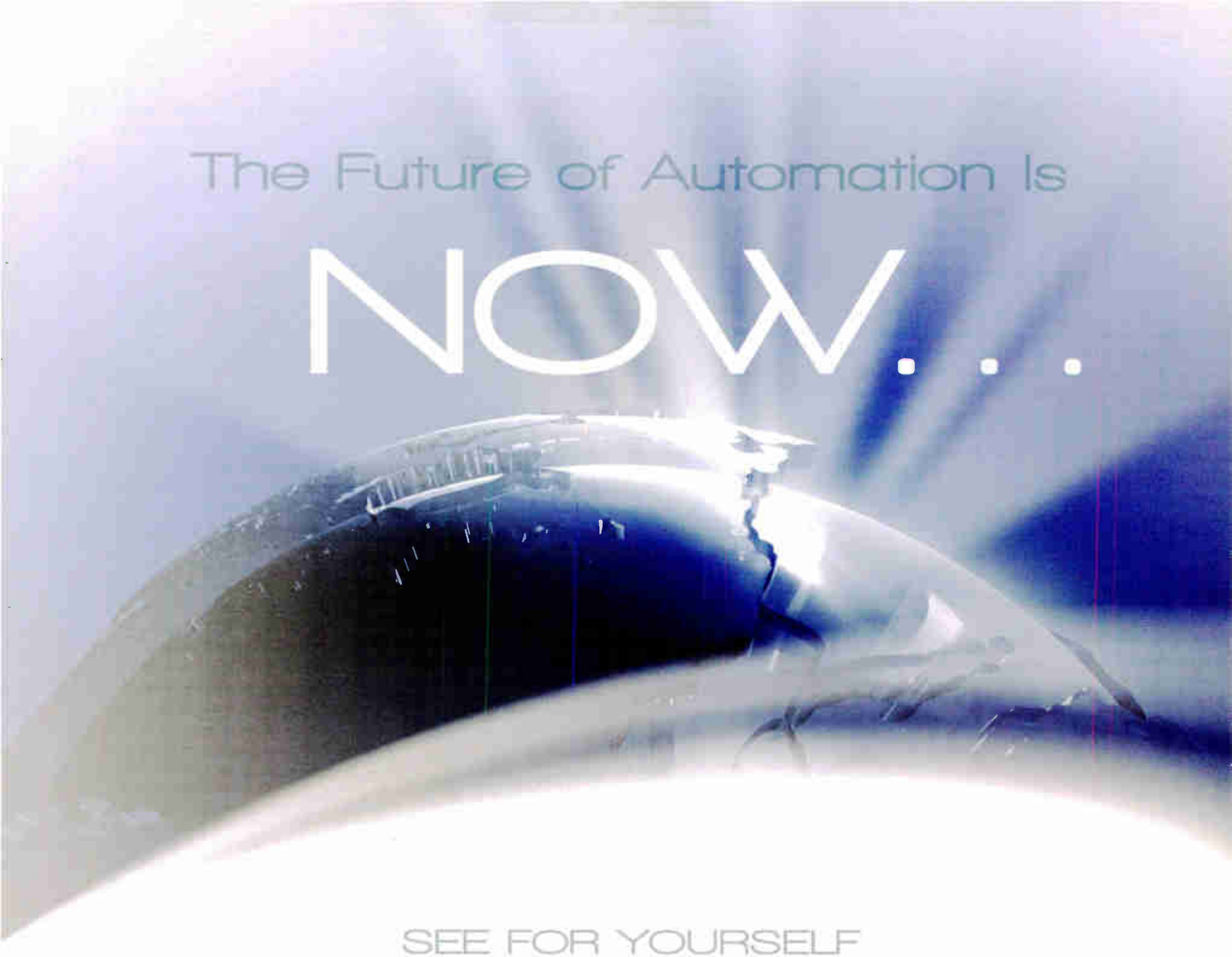

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Alec Lively of BSI talks with Brian Vita and Maria Micciche about the Stinger on-air automation software system.

Photo by Jim Peck

Orban **N5507**
Featured: The Optimod-FM 8500S now offers the 8500 sound in a compact, cool-running 1U package at a more affordable price. The 8500S provides stereo enhancement, equalization, AGC, multiband compression, low-M peak limiting, stereo encoding, and composite limiting. More than 20 format-specific factory presets.

Orbital Media Networks **SU10402**

Paravel Systems LLC **C7950**

Pelican Products Inc. **C2327**

Phasetek Inc. **C1546**

Podcast Alley **N7715**

Porta Brace Inc. **C7119**

Potomac Instruments Inc. **C2652**

Propagation Systems Inc. **C2759**

PTEK **C12833**

Quantum Corp. **SL8416**

Radio Frequency Systems **C1462**

Radio World **C6648**
Featured: The new "information economy" can be scary, or it can be exciting. Radio World helps our readers — the engineers, operations managers and top executives of the U.S. radio industry — understand this world and thrive in it, so they can employ not only FM and AM transmitters but also the many new digital and consumer electronics-based tools available to them.

RCS Sound Software

RCS **C1051**
Featured: Selector2GO, a feature of GSelector, is tailored for the Web. Selector2GO works on all of today's contemporary browsers and across platforms and mobile devices. Selector2GO gives you powerful core scheduling, schedule editing functionality and essential analysis details of your rotations in the palm of your hand. Also: Zetta2GO is an application that allows the control of a Zetta Automation/Playout system from an Internet browser. Using a tablet or smart phone a user can view and fire off Hot Keys for a station, from a laptop or remote desktop a user can control much more. Also: Aquira2GO is a browser-based application with a responsive user interface optimized to work on most modern mobile devices, tablets and smart phones. Part customer relationship manager, part sales proposal tool, Aquira2GO lets the account executive remotely access data for their clients.
Established Products: Zetta, GSelector, Aquira, RCS News
Mr. Neal Perchuk, VP Sales
445 Hamilton Ave.
White Plains, N.Y. 10601
914-428-4600
Email: sales@rcsworks.com
Website: www.rcsworks.com

RDL Radio Design Labs **C5346**

Richardson Electronics **C1548**

Rip-Tie Inc. **C8247**

Rohde & Schwarz **SL1105, SL1400MR**
Established Products: THR9, SR8000, VTS, VTE, VTC, BTC, UPP, VEGA Suite, Spycerbox

Rohn Products **C4847**

Roland **C2635**

RTW **C2134**
Featured: TM3-Primus TouchMonitor combines USB, analog and digital compact loudness and level meter with worldwide standards. Designed for workstations, edit suites, musicians and small site operations, TM3-Primus includes vectorscope, RTA, chart and monitoring capabilities. Its touch screen allows vertical and horizontal operation.

RUSHWORKS **SL7627**

RVR Elettronica/Broadcast Depot **C1633**
Featured: The TEX1002LCD 1000W is the newest transmitter of the TEX family, 1 kW output power in only 2 HE units with overall efficiency 70 percent and RF module efficiency 81 percent. TEX transmitters power ranges from 30 to 2500 kW. The TXKPS-CA hot-pluggable and broadband power amplifier modules have a better than 70 percent overall efficiency. Each module features switching mode power supply to control and stabilize power supply voltage. Each amplifier module provides automatic power control for protection against high VSWR, overdrive, overcurrent and over temperature.

Rymsa RF **C1459**

S.W.R. Inc. **C1941**

Sabre Towers & Poles **C3059**

Sennheiser Electronic Corp. **C2055**

Shively Labs **C3245**
Featured: Designing and manufacturing FM broadcast equipment for worldwide markets since 1963.

Shure Inc. **C1058**

Sierra Automated Systems & Eng. Corp. **C5049**

Sine Control Technology Inc. **C3058**
Featured: The new PowerClamp Series 10 ultra-high capacity surge suppressor has a surge-amp rating of 200,000 amps. It will clamp AC powerline surges and spikes to within a few volts of normal AC voltage, preventing or greatly reducing damage to broadcast transmitters and studio equipment.
Established Products: PowerClamp, TVSS

SIRA SRL **C1330**

SKB Corp. **C1324**

SMPTE-Society of Motion Picture & Television Engineers **L28**

Society of Broadcast Engineers **L30**
Featured: "SBE Certification Handbook for Radio Operators, 2nd Ed." This handbook helps radio board operators learn more about broadcasting

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from the technical and business side. Purchase includes an optional exam to become certified by the SBE as a SBE Certified Radio Operator. Also: The Society of Broadcast Engineers offers a variety of educational webinars, live and later on-demand, covering a range of topics for broadcast and multimedia technology professionals. Topics include HD Radio, IP-based STLs, IP networking, chief operator responsibilities, maintenance, and FCC rules and rule changes.

Solid State Logic **C1455**

Sonifex Ltd. **C2839**
Featured: DHY-04G GSM cellular hybrid, the RB-AEC acoustic echo canceller and a range of five professional PCIe sound and AM/FM/DAB+ radio capture cards with high-quality audio facilities for logging and recording applications.

Sony Electronics Inc. **C11001**

Sound Devices **C6040**

Sound Ideas **SL7620**

Soundproof Windows Inc. **C1126**

Spinner **C159**

Staco Energy Products Company **C6349**

Stagetec (Salzbrenner Stagetec Mediagroup) **C7248**

StreamOn **C2335**

Studer Professional Audio GmbH **C2851**

Superior Electric **C2758**
Featured: Stabiline UPS Systems are true online, double conversion technology available for single- and three-phase applications. Models are available in rack and floor mount configurations and are available with 1000 VA to 400 kVA capacities. External battery packs are available for extended uptimes.

Switchcraft Inc. **C8312**

T3Media **SL901**

TASCAM **SL4707**

Telestream **SL3305**

Telos Systems **C549**
Featured: Zephyr iPort Plus Multi-Codec Gateway hosts eight bidirectional stereo codecs (or 16 one-way encoders/decoders) in 2RU for high-density network transmission via IP links. Works with private WANs, IP-radio links, even public Internet connections. AAC, AAC-LD, HE-AAC (plus v2), MP2, MP3 and linear coding standard; aptX Enhanced coding optional. Also: Z/IP One IP Codec with AES/EBU delivers remotes from public IP networks and mobile phone data services. Agile Connection Technology delivers reliable audio despite varying network conditions. Included Z/IP Server service helps connect to Z/IP codecs behind firewalls and NATs. Also: Z/IPStream X/2 Streaming Audio Processor/Encoder Software; Z/IPStream 9X/2 Streaming Audio Processor/Encoder Software; Z//IPStream. S4 x8 Streaming Audio Processor/Encoder PC Card.

ThermoBond **C4647**

Tieline Technology **C2761**
Featured: Genie Distribution delivers multipoint audio distribution solutions including six channels point-to-point, three x bidirectional stereo or six x bidirectional mono, multicasting and multi-unicasting. Optional ISDN and POTS modules deliver network flexibility. Includes dual Gigabit LAN ports, dual internal power supplies, IPv4/v6, 24-bit 96 kHz sampling, plus SmartStream Plus dual streaming software. Also: Merlin Plus — Save on hardware costs create two bidirectional mono or stereo remotes, each with separate bidirectional IFB channels, or create up to six bidirectional mono connections with IP codecs or smartphones using Report-IT. Optional ISDN and POTS modules allow remotes over IP, ISDN and POTS as required. Also: Bridge-IT XTRA; Report-IT Enterprise.

Tower Consultants Inc. **C2858**

Tower Engineering Company **C3651**

TransRadio SenderSysteme Berlin AG **C8850**

TSL Products **N5112**

Visual Unity Global **N505**
Established Products: vuMedia, the award-winning OTT platform, has everything you need to start streaming.

VocalBooth.com Inc. **SL8726**

V-Soft Communications **C2917**
Featured: Microwave-Pro 2 is updated to use the NSMA OH loss model, now the industry standard. It includes bidirectional microwave paths under a single study. A new point study allows the user to identify the impact of wind farms and other structures on microwave paths. Fully integrated polygon mapping.

LPFM? ☑
Canadian CAP-CP? ☑
Still the best at CAP/EAS? ☑

The FCC CAP rules took effect in 2012, and more radio stations chose the Sage Digital ENDEC 3644 than any other for CAP compliance. Building a new station? Ready to upgrade? LPFM? We have what you need.

Canada's new rules mandating its CAP based National Public Alerting System take effect in 2015. The Sage ENDEC supports CAP-CP with English and French Canadian text to speech, and is the top selling unit for Canadian broadcasters.

The Sage Digital ENDEC, for TV or Radio, your best choice for CAP and EAS.

Questions?
914-872-4069

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Sage Alerting Systems, Inc
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Photo by Jim Peck

A magnetic mount makes it easier to change filter media on this Ecreso product.

Ward-Beck Systems Ltd. **C2541**

Wheatstone Corp. **C755**

Featured: New networked digital audio console; AoIP networked digital audio rack-mount I/O Blades; digital audio signal processing; new digital audio software.

Established Products: Digital audio control surfaces, networks and professional broadcast signal processors for all-sized markets, from standalone studios to the largest conglomerate broadcast centers.

Whirlwind **C6043**

WhisperRoom INC.
SOUND ISOLATION ENCLOSURES

WHISPERROOM INC. **SL11113**

Featured: Studio Lights — The Studio Light series provides LED puck lights for general lighting and multicolored LED lights for ambiance, in one unit. The multicolored lights can be set to various single/alternating colors using a remote control. The Studio Light in conjunction with the numerous interior acoustical foam colors provides limitless possibilities!

Established Products: MDL 4872 (4' x 6'), MDL 127 LP (12.7 sq. feet Low Profile), MDL 102102 (8.5' x 8.5')

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800-200-8168
Fax: 865-558-5370
Email: info@whisperroom.com
Website: www.whisperroom.com

WideOrbit **N5229, N5829**

Will-Burt Co. **C3205**

WinMedia inc. **C2462**

Featured: WinWeb allows broadcasters to customize Web and mobile app templates while increasing audience and ad revenues. Its calendar allows you to produce content (live shows, ad blocks, playlists, podcasts and news updates) with matching color schemes for an enriched listener experience. Designed to fit all screen sizes and devices. Also: WinMedia Visual Radio is an automated visual radio solution that automatically switches cameras and publishes content on Web, mobile and TV platforms. Also: WinSales optimizes business management by providing real-time online ad booking across all media, including web and mobile.

Winsted Corp. **C7221**

WireCAD **N4438**

World Teleport Association **SU13513**

WorldCast Systems **C2845**

Featured: APT SureStreamer enables broadcasters using single-port IP codecs to "SureStream" their audio content between locations enabling seamless playout even when there are dropouts or interruptions on the constituent connections. Using either two wired Internet connections or one wired, one wireless, this add-on device reduces costs and increases reliability. Also: MPX over IP Audio Codecs — APT IP Codec features the ability to support MPX transfer over IP links. Supporting 88 kHz of audio bandwidth and able to scale the sample rate to 192 kHz, the codec output can be transferred directly to the digital modulator. This 100 percent digital path eliminates degradation or distortion from any conversions. Also: Ecreso's 10-Year Warranty on FM transmitters is now available without subscription to the company's EMR service and no longer requires an Internet connection to the transmitter site. Ecreso transmitters now offer on-board recording via SD card which eliminates this requirement and enables remote activation of warranty if required.

Worldnow **SU12010**

Featured: Worldnow Channel in a Box (CIAB) is a cloud-based system designed for over-the-top (OTT) delivery, which effectively combines the major components of a broadcast station into a single workflow.

Wowza Media Systems **SU8513**

Yamaha Commercial Audio Systems Inc. **C1450**

Yellowtec GmbH **C1739**

World Radio History

"I Love You, Man!"

What is your station's plan to promote lasting fan engagement?

What's your fan plan?

Hint: This plan is an action list that takes listener acquisition to the next level. It's not enough to maintain an audience, or even bring in new listeners. If you want to dominate in format, you'll need to invest time, resources and perhaps a bit of dough to turn regular audience members into listeners who are part of your extended family.

Loyal Listener Clubs like this one for KFKF(FM) in Kansas City, Kan., are an opportunity to turn strangers into fans.

This idea offering is by no means exhaustive. Please consider it a starter kit to get your local brainstorm brewing.

JOIN THE CLUB

I'm a huge believer in frequent listener clubs, where people earn points for performing a specified behavior.

For example, they enter the secret word of the day on your website and get 50 points. They show a receipt from a certain store and get 100 points. They find a picture on your site and get 125 points. These points are eventually exchanged for prizes.

I've had the thrill of starting these many times and seen clubs grow from zero to hundreds of thousands of players.

Before you make the commitment, check your resources. Frequent listener clubs require technology, staffing and funding. Executed correctly, they can eventually turn a profit. If you can't make at least a two-year commitment, try something more basic, like inclusion.

INCLUSION

Fundamentally, the more people your station can recognize and include in your on-air activities, the better your chances of converting the occasional tune-in to the daily habit.

While mentioning names on-air may seem small market, this can be effective, even in major cities, in making listeners feel that they belong. It's natural, conversational and uniquely local to recognize these events: birthdays, anniversaries, requests, traffic incident calls, news tips, story ideas, jokes, obits, awards, amateur teams who win games/leagues and local heroes who achieve something for the community.

Dozens of names per day can be hundreds per week, thousands per month and over 10,000 a year. Don't think it makes a dent? Surely we've learned something from Facebook in terms of the viral nature of friends talking about friends. When you hear a friend's name on the air, you're likely going to tell a family member or another friend that this special event occurred. Many times I have met listeners who recall a song request where their voice was on the air from years ago.

MINGLE

When your station hosts activities, do you have staffers mingling with the crowd, or do they all group together talking to each other at the bar?

While you may think only air talent can have an impact, you're wrong. I've witnessed firsthand that even station interns who connect with listeners at events can make a lasting impression. Just being welcoming, friendly and asking for feedback about your station can score points with listeners.

If your staff can't do this naturally, a prop can get them going. For example, a mic plugged into a phone to record answers helps to break the ice, as does handing out small prizes like balloons for kids. These interactions can work wonders in making someone feel included.

FEEDBACK

When was the last time you heard a station recruiting for a "listener advisory board?"

While this has gone out of style, every audience still has members with opinions about the station, and they are just dying to tell you what music to play or which stories to cover in the news.

PROMO POWER

Mark Lapidus

If you have the energy, you could do a new listener advisory board every month — 12 per year of perhaps 20 people each time. Use social media and your website to recruit and sign people up. To grease the skids a bit, offer an incentive. Tickets to concerts, plays or events work well. Publicize the board's ideas on-air and thank the people who are making your broadcasts better.

Making a connection is the first step in any relationship. Once established, your next goal is to encourage an emotional commitment. This can be accomplished by showing warmth on- and off-air and giving people the opportunity to emote about your station.

If you can get a listener to care enough to say something — even if it's negative — you have a shot at transforming a passing stranger into a friend.

Mark Lapidus is president of Lapidus Media.

If you can get a listener to care enough to say something – even if it's negative – you have a shot at transforming a passing stranger into a friend.

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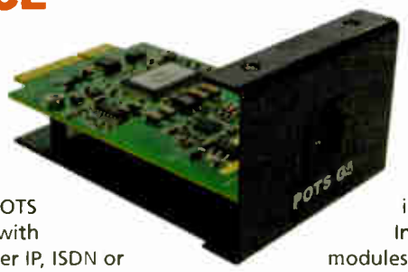
MARKETPLACE

POTS Ticker: Codec manufacturer Tieline has released a POTS G5-compatibility module for its Genie and Merlin codecs



Tieline VP Sales Americas John Lackness said, "The new POTS G5 module provides engineers with greater flexibility to connect over IP, ISDN or POTS network transports as required."

A release explained, "The addition of POTS support means a primary IP connection can also now fail over to backup ISDN or POTS connections if required." It added, "Genie and Merlin codecs can automatically monitor and manage switching between primary and backup connections over all available transports. Codecs will also seamlessly fail back to a primary connection if it becomes available after a temporary interruption."

In addition, "Two POTS modules can be installed and two POTS audio streams are supported in multi-stream Genie Distribution, Merlin and Merlin Plus codecs."

Units already in the field can be retrofitted. New firmware, v. 2.14.18, is available to initiate support for the module.

Info: www.tieline.com

JAXpot: Jacobs Media's app-making arm, jacapps, and digital advertising service XAPPmedia have teamed up to create an ad service for use with jacapps-developed apps.

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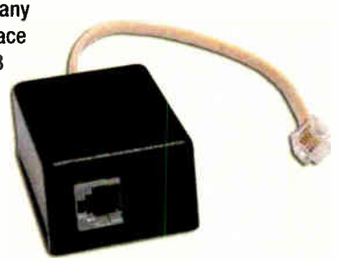

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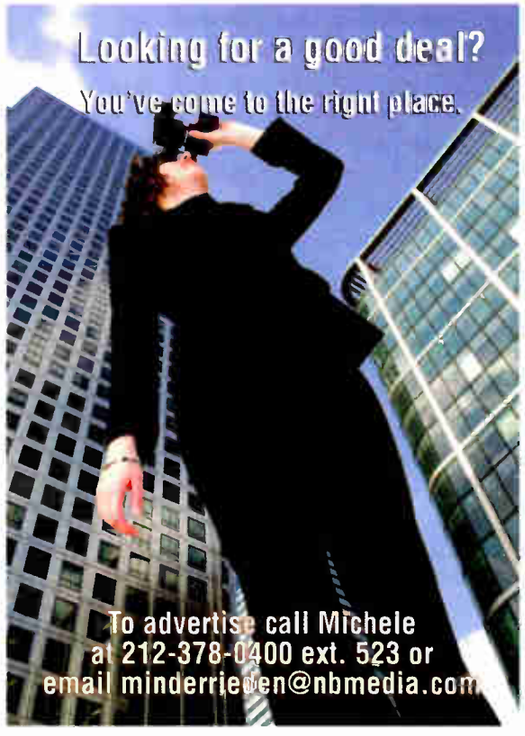

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World Radio History

The Only Right Direction Is Forward

CUSIB supports efforts to reform the Broadcasting Board of Governors

COMMENTARY

BY ANN NOONAN

The author is the executive director for the Committee for U.S. International Broadcasting.

An image from the Broadcasting Board of Governors website.

"CEOs come and go, yet the BBG limps along," declared U.S. Rep. Ed Royce, chairman of the House Foreign Affairs Committee, in a statement about the sudden departure of the Broadcasting Board of Governors' first CEO, Andy Lack.

None of us wanted to see Andy Lack leave the agency. He was an excellent choice, and there is a lot we can learn from his brief tenure.

Coming from years at Bloomberg News Organization and NBC, Mr. Lack's credentials matched the kind of experience required for a CEO of a $700+ million dollar federal governmental media umbrella organization.

Even before his Senate confirmation, Mr. Lack met with members of the Committee for U.S. International Broadcasting — an all-volunteer organization — to hear about our individual concerns and our hopes for improvement at the BBG. He accepted our offer of advice and support and learned as much as he could from the experience of our director and co-founder, Ted Lipien.

A high-ranking AFGE Local 1812 union official at the BBG was impressed with Mr. Lack's warmth and sense of humor and his knowledge of the news business, stating: "I think everyone, but the most cynical, is pulling for him."

While none of us know why he stepped down, I still believe that Mr. Lack cares deeply about international media and the journalists who provide news coverage to areas of the world that are deprived of press freedom. I am confident that in his private sector role he will continue to promote the importance of the BBG's mission.

In many ways, Mr. Lack has set the bar for his replacement. In the next CEO, we will need someone who can bring out a spirit of cooperation from others in an agency that former Secretary of State Hillary Clinton called "practically defunct."

BROADCASTING TO CHINA

Some of the most serious concerns CUSIB has about the current state of affairs at the BBG include the ongoing efforts to eliminate shortwave and medium-wave radio to China.

My awareness about this need began in 1995, when I attended the Fourth World Conference on Women in Beijing. While in China, I attended an illegal meeting with Underground Catholic clergy. They wanted to meet an American Catholic woman to share their stories of religious persecution and to let American Catholics know how abandoned they feel (they still do) by the international Catholic Church.

After returning home, I worked with members of the Chinese dissident community to draw attention to the plight of imprisoned clergy, labor rights advocates and human rights and democracy seekers in China. One thing I learned was that whenever word of our support reached those who are oppressed in China, it lifted their spirits and resolve. They knew by these actions that their plight was not ignored. Whether it was activity on behalf of an imprisoned underground Catholic Bishop or other human rights defenders: Harry Wu, Wei Jingsheng, Cheng Guangcheng or Nobel Laureate Liu Xiaobo, word of this advocacy was often carried on broadcasts by Radio Free Asia and Voice of America China Services.

In 2011, the BBG's threat to cut off shortwave and medium-wave radio broadcasting by VOA and RFA brought the issue close to home. Along with Ted Lipien and members of our newly formed CUSIB, I contacted those members of Congress with oversight for U.S. international media outreach to remind them of the historic mission of BBG, VOA and RFA and the central role of radio broadcasting.

In our efforts, we appealed to Mrs. Thomas Lantos, the late congressman's wife, who personally wrote to the Broadcasting Board of Governors re-emphasizing the importance her husband gave to the role of radio, particularly in countries where Internet censorship was so prevalent.

The end result was a congressional rejection of the funding cuts, continued use of shortwave and medium-wave radio and maintenance of the staffing levels.

ONGOING EFFORTS

These challenges, the urge to cut shortwave and medium-wave radio, TV broadcasts and journalists, are a yearly battle. The findings from the BBG's Shortwave Committee that was headed by BBG Governor Matt Armstrong gave no comfort. What also doesn't help is the notion held by some BBG officials that everyone in China has access to an unmonitored cell phone and the unblocked and fully free Internet. Nothing could be further from the truth.

While many people in China do, in fact, own cell phones and can go online, there are a good majority of poor people, especially in rural areas, who cannot afford cell phones and many people have no access to the Internet. They deserve the same access to information as any

(continued on page 54)

READER'S FORUM

LET GO OF OLD TECH

Why are we hanging on to AM, a 100-year-old modulation technique? After all it's the next step forward in technology from turning the transmitter on and off in particular patterns to send data (characters).

I completely agree with a rational process to provide existing AM licensees spectrum in the low-VHF (< 88 MHz) band.

Make the new assignment non-directional with a power level (coverage radius) a reasonable approximation of the original (or some fixed date) coverage area. Encourage common antennas in a given market.

This has to be market-driven (unlike HD). Let the receiver manufacturers assess their markets. If there's an audience for inexpensive, very local advertising, community events or high school football games, the receiver manufacturers will step up with all the cheap chips out there and produce receivers. Let the existing AM stations continue (with mandatory simulcast of every second of the new signal) as long as it makes business sense for them.

My parents had an All-American Five on their kitchen table in their last home. They're no longer with us, and eventually the operators of the big-signal, full-service format they loved will realize this and turn off the power hog.

Every bit of this will be hard. The players will jockey for every perceived advantage as the rules evolve. But it all flows from the allocation of the <88 MHz spectrum. Given that, some approximation of the above is totally doable.

What I haven't mentioned probably will be the hardest part: selection of the modulation scheme. None of the existing U.S. audio broadcast systems make any sense for the future. Utilizing 200 kHz of spectrum for one stereo program plus some low-grade side channels will not cut it, thus obsoleting the 10+ year-old HD system. Evaluating various digital modulation schemes over various path and noise impairments is not my area of expertise, but I did note the other day in a blog that the CATV boys are talking 1024 QAM in their environment.

A F (Rick) Melzig
Broadcast Engineer
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BBG CEO

(continued from page 53)

other person who deserves basic human rights. They can't get them in China and in many other countries.

That's where the BBG steps in and that's the reason U.S. taxpayers are willing to pay for radio and television broadcasts, as well as the Internet and other new media if they are available and are not censored.

But there is the Great Firewall of China, where only websites with pre-approved domain names are allowed to connect to the physical network. Internet users in China are required to provide their identity before registering any online account. Let's not forget that the People's Republic of China's government employs the largest Internet police force in the world.

During the Hong Kong Umbrella Movement protests, the BBG failed in its ability to handle surge radio broadcasting, although RFA managed to launch a satellite television channel. Congressional actions that followed included bicameral legislation sponsored by Sen. Sherrod Brown and Rep. Chris Smith, calling for the maintenance of vigorous RFA and VOA broadcasting in Cantonese "to better defend their human rights and hold their government accountable."

Some new areas of concern involve morale problems at the Office of Cuba Broadcasting. At this time in renewed U.S.-Cuba relations, the need for a voice of democracy is more crucial than ever, and while we are delighted that the BBG will finally reinstate their employees who were illegally fired more than 5 years ago, we still await justice for those whose cases have not yet been resolved.

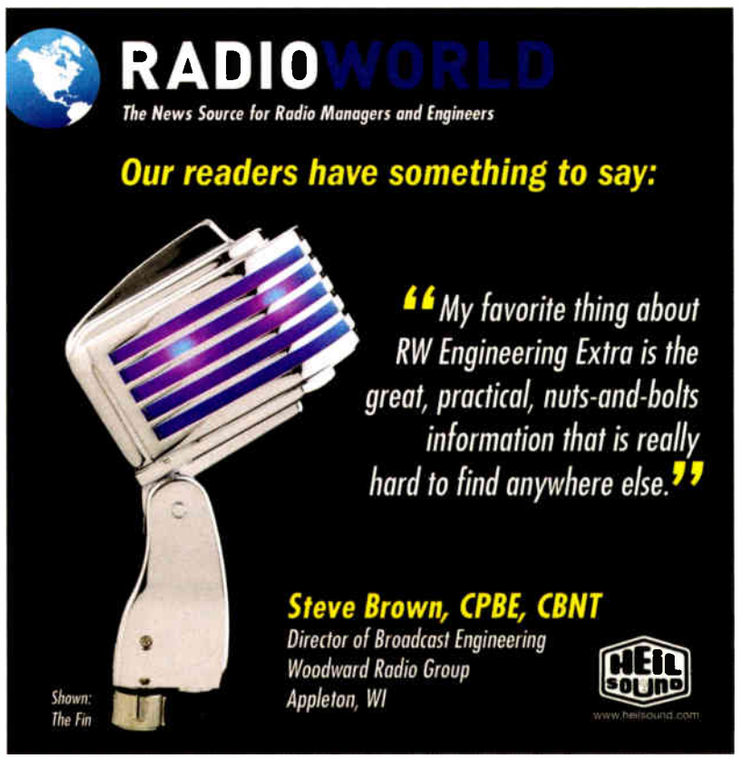
The situation in Ukraine and Russia is overcast by an old Soviet-style propaganda machine of the Kremlin, the likes of which has not been seen since the Cold War. However, the Voice of America seems more distracted by issues caused by mismanagement than focused on delivery of superior content.

Could there ever be a more pressing need to discuss the impact of ISIS and the reaction of neighboring countries to the spread and impact of radical Islamists, whose carte-blanche access to Facebook and other social media has resulted in recruitment ads for would-be jihadists throughout the world?

The need for journalists fluent in languages and cultures of these countries covered by the various BBG entities seems all too obvious. Nevertheless, management and staffing lag far behind in these areas as well.

The creation of an overall CEO could not have come at a better time, and the only direction right now for the BBG is forward.

On behalf of CUSIB, we wish André Mendes the best in his role as interim CEO, and we will continue to support the BBG's efforts to replace Andy Lack. We also support the bipartisan effort in Congress to reform the BBG.



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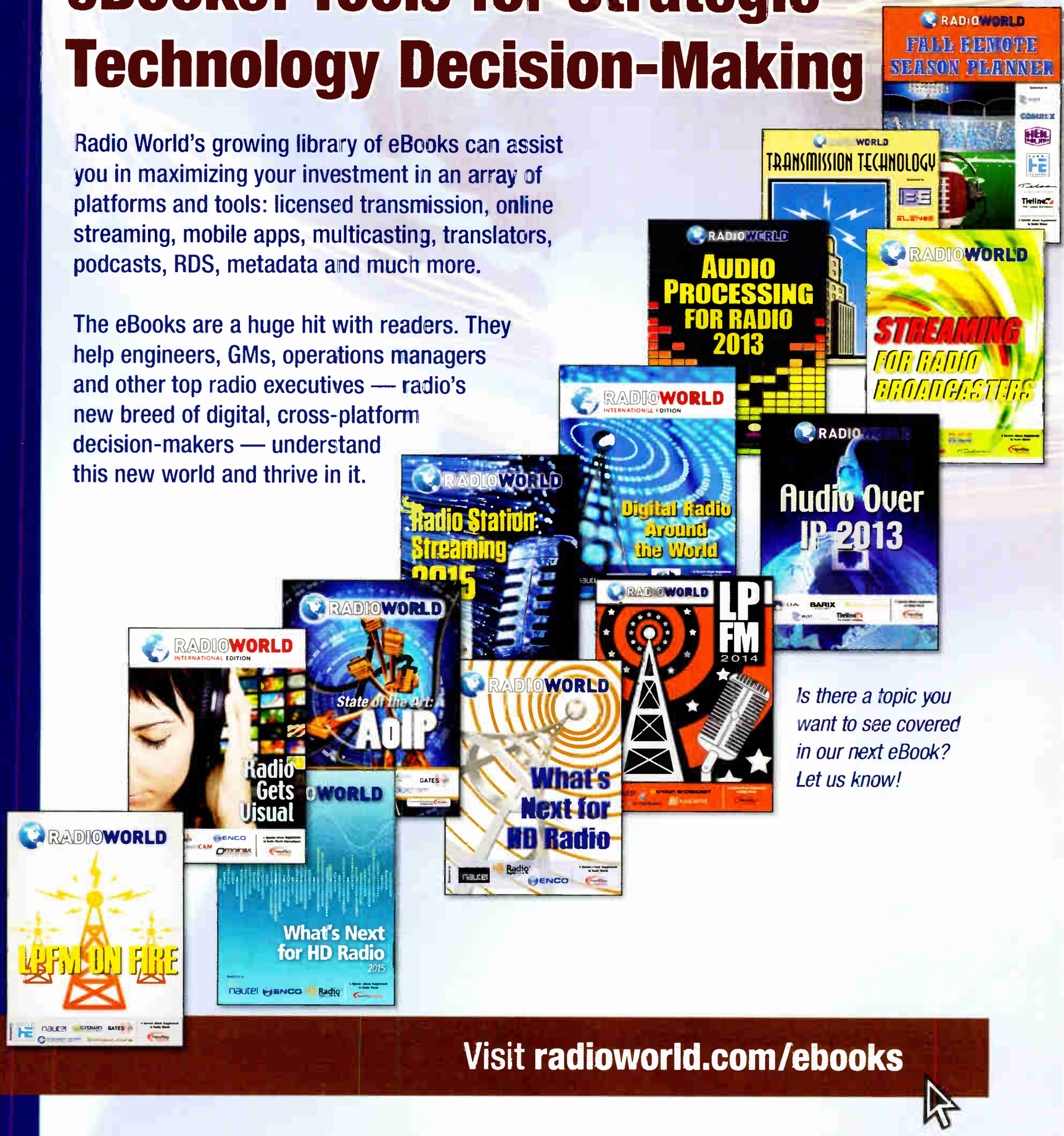

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