



RADIO WORLD

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He's Ford's Man for Apps

Marchwicki explains how the automaker sees 'radio' in the evolving dashboard

NEWSMAKER

Julius Marchwicki is all about the apps.

As global product manager for Ford Sync AppLink, he's at the center of what automakers are doing to entice young people into buying cars. Bigger engines don't do the trick anymore, according to experts in that world; so Marchwicki works with companies like Pandora, Stitcher and Clear Channel to deliver in-vehicle connectivity to infotainment sources.

Sync is the automaker's connectivity system. AppLink is an application programming interface. Marchwicki works with companies in application development and content creation and distribution, wireless handset and platform development, to deliver features into cars that consumers want.



Julius Marchwicki

The Northwestern University computer engineering grad spoke with Radio World News Editor/Washington Bureau Chief Leslie Stimson about how "radio" in all of its forms fits into the new dashboard, part of a new series of articles on radio's role in the evolving world of consumer electronics.

RW: When you think of radio, what comes to mind?

Marchwicki: When I think of radio, I think of an easy way to access localized content for any reason anywhere in the world. That content can be anything. It's music, it's news, it's all sorts of things.

There's obviously a ton of content that's delivered through radio. Traditionally, radio's only been [in one] area... When you leave that area ... you lose the radio stations that you're

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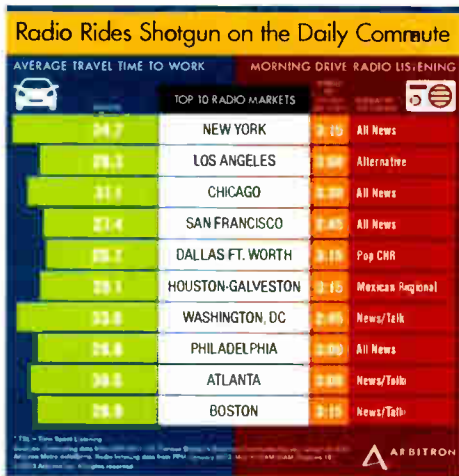
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NEWSROUNDUP

ROYALTY: The latest House resolution opposing a performance royalty for radio now has a Senate counterpart. Wyoming Republican Sen. John Barrasso and North Dakota Democrat Sen. Heidi Heitkamp introduced the Local Radio Freedom Act in the Senate in mid-March. To date, no bill calling for a performance royalty for broadcast radio has been introduced in this session of Congress.

ARBITRON: Long commutes don't necessarily translate to high Time Spent Listening, says Arbitron. It analyzed commuting data from the 2007-2011 U.S. Census Bureau American Community Survey, using Fall 2012 Arbitron Metro definitions. It found that while the New York and Washington Metros were among the top five for commute time, at 34.7 minutes and 33.6 minutes respectively, their morning-drive Time Spent



Listening was not on par with other leading commuting markets. One possible reason is that public transportation plays a big role in both New York and D.C. Without dashboard radios, bus and subway commuters are less likely to contribute to morning drive TSL, Arbitron said.

MUSICFIRST: MusicFirst released an ad published in Politico opposing the Local Radio Freedom Act. The record label-backing organization says satellite, Internet and cable radio all pay performers whenever a song is played, while AM/

FM radio does not. Broadcasters say performance rights supporters discount the free promotion, including events and airplay, that radio provides artists, and that broadcasters do pay music licensing fees to ASCAP, BMI and SESAC.

IN-CAR 4G: General Motors plans to embed 4G LTE connectivity capability directly into the dashboard of some 2015 model vehicles. The first GM cars, trucks and crossovers to get 4G LTE capability will be most 2015 Chevrolet, Buick, GMC and Cadillac models available in North America in 2014. AT&T is supplying the connectivity in these models. The 4G LTE structure is designed into the vehicle's electrical system and includes an external antenna to help maximize coverage and connectivity, according to the automaker.

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PANDORA: Joe Kennedy, Pandora's chairman, president and chief executive officer, is set to leave; the company says a search for a successor is underway. Kennedy joined Pandora in 2004. The Internet audio firm also says its audience data soon will appear in three media buying platforms, including Strata and MediaOcean's Donovan and Mediabank systems. Previously, media buyers had to research Pandora audience ratings manually. The company has also reimposed a limit to its free service, citing higher music royalty rates. Its new limit is 40 hours per month.

FM TRANSLATORS: The FCC opened a filing window for those with "singleton" FM translator applications pending from Auction 83 who wish to file for CPs. The FCC Form 349s must be filed electronically by March 28. The move is one of several the commission will take before opening an application window this fall for would-be LPFM owners.

MEDIA OWNERSHIP: FCC Chairman Julius Genachowski agreed to temporarily hold off reviewing media ownership rules, endorsing a request by the Minority Media and Telecommunications Council. MMTCC has hired BIA to study whether grandfathered newspaper/broadcast and radio/TV ownership operations harm minority- and women-owned stations. NAB supports the action.

SEQUESTER: Some \$85 billion in automatic federal spending cuts went into effect, cutting \$17 million, or 5 percent of the FCC's total \$340 million budget. The cuts will be spaced out over seven months and will likely affect travel budgets, office supplies and outside contracts, according to a spokesman who said no furloughs are planned.

ROYALTY DEAL: Clear Channel Media and Entertainment One signed an agreement to share revenue from digital and terrestrial radio. In exchange, the broadcaster receives favorable streaming music royalty rates for eOne artists. The deal is the seventh such contract for Clear Channel, following similar arrangements with Big Machine Label Group, Glassnote Entertainment Group, DashGo, rpm Entertainment, Robbins Entertainment and Naxos.

RADIO CAPTIONING: "Latino USA" is now regularly captioned; the first radio show to do so, according to NPR, which distributes the program. The captioning targets the deaf and hard of hearing. NPR Labs and Towson University's International Center for Accessible Radio Technology developed the captioning technology. Listeners can tune to the new captioned Latino USA on any web browser at 8 a.m. Eastern every Saturday and at: www.futuromediagroup//usa/captions.

To Find Answers, Ask Questions

Here are a few questions and topics I'll be watching for in Las Vegas

Questions and topics to watch at the NAB Show:

How far along is the industry toward interoperability of various IP audio systems? Is that goal achievable, or even desirable? The Broadcast Engineering Conference features an entire track of presentations on Sunday afternoon just about IP for radio.

What is Digital PowerRadio's big idea to improve HD Radio? The company promises substantial improvement in digital signal coverage radius and quality through changes in the base-band receiver chip. Its paper is part of a Monday engineering session.

What plans does The Durst Organization have for broadcasting at One World Trade Center in New York? John Lyons of Durst, a past recipient of Radio World's Excellence in Engineer-

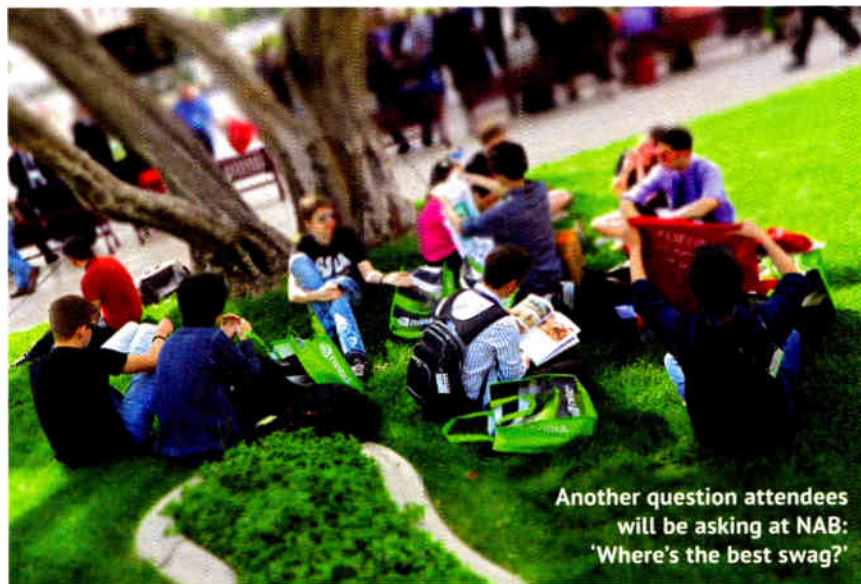


Photo by Jim Peck

ing Award, will talk about this in what is likely to be a well-attended Tuesday session.

Can the alerting community convince broadcast management, and not just engineers, to buy into a public/private warning partnership? EAS expert Richard Rudman of the Broadcast Warning Working Group will discuss that Wednesday.

approval for its geo-targeting ZoneCasting concept anytime soon?

What specific regulatory and technology options will come out of the AM revitalization discussion headed by Commissioner Ajit Pai? When was the last time AM radio had such a vocal proponent on the FCC? (Don't miss Ron Rackley and Ben Dawson commenting on AM rules on page 60.)

Who will show up in which booths? An annual rite for the equipment sales fraternity is to see who has moved around. Look for Cam Eicher and John Bisset at Telos (plus Geoff Steadman and the rest of the team of the recently acquired 25-Seven Systems). Find Don Backus at BE; Ted Nahil at SCMS; Mary Ann Seidler (back) at Tieline; Jim Thomason (back) at Harris Broadcast; and John George and Bob Groome at RF Specialties.

And if you see Geoff Mendenhall at Harris Broadcast, congratulate him on

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What are radio managers saying about a possible future where AM and FM radio are not necessarily standard in every car dashboard?

How far along is our industry at incorporating its new platforms into its business models? In other words, when will the familiar mental divide between our on-air product and our "non-traditional" platforms disappear, to be replaced by a conversation in which all of these are treated as equal parts of a multi-platform, cross-channel media infrastructure?

What are radio managers saying about a possible future where AM and FM radio are not necessarily standard in every car dashboard? When, exactly, might we confront that scenario in new car models?

What are the implications of recent regulatory actions on LPFM and translators? A Tuesday morning management session looks at that as well as copyright, move-ins and allotments; the panel features several broadcast attorneys plus the FCC's Peter Doyle.

Will Harris Broadcast and Geo-Broadcast Solutions succeed in getting

his recent retirement and his launch of an RF systems consultancy, at which he'll continue to work with his former employer.

How deserving is Leonard Charles of NAB's special Service to Broadcast Engineering award? (Answer: Very.) "Chuck" is Midwest director of engineering for Morgan Murphy Media and a leader in numerous spheres: including EAS and alerting; the Wisconsin Broadcasters Association and its Broadcasters Clinic; the Society of Broadcast Engineers; and the NAB TV Technology Committee, among others. A gentleman and a worthy recipient.

Will there be startling radio technical innovations on the show floor?

Look through the exhibitor listings in this issue and you know to expect further exploration of apps and mobile products (for listeners, of course, but also for radio engineers and managers); more products aimed at the online streaming market and the growing sports

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FORD

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familiar with at home and you suddenly have different radio stations, different personalities. Obviously, between areas, you lose signal and you have to find something new.

Today, the age of the Internet and mobile phones as data connectivity has brought us to a world where I can access any radio station anywhere in the world anytime; and I personally think that's fantastic. ... Now we're entering a world of applications and a world of data connectivity everywhere.

RW: Radio in the car is changing so much with connectivity with the phone. Jacobs Media is now Ford's development house and I'm wondering, AM/FM traditional radio is trying to stay relevant in the dash. They want to be on that first screen that comes up. What should stations be doing?

Marchwicki: My thinking is they need to start categorizing their content and making the unique aspects of their programming available to anyone at anytime.

One of the good things that Greater Media has done with its properties, they've started to record the morning shows and make them available. Basically you're caching content ... so you miss the morning show, but you wanted to hear it later in the day or later that week. Morning shows are great but sometimes you miss a segment. How do you get that segment?

RW: You can podcast ...

Marchwicki: You can podcast it or you can get it from the application inside the car. Or, for example, you say "I'm going to time-shift. I missed this. Maybe I can start at the beginning and listen to it." And I can get back in the car later and I can listen to the rest of the morning show on my way home. ... You can access that type of content through many applications. But the way you access that is you start to categorize that. You start to take the unique aspects of your station, your programming, and make that available outside of the time in which it was broadcast.

RW: Making it available through an app?

Marchwicki: Applications are definitely very common; it's a good way to go. Companies like Jacobs Media can help get you that content into an application. So there's that. There's also making it available on the Web. However I think there's a piece that's missing. You need to connect your listenership with that experience. What we've seen with Clear Channel, for example — they've taken their programming and they've created



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Ford enabled the NPR news app to be voice-activated through the Sync AppLink last year.

a method by which you can access all their content at any time.

RW: You're talking about iHeartRadio ...

Marchwicki: I'm talking about iHeartRadio, an incredibly powerful, fascinating product. What a smaller radio sta-

tion may want to do, for example, they can work with someone like a Jacobs Media or another apps development house. So they have this application, and they can get their content and start to store and publish their content outside the context of their programming. But

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that missing step is they need to connect their listenership that is listening on the radio, they need to connect them to that application. They need to incentivize use of that application, and they need to present, potentially, new content, whatever that may be. ... You need to give them a reason to go digital. And then you need to start presenting them a unique experience so you're prepped for a world where terrestrial radio — and I don't expect it to go anywhere anytime soon — we're going to start to see user trends change away from terrestrial to a more broadened device strategy through a connected strategy. That's the way I see the industry changing.

RW: So we can expect to see music tastes changing away from traditional media or ...

Marchwicki: No, it's more about how users are listening. The other thing I'd add is, a lot of what I'm saying concerns music content, but [it's] the same with news. There are stations in certain markets that still do some of their own news, they have someone that reads the news, that's something that can be provided to their customers through this digital experience.

RW: How does Ford view HD Radio? Sync was one of the first infotainment systems to include HD.

Marchwicki: We have HD Radio. It's a fantastic product. There are some advantages. You have higher [audio] quality, additional metadata and they continue to innovate in this space. There's higher

bandwidth and you have more content on some of the sideband channels that you have on particular frequencies. We have it in many of our vehicles. It's a product that some of our customers are asking us for. It's definitely something we're going to continue to have in our vehicles.

bandwidth and you have more content on some of the sideband channels that you have on particular frequencies. We have it in many of our vehicles. It's a product that some of our customers are asking us for. It's definitely something we're going to continue to have in our vehicles.

'By the time the radio in a car is built, it's almost a year and a half old. With this technology, with Ford Sync AppLink, we can stay relevant.'

RW: What about satellite radio. Are you still going to include that in your product?

Marchwicki: SiriusXM [has] a lot of compelling content that is available everywhere in the States. You don't have the same problems that a tradi-

itional AM/FM station does, which is you drove out of range. Users are asking for it. They're demanding it. For the foreseeable future I don't see us moving away from satellite in any way.

We're just trying to give consumers options, more choice. Some customers may not want satellite radio but they

prefer Pandora, so [we] provide whatever it is that they want to listen to, we provide that experience to them.

RW: You're trying to give them everything they're asking for.

Marchwicki: That's the goal of the developer program, which allows us to bring greater content from all over the world. That's what's important. Because we're talking about North America, but there are plenty of radio stations in Europe and Asia where we sell a significant amount of vehicles. They are just starting to get into these trends as well where you have these digital experiences on devices.

That's part of why we did the developer program. I don't know what radio station is popular in Germany. But a developer in Germany knows. They've probably already created the application that does ... radio, so if I bring vehicles to Germany that have AppLink, there are applications that support that experience inside the car.

RW: For a more high-level question: why is Ford employing apps as opposed

to building a different radio?

Marchwicki: One of the reasons why is we want to be able to, as a car company, keep up with changing trends in technology [is] because it takes us so long to design and engineer a radio, and then build it into a car. By the time the radio in a car is built, it's almost a year and a half old. With this technology, with Ford Sync AppLink, we can stay relevant.

Say there's a new radio station or new content that's coming. How do you plan for that? HD Radio has all this fantastic content but you can't get it unless you have an HD tuner. But the data can come to you through your phone. And the phone can present that to you like it's integrated. It can look like it's part of the experience and I never have to change the car again. ... I didn't have to add a tuner.

RW: Are AM and FM always going to be in the dash?

Marchwicki: Probably. I think there's something very visceral about turning a car on and having audio come out — not needing and requiring a data connection. Me personally, there could be some very, very low-cost vehicles that only have some speakers and don't have a tuner, for example. They use everything through a mobile device. That's possible, but I don't see that happening for a long, long time.

RW: How does the Jacobs Media deal work?

Marchwicki: If you're a radio station and you're looking for an application to be developed, Jacobs Media or JacApps ... are in the business of getting your content and helping you take that content and go digital and get it onto their application platform. They can create a branded experience for you on Android and iOS devices.

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NAB QUESTIONS

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radio segment; products for HD Radio quality control; more FM transmitter choices in the lower-power range; and at least incremental improvements in field codecs, automation and other traditional product classes.

Speaking of which: In what direction is codec design heading? What role will HD Voice play for codec manufacturers? You'll recall we asked these and other questions in our recent special report on codec trends. (Read them all at radioworld.com/codecs.)

Which vendors will announce new partnerships? Crown Broadcast and

the Ereso arm of WorldCast Systems recently announced one; and I know of another that will be announced on the first day of the show.

Is this the year radio gets more seriously into video content creation? One manufacturer expressed surprise to me that radio stations had not more fully embraced products that help them create compelling video online. That surprised me because video clearly is a "hook" for new media offerings these days.

Who will take home Radio World's coveted "Cool Stuff" Award? We'll announce them on the last day of the show, and introduce you to them in our May 22 issue.

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FORD

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RW: What's Ford's part in that?

Marchwicki: Our part is we've worked with Jacobs Media. They understand how our [software applications] work. So now when you come to Jacobs Media and you want to leverage their services, they have the ability to also add the AppLink capability to your applications. ... Not only do you get an application, but you also have that application enabled in our vehicles so that it works with voice and some other items as well.

RW: It was interesting when you were talking about Germany, for example, and that AppLink works for a Ford that can be sold in any country. So a local station in a country could have their particular app, and the driver could customize the stream?

Marchwicki: The driver customizes their experience by customizing their phone, which they already do today. Our technology works based on the smartphone. If you want a particular radio station or stations, you download that app to your phone, and that application is available inside of your vehicle.

RW: Do you physically connect your phone to the dash with a cord, but



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Ford drivers with Sync AppLink now listen to and control Greater Media radio stations on their smartphone using voice commands. Stations include Detroit's WRIF(FM) and WCSX(FM), on 101.1 and 94.7 MHz respectively.

you're controlling your screen either by voice command or some other way?

Marchwicki: The phone. On an Android phone it connects wirelessly, and on an iPhone you connect with a USB cable. But once you've done that you just put your phone away. And then you can control the app with voice or steering wheel controls or buttons inside of the car.

RW: Is there anything else we should know about how Ford views radio in

general?

Marchwicki: It's definitely a big experience and we're probably, more than any other automaker, trying to bring as many applications, trying to give the consumer as much choice as possible when it comes to their music listening. It's not just about iHeartRadio. If you're a WCSX or WRIF listener [in Detroit] those are fantastic music properties that are now available inter-vehicle, voice-activated. Jacobs Media's helped us accomplish that goal significantly.

We're here to help everybody. That's what the developer program's all about.

RW: So down the road there could be other companies developing the radio apps ...

Marchwicki: Absolutely, yes.

RW: And they would work with Ford directly?

Marchwicki: They would deal with the developer program, would be able to provide them with the necessary resources to create their products.

RW: Is the idea with AppLink, somehow the profits can be shared? Say if a station can send a coupon, or whatever... the ROI.

Marchwicki: Absolutely.

RW: But for the app program, does Ford get a slice of ...

Marchwicki: It's totally free.

RW: Say I'm listening to a Greater Media station and a coupon comes up on the display. I use the coupon for a purchase. Does Ford get a slice of that exchange?

Marchwicki: [Shakes his head no.] Our business is selling vehicles. We want a customer to buy a car because we offer

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FORD*(continued from page 8)*

them more choices, more innovation, more technology than anyone. That's the way we look at it.

RW: When people come into showrooms today and look at the dash, what are they telling Ford they want to see?

Marchwicki: A lot of people ask us for Spotify [Ford and Spotify announced a deal to collaborate on an app, targeting the end of the first quarter for availability]. We give them an immense number of options for their entertainment. They pretty much have everything. Obviously there's still some products we don't have available to them. We are certainly moving forward in a way that consumers have the ultimate choice when it comes to using applications or getting the content that they want inside the vehicle seamlessly and safely as possible.

RW: Ford has a deal with Aha ...

Marchwicki: They're one of our developer partners.

RW: NPR and CBS Radio stations are on Aha.

Marchwicki: We launched NPR stations last year on Applink. That's a fantastic application, all voice-enabled.

You can get all the content. It's one of the great things about NPR. I was talking about categorizing your content. They do a fantastic job with that. They actually segment all their programs you can get three-minute segments or snippets of any NPR show ever.

RW: Engineers are talking to me about developing station icons, instead of text or just call letters showing up on the screen, because text or call letters on a display is boring compared to what you'd see on Pandora, for example. Is that something Ford helps out with at all?

Marchwicki: No, not really. That's the business of the station itself. We're not in the business of designing logos or changing the radio experience inside the vehicle. We're there to provide a manner in which you can interact with your vehicle and access content. We have an HMI [Human-Machine Interface] and there's room for album art. There are buttons and things that are pretty standard and straightforward. Those experiences translate pretty well across the board between vehicles. So it's easy to find. But once you get into a Ford we want the experience to be one of: Here's your vehicle and you are now able to access the content that's on your phone.

NEWSROUNDUP

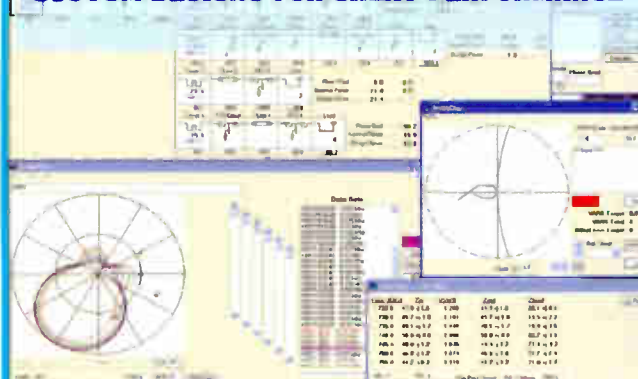
NIelsen-ARBITRON: Nielsen had temporarily withdrawn its application to buy Arbitron to give the Federal Trade Commission more time to review the proposed \$1.26 billion deal. Now the FTC formally has asked Nielsen and Arbitron for more information, which at the least could delay the agreement's closing. Apparently there's some concern over whether the combined companies would constitute a monopoly in the emerging cross-platform measurement market, according to published accounts.

MEASUREMENT: HD Radio multicasts reach nearly 3.6 million persons age 12 and up during an average week. That's according to Arbitron, which began including multicast metrics in its measurement of network radio in all 48 Portable People Meter markets. The company does not break out how much of that listening is carried on FM translators. Also, more than 5.4 million persons aged 12+ tune into AM/FM/HD streams during an average week.

PODCAST: Helping listeners access a program when they want to hear it is the new venture for Westwood One creator Norm Pattiz. Thinking of radio as "a building and a stick" is a recipe for disaster, he believes, noting that much of radio these days is consumed online. He's invested several million dollars to launch PodcastOne.com, a site that offers podcasts of shows from online broadcasters. PodcastOne partnered with Edison Research to gather data they can use to persuade companies to advertise on the site. Some 85 percent of those who download listen to a show within 48 hours, and 60 percent listen immediately, according to Pattiz.

AUCTION: Eighty-eight bidders made the initial cut for Auction 94. The FCC says those applications, competing for 112 FM construction permits, are complete. Among the groups taking part in the sale are Connoisseur Media, Educational Media Foundation, Flinn Broadcasting and Lotus Communications. The online auction is set to begin April 23.

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Bullock Was an Automation Innovator

Texas engineer's impact stretched as wide as his home state

BY JAMES O'NEAL

Earl Bullock, a long-time expert in the field of radio station automation, died on Jan. 30 in Plano, Texas, a Dallas suburb. He was 82.

Bullock is perhaps best remembered for helping to transition the automation system, originally developed in the late 1950s by Paul Schafer, from electromechanical to solid-state sequencing. Bullock's work ultimately led to the Schafer model 903, which became an industry standard for radio program stream automation and was used by hundreds of stations around the world.

Interestingly, Bullock's background and early employment did not include the broadcast industry. He studied electrical engineering at Kansas State University, and participated in several General Electric industrial electronics engineer-in-training programs before receiving his bachelor of science in



electrical engineering in 1954.

After a two-year hitch with the U.S. Army Signal Corps, he returned to General Electric with a job in the advanced engineering department at the company's General Purpose Control Division in Bloomington, Ill. There, he helped the operation move away from relays and magnetic amplifier designs to solid-state components and eventually logic gates.

He continued his career in industrial control electronics, eventually moving in the early 1960s to southern California to work in 3M's instruments division operation.

In 1970, he was hired by Paul Schafer's radio programming automation company in the aftermath of a plan by that company to move to a minicomputer platform for driving sequencing operations. The computer that Schafer's company had developed was beset with problems and extremely unreliable. (Bullock recalled that the

mean time between failures was only about two hours.)

Ultimately, the minicomputer plan was scrapped, and Bullock was given the job of designing a programmable solid-state control system that could operate without reliance on software

Century 21 Programming (later TM Century) and then launching his own company, Broadcast Automation Inc., which refurbished and remanufactured automation gear that he had designed.

Bullock's career took him to radio operations all across America and around the world; however, his knowledge of the equipment was so thorough that in most instances he could diagnose problems and offer solutions via telephone.

Bullock is perhaps best remembered for helping to transition automation systems from electromechanical to solid-state sequencing.

loads. This became the nucleus of the Schafer 903 system. Bullock noted that the circuit design was finalized just a few days short of the scheduled completion date for the project.

Bullock became Schafer's vice president of engineering and remained with the company and its successor organizations — Applied Magnetics and Cetec — until 1980. He relocated to Texas that year, first working for

Bullock also did work for Clear Channel/RCS/Prophet Systems, officially retiring in 2011. However, according to his daughter, Shari Wallace, he was still doing radio station work on a contract basis into last year.

Earl made many friends in the industry and was a regular at the NAB Show.

Contributions in memory of Earl Bullock may be made to the American Cancer Society.



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Utility Keeps the Juice Flowing

In Montana, a power company helps customers stay on the air

Greg Muir does contract and project work in Montana and is chief engineer for STARadio Corp.'s operations in Great Falls, Mont. In December, he embarked on an interesting project prompted by an expected loss of local utility power.

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

It started when STARadio was notified that construction of a 230 kV electric transmission line — linking Great Falls to Lethbridge in Alberta, Canada — would require the temporary shutdown of the local 7.2/14.4 kV circuit that supplies power to its Benton Lake transmitter site.

That location is home to STARadio's KINX(FM) and KWGF(FM), both Class Cs, plus a low-power DTV tenant, all on an 800-foot tower believed to be the tallest in the state. The new transmission lines would be run close to the lower-voltage ones, and the contractor planned to use helicopters to assist in stringing the cables.

In the interest of safety, the local utility, via its contractor, decided to shut off

nearby active circuits that could cause harm to contractor personnel during installation. The local circuit also provides power to a competitor's Class C FM transmitter site a mile away, a railroad microwave relay site and several farms and ranches.

Knowing that the interruption would last for a considerable amount of time, the utility contractor decided to employ a generator to power all users on the local circuit until service was restored.

Greg's transmitter site contains a 480 V, three-phase pad transformer, originally used to power an analog klystron televi-

sion transmitter that has since been removed. It was now highly underutilized, so he decided to connect the generator to the secondary side of the

Fig. 2: A lineman makes the connections to connect the generator.

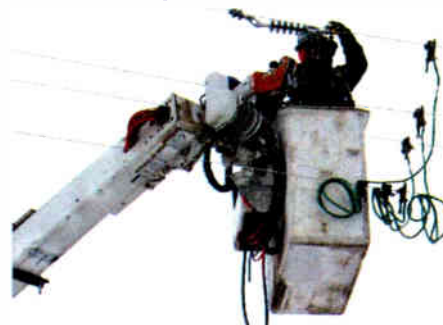
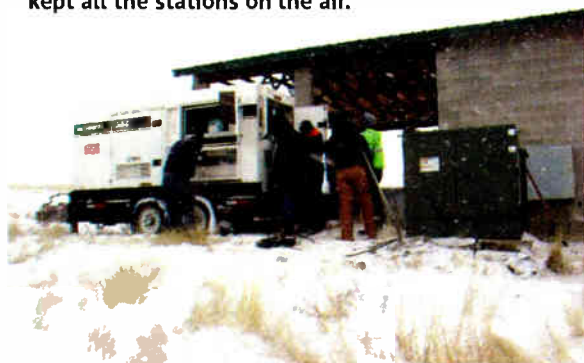


Fig. 3: The utility's generator kept all the stations on the air.



transformer and backfeed power into the primary side of the local distribution system.

To do so, line crews had to break the circuit towards the utility power source, as shown in Fig. 1 and 2. Then the 300 kW diesel generator was connected to the pad transformer secondary.

What people thought would only a few days of generator operation turned into nine, during which time the generator was loaded to approximately 75 percent capacity with an estimated die-

Fig. 1: Utility workers prepare to break the feeder.



sel consumption rate of 15 gph. When it was shut down, the unit had consumed close to 3,200 gallons of diesel fuel.

Fortunately, rental of the generator, installation and fuel cost were borne by the utility company. Who says engineers are always spending money?

This is a great example of cooperation between a broadcaster and its local utility.

It looks like a lot of readers are building Frank Hertel's RF MOSFET tester (*Workbench*, Dec. 20, 2012). I've gotten comments and questions from as far away as Brazil. So let's refer to Frank's schematic, found in the archived columns at radioworld.com/links.

The first question concerns the capacitor used. It's a 0.01 MFD (microfarad) capacitor, but the value isn't particularly critical, as it just holds the MOSFET gate charge in the "on" state when the "Charge" button is pressed and released.

If the gate isn't leaky, the LED will extinguish quickly. If the LED fails to illuminate when the "Charge" button is pushed, the MOSFET is bad. If the LED stays on all the time, this indicates a bad MOSFET. Alternately pressing the "Charge" and "Discharge" buttons should turn the LED alternately "on" and "off."

Another question concerned whether circuit modifications were necessary to test an "N" Channel MOSFET. Most RF power MOSFETS are "N" Channel, so no modification is needed.

Finally, how will the tester work with an IRFP350? Since this power MOSFET is an "N" Channel type, the conduction curves are similar to other power MOSFETS, and the tester should function properly.

Frank Hertel can be contacted at nkeng@insightbb.com.

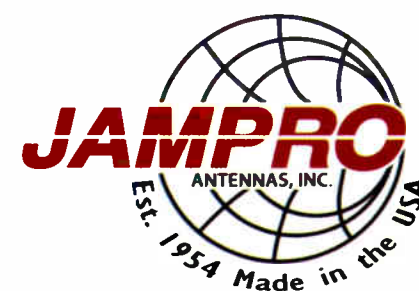
Contribute to *Workbench*. You'll help your fellow engineers and qualify for SBE recertification credit. Send *Workbench tips* to johnpbisset@gmail.com. Fax to (603) 472-4944.

Author John Bisset has spent 43 years in the broadcasting industry and is still learning. He is SBE certified and is a past recipient of the SBE's Educator of the Year Award.

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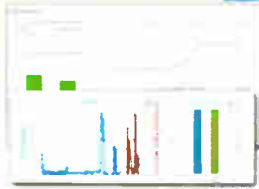
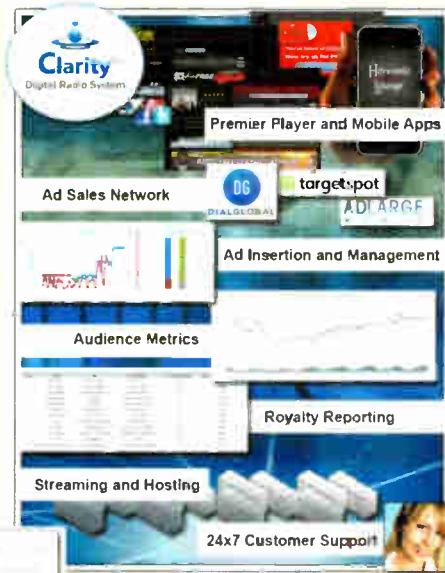


MARKET PLACE

CLOUD ADS: Abacast introduced what it called the first cloud-based ad insertion technology for the radio industry.

It said advertisers and broadcasters can serve individualized targeted ads to listening audiences regardless of the player or device the consumer is using. Each listener can receive individualized in-stream audio ads. Targeting examples include "all smartphone listeners," "all listeners in the top 20 DMAs that are on iPhones," "all male listeners in the 25-34 age range in a group of Zip codes" and "all listeners listening on the TuneIn player."

Info: www.abacast.com



CABLE-UP: Cable-Up redesigned its Premium and Industrial microphone cables. The Premium line now has better overall performance and durability. Cables are jacketed with neoprene to withstand harsh environments and use 22 AWG conductors and a high strand count of oxygen-free copper braided shielding.

XLR cables are now terminated with Amphenol AX Series connectors. Cables are RoHS compliant and can be purchased in lengths to 200 feet, and in unterminated 500-foot bulk spools.

Its Industrial line of mic cables feature PVC jackets and are made with 2 AWG connectors, braided shielding and soldered XLR connectors fitted with gold-plated contacts.

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Crown Broadcast will be exclusively responsible for the sales, service and long-term support of the Eceso line of transmitters in the United States, the companies said after signing a letter of intent. Crown will sell the transmitters through its existing U.S. dealer base; Eceso will continue selling them internationally. At the NAB Show Crown will show a new E Series, made by Eceso and carrying a Crown Broadcast E Series name.

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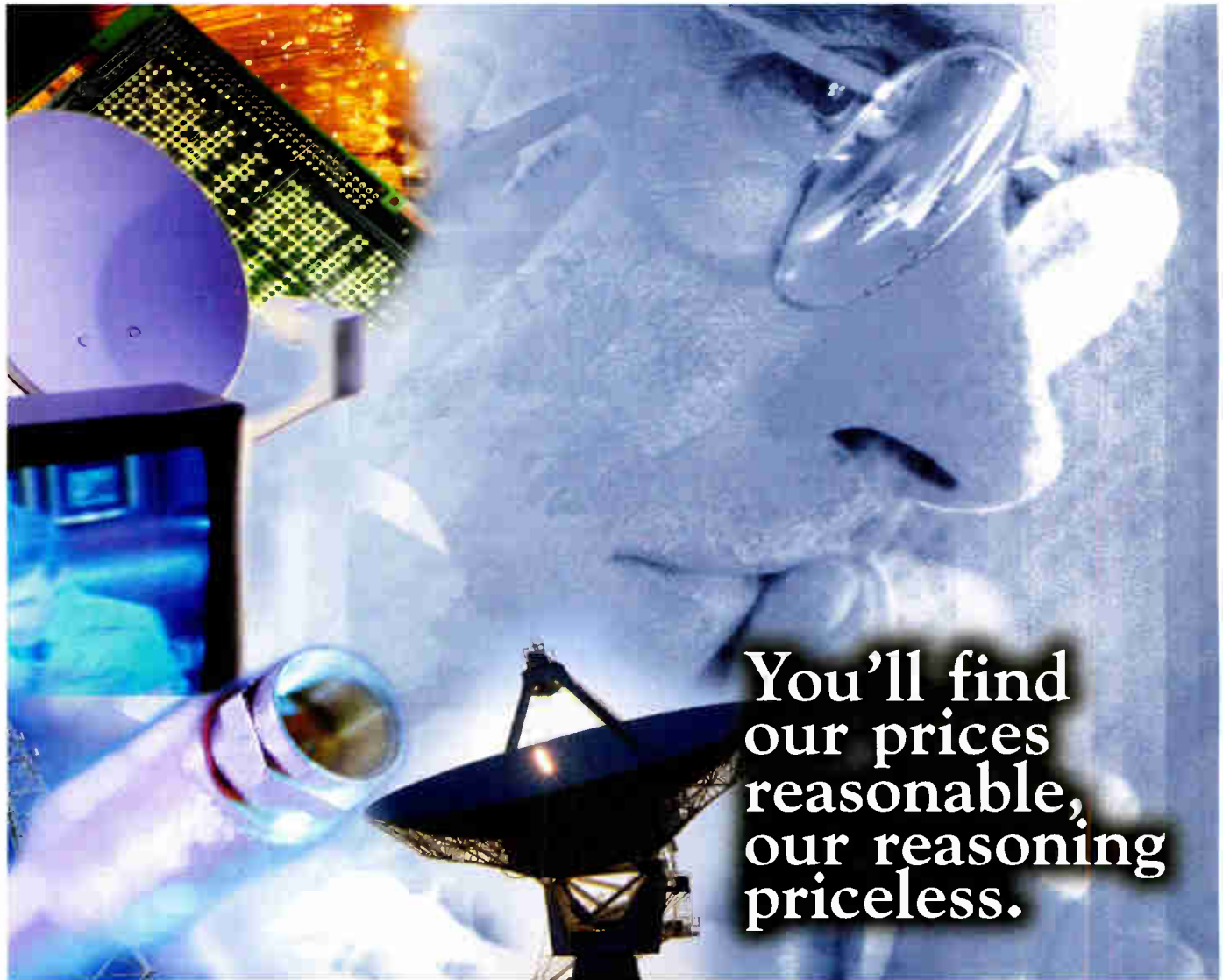


sion." Install these units to make a real difference in the reception of HD and other MPEG+ or DVB-S2 satellite channels. Internal circuitry has been completely redesigned for reduced power draw, so that indoor receivers and power supplies will never be over-taxed. In order to prevent signal outages, when outdoor temperatures fluctuate, DAWNCO's best LNBs feature a highly stable +/- 5 KHz rating.

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AM DAs Benefit From Advances

Dalke, Lockwood explore a digital development in directional monitoring

BY TOM MCGINLEY

The destructive forces of Mother Nature often create opportunities for manmade technological improvement.

Such was the case for Jim Dalke, contract engineer for KKDZ(AM), a Radio Disney station in Seattle. Fire destroyed most of the Rose Hill main transmitter building in 2005, including the six-tower phasing and antenna monitoring systems. KKDZ 1250 shares the site with KARR 1460.

Insurance covered the hardware replacement; but the need to rebuild the DA monitoring infrastructure presented a unique chance for Dalke and Steve Lockwood of Hatfield & Dawson Consulting Engineers to develop something groundbreaking.

Dalke will discuss their innovation for the legacy AM service in detail at the NAB's Broadcast Engineering Conference, on Tuesday April 9.

CREATIVE

"When two engineers spend a lot of time on a project, they can get esoterically creative," Dalke said.

"Discussions included ways to replace the miles of coaxial sample lines and better methods of tuning the array. We considered the possibility of using fiber optics to reduce the costs and improving reliability, plus different

ways to graphically display the directional parameters during the laborious and time-consuming phasor adjustments to bring each tower in each mode into licensed compliance."

Preliminary studies and experiments were conducted at the rebuilt Rose Hill



facility in Kirkland, Wash., using one of the KKDZ nighttime towers. A subsequent proof-of-concept project was completed on one tower of the daytime array of KTBK 1210 kHz Auburn, Wash. A complete system is now being installed at the three-tower directional array of KXPA, Multicultural Broadcasting, 1540 kHz in Bellevue.

Dalke chose multi-fiber heavy-duty cable suitable for direct burial to feed the digitally converted tower loop samples back to the phasor and antenna monitor. The cost of the multi-fiber cable is generally less than the tradition-

al heliax type cable used for DA sampling systems, Dalke says.

The heart of this completely digital antenna monitoring system is based on FPGA (field programmable gate array) technology.

"The custom antenna monitor

uses the latest high-speed Linux-based processor and employs very fast IOs and bi-directional data buses," he said. "High-speed A-D converters are installed right next to the tower sampling device outputs and operate at 50 megasamples per second with 14-bit resolu-

A complete system is now being installed at the three-tower directional array of KXPA, a Multicultural Broadcasting station at 1540 kHz in Bellevue.

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tion, driving the fiber at a data rate over 700 MHz."

The FCC rules regulating directional antenna systems currently are based on the use of coaxial cable in the sampling system and analog antenna monitors. With the fiber optic sample system and digital antenna monitor, many of the technical concerns related to cable length and temperature coefficients are eliminated. Another advantage of the fiber optic sample cable is the ability easily to traverse the insulated base of a series-fed tower with high RF voltages present without disturbing the impedance.

Dalke advises, "These advancements in antenna monitoring technology will require revisions to the FCC rules that govern sampling systems and antenna monitors. The new antenna monitor will require FCC type-approval per 47CFR73.53. The design specifications for the new AM should easily exceed FCC performance requirements."

The fiber optic system is well suited for arrays designed with the new MoM (Method of Moments). Dalke points out, "The FCC rules (73.155) require recertification of the MoM licensed directional antenna every two years to verify the integrity of the antenna sample system. The fiber optic sample system has a function in the digital antenna monitor to calibrate each of the fiber optic sample cables to determine the precise electrical cable delay in real time. This will eliminate the need to manually test the sample cable periodically as required in 73.155."

Fig. 1 shows a display on the digital antenna monitor representing the relative phase and amplitude of a three-tower array. The boxes represent the FCC limits. Tower 1 is the reference tower. The measured parameters from Tower 2 are out of tolerance and are represented by a red dot. The parameters from Tower 3 are in tolerance and represented by the green dot. The antenna monitor has an internal Web server with Wi-Fi capabilities. This makes it possible to use a laptop or tablet for adjusting the phasor or even making adjustments at the ATU while remotely viewing the directional parameters.

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Artist Experience Has Tech Implications

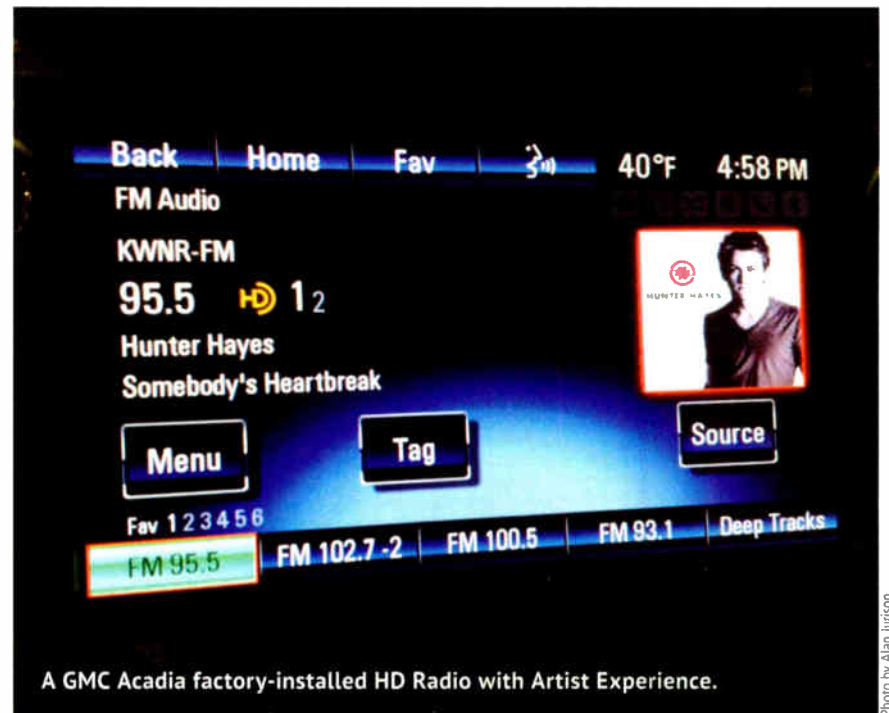
BY PAUL MCLANE

Unless you work directly with iBiquity to design an Artist Experience solution for your station, most details are left to a third-party vendor that handles them for you.

For many that might be good enough; but some users will want a true understanding of how the technology and system works — and how to troubleshoot any issues.

400 stations at Clear Channel, a key takeaway for any group owner considering this technology is to standardize software versions, configuration settings and, if possible, importer/exporter hardware, to enable rapid mass deployment and support," he said.

Also, there's a new importer software program written by iBiquity that schedules the images; it is called Multiport Synchronous/Asynchronous Client, or MSAC. Jurison will discuss the types



A GMC Acadia factory-installed HD Radio with Artist Experience.

"Data services delivered over HD Radio are an exciting and growing development in the industry," says Alan Jurison, senior operations engineer for Clear Channel Media + Entertainment in Cincinnati and a Radio World contributor.

Artist Experience is a particularly visible application of that concept. It uses some of the data bandwidth in the HD Radio stream to deliver graphical images synchronized with the audio. This involves sending relevant images of the current song on the air, such as album cover art.

Jurison will speak about technical details of AE on the Sunday morning of the NAB Show. He plans to define the technology and promises a look at current and planned receivers that support this technology.

Details of AE implementation are important to users to know about. For example, he points to importer and exporter configurations.

"Having been part of the implementation of Artist Experience on nearly

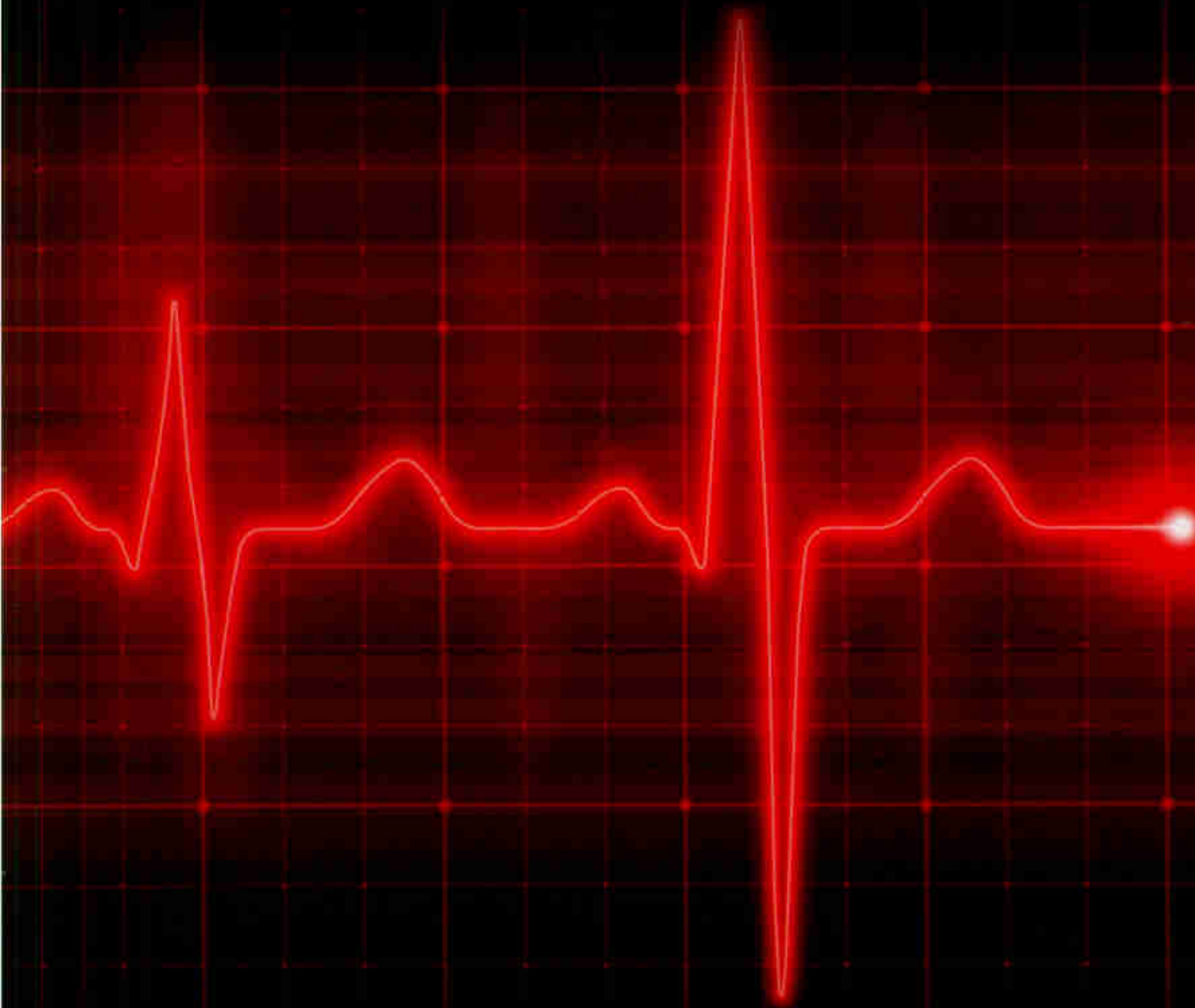
of messages that a station's Artist Experience solution needs to send to the MSAC.

"Pre-Sync messages allow MSAC to schedule image transfers into the future, and Sync messages tell MSAC that the song has just started to schedule an image resend shortly after the song has started."

Also on tap are timing requirements to get the images transferred in time before the song starts, to ensure the image is synchronized with the audio and provide the best experience to listeners. Further topics include how receivers obtain and store the image before display, and some of the caching methodologies used by various manufacturers. His presentation also notes third-party Artist Experience providers that can assist stations in implementing it.

"Automotive OEM (factory-installed) HD Radios with Artist Experience will be very common in a few years," he said. "It's important that your company creates a strategy to implement this technology."

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Technique Aims to Reduce Multipath

Jeff Keith offers his findings on FM L+R/L-R multipath control

BY TOM MCGINLEY

SSBSC on FM was a hot topic at last year's NAB Show. Single-sideband suppressed carrier generation of FM stereo instead of the conventional DSBSC has shown promise in a number of markets as an effective means of reducing multipath distortion.

Omnia, Orban and Wheatstone all offer the SSB option in their top models of FM audio processors. However, field results have not been universally judged as providing meaningful improvement for many stations.

Jeff Keith, senior product design engineer at Wheatstone Corp., offers an alternative solution to the challenge of multipath reduction in his planned April 9 presentation at the Broadcast Engineering Conference.

Keith had evaluated and added SSBSC as a feature in the Wheatstone AirAura FM audio processor. "Field experience and feedback from customers using SSB-equipped processors from both Wheatstone and our competitors has been mixed," he says. "A few claim it to be a miracle, a few claim it to be a detriment

and the rest seemingly notice no difference between conventional DSBSC and SSBSC."

Although Wheatstone still offers SSBSC as an option, Keith decided there was an entirely different FM processor design approach that provides more consistent multipath mitigation.

"The issue of minor receiver compatibilities aside, what stations really want in a multipath solution is something that is beneficial to all listeners and is compatible with all stereo receivers regardless of stereo decoder design. Combining intelligent stereo separation management with conventional DSBSC modulation achieves that goal."

NEW PERCEPTIONS

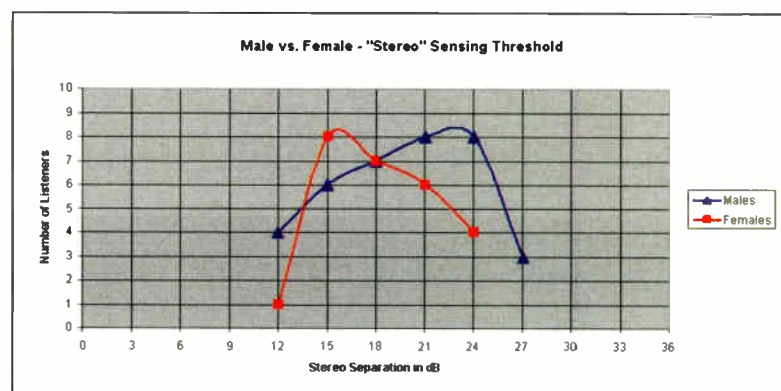
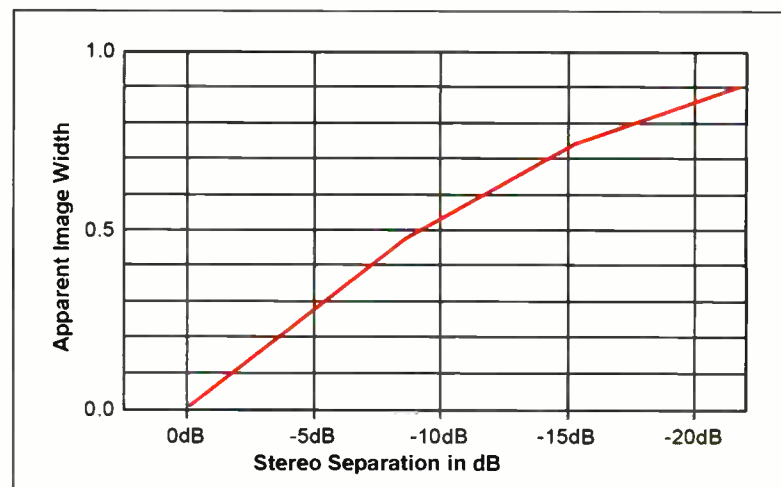
Keith built and marketed the SMO-900 Stereo Enhancer when stereo wars were heating up in the late 1980s. In 1998, as chief engineer at WMJI(FM) in Cleveland, he designed and built a processing device to preserve mono loudness when songs with ping-pong stereo were aired.

"Having had success with the SMO-900, I knew that excessive stereo

enhancement reduced mono loudness. However it had not occurred to me until WMJI that the early ping-pong stereo recordings were in fact the same thing as 'excessive stereo separation,' a problem that I knew quite well how to solve.

multipath areas and was virtually gone in others. This was a complete surprise to all of us and something that I never expected or even considered."

Wheatstone has included the algorithm from Keith's original Mono Compatibility Controller in the stereo generators of their FM processor models from the AP-2000 forward. "Over time, and so as not to give away exactly what it does or how it works to com-



The first image is a graph of data extracted from the paper 'The Psychoacoustics of Multichannel Audio' by J. Robert Stuart. Jeff Keith commented, 'I found this paper online about two years ago and was glad to see that his data pretty much matched what I discovered back in 1998.' The second shows data gathered by Keith from 62 male and female test subjects in the summer of 1998.

"The Mono Compatibility Controller that I built for WMJI was designed to dynamically adjust stereo separation on the fly according to the program material being fed to it. Its sole purpose was to even out loudness on mono radios, nothing more," he said.

He discovered that the "normal" stereo sound field could be reduced significantly without listeners noticing it.

"It didn't take very long for the station's staff to discover two new effects of the processor being in line. First, there was no noticeable change in stereo separation even though it was aggressively reducing separation on quite a lot of program material. Second was the effect on our perceived multipath — it was far less noticeable in 'bad'

petitors, we've hidden its function under several different control names and have never explained in our documentation exactly what's going on inside it."

Keith cites feedback from many hundreds of customers over the past few years that reinforced what he found at WMJI. "Intelligent stereo separation management apparently works much better at reducing the audible effects of multipath-induced stereo blending than any other method except perhaps transmitting in mono," he concludes. Further, "No special permission is needed from the FCC, and it is 100 percent compatible with every FM stereo receiver that was ever made."

Tom McGinley is technical adviser and a longtime contributor to Radio World.



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Ennes: How to Make Alternate Delivery Work

Migrating content is the theme for SBE program at 2013 NAB Show

BY FRED BAUMGARTNER

The author is trustee of the Ennes Educational Foundation Trust.

My computer monitor has been "temporarily" perched on a copy of "The Cellular Roaming Handbook" since I received the book a quarter century ago.

each year we ask, "What is it broadcast engineers most need to know?"

This year, whether you're a front-line tech setting up encoders, a manager negotiating for content delivery network services, an architect integrating new distribution or a visionary leading the charge, the thing we most need to become comfortable with is migrating



The Ennes program includes hard-core material as well as 'breath mints,' shorter, often whimsical presentations on diverse topics.

Now who among us even remembers what cellular roaming was, or why it was important to a broadcast engineer?

For more than a few years, I've been lucky enough to help put together a program that has come to be the largest yearly gathering of broadcast engineers in one room, at least on this continent. I know that reading this article is the point at which many broadcast engineers decide whether going to NAB at all, not to mention whether to attend sessions on a Saturday, is worth the political capital and out-of-pocket funds.

I could go on about the things we all know are true: fewer people doing more work, the "always on" nature of our life, the changes in distribution and technology that seem slow and distant ... then, as if overnight, these new distribution means appear in our rearview mirror and we wax nostalgic.

I'm seeing my roaming book/monitor perch as metaphor. I'm going to NAB to learn about what's next. I was thinking that this year's program was the most radically different; but it's not. In my tenure working on the Ennes/NAB/PBS educational program, no two years looked more than vaguely alike, because

our content to the world beyond transmitters and the multichannel video program delivery platforms that reach the vast majority of our viewers and listeners.

The title of the Ennes Workshop is "Alternate Broadcast Delivery: How to Make It Work."

IN THE STREAM

On Saturday we start with a two-hour tutorial on streaming media. This year we are pleased to have Jan Ozer, an author certain to be found several times over on the bookshelves of streaming-aware broadcast engineers.

Jan appears at virtually every streaming media industry event, teaches streaming and video production and is a contributing editor to Streaming Media magazine and OnlineVideo.net; he also blogs for other outlets. He has written or co-authored approximately 15 books on digital video-related topics, including "Video Compression for Flash, Apple Devices and HTML5," published in 2011.

Previous attendees know that we work in a few brief "breath mints": short, often whimsical topics related if not directly relevant to broadcast.

(continued on page 26)



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World Radio History

MIGRATION

(continued from page 24)

Our first is John Footen's argument that viewership habits are not so much about generation but age. Will millennials tweet in old age? John is with Cognizant Technology Solutions. Along the same line, Radio World contributor James O'Neal introduces us to the late Granville Klink, certainly one of the most fascinating people in this broadcast engineering business; what a legacy.

Then there is Jake Sigal of Livio Radio, who loves his smartphone, apps, music, driving and being available for contact at all times through all media; what he doesn't love is that every single app, phone and car is reaching him in complicated ways, resulting in what he sees as the macro issue of our times: fragmentation.

I love the breath mints. Broadcast engineering is more than wire and protocols.

GEO-LOCATION

Television and radio stations, more often than not, have use of content within a DMA or other geographical area. While multichannel video program delivery platforms can "black out" physical areas, it's not so easy to control distribution of Internet-delivered content.

Lionel Garin, senior director of Qual-

comm's Technology, Position and Location Department, presents a tutorial on the technology and options for geo-location of devices receiving content.

Then, regarding the movement of content within the facility, some anticipate a day when Cat-6 cable all but replaces coax. Belden's Steve Lampen, SBE Educator of the Year, unveils a tutorial on Audio Video Bridging, which is contending to be a part of this transition. He'll discuss AVB routing, timing and why this technology might find significant use in AV and eventually production and broadcasting.

AES-X192 might also answer interoperability questions for digital packet switched audio in radio and television facilities. Kevin Gross of AVA Networks has been working on this with AES and SMPTE, and will teach us about this up-and-coming standard intended to end the proliferation of standards for audio distribution.

Cable too is seeing a transition, not just from analog to QAM, but to IP distribution. Cable represents a large piece of a broadcaster's distribution, and interfacing and working with this evolving delivery platform should be high on any engineer's list of topics to follow. So Vang, vice president of video technology for Cable Television Laboratories Inc. (CableLabs), presents the seminar.

SBE ON THE FLOOR

Photo by Jim Peck

SOCIETY OF BROADCAST ENGINEERS



The Society of Broadcast Engineers can be found in the NAB Show lobby, in booth L29. Here, leaders of SBE and AMITRA, an association of broadcast engineers in Mexico, meet at the booth in 2012. From left: SBE Executive Director John Poray; past AMITRA President Sergio Rojano; SBE President Ralph Hogan; past SBE President Vinny Lopez (rear); AMITRA President David Salas; SBE International Committee member John Schneider; AMITRA board members Carlos Mullan and Guadalupe Chaparro.

Moving content on the Internet presents more options than one might think. John Maniccia of Octoshape talks about a unique approach to "over-the-top" video delivery and video delivery to multiple screens in an effort to enable and offer large-scale, high-quality networks. Moving content to the user via over-the-top, or OTT, also presents options. Skitter is an up-and-coming potential participant in the broadcast/OTT space.

From Robert Saunders, president of Skitter, we share lessons learned building an OTT platform and the opportunities for broadcasters.

With ever more protocols, players and formats for video distribution, each having their sweet spot in the ecosystem, it seems that the sheer quantity might be one of the biggest impediments to Internet distribution. MPEG-DASH, the first adaptive bit rate HTTP international standard, may well play a role in our OTT puzzle. Kevin Streeter, senior architect of Adobe Primetime, presents the concluding session of the day.

Find the full list of Ennes Workshop topics and other Broadcast Engineering Conference sessions at www.nabshow.com/2013/education/conferences/.

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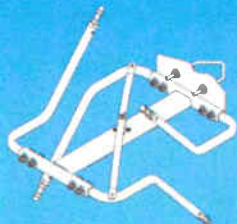
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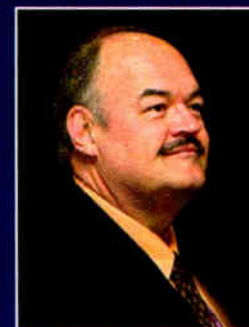
And the NAB Engineering Achievement Awards go to ... Frank Foti and Jay Adrick. They'll be honored with the radio and TV awards, respectively. (Watch for RW's interview with Foti here next month.) Special bonus: NAB honors Leonard Charles with its Service to Broadcast Engineering Award.



Frank Foti



Jay Adrick



Leonard Charles



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ACE Awards Salute Best Booths

NAB recognizes efforts and creativity of exhibitors

BY EMILY REIGART

The NAB Show will sponsor the second ACE Awards, to recognize "Awesome Cool Exhibits" at the 2013 event in Las Vegas.

The awards are the brainchild of Steve Hayes, chair of the NAB exhibitor advisory committee, who knew that other conventions used this technique to recognize exhibitors.

This year, the committee and NAB are trying to drum up more awareness and enthusiasm for the ACE awards, which, after all, are about recognizing exhibitors' efforts, says Diana Stokey, the director of Web marketing for Media Monitors, RCS and Floralcal Systems and a member of the advisory committee.

"The advisory committee is 100 percent about the exhibitors, and I'm really very impressed with how much NAB listens to us," Stokey says, adding that the NAB puts its money where its mouth is by providing funding for the award plaques and promotions.

Participation in the competition is simple. Any booth that has been set up by Sunday afternoon will be included

in the first round of judging, conducted through peer review by volunteers from the advisory committee.

The next round is decided by what Stokey calls "an unbiased third level" designed to avoid undue influence or nepotism. Judges in this round include a stage designer or creative director, a sales/marketing specialist from the NAB, a senior staff member of the general contractor and a member from a university who teaches design and/or marketing.

Finalists will be notified Monday afternoon, and winners will receive plaques at a ceremony Wednesday afternoon.

Stokey is the trade show director for her employer, so she knows firsthand what it's like to prepare for and attend the NAB Show.

"It's nice to know that you're appreciated and recognized, and it's hard to keep doing this year after year and come up with new ideas and try to get the best exposure for your company, so we just want to applaud those who we think do a great job."

Booths are judged based on creativity, effectiveness, overall structure and

the peer review.

"I think impression, first of all, is so important because you're trying to catch the eye of thousands of people walking down the aisles," Stokey says. Anything that will catch the eyes of

The 2012 award winners were:

Best Small Booth (up to 200 square feet)
Shenzhen Skyworth Digital

Best Medium Booth (200 to 900 square feet)
Sennheiser

Best Large Booth (900 square feet and up)
Harris Corp.

Photos: © NAB



Officials of Sennheiser, above, and Harris celebrate last year's ACE wins.

attendees is likely to go over well with the judges.

"Your message and signage have to be clear because it's such an overload when you're trying to surf your way through all of the booths and exhibits;

and then third is function," Stokey adds. "It needs to be able to work, both for your booth staff and for the people who stop."

Interested exhibitors can learn more at www.nabshow.com, keyword ACE.

SECOND SCREEN

(continued from page 28)

hearing your station; it knows which station the user is listening to regardless of source device. While the consumer is listening to the FM or AM station, the app will display related rich info, where the user can browse for additional information or take action such as "click to call the advertiser" or tag the song or ad for later action.

Harb said a station that signs up for the service will receive software with a minimum footprint that communicates with Quu's servers and helps ScreenTwo identify the station the listener is tuned to. The methodology by which the app knows this is confidential, Harb said; but the system does not rely on embedded coding of the over-the-air signal.

The next step is bringing this second screen info into the car, and utilizing the automotive touchscreen and mobile environments to make radio an interactive medium.

Today's car stereos are application-driven, and the industry should put its weight behind bringing ScreenTwo as a standard app in the car dash, Harb says. The consumer would be listening to regular broadcast FM or AM, but the display on the car stereo would be fed using the data connection on the phone for a rich consumer experience.

For example, a DJ may play three songs and ask listeners to vote for their favorite by pressing A, B or C. (In the car environment, they may also use voice commands.) The station thus gets immediate feedback from its listeners. The system provides rich analytics to the station and the advertiser.

"Information about who is listening, where they are listening, what ads interest them, what songs they acted on and the total number of listeners, can all be provided instantly," said Harb.

Features of interactive advertising include coupons, lead generation for advertisers and content that can be tagged and shared via social networks. Display companion advertising can be localized and targeted to individuals. For example, if an ad for car brand is playing, the display ad would show the ad with directions and the phone to the local dealer.

The costs to stations are relatively modest, according to Harb. "The cash outlay is a few thousand dollars." He adds that the solution is software-based, no hardware purchases are necessary, and two major broadcast groups are on board.

The transition to new forms of interactive advertising, he adds, is underway up north, where major advertisers in Canada have announced that they will no longer support advertising with less than two screens.

The ABCs of AoIP

IP for radio is an important topic for engineers right now. Watch for Radio World's new eBook on this topic, which is also well represented at the spring Broadcast Engineering Conference including a Sunday series of sessions devoted to it:

Saturday: Ennes Workshop "Audio Video Bridging" — Steve Lampen, Belden

"AES X192" — Kevin Gross, AVA Networks, Media Network Consultant

Sunday: IP for Radio "Audio Reliability Over the Public Internet: Designing robust IP streaming for outside broadcasts, STL and program distribution" — Kirk Harnack, The Telos Alliance

"Put Your Audio on the IP Path: Integrating audio over IP into your current or new radio facility" — Sam Caputa, Emmis Radio

"AES X192: An emerging standard for

high-performance streaming audio-over-IP interoperability" — Andreas Hildebrand, ALC NetworX GmbH

"Audio Networking Interoperability: Advantages, challenges and standards" — Chuck Alexander and Ted Staros, Harris Broadcast Communications Division

"Advances in AoIP Connectivity for Extending the Radio Operation Beyond the Studio" — Andrew Calvanese, Wheatstone

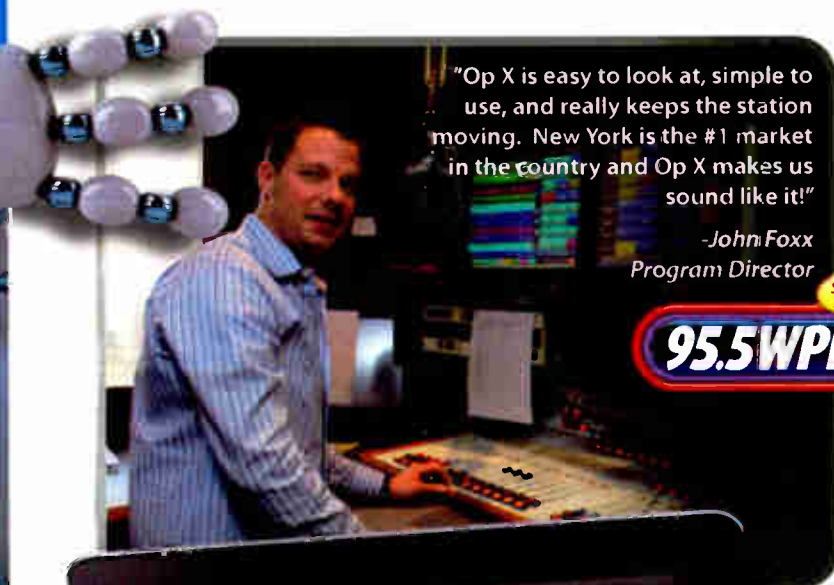
"The Open Control Architecture" — Jeff Berryman, Bosch Communications Systems

"IP Audio in the Real World: Pitfalls and practical solutions encountered and implemented when rolling out the redundant streaming approach to IP audio" — Kevin Campbell and Tony Peterle, WorldCast Systems

"Taking the Sting Out of the Evolving Digital Audio Networks" — Greg Shay, The Telos Alliance

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pictured: Wheatstone LX-24



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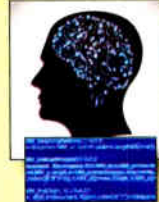
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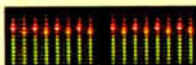


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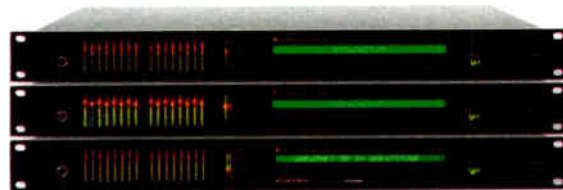
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World Radio History

‘Raise Power or Raise the Antenna?’

Kelly explains a free online tool to help with such propagation decisions

BY TOM OSENKOWSKY

An accurate computer model of a station’s coverage is important, if not critical, in deciding whether you

can make facility changes to help the programming and sales departments meet their goals.

Perhaps your transmitter site was chosen when distribution of the local population was different than it is today. Pastures have evolved into condo complexes; wooded areas have given way to strip malls. Your audience and revenue sources have shifted while your transmitter location has remained the same.

Should you raise your antenna height? Increase your power? Move your site?

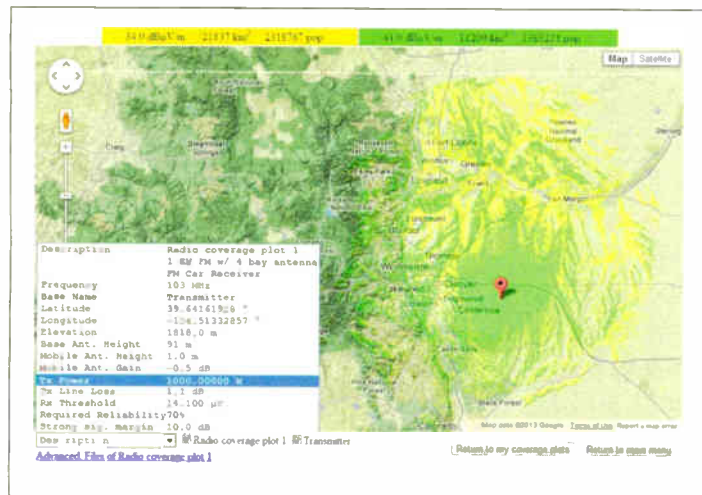
Another reason for a good propagation tool is that technologies such as digital television, HD Radio, RDS and transmitter GUI interfaces have put even more of a premium on STL bandwidth to and from a transmitter site.

PRELIMINARY EVALUATION

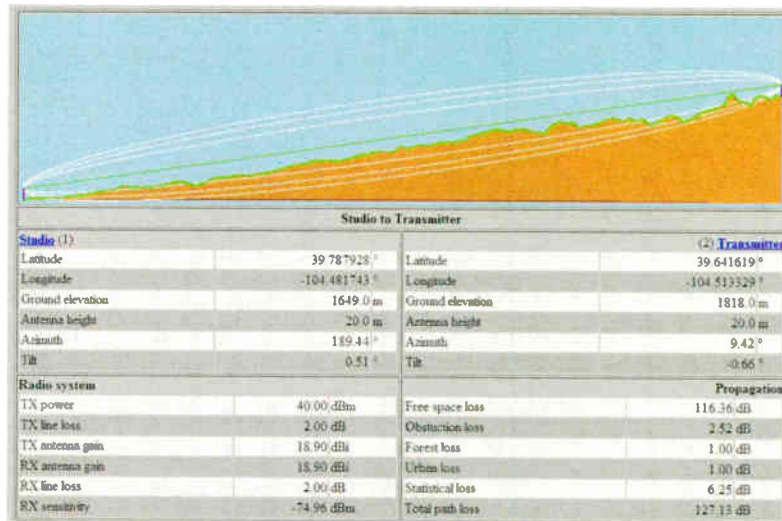
A presentation by Chuck Kelly, director of sales at Nautel Ltd., is planned for Tuesday during the Broadcast Engineering Conference. The title is “A Free Online VHF/UHF Propagation Tool

for Technical and Non-Technical Users.”

“Our goal in developing this tool was to put easy-to-use and easy-to-interpret RF coverage and path analysis in the hands of station personnel for the preliminary evaluation of transmitter sites and tower height, antenna gain and TPO tradeoffs,” Kelly said.



The tool uses Longley-Rice modeling and terrain mapping data to provide coverage maps of up to 10-meter accuracy in the U.S.



In addition to coverage mapping, the system can be used to make an STL path analysis including a path profile showing Fresnel zone clearance and a path fade margin budget.

In addition to selecting an optimum transmitter site, there are considerations such as antenna height above ground and number of bays vs. transmitter power. The ability to model these prior to making an investment



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is valuable.

Further, given the increasing need to transport audio and data to the transmitter site as well as diminishing availability of analog telephone lines, STLs are a popular alternative. They offer greater bandwidth, are under the control of the station and are generally more reliable. The proper selection of antenna height is critical at both ends of the STL path. Kelly says the tool allows the user to display a path showing free space and Fresnel Zone clearances. It also calculates a path budget and fade margin.

The tool employs Longley-Rice ITM terrain method.

"The Longley-Rice ITM is well accepted and covers a wide frequency range that is ideal for FM/STL/TV use." One of the most important advances in terrain data accuracy was the release by NASA and others of Shuttle Radar Topography Mission data online. This terrain data was gathered during an 11-day mission aboard the space shuttle Endeavour in February of 2000.

Another valuable feature in the tool is population count that can be compared against various runs of different transmitter sites and antenna height selections.

Nautel says the tool — found at rftoolkit.net — is not a substitute for an experienced engineering consultant, but it can help a station obtain approximate general answers quickly and at no cost.

Photo by Jim Peck



Rudman on Warning

Richard Rudman with the Broadcast Warning Working Group, shown speaking at a past NAB Show, will lead a Wednesday morning session called "Two Steps Forward: Building a Partnership to Improve Public Warnings."



Photo by Jim Peck

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More Highlights

Here's a sampling of interesting Broadcast Engineering Conference sessions, in addition to those mentioned elsewhere in this section. For a full list see www.nabshow.com.

Sunday

"Program-Associated Data Implementation at Wisconsin Public Radio"

Steve Johnston describes the rollout of PAD for display on FM RDS/RBDS receivers, HD Radios, Web players and other test-display devices.

Monday

"Three In-Car Trends Broadcasters Need to Know About"

Deeper integration. More demand for entertainment. Faster pace of change. This session is presented by Chia-Lin Simmons of Harman International and Robert Acker of Aha.

"Advances in HD Radio: Improving Coverage and Reception Quality"

Mark Fowler and Brana Vojcic of Digital PowerRadio believe their technology can "significantly improve the signal coverage radius and quality for FM and AM HD Radio, assuring improved reception and strong HD reception into smart phones and other mobile and portable devices, as well as car and table top radios."

"AM Revitalization" featuring FCC Commissioner Ajit V. Pai

As reported in RW, this is likely to be a hot session. NAB AM Task Force Chair and Bryan Broadcasting owner Ben Downs, BounceOlogy President Diane Warren, CBS Radio SVP Engineering Glynn Walden, Womble Carlyle attorney John Garziglia and Garvey Schubert Barer attorney Melodie Virtue.



Taxis leave the LVCC. NAB estimated about 92,000 attendees at last year's convention.



Service carts await use at the Las Vegas Convention Center.

Photos by Kovacs/Dawley

Tuesday

"Broadcasting in New York City — The Reestablishment of Broadcasting at the World Trade Center in a Post-9/11 World"

It features John Lyons of the Durst Organization, which has a joint-venture agreement with the Port Authority to lease and manage One World Trade Center. Durst will develop a broadcasting and communications facility there.

"Integrated Content Presentation at the Canadian Broadcasting Corp."

Jeff Vella of the CBC talks about a new infrastructure that provides common workflows, tools and interfaces for the on-air presentation of all CBC Media.

Wednesday

"Digital Strategies Exchange for Radio"

This event debuted last year and is part of the Broadcast Management Conference; it reports on alternative delivery systems for radio content. Speakers represent NAB, Bonneville, Greater Media, Jacobs Media/JacAPPs, Beasley, Tuelin, CEA, Ford, the Connected Vehicle Trade Association, Marketron Interactive, RadioDNS, Emmis, Audioboo, Envision Radio Networks, Abacast and Paragon Media Strategies.

"EAS, Superstorm Sandy and Accessible Emergency Warnings"

A discussion of broadcasters' role as "first informers."

"RF Boot Camp: Understanding Radio & Television Transmission"

An all-day session to offer basics regarding operations of a broadcast radio or television RF plant. Speakers include Radio World contributor John Bisset; Cindy Cavell and Garrison Cavell of Cavell, Mertz & Associates; and Mary Ann Seidler of Tieline.

Thursday

"Tower Contractors, Qualifications, Safety Checklists and Guidelines — What to Look For ... and Why"

Don Doty of Stainless and Doty Moore Tower Services reviews several guides for broadcasters from the National Association of Tower Erectors.

"Practical Application of the ANSI/IEEE RF Safety Program Standards to Radio/TV Broadcast Antenna Sites"

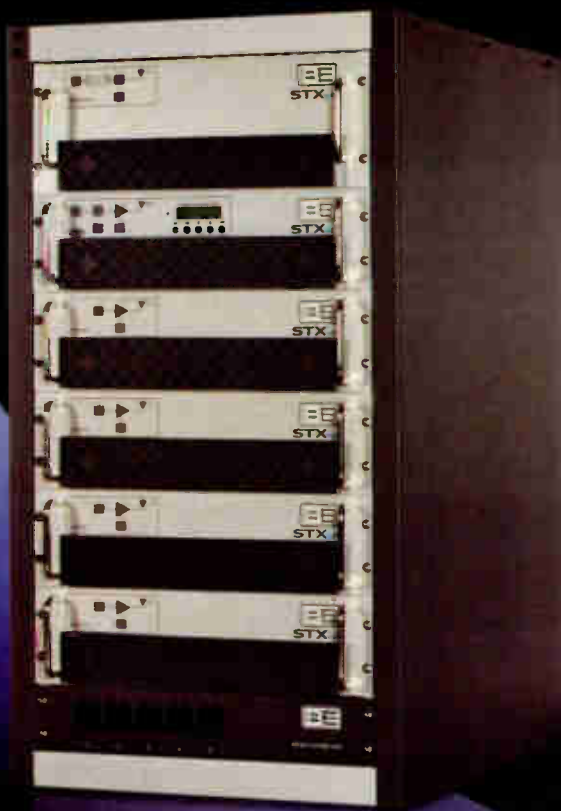
Robert Curtis of Curtis Engineering & Management Services will show photos of common RF violations occurring at AM and FM radio and TV broadcast sites based on the assessment of 80 sites.

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STX LP Generation II

The new STX LP series offers better performance, flexibility, reliability and value than any other transmitter in its class. This 2nd Generation STX LP now includes enhancements to provide more redundancy options and more value such as an integrated digital exciter, improved audio performance equal to the legendary FXi Series, improved AC to RF efficiency, SNMP Level 3 Control, HD and DRM+ capability, quieter fans, and a Fan Mute Option in Main/Alternate or N+1 configurations.

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STX LP



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Telephone: (217) 224-9600 • E-Mail: bdcast@bdcast.com • www.bdcast.com

Radio Exhibitors

Photo by Jim Peck



Exhibit Hours

Monday, April 8: 9 a.m. – 6 p.m.
Tuesday, April 9: 9 a.m. – 6 p.m.
Wednesday, April 10: 9 a.m. – 6 p.m.
Thursday, April 11: 9 a.m. – 2 p.m.

This is a selection of exhibitors of interest at the 2013 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.

25-Seven Systems

C3007

Featured: PDM profanity delay provides PD Alert emails with audio clips of every dump event. Real-time time-compressor/shifter ATM lets stations "pause" live radio, insert material, then seamlessly return to the original program. Precision Delay offers superior accuracy, adjustable from a fraction of a second to over an hour. PLM shrinks/stretchers programs by 3 minutes per hour or more without pitch change or artifacts.

305 Broadcast

C1723

Acoustical Solutions Inc.

C7322

Intro: AcoustiArt Sound Absorbing Panels reduce noise like a traditional acoustical wall panel, but can be printed with high-resolution graphic or photo. Whisperwave acoustical products add movement and style to any space while absorbing noise from above. Sonex Acoustical Foams are the industry standard in the recording and broadcast community. AudioSeal sound barrier offers the most sound blocking power in the industry. With impressive STC ratings, AudioSeal MLV is the true wall and ceiling soundproofing solution. AlphaSorb barrier wall panels both block and absorb noise, lowering sound intensity within a space, while also keeping it from transmitting to other areas.

AEQ

C2026

Intro: AEQ Systal IP is a "call-in" system with multi-conference capability. IP technology has drastically reduced costs for communications; AEQ's solution improves audio quality, increases the flexibility and integration with existing telephone systems at your station. Also: AEQ Phoenix Venus is a dual IP stereo, full-duplex audio codec system; with a single unit it is possible to establish two bidirectional stereo or four mono (to one or two locations). AEQ Phoenix Mercury is a full-duplex, stereo, IP audio codec controlled through a PC interface providing remote or local management of one or a series of audio codecs. Also: AEQ ControlPhoenix software; AEQ AudioPlus.

AETA Audio Systems

C2953

Intro: ScoopFone HD is a professional mobile phone for wireless transmission over 2G and 3G, with HD Voice service. 7 kHz wideband sound quality. In the U.S., HD Voice service is supported by T-Mobile. Also: Scoopy + HD is a lightweight portable audio codec that transmits from everywhere, with recording and editing functions. HD

Voice now offers additional advantages. Also: Scoopy+ can now take advantage of LTE. Adding an extra network to your lightweight portable codec significantly increases flexibility in rural areas and in places where 3G networks are overloaded. Also: ScoopFone Rack is designed as a telephone insert to receive wireless call on GSM or in HD Voice. You double the audio quality compared to a standard, traditional telephone insert, while passing from 3.5 kHz to 7 kHz bandwidth.

Alan Dick Broadcast Ltd. C2607 (Jampro)

Intro: ADB-VP Vertical Dipole FM Broadband Antenna, for HD Radio and analog broadcasting, is a vertically polarized broadband FM side-mount antenna consisting of a balun-fed vertical dipole, power divider, coaxial feed lines and featuring symmetrical band bass. Stainless steel construction with a brass inner conductor, all associated brackets and hardware are made of hot dipped, galvanized steel for long-lasting and dependable service. Assembled full size and factory tuned for proper impedance match and low VSWR. Also: ADB-CNQ-X1X-FM is a coaxial quarter-wave notch filter.

Aldena Telecomunicazioni C549

Intro: AVP020242x is an FM panel antenna with twin dipoles in vertical, or horizontal, polarization. Also: EMLAB — ISDB-T standard is now available on EMLAB platform. EMLAB will help you to plan SFN/MFN networks (analog or digital signals) with area coverage calculations, interference analysis and discovery of SFN problems, as well as EM health and safety controls; and today all these functions are available for ISDB-T standard too. Also: AQPO40442x is the new VHF B.III antenna with four dipoles, and can be used in vertical, horizontal, circular, elliptical or mixed polarization. It can broadcast two simultaneous services as DTV and DAB.

Aitronic Research Inc. C2243

Ampegon SU2321 (Comark)

Intro: Ampegon, established in October, is the result of a merger of Thomson Broadcast's former radio activities in Turgi, Switzerland; Schifferstadt, Germany; and Beijing, China. Manufacturer and system integrator of AM/DRM radio transmission systems including transmitters, antennas and a range of auxiliary equipment.

Aphex C3017

Arctic Palm Technology C1333 (OMT)

Armstrong Transmitter C2033

Arrakis Systems C2324

Intro: New automation flagship, the Digilink-HD, designed for major-market radio. Powerful and flexible, it can network up to 10 local stations, and with remote access, can connect station groups anywhere in the world. Starting at \$200 a month, DHD is the affordable solution for any station. Also: Bluetooth for ARC series consoles allows you to connect your cell phone, MP3 player, tablet or any Bluetooth-enabled device to the console. Take calls over the air using your cell phone, or play music or audio off your Bluetooth device. Also: New-Wave Lite is a Windows PC-based software solution for professional radio applications. Also: New-Wave automation and Accent advanced component studio furniture for radio.

ARRL National Assn. for Amateur Radio L1

Associated Press/ENPS SL9005

ATTO Technology Inc. SL7613

Audio-Technica U.S. Inc. C1711

Intro: AT5040 Cardioid Condenser Microphone is A-T's offers remarkably musical high-fidelity performance, with profound realism and depth, presence and purity of sound. Also: AT2020USB+ cardioid condenser USB microphone.

AudioScience Inc. C1737

Intro: ASI8921-5xxx — Eight channels of HD Radio/DAB/DAB+ audio capture, AM/FM audio capture, PCI interface (ASI8921) or PCIe interface (ASI8821), FM/RBDS/RDS tuners can be fed from individual external antennae. Up to eight cards in one system. Windows 7, XP, Server 2008/2003 and Linux software drivers available.

AVP MFG & Supply Inc. C6649

AVT Audio Video Technologies GmbH C8140

Intro: Magic THipPro Talkshow System/Telephone Hybrid is a POTS, ISDN or VoIP telephone hybrid, up to 16 callers. Digital Echo Canceller, Expander and AGC for each line provide high speech intelligibility, even in conferences with 16 callers; up to 20 workplaces with user-friendly PC Software; resources can be shared between six studios; comfortable

screening software with database; HD Voice (G.722) in IP mode, Pretalk Streaming (audio via LAN) provides maximum flexibility; DTMF function. Also: Magic TH6 Talkshow System/Telephone Hybrid; and Magic TH2plus Talkshow System/Telephone Hybrid is the smallest talkshow system in the market.

Axel Technology C1317

Axia Audio C3007

Featured: Element IP audio console, iQ IP audio console, Radius IP audio console, DESQ IP audio console, RAQ IP audio console, IP intercom, xNodes IP audio interfaces, SoftSurface virtual console software, PathfinderPC routing control software, PowerStation integrated console engine, IP audio driver for Windows, Livewire audio routing networks

Azden Corp. C1119

B&H Photo Video Pro Audio C11022

Barix C144

Intro: Annunicom 60 is an IP audio gateway device that supports music (MP3) as well as voice codecs (G.711, uLaw, aLaw) and a large number of protocols (including shoutcast, SIP etc). The device can be used for background music as well as VoIP applications. Two-way functionality makes it ideal for monitoring on-air audio. Also: The market-agnostic, self-sustaining reference Real-Time Clock clock plugs into any device with an RS-232 serial port, including but not limited to Barix IP audio and control products. The RTC maintains time independent of a network-based time reference, and provides that time information immediately after a device startup.

Beat the Traffic SL15713

Belar Electronics Lab C2023

Belden N2513

Bext Inc. C1327

Bird Technologies C157

Bittree Inc. SU6521

Broadcast Bionics C1122

Intro: PhoneBox version 4 with OASIS (On Air Social Interaction System) is the talkshow system with a difference. Interact! Be part of what's going on outside your studio. Follow hot topics, search celebrity tweets, use for readouts, tweet back from your studio. With SMS and email too, this awesome interface is the only communication tool you'll need in your studio.

Broadcast Depot C3327

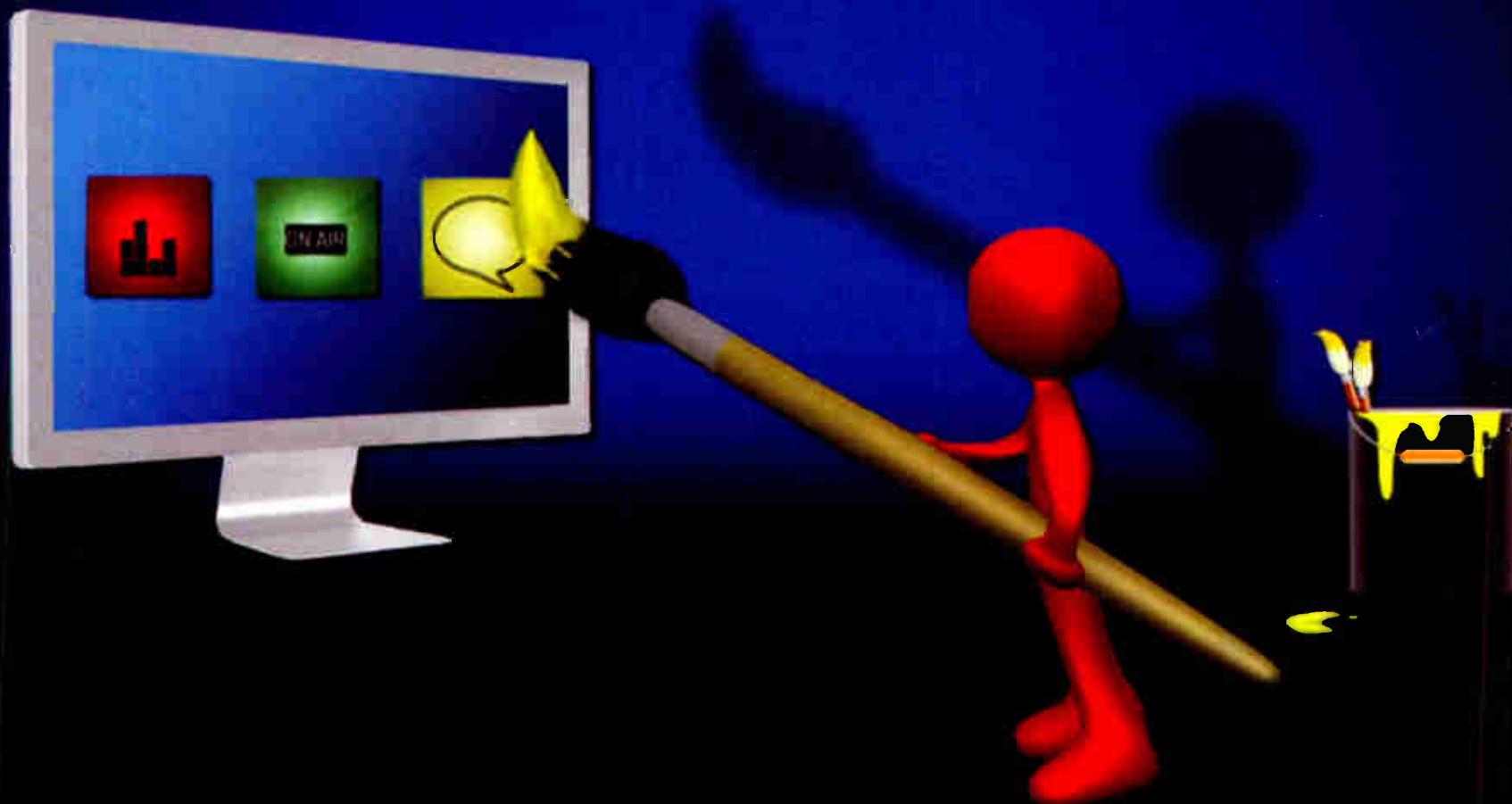
Featured: Your one-stop booth for hands-on experience and the most important products you need for radio and TV stations. Everything from TV playout servers to Axia IP audio consoles. The Broadcast Depot team can provide you with experts for planning, training, installation and support anywhere in the world.

Broadcast Devices Inc. C2030

Intro: RF Dashboard Global Monitor Software is an

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Introducing our most flexible On-Air interface yet!



iMediaTouch

Customizable screens are just a few of the innovations featured in the next generation of iMediaTouch. Visit us at the NAB 2013 to see the future in broadcast automation technology.

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omt
technologies

SNMP technology that allows the user to monitor hundreds of BDI's DPS-100D RMS Power sensors anywhere in the world. View multiple sites on a single screen. Alarms alert the operator in real time of events such as high VSWR, high/low temperature, low pressure. Also: AES-400 Digital Audio Switcher/DA/D-to-A Converter is the next-generation digital audio path switcher. Also: SSM-200 Smart Switch Mini is an SNMP motorized RF switch controller interface for use with motorized RF switches. It is an SNMP controllable device that allows for the control of one to multiple motorized RF switches. A standard MIB file is available for remote controlling the Smart Switch Mini, making it a versatile choice for switch interfacing.

Broadcast Electronics/Commotion C2217

Intro: Commotion Mobile App, branded for the broadcaster, showcases social engagement between station and listeners. Crowdsourcing options give listeners the power to affect the playlist in real time. Also: STXe exciters have a small footprint, are operational in FM, FM + HD Radio, HD Radio only, DRM+, or HD Radio + DRM+ modes, and range in power from 100 mW to 250 W. Standard in S and T Series FM transmitters. Also: STX LP Generation II FM transmitter broadcasts a DRM+ signal and an analog FM signal simultaneously through a single transmitter. BE will demonstrate DRM+ live using a DRM+ signal that is 200 kHz offset from the FM signal, showing an FM signal at 97.1 MHz and a DRM+ signal at 97.3 MHz output from a single BE transmitter. Also: AVUnity platform allows virtually all versions of BE's Vault2

(V9.2) and AudioVault VFleX (V10+) systems to share inventory and production resources.

Broadcast Software International C1446

Intro: Simian Gateway and Remote — The Simian Gateway creates a TCP/IP portal into your Simian 2.2 Pro automation system for Simian Remote for PC, Simian Remote for iPhone and Simian Remote for iPad clients to connect. The Simian Gateway manages a connection to your Simian 2.2 Pro on-air or production software to Simian Remote clients on your local network, or across the internet. *Featured:* Op-X radio automation, Simian automation, SkimmerPlus audio logging, WaveCart, Stinger

Broadcast Supply Worldwide C1556

Broadcasters General Store C2030

BroadView Software N3130

BTX Technologies C7319

Burk Technology C1727

Intro: ARC Plus Touch transmitter remote control features a full-color LCD touchscreen for on-site monitoring and control. Includes built-in macros, virtual channels, Web/smartphone interface and all Version 3 upgrades. Works with all Plus—X and PlusConnect Ethernet I/O devices. Voice/DTMF dial-in and dial-out option available with ESI Plus. Also: Plus-X RP-8 Adapter connects up to eight existing Sine RP-8 interface panels to an ARC Plus Touch or an existing ARC Plus system via LAN/

WAN. Allows easy, cost effective upgrade to ARC Plus from Sine by eliminating rewiring.

Burli Software C2336

New: Updates to our widely used newsroom software include expanded Twitter support, podcast subscriptions, improved GPIO integration with Axia systems, and support for a greater range of audio formats, including audio formats used by iOS and Blackberry 10 mobile devices. Also: Expanded Virtual Newsroom tools to help broadcast chains and groups manage news content across markets and bureaus with greater ease, and improved single sign-on tools for newsrooms.

BW Broadcast C1150

Intro: V2 — The next generation of FM transmitters is here. BW Broadcast brings to NAB the culmination of 15 years of development, the V2. With Ethernet remote control, built-in audio processing and all their FM/RF knowledge, this FM transmitter is a game-changer.

Calrec Audio C1746

CEITON Technologies Inc. N1007

Checkers Industrial Products C4345

CircuitWerkes Inc. C3020

Intro: SiteSentry4 is a four-channel Web remote control with onboard temperature sensor, dual-channel audio monitor & optional audio streaming. Optional new streaming core supports SSL for

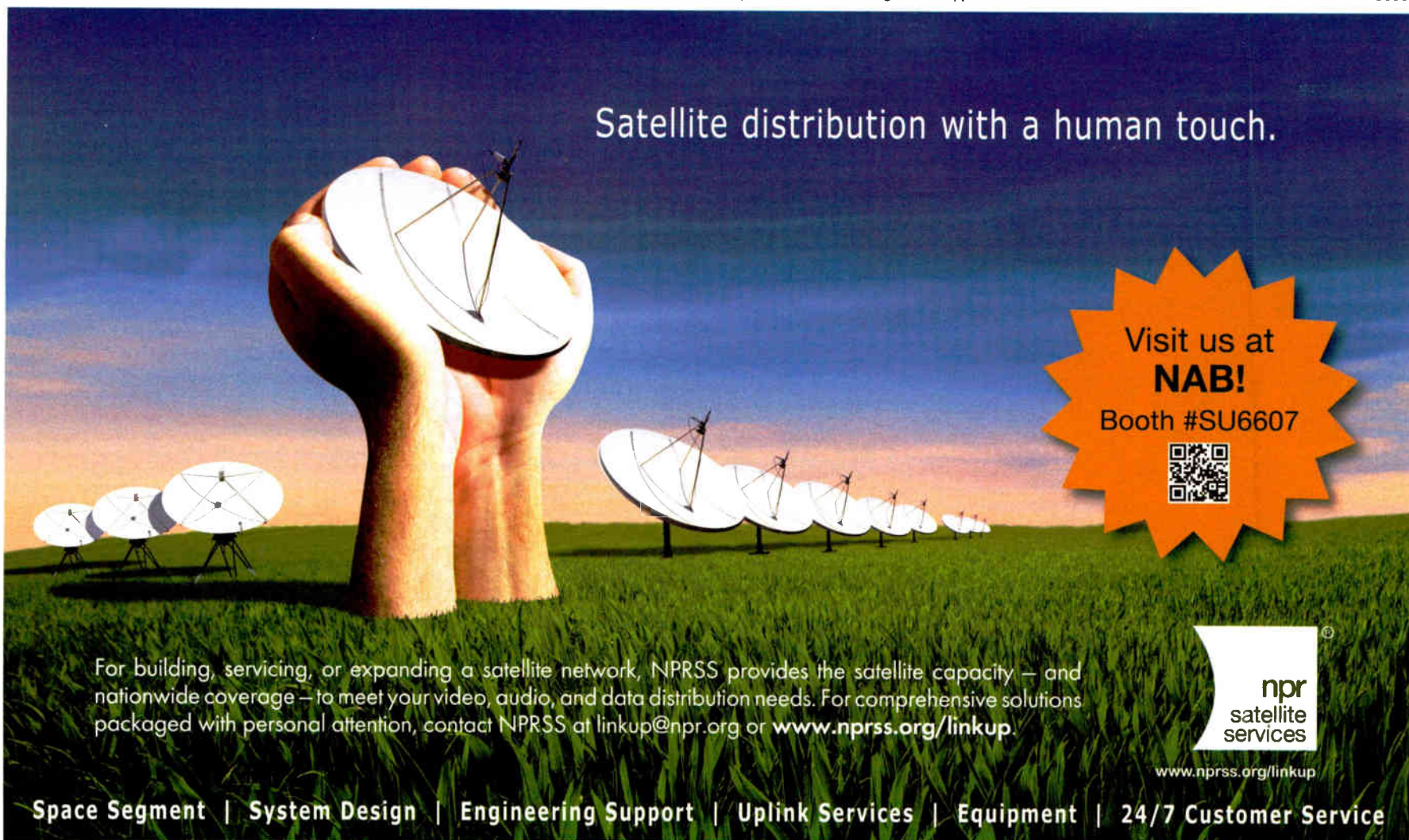
secured emailing and limited SNMP, and includes a real-time clock with event scheduler. Alarms or events can trigger actions like relay closures or emailing. Supports Shoutcast/Icecast incoming audio streams in MP3 or Ogg Vorbis and outgoing Ogg Vorbis streams. Balanced audio I/O is on depluggable terminal strips. SiteSentry2 is a dual-channel Web remote control with many of the same features. Also: WAM-2 is a dual-channel Web-based audio monitor with onboard temperature sensor, two optocoupled status inputs and six relay outputs (two are DPDT for audio switching). Alarms or events can trigger actions like relay closures or emailing. The optional new streaming core supports SSL, limited SNMP and includes a real-time clock with event scheduler. Also: WAMP-rx is a Shoutcast/Icecast compatible network audio receiver.

Clark Wire & Cable C8312

Clear Channel Satellite SU10202


Intro: Designed as an advanced replacement for outdated and poorly supported SCPC audio systems, XtremeSat media content receivers have all of the features a radio syndicator needs and more. Professional XtremeSat MCRs meet customer demands for major bandwidth savings and higher audio quality. The advanced features of these DVB-S/S2 capable systems provides owner-operated networks with MCPC, fleet management and DVR-like capabilities previously only available in the giant networks' hosted MCPC systems.


Clear-Com C8008



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Space Segment | System Design | Engineering Support | Uplink Services | Equipment | 24/7 Customer Service

Coaxial Dynamics C1114
Featured: Radio frequency wattmeters, loads, filters, couplers for use in analog and digital applications

Cobalt Digital Inc. N4624

Communications Specialties Inc. N3125

COMREX CORP. C2221

Intro: LiveShot IP Video Codec — Comrex LiveShot delivers live video over a range of IP networks for broadcasters wanting to deliver high-quality, low-latency video from anywhere Internet access is available and is specifically optimized to perform well on challenging IP networks like 3G, 4G and satellite-based links. LiveShot leverages the success of Comrex ACCESS audio IP codecs and uses the same technology to smooth out the “bumps” on the public Internet to allow broadcast-quality live video streaming. Also: STAC VIP VoIP Call Management System — STAC VIP smoothly integrates legacy POTS lines with VoIP technology to deliver a new way to manage telephone calls for talk shows, interviews and contests. STAC VIP can take traditional POTS calls, but breaks new ground by handling calls from “HD Voice”-capable telephones and Smartphones apps as well as high quality calls from Skype users — just another reason to put Comrex on the line.

Featured: ACCESS IP Audio Codec, BRIC-Link IP Audio Codec, STAC Telephone Talk Show System

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Continental Electronics Corp. C2014

CPI C1107, SU2602

Crown Broadcast IREC C01152

Intro: RFBA-1 AM/FM/WR Triple tuner is a DSP-based high-quality product that fills the need for EAS monitoring and AM/FM translator composite output into an FM transmitter. Optional mod monitor is available for a free short-term trial to test its many features and benefits. Full Internet command and control. Also: Crown Broadcast will be exclusively responsible for sales, service and long-term support of the Ereso line of transmitters in the United States, and will introduce an E Series of transmitters. Also: The high-end, DSP-based CT-1 AM/FM Internal Receiver is the most sensitive and selective internal translator receiver on the market. Crown Broadcast “R” Model translators come with the CT-1 standard. The CT-1 is also a drop-in replacement in older Crown Broadcast transmitters from 30 to 600 watts.

Dalet Digital Media Systems SL4524

Dan Dugan Sound Design C1630

Intro: Model E-2 Automatic Mixing Controller — Incorporating eight channels with Dugan Music System and Dugan Gain Limiting (analog I/O) and 16 channels Dugan Speech System (ADAT digital), this product replaces the Dugan Model D-2 as the company’s top-of-the-line automatic mixing controller with analog I/O.

Davicom, a division of Comlab Inc. C1111

Intro: The DADS-01 AES/EBU audio detector switcher is designed to be used as an automatic or manual switch for AES/EBU digital audio signals. It offers the necessary inputs and outputs to be controlled and monitored by other equipment such as Davicom remote site monitoring and control

systems. The DADS-01 has sophisticated audio level detection algorithms that enable thresholds with delays to be programmed on each of its three input sources (two digital, one analog). Also: Version 5.50 firmware and software for use with its remote monitoring, alarm and control products.

DAVID Systems C7941

DAWNco SU3402

Intro: LNB for satellite, HD ready ± 5 kHz stability — Top of the line C and Ku band LNBs, recommended by major networks for use with HD satellite receivers. Also: DAWNflex cable to improve signal quality on satellite downlink,

by reducing loss on signal cable run from dish to building. Flexible coax passes signals up to 3 GHz, including satellite L band. The cable is flooded for direct burial, quad shielded for best protection from signal ingress, flexible 2.5 inch bending radius, with .61 inch overall diameter. New “DAWNflex” can cut signal path loss in half. Also: Satellite identifier & signal level meter, model #BestBuddy-TurboS2; and Satellite TI filter, to block radar interference.

DaySequerra N3839

Intro: M4.2S TimeLock — Most powerful HD Radio AM/FM tuner available, with proprietary TimeLock MPS/HD-1 diversity delay measurement algorithm.

SureStream Enables Affordable Broadcast-Quality STL over Consumer DSL

K@XE 91.7 fm

By Dan Houg, Minnesota Public Broadcaster KAXE/KBXE

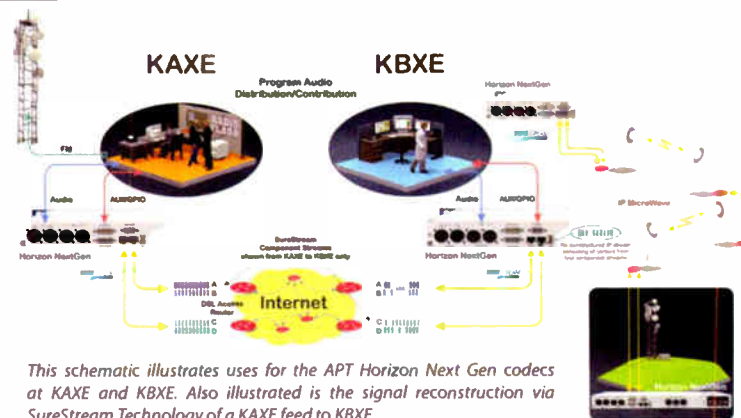
“The APT SureStream technology made possible the impossible: having a high quality, real audio link over open internet”

We at Northern Community Radio operate two public broadcast FM stations in northern Minnesota, KAXE(FM) and KBXE(FM), each with full-power stations and a couple of translator sites. KBXE was constructed in 2012 and I was seeking an STL for the station and interconnectivity to its sister station, KAXE.

When it came time to link the two studios and implement a new STL I was faced with a number of choices on the market. Due to the fact that the two studios were some 70 miles apart a microwave link was not practical, so we needed an alternative economical way to have a 24/7 bidirectional stereo link with CD-quality audio. A dedicated MPLS (multi protocol label switching) metro Ethernet link between KAXE and KBXE was available but cost-prohibitive, so our only other option was sending the audio via IP over the open Internet.

I also needed an audio codec that was rock-solid and reliable but also a solution that could match the economical operational expenditure costs associated with microwave links. But we also needed an STL solution from the KBXE studio to the KBXE transmitter site, which did not have high-speed Internet available at all.

After evaluating several available solutions from a number of different vendors I decided to go with the Horizon NextGen from APT WorldCast Systems for several reasons. The SureStream technology using two Ethernet NICs and gateways creating redundant streams was unique. The feature set with the Horizon



This schematic illustrates uses for the APT Horizon Next Gen codecs at KAXE and KBXE. Also illustrated is the signal reconstruction via SureStream Technology of a KAXE feed to KBXE

NextGen including the relay closures and RS-232 data, which I needed to send control information, was strong. The front-panel audio level indicators were invaluable for quick status indication. APT WorldCast has a sound reputation for audio quality and IP transport and lastly, the product was currently shipping and my need was immediate.

For the STL I had a single Internet provider, who provided me with bandwidth at each site. We installed two links per site to utilize the two Ethernet NICs on the Horizon NextGen. These links’ average speed is 4 Mbps upload and 7 Mbps download. Over each of the two links I send four tributary streams which are then perfectly recombined to create the broadcast quality audio output, thanks to the APT SureStream technology running on the Horizon Next Gen.

The cost of these four consumer DSL accounts, two at KAXE and two at KBXE, with static IP address, is approx \$60/month each.

The 17-mile STL microwave link using the other pair of Horizon NextGens we purchased has an upload/download speed of 10 Mbps via a combination of license-exempt Ubiquity Nanobridge 2.4GHz and licensed 11GHz Motorola PTP800 radios. This is more bandwidth than we need. SureStream, in fact, only requires a 700 kbps up/down link on each Ethernet NIC. We own this link and have zero monthly costs other than the power to run it.

Over the time we’ve been using the Horizon NextGens and SureStream technology we’ve been able to use very economical consumer level DSL and had a reliable signal with no dropouts. The APT SureStream technology has made possible something that was conventionally assumed to be impossible - that is having a high quality, real-time audio link over the open Internet.

Read complete report at www.surestream.ws

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rooms, and allows an additional frequency to be added easily. Also: JMPC antenna is the medium-power version of the Penetrator antenna, an industry standard for quality and performance. Each bay consists of a Penetrator-style radiating element. Each JMPC is factory tuned to any frequency in the FM Band II range on a tower structure that best simulates the customer's actual tower. Multiple frequency design is available. True circular polarization offers excellent performance for HD Radio. Also: JCPB side-mount antenna is a broadband version of the Penetrator.

JK Audio Inc. C3249
Intro: RemoteMix 2 is a two-channel field mixer/headphone amplifier that provides a communications interface for remote broadcast, IFB or backup audio paths. The headphone amplifier monitors all inputs plus an external feed. Features a phone line hybrid with keypad and a notebook/cellphone headset interface. Also: CSM-IP call screener module — IP web server is a remote interface to our Concierge talk show system. CSM-IP contains a server that allows the user remote control of Concierge through their browser. A virtual Guest Module control surface. Also: BluePack Wireless Interview Tool with HD Voice allows live man-on-the-street interviews through a cellphone equipped with Bluetooth wireless technology.

Jünger Audio C2333
Intro: D*AP LM4, a digital dynamics processor designed for television and radio, is a professional non-destructive normalizer performing automated and adaptive leveling of audio signals. Also: D*AP LM2 digital audio processor and V*AP voice audio processor.

K-Tek C8325

KAE Corp. C8036

Kathrein-Werke KG C2327
Intro: VHF Band III Dipole Antenna — VHF band III dipole antenna for top- or side-mount, wideband, vertical polarized, particularly for DAB broadcast applications.

Kintronic Labs C2920
Intro: Lite economy AM directional antenna phasor cabinet for budget-minded AM broadcast station owners. Also: Economy antenna tuning unit series will have the same functionality with typical wide audio bandwidth performance as higher priced models, but without the non-essential features. Also: Kintronic Labs offers field service, including FM antenna system sweeps to identify transmission deficiencies. We also offer FM antenna repair services.

Larcen USA SU5306

Lawo North America Corp. C1311
Intro: mc²56 is compact, flexible, versatile. With a resourceful engine, there's plenty of power to handle any situation. It is easy to understand and intuitive to operate. The console is suitable for everyday use. The mc²56 combines the proven quality of its predecessors with new features, improved functions and clever innovations.

Linear Acoustic N3438

Logitek Electronic Systems C1817
Intro: The AE-IP card turns the Logitek AE-32 Audio Engine platform into an AoIP node and mixer capable of up to 128 inputs x 128 outputs in a single box. The AE-IP lets existing Audio Engine customers upgrade to Logitek's JetStream technology without having to rewire existing inputs and outputs and gives new customers the ability to build a large AoIP routing matrix in less rack space than competing node systems. Also: The updated Mosaic control surface features a new look and feel along with easier access to new features of streaming consoles and networked audio systems. Also: vMix+ combines multiple Logitek virtual clients into a single platform for creating virtual mixing consoles, metering displays, routing controls and more. It eliminates clutter on the computer desktop by allowing you to custom build a display of components including buttons, meters, routers, faders and delays for display on a monitor or screen. Also: Large meter bridge for Mosaic and ROC will feature two large high-resolution LED meters as well as a 7 inch LCD screen to display timers, clocks, delay and other information.

LS telcom C249

Magnum Towers C1118

Markertek C5443

Mayah Communications C2256

Merging Technologies C3239

Micronetix Communications C1133
Intro: CDA Cross Dipole Antennas are built for a specific frequency from 50 to 230 MHz. The antenna has an omnidirectional pattern and is horizontally polarized. One- to six-bay elevation patterns.

Middle Atlantic Products SU11018
Intro: RackLink Power Management System offers flexible, intelligent power monitoring and management for AV systems and features extensive monitoring and preemptive support functions.

Minnetonka Audio Software Inc. SU8918

Moseley Broadcast C1307
Intro: LANlink Turbo 900 LAN Extender/Data Link transports Ethernet at high data rates in the 900 MHz unlicensed band. The built-in duplexer allows LANlink to be used with existing 950 MHz STLs and antenna systems. Also: Rincon digital audio transporter conveys four stereo audio programs using multiple codecs over combinations of IP and T1/E1 networks. STL solutions include Starlink digital STL for 950 MHz and all worldwide bands, Starlink T1, LANlink TURBO 900 LAN extender/data link and Event high capacity radio link for 5.8 GHz unlicensed and 18 and 23 GHz licensed multi-station links.

Museum of Broadcast Technology L7

Musicam USA SU9125
Intro: Ikusnet — Portable HD video codec. Two 4-inch built-in alarm board color monitors. Bidirectional audio and video. HD video as low as 2 MBPS.



Photo by Kovacs/Dawley

MYAT INC. C2621

Intro: 7-16 DIN Coaxial Transfer Switch — Fast, reliable switching is essential to every remote control transmission system. Myat has expanded its industry-leading line of coaxial transfer switches to include 7-16 DIN. Like all Myat switches, the 7-16 DIN switch offers low VSWR, high isolation between ports and unsurpassed power handling capacity. Mechanical and LED switch position indicators, and manual override provide versatility and peace-of-mind. Also available in 3-1/8, 1-5/8 and 7/8-inch sizes.

Featured: Filters, combiners, transmission line, switches and complete RF systems.

Mr. Dennis Heymans, Sales
 360 Franklin Turnpike
 Mahwah, NJ 07430
 201-684-0100
 Fax: 201-684-0104
 Email: sales@myat.com
 Website: www.myat.com

Myers N6415
Intro: ProTrack Radio is a comprehensive broadcast management solution that interconnects traffic, scheduling, sales, engineering and IT departments.

Narda SU6906

National Association of Tower Erectors C1134

Nautel C2207
Intro: Award-winning diagnostic tool Phone Home is a virtual watch dog that continuously monitors and logs parameters of your transmitter, diagnosing problems sometimes before they can affect transmitter performance. Phone Home means faster evaluation and recognition of problems at the site, fewer site visits and less off-air time. Also: Nautel's Free VHF/UHF propagation tool answers broadcasters "What if?" questions. Broadcasters often are confronted by questions about FM or TV propagation: "Is it more effective to raise my antenna or increase my transmitter power?" or "what would be the effect on coverage if I move my transmitter site?" Or maybe you just need a good, usable coverage map for your existing

facility. While really accurate answers require the assistance of a consulting engineer, Nautel's RF toolkit gives some approximate indication quickly and at no cost.

Neogroupe SU6915
Intro: NeoAgent is a link between radio and television stations and their audiences. The solution allows the enhancement of their interaction by adding SMS/Website/Facebook/Twitter/iPhone inputs into the NeoScreener and the NeoWinners databases. Also: NeoWinners V3.4 is the latest version of the NeoWinners solution, our business software tracking winners, prizes and scheduling on-air contests.

Netia SU4911 (Globecast)

Neutrik USA C7137

Neuvion SU3117

NewBay Media C2844
Featured: NewBay Media, publisher of Radio World, is the leading information and marketing solutions provider for the AV/pro audio, broadcast and video, music, consumer electronics/gaming and education markets. NewBay delivers its premier content through our award-winning portfolio of integrated platforms, including print and digital magazines, websites, show dailies, e-newsletters, events and conferences. NewBay Media reaches more than 10 million people in 100+ countries. For more information, visit www.nbmedia.com.

NewTek Inc. SL4610

NicomUSA Inc. C2057
Intro: NT500 500 Watt FM transmitter, redesigned to fit in a 2 rack space chassis. Also: New NT2500 2.5 kW output power FM transmitter fits in 4 rack unit chassis. Also: New FM broadcast isolation transformer, recommended for transmitter protection in remote sites. Available in different models depending upon the size of your transmitter.

NPR Satellite Services SU6607



Big Talker. Small Price.

Introducing the new Telos Hx6.

Winning stations know the secret to great-sounding call-ins: Telos phone systems. And with the new Hx6, everyone can afford smooth, dynamic phone segments — just like major markets have enjoyed for years. Six lines, two Telos hybrids — one certain way to extract excellent caller audio from any POTS or ISDN phone connection.

Even unruly cell phone audio gets smoothed out, thanks to adaptive Digital Dynamic EQ, caller audio sweetening from Omnia, and the most advanced DSP hybrids in broadcast. Not to mention beautiful VSet phones, with animated color displays that makes airing calls easier than ever. All at a price guaranteed to have everyone talking.

NUGEN Audio **SU8918**
OConnor **C6425**
OMB Sistemas Electronicos **C1754**
Omnia Audio **C3007**
Intro: AudioActive by Omnia is a new series of devices and services that will not only allow RDS-based data and images to be reproduced on a smartphone screen during Internet streaming, but will also allow direct user interaction via the same screen. It will also allow data reproduction and interaction on FM transmissions received off-the-air on FM-equipped smartphones. Also: Omnia One.SG is a stereo generator software option that is downloadable to any Omnia One, to convert the unit to a stand-alone stereo generator.
Featured: Omnia.11, Omnia.9, Omnia One, Omnia A/XE, Omnia F/XE, Omnia.8x

Omnirax Furniture Company **C2433**
Intro: eDesktop office furniture — Our new, innovative ergonomic private office (eDesk) and open office systems (unCube) furniture, coupled with our custom (Innova) and production (Phoenix) broadcast furniture, provide a convenient “one-stop-furniture-shop” for your entire facility. Our patented eDesktop design (U.S. patent 7,438,002 B2) provides more usable desk surface, for more people, in less space while promoting collaboration in the workplace.

OMT Technologies Inc. **C1333**
Intro: iMediaTouch V4.3 broadcast automation

suite. Music Master Nexus server interface provides live interaction with Music Master featuring On-Air “Perfect Match” rules-based live song replacement, production workflow integration and real time reconciliation. System fault tolerance improvements including log scanning priority management for store/forward and manual database failover. Other 4.3 enhancements include support for Arctic Palm Live Copy, rejoin liner, fixed time feed and an EAS closure feed feature. Also: iMediaTouch V5.0, previewing the next generation of the iMediaTouch broadcast automation suite. Exciting innovations will be showcased including a user-customizable on-air interface and the integration of an advanced content database topology operating on Windows 8.

Orban **N5006**
Intro: Optimod-FM 8600S offers Orban’s flagship 8600 “MX” audio processing technology in a compact, 1 rack-unit package. The 8600S is available in two models: 8600S-FM (processing for analog FM transmitters) and 8600S-HD (processing for both analog FM and digital distribution channels). Via an upgrade kit, an 8600S-FM can be upgraded to an 8600S-HD at any time without removing the unit from the rack. Also: Optimod-FM 8600 is now shipping with software and hardware support for a “ratings-encoder loopthrough.”

Paravel Systems **C1125**
PESA **SL4305**
Petrol Bags **C6432**



Photo by Jim Peck

Phasetek Inc. **C1739** analog outputs plus phones. Digital I/O on Toslink with SRC capability up to 192 kHz. Core audio, ASIO and WDM compatibility. Front-panel master volume control assignable to digital and analog outputs. Also: Lyra 2 USB Audio interface provides extra flexibility; dScope Series IIIe is the latest addition to the dScope family.

Plaber Srl **C12139**




Plura Broadcast **N2519**

Potomac Instruments Inc. **C2124**

Prism Sound **C944** **ProConsultant Informatique** **N5824**
Intro: Lyra 1 USB Audio interface offers two analog inputs of mic/line and line/instrument with two

Propagation Systems Inc. (PSI) **C1751**

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<p style="text-align: center;">THE AWARD WINNING, ACCLAIMED FMHD-1 NOW WILL SIMULTANEOUSLY DECODE & DISPLAY 4 HD AUDIO STREAMS!</p>  <ul style="list-style-type: none"> Direct Sampling of the FM RF Carrier Digital FM Carrier Demodulation Frequency Agile on both Antenna & High Level RF Inputs RF Spectrum Analysis with FFT Power Band Calculations 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 	<p style="text-align: center;">THE ALL NEW FM SOLUTION FMCS-1 All-in-One FM Modulation Monitor Now includes Peak Weighting! (with software update)</p>  <ul style="list-style-type: none"> Direct Sampling of FM RF Carrier Frequency Agile on both Antenna & High Level RF Inputs AM & Sync AM Noise Measurements Variable BW Digital IF Filtering Digital FM Demodulation with 100dB 75µs SNR Variable BW Composite Filtering Digital Stereo Demodulation with 100dB L/R Separations Full Metering of Analog Peak and RMS Values RDS Injection and Full Data Decoding Two Digital SCA Decoders 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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Radio Frequency Systems C1714

RadioDNS C147

RadioTraffic.com C1113

Radio World/NewBay Media C2844

New: Our new series of eBooks is a smash hit. These are free online resources about cutting-edge technology topics like transmission design, AoIP and remote broadcasting. Find them at <http://radioworld.com/ebooks>. Also: Subscribe today to receive Radio World Engineering Extra's TechBytes, a special e-newsletter for engineers only, delivered twice a month. Visit <http://radioworld.com/subscribe>.

RCS C2631

Intro: Tailored for the web, Selector2Go works on contemporary browsers and across platforms and mobile devices. The system is designed to keep the interface straightforward. The data flow is kept small to enable fast performance, even on mobile networks like 3G. Core scheduling and schedule editing functionality and essential analysis details of your rotations in the palm of your hand. Also: Zetta's new sleek design is simplified; streamlined interface feels comfortable to those who have worked in radio for decades or one day. Zetta integrates with music scheduler GSelector4, RCSnews and traffic system Aquira. Also: RCSremote is an app for your phone or handheld device that lets you control your Zetta's station log; Aquira Online lets you stay in constant contact with the traffic team back at the station.

RDL Radio Design Labs C1336

Richland Towers C1324

Riedel Communications C4937

Rohde & Schwarz SL6320

Rohn Products C1255

RTS C6908

RTW C1844

Rushworks C5640

Featured: VDesk Radio/TV transforms your radio station into a dynamic Internet TV station. This integrated PTZ hardware/software production system lets you generate additional revenue streams by placing your brand "where the action is," on mobile media and Internet TV screens. Using our DoubleTake PTZ control we assign presets to placeholders on a FloorPlan of your control room. Using the touchscreen, the operator taps the picture of who is speaking, and they're on the air in about one second. Package includes computer hardware and software, touchscreen with additional tablet interface, and two or three PTZ cameras.

RVR Elettronica SpA C3327

Intro: TEX2000LIGHT Green Line compact transmitter — Overall efficiency 70 percent, RF module efficiency 81 percent. Ideal for use as drivers for mid-power stations or as transmitters in stand-alone applications. Compliant with EC, FCC and

CCIR standards. Power range from 500 to 2500 W. Also: Holiday Green Line modular transmitter — Modular; available power range from 3.5 to 15 kW. Air cooled. Compact, only 6 HE rack for the 3.5/5 kW power amplifier module, 3 HE for power amplifiers module and 3 HE for power suppliers module. Green Line technology inside. Ultra-modern PFC/power supply. Lower power consumption and high efficiency. Also: Barracuda liquid-cooled Green Line transmitter; Plug-In Green Line transmitter.

Sabre Towers and Poles C2728

Featured: Custom and pre-engineered towers

SCISYS C151

Scott Traffic LLC C1113

Intro: Radio Traffic XP, Essentials and Premier versions — New for 2013 software for radio and LPTV order entry, log generating, billing and data analysis reports. Affordable, efficient and easy to use. Multi-user, multistation, Internet ("cloud") powered.

Screen Service Broadcasting Technologies SU5705

Sennheiser Electronic Corp. C3217

Seratel Technology C2253

Shively Labs C2624

Intro: Versa2une is a field-tunable, low power, circular polarized FM antenna. Maximum input power 5 kW with 2.5 kW into a signal bay. VSWR <1.2:1. Tunes to your frequency quickly. Also: Model 6843, a new high-power, side-mount, circularly polarized antenna for multiplexed stations up to 12 MHz apart. Each bay will have a 10 kW power rating. The 6843 is a branched-fed system offering directional patterns, completed on our pattern range. Also: Model 6025 log periodic antenna. Designed for longevity and highly directional patterns, this robust system is perfect for complicated, narrow or multi-lobe FCC pattern envelopes. Including fixed attachments for stability in vertical and horizontal planes, movement is minimized on the tower.

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Shure Inc. **C2627**

Sierra Automated Systems & Eng. **C1330**

SINE CONTROL TECHNOLOGY INC. **C1831**

Intro: POWERCLAMP SERIES 10 TVSS — New Series 10 PowerClamp surge suppressors (TVSS) provide exceptional protection against power line surges and spikes. Rated at 200,000 surge-amps, they will absorb the extreme transients that would cause serious damage to transmitting and studio equipment. PowerClamp TVSS units are maintenance-free, and do not degrade even after thousands of "hits."

Featured: PowerClamp TVSS Series 6 and Series 8 TVSS units

Mr. Hank Landsberg, President
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Seal Beach, CA 90740
562-493-3589
Email: henryeng@aol.com
Website: www.sinecontrol.com

SIRA **C1451**

Skylark Technology Inc. **N5138**

SMPTE **L28**

Intro: SMPTE will showcase the newly launched SMPTE digital library, which enables users to search and access content including the SMPTE Motion Imaging Journal (1916 to the present), the society's conference proceedings and the suite of SMPTE standards, recommended practices and engineering guidelines. Available on the HighWire online platform at library.smpte.org, the SMPTE digital library provides one-stop access to SMPTE resources, informing professionals about the latest technology and industry research as they happen.

Snell **N1820**

Society of Broadcast Engineers **L29**

Softron Media Services **SL12416**

Intro: OnTheAir Studio is all-in-one webradio software. With its unique and easy-to-use user interface as well as its built-in AAC+ streaming technology, everybody can now run a radio station. It literally takes only a few minutes to be on air. First get a SHOUTcast or Icecast subscription and then in OnTheAir Studio, enter your credentials, drag some songs in an OnTheAir Studio playlist and hit play.

Solid State Logic **C2617**

Sonifex Ltd. **C1730**

Intro: Redbox RB-IPE IP Extender for GPIO & Analog Control Signals is a 1U rackmount unit to provide remote control of GPIO and analog control voltages over an Ethernet network. It can be configured using a built-in Web server to enable two units to control each other or a single unit can be controlled via Ethernet commands and the web server interface. Also: CM-CU1 Commentator Unit 1 Commentator & Line Input has a feature set tailored to single-commentator applications. The unit has an individual commentator output, with an additional output providing a mix of commentator and line input audio. The line input can be configured to remain present at the mix output even if the commentator is off air, making it useful for routing crowd effects or pre-recorded material to the program feed.

Sound4 **C2952**

Soundcraft Studer **C2923**

Soundproof Windows Inc. **C2134**

Sound Devices LLC **C2849**

Intro: 664 Field Mixer is built for audio profession-

als mixing feature film, episodic TV, reality-style production, news and documentary production. The PIX 260i is a file-based video recorder/player that replaces tape-based video decks in production and post-production environments.

SPX/Dielectric **C1707**

Staco Energy Products **C3205**

Intro: FirstLine P online, double-conversion UPS units for 160–250 kVA applications boast efficiencies of up to 98 percent while delivering maximum availability and flexibility. They are ideal for information technology applications including the broadcast arena's digitized environment, to protect transmitter exciters and HD Radio coders, monitoring, remote control and Emergency Alert Systems, links to remote programming sources via digital telephony, satellite and office computers, stand-alone computers and computer networks for audio playback, program scheduling and more.

Stainless LLC **C1405**

Featured: Towers, engineering & design, analysis, modifications, services, RF

Stirlitz Media **C2217**

Intro: With Stirlitz Media Logger 4 – audio, you can record up to 256 stations, accompanied by levels of metadata; access recorded logs anywhere through timeline-based player on Windows, OSX, iOS and Android devices.

StreamOn! **C1149**

Studer **C2923**

Intro: The all-in-one Studer Vista 1 console is available in an even more compact 22-fader version, measuring just over 1 meter in width, and suited to small spaces such as in OB vans. For smaller vans where the audio console fits into the cab area, the Vista 1 provides a comprehensive solution requiring no additional racks, including integral I/O, DSP

and surround sound management including up and down-mixing.

Studio Technologies Inc. **C5449**

Superior Broadcast Products **SU5921**

Superior Electric **C1109**

Featured: Stabiline Power Protection Products: automatic voltage regulators, surge protective devices, uninterruptible power supplies and power conditioners.

TASCAM **SL10827**

Intro: TH-02 closed-back, stylish headphone delivers a sound you have to hear to believe, and at a low price you can't ignore. Also: US-366 USB Audio Interface is for easy podcast recording and affordable broadcast solutions. Paired with high-definition HDDA mic pres, XLR, 1/4-inch and digital inputs and an onboard mixer designed for podcast use, the US-366 is a great piece for home broadcasters. Also: iXJ2 line-in 30-pin dock for Apple iPhone, iPod and iPad is perfect for on-the-spot reporting.

Tektronix **N609**

Telos Systems **C3007**

Intro: Telos Hx6 is the advanced new six-line phone system that works with POTS or digital ISDN phone lines. It's equipped with two advanced Telos DSP hybrids and a full suite of audio processing tools, including Digital Dynamic EQ, caller sweetening from Omnia, acoustic echo cancellation and DSP technology fine-tuned to get excellent audio from even cell-phone callers. Beautiful VSet phones with color displays make handling callers second nature; analog and Livewire I/O are standard. *Featured:* ProStream streaming audio processor/encoder, Hx1 POTS hybrid, Hx2 POTS hybrid, VX broadcast VoIP phone system, Zephyr Xstream ISDN Codec, Z/IP One IP codec, Nx12 POTS/ISDN phone system, Zephyr Xport POTS + ISDN codec, ProFiler automated program logging

TFT Inc. **C2330**

Thermo Bond Buildings **C2034**

Thinklogical **N2819**

Tieline Technology **C3034**

New: Genie Distribution is the world's most powerful DSP-based IP audio codec for multipoint audio distribution over IP networks. Connect six channels point-to-point, or simultaneously distribute stereo audio to up to 50 multi-unicast endpoints, or multicast to any number of IP codecs. Also: Use Merlin for stereo bidirectional IP audio and full-duplex communications from the studio to a remote codec, or use Tieline's Merlin Plus to create up to six independent bidirectional mono connections with IP codecs or smartphones using Report-IT, saving you money on codec hardware. Also: A new Bridge-IT Xtra 1RU IP codec will be released soon featuring all the functions of the Bridge-IT ½ x 1RU codec and more. It will include an LCD display, PPM metering and dialing keypad; additions include dual power supplies, front-panel stereo headphone out and four GPIO in/outs. Also: Report-

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IT Enterprise App now includes the Opus algorithm, Nétia Radio-Assist file sharing compatibility, plus a new Android administrator application.

Transradio **C2014 (Continental)**

V-Soft Communications **C2739**

Intro: V-Soft Plus Package for Probe 4 and FMCommander — Special features for Probe 4, our high image mapping and propagation prediction program: New bundled options include Synchronous Booster, Measured Signal Importer, Antenna Workshop, Zip Code Module, Airport Module, ITU-R P. 1546-1 Model, 200 Meter Resolution LULC, Canadian FM and TV station database, free downloads of Zip code boundaries, centroids and airport runways and 2010 U.S. Census TIGER Boundaries. All bundled options of the Plus Pack are offered for one low price on a quarterly basis. Also: XField — Under certain circumstances, both LPFM and FM translators may occupy channels which are second-adjacent to full-service stations. XField determines the location of the interference area using the vertical elevation field and azimuth pattern of the user selected antenna. Vertical patterns for most bayed antennas are packaged with the program. This program requires no mathematical calculations by the user. XField is also valuable for determining IBOC host interference when separate antennas are used.

Viking Satcom **OE1322**

Wegener **SU3021**

Wheatstone Corp. **C3112**

Intro: L-8 radio console is a high-end, small-format networking digital audio console. Also: TS-22 is a multi-featured studio talent station that integrates microphone, monitoring and communication functions over the Wheatnet-IP audio network. New Wheatstone signal processors include models, the FM-531HD, the M-4 mic processor and the Wheatnet-IP LIO-48 logic array Blade. Also: AirAura X-3 — Wheatstone's latest flagship digital audio processor. Also: Wheatstone and Audioarts Engineering audio consoles

WhisperRoom Inc. **SL5027**

WideOrbit **N5129 & N5829**

Intro: WO Media Sales offers robust account management with Outlook, Gmail and mobile integration. Flexible scheduling with customizable estimates and access to Nielsen data. Live posting to Traffic. Order EC from Proposal to Traffic. Multimedia selling: Internet and mobile, non-traditional revenue. Robust research module with Rankers, Trenders, Comparatrend and Audience Composition reports. Integration with Nielsen, Kantar, Rentrak and Arbitron ratings. Also: With WO Media CRM, managers can approve, disapprove or transfer accounts. Track pending business by stages, promotions, packages, lead sources. Accurately forecast revenue. Track appointments/tasks with Outlook, Gmail and mobile integration. Client profiles are customizable and searchable by favorite demos/dayparts, buying habits. Real-time integration with Traffic. Multiple pre-built reports: Top 10, AE Close Ratio, revenue

history, pending business, Closed-Lost Business summary. Roll-up reporting based on market, region or revenue groups.

Will-Burt Co. **C12142**

WinMedia **C2753**

WireCAD **N4036**

Wohler Technologies **N3729**

WorldCast Systems **C2546**

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Wowza Media Systems **SU11007**

Intro: The Wowza platform engages hundreds of

millions of viewers by delivering the highest quality streaming media to any Internet-connected device. Wowza Media Server improves productivity among thousands of organizations by simplifying the workflow of online video delivery. Also: Enhancements to Wowza Media Server 3.

Yamaha Commercial Audio Systems **C2239**

Yellowtec GmbH **C1457**

Intro: litt is a sleek, streamlined programmable visual signaling system for studios and galleries. iXm is the industry's only high-quality pro microphone with built-in recording and auto-leveling. PUC2 is a high-definition audio interface with built-in PSU and class-leading performance. m!ka is our elegant and versatile studio mic/monitor mounting and lighting system. m!ka Pad-Dock with QuickFix is the newest addition to the m!ka system; use your iPad or similar devices in combination with m!ka monitor arms.

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Don't Just Hire Well; Hire Great

It takes skill to pull solid candidates from a giant pile of résumés

Regardless of which side of the desk you're on, job interviews are exhausting. Because hiring well is essential for every department at a radio station, I'd like to present you with tactics that have worked — not just for me, but for others — over many decades of sifting through mounds of résumés and asking tons of questions.

While this is written primarily for those doing the hiring, potential job seekers will glean helpful tips as well.

More than ever, we employers are looking for the perfect fit. Looking for essential criteria on a résumé will get you halfway there, but it's the interview process that truly tells the tale. You should be able to select about 10 candidates to speak with on the phone. Sure, you can pick more than that, but at some point you'll cut into the amount of time you can spend focusing on each interview, and that can be risky.

During the 15-minute phone conversation, you need to be an excellent listener to be able to determine whether the candidate deserves more attention. Set him or her at ease by speaking first about the organization and your structure.

The questioning starts with asking the candidate to describe the job she's up for as she understands it. Unfortunately, many applicants want to invent a job based on personal career interests and wishful thinking. If you've posted a job description — which you should do, with care,

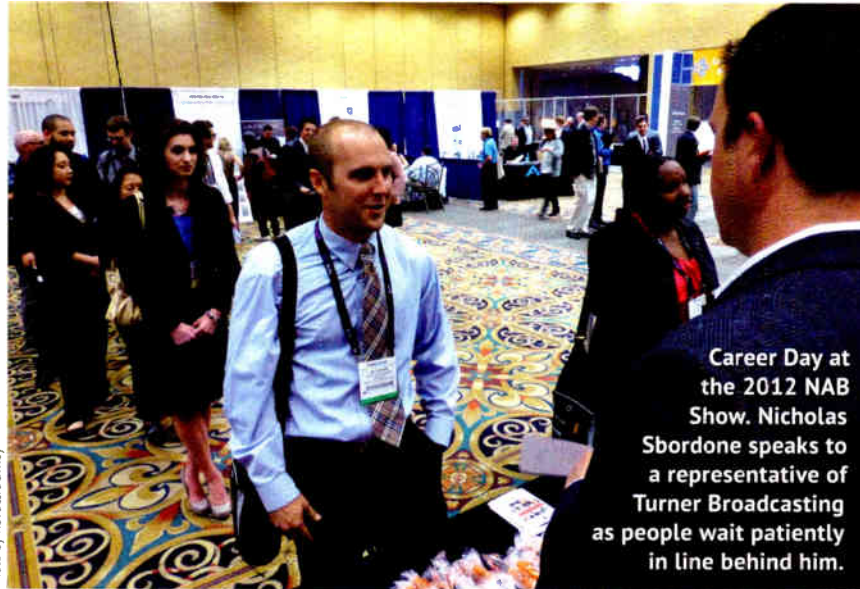


Photo by Kovacs/Dawley

Career Day at the 2012 NAB Show. Nicholas Sbordone speaks to a representative of Turner Broadcasting as people wait patiently in line behind him.

when advertising an opening — the candidate should mirror your requirements.

If she doesn't summarize those requirements, she wasn't paying attention to what you posted or is ignoring reality. Either way, it's a red flag, and unless another component in the interview goes extremely well, it is enough to warrant caution.

SALARY

Next, ask your applicant for her present salary. Managers often have a tough time asking this question of candidates early in the game, because it seems so

I've had great success with Skype interviews and highly recommend that option.

personal. The reality is that if an applicant is not in your financial ballpark, you will both be wasting time.

Some attempt to skirt the question by replying that they'd prefer to hear your range first, but it's important to know their figure at this point so that if yours is not within reach, everything is on the table "as is" and it is clear that the salary is not up for negotiation.

If a candidate doesn't want to tell you what he's making, then you don't have much more to discuss.

Finally, clearly define anything unusual about the job. For example, people outside of radio may not realize that we don't all work traditional hours. They may cease to be excited after discovering that they have to work some weekends, holidays, overnights or extra-long days.

With 10 phone finalists, you'll get lucky if you have five left to interview in person. Many companies these days do not want to pay for candidates to come in from out of town, in which case you have two options to present: You can interview them via Skype or they can cover their own travel expenses.

PROMO POWER



Mark Lapidus

I've had great success with Skype interviews and highly recommend that option. If you're thrilled with someone via webcam, you may be able to convince him to invest in his future by springing for a plane ticket.

There are experts who say that the first three minutes of an interview set the tone, so managers need to be ultra-aware of why they are already drawing either positive or negative conclusions due to body language, dress, or appearance.

CHECK BACKGROUND

Should any of these really matter to you? For positions in sales, these attributes can be important, but for on-air personalities, this focus can be counterproductive. In-person interviews should last at least 30 minutes, and it may be useful to go a full hour with one manager.

If you're going to want candidates to meet with others at the station, try to set it up in advance so they can leave your office and go to the next. If you are not an experienced interviewer, have your questions written down.

Extroverts, and there are a lot of them in this business, must tone themselves down to give the candidate a chance to do most of the talking. Allow time at the end of your questions for the examined to ask *you* whatever she likes. This part may seem trivial, but it is another key differentiation. Those who ask intelligent questions are more engaged and often have more confidence about their ability to do the actual job.

You're at the end and down to two candidates. Do you flip a coin — or call references? Based on the shortage of reference calls I've received over the years, I'd say most people flip a coin. It's astounding to me how many people don't call listed references and, if possible, the most recent employer.

An on-air personality who once worked overnights for me wanted to go to a party New Year's Eve, so he turned off the transmitter and left at 2 a.m., thinking it wasn't a big deal. He was fired. A month later, he was on the air in Detroit. Nobody there had called me for a reference.

If you take nothing else away, remember this: Be a great listener during this process and your odds of "hiring great" are that much greater!

Mark Lapidus is president of Lapidus Media. Reach him at marklapidus@verizon.net.

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Viva Las NAB: 38 Years and Counting

Changes, some large, some small, all interesting, since first convention held in Las Vegas

BY JIM WITHERS

The NAB first took its annual broadcasting convention across the continental divide to Las Vegas on April 6, 1975, though the association fathers weren't ready to bet the farm on the new location until 1991.

The convention left town six times after its first visit: In 1976 and '77 to Chicago and Washington, respectively; to Dallas three times, in the 1980s; and to Atlanta, in 1990.

After that final trip back east, the NAB packed up the show tent and decamped for the west. The weather was great, the convention center was big (seemingly bigger every year) and, as a bonus, there were the 50 cent shrimp cocktails at the Four Queens.

As The Show once again approaches, I have begun to think about the changes that have occurred since that first trip west 38 years ago.

THE CONVENTION

Broadcasting Magazine reported in

March 1975 that preregistration for the convention was a whopping 3,166, and that the NAB predicted a record-breaking 5,500 members of the broadcasting industry to attend (they got just shy of that).

This year, the "Fast Facts" page on

the NAB website says organizers are expecting north of 91,000. No matter what you hear in the trenches about broadcasting being a dying medium, that's still a lot of folks.

The 1975 version of the LVCC had two medium-sized halls and a "rotunda" between them, which from the air looked like a giant aluminum wok turned upside down; 203 exhibitors showed off their

wares and services, and the whole thing was in, up and out in three days.

The wok is long gone. The floor is now four halls (really five, given that the South Hall has upper and lower levels), with 1.5 million square feet of floor space and more than 1,500 exhibitors.

The fun kicks off on Saturday and runs until 2 p.m. the following Thursday. It's enough walking to wear the treads off anyone's Nikes.

One of the biggest changes since 1975 is in the mix of exhibitors. Hundreds of companies that did not exist in 1975 are now front and center. Take Microsoft, for instance. Big deal now, right? On April 6, 1975, the company was two days old and had two employees: Bill Gates and Paul Allen.

By comparison, the companies commanding the largest exhibit spaces in Las Vegas in 1975 were RCA (#1) and Ampex (#2). Both have been gone for years. For the most part, exhibitor changes have been a direct result of technological changes and the ability (or lack of it) of companies to adapt.

TECHNOLOGY

Fidelipac was a well-known exhibitor at the 1975 show. (Any reader under 30 will be saying, "Who?") Fidelipac made tape cartridges (to which younger

(continued on page 52)



Photo Courtesy Jim Withers

The once ubiquitous cart machine, now relegated to storage.

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World Radio History

VIVA NAB

(continued from page 51)

readers might now be saying "What?").

These little clear plastic cases with gray undersides held endless loops of 1/4-inch audiotape wound around a spool. All of this, of course, is gone, except in stations (like mine, I confess) where machines and tapes gather dust in storage rooms because the engineer or owner just cannot part with the stuff.

The big transmitter news in 1975 came from Harris, which announced the very first all-solid-state 1 kW AM transmitter, the MW-1.

I was about 10 in the early 1960s when the first germanium transistor became widely available; those devices were fragile in the extreme. Heat (and by that I mean anything beyond shirt-sleeve temperature), static electricity, mechanical shock, almost anything would destroy those first-generation devices. Even if they did somehow survive being breathed on, they could only handle a fraction of a watt of power.

Given all that, the MW-1 was a big development in 1975. Harris Broadcast, I am happy to report, is alive and well, now under new management, and will be a prominent exhibitor again this year.

In 1975, most broadcast engineers had little knowledge or understanding



The author's reel-to-reel tape machine: Not quite an antique, but getting there.

of digital computers. Mainframes were still the primary computing platform. DEC was only five years into making its PDP-11 minicomputer (which powered a fair number of station traffic systems and a few video editing systems in 1975) and the IBM PC (with Gates' and Allen's DOS operating system) was still six

years in the future.

CD players were seven years away. The only way to play back quality audio was by magnetic tape or vinyl disc.

Everything was mechanical. Capstans, pinch-rollers, belts, motors, brake shoes, solenoids, idler wheels, tension arms ... everything was clunking and ratcheting along all the time. Routine wear and tear kept station maintenance engineers extremely busy; when I look back, it seems astonishing that any of it worked at all.

REGULATION

The regulatory news in 1975 was the FCC's adoption of the cross-ownership rule, which said that radio and television stations could not be co-owned with newspapers in the same market.

This was to guard against too much "concentration of media" (no one realizing that an obscure 1969 paper proposing what would eventually become the Internet would upend media concentra-

Photos courtesy: Jim Withers



Records, carts or open-reel tapes, like the assortment pictured here, were about the only options for playback in 1975.

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tion to a far greater extent).

Cross-ownership restrictions, coupled with the "7/7/7 rule" — no company could own more than seven AM, seven FM and seven TV stations — kept even the biggest media conglomerates fairly small. The restriction evolved into the "12/12/12 rule" and finally went away altogether.

One part of the FCC/broadcaster relationship has stayed the same: Tension over indecent and obscene programming is as visceral today as it was then.

In an FCC Q&A forum at the convention in 1975, General Counsel Ashton Hardy and Complaints and Compliance Chief William Ray mused on the commission's position on that topic. Mr. Hardy at one point referred to the then-controversial George Carlin "Seven Words You Can Never Say on Television" record, saying that no matter if it aired at 2 p.m. or 2 a.m., "If it has no serious social value, and I think it did not, this record would be prohibited."

(I highlighted the middle part of this quote, taken from a published report in Broadcasting of April 14, 1975, because, of course, this has been, and remains the problem: One person's obscenity is another person's comedy.)

THE FM/AM FLIP

In 1975, there were hundreds of vacant FM allocations, many of them in major markets, just waiting for someone to come along and figure out how to

make money with them. AM radio was not just dominant; it was overwhelmingly dominant.

The numbers tell the story of what happened next.

There were 4,434 AM stations on the air at the beginning of 1975, with only 2,648 commercial FM's. Many FM stations would have been in the red had it not been for the Subsidiary Communications Authority provision of the rules, which allowed FM stations to transmit a secondary programming service via SCA: Muzak.

But the wind was changing.

FM stations were signing on at the rate of more than a hundred a year. AM, about half that. By 1993, the FM station count finally surpassed the AM (4,959 to 4,945) according to the FCC, and the disparity has only grown.

At the end of last year, the score was FM, 6,580; AM, 4,745. Adding in low-power and non-commercial FM stations tilts the tally even further. The AM tally meanwhile is down from its peak in the early 1990s.

AND, OF COURSE, VEGAS

Las Vegas in 1975 was a blip compared to today — 140,000 people in 1975, give or take a few thousand. A bit more than 1.5 million now. The biggest hotel in 1975 was the Las Vegas Hilton (biggest in the world when it opened as the International Hotel six years earlier).

Vegas has continued the building



Photo courtesy Wikimedia Commons

Think you know all about NAB and Sin City? Can you identify the man pictured, a Vegas history legend? Do you know the cost of the \$15.99 buffet at Circus Circus?

Go to radioworld.com/links and take a fun, informative (we promise!) quiz. Part of Radio World's online-only content.

binge and now has more than 124,000 rooms (62,000 on The Strip alone, but most of the legacy hotel/casinos are gone, replaced by mega-resorts). The Thunderbird, Stardust, Frontier, El Rancho, Sands, Dunes, Silver Slipper, Desert Inn, Landmark ... all gone the way of Howard Hughes, who had bought most of them between 1967 and 1970.

Hughes was a big Las Vegas guy, even after he left town in the dark of night in 1970 for the Bahamas. In addition to all of the casinos, he owned KLAS(TV), more Nevada land than the BLM and the North Las Vegas airport.

Other changes? The monorail, elevated pedestrian crosswalks, not to mention

Steve Wynn ... all new since 1975.

So there it is. A short list of changes that have transpired in the 38 years since the annual NAB Convention hit town. Who knows what the next 38 years will bring to our industry? Or to Vegas? We'll just have to, as they say on the radio, "Stay tuned."

Many of the facts and figures came from magazines archived on the website www.americanradiohistory.com. I am indebted to David Gleason for his fine work in establishing and maintaining that resource.

Share your own favorite Vegas NAB memories. Email radioworld@nbmedia.com, attention Letters.

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Petite Mics for the Smartphone Era

Al tries out several of MicW's mics for use with your iPhone

PRODUCT EVALUATION

BY ALAN R. PETERSON

In just a short time, the Apple iPhone and its myriad Android cousins have changed the face of personal communications, gaming, photography, portable computing ... and now audio recording for radio broadcast.

Radio reporters are using smartphones in the field as recording devices for collecting nat sound, conducting interviews and — with the proper app — editing and mixing files down for delivery. Quite often, portable USB Flash recorders are being left behind at the station in favor of the speed and portability of smartphones.

But what has been generally lacking in this arrangement has been a decent microphone. There has to be a better way to acquire good audio than by awkwardly pointing a phone at a subject, especially when there are multiple reporters in your way.

Cobbling together an adapter for a standard EV 635 mic isn't always a good solution, and there is the hassle of figuring out the pin out of those odd four-connector 3.5 mm plugs.

Which is where the MicW product line steps in. Part of BSWA Technology Ltd. of China, MicW offers multiple

microphone products and adapters for audio acquisition, all designed primarily for use with the iPhone, iPad and other mobile devices.

THE ONCE-OVER

MicW products all are electret condenser-style units, phantom-powered by the smartphone's audio jack. No batteries — other than that of your phone — will die unexpectedly and botch a recording. Mics come in both omni and directional patterns, and all are precision-made and offer wide frequency response.

I have limited my review to a portion of the MicW lineup, concentrating on specific requirements: cardioid (directional) response for rejection of off-axis sounds, a sturdy mic mount to avoid damaging the phone or the connector when used in hostile conditions and decent audio specs that hopefully come in better than the phone's internal mic.

It should be noted the company offers one mic — the i436 — which is a flat-response omni mic best suited to audio analysis. Good to know about and probably handy in the lab, but not really suited for gun-and-run field audio.

MICS

First out of the box is the model i266 (\$169.99 kit, \$129.99 mic only), a high-sensitivity mic surprisingly hefty; it's about twice the weight and diameter of other MicW models.



iShotgun with iPhone

i456 cardioid microphone

PRODUCT CAPSULE

MICW I SERIES

Thumbs Up

- + Fills a need for accurate mobile audio recording
- + Compatible with Apple, Android and Windows devices
- + Small size and well manufactured
- + Accessory kits with adapters, cables and lapel clips in some models

Thumbs Down

- Directionality and frequency response less than ideal in some cases

Prices: i266 (\$169.99 kit, \$129.99 mic only); i456 (\$159.99 kit, \$119.99 mic only); i855 lavalier kit (\$209.99); iShotgun mic kit (\$249.99)

For information, contact MicW in Washington state at (425) 635-8117, email qunyanm@mic-w.com or visit www.micwaudio.com.

or use the included lapel clip and pop filter to pin the mic to the clothing of your interview subject.

The frequency response chart packed with this mic shows some peakiness around 10 kHz and 16 kHz, and a long bass rolloff starting around 600 Hz downwards. This is confirmed audibly (if not scientifically) in test recordings made on an LG smartphone running the RecForge Lite audio app.

A recording made with this mic is going to sound much like what you might hear in TV news audio: articulation of consonants will be fine but with little punch in the region where human vocal energy is the greatest (below 300 Hz). This response is not much different from what you might find in a typical lavalier-type mic, so you shouldn't be expecting RE20 response.

I found the polar pattern description generous in referring to this mic as cardioid. Side rejection is minimal, and rear response is at best passable. If you're going to use this mic, try to use it in a quiet area.

Also, the published specs indicated

PRODUCT SPOTLIGHT

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This mic comes in a plastic case with locking lid, a robust metal tube for storage, extension cable and headphone adapter. You can connect it right to your phone's audio jack and record on the fly,

STUDIO SESSIONS

an S/N ratio of “more than 55 dB.” I would rather see about 65 to 69 dB as a starting point, much like what is offered by something like the Audio-Technica AT831R lavalier.

The slightly narrower i456 (\$159.99 kit, \$119.99 mic only) was next in my testing. Half the weight and radius of the i266, and packed in the same case and tube as the previous model, the i456 turned in a slightly lesser performance. Bass rolloff began as far up as 900 Hz and the highs jumped off a cliff starting just below 8 kHz, with a little blip up around 4 kHz.

GETTING FANCY

One mic kit in the collection that caught my eye is the i855 lavalier kit (\$209.99). Packed with an assortment of adhesive pads, clips and a few pop screens, this MicW product is meant for sit-down, serious interviewing where the mic is pinned to the talent rather than stabbed into the end of the phone for a grab-and-go actuality.

Response on this mic is generally what one would expect from a standard lav mic: rolloff starting around 200 Hz and a brightness bump around 12 kHz, but nicely flat in between. But like the i456, reports of its performance as a cardioid mic are somewhat exaggerated, charting more like an omni.



MicW i855 and its accessories

The cable between the mic and plug is thin and oddly stiff, for anyone used to using lav microphones. Manufacturers like Countryman also use very thin cable on its tiniest mics, but the cable typically has a little more give to it. Whether this impacts on its durability and function remains to be seen.

Top dog honors has to go to the iShotgun mic kit (\$249.99). Packaged in a foam-lined locking plastic carry case, this mic is designed more for smartphone video acquisition than radio

ENG, but is just the edge needed to lift a mic above a crowd of reporters to get close to the action.

Low-frequency response cuts off between 80 and 100 Hz, so street rumble and A/C noise are somewhat tamed. A lift centered around 3.5 kHz helps with clarity without being shrill, and the longer shotgun body helps with directionality. The specs state “super cardioid” and it does indeed have better rejection than the other models tested.

The kit also comes with a shock-

mount ring that can mount to a camera shoe, and a clever telescoping wand and cable that lifts the mic a full yard in the air for those out-of-shot (or above-the-crowd) pickups.

Using all the accessories in this kit is too cumbersome for gun-and-run audio, but the beauty of the MicW line is that you can connect anything directly into your phone, point and record, without all the extras. But this is the most versatile of the bunch.

If you have not had experience with a shotgun mic, be aware that you need to be pointing your mic directly at your subject. They don’t call them shotguns for nothing, and an errant bump in the arm or a moment of distraction that takes you off-axis will be quite obvious during playback.

CONCLUSIONS

MicW microphones fulfill a need for accurate, clear-sounding smartphone-oriented microphones in the smartphone era. Manufacturing is top-notch, with well-finished metal bodies instead of fragile plastic ones.

The designers outdid themselves on several fronts. First, they crafted the metal storage tube used in several of their products to pull double-duty as a safety case *and* a mic clamp to allow

(continued on page 56)









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MICW

(continued from page 55)

mounting to a stand (with a threaded adapter, not included). This is the kind of inventiveness one might find in an Ikea product.

Second, mic kits are packed with a headphone/mic splitter that let you plug in a set of buds to listen in on your recording. And most are also bundled with a 6-foot cable to extend the reach

If it were up to me, I would probably go with the iShotgun, with a tossup between the i266 and the i855 lavalier.

of the mic off the phone — although now mechanical handling noise of the mic becomes an issue.

The plug end of several MicW microphones is fairly wide and may not fit the 3.5 mm jack on your mobile device. Assuming the jack is not recessed, the problem is likely a too-narrow hole in the cellphone cover. Buying a new protective cover, or spending two minutes with an X-Acto knife, solves that problem.

I realize mic design can only go so far, but if there were a way to improve the directionality and S/N specs on these models, the engineers should pursue it. As smartphone audio acquisition becomes more of a standard process, the demand for better audio will not be far behind.

If it were up to me, I would probably go with the iShotgun, with a tossup between the i266 and the i855 lavalier. The 266 mounts right to the smartphone or pins to a lapel and I don't have to worry about a thin cable flexing out on me; but I like the audio specs on the 855 just a tiny bit more.

Depending on the model and brand of smartphone in use, audio acquisition may be a breeze or a bother. One popular manufacturer decided to mount the

audio jack at the bottom of the phone this year, making it awkward to point a mic and watch the display at the same time.

Finally, don't let the accessories affect your purchase decision. The idea is to *reduce* the amount of gear we go out the door with, and a bag filled with goodies may slow you down. Being able to record, edit and upload via smartphone is an enormous time- and budget-saver; no sense bogging it down with pieces we may not need.

Alan Peterson, KJ4IVD, is an SBE-certified audio engineer, a longtime RW contributor and production director for the Radio America Network in Arlington, Va. Contact him at apeterson@radioamerica.org

WHO'S BUYING WHAT

Wheatstone reported a number of recent sales. **Fairchild Radio** (Toronto) added seven PC drivers to its WheatNet-IP system to replace soundcards, through Ron Paley Broadcast, Canada. **Skyview Satellite Networks** (Scottsdale, Ariz.) purchased II Blades and Navigator software for a new core routing system; the company is also partnering with Wheatstone for a WheatNet-IP interface into the Skyview automation system. **CBC** (Alberta) purchased a Blade, three controllers and PC drivers for a WheatNet-IP system through Marketing Marc Vallee, Quebec.

KFYN(AM) of Bonham, Texas, purchased an **Audioarts Engineering** Air-4 console. **Cumulus in Miami** purchased an IP-12 digital console. **Broadcast and Studio Company** of Bangkok, Thailand, purchased an R-55e control surface.

Low-power FM station **WDRW** in Athens, Ga., is using a **BW Broadcast** TX300+ transmitter.

Tampa's **WSUN(FM)**, an alt-rock station, has turned to crowdsourcing its playlist via **Listener Driven Radio's** LDR Takeover platform.

South Africa's **Radio Pretoria**, a community radio station that operates a network of 10 transmitters, recently added a **Nautel** VS2.5 FM transmitter to its fleet.

Triton Digital powered **SXSWfm**, the official online radio channel of

the South by Southwest Music, Film and Interactive Conferences and Festivals, through its audio streaming suite. **SXSW** utilized Live Streaming for high-quality delivery, the Ad Injector platform and its MRC-accredited Weecast Metrics audience measurement solution.

KSBJ(FM), an expanding religious broadcaster in the Houston area, has chosen **Clear Channel Satellite** for equipment and satellite program distribution services. The XtremeSatMedia satellite distribution platform equipment will be at the base of uplinking and receiving program material.

Axia reported recent sales.

Vista Radio's **CJCS(AM)** and **CHGK(FM)** in Stratford, Ontario, Canada, have outfitted its studios with Axia iQ consoles, QOR.32 mixing engines and Axia xNode IP-Audio interfaces.

Shamrock Communications' **KNEZ(FM)** and **KRZQ(FM)** in Reno, Nev., has new studios equipped with Axia iQ consoles, QOR.32 mixing engines and a studio network using xNodes IP-Audio interfaces.

NEP purchased an Nx12 for its TV studios in New York. Inspiration Media's **KGW(AM)** in Seattle is using **Telos** Zephyr Xstream ISDN codecs for remotes. Also buying Zephyr Xstreams are Lincoln Financial's **WSTR(FM)** and **WQXI(AM)** in Atlanta.

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Take a Fresh Look at AM Rules

Dawson and Rackley say several changes can be made right away

COMMENTARY

BY BEN DAWSON
AND RON RACKLEY

We are pleased to see attention being paid to the question of what changes might be made in radio regulation to enable AM broadcasters to plan for a future. We believe that AM radio is being held back from realizing its best uses, now and in the future, by long-obsolete technical regulations.

As consulting engineers, AM radio station owners rely on us for studies on how their facilities can continue to operate when they are forced to move transmitter sites and, sometimes, how their coverage can be improved with antenna system changes.

In this capacity, we can see how the present technical rules of the FCC impair, rather than assist, AM radio in remaining relevant while filling roles where its service will be needed in the ever more diverse technological marketplace of the future.

DATED PRINCIPLES

The present rules, we believe, are based on principles that may have reflected the situation in the 1920s and 1930s, when AM radio was the only over-the-air electronic medium, communities consisted of centered population areas, rural areas were sparsely



Ben Dawson



Ron Rackley

populated and man-made noise levels were low. But they fall short of what is needed today.

Our rules have their roots in a time when an AM radio station provided one of only a few sources — if not the

only one — of electronic entertainment and information within its coverage area. Most AM licenses were valuable business franchises. It was the FCC's job to see to it that as many communities as possible were served by them as well as possible.

Now, AM radio is but one of a multitude of electronic options for its potential listeners, and most stations are in survival mode searching for audiences to serve with at least modest profitability.

There is more. The rules have been changed over the years with the focus on reducing interference between stations instead of improving coverage. But now AM stations are in "straightjackets" imposed to restrict stations from interfering with each other but that instead severely limit their ability to improve coverage or to make transmitter site changes.

TYPICAL CASE

We see examples of how AM broadcasters are hampered in providing service by obsolete rules all the time, when AM stations are forced to move.

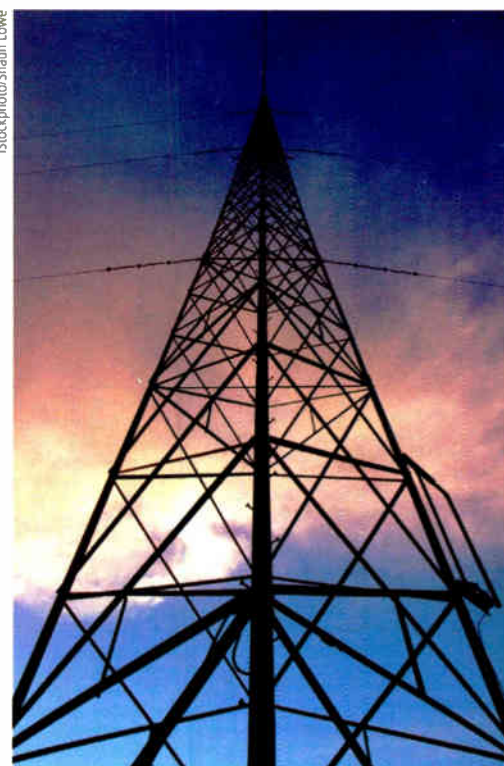
A typical situation arises when an AM station loses the lease on the transmitter site it has occupied for decades and comes to one of us wishing to build a new site more centrally located for its listeners (often minority and/or foreign language speakers).

We have to make them face the reality that the station's power must be reduced to avoid increasing "grandfathered" signal overlap with other stations. A tower of the height that can be approved for a building permit locally will not meet the FCC's minimum efficiency requirements. The city of license will have to change because coverage requirements of the rules cannot be met for the present one.

And, to make matters worse, the city of license change is going to be difficult, if not impossible, because it will be caught in the "net" put in place to stop FM stations from moving out of rural communities closer to large cities — a situation nothing at all like what the AM station needs to do.

Dealing with the unnecessary requirements makes lots of expensive work for consulting engineers, too. We would like to be able to provide the services that are really needed for the survival of AM radio stations for much lower costs than are possible in the present regulatory environment.

iStockphoto/Shawn Lowe




OUR SUGGESTIONS

There needs to be a totally fresh look at what the AM radio technical rules should be, taking into account the flexibility stations require to best serve the population segments they desire in the expanding universe of electronic media.

We suggest:

- Eliminating the city of license coverage requirements to allow stations to use a marketplace approach to providing service to their actual audiences;
- Eliminating antenna minimum efficiency requirements to allow stations flexibility in tower height as long as the maximum radiated field can be known for the actual transmitter power;
- Eliminating the minimum ground system requirements for AM antennas to allow stations flexibility in choosing new transmitter sites when they have to move;
- Increasing the daytime protected contour level from 0.5 mV/m to a higher value more representative of man-made noise levels to allow higher power for AM stations;
- Returning the daytime first-adjacent channel protection ratio to 1:1 and eliminating the nighttime first-adjacent channel RSS contribution since the very wideband radios that were posited when the present rules were developed never materialized;


(continued on page 62)



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A New Vision for U.S. Global Media

Unite the six USIB entities into a single broadcasting organization

COMMENTARY

BY A. ROSS JOHNSON AND
R. EUGENE PARTA

United States international broadcasting (USIB) is at a critical juncture as it faces new, 21st century challenges.

In a recent Woodrow Wilson Center paper, we proposed a new vision for U.S. international broadcasting: a single, non-federal, congressionally-funded broadcasting organization that unites the current six USIB entities into one, with a revitalized mission employing the latest technologies in an "audience-centric" communications strategy [read the paper at radioworld.com/links].

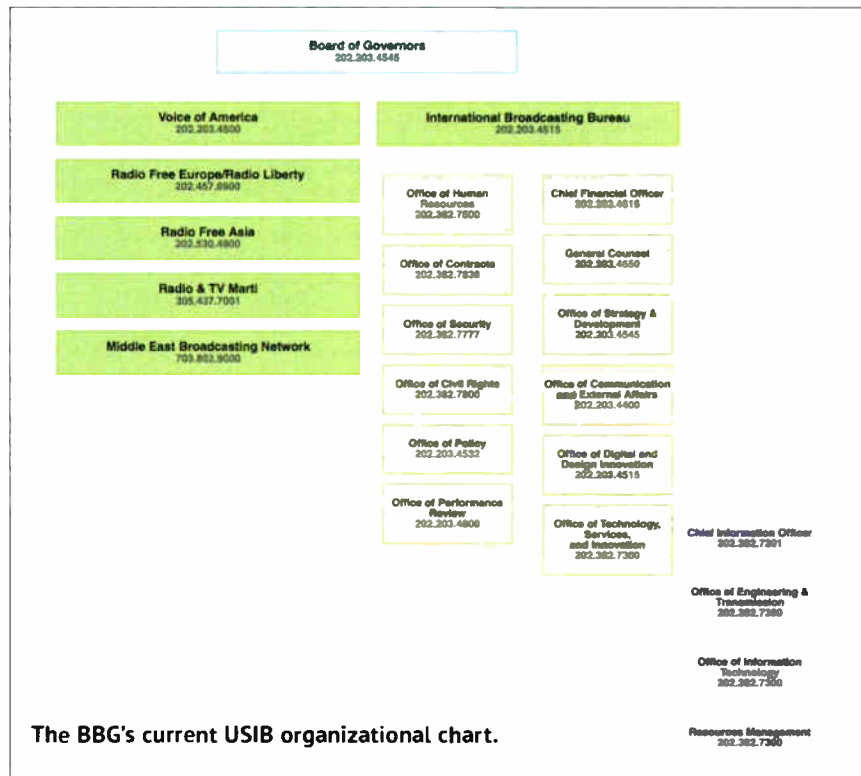
This reform will be essential to maintain an effective U.S. presence in an often hostile international media milieu.

USIB remains the leading edge of American soft power; the principal means by which the United States speaks directly to less free and impoverished nations, including North Korea, Iran, China, Afghanistan, Pakistan, Russia, Belarus and Cuba.

USIB works, but not nearly as well as it could. Its Cold War organizational legacy of multiple, partly duplicative broadcasting organizations detracts from maximizing its potential reach and impact.

LEGACY HAMPERS INNOVATION

The Cold War role of USIB, as a highly effective tool of U.S. "soft power," has been widely acknowledged. Voice of America, Radio Free Europe and Radio Liberty all made important contributions to the political, economic



The BBG's current USIB organizational chart.

and social transformation of Eastern Europe and the USSR, in moving away from communist authoritarianism.

By denying controlled state media the monopoly on information and public discussion, USIB helped keep critical thinking alive and fostered an understanding of democratic alternatives.

However, the two-pronged Cold War communications strategy of "telling America's story" (VOA) and providing a "surrogate free press focused on domestic issues" (RFE and RL) is no longer relevant in the new international

media environment.

Moreover, two USIB organizations, VOA and RFE/RL, have now grown to six (adding the International Broadcasting Bureau, Radio Free Asia, Radio and TV Marti and the Middle East Broadcasting Network), with overlapping language services, duplicative management and support structures, and largely un-coordinated missions and operations.

This hodgepodge of U.S. broadcast organizations, often competing among themselves, can no longer be defended

on either mission-related or budgetary grounds, and hampers a rational allocation of resources in line with American strategic priorities.

New technologies have also dramatically altered media consumption patterns worldwide.

Satellite television is now more important than radio in most areas, especially in the high-priority target area of the Middle East. Social media, such as Facebook and Twitter, are taking on increasing importance for international broadcasters as was seen in the Arab uprisings of 2011–2012.

Communications are no longer one-way but an interactive dialogue between sender and receiver and among receivers on various platforms. While the role social media played in fostering political change in the Arab uprisings may have been exaggerated, as with all technologies, they can be used for good or ill.

Just as political activists seeking democratic change can use these new technologies to their advantage, they can also be employed effectively by repressive regimes for their own less noble purposes.

OUTMOODED STRUCTURE

Congress and the OMB are showing less tolerance for multiple legacy broadcast organizations with overlapping activities and management structures.

The Government Accounting Office issued a report in January that focused on overlap [also at radioworld.com/links]. Unlike the Cold War era, where a strong case could be made that VOA and RFE/RL were largely complementary, they and their more recent siblings Radio Free Asia, the Middle East Broadcasting Network (comprising Alhurra TV and Radio Sawa) and the Office of Cuba Broadcasting (Radio and TV Marti) are

(continued on page 62)

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41	APT Worldcast Systems	www.aptcodes.com	57	Dixon Systems	www.dixon.com	19	Nautel Ltd.	www.nautel.com
54	Audio Technica	www.audio-technica.com	25	Ecreso Worldcast System	www.ecreso.com	12	Netia	www.netia.com
5	AudioScience Inc.	www.audioscience.com	20	Elenos	www.elenos.com	40	NPR Satellite Services	www.nprss.org/rworld
13	Axia - The Telos Alliance	www.axiaaudio.com	28	ENCO	www.enco.com	21	Omnia - The Telos Alliance	www.omniaaudio.com
46	Belar	www.belar.com	18	ESE	www.es-web.com	47	Omnirax	www.omnirax.com
57	Besco Internacional	www.besco-int.com	43	Eventide	www.eventide.com	39	OMT Technologies/iMediaTouch	www.omt.net
57	Bext, Inc	www.bext.com	57	FM Services	www.towermonitor.com	55	Ram Broadcast Systems	www.ramsys.com
16	Broadcast Bionics	www.phonebox.com	57	Gorman Redlich Mfg	www.gorman-redlich.com	35	RCS	www.rcsworks.com
37	Broadcast Electronics	www.bdcast.com	52	Grace Broadcast Sales	www.gracebroadcast.com	26	Shively Labs	www.shively.com
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31	BSI	www.bsiusa.com	60	Heil Sound, Ltd.	www.heilsound.com	52	Superior Electric	www.superiorelectric.com
3	BSW	www.bswusa.com	22	Henry Engineering	www.henryeng.com	45	Telos Alliance	www.telosalliance.com/now
6	Burk Technology	www.burk.com	15	Inovonics Inc	www.inovon.com	1	Tieline Technology	www.tieline.com
51	Clear Channel Satellite	www.clearchannelsatellite.com	14	Jampro Antennas, Inc.	www.jampro.com	2, 32-33, 64	Wheatstone Corporation	www.wheatstone.com
56	Coaxial Dynamics	www.coaxial.com	49	JK Audio	www.jkaudio.com	57	Whisper Room, Inc.	www.whisperroom.com
6, 63	Comrex Corporation	www.comrex.com	10	Kintronic Labs Inc	www.kintronic.com	11	Wide Orbit	www.wideorbit.com
8	Continental Electronics Corp.	www.contelec.com	9	Logitek	www.logitekaudio.com	27, 34	Yellowtec	www.yellowtec.com

GLOBAL MEDIA*(continued from page 61)*

now often viewed with considerable justification as duplicative.

USIB broadcasters produce programs in 59 languages, targeted on countries, which, with three exceptions, lack fully free media. Roughly a third of these languages (20) are carried by two of the broadcasters (VOA and RFE/RL or RFA).

The different and often competing elements of USIB have strong patrons among America's politicians and pundits, who have little appetite for seeing favored broadcasters reduced, consolidated with the same language service of another USIB broadcaster, or eliminated.

The current structure impedes allocation of resources according to strategic priorities. Funding for broadcasts to Cuba, for example, nearly match funding for broadcasts to China, which is of major strategic importance, and that funding is divided between VOA and RFA.

A changed global, political and media environment, new technologies, heightened friendly and adversarial competition, budgetary pressures and outmoded legacy structures and their political patrons have coalesced to place USIB at a critical juncture. Major institutional reform is essential to meet the challenges of the 21st century.

AUDIENCE-CENTRIC

All USIB — if it is to serve American strategic interests and compete successfully in the fragmented and rapidly diversifying global information market place — must focus on intended audiences and be attuned to their culture, perceptions and information deficits.

It must be more than audience-focused; it must be audience-centric.

And that "audience" should be plural: audiences. Within a given society, key elites and other social groups have different information needs from those of the general population, and reliable market

intelligence is crucial in determining changing target audiences and communications strategies to reach them with credible, objective news and analysis.

The challenge today is to recast USIB as a single organization, funded by Congress but not part of executive branch, that will produce and distribute audience-centric programming efficiently on multiple platforms.

This organizational structure would be similar to the BBC World Service (in its former, more independent state), the National Endowment for Democracy, and the United States Institute of Peace, all of which are funded by government grants but are guaranteed operational independence.

This reform will be essential to maintain an effective U.S. presence in an often hostile international media milieu.

Distance from government — a firewall — is essential to ensure the journalistic professionalism, free from bureaucratic interference, that is crucial to the credibility of the operation. Governance should be provided not by a federal agency (such as the Board for International Broadcasting, which oversaw RFE/RL prior to 1995, or the Broadcasting Board Governors today), but by a non-partisan board of directors including individuals with journalism and foreign affairs experience who exercise oversight but delegate management functions to the executives it appoints.

A single new organization, congressionally funded but non-federal, would avoid duplication of resources and permit maximizing capabilities devoted to individual countries on a rational basis. As a non-profit entity, it would avoid the stigma of "official radio or TV," which

other international broadcasters (apart from China and Russia) have avoided or are now abandoning.

The proposed new organization would not abolish language services of the current broadcasters but would incorporate them as building blocks supported by a central news operation, with the eventual goal of one language service to a given country using a given technology.

The new organization would preserve, not abandon, respected brands that have acquired equity over time in their respective broadcast regions — the VOA brand in Asia, Africa and Latin America, RFE/RL brands in Eurasia, RFA brands in East Asia and, increas-

ingly, MBN brands in the Middle East.

U.S. international broadcasting has a proud and successful history and even in its current unwieldy state does many things right. But bold restructuring is required to respond vigorously and credibly to 21st century challenges.

A. Ross Johnson is a Wilson Center Senior Scholar and Hoover Institution Research Fellow. He has held senior management positions at RFE/RL including director of Radio Free Europe. R. Eugene Parta is a consultant on international broadcasting issues. He is retired director of audience research and program evaluation at RREIRL and was chairman of the Conference on International Broadcasting Audience Research. They are co-editors of "Cold War Broadcasting: Impact on the Soviet Union and Eastern Europe," Central European University Press, 2010.

We do not wish to discourage long-term thinking about how AM broadcasters might be granted new spectrum for replacement of their present service — such as the TV Channel 5/6 idea that has been receiving a lot of attention lately — but we do not see that proposal becoming a reality for many years, if ever.

There is a lot that can be done now, including some non-technical rule changes we haven't included here, to improve the viability of AM stations that have a chance to survive in the meantime. We say, "Let's get to it."

Ron Rackley is a partner in the firm of duTreil, Lundin & Rackley. Ben Dawson is a partner in the firm of Hatfield & Dawson. In naming the duo to receive its 2006 Radio Engineering Achievement Awards, the NAB described them as "icons in the field of AM broadcast antenna system design and optimization."

Comment on this or any story. Write to radioworld@nbmedia.com.

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1664: Just what it looks like. Two tin cups and a string. But it transmitted sound!



1876: Alexander Graham Bell's commercially viable telephone.



1900: Phones become fixtures in more well-to-do and steam-punk homes.



1920: Every home is working toward having a telephone!



1936: The advent of the dial desk phone. No more asking the operator to connect you.



1963: Push buttons usher in the thoroughly modern world. Touch tones enter pop culture.



1983: The mobile phone is a reality. Plots in all TV shows get a boost!



2004: IP Telephones begin to become the staple of modern business.



2007: Smartphones are complete communications centers. AND they can sound great!



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