NAB SHOW PREVIEW SPECIAL

NewBay Media

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How Many HD FMs Will Raise Power?

Cost Considerations Make A Sudden Rush Unlikely

BY LESLIE STIMSON

Now that radio has its answer from the FCC about an FM IBOC power increase, groups and other station owners are determining whether they have the capital to raise digital power and how much of an increase their budgets and transmission chains can accommodate.

NEWSANALYSIS

Observers contacted by Radio World believe the industry process to higher power will be a slow, steady one rather than a rush.

Opponents of the power boost have predicted that increases will be limited to a few high-power FMs owned by large groups and to noncoms in large markets. They think other FMs will wait to see how increases work out for early IBOC adopters and stations that purchase equipment with the increase in mind.

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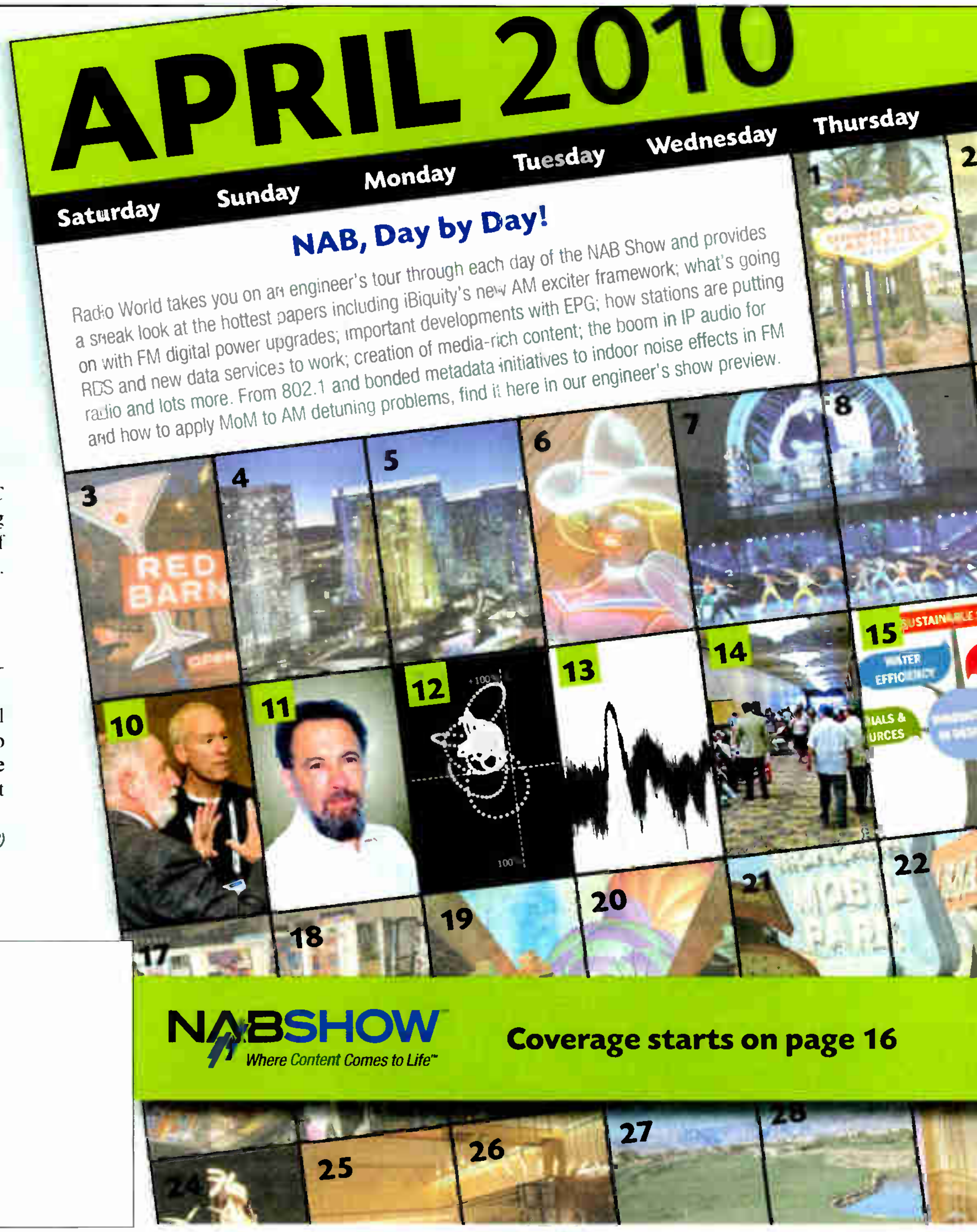

NAB, Day by Day!

Radio World takes you on an engineer's tour through each day of the NAB Show and provides a sneak look at the hottest papers including iBiquity's new AM exciter framework; what's going on with FM digital power upgrades; important developments with EPG; how stations are putting RDS and new data services to work; creation of media-rich content; the boom in IP audio for radio and lots more. From 802.1 and bonded metadata initiatives to indoor noise effects in FM and how to apply MoM to AM detuning problems, find it here in our engineer's show preview.

NABSHOW Where Content Comes to Life™

Coverage starts on page 16

Calendar photos: 1 & 6: Las Vegas News Bureau; 3 & 21-22: Courtesy The Neon Museum; 10 & 14: Jim Peck; 17-18: bentradio.com; 24: Eugene Buchko; 27-28: Courtesy TPC Las Vegas; 29: Courtesy The Palazzo

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Audio Fidelity Is Big at PREC 2010

Manufacturers Will Detail HD Radio Power Increase Options as Well

How a station might implement the FM IBOC power increase, the fundamentals of audio processing, radio captioning and coming advances in Public Radio Satellite System receivers are among topics planned for discussion at the 2010 Public Radio Engineering Conference.

The PREC takes place April 8–9 at the MGM Grand in Las Vegas just before the spring NAB Show; some sessions will be shared with the PBS Tech Con. The registration fee includes admission to the SBE Ennes workshops on April 10.

Roger Karwoski, assistant general manager and chief engineer of KBIA(FM), Columbia, Mo., has titled his presentation "Last Mile Via IP," a discussion of his efforts to put a repeater station on the air in rural Missouri and electing to use a wireless connection to feed IP audio to the repeater.

The KBIA experience is an early example of a trend in which, for cost and availability reasons, audio over IP becomes the best choice for a main STL feed, according to Dan Mansergh, director of engineering for KQED Public Radio, San Francisco and vice-president of the Association for Public Radio Engineers, which organizes the PREC.

WFMT(FM) Chicago's Chief Engineer Gordon Carter will focus on the fundamentals of audio processing including a discussion of the balance between dynamic range and loudness.

Like Carter's station, KUVO(FM) in Denver is a classical format station that pays special attention to its audio, in particular for live broadcasts of the Colorado Symphony Orchestra. Chief Engineer Mike Pappas said he'll share his experiences using audio loudness specifications originally developed for HDTV multichannel audio to avoid the "too loud or too soft" problem.

NPR Labs will update attendees on grant projects including captioned radio, an application possible with stations transmitting an HD Radio signal.

Public Radio Satellite System employees will detail upgrades planned for the PRSS programming distribution system. New satellite receivers are being designed to help the ContentDepot program delivery system accommodate more features, according to Mansergh.

Photos by Leslie Stimson

Don Danko of Cincinnati Public Radio and John Kean of NPR Labs were the 2009 PREC Engineering Achievement Awards winners.

Where the updating of the next-gen Emergency Alert System stands is also a topic planned for discussion.

Panels from manufacturers detailing how stations might achieve an FM HD Radio power increase will round out the program, specifying how those who transmit in HD now might get additional power out of their RF system using transmitters, filters, antennas and combiners. Manufacturers also will focus their power discussions for those whose stations haven't yet deployed IBOC but plan to.

Paid registrations for the PREC are due by March 31. Download a registration form at *www.nprlabs.org/apre*. Direct questions to Jobie Sprinkle at WFAE(FM) in Charlotte, N.C., at *jsprinkle@wfae.org*.

Companies that have announced support for PREC 2010 are Broadcast Electronics, Harris, Nautel, DTS-Neural, ERI, NPR Labs and PRSS.

— *Leslie Stimson*

Blesser Advocates Creative Learning

For This Technically Minded Man, It's All About Psychology

Broadcast engineers, do you want to enhance your stature and your value to employers? If so, augment your technical skills with a better understanding of people

That's a key message of Barry Blesser, who will deliver the keynote at the opening of the Broadcast Engineering Conference of the NAB Show.

Blesser is director of engineering for 25-Seven Systems and may be familiar to you from his column on the last inside page of Radio World Engineering Extra. I'm delighted that NAB officials cited his articles in Radio World as one of the reasons they were aware of Blesser's talents, and I'm pleased you will have a chance to hear from this affable, deep-thinking man in person if you attend the convention.

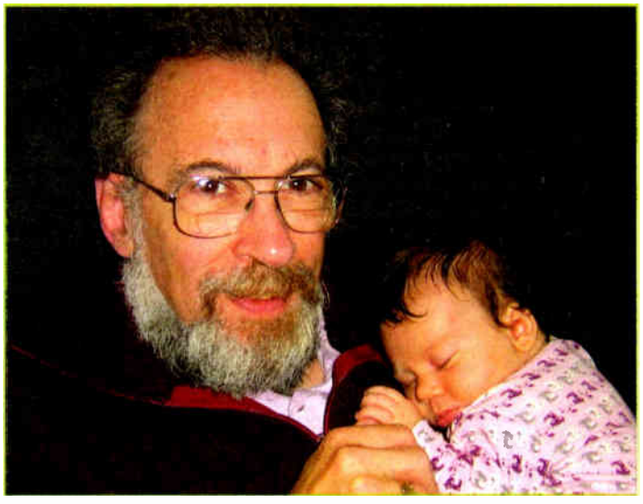
ADDED VALUE

Barry says he learned early in life that the best predictor of career success "isn't their smarts but how well they play in a group." Unfortunately, the personality type most common in our part of the radio business doesn't always do so well at this.

"Engineers tend to relate to their colleagues and managers as if logic trumps emotion, psychology and self-interest. People assume other people are logical and rational, and don't take into account other aspect of humanity."

The title of his keynote is "A Path for Restoring the Lofty Status of Broadcast Engineers."

Barry argues that the broadcast "systems" in which we work are collections of elements that interact with each other, "such that the personality of the system cannot be found in any of the individual pieces."



Barry Blesser with granddaughter Rebecca

In other words, you are one cog, one piece of the puzzle, one slice of the radio pizza pie. The system also includes "investors, managers, listeners, colleagues, advertisers, competitors, journalists and of course, technology."

Yet while systems have become more complex, technology has become more of a commodity. As a result, broadcast engineers have found themselves bumped off their former perches as "brilliant wizards."

To succeed in today's environment, he says, engineers must understand that technology, while necessary, is not enough — a lesson he learned in his own career.

"When I started out, I thought I'd be a pro audio designer using transistors. I then moved to digital, then signal processing, then systems. I kept going — it became clear that the technology was becoming easier. More people can do it; it has elements of becoming a commodity whereas at one time it was a rarefied skill.

"Designing a transistor amplifier was a unique skill, as was digital processing. They had very high added value, stature and compensation. We were considered whizzes. But that situation doesn't last very long because stuff spreads rapidly. With so many people, the competition gets very steep if you want to be a wizard.

"What makes high added value is combining different disciplines and skill sets."

SPACES SPEAK

Blesser is an unassuming man whose gentle nature and intelligence are obvious when you meet him. What's less immediately apparent is the depth of his fascinating experiences.

He was a professor of electrical engineering and computer science for 10 years at his alma mater MIT; he then founded his own consultancy in 1978. He was an unpaid consultant to the Department of Justice during Watergate (when DOJ had some little matter of audio tapes to deal with), and he has been an expert witness on many audio cases.

Blesser developed the first commercial digital audio concert hall simulation, a reverberation system, in 1976 for German manufacturer EMT, and was recently hired by another company to reproduce that earlier product in software. He was the president of the Audio Engineering Society in 1980–81 and has received several prominent AES awards; he organized the first AES conference on digital audio.

He has had a hand in products or companies you know, and holds numerous patents.

He was director of engineering at Orban and principle engineer for its Audicy DAW in the 1990s; he designed the DSP in some Lexicon reverbs. He was chief technology officer for Studer and co-founder of Pencept Inc. The latter company explored the idea of "pen computing" and handwriting and gesture recognition algorithms in the 1980s. In 2006 he co-authored the book "Spaces Speak, Are You Listening?" which introduced the concept of "aural architecture," how what we hear affects our experience of a space.

He offers management consulting, executive coaching and career development services, and he remains director

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FROM THE EDITOR

Paul McLane

THIS ISSUE

MARCH 24, 2010

Public Interest in the Digital Era

Copps Says the Question Is How to Make It Survive and Thrive

The following are excerpts of comments by FCC Commissioner Michael J. Copps to the Future of Media Workshop on March 4 in Washington.

NEWSMAKERS

What you're here to talk about today goes to the heart of one of the most pressing challenges confronting our nation today. And it goes to the heart of what this agency should be all about. I'm talking about helping to ensure that our citizens have a media that truly serves the public interest.

Since I walked through the doors of this building nearly nine years ago, I have been working to revitalize the public interest, especially in our broadcast media — as required by our enabling statute. Frankly, when I got here, I couldn't understand why this should be such a steep climb. How can it be too much to ask? Wasn't this the deal in the first place: Broadcasters would get to use the people's spectrum for free in exchange for serving the people in their diverse and local communities?

But then I found out that for most of the past 30 years, we had really dropped the ball. And I use "we" to include both the private and public sectors. ...

Those three decades of horrendous decisions set in motion a media free-fall that has inflicted serious consequences on the body politic. The private sector harm here was a tsunami of media consolidation fueled by the same hyper-speculation that was fueling so many bubbles in so many other industries. ... At about the same time these sins of commission were issuing from the private sector, sins of both commission and omission emanated from the FCC. We fell under the spell of an ideological deregulatory mind-set that fueled the evisceration or outright elimination of just about every public interest obligation or public interest guideline we had. ...

RE-INSTILL WHAT WAS LOST

There's some good news, though. And the good news is we have a chance now — better than in many, many years — to bring the public interest back.

Change is in the air. And my belief is that, if we all do our work, the days of dismantling public interest protections and walking away from our statutory mandates; of treating TV as just a toaster with pictures and nothing more; of writing blank checks for every sort of hyper-speculative deal that some budding financial genius could devise; the days of wondering if such a thing as the public interest actually existed and waiting skeptically in the night for an angel of the public interest to appear to prove it — I believe those days are passing away.

This commission, with another helping hand from the American people, can — and I believe it will — bring the public interest back to life. Change won't be easy, but nothing worthwhile ever is.

The question now is not *whether* there is a public interest, but how to make it survive and thrive. And that's why we're here today — to solicit and elicit your thoughts on how public interest oversight applies to the world we're in and to the world we're heading toward.

How should it apply to the world of new digital media, but also how do we re-instill some of what has been lost in traditional media? This latter part is as important as the former because it is newspapers and broadcast media that still originate the overwhelming amount of the news we get — on the order of three-quarters or more — and that number is going to go down only slowly, so traditional media will be playing the major news role for some years to come. Five more years of watching it slide as it has been sliding is not something American democracy can afford. Address this problem with the urgency it deserves, please.

As for the new media to which much

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COPPS

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of our media will one day migrate, how do we ensure that it serves the public interest and that it nourishes the civic dialogue and citizen engagement that democracy depends upon — on a technology platform that has not thus far been much subject to public interest consideration? ...

HOW TO BE HEARD

And there are lots of other questions. There's budding and insightful scholarship on this, one example being Matthew Hindman's new book, "The Myth of Digital Democracy."

How do people really get *heard* on the Internet? It's easy to type something and send it into the ether, but what guarantees that anyone reads it — what guarantees that it doesn't just evaporate into the ether? Anyone who has access can log on and say what they want, but do minorities, women, the disabled, the poor, the non-affluent and the non-elite — do they really have an equal chance of being heard?

And how much does the hidden architecture of network design tilt the field in favor of the kind of big company control and consolidation in the new media that we saw visited so harmfully on traditional media? The future town square will likely be paved with broadband bricks, and we need to make sure that every community, group and individual in this country has access to that town square. But it's no slam-dunk it will happen that way. It will happen that way only if we *make* it happen that way.

Technology is public interest neutral. It can accomplish good things and bad — what decides the outcome is you and me.

Here's a final piece of good news. Chairman Genachowski has teed up for the commission a public notice that asks many of these questions. That notice is entitled "The Future of Media and Information Needs of Communities in a Digital Age." And he has brought onboard my new friend Steve Waldman to spearhead this work and to work with all of us in finding answers and identifying solutions. I hope each of you will work closely with Steve and respond as fully and creatively for the record as you can.

I don't pretend there are a lot of easy answers to these tough questions. But, at their core, they're not new and unprecedented either. The challenge to guarantee the flow of news and information all across the land long predates broadband. It's actually a very old challenge. George Washington, Thomas Jefferson and James Madison put it front-and-center as first things for their young country to ensure. And they figured out ways to get the job done, to make sure that the information infrastructure of their day, which was newspapers, was widely available *as a matter of public interest policy* — because they knew their fragile new democracy depended on it. Today our technology is new, but our democratic challenge is exactly the same.

Michael J. Copps was sworn in for a second term as a member of the Federal Communications Commission in 2006. He served from 1998 until 2001 as assistant secretary of commerce for trade development at the U.S. Department of Commerce and is a former chief of staff to Sen. Fritz Hollings, D-S.C.

BLESSER

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of engineering for 25-Seven Systems, an audio technology company he co-founded with Geoff Steadman and Derek Pilkington seven years ago. You can read more about his career and download his audio presentations at *blesser.net*.

HOW YOU THINK

Through four decades he has been fascinated by how technology and people interact and sometimes collide, wondering about "how to glue people together into a system. It's common sense, but there's no place in our culture where you can be exposed to that." His study leads him to believe that lifelong learning is essential to staying psychologically young.

Many broadcast engineers "don't have a clue about psychology, what drives managers or themselves. It's a critical step. They need to learn new ways of looking at things, rather than just learning concrete facts."

So take a course in economics or psychology. Subscribe to BusinessWeek to learn how other types of managers think. Rather than learning yet another programming language, learn the *psychology* of software.

"In this day and age, when you drown in information, in hundreds of thousands of books, you'd never be able to keep up if you were just absorbing content. It's how to think about yourself and your situation."

Blesser speaks at the Broadcast Engineering Conference on Sunday April 11 at 9 a.m.

Selected content from Radio World's "The Leslie Report" by News Editor/Washington Bureau Chief Leslie Stimson. To receive the free, bimonthly e-mail newsletter, subscribe at www.radioworld.com/subscribe.

WJFK HD PROJECT AVOIDED WINDOW LIFT

A backstory on the Harris install of WJFK(FM)'s new HD Radio gear including an HD4 channel is interesting.

Tim Anderson, manager of strategic radio market/product development for Harris Broadcast, tells me the crew thought they might have to haul the disassembled new HPX30 transmitter up three floors by crane and hoist it through a window, but they were able to take it up the stairs after all.

The install crew didn't want to use the small elevator because they were worried the weight might be too much for the elevator in the transmitter building located in Falls Church, Va.

In addition to the transmitter, WJFK purchased the Generation III Flexstar HDx FM/HD exciter, HDE200 Embedded Exporter and HDI100 Importer running the latest version 4.3 software; he estimated the package's list price at about $120,000.

Anderson says stations that have Generation 3 compatible hardware can achieve the HD4 channel with a free software upgrade to their HD importer. Gen 3 HD Radio gear, which supports the embedded exporter, shipped last year. The company also plans to release a version of the software for the older first-and second-generation hardware for a fee.

Taking part in WJFK's HD4 launch were CBS Radio Market Chief Engineer Jeff Loughridge, Regional Director of Engineering Erich Steinnagel and Senior Vice President of Engineering Glynn Walden.

CBS Radio SVP Engineering Glynn Walden pushed the button to start the new digital transmitter, I'm told, which seems fitting.

WJFK USES MP3 MODE FOR HD4 CHANNEL

With a licensed analog ERP of 22.5 kW, WJFK(FM) was granted an STA to raise its digital power by 6 dB to –14 dBc as part of its RF project. That equates to 1,074 Watts of digital power in MP3 mode.

Using common amplification, the Harris HPX30 transmitter is delivering 13 kW of analog power and 621 Watts of digital power to the antenna that needed no changes to accommodate the HD4 multicast.

The station is dividing up its channel bitrate with 48 kbps for the HD main channel, and 24 and 24 for HD2 and HD3 channels (using up its 96 kilobits). To achieve the HD4 channel WJFK is using the extended hybrid carriers (MP3 mode) for an additional 24 kbps.

It's also using Neural codec pre-conditioning, which optimizes the audio for the lower-bitrate codec. The HD4 feed is being supplied to WJFK as a streaming feed over the Internet. All of WJFK's HD channels are delivered by IP to the transmitter site in the Tysons Corner, Va. area about seven miles from their studio site, according to Tim Anderson, manager of strategic radio market/product development for Harris Broadcast.

Anderson says CBS using its HD4 to air out-of market sports is innovative; I agree. Many D.C. residents are from elsewhere on the Eastern seaboard and want to hear games originating from nearby Baltimore, Philly and New York.

POWER

(continued from page 1)

STAS

The Federal Communications Commission on Jan. 29 released an order allowing most of the approximately 1,500 stations that broadcast FM digital signals to increase digital power immediately by 6 dB, a four-fold power increase (see Feb. 10 issue).

Proponents asked for this voluntary increase so stations could match analog coverage areas and to make the digital signal more robust to strengthen multicast channel reception. The latter consideration is even more important now that four digital channels are possible.

The Media Bureau also established application procedures for stations that want to raise FM digital power more than 6 dB, up to a possible10 dB, a tenfold increase from current levels.

The changes were to become effective 30 days after Federal Register publication, which had not occurred as of early March.

No sources contacted by Radio World could say for certain how many stations will make the leap. Some noncom FMs, including KUHF in Houston, KUVO in Denver and WAMU in Washington, had applied earlier for STAs. An NPR survey of member station managers in October which found that 70 percent plan to upgrade FM digital power within the next 12 months.

As of March 9, the commission had granted 24 STAs allowing higher digital power; it did not distinguish between commercial and noncommercial outlets in the figure it provided to Radio World. Of these, 19 were granted a 6 dB increase, one a 3 dB increase and four were granted the full 10 dB increase.

Bob Struble, president/CEO of HD Radio developer iBiquity Digital Corp., was pleased with the FCC's January decision. He called it a "great example of government cooperating with the relevant industries to get something done. There was some debate on the tradeoff between power and interference. The various parties came together and came forth with a solution."

He was referring to a compromise proposal between commercial radio and iBiquity on the one hand and NPR on the other, on which the commission largely based its order.

"With that compromise, the FCC got it [the order] out quickly. To me, that's a good news story."

Struble couldn't say how many stations would go to higher power, saying the decision will be up to each station and group. He believes a "meaningful" number of stations will increase their FM digital ERP "but by no means will it be the majority or a huge number" right away.

"There are stations out there that have the headroom and can turn up the power. There are others that we know of that have plans to increase power." Struble predicts a gradual transition.

Photo by Leslie Stimson

The HD Radio power boost is intended, among other things, to help support next-gen data services. This is an ST Microelectronics-based HD Radio receiver development board showing Navteq traffic information displayed at CES.

EXPENSE

Many of those who wait to implement an increase will do so because of the significant expense.

Milford Smith is vice president of radio engineering for Greater Media, one of 18 groups that filed a petition with the FCC in 2008 asking for the digital increase.

He is hopeful that "a number of stations" will increase FM digital power in 2010. Yet he said that for higher-power FMs, mainly Class Bs and Cs, the cost of increasing digital power from 20 decibels below carrier to –14 dBc or higher is substantial. For Greater Media, for example, Smith pegged the cost at $100,000+ per station, not including redundant facilities.

"Obviously we can't ignore the economic realities of the moment; but the decision certainly provides certainty to both the broadcasters and the manufacturers that any power increases implemented and any equipment acquired to do so will not be rendered obsolete in the future," Smith said.

He and other proponents hope stations that may have been waiting on the FCC decision will now be confident enough in HD Radio to "take the IBOC plunge with certainty as to the value of their hardware."

Gary Kline, vice president of engineering and information technology at Cumulus Media, suspects many stations are evaluating whether they can "push the button" to raise power immediately, which depends on whether their transmitter has enough headroom. If not, "they are likely facing additional equipment upgrade costs. At that point it will come down to whether an investment will be made, and if so, when. Everyone has their own specific agenda and roadmap for technology/audience advancement as well as their individual capital dollar strategy for the year."

Cumulus is going through this process call letter by call letter, he said.

Continental Electronics is one of four transmission manufacturers that joined in the group petition to the FCC for the power increase. Mike Troje, its domestic and international sales manager, believes many stations will seek to upgrade quickly to –14 dBc and a few to the full –10 dBc, but he fears that few station managers — and perhaps not mayn engineers — understand the costs related to even a 6 dB increase.

He predicts upgrades will take place gradually over three to five years as stations that have been on the fence come to see HD Radio as a viable business model, one made possible due to increased power.

Transmitter manufacturer Nautel Ltd. believes "a good number" of stations are poised to increase power because they planned for it in earlier equipment purchases, according to Market Development Manager Hal Kneller.

"The next group to consider the increase is stations who have been contacting manufacturers for information regarding upgrading the installed base which pre-dates the planning of elevated carrier levels," said Kneller.

He said Nautel is receiving inquiries for such information but it's hard to predict how quickly these stations would move forward. Reflecting interest in the topic, Nautel created a Web page dedicated to the power increase with industry information along with data specific to its products.

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POWER

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FEAR OF INTERFERENCE

Opponents of the increase cite fear of interference to adjacent analog stations — no small worry, since analog remains the primary method through which listeners hear radio and is likely to be so for quite some time, as the commission and even the power hike's supporters have noted.

One contentious issue has been the recourse available to "victim" stations in interference cases.

The iBiquity-NPR compromise proposal suggested that at least three interference complaints from within the victim station's affected contour should be required to trigger commission action, but the FCC decided to set the bar higher. It will require six complaints of "ongoing (rather than transitory) objectionable interference."

Those complaints start a 90-day clock for the FCC to investigate and take action. If the Enforcement Bureau misses this deadline, the interfering station would have to begin reducing power in stages, all the way back down to the current –20 dBc, until the parties agree that the interference is gone.

Some observers worry that the commission will not put teeth into enforcing the interference remediation procedure.

Barry McLarnon is a former research engineer with Communications Research Centre, a government research lab attached to Industry Canada that conducts research in communications including broadcasting. Industry Canada handles technical aspects of broadcasting such as standards and allocations.

Now semi-retired and an independent consultant performing occasional contract work for CRC, McLarnon is "highly skeptical" that interference remediation will work.

"Up to now, the commission has maintained a hands-off policy regarding IBOC interference, and I don't see that changing. I don't buy the claim that there have been no interference complaints — I've heard otherwise." He cited the case of WYSL, an AM station, but did not identify any FM cases.

The commission stated in its order that "since the commencement of 1 percent FM IBOC power operations in 2004, the [Media] Bureau has not received any well-documented complaints of interference to analog FM stations from digital signals," nor had it received any since 2006 when FCC granted 15 experimental authorizations for some FMs to run at higher digital power, some with "as many as four first-adjacent channel short spacings."

Radio World has reported on complaints about both AM and FM interference, but power hike supporters argue that those have occurred outside protected contours and/or cannot be replicated in testing.

The problem, says McLarnon, is that the bar has now been set too high on required interference documentation. IBOC interference is "insidious," "it is indistinguishable from noise, and thus seldom recognized as interference."

He believes an affected station will have a hard time showing that it is receiving interference from an IBOC neighbor running at higher digital power unless the victim station can convince the IBOC neighbor to conduct "carefully controlled tests" at different IBOC power levels.

Another vocal opponent, Bob Savage, president and chief executive officer of WYSL(AM) in Rochester, N.Y., said when there's "the first decision ordering an interfering station to reduce power, I'm buying you a steak dinner. It will never happen."

To be considered for remediation, the FCC said interference must be quantifiable and not transitory, according to Savage, and "they didn't define transitory."

In its order, the commission said interference would have to be sustained and not intermittent.

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WHO'S RAISING THEIR POWER

As of March 9 the FCC had granted 24 STAs to FMs to raise digital power.

Station	Licensee
KNDE, College Station, Texas	Bryan Broadcasting
KWAX, Eugene, Ore.	Univ. of Oregon
KQAC, Portland, Ore.	All Classical Public Media
KQHR, The Dalles, Ore.	All Classical Public Media
KUVO, Denver	Denver Educational Broadcasting
WJFK, Manassas, Va.	CBS Radio
KSKA, Anchorage	Alaska Public Telecom
KQOC, Gleneden Beach, Ore.	All Classical Public Media
KJAQ, Seattle	CBS Radio
KUWC, Casper, Wyo.	University Of Wyoming
WQYK, St. Petersburg, Fla.	CBS Radio
WRBQ, Tampa, Fla.	CBS Radio
KNBA, Anchorage	Koahnic Broadcast Corp.
WNPR, Norwich, Conn.	Connecticut Public Broadcasting
WPLN, Nashville, Tenn.	Nashville Public Radio
WQNY, Ithaca, N.Y.	Saga Communications
WGTD, Kenosha, Wis.	Gateway Technical College
KSCF, San Diego	CBS Radio
WSOU, South Orange, N.J.	Seton Hall University
KROQ, Pasadena, Calif.	CBS Radio
WMUZ, Detroit	WMUZ Radio
KKTR, Kirksville, Mo.	Truman State University
KTRM, Kirksville, Mo.	Truman State University
WRKS, New York.	Emmis Communications

Source: FCC

SMART:

JetStream MINI IP Audio Networking System

Logitek Jetstream IP audio networking is smart and our lineup of surfaces gives you more choices. JetStream MINI covers all your console and routing options whether it's for a large standalone console, a smaller desktop control surface or a space-saving virtual controller. You decide what's best for your operation. With JetStream IP audio networking, it's all about smart choices.

Next generation 'smart' IP audio. JetStream supports the latest IP and Ethernet protocols for affordable, easy and ultra-fast audio networking.

More I/O choices for all sources and destinations. Just one JetStream MINI handles 64 digital or analog inputs/outputs of your choice and up to four Logitek control surfaces or vScreen virtual controllers of your choice. **Choose what you need.** Everything you need is in one user-configurable, 64-channel node. Your JetStream can have mic inputs, line-level and digital I/O, built-in EQ, dynamics and mic processing, profanity delay, GPI/O, Internet codecs, WAN support, automation interface, battery power and a whole lot more.

No computer science degree needed. JetStream IP audio networking is super easy to set up with built-in memory and automatic configuration. Just plug in and let JetStream do the rest.

Affordable and flexible. Regardless of studio size, Logitek's smart architecture allows you to get more done for less. Complete systems start at under $6000.

CHOICES:

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POWER

(continued from page 10)

Savage — who refers to himself as "the poster boy for naysayers of HD Radio" — said the commission still has not acted on his 2007 interference complaint of problems caused by digital operation at CBS station WBZ(AM) in Boston, an argument denied by the broadcaster.

Proponents believe the FM interference remediation steps are workable. Kneller, for example, believes the 90-day "shot clock" will be especially effective. "It will not be a protracted proceeding where nobody wins."

OPPOSITION

Others cite different reasons for opposing the FCC action allowing the increase.

Low-power FM proponent Prometheus Radio Project was not happy that LPFMs didn't get special protections in the order. The FCC said that to "deny a full-powered station additional digital power based on the potential of increased interference to an LPFM" would be unfair since LPFMs are licensed as a secondary service.

Prometheus spokesman Pete Tridish said, "A more measured, case-by-case approach would have hurt no one and built more of a factual record that they [the agency] could have used to take further action."

A station using IBOC has multiple opportunities to reach the listener including the analog and digital side carriers, said Tridish, whereas LPFMs have just one opportunity to reach theirs with an analog signal.

"For an LPFM signal to be secondary to the second digital sideband of an IBOC station, that makes no sense. We think it would have been easy to individually engineer power increases using contours, and make the authorizations provisional till they proved themselves to be trouble-free," he said.

"The experiments showed that we could expect some real difficulties, but the FCC decided to go full steam ahead despite the poor results."

The compromise adopted by the FCC includes a formula developed by NPR and endorsed by iBiquity to calculate how much of an increase stations can take without interfering with their analog neighbors. In its decision, the commission wrote that its experience with higher digital-powered experimental authorizations suggests the formula is "over-predictive of the potential for interference. Nevertheless we believe that the protection this methodology provides to first-adjacent" stations will work.

Prometheus planned to ask that the commissioners themselves review the Media Bureau order.

Alan Jurison, a regional IT manager/broadcast engineer for Citadel Syracuse and contributor to Radio World, thinks the FCC was overly conservative.

Filing on his own behalf, he submitted in February a Petition for Reconsideration arguing that the rules are too limiting because the NPR formula is too restrictive, and that more stations should be allowed to go up to a 10 dB increase without harm. He also takes issue with some of NPR's methods in its studies and points out what he says are "significant flaws" in NPR's data.

NPR replied in its filing that the criticism of its test methodology from Prometheus and Jurison are "utterly without foundation" and that Jurison in particular misunderstood or misinterpreted much of its findings.

Unknown at press time is whether 6 dB is enough of an increase to make an appreciable difference in indoor and mobile reception of HD Radio. Proponents are confident it will.

Will all the discussion about interference will be relevant a year from now? One engineer said the industry won't hear "a lot of noise," meaning vocal criticism, unless lots of stations go with a higher power.

NEWSROUNDUP

KLOTZ: Officials at Klotz Digital say their commitment to the U.S. market remains firm despite changes at the top. The German maker of digital broadcast consoles and studio networking equipment has been acquired and its founder Thomas Klotz resigned. The buyer is UnitedScreens Media AG, a German advertising distribution company concentrated on the point-of-purchase (POP) display market. UnitedScreens CEO Dr. Andreas Gruettner, an executive with experience in restructuring companies, assumed the role of CEO of Klotz. The company said it will maintain its office in Georgia and plans to exhibit at the NAB Show.

PIG: The Radio Accountability Project posed an inflatable 12-foot-high pig in front of NAB's headquarters in a protest March 10. RAP claims radio companies are being "piggish" by opposing a performance fee for airplay of copyrighted music. Its members include the Recording Industry Association of America, SoundExchange and the American Federation of Musicians. NAB sent sausage pizzas to the five protestors.

HD4: CBS Radio's WJFK(FM) in Washington launched an HD4 channel, the first anywhere, according to those involved, as part of a "quadcast" programming strategy. WJFK is running four sports streams: its own programming on HD1 as well as the audio of Baltimore's WJZ(FM) on its HD2, New York's WFAN on HD3 and Philadelphia's WIP(AM) on HD4. (See page 7.)

ENGINEERS: Rep. Jerry McNerney, D-Calif., introduced a House companion to a Senate bill that would add an engineer to the staff of each Federal Communications Commission commissioner. Society of Broadcast Engineers representatives Barry Thomas and Chris Imlay visited offices of several House members to garner support.

EPG: The companies involved with radio's electronic program guide project for HD Radio say the service is "viable" for U.S. radio. In a report funded by NAB, BIA/Kelsey, Broadcast Signal Lab and Unique Interactive present recommendations on how to help stations set up an EPG as well as methods for transmitting the data over HD Radio and the Internet. Download the report at *www.nabfastroad.org*.

PANDORA: Looking to deliver its "personalized Internet radio" in cars, Pandora Media hired George Lynch of Sirius XM Radio as vice president of automotive business development; it also hired a chief financial officer.

BMW: The automoaker is going to offer Internet radio from RadioTime as an option in one of its Mini Cooper models using its Mini Connected option, which has a USB interface so drivers can integrate their Apple iPhone in the car's audio and infotainment system. Drivers can choose analog AM/FM as well as Internet stations using the in-dash display and "Mini Joystick" to tune to Web radio. Mini Connected system will be available in the 2011 Mini Countryman, Mini's version of a small SUV.

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And more compatible equipment is likely on the way. The IEEE is working on a consumer electronics standard called "AVB" (802.1), which is similar to Livewire. When the standards-making process is eventually complete, CD players and other devices that can interoperate with Livewire studio equipment will probably appear.

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A Chat With the BEC Moderators

Radio Data Services and AoIP Are Among 2010's Prominent Themes

BY TOM VERNON

The flagging economy has done little to slow the pace of broadcast technology. Staying current with developments is as challenging as ever.

Radio World spoke with the chairmen of the upcoming NAB Show Broadcast Engineering Conference about themes and trends that underlie this year's presentations. BEC sessions are explored in detail in the subsequent pages of this issue.

Jeff Smith, supervisor of broadcast/studio engineering for Clear Channel New York, is chairing two groups of sessions, one about IP and the other about radio facilities.

He notes that AoIP is well established among broadcast plants. "It offers a cost-effective, sensible and efficient way to move audio around the facility. What's different this year is that the IP audio industry has matured to the point that manufacturers are talking seriously about standards, and that will be the focus of many of the papers."

He adds that the IEEE 802.1 AVB standard addresses broadcast needs such as multichannel capability, synchronous operation, transmission over the Internet and the ability to send control and data information along with audio.

"What may surprise radio engineers," he said, "is that 802.1 AVB has been embraced by such non-broadcasters as BMW, JBL and Sony, as they see the potential for seamless integration of radio content into auto and consumer audio environments."

Jeff Smith

Smith notes that the standard is in use by other sectors. "You will be able to see products on the floor at NAB that already utilize it. We are now beginning to see true standards in IP audio rather than company standards."

Smith's other session grouping is about radio facilities, and it reflects today's operating realities and limited budgets. The three presentations will highlight facilities control and monitoring at both the studio and transmitter. "The trend in the industry is to do more with fewer engineers, and these sessions address that need in different ways.

"One trend that we're seeing in facilities control is a greater adoption of IT standards in the broadcast world. This makes sense, as the larger IT players like Cisco and HP have invested considerable resources in research and development. Broadcast manufacturers might as well take advantage of it.

"Presentations by WorldCast and Nautel will probably appeal to clusters and those who have larger infrastructures to maintain, while Radio Free Asia's presentation will be of interest to stations with a limited budget."

ROLLOUT RENEWAL?

Two groupings about sessions on digital radio will be hosted by Mike Cooney, vice president of engineering and chief technology officer of Beasley Broadcast Group.

Mike Cooney, right, visits a job site with Richard Gallow, Beasley chief engineer for Ft. Myers, Fla.

He said that prior to the recent FCC ruling allowing a power increase for HD Radio, most broadcasters had stopped upgrading facilities. Many manufacturers also had ceased developing new high-power HD solutions.

"With the commission's recent approval, expect transmitter manufacturers to present new and innovative solutions to solve many of the challenges associated with the power increase."

Cooney believes these changes will have a major impact on the HD Radio landscape.

"Many of the solutions used in the initial launch of HD, such as high-level combining, are no longer viable at the new power levels. In many cases, we will spend more on the second HD launch than we did on the first." However, he is encouraged to see more clarity about the future of HD power levels, and said manufacturers are developing and presenting solutions that will help overall efficiencies while minimizing the size and cost of IBOC transmitters.

While most engineers may understand the issues related to digital power upgrades, Cooney fears others in the management and financial ends of the business may not.

"Other people involved in the process may vastly underestimate how difficult and expensive higher-power HD will be to implement."

When he is not moderating, Cooney plans to be shopping for new gear.

"We have several unlicensed microwave systems in need of replacement, so I will be looking at licensed and unlicensed alternatives as well as IP-based systems."

EASY BEIN' GREEN

BEC sessions about radio data services and green technologies will be chaired by Dom Bordonaro, chief engineer of Cox Radio Connecticut.

Green technology is a topic of increasing importance to broadcasters. Two notable themes are Leadership in Energy and Environmental Design certification and the Waste Electrical and Electronic Equipment Directive.

"LEED certification is the industry standard for measuring building sustainability," said Bordonaro. "Achieving LEED certification is the best way to demonstrate that a station's physical plant is truly green."

Dom Bordonaro

This rating system was developed and is administered by the U.S. Green Building Council. It is designed to promote construction practices that increase profitability while reducing the negative environmental impacts of buildings.

The WEEE Directive seeks to minimize the impact of electrical and electronic goods on the environment by increasing reuse and recycling of equipment, reducing the amount going into landfills. It seeks to achieve this by making manufacturers responsible for financing the collection, treatment and recovery of surplus equipment and by obliging distributors to allow consumers to return unwanted equipment free of charge.

"WEEE has already been legislated in Europe by the EU, and we can expect to see something similar here in the United States," Bordonaro believes.

Presentations on radio data systems will include information on both analog RDS and HD data services.

He notes that, in addition to FM receivers, many portable devices have RDS capability, most notably mobile phones. Though RDS is not widely deployed on mobile devices in the United States, it is popular overseas for emergency alert purposes.

HD Radio's datacasting technology has more bandwidth than RDS and is field-based (title, artist, album) rather than text-based. It can also send tagged graphics that are not visible on HD Radios but can be used for advertising with billboards and signs on taxicabs. These capabilities are beginning to be exploited on a larger scale in the marketplace.

"Broadcasters are looking beyond posting artist and song title information towards options that may enhance the revenue stream. Possibilities include alerting for security purposes, public warnings, services for the hearing impaired, and tagging songs for download into consumer electronics devices."

SEMPER PARATUS

Andy Laird, vice president and chief technology officer of Journal Broadcast

(continued on page 18)

Andy Laird, shown diving under an iceberg in the Antarctic and in more familiar garb.

iStockphoto/pagadesign

Saturday: AoIP, EAS & More

Membership Meeting, Ennes Workshop Highlight SBE's Week at the NAB Show

BY FRED BAUMGARTNER AND KIMBERLY KISSEL

Radio World provides editorial space to the Society of Broadcast Engineers to share news of its events and priorities. Fred Baumgartner, CPBE, CBNT, develops the SBE Ennes NAB tutorial and traveling Workshop programs. Kimberly Kissel is SBE education director.

Since the inception of the Society of Broadcast Engineers, the dissemination of information about the science, process, art and industry of broadcasting has been the biggest piece of our foundation. Developing our skills and expanding our knowledge probably is the single most important part of our personal professional development.

Over the years, the SBE has expanded its educational efforts. This year the SBE added a full-time staff position devoted to member education with Kimberly Kissel; and you are seeing an increasing number of Webinars, publications and other educational opportunities to help make you better and more valuable in your profession.

One part of the SBE educational program is the Ennes sessions that travel the United States. The first traveling program of the year occurred in Miramar, Fla., and we are planning others for El Paso, Dallas, San Diego and Boston. These are not the same programs as the Ennes/SBE program held as a part of the NAB Show in Las Vegas. Most of our traveling Ennes programs include both a radio and TV track.

The largest attended live program of the year for Ennes is the full-day session held as part of the NAB Show in Las Vegas. Tightly packed, this program is done in conjunction with NPR and PBS. Beginning bright and early at 8 a.m. on the Saturday (April 10 this year), the program often draws about 500 people, mostly broadcast engineers, directors of engineering and above.

AN AOIP '101'

Every year we program to answer what it is that broadcast engineers most need to know.

This year the answer is simple. First and foremost, audio over IP rapidly is becoming the mature, standardized, ubiquitous means of dealing with audio. Technology consultant Skip Pizzi has agreed to do a two-hour tutorial on the topic.

Those who have attended know that we almost always provide an early bird "101" presentation of some substance. The new book "Audio Over IP," co-authored by Pizzi with Steve Church, is published by Focal Press; more than a few will be given away as prizes to early-bird program attendees.

After lunch, we have another long-form program as Terry Baun, director of engineering and operations for Wisconsin Public Broadcasting, a past president of the SBE, has agreed to return with a two-hour program on "Management/Media Skills and the Future of Broadcast Engineering."

Terry for several years offered programs on management for broadcast engineers and management; he has consulted with broadcast companies on several levels. Broadcast engineering, and radio engineering in particular, has been a challenging profession as the industry matures, consolidates and becomes a smaller piece of the media pie. The economic downturn has been difficult. Management and career skills may be more important than technical skills for the moment.

The SBE/Ennes program speaks to other issues as well. Clay Freinwald of Entercom will update us on next-generation EAS and the Common Alerting Protocol. Richard Chernock of Triveni Digital will discuss considerations for adding mobile DTV to a broadcast station. We'll have a SMPTE update from Peter Symes.

Hal Kneller of Nautel will discuss issues surrounding HD Radio and the power increase. Ralph Beaver of Media Alert takes on the topic of wireless mics after the DTV transition. Dan Holden of Comcast Media Center addresses the impact of 3D television on video and broadcasting; Greg Doyle of Diversified Systems Inc. talks about the reorganization of broadcast workflows.

Attendance requires full NAB registration; members of SBE can register for the show at a special "partner" rate, a savings of $100 off the NAB non-member rate. Register using the

(continued on page 20)

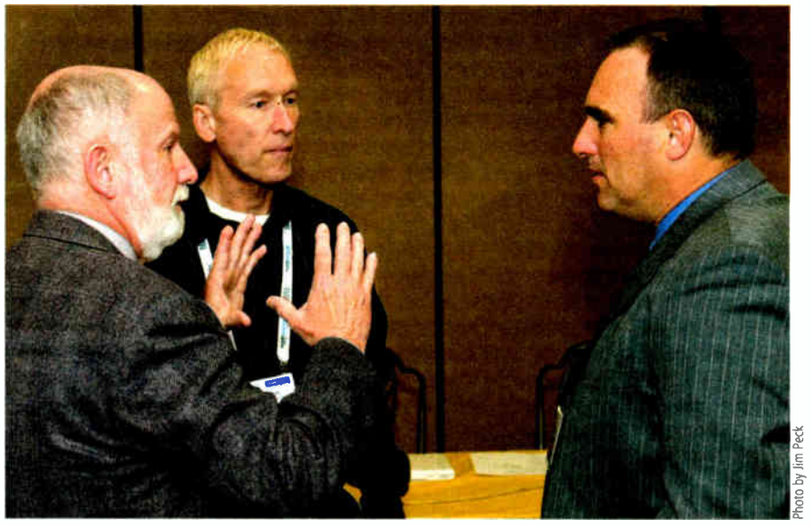
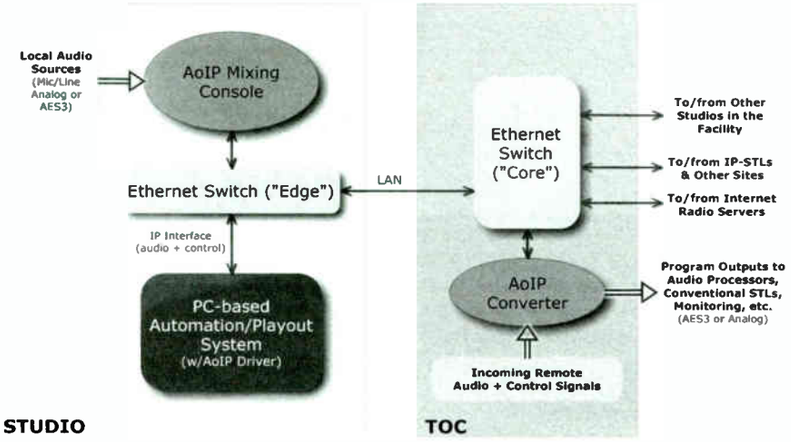


Photo by Jim Peck

Shown talking about EAS at an SBE meeting during NAB last year are Clay Freinwald of Entercom, Gary Timm of Journal Broadcast and Wade Witmer of the Federal Emergency Management Agency.



A tutorial about audio over IP is part of Saturday's Ennes program.

BEC

(continued from page 17)

Group, will moderate two groups of presentations, one on disaster preparedness, recovery and security, the other on radio case studies.

The topic of being prepared has special interest for Laird.

"Last year while at NAB, we lost a 1,250-foot tower in an ice storm, and since then have lost another tower and an FM antenna."

In the era of smaller staffs, considerations in planning emergency response include how to access your plans and keeping those plans current.

The idea of presenting case studies comes from Laird's experiences attending NAB conventions since 1968.

"I've found it's useful to learn what others have had success with, and where they've run into trouble."

Laird is cautiously optimistic about how the current year is shaping up for broadcasters.

"We expect to have a reasonable 2010 for both radio and TV. This year should mark a return to a positive business climate, and the first quarter is already looking good."

Details of the Broadcast Engineering Conference, day by day from Saturday to Thursday of the NAB Show, are provided in the following pages.

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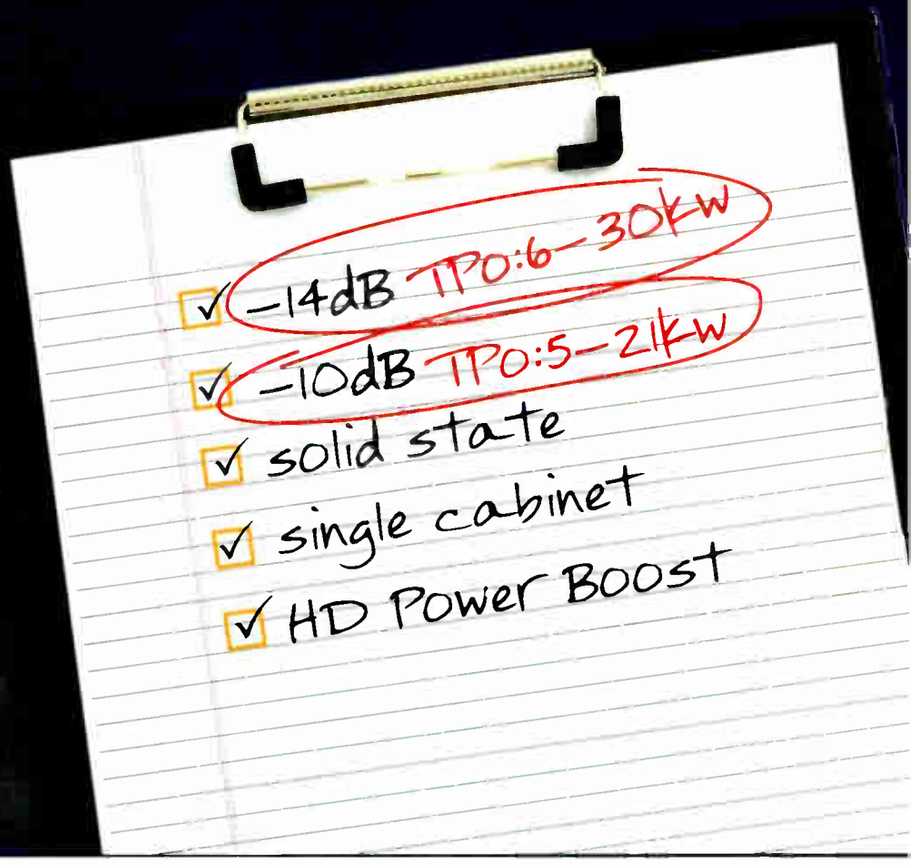

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Making Digital Radio **Work.**

SBE

(continued from page 18)

NAB online registration form, check the "Partner" box at the bottom and select "Society of Broadcast Engineers" from the drop-down box.

The cost of traveling to, and a night's stay in, Las Vegas are more reasonable than in many years. With all that is changing in the profession and the bargain prices for travel, this might be the year you best attend the NAB Show and the Ennes/SBE sessions.

Note that programs also are made available online by the NAB at a lower price after the show is done. You might for instance consider Skip or Terry's presentation for a special SBE meeting or your departmental training.

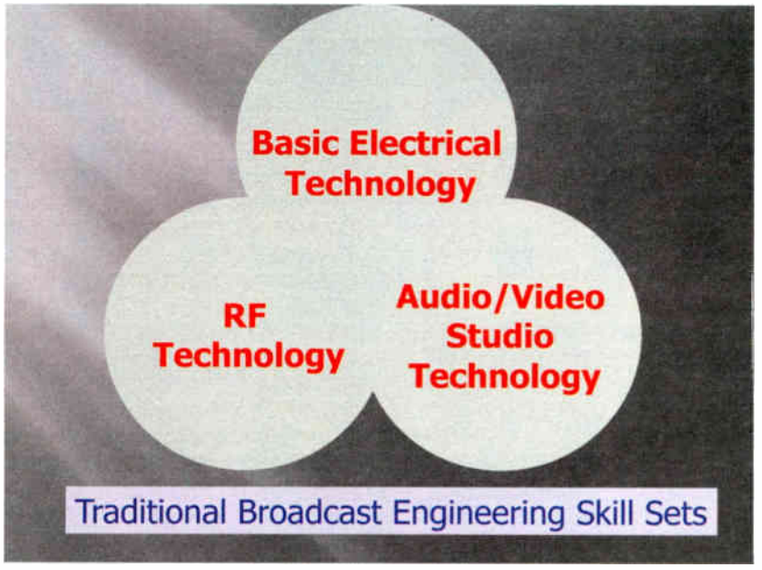
IN THE BOOTH

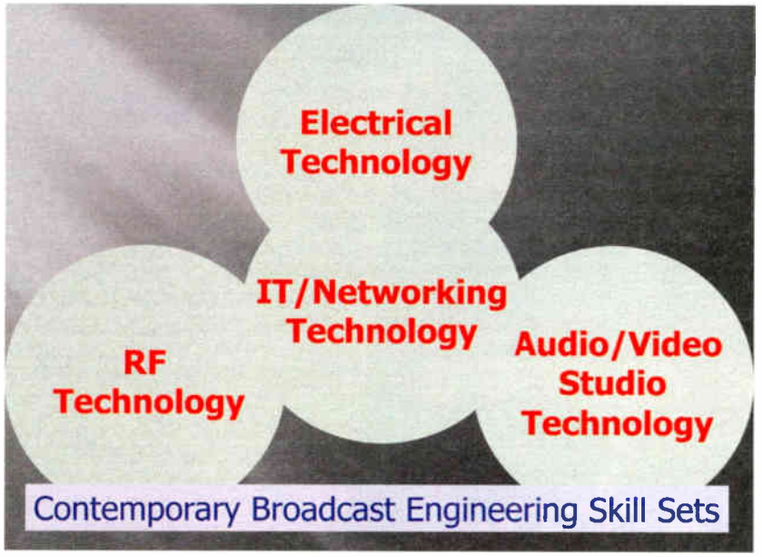
SBE's exhibit booth will be on the second floor concourse of the Las Vegas Convention Center South Hall, Lobby Booth 29. The location is just up the escalator from the South Hall main entrance, outside the entry to the exhibits on the second floor. This is the same spot as in recent years (see *www.sbe.org* for the location).

The NAB Broadcast Engineering Conference technical sessions will be nearby, in the South Hall second floor meeting rooms.

Be sure to stop by the booth. We'll have the new SBE CertPreview, SBE-published handbooks and many technical books from major publishers at discounted prices, plus an assortment of SBE logo items. Membership renewal and new memberships may also be transacted at the booth. SBE staff and national board and committee members will be there to answer your questions about membership, certification, educational programs and regulatory issues.

Booth hours are Sunday 2–4 p.m., Monday through Wednesday 9 a.m.–6 p.m., and Thursday 9 a.m.–2 p.m.





Network technology has become the core component that brings together the traditional areas of broadcast engineering. The images at left are from Terry Baun's presentation.

MORE SBE

The society's annual spring membership meeting will be held Tuesday, April 13, 5–6 p.m. in the South Hall of the Las Vegas Convention Center, in one of the NAB Broadcast Engineering Conference rooms.

The society will recognize local chapter certification chairs for service; there will be prizes given away including a camcorder, several dinner gift cards and, to the first 100 in attendance, a level/screwdriver combination tool. The highlight of the meeting will be the presentation of the SBE Lifetime Achievement Award to an SBE member. The recipient will not be aware of the award until the announcement is made during the meeting.

SBE will hold other meetings that may be of interest. The list is below; events are at the Las Vegas Hilton Hotel or the Las Vegas Convention Center. For exact locations visit *www.sbe.org*.

Saturday, April 10
Ennes Workshop, 8 a.m.–5 p.m. (Conference registration required)
Certification Committee Meeting, 6:30–11 p.m.

Sunday, April 11
Board of Directors, 8:30 a.m.–Noon
Education Committee, 2–4 p.m.
Frequency Coordination Committee, 2–4 p.m.
EAS Committee, 4–5:30 p.m.

Monday, April 12
EAS Meeting, 2–4 p.m

Tuesday, April 13
Certification Exams, 9 a.m.–Noon (pre-registration required)
Frequency Coordinators, 10 a.m.–Noon
Spring Membership, 5–6 p.m.

DAWNlink SATELLITE CHANNEL IDENTIFIER, WITH LCD DISPLAY

Satellite users report that with DAWNlink in hand, they can navigate through a maze of digital channels, to quickly identify any satellite. Users are now able to perfectly peak their dish to maximum performance. Start by using the full-screen SPECTRUM ANALYZER to aim the dish for the

best carrier-to-noise ratio. Confirm that you are on the proper satellite with the built-in MPEG2 SATELLITE RECEIVER, to view unencrypted sat channels on the DAWNlink's color 4.5 inch LCD display. Perfectly peak when precise dish adjustments show up clearly, in the CONSTELLATION VIEW dot pattern display of a digital channel. Watch for text that comes directly from the digital channel data stream, which will identify the satellite name and channel. The satellite user's job is made simpler, with the convenient carrying case and neck strap, plus LNB powering directly from the DAWNlink. Greatly improved operation and storage time is made possible, with the rechargeable lithium ion battery. There are two different models to choose from, but most users get the "sat" model that measures the 920-2150 MHz satellite L band. Some users pay a little more, to get the "sat plus terrestrial" model, which adds measurement of the 5-900 Mhz band.

DAWNco "L SERIES" LNB AMPLIFIERS ARE NEEDED FOR NEW SAT CHANNELS

Several networks have made the switch to DAWNco's new "L series" of C and Ku band LNB amplifiers, to accommodate the "finicky" nature of new digital satellite receivers. This new generation of LNB has improved specs that can make a real difference in the reception of digital satellite channels. These new LNBs feature best-in-industry specs for "1dB compression point" and "phase noise." Internal circuitry has been

completely redesigned for reduced power draw, so that indoor receivers and power supplies will never be overtaxed. In order to prevent audio drop-outs and signal outages, when outdoor temperatures fluctuate, DAWNco's best LNBs feature a highly stable +/- 5 Khz rating. Make sure to upgrade to the new DAWNco "L series" LNBs, and watch for improved EbNo readings on your digital satellite receivers.

TI INTERFERENCE FILTER BLOCKS RADAR FROM AIRPORTS & MILITARY TO IMPROVE SATELLITE RECEPTION

Many satellite users find that their interference problems go away, when they install the DAWNco TI Filter between the feedhorn and LNB. Airport and marine radar frequently wipe out satellite reception, when the dish is located close to military bases and airports. The TI filters suppress strong out-of-band interference caused by radar. The #C-BANDPASS-6LIGHT model is best for USA reception of C band satellites. There is also a "Wimax" version and "International" model filter, for use outside the USA.

DAWNco 4.2 METER SATELLITE ANTENNA FOR BEST RECEPTION

Finicky new digital satellite channels can be received perfectly, using DAWNco's high-gain 4.2 meter satellite antenna. Satellite users are noticing that this antenna doesn't cost more than competing 3.7 meter dishes on the market, yet has 2.6 dB more C band gain. Seasoned engineers realize that accuracy-of-installation has a big impact on performance, and prefer DAWNco's 1-piece spun aluminum reflector, because it always installs perfectly. When compared to multi-panel dishes, the DAWNco antenna has 90% fewer parts. Fewer parts makes for a faster, and more precise installation, with resulting gain that actually matches published specs. The single piece reflector design has inherent structural strength and parabolic shape retention. Customers receive their new 4.2 meter satellite antenna, delivered on a factory truck in perfect condition. When satellite users are short handed, they can ask DAWNco about installation by an experienced technician. The knowledgeable people at DAWNco will help each satellite user plan for installation of their new satellite antenna, with advice on site selection choices, pad preparation details, and low loss cable solutions.

Sunday in One Word: Digital!

Implications of the FM IBOC Power Hike Are Explored, Along With Other Issues

BY TOM OSENKOWSKY

"Digital Radio Advances in Technology," the title of the Sunday morning sessions moderated by Mike Cooney, vice president of engineering and chief technology officer for Beasley Broadcast Group, sums up the theme of evolving improvements and upgrades to digital terrestrial radio broadcasting.

On the AM side, *"New Tools in the AM HD Radio Toolbox"* addresses several innovations.

Jeff Detweiler, director of broadcast business development for iBiquity Digital Corp., says the company's new v4.3 Exciter MPS Framework "has many new features designed to improve the AM digital listener experience."

These features include a new configuration for AM HD Radio's primary service mode, or MA1, specifically a core-only mode with single 20 kHz stream with no secondary or tertiary carriers, promising analog at full 10 kHz bandwidth. Additionally, there are new AM HDC codec configurations for talk, parametric stereo and monaural programming.

Other updates include AM HD Radio data support, which now enables connectivity to the Importer; AM HD Radio support for synchronizing audio and data applications; and improved time synchronization between audio and PSD to improve music tagging applications. Another feature is the new XHDR Trigger support in the PSD GEN API to support station logo, album art and synchronized images.

"Each of these new features in the reference exciter software will be discussed, describing how iBiquity's ongoing product improvement campaign will benefit AM radio broadcasters and their listeners," Detweiler said.

"When and How Will Terrestrial Radio Go Digital in Europe?" is a question to be addressed by Markus Ruoss, founder and owner of Ruoss AG.

With a variety of available options and a patchwork of various digital radio solutions throughout the continent, factors such as economy, politics and differing technical rules make a single digital solution in Europe unlikely, Ruoss says. A number of distribution platforms are expected. While a transition to digital was expected earlier, the financial crisis has slowed progress, resulting in a longer-than-expected life span for analog.

He'll talk about navigating the barriers, a solution through a gradual transition and an example of a "yes-but" as opposed to a "no-but" scenario.

One of the features made possible by HD Radio is an EPG. *"Electronic Program Guide Field Trial: How HD Radio EPG Works"* will be presented by David Maxson, managing partner in Broadcast Signal Lab LLP.

This is intended to explain to engineers, programmers and managers the ease of integrating EPG content to better serve listeners. According to Maxson — who with Steve Riggs coordinated a field trial in the Boston, Providence and Worcester areas — BIA/Kelsey and Broadcast Signal Lab teamed with Unique Interactive to explore the requirements for a radio electronic program guide.

> **There is** a lot of hype on both sides and we want to peel that away.
>
> – Mike Troje

"Radio broadcasters are at a disadvantage to other digital media that have online program information available to the listener at the point of listening — more than just title and artist," he said. As Radio World has detailed in the past, the EPG project was sponsored by the NAB FASTROAD program.

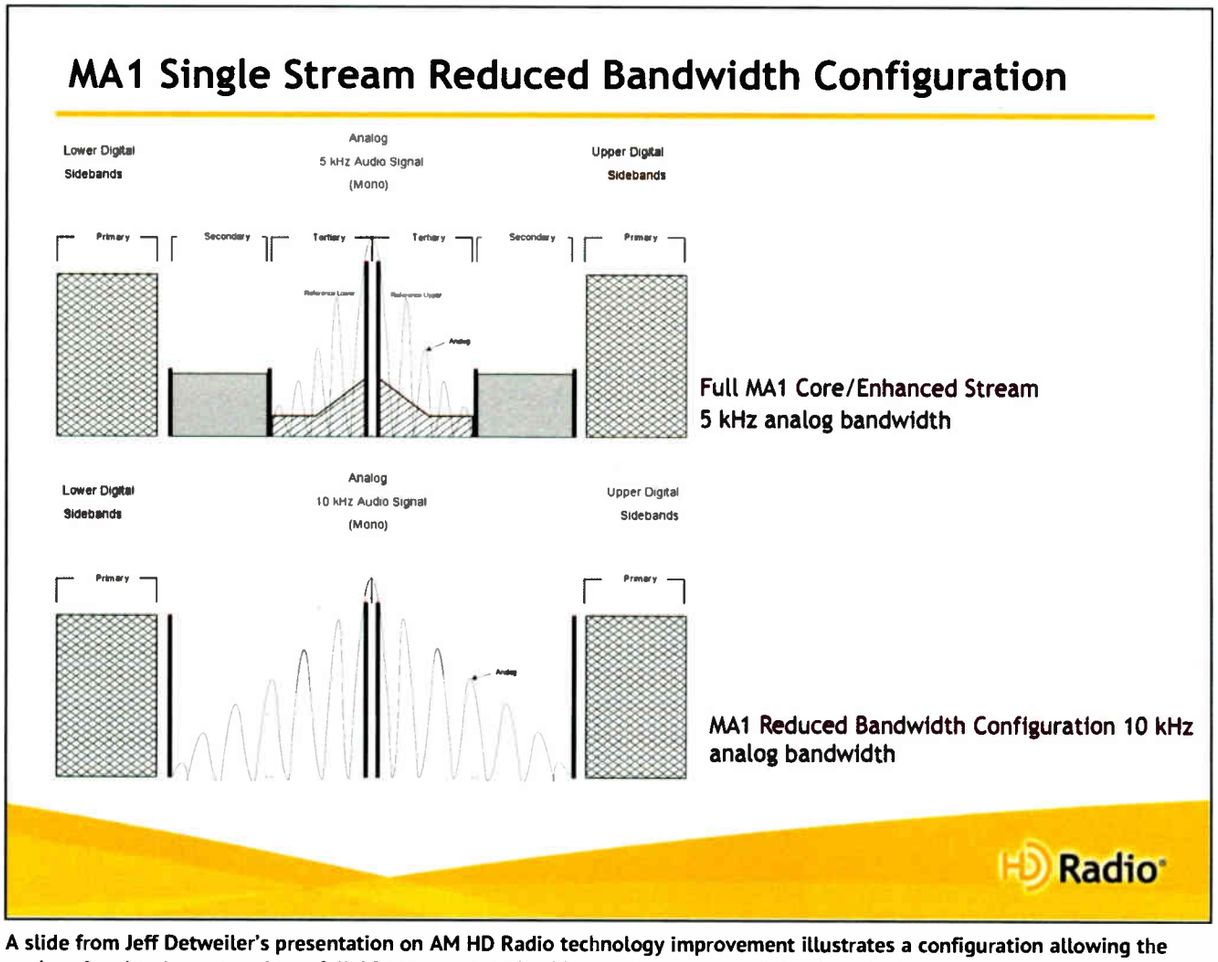
"This talk explains how EPG services for radio will work. It includes a discussion of the impact of EPG content creation on station workflow, as well as a cook's tour of how EPG data gets on the air via HD Radio transmissions. Also, as more and more devices become both radio-capable and Internet-connected, rich radio EPG services can be delivered in a complementary way over both media."

"Laboratory Test Results of Digital Radio Technologies: DAB, DAB+, T-DMB Audio and HD Radio" examines evaluations performed in the lab.

Yong-Tae Lee, principal researcher for ETRI, performed tests and comparisons with computer simulations for the purpose of determining which technology is best suited for operation in Korea.

DAB, DAB+ and T-DMB audio were tested for service in the VHF III band, and HD Radio and DRM+ tested for service in the VHF II band. Among the tested items were spectrum mask, phase error, dynamic range and Bit Error Rate performance in the Gaussian and fading chan-

(continued on page 24)



A slide from Jeff Detweiler's presentation on AM HD Radio technology improvement illustrates a configuration allowing the analog signal to be restored to a full 10 kHz bandwidth while providing stereo digital in a single-stream configuration that is backwardly compatible with existing receivers.

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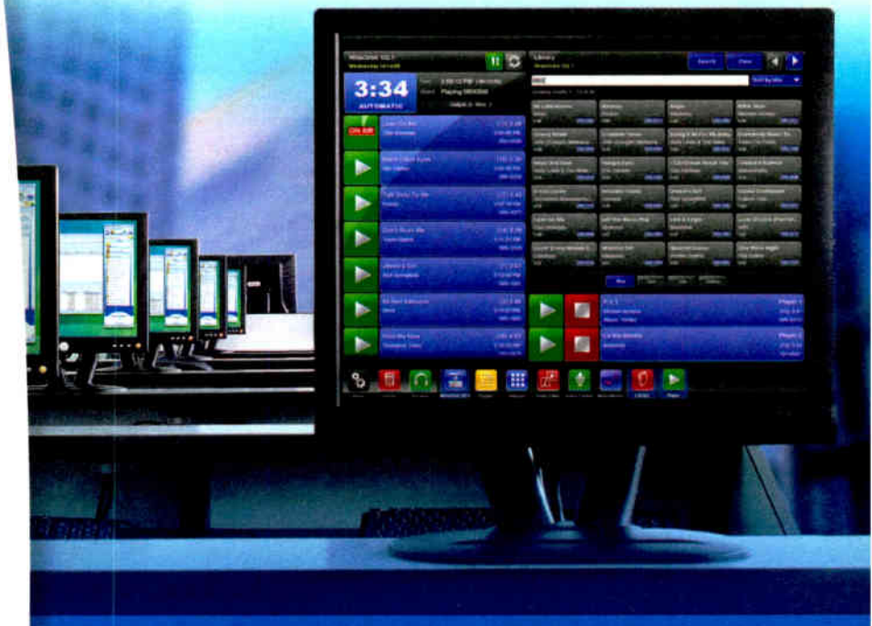

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WIDEORBIT

SUREBETS

THERE'S A BOULDER IN MY CUP

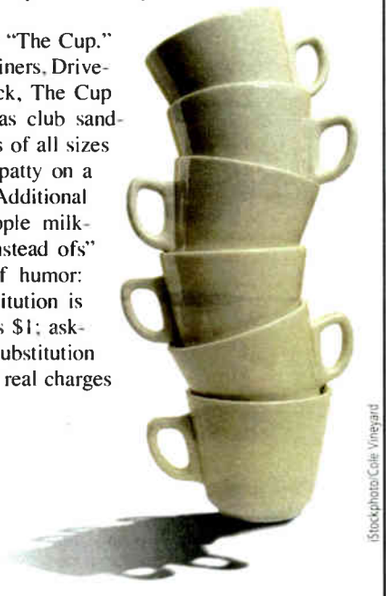
Need a break from the casinos? If you're already planning a day trip to Hoover Dam, plan a stop on the way to Boulder City, one of two cities in Nevada where it's illegal to gamble (the other is the town of Panaca). The small-town vibe offers a refreshing change of pace from the Strip.

First a little background. Approximately 20 miles outside Las Vegas, Boulder City was born in 1932 from the need for housing for the workers building what was originally called Boulder Dam.

In an effort to keep workers focused on the dam task at hand, alcohol sales and all forms of gambling were prohibited in the city. The Bureau of Reclamation, an agency under the Department of the Interior that oversees water resource management and power generation projects, did not relinquish control of the city until 1958, and Boulder City was incorporated in 1960. The city council selected a pharmacist as its first mayor; the residents approved the city charter, which retained the prohibition of gambling.

But with Boulder City's quirky shops and cafes you won't even miss the casinos.

One is the Coffee Cup Cafe, or "The Cup." Featured on the Food Network's "Diners, Drive-Ins and Dives" a couple years back, The Cup offers traditional diner fare such as club sandwiches and tuna melts, and burgers of all sizes including "chili size" (hamburger patty on a bun with chili, cheese and onions). Additional menu highlights include a pineapple milkshake and a pricing list for or "instead ofs" that conveys The Cup's sense of humor: Thinking about asking for a substitution is free; asking for a substitution costs $1; asking for a substitution in the no-substitution area is $20; and asking if these are real charges costs $40.



iStockphoto/Cole Vineyard

The Coffee Cup
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Boulder City
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www.worldfamouscoffeecup.com

— Sure Bets written by Kelly Brooks

SUNDAY

(continued from page 22)

nels. Also examined were interference in the co-channel and adjacent-channel scenario and single-frequency network capability testing. Audio quality testing based on the lab work also was performed. Field testing is expected in the next year.

"We believe that these test results will be useful to the countries considering analog FM service conversion to digital radio," the author wrote in an NAB conference summary.

The companies researching an electronic program guide, with NAB funding, will discuss their new Phase 2 Final Report including findings of lab and field trials.

Digital signal processing is used in many pieces of broadcast equipment, most notably audio processors. It can also be employed to enhance Digital Radio Mondiale power, resulting in increased coverage.

"Digital Power Enhancement for DRM" was developed by Transradio. Discussing the details of this process will be Christian Horlle, project manager for digital radio at Transradio in his presentation.

AFTERNOON: FOCUS ON FM DIGITAL

"FM Digital Radio," a track of afternoon sessions also moderated by Mike Cooney, brings a focus to FM HD Radio issues. Many, though not all, of the presentations delve into implications of the decision by the FCC to allow higher IBOC power.

"There are consequences to increasing HD power," said Mike Troje, marketing manager for Continental Electronics. "As with most engineering problems, compromises must be made so a detailed understanding of the issues and their impact on each station must be understood. There is a lot of hype on all sides and we want to peel that away and expose the hard truths. Increasing HD power levels will require a great deal of research on the part of each FM station's engineering staff."

His presentation, *"Planning for the Increase in Digital Power for FM HD Radio Signals,"* examines the "good and the bad" sides of the power increase.

"Preserving the existing analog revenue stream while advancing the conversion to digital will benefit the industry both now and well into the future.

"More specifically we will discuss how increased HD power increases the negative envelope modulation of the hybrid waveform. If the negative envelope gets too close to zero, some receivers such as clock radios and some hi-fi receivers with relatively wide IF bandwidths will cause their FM limiter to fail. This can be a real nuisance on some radios and not noticeable on others with narrower IF bandwidth," Troje said.

With the FCC approval for an increase in HD Radio power from –20 dBc to –14 dBc, broadcasters have a number of available options to implement this improvement as well as a possible power upgrade to –10 dBc.

"Extending Your HD Radio Footprint," presented by Harris Corp. Vice President of Transmission Research and Technology Geoff Mendenhall, P.E, examines the power increase issue and other topics related to HD Radio coverage improvement.

The power increase "will require more digital transmitter power with greater isolation between the analog FM transmitter and the digital transmitter in separate amplification systems," said Mendenhall.

Additional topics include RF power amplifier linearity improvement, space

combining, common amplification, high-power filterplexers, sharp-tuned RF mask filters, additional HD power with hybrid crest factor reduction techniques, and unequal HD Radio sideband powers to achieve interference reduction. He will also discuss the use of HD Radio gap fillers and translators.

Mendenhall will share results of the industry working group he chaired on a standardized method to measure the HD Radio signal transmission quality.

He said he wants to help the radio station engineer understand facility planning requirements and technology choices to improve a station's HD Radio signal footprint. "This is intended to be a primer on several methods to improve HD Radio coverage." The system must deliver a quality signal to listeners in a variety of locations and receivers as well as conform to FCC emission specifications.

Further examining the power increase is *"Practical Tools for HD Radio: HD Power Boost, Increased Sideband Levels and More"* presented by Nautel Market Development Manager Hal Kneller.

Among his topics are "new technologies that enhance the Peak-to-Average Power Ratio (PAPR) already contained in the iBiquity code. Nautel now incorporates the digital constellations as well as the analog signal to further increase amplifier efficiency and power output. This product is called HD Power Boost. Also discussed are elevated sideband modifications to existing and new products."

Kneller added, "With the FCC approval of increased HD Radio injection levels, many issues come to the table, and manufacturers are working hard to get information, modifications and support to customers."

A talk by Henry Downs, vice president of engineering for Mega Industries, will explore *"HD Radio, The Way Forward,"* intended to guide a broadcaster toward the most effective solution to realize HD Radio in its market.

Given the transmission equipment already in use, the available budget and all other options, an examination of offerings from many manufacturers will assist in the final decision, Downs said. These options include transmitter upgrades or modifications, dual-input antennas and low-level combining.

Two common technologies long employed by analog broadcasters are boosters and translators. The former operate on the station's assigned frequency, the latter broadcast on another frequency.

Tim Bealor of Broadcast Electronics will talk about the benefits to FM HD Radio broadcasters in *"Translators and Boosters: What You Need To Know."*

"While boosters still do and always will have limited usage, with the right implementation, they can be a very effective tool," he said. According to Bealor the most important technology advances are in the exciter, with accurate delays and modulation controls and better synchronization techniques.

"Boosters have limited application, and must be correctly engineered to be successful."

"Putting the IBOC Quality Metric to the Test" examines a newly developed metric aimed at evaluating signal integrity to permit maximum coverage and minimize the amount of error correction in receivers.

"Now all manufacturers and broadcasters have a uniform standard to work from," said Philipp Schmid, digital design engineer for Nautel Ltd.

The metric is an effort of the National Radio Systems Committee, the NAB, various manufacturers, iBiquity and other professionals.

"In the past, stations installed IBOC equipment, checked the mask and injection level via spectrum analyzer and dealt with things they could hear like audio processing, and assumed the best," Schmid said.

"Having a uniform standard to work from allows us to evaluate Modulation Error Ratio (MER) separately for data and reference carriers, IBOC carrier amplitude and group delay variations.

"We expect the MER measurements to benefit HD Radio broadcasters by improving signal integrity by permitting exact measurements."

Tom Osenkowsky is a broadcast engineering consultant and long-time contributor to Radio World.

Monday: Radio Facilities and IP Audio

BEC Explores How Devices Talk to Us and The Sweeping Impact of Internet Protocol

BY CHARLES DUBÉ

On the Monday morning of the NAB Show, the Broadcast Engineering Conference turns its attention to radio facilities in a group of presentations chaired by Jeff Smith of Clear Channel Radio.

Not long ago, when we used the term "network" around a station, we commonly meant a national source of broadcast programming. In today's studio and transmission sites, another kind of network has taken root; this is changing not only the way we use the word but the way we operate our facilities.

Studio control boards, remote controls, transmitters and myriad of other devices are interconnected, allowing for remote control and status verification on an unprecedented level. How these devices talk to us, and potentially to each other, are among topics of discussion at the BEC.

Tony Peterle, technical support manager at World Cast Systems Inc., will present *"The Smart Site: Integrating Intelligence Into All Facets of the Broadcast Facility."*

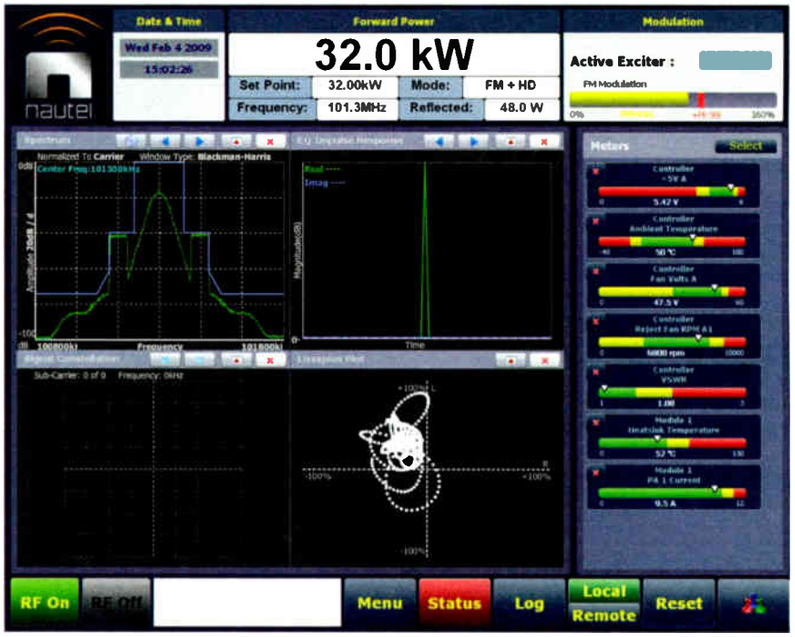
When the FCC began to allow for the unattended studio and transmitter facility, it did so knowing that remote controls had progressed to the point where the engineer, if alerted to a compromised condition, could react and, in most cases, remedy the situation enough so as to prevent illegal operation, restore service at least to some degree and even to prevent equipment damage. But for most facilities, it is still a matter of occurrence, diagnosis and human response.

Now we are moving into the next phase of automation, the ability of the equipment not only to query itself but to react immediately, switching to an auxiliary device and notifying a control operator of an out-of-tolerance condition. In addition, the analysis now has the potential to go beyond the traditional parameters of power output, tower lighting alarms, antenna switches and backup systems. Equipment now has a voice to communicate with its peers, via serial or network paths. As manufacturers include means for devices to be networked, and as software is developed to allow for artful interface, "site intelligence" has flipped the task list from the human to the machine, meaning equipment at a smart site can handle a tremendous variety of conditions, correcting for them and notifying the engineer as needed.

Peterle says it is now possible for users to network the studio, the transmitter site and the various support systems that not only transmit but maintain the environmental factors that help to sustain equipment's longevity and safety. Systems also can keep watch on the traditional points (transmission, temperatures, security) as well as security systems, HVAC, servers, even the quality of the transmission itself, such as a station's pilot, modulation or any instability that might occur.

In his paper *"Reducing Operating Costs With Better Monitoring and Control of Facilities,"* Kevin Rodgers, director of customer service at Nautel, examines it monetarily.

With centralized intelligence effectively monitoring multiple facets of the operation, users can explore ways to reduce expensive operating (and repair) costs. He plans to demonstrate with examples how this can be managed utilizing a TCP/IP backbone. Rodgers asks, "What would you say to a remote control that included spectral analysis, or a Smith Chart function (to view phase rotation)?"



An image from a presentation by Kevin Rodgers of Nautel about facility monitoring and control.

IP remote controlling realizes monitoring in "deep-drill" mode, allowing an engineer to assess conditions from the office or at home, which may save on trips to the transmitter site. He or she can confirm compliance of the signal without having to resort to additional expensive test gear along with the visit.

"Radio in the Cloud" — As networking and the Internet have gained in sophistication, the need for each device on the network to perform every support function decreases, as common tasks can be managed by "the cloud" and an increased amount of applications can be shared, as opposed to unnecessary replication at the local level.

Andrew Janitschek, director of program and operations support for Radio Free Asia, will take us beyond the individual station, showing how networking can be expanded via offsite warehousing of records, logs and

(continued on page 28)

SURE BETS

CIRQUE DOES ELVIS

Elvis impersonators are the sine qua non of the Strip. An oft-lampooned army of performance artists can be found throughout the city at birthdays, corporate events, music revues and/or tribute shows, even weddings.

But if you're looking for more than the stereotypically pudgy dude adorned with sideburns and squeezed into a rhinestone-studded jumpsuit," Cirque du Soleil's got the ticket.

Much like Cirque's 2006 show "Love," which paid homage to the Beatles, "Viva Elvis" seeks to honor the life of the King through a mix of song, classic footage shown on large screens behind the performers and feats of strength and agility. In its review of the show, which debuted Feb. 19, Time magazine called Viva Elvis" an "audiovisual-balletic-acrobatic explosion." The 90-minute show begins in 1956 and spans significant times in Presley's life including his Army service, marriage to Priscilla Beaulieu and his film success.

More than a medley or tribute, "Viva Elvis" has poignant moments as well. During the performance of "One Night," the audience is shown an image of two men in T-shirts and jeans executing an acrobatic routine, both together and solo, on a guitar-shaped platform. One of the men falls off into the darkness at the end, symbolic of the death of Elvis's twin brother, Jesse, at birth.

Ticket prices range from $99–$175. Shows daily at 7 and 9:30 p.m. The show is dark Wednesdays and Thursdays, but there are special added performances on Wednesday April 14.

"Viva Elvis"
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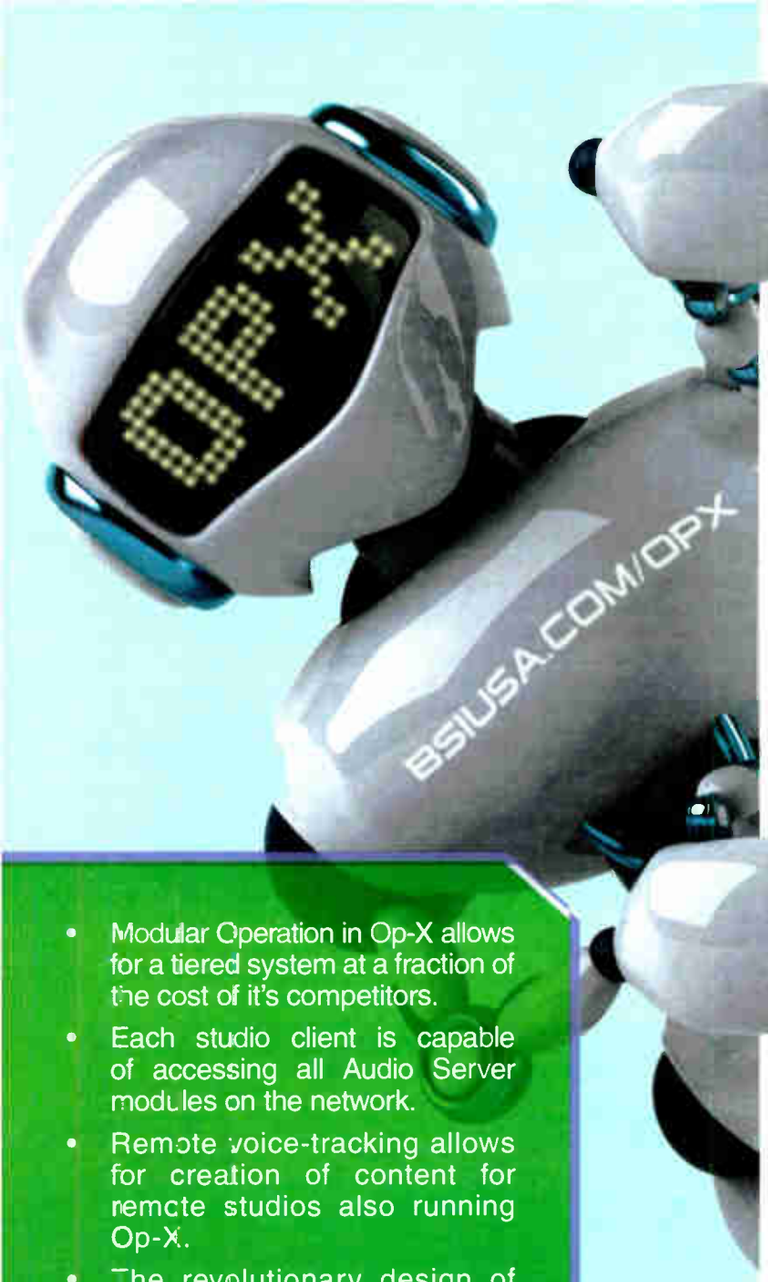
Tickets: (877)-25 ELVIS



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MONDAY

(continued from page 26)

source material (i.e., audio).

The "cloud" paradigm allows for a more focused tasking at the local level, leaving general applications to a greater, shared community saving time and labor.

AFTERNOON: IP AUDIO FOR RADIO

Monday afternoon, the Broadcast Engineering Conference turns its attention to IP audio for radio in a set of sessions also chaired by Jeff Smith.

"LANS and Drivers and Fares: Oh My!" — It's clear that digital audio now reigns supreme in the broadcast plant, and we have some standardization coming that nudges different products to speak the same language, allowing distribution of digital audio efficiently within and without the facility.

Even in the world of digital communication, talk is not always cheap, as Al Salci, vice president of Sierra Automated Systems warns us in his presentation. He plans to consider proprietary protocols in the IP audio world, many requiring differing fees and fares for licensing, and argues that there is movement afoot to bring these together under a common umbrella, making the transportation of audio more cost-effective.

"The misconception is that there are no proprietary protocols that indeed require drivers to be installed when speaking to other third-party equipment," he said. "Accordingly, to interface DAWs, a driver must be purchased or licensed, thereby negating the perceived savings of a hardware soundcard."

With the IEEE close to standardizing 802.1 AVB, Salci said, he will discuss how the standard can provide a plug-and-play process where drivers automatically install and the devices will be ready to communicate without the need for additional licensing costs. Later in the day he will go into more detail of the 802.1 AVB protocol.

"Extending AoIP to the Transmitter" — Kirk Harnack, executive director of international business development at Telos-Omnia-Axia, will discuss and show examples of bringing the remote transmitter site into the LAN; Chuck Kelly, director of sales at Nautel, will co-present and describe the functionality brought by adding Ethernet to modern transmitters, not only for remote control and monitoring, but for linear audio delivery as well.

"FM transmitters are now available with AoIP network connections," Kelly said. "This implies that, for the first time, audio may be routed from PC playout systems or other sources all the way to the transmitter and be carried in a completely linear format by IP audio packets across a qualified Ethernet/IP network."

Harnack added, "Now virtually all of a radio station facility's engineering infrastructure can be interconnected using Ethernet/IP. Separate functions and systems such as real-time linear audio transport, audio content backup, IP-video security systems, monitoring and control of studio and transmitter gear, plus voice over IP, or VoIP, and other routine IP traffic can all share a common, ubiquitous transport infrastructure." Harnack and Kelly will discuss how radio stations are doing this now.

So, we know the transmitter site is humming along well, but what about life at the studio? What can help us create that sound that will make your hardworking talent stand out? And how do we bring this technology into the control room in a way that frees up the creativity and energy?

Patrick Campion, the director of product development at ENCO Systems, will address this point in *"Beyond Automation: Intelligent Software Design for Live-Assist Applications."*

Stations want software to "be an aid to the personality, instead of a replacement," he said. "Software made to be used by humans instead of replacing humans isn't a new concept, but it's something that doesn't get the attention that it deserves."

Integration of software to simplify the creation of logs and allow for easy access to more devices by more station personnel gives the talent time to focus on the fun and not have to tangle with the tedious aspects of their routines. Intelligent GUI design is one major way to make this happen, he argues.

The evolution of telephone technology has seeped its way into our lives as well, starting with large-scale digital networks connecting coast to coast, to the soon-to-be-ubiquitous AoIP business networks in offices worldwide.

The need to for analog-to-digital conversions over various circuitry paths is becoming a thing of the past, as are bulky and expensive PBXs.

Steve Church, founder and CEO of Telos Systems and recipient of this year's NAB Radio Engineering Achievement Award, and Michael Dosch, president of Axia Audio, have co-authored *"VoIP in the Broadcast Studio,"* highlighting the uses of VoIP phone systems and how this has created versatility with direct call traffic within the studio complex, operational flexibility and the move of telephone communication into the next generation with advancements such as Session Initiation Protocol (SIP).

Audio over IP has the potential to reach just about every place on the globe. But as the Internet grows, so does the demand as

we discover new and creative things desirable to transport.

Whether it be in a closed network or over the Internet, success will require planning that takes into account capacity, latency and jitter. In the world of broadcasting, where drops and disruptions are not acceptable, some means of backup can be mission-critical.

Greg Massey, chief technical officer for AIPT, part of WorldCast Systems, will present his talk *"Going National: Special Considerations for Large-Scale Deployments of Audio Over IP,"* showing ways in which broadcasters have implemented multiple codecs to ship audio between facilities on a continental basis.

He believes that the broadcaster must learn to "think like the telecom ops" when designing the network, keeping in mind peak time, bandwidth fluctuations and other things inherent in the system in which workarounds might be required.

Al Salci of Sierra Automated Systems returns to expand upon an arena of high-bandwidth data transport with *"An Introduction to IEEE 802.1 Audio/Video Bridging for Radio Broadcasters."*

This standard was developed by an organization of professional companies dedicated to provide the specifications that will allow time-synchronized low-latency streaming services through IEEE 802 networks. With Apple and Microsoft embracing this standard, "it likely we'll see the AVB connector on future products such as we see AES or S/PDIF connectors," Salci said.

Audio over IP is now commonplace in shipping audio from point to point geographically, such as with remote broadcasting and in some cases as an STL. However, these applications require bandwidth for each receiving location. Could AoIP one day replace satellites for simultaneous distribution to multiple users?

WorldCast System's Rolf Taylor speaks about *"Point-to-Point Audio Distribution: It's Not Just Satellite Anymore."*

One new network type offered by providers, Multiple Protocol Label Switching, may be an answer. Taylor will examine how an MPLS network's data packets are assigned labels. Packets are forwarded based on the contents of the labels without the need for examination of the packet itself. As a result, end-to-end circuits of any protocol can be used to transport any form of data in a "virtually private" network.

These networks often support IP Multicast, which is designed to transport one stream to multiple locations efficiently without the need for multiple redundant streams. Taylor also covers the topic of Ethernet-IP Address Resolution Protocol and creative use to allow multipoint distribution over simplex media.

Charles Dubé is chief engineer at WFCR(FM), Amherst, Mass.

SUREBETS

THE ARIA SINGS

Aria Resort & Casino opened in December, the centerpiece of a new "urban resort destination" called CityCenter, which also features Vdara Hotel & Spa, Mandarin Oriental, Las Vegas and Crystals.

Aria was designed by Pelli Clarke Pelli, which incorporated two curvilinear steel and glass towers as well as natural elements foliage, wood and stone. The developers highlight its unusual architecture, sustainable design, "high-end service and spectacular amenities."

MGM Mirage developed CityCenter with Infinity World Development Corp. CityCenter is called the largest private sustainable development in the world. It occupies 67 acres between Bellagio and Monte Carlo resorts.

Tuesday: Radio Data Services and More

Sessions Also Look at AM Detuning, STLs And the Impact of Indoor Noise on FM Radio

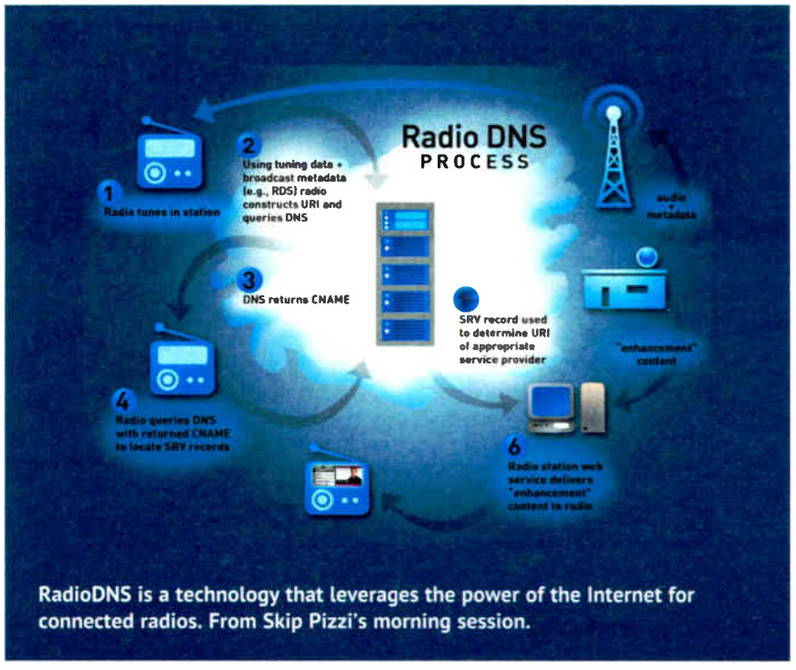
BY ALAN JURISON

Tuesday's engineering sessions offer a sampling of new technologies that are being developed for radio. In the morning, the focus will be on "Radio Data Services" covering topics related to RDS, HD Radio and other technologies to deliver more content and applications to receivers. The session chair is Dom Bordonaro of Cox Radio.

Tuesday morning's presentations start with Mike Starling, NPR's vice president and chief technology officer and the executive director of its Technical Research Center and NPR Labs.

In *"Emerging Bonded Metadata Applications and Accessible Radio Services,"* Starling will provide an update of the Technology Research Center's work on a initiative to support synchronized bonded metadata services, for live and delayed broadcast, in the rollout of the next-generation Public Radio Satellite System (Radio World, March 1).

The TRC is a new service initiative of NPR Distribution, which now houses the NPR Labs operating unit. One of the new bonded metadata applications under development is Captioning for Radio, an emerging digital service feature previously unavailable to analog-only radio.



RadioDNS is a technology that leverages the power of the Internet for connected radios. From Skip Pizzi's morning session.

Papers by individuals involved in employing alert technologies will focus on using RDS/RBDS technology on FM stations.

Matthew Straeb, executive vice president of Global Security Systems, will present *"Saving Lives With FM Radio-Based Mass Notification."*

He will discuss how emergency alerts can be done via RBDS, and technologies that can be more granular at assigning alerts than traditional FIPS codes used in EAS broadcasts. Alerts using these types of technology can be assigned to smaller and specific areas, such as a Zip code.

While this technology now requires receivers meant to decode the warning messages, Straeb anticipates that these features will be integrated into more common devices — specifically the cell phone, should U.S. carriers start including FM radios in phones.

Straeb states that 40 percent of cell phones outside of the United States have integrated FM radios; if that were to be extended inside the United States, it would create a valuable platform for mass notification of alerts to the public. Straeb said many design issues related to the implementation of this technology in cell phones has been achieved.

He adds that some 500 million FM/RBDS chips have been shipped since 2001.

"The Benefits of Using FM RBDS Data in Integrated Public Alert and Warning" is by Bill Marriott, chief technology officer of viaRadio.

While Marriott would like to see implementation in cell phones, he said other issues need to be considered.

Phone manufacturers will have to coordinate and agree with the carriers to incorporate these features; he doesn't foresee that happening quickly. Other items such as giving control over the phones software to a third-party alerting service and even controlling the FM tuner to monitor alerts will be issues to work out. Having the user of the phone listening to an FM station, and having the phone listening for alerts, can present a competing use for the tuner.

He feels this will take time to resolve and is instead focusing on devices that are radios, such as a clock radio, with two tuners; one tuner to monitor for alerts, and one for the listener to control.

"No single warning technology is perfect. We need a layered approach."

He thinks FM alerting via RBDS is an important layer in conjunction with EAS, SMS, Reverse 911 and Internet technologies, and that RBDS is the most efficient way to broadcast rapidly to many people. Using New York City as an example, if devices to receive such alerts became ubiquitous, "It's the fastest way to wake up millions of people."

Continuing with the RDS/RBDS theme, Jim Roberts, product manager for The Radio Experience at Broadcast Electronics, will present *"Do More With RDS Data."*

He will discuss the basics of RDS displays and the use of software to improve the listener experience.

Roberts also will address more

advanced RDS concepts such as interleaving messages, linking messages to audio and how to utilize RDS to improve promotions and advertisements.

He'll also talk about RDS tagging and the implementation of tagging via social networking sites like Twitter and Facebook to make tagging accessible to more listeners without the need for specific mobile devices or special receivers.

"Providing Media-Rich Content Using Digital Radio" will be presented by Tim Anderson, manager of strategic market and product development at Harris Broadcast.

He will discuss new applications for digital radio; the paper will focus on HD Radio technologies and developments, but he said many of these advances apply to international DRM/DAB platforms as well.

This, or something like this, is going to be the future of STLs.

– Paul Shulins

Exciting applications such as transmitting graphical slide shows are being developed and could be used for sending station logos, album art, advertisements and weather graphics synchronized to audio content. Other applications include electronic program guide (EPG), 5.1 surround sound, Traffic Message Channel, conditional access and Journaline, a service that provides structured text data to radio receivers to present "magazine content" or news content on the radio display.

Anderson will outline some of the transmission and receiver sub-systems and protocols required to do this as well.

Before lunch, media technology consultant Skip Pizzi will present *"Enhanced Radio Broadcasting: Next-Gen Features for Connected Devices."*

Pizzi will share his experiences working on some of these new technologies and provide a status of their development. For instance, the electronic program guide could enhance the listening experience.

"There's a lot of content on radio that people don't know about unless they stumble on it," he said. "This puts terrestrial radio at some sort of parity with other mediums" such as television.

RadioDNS/RadioVIS is another technology he will address; it leverages the power of the Internet for connected radios. New receivers are being designed that not only tune in terrestrial broadcasts but can be connected to a network and have access to the Internet, creating exciting opportunities for the radio to download content and graphics to the display.

Pizzi will also discuss the various types of tagging via RBDS and HD Radio and apps for mobile devices.

AFTERNOON: CASE STUDIES

The afternoon sessions, "Radio Case Studies," will present a range of topics ranging from non-traditional STLs, interference/noise analysis on the FM band and satellite delivery networks to enhancing digital content on the web, using computer modeling for reradiating structures on AM, and using voice over IP in a broadcast environment. The chair is Andy Laird of Journal Broadcast Group.

The first, *"Satellite Distribution of HD Radio and Analog FM Using HDC,"* is presented by Mike Pappas, chief engineer of KUVO(FM) in Denver.

For stations that need to deliver STL-quality audio to multiple transmitters across large distances, the costs of data links to these locations can be expensive, especially when you consider HD1/HD2/HD3 streams along with the traditional analog FM audio. Pappas will share his experiences in a project involving a satellite network to deliver audio to two distant sites via satellite using the 300 kbps HDC "HD Radio" audio codec and then deriving the analog FM audio from this stream.

Doing such provides significant savings over the long term when considering two or more stations, and becomes "a cost-effective solution to roll out HD" in those situations, Pappas said.

(continued on page 32)

TUESDAY

(continued from page 31)

For shorter distances, Paul Shulins of Greater Media in Boston shares his experiences of using non-traditional point-to-point wireless STLs in his presentation *"Maximizing the Reliability of Studio-to-Transmitter Links for Radio."*

When it comes to today's STL requirements of getting multiple audio sources to a single site, "the old Part 74 stuff isn't cutting it anymore," he states. "People need to find new [higher capacity] links."

While solutions that use 2.4 GHz and 5.8 GHz unlicensed spread-spectrum technologies have been popular to deploy and offer a lot more capacity, Shulins said he experienced problems with reliability as these unlicensed bands became saturated.

He will outline his successes and challenges using licensed 11 GHz and 18 GHz links, bands that were traditionally off-limits to broadcasters for STLs due to FCC rules.

"The commission needed to be convinced to allow it... [w]e had to show the need." The benefits are enormous; licensed, protected channels and transmission rates of 150 megabits (or more) are possible. Shulins will outline the regulatory landscape, technology and some of the theory to consider for these types of links. "This, or something like this, is going to be the future of STLs."

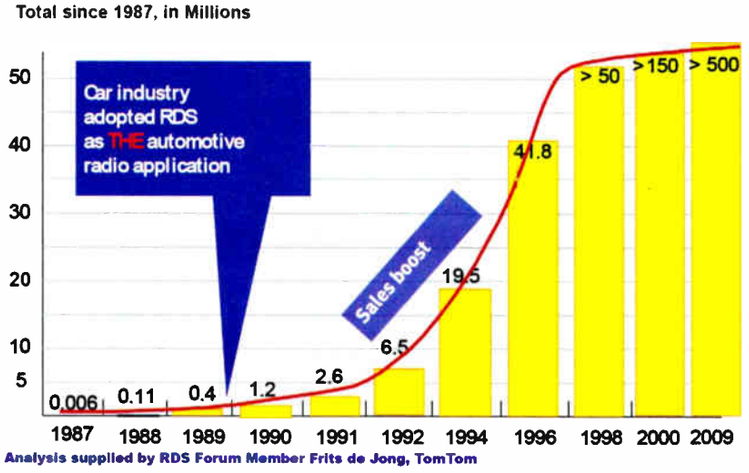
Steve Johnston of Wisconsin Public Radio will present *"Indoor Noise Conditions in the FM Broadcast Band,"* sharing his experience of finding devices in homes and businesses that create noise that interferes with FM broadcasts.

"It's hard to put absolute numbers on this," he states, but he will present data comparing the FM band inside and outside of homes and offices.

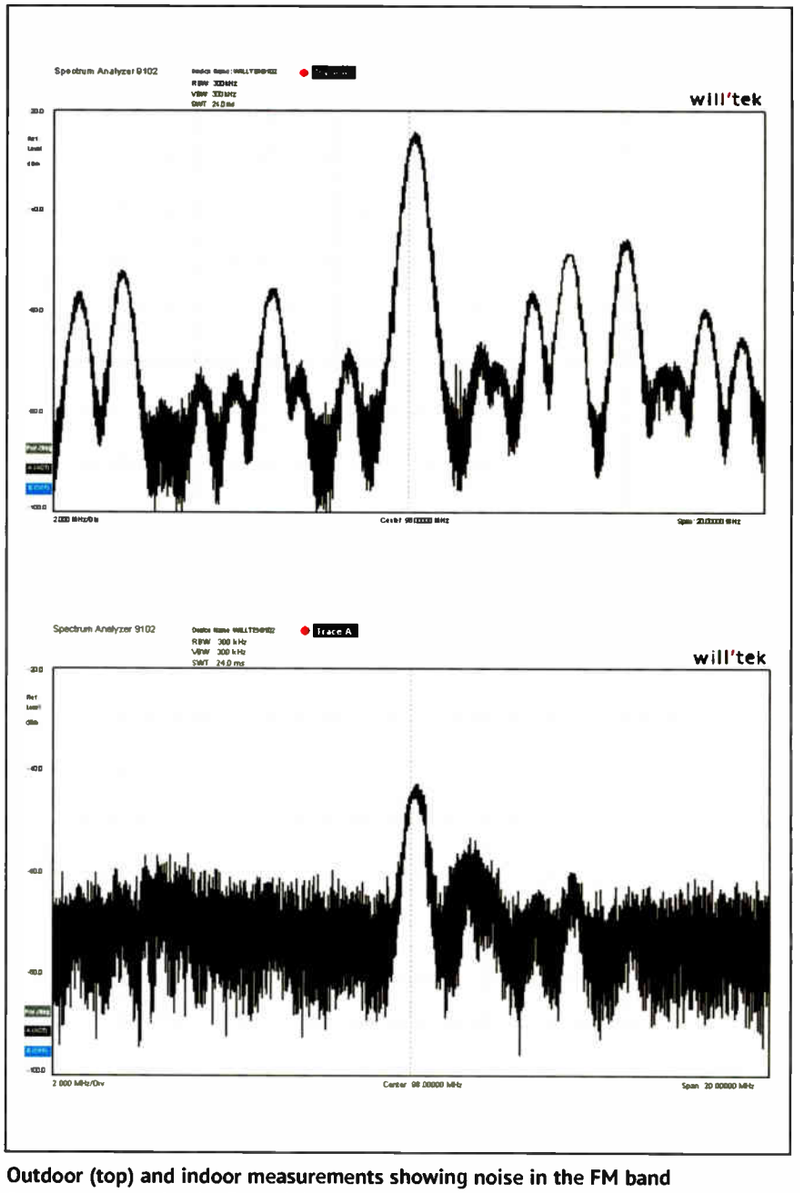
"As soon as you step in the door ... the noise floor rises significantly, covering up the weaker signals." Some of the worst noise polluters include newer TVs and lightweight AC adapters to charge smaller devices like cell phones.

"Due to the relatively low power of HD carriers, this could be partially to blame for the poor indoor HD reception," he said.

"Case Study: PRSS Next-Generation Content Delivery" by Pete Loewenstein, vice president of distribution for NPR, focuses on important upgrades planned



Matthew Straeb says more than 500 million FM RBDS chips have been shipped since 2001.



Outdoor (top) and indoor measurements showing noise in the FM band from a presentation by Steve Johnston.

for the Public Radio Satellite System, which is used by some 400 NPR and other public stations and serves hundreds more.

New receivers are being tested and will start being deployed this summer, with an eventual goal to be converted to the new system in 2011.

Engineers whose stations use the system may wish to attend as Loewenstein will outline the new features and benefits, an updated timetable for the project and what interconnected stations must do to convert.

A.J. Janitschek of Radio Free Asia will share ideas to improve your on-air and interactive offerings.

In his presentation *"Radio Living in a Multimedia World,"* he will discuss the use of video and social media by your station's reporters and personalities to help capture more than audio when they're at an event or covering a story.

A lot of towers ... have been detuned that didn't need to be.

– John Warner

"We are no longer in just the radio business, we're in the multimedia business," he said. Radio Free Asia has had success adding such content to its web site and social media sites and YouTube. Including this content on other popular sites has been helpful as the Radio Free Asia site is censored in some nations.

"Detuning in the MoM Era," presented by John Warner, vice president of AM engineering for Clear Channel, will focus on new rules under consideration by the FCC that would allow other licensees building or making modifications to towers near AM stations to use Method of Moments (MoM) computer modeling to determine if a proposed tower will impact the AM station.

If the MoM analysis shows adverse effects, they can use the computer modeling to determine the detuning solution and impact. This is in contrast to current rules that require field measurements before and after construction. These rules could be enacted as early as this spring.

Warner will cover how to interpret reports that might be served as notification to a station, and what you should do if you get the paperwork. He also will talk about detuning and some of its myths.

"There are a lot of towers that have been detuned that didn't need to be," he said. Using MoM should help in understanding the difference between a tower that will affect the entire pattern vs. having just a localized effect on a single area or monitor point.

The presentation *"Telephones in Your Studio or Newsroom: Big Changes Coming"* is by Joe Talbot, director of engineering of Citadel Broadcasting in San Francisco.

"The handwriting is on the wall. POTS is done," Talbot says. He will talk about how voice-over-IP technologies can be leveraged in a broadcast environment to reduce costs while improving the quality of the content and making it easier for your operation to use.

"You don't have to spend much money ... to enjoy the benefits of these changes," he said. "You are no longer tied to a single vendor for everything." Talbot will share experiences with name-brand and open-source solutions.

And *"Power Quality in Communications Facilities"* is intended to recommend wiring and grounding techniques and practices that should be part of new or renovated structures.

"We will examine several case histories, including television, radio and 911 communications centers," stated David Brender, national program manager for the Copper Development Association, in an NAB summary.

"The power quality wiring and grounding practices to help prevent power quality problems from occurring, or diminish their effect, are applicable to every industrial end use."

Alan Jurison, CSRE, AMD, DRB and CBNT, is a regional IT manager/broadcast engineer for Citadel Broadcasting in Syracuse, N.Y.

Wednesday: Disaster Prep and You

Speakers Offer Tips to Anticipate the Worst, and Stay on the Air If It Comes

Steve Fluker will talk about disaster preparation. This picture shows damage from a 2007 tornado that struck WCFB(FM) in Daytona Beach, Fla.

BY DANIEL SLENTZ

Engineers face a lot of adventures, from the late-night phone call that something has just gone terribly wrong to how to keep the GM happy by reducing costs.

This year's NAB Show presents two session sequences that radio engineers will find fascinating and informative — or may turn your stomach.

The morning sessions regarding "Disaster Preparedness, Recovery and Security" may cause the butterflies to start flying. Andy Laird of Journal Broadcast Group is moderator.

The discussion begins with "*Strategies for Disaster Preparedness: Staying on the Air if the Worst Happens.*" Chuck Kelly of Nautel Ltd. leads this talk.

Kelly, who has been in the business for 37 years and started as a DJ, says natural or man-made disasters are a critical element to consider when planning for the worst. From tsunamis to hurricanes, such events disrupt basic infrastructure and put increased responsibility on broadcasters. It's radio's job to have a plan in place so we can continue to provide information (and maybe a little entertainment) to our listeners. Radio is still the strongest mobile media; even with an increase on Web services, generally our systems are built to be robust enough to handle emergencies.

Kelly said broadcasters should plan for loss of power, communications and transportation; have alternate sites in mind should normal studio and transmitter sites not be available; and consider a kit of supplies, ranging from "studios in a box" to generator fuel.

Steve Fluker of Cox Radio then discusses "*Are You Prepared for a Disaster?*"

He's seen a few of them. Florida may get more than its share of bad weather but there is no place immune to all forms of natural or man-caused calamity. Fluker will talk about your planning and how it will might make you, as he put it, "the station hero."

Critical failures or disasters need not be big events. We think of tornadoes, hurricanes, floods, lightning, hail and wind damage; we see fire and vandalism. But small events too can take you down: a power failure coupled with a generator that's offline; an STL path failure due to a dish blowing out of alignment or atmospheric conditions causing microwave fade or ducting; a transmission line section burning. A pandemic could send a quarter of your staff home sick; a chemical scare could cause your building to be evacuated.

Fluker will discuss how to be prepared to handle eventualities so you confidently can face your managers, corporate office and insurance companies while you rebuild and recover.

"*Putting the Final Touches on Next-Generation EAS*" is a panel moderated by NAB's Larry Walke and featuring speakers from FEMA, the FCC and the Maine Association of Broadcasters.

As Radio World has reported, FEMA is rolling out a new Common Alerting Protocol that will allow the same warning message to be delivered via many different warning platforms, while the FCC is exploring a new process of required annual nationwide EAS tests.

Such transitions can produce questions and confusion. This discussion promises insight as to what the process means to you.

Daniel Slentz is vice president of technology and broadcast operations for KERA(FM/TV) and KKXT(FM) in Dallas/Ft. Worth.

THE WHITE SPACE ERA

A Wednesday afternoon session of the Broadcasting Engineering Conference focuses on "Spectrum Issues for Broadcasters."

Topics include "Leveraging White Spaces and an Introduction to the New Networks Being Built With Them," "Wireless Microphone Testing for White Space Proceeding in Mid-town Manhattan," "What Wireless Mic Users Need To Know About White Spaces and the 700 MHz Band," "Radio Communications in Today's Complex RF World," "Broadcast Operation and Coexistence in the White Space Era" and a panel discussion about these spectrum issues.

SURE BETS

YOU GOTTA BELIEVE

For early NAB arrivals only:

Illusionist Criss Angel's favorite movie is "The Wizard of Oz." So perhaps it's no surprise that the goal of his new show at the Luxor, "Believe," was to transport the audience into another dimension.

Note the style of the name with the letters "l-i-e" in bold. Unlike his popular show on A&E, "Criss Angel—Mindfreak," in which he works his magic for both celebrities and passersby on the street, "Believe" partners the illusionist with the surrealistic performance art/dance troupe Cirque du Soleil for a show it describes as transcending "any preconceived notion of what it means to be emotionally engaged by the arts of mysticism and illusion."

Angel stars as a Victorian nobleman on a "path of imaginative exploration" when he encounters two women representing different aspects of femininity and four bizarre "Ushers," who introduce the audience to the characters' and dancers' "high-energy visual feast."

But the show is dark April 11–17, so this tip applies to early convention arrivals only. Tickets range $59–$160. Book online through Ticketmaster, or by phone at (702) 262-4400 or (800) 557-7428.

"Believe"
Luxor Hotel and Casino
3900 Las Vegas Boulevard South
(702) 262-4400
www.luxor.com

MORE SHOW HIGHLIGHTS

Find session details at www.nabshow.com

BEC Keynote: Dr. Barry Blesser
"A Path for Restoring the Lofty Status of Broadcast Engineers"
Sunday, 9 a.m.

Mobile Television
Two-part BEC sessions
Sunday, 9:30 a.m.–5:30 p.m.

Ray Kurzweil Keynote and Q&A with Doug Trumbull
Tuesday, 9 a.m.

Mobile TV: Ready for Primetime?
Tuesday, 1 p.m.

In Conversation With: Stan Lee
Yes, that Stan Lee.
Wednesday, 9 a.m.

Military and Government Summit
Howard Lance, president/CEO of Harris Corp., speaks on "Dual Utilization of Broadcast Technology for Industry and Government."
Wednesday, 10 a.m.

The Business and Technology of Sports Broadcasting: From Mobile Devices to 3D
Wednesday, 11:30 a.m.

Technology Luncheon
NAB Engineering Achievement Awards to Steve Church, shown, and Mark Richer. Church is profiled in our next issue.
Wednesday 12:30 p.m.

Amateur Radio Operators Reception
Wednesday 6 p.m.

Thursday: Green Getaway Day

Energy Efficiency Is the Focus of 'Green Technologies for Broadcasters'

BY DANIEL SLENTZ

As our managers and company ownership look for ways to improve efficiencies, we may find ourselves exploring cost reductions. But turning the power down on the transmitter or reducing the frequency of the tower strobe are frowned upon.

Energy efficiency is the theme of Thursday papers on "Green Technologies for Broadcasters," chaired by Dom Bordonaro of Cox Radio. While some are not specific to radio, you will find that green is green. TV stations and film studios utilize a lot of gear similar to radio; heat load, power distribution and economics are as critical to them as they are to us. And if your station is breaking down the barriers between "just radio" and a full-service provider (including web video), most of this does apply.

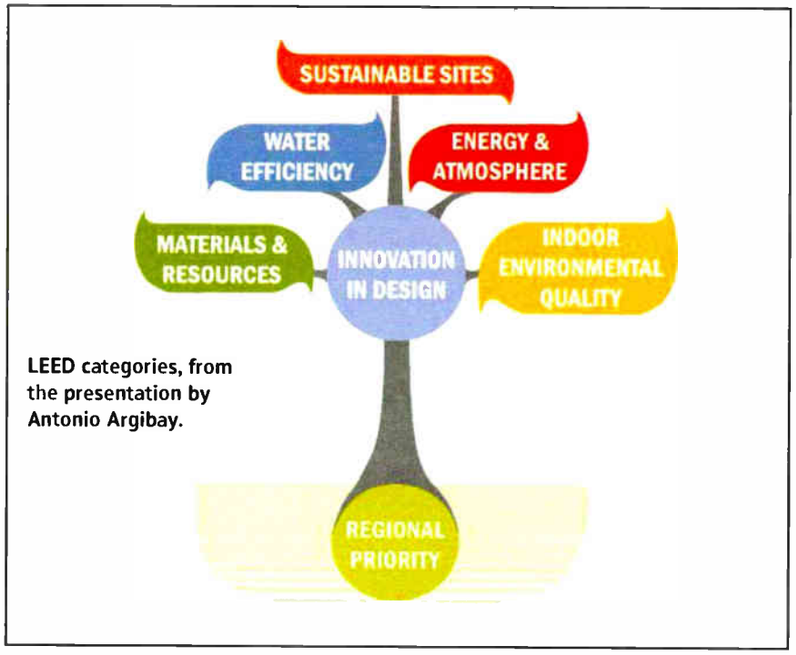
The morning begins with *"Sustainable Facilities and LEED Certification: A Broadcaster's Guide"* by Antonio Argibay from Meridian Design Associates.

The Leadership in Energy and Environmental Design rating system was developed by the U.S. Green Building Council. Such certifications are becoming mandatory or affecting regulations in some states and municipalities, and are therefore increasingly important in the design of broadcast facilities.

His paper is an introduction to the LEED Certification process including how to meet the emerging regulatory landscape under which future facilities are built and existing ones upgraded.

Discussion of green technologies continue every half hour throughout the morning. These include one specific to what occurred at a DTV station, the design for a new film studio in Massachusetts, facility design improvements, improved lighting and alternative power for broadcasters.

A discussion of note is called *"Hollywood East: Home of Sustainable Production."* The presenter, Stephen Newbold, an architect with Gensler, says that though radio is a vocal art, audiences are expecting more services, including visual, from radio broadcasters.



LEED categories, from the presentation by Antonio Argibay.

Newbold suggested these simple planning items for "green radio facilities":

1) Do more digitally. Remove "hard copy" from the process; this lowers power/heat requirements, space needs and speeds workflow.
2) Include comfortable work areas, ergonomics, day lighting, visible teams and more supportive "work communities" in your planning to enhance staff retention.
3) Increase "social spaces" in facilities; this may seem counterproductive but actually can increase productivity, enhance company culture and strengthen your brand.
4) Limit isolation spaces to tasks that absolutely need them. This reduces operating expenses and lowers new construction costs.
5) In 24/7 projects, pay special attention to amenities, services, parking, security and any non-core functions.
6) Seriously address all equipment energy usage; great savings may be found in both ongoing operation and initial capital expenditures.
7) Don't perfect a facility for today's needs and inadvertently exclude tomorrow's.
8) Build consensus before you build anything. Spend the time, money and energy in thorough planning. This falls under "those who fail to plan, plan to fail."

Peter Bloomfield of Bloomfield & Associates will explore *"Best Practices for the Design of Facilities: How Better Design, Better Acoustics and New Media Impact the Cost of Operations."*

More stations are adding streaming media, video content, webcasting and other new services. When architects are required not only to design for "sublime" spaces but to accommodate this increased technology and energy efficiency, what is the impact on design and operational cost?

Another morning discussion is about lighting. Though we in radio may not place emphasis on this, we can appreciate the impact of poor lighting on work performance (think of the movie "Joe Versus the Volcano" with Tom Hanks). We look at the impact on personal health and attitude, plus the cost benefit of being energy efficient — even of considering color temperature.

As a radio broadcaster, this may be a new phrase to you, but color temperature of lights is important when you are considering the addition of video. Your talent may look green on Sunday mornings but you want them looking healthy for your future video endeavors.

The presentation is *"HD Quality Energy Efficient, Low Heat Broadcast Lighting."*

And the morning concludes with Joe Talbot of Citadel's KGO(AM)/KSFO(AM) in San Francisco, who talks about *"Alternative Power Options for Broadcasters."*

A handful of stations have been able to "swipe power from nature" over the years. KFMU(FM) in Steamboat Springs, Colo., pulls about 3 kW from solar, which is enough to cover about 90 percent of their transmitter usage. WNHS(LP) in Newcomerstown, Ohio, may be pulling power from both solar and wind as their school district takes advantage of grants to install this green energy.

KGO needed about 20 kW of power for its transmitter site. Find out at this discussion how they did it and what your station might be able to do.

SUREBETS

MEET A PAWN STAR

Did you know the first pawn shops appeared in ancient China more than 3,000 years ago or that there are more than 12,000 pawn shops operating in the United States? Did you know the average loan granted for a pawned item is $75? Or that St. Nicolas is the patron saint of pawnbrokers?

Whether or not you are familiar with the concept of pawning or a fan of the History Channel's hit show "Pawn Stars," a visit to the Gold and Silver Pawn Shop on Las Vegas Boulevard is likely to be entertaining.

More like a museum than the stereotypically rundown pawn shop one might imagine, the bustling Gold and Silver features an eclectic mix of typical pawn shop items such as jewelry, furniture and guitars, but also pop culture lore and historical artifacts — sometimes really historical artifacts. Recent episodes of the television show have featured a 1940s quartermaster's spyglass, a silver spoon made by Paul Revere and a Ford's Theater playbill from the night Abraham Lincoln was assassinated.

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Exhibit Hours

Monday April 12: 9 a.m.–6 p.m.
Tuesday April 13: 9 a.m.–6 p.m.
Wednesday April 14: 9 a.m.–6 p.m.
Thursday April 15: 9 a.m.–2 p.m.

(RTNDA@NAB hours vary)

This is a selection of exhibitors of interest at the 2010 NAB Show. Highlights are paid for by exhibitors; information is from 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, R is RTNDA at the Las Vegas Hilton.

25-Seven Systems **C144**
Intro: Program Length Manager shrinks or stretches your programs and program segments by 5% (three minutes per hour) or even 10%, without pitch change, artifacts or glitches. Time-manipulated audio is clean enough to use on stereo music programs and live events.
Featured: Audio Time Manager (ATM); Program Delay Manager (PDM)

Acoustical Solutions **C4937**

AEQ **C1928**
Intro: Opera analog on-air console is based upon the BC-500 with new features, suitable for medium to large radio operations. Modular design. Adjustable monitor bridge has dual VU meters and two-way stereo monitor speakers. No-maintenance LED illuminated switches. RF filters are on inputs with balanced transformers on mic/line I/Os. Fader start and VCA signal control. Chassis accommodates 17 input/output channels. Two standard configurations: Studio Control or Auto Control. Also: AM-04 is an analog/digital/SDI audio monitor for VTR rooms, OB vans, television/radio, control rooms and media systems. AEQ Forum is a self-contained compact digital audio console based upon the Arena. Digital audio features built into a self-contained modular design. AEQ Titan is a 5,120 x 5,120 high-speed/high-capacity digital audio router with five bidirectional optical fiber ports. Using a non-blocking architecture, each of the ports is capable of connecting up to 1,024 channels. AEQ Titan is an audio switching "core" for critical systems. AEQ Phoenix is a studio IP audio codec in a single RU chassis, with stereo analog and digital inputs and outputs as well as a universal power supply (90–250V AC); two slots accommodate optional modules such as POTS (PSTN), ISDN (RDSI), X.21, V.35 and GSM. Modular design.

Aeta Audio Systems **N1002**
Featured: Scoopy+ portable audio codec for remote broadcast suitable for NGN IP (SIP), 3G/UMTS, GSM, ISDN. Also: Scoop 4+ is a stereo studio audio codec in a single RU format designed for leased lines and IP (SIP), ISDN optional (one or two lines); Mixy is an analog and digital, compact stereo audio mixer convenient for news, documentaries, concerts and cinema.

Aldena **C3132**
Featured: Professional antenna systems and services for analog and digital broadcasting.

Altronic Research Inc. **C1625**
Featured: RF coaxial dummy loads from 1 kW to 1500 kW. Available in water-cooled, air-cooled and soda/water-cooled.

Argosy **N4316**

Armstrong Transmitter **C1420**
Featured: AM transmitters, FM transmitters, FM antennas, STL systems, band-pass filters and diplexers.

Arrakis Systems **C2007**
Intro: ARC-8 Console for on-air, Internet radio, podcasting and church radio. It features 10 source inputs: two mic, seven stereo line, one USB; eight input channels, two mic channels (with optional 48 V phantom power), five stereo line input channels (with both unbalanced and balanced inputs), Channel 8 is selectable between a PC USB sound card input or a stereo line input. Balanced mix-minus telephone output for interfacing with an external phone hybrid. Also: Digilink Xtreme-Complete is the latest iteration of the Digilink radio automation system. On-air, production, scheduling and logging can be performed at the same time on the turnkey workstation. Includes Dell Optiplex PC (per current configuration), 19-inch LCD monitor, keyboard, mouse, Dell three-year, next business day on-site service, PC configuration and setup for automation, Xtreme "Bridge," Xtreme software, one-year DX-Support (Xtreme Solutions Program), telephone training and support, training at the Arrakis factory, Bridge hardware replacement, software upgrades. Also: Accent line of component studio furniture for radio brings art and function together. The metal structure is integrated into the visible design decor of the cabinetry, creating a durable and attractive studio.
Featured: Digilink-Xtreme radio automation, ARC series consoles (MARC15/ARC15/ARC10/ARC8), AARC-NET networked audio.


Photo by Jim Peck

Andy Stadheim of Barix and Jerry Jeske of the Rio Grande Bible Institute talk at last year's show about the analog/digital Exstreamer 1000 codec.

ATI-Audio Technologies Inc. **C1720**

Audemat - APT Inc **C751**
See WorldCast Systems

Audio Precision **C2023**

AudioScience Inc. **C1721**
Intro: The ASI564x series are junior partners of the ASI6600 series of PCI Express sound cards used in radio automation. The cards retain high-end features such as +24 dBu balanced analog audio with 110 dB dynamic range, together with AES/EBU digital I/O with hardware sample rate converters on all inputs. Multichannel support is standard. Using surround sound extensions (SSX), streams of up to eight channels may be played, recorded and mixed. Useful for production and automation systems that do not require DSP-based MPEG compression. Also: ASI8914 is a universal PCI card that contains four HD Radio/AM/FM tuners. Each may be set to an independent analog or HD Radio station. The audio from each is presented to the computer host as a mono or stereo record stream that may be accessed through a 32-bit PCI bus master interface. Each tuner can decode and stream HD Radio Program-Associated Data (PAD) data and RDS/RDBS data for analog FM. HD Radio multicast is supported, allowing audio and PAD stream to be switched between the Main Program Service (MPS) and Secondary Program Services (SPS) under software control. Also: The ASI6585 merges Axia's Livewire with advanced audio processing on one adapter.

Audioarts **C2623**
See Wheatstone

Audio-Technica U.S. Inc **C1632**
Intro: AT4080 is a phantom-powered bidirectional ribbon mic that solves problems of fragility and low output that have plagued such mics. Also: Bidirectional, phantom-powered AT4081 offers robust build for performance and higher output for compatibility with mic preamplifiers. With low-profile stick design, this is use on instruments and guitar cabinets in recording studios and live-sound. The AT4050ST is a side-address condenser with cardioid and figure eight elements configured in a mid-side arrangement. This stereo condenser allows recordists the choice of a left-right stereo output or discrete mid-side signals for later manipulation. The multipattern condenser AT4047MP delivers vintage sound in a multipattern design

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omt technologies

with omni, cardioids and figure eight polar patterns, suitable for vocals, strings, guitar, instrument ensembles, small vocal groups and voiceovers. The BPHS1 broadcast stereo headset is for news and sports, announcing and interviews. The headset offers focused vocal reproduction, closed-back circumaural cups and a high-output dynamic mic mounted on a gooseneck boom. The microphone has a cardioid polar pattern tailored for voice intelligibility. It is more sensitive to sound originating in front of the element, making it useful in reducing pickup of unwanted sounds. The boom swivels for positioning on either right or left.

AVT Audio Video Technologies **C12238**

Intro: Magic SP2 Downmix System provides an automatic downmix from 5.1 surround sound to stereo. The Magic SP2 uses a new downmix algorithm developed by the Institut für Rundfunktechnik that avoids distracting effects or compensates them. The ITU-R BS.775 downmix standard is supported. Presets for various productions (e.g., pop, classic, radio drama etc.) are available. Delay is adjustable to compensate for application used. Magic SP2 has three digital AES3 audio interfaces for the input of the 5.1 multichannel sound which are additionally looped through to three digital AES3 outputs for further usage. The output of the stereo downmix sound signal is available at the analog XLR audio interfaces or, to guarantee quality, at a digital AES3 interface. Monitoring of the downmix signal and the multichannel audio inputs can be done from the front-panel headphone output. For integrating in a network management system the SNMP function can be used. Also: Magic TH6 digital telephone hybrid; Magic AC1 XIP audio codec; Magic TH2 and Magic TH2 POTS telephone hybrids.

Featured: Magic AE1 DAB and Magic AE1 DAB+ audio encoders, D-Vaudax DAB/DAB+/DMB multiplexer, Magic AD1 ETI decoder.

Axel Technology S.R.L. **C1654**

Intro: Falcon Five is a series of audio processors for FM, TV, satellite and Web broadcasting. Features of some models include five-band audio processors, RDS/RBDS encoding, MPX stereo generator, audio changeover, bass and stereo enhancers. It is ITU-R-BS412 and ITU-R-BS1770 compliant. It also has an advanced interface, TCP/IP, Web server and PC software. Also: The Oxygen 4 Digital is a digital mixing console with 18 digital and analog inputs, a crosspoint router, 32-bit processing, sampling rates up to 96 kHz, sample rate converters on all the digital inputs, and both EQ and dynamics on every channel. Tools can be accessed from the control surface or controlled from a PC attached to the console via an IP network. Wolf is a real-time FM network measurement and monitoring system. Enterprise Edition is a solution for advanced broadcast automation.

Axia Audio **C146**

Intro: iQ is an IP console/routing system that includes control surface, DSP-based mixing engine, audio I/O, machine-control logic, even built-in Ethernet switch. Setup is by connecting the control surface to the Core with a single cable. Audio inputs are added using Cat-5 cable and system configuration can be handled via a Web-based configurator. iQ Simple Networking lets users daisy-chain four iQ Cores without an external Ethernet switch. Or iQ can be connected an existing Axia IP-Audio network with a single Ethernet connection. iQ is customizable and scalable. Starting with the eight-fader iQ Main Frame, expansion frames with more faders and capabilities can be added. Options include backup power supply, programmable routing control panels, a six-fader expansion frame with a built-in controller for Telos talk systems. A 20-input iQ Core supports large consoles of up to 24 faders; more inputs can be added using Axia audio nodes. The iQ mixing console features four stereo program busses plus dedicated phone bus, Record Mode one-touch off-air recording, automatic mix-minus (clean feed) for every fader, countdown timer with auto-start/auto-reset functions, and one-button access to up to four show profiles for instant recall of console settings. Talkback functions provide operators with communication to talent, guests, remote hosts and telephone callers. Also: Axia's new IP-Intercom system delivers broadcast-quality intercom audio over Ethernet, eliminating the complication and expense of multiple hardwired connections. It works with mixing consoles, giving broadcasters the ability to bring audio from any station in the plant to air. Features Advanced Echo Cancellation technology that aims to eliminate acoustic feedback generated between open mics and speakers. The IP-Intercom family includes a range of rackmount intercoms that can be deployed as a standalone system, along with drop-in modules for Axia Element 2.0 mixing consoles. IP-Intercom equipment integrates into Livewire IP audio networks and scales economically. Also: Element 2.0 modular broadcast console now has programmable fader modules with a soft-selector that gives one-touch access to frequently-used functions like input gain, fader trim, source selection and pan controls.

Azden Corp. **C1110**

Barix Technology **C1139**

Intro: Barix's STL Package is based on a special firmware load and device preconfiguration for the Barix Exstreamer 1000 encoding and decoding device; this allows broadcasters to launch an IP-based STL platform more quickly when based on the Exstreamer 1000, the first Barix Instreamer or Exstreamer device to include contact closures to trigger and control local announcements. Also: Our new low-latency local ad insertion solution provides radio networks with an effective toolset to deliver syndicated programming with individual advertisements, promos, jingles, station IDs and other content to affiliates. Developed in partnership with StreamGuys and MOH Technologies, the solution allows broadcasters to trigger local content for affiliates during specific ad slots via a Web browser. Networks or affiliates can upload files and assign destination sites using pull-down menus and schedule accordingly. A Barix Exstreamer 100 device at each affiliate receives and decodes the individualized stream, which can be processed or directly broadcast via terrestrial or cable systems. A Barix Instreamer real-time audio encoder can be added at the origination point for the absolute lowest latency. Also: Barionet 50 is a low-cost IP automation controller.

Beat The Traffic **SU2302**
Intro: BeatTheTraffic.com includes an embeddable widget providing personalized driving directions based on traffic conditions and showing alternate roads. BeatTheTraffic.com has features such as interactive, draggable AJAX maps with real-time speeds and mouse-over information, point-to-point travel times and forecasts for key routes and overlaid weather info providing a decision-making tool for commuters and traveling professionals. One-screen access to information. Along with its mobile-optimized Web site, BeatTheTraffic.com has released two native applications for iPhone and BlackBerry devices featuring camera images and traffic forecast in selected markets. Our mobile apps are available for co-branding opportunities. Also new is an upgrade to the Beat the Traffic Radio Console that will make traffic reporting easier for radio broadcasters. The console allows access to traffic flow, incident information and point-to-point travel times. Reporters can sort and categorize information to deliver traffic updates as news happens from their booth.

Belar Electronics Lab Inc. **C846**
Intro: The FMCS-1 is a new all-in-one monitoring solution for FM analog broadcast. Frequency agile off-air and transmitter feed, featuring mono and stereo monitoring as well as RDS, SCA(2), and spectrum analyzer
Featured: FMHD-1.

Bird Technologies Group **C3062MR, C454**

Broadcast Devices Inc. **C1451**
Intro: SWP-200 series is a calibrated RF power meter and RF switch controller for up to four RF switches. It provides simultaneous readout of forward, and reflected power, and management of interlocks and transmitter control for RF switch operations. Also: The ATB-300 is a 4/8 digital, composite and analog L/R input switcher. Switch any of four or eight inputs to all outputs simultaneously. Units can be configured for all-analog, all-digital or composite FM stereo base band. Uses include general-purpose audio switching such as studio switching or transmitter site audio path switching. Also: The GPM-300 is a 4/8 x 4/8 digital, composite and analog L/R input switcher. This has the ability to switch any input to any output and includes a programmable feature that allows users to create up to eight A/B switchers. Units can be configured for all-analog, all-digital or composite FM stereo base band. Uses include general-purpose cross-point audio switching, EAS generator insertion for sharing single EAS source to multiple studios in cluster configurations or any application where one common source needs to be shared to up to eight locations. Also: DAB-300 is a dual-path switch for use in digital audio IBOC routing.

Broadcast Electronics **C1628**
Intro: The STX LP low-power, solid-state transmitter line is scalable from 1 kW to 5 kW, comes with exciter, backup controller and IP connectivity. Also: TRE Message Manager studio suite brings new functions for RDS, HD Radio, Internet and Twitter output. It has tools for unscheduled messages such as weather warning, news flash or live concert details to all or select stations in a region or format category. These and other messages can be archived to a clipboard for access by announcers and from any station in the network for redistribution on RDS, HD Radio, the Web or Twitter. This is in addition to Twitter capability giving listeners the ability to receive station messaging as well as earmark for purchase any song played on the station's Twitter feed. Compatible with AudioVault and most other automation, TRE messagecasting software enables operators to schedule text messages as they would music. Also: AudioVault FleX system sports new tools including distributed asset management and integration tools to synchronize schedules and inventory across multiple sites. BE will demonstrate expanded editor and new user interfaces for AudioVault FleX. Also: New audio logger for AudioVault includes podcast, PPM, RDS and other metadata capabilities. It can import PPM data and display minute-by-minute audience graph together with program info imported from the play-out system. It can log metadata from HD Radio, DMB/DAB/DAB+, as well as RDS text, station volume and signal output levels and display all data in the player.

Broadcast Software International **C1151**
Intro: Simian 2.0 Pro is a full-featured, professional radio automation and computer playout system for radio, Internet and satellite broadcasting. The most feature-rich version of Simian, with new streaming and metadata features. Also: Simian 2.0 Lite is for use by Internet broadcast professionals. Take your Webcast to the next level using a professional-grade automation system with automated program log playback. Features include ability to import logs from major third-party log generating applications, create logs from within Simian, outgoing serial communications, voice tracking function for voice-overs, event logging to track played items and 39 available automation macros. Also: Stinger 3.0 provides playback of up to 1,152 audio files at the touch of a button. Stinger 3.0 has a new record functionality that is as easy to use as its playback feature.

Broadcast Tools Inc. **C1451**
Intro: Site Sentinel 16 is a one-rack unit solution for Web-enabled remote control. Each metering (telemetry), status/logic, stereo silence sensor, temperature sensors, power failure input, along with all relays can be controlled and/or monitored over any IP network including private networks, IP-based industrial control network and the Internet. Users can operate it using browser or Web-enabled mobile device, while e-mail notification may be configured to alert four recipients when alarms are detected. The user may enable a sound effect to play on the monitoring PC when an alarm is generated. Site Sentinel 16 is equipped with 16, 12-bit-resolution bipolar 10 volt metering (telemetry) channels, along with four virtual channels. Also: Site Sentinel 4 provides a one-third-rack solution for Web-based site remote control. Also: WebSwitch is a solution for remote reboot or remote control over the Internet. Also: Audio Sentinel is a Web-enabled two-channel stereo silence monitor combined with integrated audio switcher. Designed to monitor two balanced or unbalanced independent stereo analog audio sources and switch to a backup analog audio source when silence is detected on either or both channels. May also be configured for independent dual-stereo non-switching applications.

Broadcasters General Store **C1451**

BroadcastStore.com **C9733**

Broadview Software Inc. **N4334**

Burk Technology **C1614**
Intro: AutoPilot 2010 — AutoPilot 2010 is an advanced management platform integrating GSC3000, VRC2500, ARC Plus and ARC-16 remote controls. Combine network management and transmitter control using new, enhanced SNMP tools and a fully customizable interface. Integrated, flexible control maximizes efficiency though consolidated operations.

Jet Active Flow Charts — Jet is Burk Technology's innovative new Active Flow Chart engine for automatic transmitter control. Without writing a single line of code, broadcasters can design complex automated routines using simple flow chart tools. Available as an extension to AutoPilot 2010, Jet works with GSC3000, VRC2500, ARC Plus and ARC-16 remote controls. Combine multiple sites and even different remote control models in a single Active Flow Chart.

Plus-X Integrated Input Unit — New in the Plus-X Ethernet I/O series for the ARC Plus, the Plus-X Integrated Input Unit connects 16 meter and status inputs via LAN or WAN. Meter channels support status inputs for up to 32 status channels. IP connectivity with the ARC Plus simplifies wiring and enables cost-effective expansion down the hall or across town.

Plus-X Integrated Command Relay Unit — New in the Plus-X Ethernet I/O series for the ARC Plus, the Plus-X Integrated Command Relay Unit connects 32 relays via LAN or WAN. Each relay may be used individually, or combined in raise/lower pairs. IP connectivity with the ARC Plus simplifies wiring and enables cost effective expansion down the hall or across town.

Climate Guard — Burk Technology brings decades of equipment monitoring experience to the server room with Climate Guard. Monitor temperature, humidity, flood, and many other environmental conditions that threaten your mission critical IT infrastructure. Climate Guard is an affordable way to detect problems early and prevent costly equipment failure.
Featured: PPM Assurance, ARC Plus, GSC3000, VRC2500, ARC-16, Watchband

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Burli Software Inc. **C2343**

BW Broadcast **C3034**
Intro: BW Broadcast IPCA1 Audio Over IP device

is designed for stable operation with the lowest latency and best audio performance based on network characteristics. It uses a dynamically adjustable jitter buffer that adjusts to network conditions, providing 24-bit audio, with up to 48 kHz sampling, at the lowest possible delay. Supporting UDP, UDP Multicast and TCP/IP protocols, the unit includes a range of low-delay codecs operating at bitrates as low as 32 kbps with fewer quality/bitrate tradeoffs. Also: RB1 and RBRX1 DSP-based analog FM tuners with features for professional use. Adjustments are provided for ~50 parameters, including audio bandwidth, IF, bandwidth, de-emphasis, stereo, HF and ultrasonic noise blending. For retransmission applications, RBRX1 adds DSP-enhanced MPX output that reconstructs a clean, peak-level and bandwidth limited waveform, eliminating worries about studio-transmitter link overshoots. RDS PI code checking prevents translators and repeaters from being hijacked or jammed. Also: TX1000 1kW FM transmitter. Small in size, it features configurable compressor/limiter and front-panel LCD control interface, dual-loop Virtual VFO exciter, ultra-low distortion, modulator and high-performance stereo encoder integrated into a highly stable FM transmission system. Designed for global use, the TX1000 complies with applicable CE, FCC and EU regulations and has a universal power input.

Calrec Audio **C1746**

CGS Infographics Automation **SU2602**
Intro: CGS Automation will debut an improved feature to voice-synthesize collected school and event closings, in order to fully automate the process from collection to air.

CircuitWerkes Inc. **C1451**
Intro: SiteSentry6 — Six-channel, Web-based remote control with stereo audio monitor and temperature sensor. Front-panel LCD lets users set up and control it locally. An embedded USB port lets the free setup and monitoring software communicate locally for setup and/or monitoring. WebGain4 — Four-channel remote audio controller with integrated Web server. All channels feature active, balanced audio inputs and outputs. Each channel can be controlled or channels can be grouped into one of two groups to be controlled jointly. Users can set up and control WebGain4 locally. TAC-5 — Dial-up remote control with five user-programmable relay outputs. Each relay can be programmed to respond to a single DTMF tone or sequence of tones. A telephone hybrid with active, balanced audio inputs and outputs lets you send audio while receiving DTMF commands. Audio input and output levels are user-adjustable. DTMF-16C — A programmable DTMF decoder provides remote control capabilities over any audio line. Includes two DPDT relays and two SPST relays and 12 optocoupled outputs. Outputs are programmable to respond to any DTMF tone, or sequences of tones up to six digits long. Programming is done via serial port and any standard terminal program. Decoded DTMF tones are outputted serially as well. AC-1H — A hybrid telephone auto-coupler card for the AC-12 cardcage coupler line.

Pete Gilchriest of ARG Brickhouse reads the NAB Daily News.

Photo by Bob Kovacs

Clark Wire & Cable **C9533**

Clear Channel Satellite **SU3117**

Coaxial Dynamics **C1310**

Comrex Corp. **C1920**
Intro: BRIC-Link Stereo BRIC IP Codec — The Comrex BRIC-Link is a low-cost, high-performance solution for audio-to-IP conversion. Leveraging many of the core technical aspects of Comrex's successful remote broadcast ACCESS product line, BRIC-Link provides for an elegant way of moving linear or compressed audio with very low delay. BRIC-Link is very simple to use, and can be used over a wide range of IP links. While it carries an entry-level cost, BRIC-Link maintains superb audio specifications and hardware reliability, making the system suitable for STLs and other mission-critical functions without the expense required of more full-featured codecs. Capable of multistreaming, IP Multicast, HTTP streaming. Includes AAC and HE-AAC coding algorithms as standard.
Featured: ACCESS Stereo BRIC IP/POTS Codec, STAC Studio Telephone System, Matrix POTS/ISDN Codec, BlueBox POTS Codec

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Continental Electronics Corp. **C1607**
Featured: 816HD-25 transmitter, 802Ex Exciter, 800Exp Exporter, 800i Importer

CPI **SU2617, C1407**

Crown Broadcast IREC **C2632**
Featured: FM broadcast transmitters from 30 watts to 10 kW; transmitters feature optional built-in audio processor/stereo generator or receiver for translator applications. All Crown transmitters offer a 3-year warranty.

Dalet Digital Media Systems **SL4720**
Featured: Dalet Radio Suite HD

Dan Dugan Sound Design **C1944**
Featured: Dugan Models D-2 (analog I/O) and D-3 (AES I/O) Automatic Mixing Controllers incorporate three Dugan-patented technologies to manage any number of live microphones in unscripted talking situations; the Model E-1 (analog or ADAT I/O) detects which mics are being used and makes fast, transparent cross-fades, freeing the operator to focus on balance and sound quality. Dugan products are used in some of the broadcast industry's most popular talk shows and other live venues.

Davicom, div of Comlab **C1124**
New: With MAC Firmware 5.40, MAC units can interface with hundreds of MODBUS sensors and I/O devices on the market. Adds extensive data logging functionality, support for reach-through via USB port, supports trending and graphs for use with the data logging feature. Also: MacNet 5.30 Multi-Site Alarm Management Software offers Unicode GUI for operation in any language, BitMap display option for quick easy displays, MapInfo option for comlex display requirements using MapInfo GIS, more.

DAWNco **SU7813**
Intro: DAWNlink satellite channel identifier with LCD display lets users navigate through digital channels to identify any satellite and peak the dish to maximum performance. Use the spectrum analyzer to aim the dish for best carrier-to-noise ratio. Confirm that you are on the proper satellite with the MPEG2 satellite receiver, view unencrypted sat channels on the DAWNlink's color LCD display. "Sat" model measures the 920–2150 MHz band and "sat plus terrestrial" model adds measurement of the 5-900 MHz band. Also: DAWNco's "L series" of C and Ku band LNB amplifiers have improved specs for improved reception of high-definition and 8PSK satellite channels. Also: DivinSup satellite signal splitter and LNB power source — Get rid of your old "mess" of wall-mounted splitters and get organized with DivinSup units that take care of your LNB-to-receiver signal processing needs. Your satellite receivers get the proper signal level when you place the rack-mounted DivinSup unit adjacent to your receivers and connect to the cable coming from an LNB. Two models: "Two 5-way splitter" model that connects five receivers to LNB #1, and five receivers to LNB #2. "One 16-way splitter" model that connects up to 16 receivers to 1 LNB. Also: Finicky new digital satellite channels can be received perfectly using DAWNco's high-gain 5.0 meter satellite antenna.
Featured: TI filters to stop radar interference with satellite downlink

DaySequerra Corp. **N3400**
Featured: M4DDM Diversity Delay Monitor is a single-box solution to solve drift of time alignment between your analog and HD-1 audio. Using selective off-air tuner and TimeLock algorithm, it measures the MPS analog and HD-1 digital audio diversity and generates correction vectors to keep the analog and digital audio time- and level-aligned. These can be processed internally to delay the digital program audio or sent via Ethernet to an HD Radio Embedded Exporter or audio processor to provide adjustments to the analog audio delay. Comes with DDM Remote Dashboard software, a PC-based application for remote control monitoring, logging and alarms with e-mail/SMS notification. Also: M2DSP is a DSP-based version of the M2 that replaces M2.2R analog measurement circuits with DSP measurements, meaning no more periodic calibration and possible drifting. A first for a mod monitor, the M2DSP measures the perceived loudness of broadcast audio using ITU-R BS.1770/1. It also uses our diversity delay algorithm DDM for monitoring your HD1's analog and digital delay settings. Also: DaySequerra iLM4ST Intelligent Stereo Loudness Monitor can be used by an HD Radio station to monitor loudness of analog, HD-1, HD-2 and Internet broadcasts.

DB Elettronica Telecomunicazioni SPA **SU5610**

Denon & Marantz Professional **C1444**

Dielectric Communications **C2222**
Featured: HDR Plus 8-Bay Antenna; HDCBR Antenna; DFM Manifold Combiner

Digigram **N1306**
Featured: Digital audio network solutions for radio broadcast and sound distribution in public places. The company develops digital audio network devices (e.g., IP audio codecs, EtherSound equipment), professional sound cards and audio processing software. Brands include IQOYA IP audio codecs; PYKO, the affordable "100% audio over IP" STL solution; LoLa, PCX and VX range sound cards

Digital Alert Systems **C3651**
Intro: DASDEC-II is a flexible platform for emergency alert management in television broadcasting. Includes integrated support for MPEG-2 or MPEG-4 outputs, a browser-based interface for remote monitoring, up to four Ethernet ports for access points within a station and FCC-compliance logging within the system's non-volatile memory bank. DASDEC-IR Multistation — For broadcasters multicasting more than one channel from one location, DASDEC-IR offers a platform for distributing and monitoring EAS messages on up to five stations — whether they originate from the same building, same state or across the nation. By eliminating the need for an encoder/decoder set dedicated to each station, it helps broadcasters conserve resources while ensuring that equipment upgrades and FCC compliance are more simple and efficient.
Featured: EAS encoder-decoders

Digital Radio Mondiale **C1607, C2615**
Intro: DRM is the universal, openly standardized digital broadcasting system for broadcasting frequencies up to 174 MHz, including LW, MW, SW, Band I and II (FM band). DRM provides digital sound quality and the ease of use that comes from digital radio, combined with features: Surround Sound, Journaline text information, Slideshow, EPG and data services. Find out more at our DRM members' booths Continental Electronics and Nautel.

DK - Technologies C1751

DNF Controls N1212

Dorrough Electronics C3016

DPA Microphones C3319

DSI RF Systems Inc. SU5717
Featured: Engineering, integration, project management and technical expertise on projects ranging from TV/FM transmitter facility builds, satellite facilities, microwave system and specialty antenna installations to researching and specifying solutions on transmission issues and problems.

Econco C1407

Elber SRL SU2624
Featured: SRS-NBFM LINK

Electrorack Enclosure Products C10421

Electrosys S.r.l. SU2226
Featured: FM solid-state transmitter, FEX FM Exciter (1HE)

Electro-Voice C4337

Elenos C3207
Intro: 5000W FM transmitter in only four rack units. Measures and controls more than 100 parameters. Low power consumption; durable; easy-to-use interface. Also: ETG1.5 FM Transmitter Planar Technology, compact size, 2 rack units, includes 1.5 kW ICEFET FM amplifier and high-performance stereo exciter.
Featured: Transmitter, exciter, amplifier, integrator systems

ENCO Systems Inc. C3036
Intro: Presenter — Live Assist studio audio system for radio with integral voice tracking and editor. Works with existing DAD systems as well as ENCO's StreamLine interface. iDAD — iPhone and iPad App for remote audio and remote control of DAD and Presenter systems.
Featured: DAD, Presenter, NewsBoss, RAMA, PADapult

ERI-Electronics Research Inc. C2032
Intro: Axiom 4-Bay Broadband FM Antenna is a cost-effective lightweight option as a main or aux FM antenna for multiple FM stations; it accommodates any channel combination over the 88 to 108 MHz FM band. It has been used to provide backup FM transmission facilities for multiple FM stations in a single market and as an emergency standby that can be deployed to restore service following a facility disaster. ERI can provide systems that include towers, channel combiners and transmission line. Also, ERI will introduce a broadband (54–862 MHz) four-port motorized coaxial switch that operates on any VHF or UHF channel without tuning or modification, suitable for switching multi-channel television systems and for N+1 transmitter systems. ERI will show a line of directional couplers for VHF and UHF applications available for 1-5/8-inch to 6-1/8-inch (50 ohm) transmission lines and can be purchased with one to four coupling probes; they include required external terminating loads.

ESE C6437
Intro: ES-110, GPS-Based 10 MHz Frequency Standard — Disciplined Temperature-Compensated Crystal Oscillator, GPS Timing Reference With 1 x 10-8 Accuracy, Two 10 MHz Outputs (1 Sine Wave & 1 Square Wave), Phase Coherent 1 PPS Output, Indoor/Outdoor Antenna with 16' Cable, Ruggedized Desk-Top Enclosure
Featured: Master Clock Systems, Audio & Video Distribution Amplifiers, Frequency Generators, Time Code Products, Audio Level Indicators & Interfaces

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Eventide C2634
Intro: V1.6 software upgrade for flagship broadcast delays BD600 and BD600E. Available as a free download in May, the upgrade enhances functionality of the BD600 series in two areas. In MicroPrecision mode, the delay now extends to 20 seconds. This mode is ideal for syncing analog with digital signals in an HD Radio chain, or for delaying the signal to compensate for satellite delay on TV simulcasts. The delay is adjustable in sub-sample increments, is tweakable in real time, while on-air, with no audible artifacts. For compatibility with certain exciters, 1200 baud support has been added. The BD600 and BD600E with expanded control ability offer 80 seconds of 24-bit profanity delay protection, with adjustable delay buffer in half-second increments from 1 second to 80 seconds, and feature Panic mode, where if the maximum delay buffer has been deployed, a WAV file can be played from the compact flash while the buffer is rebuilding in the background.

Flash Technology, an SPX Division C3129

Fraunhofer IIS C1446
Intro: Journaline is a text-based news service for digital broadcasting systems. It provides textual information similar to teletext that can be accessed from mobile devices via menu structure. Also: HECA (High Efficiency Conditional Access) protects premium content for delivery to closed target groups using encryption methods. It was developed for applications involving Transport Protocol Experts Group and digital distribution systems, e.g. 3G, DAB, HD Radio. Service providers can achieve new business models with flexible combinations of scrambled and unscrambled parts, and employ subscription modes including time-limited, lifetime and pay-per-use. Also: Audio technologies for Internet radio and digital broadcast systems in 5.1 sound — Fraunhofer IIS supplies optimized audio encoder and decoder libraries for mobile applications, e.g. Internet radio and for multichannel digital radio. The efficient coding technologies help to reduce the streaming costs associated with Internet-based audio services. Fraunhofer's surround audio codecs enable new services such as high-quality 5.1 broadcast over low bandwidth channels.

Genelec C2239

Gepco International C5643
Featured: Cable and connectivity solutions for the broadcast and professional A/V markets. Come see what's brewing.

Harris Corp. N2502
Intro: Harris PR&E VMXpress is the latest in a series of devices designed to extend low-cost connectivity and scalability for radio operations. These devices (VMXpress and the previously introduced VMQuadra and VMConnect) enhance the value, performance and interactivity of systems built upon RMXdigital and NetWave networked digital consoles, as well as the VistaMax networked audio platform. VMXpress creates new options for VistaMax-enabled studios by interconnecting third-party studio equipment to the network, offering a decentralized I/O approach while maintaining the robust VistaMax audio architecture. Available in eight configurations with combinations of analog audio I/O, digital audio I/O and logic-follow-audio to match user requirements. Multiple external devices may be connected to each VMXpress to increase on-air and production sources.

HD Radio C151

SUREBETS

HONOR THY PROTEIN

Honor the protein. That's "Top Chef" judge Tom Colicchio's philosophy when it comes to steak.

Fans of the show will remember his near-sadness at being served a piece of overcooked or poorly seasoned meat. Colicchio feels that if an animal is to lose its life for your dinner, the least the chef can do is cook it perfectly and make it taste even better. His ardent and renowned belief in this credo — as well as in the use of simple, fresh ingredients from small family farms — is how patrons of his Craftsteak at MGM Grand know they're in for a good meal.

Menu options are served family-style and range from chicken, lamb, veal and short ribs to seafood and, of course, steak. Beef lovers can choose between filet mignon, a porterhouse for two, sirloin, New York or a ribeye. Seafood options include dive scallops, salmon, roasted halibut and lobster.

For those running low on spending cash or just looking for a lighter meal, Craftsteak offers its "Halfsteak" menu: 6-ounce portions of its filet, hangar and skirt steaks. Also featured are several vegetarian-friendly sides such as butternut squash and chanterelle risotto; Japanese eggplant; and roasted asparagus and shiitake mushrooms.

Additional highlights include a grand 22-seat bar and thorough wine list. Doors open at 5:30 p.m.

Craftsteak
MGM Grand Hotel & Casino
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For nine or more: (702) 891-7433

LIVE REMOTES VIA INTERNET?
Z/IP MAKES IT POSSIBLE.

GET A PAIR OF Z/IPs FOR JUST $5,995. BUT HURRY – SUPPLIES ARE LIMITED.

High-speed Internet connections are everywhere. Wouldn't it be great to use them for broadcast remotes? Telos Zephyr/IP makes it possible.

The heart and soul of Z/IP is the amazing Agile Connection Technology from FhG. ACT combines state-of-the-art loss detection and concealment with dynamic buffering and adaptive bitrates. Your Z/IP will intuitively use every digital trick in the book to ensure audio gets to your studio with the lowest possible delay.

Not only is the audio incredible, but using it couldn't be easier. Z/IPs can find each other, even behind firewalls and NATS, thanks to a network of distributed servers. Z/IP can even connect to calls from PBXs that use the SIP standard. And users love the big, color display that can even show their connection being routed around the world.

Unless you're broadcasting from the moon, you'll probably find the Internet just about everywhere you'll want to do a remote. IP is everywhere. And Z/IP is the best way to hear from everywhere.

Telos
AUDIO | NETWORKS

Radio Never Sleeps. Neither do we. We're here for you, anytime, with free round-the-clock, 24/7 technical support. Call +1-216-622-0247.

Henry Engineering **C1246**

Intro: MultiPort is a multi-format, multi-connector audio interface for radio and TV studios. MultiPort provides both digital and analog interface from outboard audio equipment to any studio. Supports AES and S/PDIF digital formats, plus balanced professional and unbalanced consumer analog interface, with connectors for XLR, 1/4-inch TRS, RCA and 3.5mm TRS. Both stereo Line and mono Mic outputs are provided. Mounts in cabinetry or in 2RU rack space.

PowerClamp Series 10 is a new ultra-high capacity transient voltage surge suppressor (TVSS) that is designed specifically for use at broadcast transmitter sites and studios. The Series 10 absorbs extremely powerful spikes and surges with a rating of 200,000 surge-amps. PowerClamp Series 10 prevents serious transmitter and equipment damage by reducing spikes and surges to within a few volts of the AC sine wave.

Featured: Matchbox HD, USB Matchbox II, SixMix USB Audio Console, TwinMatch, Superelay, USDA 2X4, PowerSwitch, MicroMixer, MultiPhones II, MiniPod, StereoMixer, DigiMatch 2X6, AutoSwitch, StereoSwitch II, PowerClamp TVSS

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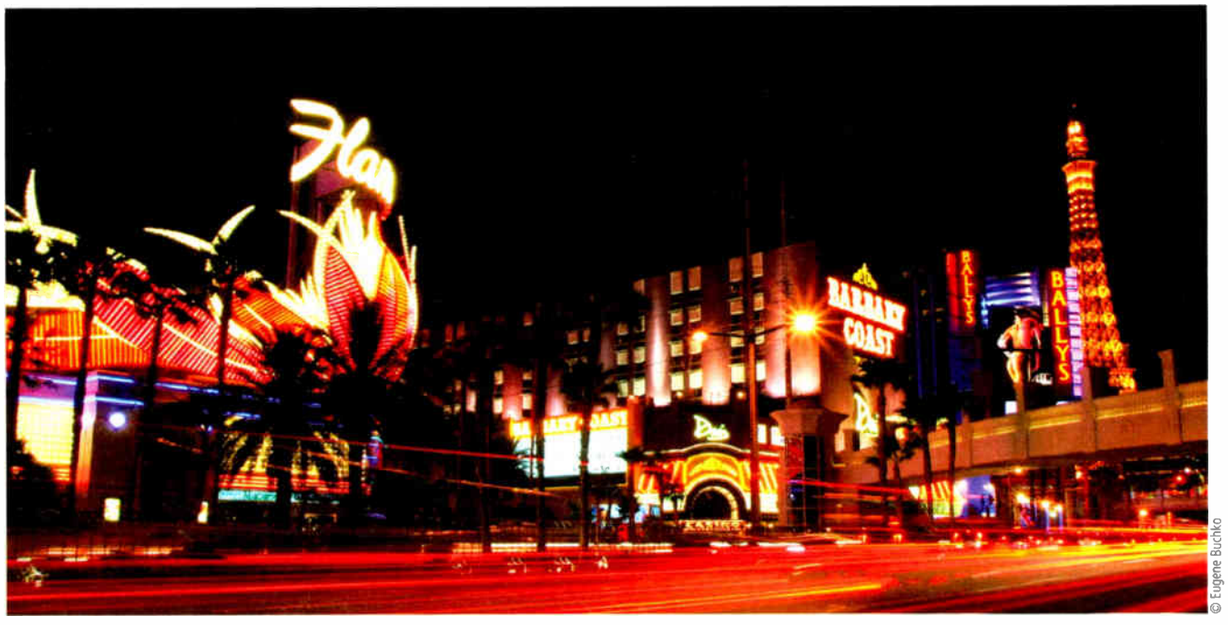

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HHB USA **C2228**

HME **C8439**

IABM **C10149**

IEEE Broadcast Technology Society **L30**

Independent Audio Inc. **C2939**

Inlet Technologies **SL929**

Inovonics Inc. **C1411**

Intro: Model 730 RDS/RBDS encoder software upgrade with new software and firmware to simplify RT+ tagging and on-board scheduler can update RDS commands, as well as messages, by time, day and date.

Featured: On-air and production audio processing systems; AM, FM and subcarrier modulation monitors; RDS/RBDS RadioData encoders and decoders to scroll and tag song titles and advertising messages on listeners' radios; rebroadcast receivers for FM translators; as well as other miscellaneous broadcast support products.

Intelsat **SU1417**

International Datacasting Corp. **SU6321**

iZotope **C1620**

Jampro Antennas Inc. **C2607**

Intro: Jampro Antennas Inc. Product Range — Jampro Antennas Inc. of Sacramento, Calif., a world leader in the manufacture and design of radio frequency components and broadcast antennas for radio and television since 1954, is exhibiting its diverse range of advanced antennas and RF components at NAB 2010. The company's lineup includes television and radio solutions for DTV, FM, LP-FM, FM-HD and HD Radio.

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Jetcast Inc. **C3128**

JK Audio Inc. **C2010**

Intro: BlueDriver Series audio interface adapters plug into a dynamic mic or the mic-level output from a mixing console and pair to a Bluetooth-enabled cell phone or headset, the 3.5 mm stereo jack contains a mic-level output suitable for recording with the clean mic signal on the left channel and the Bluetooth return on the right; BlueDriver-M3 plugs into the mic-input channel of a mixer and when paired to a Bluetooth-enabled cell phone or headset, the 3.5 mm jack will accept a signal from the headphone output of the mixer for transmission back to the cell phone or headset; Universal Host desktop digital hybrid provides talkshow-quality caller audio from most IP and PBX telephone systems, sends mic- and line-level signals to a telephone while maintaining excellent separation between your voice and the caller, 16-bit USB audio codec allows stereo recording at up to 48 kHz sampling rate with the talent voice on the left channel in full bandwidth, and the caller on the right.

Featured: RemoteMix Series field mixers, innkeeper Series digital hybrids, Broadcast Host, innkeeper LTD, innkeeper PBX, PBXport, BlueKeeper, BluePack, ComPack, AutoHybrid, THAT-1, THAT-2, Daptor 1, 2, 3, RemoteAmp Series Beltpacks.

Jünger Audio **SU7206**

Featured: Level Magic LT & D06 analog and digital two-channel loudness processors; four-fader mixers.

Kathrein-Werke **SU817**

Featured: FM and TV broadcast antenna and combiner systems

KD Kanopy Inc. **C1134**

Kintronic Labs Inc. **C1332**

New: A fully integrated, self-contained AM or FM radio transmission system in a climate-controlled weatherproof enclosure that is expandable from 1 kW to 10 kW with built-in security features. These target small and medium-size market stations where low initial capital expenditures are necessary and low operating costs must be realized. Also: A variety of security features and accessories for transmitter sites; Array Solutions Model VNA2180 two-port antenna analyzer; andKintronic Labs Model VCDS-1/2/3 AM directional antenna voltage sampling system to permit Method of Moment proofs for tall electrical height tower arrays.

KLZ Innovations LTD **C862**

K-Tek **C10037**

SANITIZED FOR YOUR PROTECTION

SOME WORDS SHOULD BE OBSCENE AND NOT HEARD

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

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

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

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

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

Eventide®

HD COMPATIBLE

One Alsan Way, Little Ferry, NJ 07643 tel.201.641.1200 www.eventide.com

See us at NAB Booth C2634

LARCAN USA **SU3317**
Intro: Encore Series IBOC FM translator combines translator and linear amplifier technology to achieve extensive power range, power levels from 25 W to 250 W, superior IBOC FM performance and coverage, capable of all standards in analog FM and IBOC digital radio, broadband design, frequency agile, fully regulated power supplies and integrated cooling system.

Lawo AG **C2217**

LBA Technology Inc. **N516**
Intro: TUP-3N AM broadcast antenna mobility platform is adapted to NATO standards, enabling relocation of a self-contained trailored broadcast antenna and tuning system capable of up to 10 kW between 540 and 1720 kHz for military operations, disaster area communications and other interim/transient broadcasts. Also: SafeOne personal RF safety monitor senses potentially hazardous RF fields from antennas and radio and television installations between 10 and 10,000 MHz, helps in compliance with FCC and OSHA requirements, gives audio and visual warning when safe limit is exceeded; Schomandl Model 3024 digital broadcast power monitor provides computed true RMS values for AM/FM, CW, DVB-T, 8 VSB and CDMA carriers with a peak function for NTSC and CCIR TV, SSB and TDMA, measurements from below 1 MHz to above 3,000 MHz and up to 1,000 kW are enabled with appropriate coupler units, VSWR monitoring, remote temperature measurement, external device voltage sensing and a external alarm and data modes are standard, rack mountable or portable.

Linear Srl **SU7327**

Logitek Electronic Systems **C2636**
Intro: Pilot digital console complements the Logitek JetStream IP audio networking system, modular and scalable console that provides up to 24 faders, audio sources can be routed as desired to each Pilot fader, change buttons above each fader work in conjunction with a select knob to the side, each fader has access to program bus, three aux buses and cue speaker, wide-angle displays below the faders have room for 16-character source names and support Unicode characters for display of Chinese or kanji text.
Featured: JetStream IP audio networking system with many operational features included such as analog and digital I/O, profanity delay, silence alarms, input metering, mic processing and automation protocols.

Magnum Towers Inc. **C1307**

Markertek **C5343**

Marshall Electronics **C8931**

Mayah Communications **C444**
Intro: Version 4.0 firmware for the C1191 codec supports full dual audio streaming over IP with redundant streaming capability along with WLAN/Wi-Fi support, and version 4.0 firmware for Sporty and Flashman II now supports WLAN/Wi-Fi along with ISDN, POTS, IP, 3G, BGAN and SIPS, all three units offer full SIP/N/ACIP support with ACC for IP communications with non-Mayah audio codecs with SIP support, real-time audio recording during transmission and playback to SD or USB memory storage.
Featured: Professional audio codecs for rack and mobile applications.

Megatrax Production Music Inc. **C757, SL8013**

Merging Technologies **C3139**

Microsoft Corp. **SL220, SL227**

Minnetonka Audio Software Inc. **C2037**

Moseley Associates Inc. **C2610**
Featured: Rincon audio transport system for IP & T1/E1. Starlink digital STL solutions featuring AES digital audio & Ethernet data transport required for HD Radio broadcasting. Event 5800 High-Capacity Digital Aural STL/TSL. Lanlink HS900D LAN Extender/Data Link, which provides bidirectional Ethernet & serial data link in the license-free 900 MHz band. Starlink SL9003T1 for T1 circuits transports digital program audio, Ethernet, control data & telephone voice circuits over bidirectional T1 lines or license-free 5.8 GHz links.

Myat Inc. **C1317**

Myers Information Systems Inc. **N1615**
Featured: ProTrack Radio and all applicable modules/interfaces. Myers offers broadcast management software for the television, radio and digital signage industries. Technology and services to improve operations lifecycle, from contracting to invoicing, media management to scheduling and trafficking to reconciliation.

NAB Public Service Initiatives **N6138**

Nagra USA Inc. **C1107**
Intro: Standalone microphone preamplifier based on the design of the preamplifiers used in the Nagra VI recorder, can be used as two additional inputs for the Nagra VI or as external preamplifier for any other recorder.
Featured: Nagra VI 24-bit/96 kHz recorded; Nagra LB 2 channel 24 bit/192 kHz recorder

National Association of Tower Erectors **SU7202**

National Weather Service **C3029**

Nautel **C2615**
Intro: Affordable, single-cabinet, solid-state transmitters with power outputs as high as 44 kW analog, 30 kW at –14 dB and 21 kW for –10 dB digital, more power is available by combining these compact transmitters. Also: HD Power Boost technology increases HD Radio power output while increasing efficiency; VS Series compact FM transmitters with power outputs of 300 W, 1 kW and 2.5 kW with digital exciters, IP audio I/O, USB backup audio, advanced remote control and easy path to DRM+ or HD Radio in a simple design built for harsh environments, includes Livewire IP audio support, Nautel's Advanced User Interface (AUI) and optional Orban Inside. Support for Livewire IP Audio connectivity in a transmitter gives customers the option to create an end-to-end IP workflow to connect Livewire networks to a VS Series transmitter with a single RJ-45 cable; no intermediary connections or D/A conversions will be needed, also supports IP audio input, such as

Photo by Jim Peck

The Society of Broadcast Engineers booth will be on the second floor concourse of the LVCC South Hall, up the escalator from the South Hall main entrance.

SHOUTcast, that can be used as a backup audio source or to enable a single simultaneous feed to over-the-air transmission and Internet radio. Also: Commercial-grade DRM+ transmission system.
Featured: NX Series and XR Series AM transmitters with power outputs of 1 kW to megawatts; NV Series FM transmitters with power outputs of 3.5 kW to 88 kW; HD Radio components including the Exporter Plus and Importer Plus.

Nemal Electronics Int'l Inc. **C2541**

Netia **SU3502**
Intro: CamDirector module brings direct camera control and automated video switching to the Netia Radio-Assist 8 suite of digital audio automation software, radio broadcasters can create live, switched programs for broadcast, streaming or podcast, with CamDirector automatic voice detection enables complete automation of the production of in-studio interviews and on-set events by triggering switching of cameras according to the speaker and microphone in use, also allows cameras in a radio facility to be controlled from Radio-Assist 8. Also: Workflow Engine for Netia Radio Assist 8 helps stations enrich their content, work with more complex workflows and publish to multiple platforms. Manreo 2 offers an open, scalable architecture along with all the tools needed to simplify the cataloging, indexing, accessing, and distribution of media, now incorporates the new Netia Workflow Engine as well as Netia's Hypercast Warehouse set of archiving tools.

Neumann USA **C2228**

Neutrik **C2336**
Intro: Multimedia Connector Series allow users to combine Neutrik USB 2.0 cable and chassis connectors or Neutrik HDMI 1.3 chassis and cables in a way that makes the connection lockable and water-resistant according to IP65; opticalCON Quad offers four channels and is optimized for point-to-point interconnections and multichannel routing applications with a choice of three cables: lightweight mobile field cable, cut-proof and rodent-resistant X-treme cable or Triple Split multichannel cable; opticalCon powerMonitor cost-saving, purpose-built measurement and monitoring device for fiber-optic broadcast, audio and video applications, monitoring the attenuation of up to four transmission channels simultaneously.

NewBay Media LLC **C1458**
Featured: NewBay Media, parent of Radio World, serves readers and business partners in dynamic, inspired, creative and interactive vertical markets. Built upon an information network of award-winning magazines, conferences and events, online communities and marketing services, NewBay Media reaches millions of professionals worldwide in print, in person and online. Our goal is to help you achieve success.

NewTek **SL10814**
Intro: NewTek TriCaster portable live production system is like having an HD live remote production truck small enough to fit in a backpack, offers HD/SD live switching, HD projection, live HD streaming and network-style live HD virtual sets, available in several different models.

Nielsen Company, The **R106**

NOAA **R216**

NPR Satellite Services **SU6913**
Featured: A full-time C Band satellite space segment provider specializing in building and designing video and radio networks. NPRSS helps broadcasters reach new markets while providing a cost-effective way to distribute video content to affiliates. NPRSS offers the satellite capacity and everything to get started including channel space segment, uplink licensing and the right gear for your needs. We provide system designs using the newest compression methods to save bandwidth while lowering your costs. Talk to us about our custom-designed video services. For space segment, system design, engineering support, uplink services, equipment and 24/7 customer service, call on us.

NVerzion **N729**

OMB Sistemas Electrónicos **SU5720**
Featured: FM radio and TV transmitters for power from 15 W up to 10 kW, STL systems, antenna systems for FM and TV. The headquarters and factory are in Zaragoza, Spain and international division in Miami, Fla. OMB has more than 40 years in the broadcasting industry and sales in Europe, America (North to South), Asia, South Pacific, Middle East and Africa.

Omnia Audio **C146**
Intro: Omnia A/XE processes audio for a variety of applications, bitrate-reduced and linear, runs as a Windows service, can be managed and configured remotely with a Web browser, and processes and/or encodes multiple streams in various formats simultaneously, new Virtual Patch Cable allows Omnia A/XE to receive, process and send audio to other software on the PC, built-in scheduler allows streams and processing presets to be started and stopped at specific times. Also: Omnia One processor meets the challenges of AM, FM, HD Radio, DAB, DRM, multicasting, podcasting, netcasting, satcasting and just about any application where signal processing is needed, quickly adapts to needs by simple software downloads, can be used in the studio for transmission and in networked applications thanks to a Livewire interface, dual software banks make it easy to switch between styles. Also: Omnia.8x combines eight discrete three-band stereo Omnia audio processors in a single networked box, unique processing architecture works ahead of any bit-reduced audio coder to reduce artifacts and improve the sound of audio destined for HD Radio, Internet and satellite broadcasting;
Featured: Omnia 6EX/EXi, Omnia One (AM, FM, Multicast, DAB, Studio Pro), Omnia 5EX, Omnia 5EX/i HD+AM, Omnia A/XE, Omnia.8x.

OmniBus Systems **N3722**

Omnirax Broadcast Furniture **C1357**
Intro: Ergonomic height-adjustable workstations to satisfy every need and requirement.
Featured: Innova line of custom broadcast furniture combines modular components with custom-tailored shapes to fit particular requirements of on-air, production and imaging studios.

OMT Technnologies/iMediaTouch **C1054**
Intro: iMediaTouch version 4 contains new features, including on-air graphical user interface, a quick scroll "next-hour button," ability to change the color of the hot keys, color coded display in full log, more dynamic on-the-fly adjustable segue editor, ability to add station logo, production style enhanced library search and drag-and-drop from library to the hot keys page.
Featured: iMediaTouch On-Air, iMediaTouch Production, iMediaTouch Log Tools, iMediaTouch Voice Tracking, iMediaLogger

Orban **C1657**
Intro: Orban Optimod-FM 8600 features dramatically improved peak limiter technology to decrease distortion while increasing transient punch and high-frequency power handling capacity, compared to the FM channel peak limiter in the Optimod-FM 8500, the new peak limiter typically provides 2.5 dB to 3 dB more power at high frequencies, minimizing audible HF loss caused by preëmphasis limiting; Orban Optimod-FM 5500 value-oriented two-band and five-band audio processor combines 5300 and 2300 functionality, can serve as a stand-alone stereo generator or can be configured to interface with any commonly found transmission system.
Featured: Optimod-FM 8500, Optimod-FM 8300, Optimod-AM 9400, Optimod-AM 9300, Optimod DAB 6300, Optimod-PC 1101e, Opticodec 7600

Potomac Instruments Inc. **C1410**

Power Module Technology **C1623**

Prime Image/Greentec **N4036**

Pristine Systems/Summit Traffic **C3032**

Propagation Systems Inc. (PSI) **C754**
Featured : PSI designs and manufactures solutions for TV and FM broadcasting. Product lines include TV and FM broadcast antennas, combiners, filters and transmission lines. Antenna designs are available for all power levels, directional or non-directional, pattern optimization, customization and multi-station. PSI also offers full TV and FM Turnkey transmission systems. Two of the FM models available are the popular Power-Tiller, noted for its superb radiation characteristics, and our Slant-V that provides a reliable solution at a lower cost. An HD version of each model is available. A variety of panel designs accommodate multi-station requirements.

Radio Frequency Systems **C2907**

Radio Systems **C3013**

Radio World **C1458**
Intro: Radio World, the news source for radio managers and engineers, has introduced a new look and touch. Our pages are more open, our text easier to follow. Pictures and ads are brighter, fresher. Like you, we're reinvesting in our product. We believe in radio and its future. As a supplier to broadcasters, you must reinvent yourself and your business constantly; we're there with you, as we have been for 34 years. Radio evolves. So do we. Our goal is to provide the industry's best readers and advertisers with the best publication possible. Join us.

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RCS C2628

Intro: RCS iPush — New for NexGen Digital is the ability to use your iPhone. There is now an app for recording one or more news reports or remote inserts and sending them to NexGen Digital via an integrated version of WANcasting. The audio lands into the system for playback on the air. With RCS iPush you can leave bulky recording equipment at the studio and still capture events. iPush recordings directly to the automation system's library. iPush works with an iPhone or second generation or newer iPod Touch. iPush is compatible with the phone's microphone, or upgrade to plug-in a higher quality over-the-counter microphone.

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Web Site: www.rcsworks.com

RDL Radio Design Labs C451

Richland Towers C1635

Rohde & Schwarz SU3717

Featured: FM and DAB/DAB+/T-DMB transmitters; test and measurement systems.

Roland Systems Group C4345

Intro: RSS S-0808 eight input by eight output portable digital snake, compact, lightweight with rugged design for portable applications, external battery powered or embedded power over REAC allows for use in a variety of portable applications.

RVR Elettronica C848

Rymsa C2313

S.W.R. Inc. C1126

Sabre Towers and Poles C1925

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Sage Alerting Systems C1358

Featured: Sage Digital ENDEC

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Sennheiser Electronic Corp. C2228

Seratel Technology C3316

Shively Labs C3019

Intro: New line of linearly and circularly polarized low windload FM panel antennas, supplementing the established 6014/6016 range. Also: Model 6020 broadband dipole ideal for emergency or standby applications, rated for 5 kW per dipole; Model 6017 Lindenblad array is being upgraded to accommodate higher input powers or T-DMB/DRM+ applications looking for an economical, top-mounted circularly polarized solution with an omnidirectional pattern; pattern analysis for log-periodics and yagis, as well as omnidirectional and directional arrays.
Featured: Antennas, filters, combiners, coax products and directional pattern development.

Shure Inc. C2013

Intro: PSM900 Wireless Personal Monitor System delivers audio quality and RF performance for demanding professional events, installations and tours.

Sierra Automated Systems C3010

Singular Software SL4128

Intro: The PluralEyes application accelerates workflow for multi-camera, multi-take and dual-system audio productions. By analyzing audio information, it synchronizes audio and video clips automatically without the need for time code, clappers or other manual preparation. Optimized for performance on both Mac and PC platforms, it supports both Vegas Pro and Final Cut Pro.

SIRA S.r.l. SU3022

Intro: A line of FM filters, lowest to highest power rates, from the most-frequency-spaced combination to the toughest applications, granting high selectivity as close as 0.5 MHz.
Featured: Antennas, filters, double bridge combiners, directional couplers, trimmer lines, patch panels, measuring units, connectors and accessories.

Society of Broadcast Engineers L29

Solid State Logic C3313

Sonifex Ltd. C2739

Intro: Redbox RB-DD4 4 Channel Digital Audio Delay allows you to delay four mono channels of audio independently or together. The unit is suitable for synchronizing audio to video that has been delayed by processing latency. Also: Sonifex Reference Monitor Meters offer high-resolution metering of one to four stereo audio sources. Each stereo source is auto-switching between either analog or digital AES/EBU format with sample rates up to 192 kHz accepted. Line includes five rack-mounted and three freestanding meters. The level of each stereo source is displayed on a pair of bright, multi-colored bargraph meters with a choice of scales/responses. Separate five-LED phase meters indicate channel correlation or phase error conditions, and additional LEDs show digital input lock and audio level alarm status.
Featured: The Redbox range of audio interfaces, Net-Log logging system, reference monitor, telephone hybrids and S2 solutions.

Sony Electronics Inc. C11001

Sound Devices C1354

Intro: CL-9 Linear Fader Controller is an accessory for the 788T Digital Recorder, turning it into a mixing/recording system for audio capture in sound-for-picture, broadcast and music-oriented productions. Also on display will be the 1.10 firmware update for the 552 Production Mixer, our first to incorporate an integrated digital audio recorder. This firmware release includes enhancements and upgrades.
Featured: 7-Series line of Digital Recorders, 552 Production Mixer, Wave Agent File Librarian

Sound4 N1403

Staco Energy Products Co. C1148

STAGETEC (Salzbrenner Stagetec Mediagroup) C1057

Stainless LLC C2025

Featured: Towers, antennas, engineering studies & analysis, 24-hour service repair & maintenance

Stantron C6049

Stratos OE1720

Studer Soundcraft C2619

SURFBETS

DANKE SCHOEN, WAYNE

If you've never had the pleasure of seeing Mr. Las Vegas himself, this may be the year you have to blow off that big dinner and hit the Strip.

Wayne Newton's show "Once Before I Go" is at the Tropicana's Tiffany Theater through April 24 and will then close. The show is backed by full orchestra and celebrates the iconic performer's 50-year career entertaining Strip-goers with jokes; banjo, fiddle and guitar skills; and tunes such as "Danke Schoen" and "Great Balls of Fire," during which he's been known to play the piano with his toes a la Jerry Lee Lewis. Classic photos and videos, as well as Newton's signature "meet and greets" with the audience, add to the fun. Ticket prices range from $69.99–$168.99 VIP; the latter includes a "golden circle" seat, meet and greet with Wayne Newton plus photo taken with Wayne.

Tropicana
3801 Las Vegas Boulevard S.
(800) 634-4000
www.troplv.com

Studio Technologies Inc. **C10048**

Superior Broadcast Products **SU2713**

Superior Electric **C1108**
Featured: Stabiline Automatic voltage regulators, transient voltage surge suppressors, uninterruptible power supplies & power conditioners.

Sure Shot Transmissions Inc. **OE1715**

Switchcraft Inc. **C8137**

Systembase Ltd. **C3134**
Intro: C500ip Codec offers reliable audio streaming over IP networks with low delay. Backward-compatible with previous models of Systembase codecs. SNMP Management Ports and the Internet Webserver enable remote access to users.

TASCAM **SL1717**

TBC Consoles Inc. **C12626**

Tec Nec Distributing **C1941**

Tektronix Inc. **N2522**

Telestream Inc. **SL3614**

Telex **C4337**

Telos Systems **C146**
Intro: Telos VX Broadcast VoIP System is our next-generation multi-studio phone system, a convergence of IP audio and advanced studio telephone systems, a scalable entry-level solution with room to grow. It connects to telco lines using SIP, making it compatible with a variety of VoIP gateways and PBXs. VX is Livewire-enabled for integration with Axia IP-audio networks, or pair it with Axia audio nodes to connect with traditional audio systems. Each line has its own Telos hybrid. Telos VX works with new IP-based Telos VX Director phonesets. Also new: Nx6 compact six-line version of the Nx12 talk show system has four digital hybrids, each with its own AGC, noise gate and caller override dynamics using tuned DSP algorithms. Each includes Digital Dynamic EQ, a multi-band equalizer that analyzes and adjusts audio spectral characteristics from various phone sets and connection paths. Includes special echo cancellation for tricky VoIP and cellular calls. Feedback in open speaker applications is virtually eliminated thanks to a unique adaptive function. Also: Zephyr/IP, available in a 2RU rackmount and compact mixer version, uses public IP networks and mobile phone data services for broadcast-quality, trouble-free audio transmission. The Z/IP produces superior audio for two-way applications over uncontrolled IP networks by adapting to the network and minimizing the effects of packet loss and jitter, resulting in a stable connection even in adverse conditions. Uses AAC-ELD codec for excellent fidelity at low bitrates with nearly inaudible loss concealment. Z/IP is wireless-capable and can connect to IP networks via Wi-Fi, EVDO and UMTS. It's Livewire ready, includes AES-EBU Digital I/O and can register and accept calls from compatible PBXs. Z/IP server technology makes it easy to connect to other Z/IP units through firewalls and NATs. Z/IP Mixer combines the versatility of Zephyr/IP with the utility of a digital four-channel stereo mixer in a road-ready portable chassis. Also: Telos Zephyr iPort MPEG Gateway enables broadcasters to transport eight stereo channels of CD-quality audio on a single connection. It houses eight stereo MPEG codecs in a 2RU box, capable of eight bidirectional or 16 encode-only channels.

TFT Inc. **C2307**

Thales Angenieux **C6037**

Thermo Bond Buildings Inc. **C1430**

Tieline Technology **C157**
Intro: Report-IT Live iPhone Application turns your iPhone into an IP audio codec for wireless newsgathering, lets you broadcast live and record your broadcast on the iPhone at the same time. Record an interview or report offline, then go live on air later. You can report live and play grabs from any recorded interview while on the air. Conduct an interview off-line. Audio files can be forwarded in real time to a Tieline codec in studio for recording, or uploaded via FTP to a news server with no codec in the studio. Report-IT supports live, bidirectional 15 kHz audio with low delay, so studio can send a program mix-minus and communicate with the reporter while they are broadcasting. Reporters can use Report-IT Live app on the iPhone alone (using mic and headphone inputs on the phone), or combine it with Report-It Live hardware Dock and use professional inputs with enhanced audio level management and control. Also: Report-IT Live Hardware Dock enables pro mics and headphones to interface with Tieline Report-IT iPhone Application. Also: Bridge-IT Multiple Unicast/Multicast IP Audio Codec is a low-cost codec for STLs and audio distribution, with new features such as support for AAC-LC, AAC-HE v.1 and v.2 algorithms, as well as multicasting and multiple unicasting. Also: G5 Rack Mount IP STL Codec delivers studio-quality audio over wireless 3G/4G IP networks, wired LANs, WANs, the Internet, satellite IP, Wi-MAX and Wi-Fi. Also supports connections over POTS and ISDN networks.

TrafficLand Inc. **SU1708**

TransLanTech Sound **C1323**
Intro: Ariane Sequel V2 is the new and improved Ariane Sequel Digital Audio Leveler. New and improved firmware with more robust AES/EBU system and improved AGC functions incorporating the best ideas and suggestions from customers.

Transradio **C1607**
Intro: DRM DMOD3 exciter with digital power enhancement — new notebook PC design, best reliability, back channel for automatic precorrection, digital power enhancement for larger coverage areas, low operation cost, Linux design, included GPS receiver for SFN operation, single- and multi-channel simulcast operation, supports all DRM modes

TWR/Orga Aviation Lighting Inc. **C2136**
Featured: LED L810 single & double fixtures can be used as direct incandescent replacements. L864 LEDBeacon is a direct replacement for

300 mm beacons. High-Intensity Lighting System (HILS) for new and replacement systems offer long lamp life, low UV and ozone generation, lowest power consumption and ease of installation using a single cable for both power and control wires.

Utah Scientific **N4511**

Vaddio **C8008**

VIDIZMO **SL8207**

Vimsoft **N520**

Vocalbooth.com Inc. **SL8510**

Volicon **SU5302**

Vorsis **C2623**
See Wheatstone

V-Soft Communications **C2734**
Intro: Probe 4 uses using unique geographic mapping engine that combines polygon mapping graphics with precision coordinate information and map projections to produce stunning coverage maps. An ultimate computer tool for predicting radio propagation for the 20 MHz to 20 GHz frequency range. Handles the simplest to the most difficult propagation studies for FM, TV and DTV. Features propagation models including Longley-Rice, Standard FCC, Line of Sight, ITU-R P. 1546-1. TIREM methodology is available. Single or multiple station coverage studies, incoming or outgoing interference studies, D/U ration studies and DTV OET 69 analysis are available for user selection. For interference studies, Probe 4 will automatically identify stations that cause or receive interference to the reference station. Probe 4 uses any V-Soft terrain database with resolutions from NGDC 30 arc second to our National Elevation Dataset (NED) 30 meter (1 arc second) terrain. Signal values can be examined down to street level including street names. Also: AM-Pro 2 AM mapping and allocation study tool for day and nighttime propagation analysis; FMCommander FM allocations program with time-saving features.

Ward-Beck Systems Ltd. **N3425**

Wegener **SU4902**

Wheatstone Corp. **C2623**
Intro: New products for radio and television audio including two new Vorsis signal processors, a new Audioarts Engineering product, a new Wheatstone radio product, a new television control surface, Wheatstone AoIP Blades 2.0 and a breakthrough new television console/mix engine. *Featured:* Audio consoles and control surfaces, software, AoIP digital audio networking, Vorsis signal processing

Whirlwind **C4342**

WhisperRoom Inc. **SL5105**
Featured: WhisperRoom Sound Isolation Enclosures

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Web Site: www.whisperroom.com

WideOrbit **N5129**
Featured: WO Traffic, WO Sales, WO Automation for Radio

Will-Burt Co. **C8333**

WinMedia America **N1005**
Intro: WinMedia Suite software for radio/TV broadcasters. Answers the needs of the broadcast process from editing, music and ads scheduling, voice track, live assist, archiving and report. The suite can adapt to Web, local, regional or national, radios and music TV stations.

Winsted **C8608**

WireCAD **N6219**

Photo by Jim Peck

Digital Radio Mondiale's Roxandra Obreja addresses the audience during a DRM Consortium panel discussion in 2009, as Fanny Podworny looks on.

Wireworks Corp. **C8612**

Wohler Technologies **N3023**
Intro: AMP2-16V Series Modular Audio/Video Monitor is a 16-channel audio/video monitor, a dual 4.3-inch OLED version of the AMP2-16 Series modular audio monitor. The addition of dedicated video monitoring to the AMP2-16 Series along with Free Mix and Dolby Zoom functions makes it a flexible and comprehensive 3G/HD/SD-SDI audio/video monitor.
Featured: AMP1-16, AMP2-16

WorldCast Systems Inc **C751**
Intro: Goldeneagle HD V2 with RDS monitoring capabilities such as analysis of RDS groups distribution, AID monitoring and remote streaming of raw RDS data; advanced monitoring of HD Data such as UFID (iTunes HD Tagging), IBOC BER and PSD (PAD) as well as support for Scripteasy V2 software allowing graphical scripting for remote control devices. With PSD (PAD) monitoring, Goldeneagle HD V2 can be configured so an alarm is triggered if the PSD fails to change. V2 includes a new HD Tuner, also available as a hardware retrofit to users of V1. The tuner enables broadcasters to perform detailed HD data monitoring such as presence of services and MIME types as well as enabling the streaming of raw HD data. Also: An update on Audemat's FMB80 RDS encoder provides improved support for RT+ standard and ability to implement iTunes tagging.

Wowza Media Systems **SU9310**

XDT Pty. Ltd. **SU3010**

Yamaha Commercial Audio Systems Inc. **C1336**

Yellowtec **C1451**
Featured: Yellowtec is a brand of Thum + Mahr in Germany, system integrators for broadcast facilities. Products include iXm recording microphone, PUC2 professional USB-powered soundcard, m!ka microphone arms.

Zaxcom Inc. **C154**

Zeus Broadcast - An Obor Digital Company **N4319**

IN YOUR NEXT ISSUE OF RADIO WORLD

April 7, 2010

Manager's Show Preview

NABSHOW Where Content Comes to Life

Snakes Among Sweet Flowers Do Creep

Don't Think for a Moment That Your Network Can't Be Compromised

BY BRIAN CUNNINGHAM

"I think computer viruses should count as life. I think it says something about human nature that the only form of life we have created so far is purely destructive. We've created life in our own image." — Stephen Hawking

We wrote in the Jan. 13 and March 10 issues about protecting your network from worms and other threats.

iStockphoto/Robert Creigh

RADIO IT MANAGEMENT

Don't think for a moment that your computer network cannot be compromised. Hackers have thousands of tools at their disposal to use to compromise your computers and file servers.

Take some time and look closely at your computer network. Where are the likely spots that intruders could get in? Are all of the computers on your network protected by antivirus software? Do you have a firewall in place to "hide" your computers from possible intruders?

A hardware firewall is preferable, such as a Linksys Broadband Firewall Router, but a software firewall, such as the one included with Windows, is better than nothing.

The disadvantage with using a software firewall that is constantly running, it takes up RAM and could slow down the computers performance.

Here are 10 tips about protecting your computer network and all equipment attached to it from a possible intrusion.

1. *Update your computer.* Stop using computers with old operating systems such as Windows 95, Windows 98 and Windows ME. These OS are so old and outdated, they cannot be considered secure.

2. *Update Microsoft Windows XP.* Make sure that your automatic update setting in Windows Control Panel is turned on. This ensures that all new vulnerabilities on your computer are patched up as soon as Microsoft discovers a new threat and develops a patch. This will ensure that your computer is always up to date.

3. *Install antivirus software.* I can't say this enough. Your first defense is this software. It really doesn't matter which brand you choose, there are a dozen out there that will get the job done. Just make sure that with the purchase of the software you get automatic updates for the time period that your subscription is

(continued on page 54)

WORMS

(continued from page 53)

good for, and *make sure* that the automatic updates are scheduled to check for any updates or patches, daily! Also, once a month, perform a full system scan to ensure that nothing slipped in between antivirus software updates.

4. *Install anti-spyware.* Spyware and viruses go hand in hand. Spyware gets its name from the fact that it allows someone else to view your personal files, gain access to passwords, track your movement on the Internet and allow some degree of control over your computer. Like the antivirus software, there are many brands out there. Choose the one you feel most comfortable with and gives you the best protection. There are software companies that offer anti-spyware and antivirus in the same package. This is generally cheaper to purchase in a bundled package vs. purchasing separately.

5. *Use a spam filter.* Spam filters can block e-mails suspected of being spam or they can flag certain e-mails suspected of being spam. The real danger of spam is that it is a tool often used by hackers to slip a virus, spyware or other infectious code into your computer.

6. *Use a firewall to hide your computers from malicious attackers.* A hardware firewall is preferred, but if you cannot afford one, at least use the windows firewall in Microsoft and make sure that it is set to regularly check for updates. If using a hardware firewall, never use the default settings, and always change the user name/password from the default setting. Most hardware firewalls use port 5900 as the default. Use some number higher than the default. This makes it much harder for intruders to figure out what port is opened to gain access. As for the username/password, use a combination of letters and numbers, and just for good measure, throw in capital and lower-case letters.

7. *Change your computer passwords often.* I would recommend changing passwords every 60 days, and like the passwords for the firewall router, use numbers along with upper/lower case letters for the password.

8. *Back up your data often.* Storage devices have dropped considerably in price. You can purchase a 1 TB external drive these days for less than $100 or if you do not have that much data to back up, a simple thumb drive will do the trick. I have seen some of these recently for as little as $18 for an 8 GB drive.

9. *Periodically check your computers* to ensure that automatic updates are turned on and working. Some of the viruses out today specifically target the automatic update function of your antivirus software and turn it off so critical updates cannot be installed.

10. And finally, if you do not feel confident in maintaining the security of your network, *hire a competent professional* in your area that you trust to do the job. Or if you do not know enough about network security, perhaps you can hire him or her to train you on what to do and how to do it. Perhaps you can work it out to where you can call and ask questions when needed or they can be "on call" when a situation arises.

I recently had a Mac user tell me that the Mac was virtually unable to be infected by a computer virus!

While it's true that many Mac users do not even run any type of antivirus software, they can and do get viruses, especially if running a virtual PC on an Apple MacIntosh; it is emulating Microsoft Windows, therefore it can be infected with Windows viruses.

As a standalone, the Mac is less likely to be attacked for several reasons: 1) Newer operating systems such as the Mac OS X are built on the Unix kernel, which is one of the oldest and most secure operating systems available. 2) Most virus writers are more familiar with the IBM platform and Microsoft Windows, therefore are only going to be able to create a virus for that platform. 3) Because most of the world uses Windows over Mac, Windows users are a much bigger target.

I have not had the opportunity to check out Windows 7 but from what I hear, vast improvements have been made to the OS, especially in the area of security. If you have had issues with Windows 7 security, or other suggestions for future IT articles, drop me an e-mail and let me know about it: *brianc@crawfordbroadcasting.com.*

Brian Cunningham, CBRE, is chief engineer for Crawford Broadcasting's western New York region, based in Buffalo.

PEOPLENEWS

Middle Atlantic Products promoted **Craig Decker** to director of customer and sales resources, a new position "created to emphasize the voice of the customer in day-to-day activities." The company recently promoted **Mike Baker** to be its president. Founder **Bob Schluter** continues as chief engineer and CEO.

Craig Decker

The **National Association of Farm Broadcasting** named **Mark Vail** as executive director. He worked for Eagle Communications in various capacities and was executive producer and co-creator of the national ag show "AgriTalk."

Lauren Darr

The Alliance for Women in Media, formerly American Women in Radio and Television, announced its national board. **Sylvia Strobel**, partner with Lehmann Strobel PLC, is chair. The vice chair is **Valerie Blackburn** of CBS Radio, treasurer is **Elizabeth Hammond** of Nexstar Broadcasting Group and treasurer-elect is **Kristen Welch of** Discovery Channel.

Directors at large include **Lauren Darr** of LOI International, **Christina Anderson**, NCTA; **Mary Bennett**, Bennett Consulting Services; **Bill Diaz**, My TV Tampa Bay; **Lisa Dollinger**, Clear Channel Communications; **Michelle Duke**, NAB Education Foundation; **Sarah Foss**, VCI Solutions; **Carol Grothem**, Campbell Mithun/Compass Point Media; **Corny Koehl**, Harpo Radio; **Christine McLaughlin**, Venable LLP; **Kay Olin**, Local Focus Radio; **Bonnie Press**, Katz Media Group; **Heidi Raphael**, Greater Media; **Carolyn Stidham**, CNN; and **Jennifer Zeidman Bloch**, Google.

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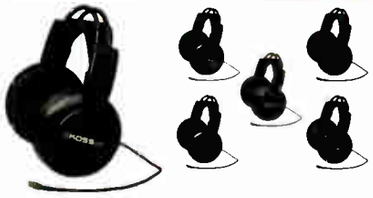

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New Capacitors End Stability Issues

And We Bring You Another Fun Episode of 'Spot the Problems'

Bill Frahm handles engineering for Citadel in Boise, Idaho. After reading several of Buc Fitch's Marti tips here, he offers a couple of his own.

Bill says he has always hated that red LED for "squelch open" on the Martis; he's been replacing them with green LEDs. Now he can tell at a glance that the Marti is up and running.

WORKBENCH
by John Bisset
Read more Workbench articles online at radioworld.com

He has found that the Marti transmitters seem to have more problems when the 22MFD, +12 VDC bypass caps on the IPS/PA board get old and leaky. After replacement, things settle down. This is a good reminder for all power supply filter caps, too. A rule of thumb is five to seven years of life. Stock up on replacement caps; you eventually will need them for all sorts of equipment.

After tuning for least trees in the RF forest, Bill runs the power adjust up and down. If the RF output stays clean during this test, he finds the unit will be more stable.

Another trick is to run the transmitter into a "tuned" whip and see if the unit spurs when the load changes.

Bill Frahm can be reached at bill.*frahm@citcomm.com*.

It's common during construction to let safety slide. It's not intentional; there's just so much to do.

Fig. 1 is a case in point. It is contributed by John Ramsey, who was called to this site.

A nice, new AM installation; looks great, right? What's wrong with this picture?

I know: "Where's the fence?" Remember, even during construction, climbing protection is required.

But the fence is not all that's missing. Study the photo and read on for more answers.

Besides being a contract broadcast engineer, Nick Markowitz Jr. is an electrical and fire/security contractor, proprietor of Markowitz Electric Protection. He added observations about our "spot the problem" picture in the Feb. 10 *Workbench*, shown again in Fig. 2.

Fig. 1: A new tower site, but can you spot the problems?

There is a spiral wrapped cable, commonly called BX cable, coming from the box, which is not properly secured to NEC70 standards. The box looks like it has more than one power source feeding it. If this is the case, the switches need to be clearly marked as to what they are serving and if more than one energy source is involved.

The other cable or air line floating around should be secured properly to prevent it from being snagged.

Also, Nick says that all electrical switch gear is now required to have arc fault flash ratings. OSHA requires an appropriate level of gear required to work on energized systems safely. Be aware: Nick sees a lot of new regulations creeping into the broadcast industry.

Nick Markowitz can be reached at *nmarkowitz@gmail.com*.

Steve Callahan is the director of engineering for Rhode Island Public Radio. He stumbled onto this cheap and quick little fix and thought it might be helpful to someone else.

WRNI is an NPR station. During their on-air fundraising campaigns things in the studio can get hectic. WRNI uses an Audio-Technica AT808G gooseneck mic as part of their intercom/IFB system.

You've probably seen this model of black microphone on podiums. The IFB is important for communication with the on-air talent, but the AT808G turned up dead one morning in the middle of fundraising.

After making sure that the problem wasn't in the wiring in the "flex" portion of the microphone's gooseneck, Steve discovered that the problem was an open coil in the microphone element. He couldn't wait for a replacement part, or a replacement AT808G, so he located a pair of ear bud earpieces from his junk box. He found a set of "buds" with a speaker element the same size as the mic element in the AT808G.

(continued on page 58)

Fig. 2: Note the spiral wrapped cable coming from the box.

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Datacasting Today and Tomorrow

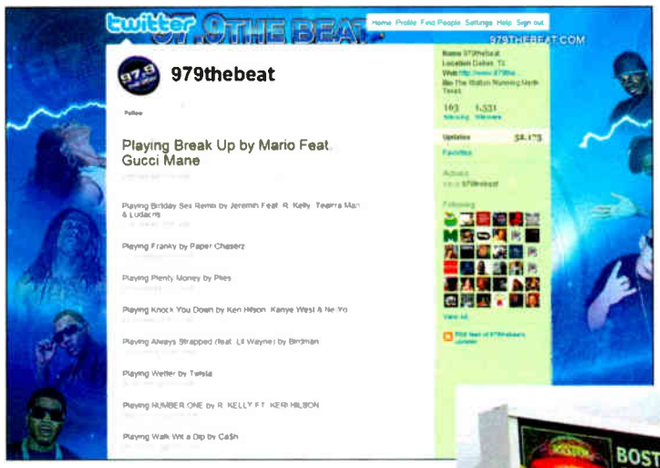
Roberts Says the Infrastructure Offers Ample New Business Opportunities

BY TOM VERNON

Broadcasters seeking to maximize their interaction with listeners need to understand trends in datacasting, says Jim Roberts, product manager of datacast systems at Broadcast Electronics, who speaks often about the topic at conventions such as the upcoming NAB Show.

For instance, Roberts says that many portable devices including mobile phones have RDS chips installed, yet these services are not yet supported in the device firmware. Broadcasters should consider lobbying manufacturers to activate this RDS capability, he said, to open significant new opportunities.

Datacasting also can be used with interactive billboards, which are becoming more flexible communication platforms. A broadcaster can publish data to an XML file read by the LCD billboard, which is connected to the Internet. For the broadcaster the operation is much like updating a Web site. The older method also works, sending information to a billboard in the group 5A subset of RDS, which is not displayed on RDS receivers. In this case, text-only data can be displayed on an LED sign within the billboard.



Top: With an API, a station's automation can send now-playing events to Twitter.

Right: Interactive billboards may be controlled by the group 5A subset of RDS, or if they are connected to the Internet, via XML files.

Roberts also says new technologies are tightening the links between the playlist on a station's automation system and the Internet.

Tune Genie for instance takes now-playing data and does a real-time dynamic lookup on the Web to display song lyrics, artist bios and videos. One application for this might be to have a station's Web site display videos from YouTube for each artist as they played.

Listener-Driven Radio, launched in 2009, is a mashup of crowdsourcing and broadcasting that allows listeners to vote on the songs in a station's playlist and inject that information into the music scheduling software. LDR also integrates with social networks like Facebook and Twitter, adding information about what's going on at a station or on its playlist.

Stations using RDS for artist/title information may enhance their data stream by adding generic or non-music information to the stream such as day-parted messages during sweepers, liners and promos, Roberts continued. Text may be linked to audio, such as information on area concerts and tickets. News, weather, traffic, sports and EAS information may be inserted into the RDS or HD stream, as well as contest information.

Datacasting may also provide a station with sources of non-traditional revenue. High-impact ads may showcase a single advertiser on a one-day schedule; they are an excellent vehicle for one-day sales or holiday events. Linked events can be another source of revenue. Radio text can be linked to a commercial, song or any piece of audio.

To get the most out of datacasting, a station's sales force must educatate advertisers to the potential. Some may not understand the technology, and would benefit by seeing it, so sales people may need to bring along portable radios. Roberts says one group of businesses that seems to grasp the potential for this medium is car dealers.

PUT A TAG ON IT

Tagging is an area of interest; it involves a listener marking selected songs for later purchase. It can be accomplished both with analog FM and HD Radio, working in conjunction with selected iPods and Microsoft's Zune devices. Roberts says he receives frequent questions from stations about tagging.

For analog FM, listeners hear songs on the iPod Nano's built-in FM receiver. Songs can be purchased after synching with iTunes on a PC or Mac. This method requires stations to identify song and station data via the Radio Text+ standard of RDS. Some of these arrangements allow revenue sharing for the station.

In HD Radio, the tagging process involves datacasting in conjunction with

(continued on page 60)

WORKBENCH

(continued from page 56)

With a sharp blade and a quick solder job, Steve swapped the ear bud element for the dead mic element and the IFB was back in service in 10 minutes. Since the AT808G is used exclusively for IFB, the quality was equivalent, and the fundraising campaign went on with no more technical hitches.

Quick thinking Steve. Another example of where engineering saves the day.

Steve Callahan can be reached at *scallahan@wrni.org*.

There's nothing like a new site, but don't let a construction project cause you to forget about necessities.

You've noticed there is no fence in Fig. 1; but did you also note that there was no surge loop in the pipe connecting the ATU to the tower?

And here's one that you may have missed: no expansion loop in the radials, where the ground radials attach to the base of the tower strap, at lower right foreground.

One would hope that the base would be covered with landscaping fabric or heavy black plastic and a layer of crushed stone. Weeds growing up between closely space radials can cause detachment when pulled.

Did you find more? Let me know. E-mail your suggestions to *johnbisset@myfairpoint.net*.

John Ramsey handles engineering for Marlin Broadcasting and other contract clients. He can be reached at *jramsey@marlinbroadcasting.com*.

John Bisset marked his 40th year in broadcasting recently. He is international sales manager for Europe and Southern Africa for Nautel and a past recipient of the SBE's Educator of the Year Award. Reach him at johnbisset@myfairpoint.net. *Faxed submissions can be sent to (603) 472-4944.*

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

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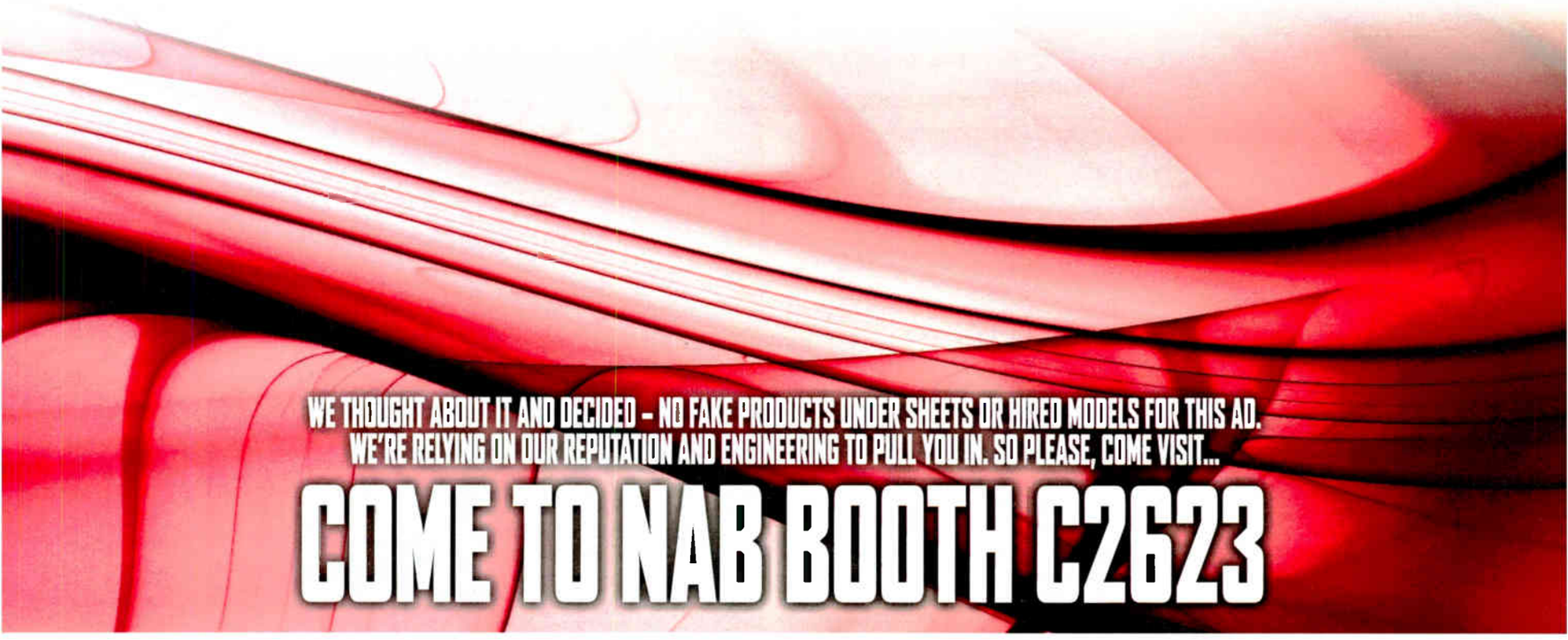

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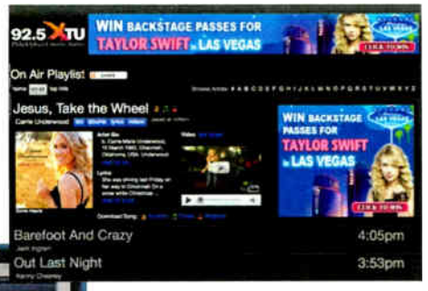
ROBERTS

(continued from page 58)

suitably equipped receivers. Listeners "tag" a song they like by pressing a button on a supported HD Radio. An attached iPod records this information. The next time the iPod, either iPod Classic (sixth generation) or iPod Nano (third generation) is synchronized to iTunes, the tagged songs are displayed and can be purchased through the iTunes Store.



Left: Zune enables listeners to purchase songs via the Zune marketplace on Wi-Fi or via the Internet.

Top: Tune Genie uses now playing data for dynamic lookup on the Web of lyrics, concerts and artist bios.

Listeners who hear songs on Zune's built-in FM receiver can tag them and make purchases through the Zune market place via Wi-Fi. Songs can also be purchased on a PC using the Zune software.

Roberts noted that an increasing number of stations are integrating with social networks such as Twitter, Facebook and Last.fm. Broadcasters may use a product's Application Program Interface or API so its automation can send now-playing events to Twitter. Twitter in turn can turn this into an RSS feed.

Stations also can use social networks such as Twitter to implement homebrew methods of tagging that do not restrict listeners to specific hardware or proprietary technologies.

The Last.fm service, now owned by CBS, is a social network that creates music statistics and will tally the most popular artists played by a station. This can be a valuable tool for broadcasters, but Roberts cautions that a station may want to delete this information on a daily basis if they don't want competitors to have access to it.

While many of these functions can be homebrewed with APIs, commercial products such as those from The Radio Experience from Broadcast Electronics are available. Another product from BE, TRECast, allows talent to send text messages in real time to RDS, HD and Twitter, and functions as a form of "instant messaging" for datacasting. It may be used to announce contest winners or insert special text messages during live segments.

A series of sessions at the NAB Show will explore "Radio Data Services." For details see page 30.

PRODUCT SPOTLIGHT

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NOISE REMOVAL: Noise reduction in audio recordings can be a dark art. An inexpensive software packages is from iZotope. Music & Speech Cleaner tips the wallet scale at under $40. Function buttons are labeled with duties such as "Reduce Hum," "Reduce Pops" and "Enhance Voice." These have simple sliders for increasing or decreasing the effect. A waveform monitor allows for some control on where to apply the various processes. Compatible with Windows (incl. Windows 7) and Mac. www.emediamusic.com/msc.html

NEW DIGS FOR TELOS/OMNIA/AXIA

The Telos group of companies has a new home.

Cleveland-based Telos Systems, Omnia Audio and Axia Audio are in an expanded headquarters that the company says larger and more efficient office and R&D space. It had been leasing space nearby.

The headquarters occupies three floors of a 55,000-square-foot building at 1241 Superior Avenue East in Cleveland. The manufacturer says the facility provides more individual work areas for staff as well as a more streamlined layout for its departments.

"Our new space provides vastly improved work areas for all of our divisions. Our support engineering team now has better access to our 24/7/365 support crew," Managing Director Denny Sanders stated.

"In our operations department, we have improved workplace tools to assist our dealers with their interactivity with the company." The company offered SBE Chapter 70 the use of its new demo space for its monthly meetings.

Phone contact info remains the same.

ON THE PHONES: Denon DJ offers the DN-HP500, shown, which are "entry-level" headphones featuring 40 mm drivers with neodymium magnets. Impedance is 40 ohms with an expected frequency response range of 10 Hz–28 kHz. The ear cups swivel 90 degrees for tight storage. Price is around $69. The DN-S700 is a tabletop DJ-style slot-load CD player (not shown). It will also play MP3 discs. MSRP is $499 though it is street pricing for significantly less. www.denondj.com

DIGIGRAM, ENHANCED: Digigram has licensed the Enhanced apt-X codec from developer APTX. The technology will be used in Digigram's IQOYA line of IP codecs and integrated into its Visiblu networking system. Enhanced apt-X will be an option. www.digigram.com

IN YOUR FACE: The RME Fireface UC USB is a USB 2.0 device offering USB, ADAT, S/PDIF and 1/4-inch analog I/O, along with word clock and MIDI protocols. The front has dual XLR 48 V mic/line inputs along with dual 1/4-inch instrument/line inputs and a headphone output and channel gain control. Digital channels top out at 192 kHz. Rackmountable and Windows and Mac OS X compatible. www.synthax.com.

HOTCOPY: Envision Radio Networks, a content and services provider, added a new tool to its SmartSite Systems called HotCopy, a database consisting of thousands of sample radio ad copy scripts and templates, covering some 300 categories. Users can use and modify the scripts for use on their station. www.smartsitesystems.com

LOCKING USB: To combat loose USB connectors that rely on a friction fit, L-com Global Connectivity introduced USB cables with "latching" USB connectors; the cables are the CAUALAL and CAUALB. The male USB connector has a "Type A" spring-loaded latch that uses side-mounted tabs on the connector tongue to extend inside the female USB shell. The tabs can be retracted by pressing on releases mounted on the sides of the exposed part of the male USB shell. Particularly useful in vibration environments like off-road vehicles and aircraft. www.l-com.com

SOS: Tossing another log onto the handheld recording fire, Korg introduced the Sound on Sound (SOS) digital recorder. It records to microSD cards, with 16-bit/44.1 kHz BWF file performance. Korg estimates it consumes 1 GB per 100 minutes of record time. Musicians will like that it features 100 DSP effects, 50 rhythm patterns, looping function, high-speed playback and onboard guitar, bass and chromatic tuners. A touchscreen and jog-shuttle dial facilitate operation. There is an onboard microphone and 1/4-inch instrument input, 1/8-inch external mic input and 1/8-inch stereo input. A headphone output and speaker are included. Price: $400. www.korg.com

The Show Behind the Show

Perhaps the Most Interesting Exhibit at NAB Is the City of Las Vegas Itself

BY JAMES G. WITHERS

Las Vegas is a fascinating town. First a wagon train layover, later a railroad junction, it has morphed into a Mecca for conventioneers, pleasure-seekers and risk-takers from around the world.

FIRSTPERSON

Given its colorful past (not to mention the present), it is not surprising that the town has a unique character. So as we once again pack our bags for the annual pilgrimage to The Show, consider some tidbits about our host city with which you can amaze and amuse your seatmates on the flight out.

BUGSY AND THE ROSE GARDEN

In the 1940s an L.A. bad guy named Benjamin Siegel was sent here by the mob to build a desert getaway for wiseguys and other West Coast types.

He built the Flamingo Hotel with money collected from various shady enterprises, and semi-retired to the desert. Vegas in those days was not the glitz machine it is today; there were no pirate ships, no spewing volcanoes, no gondola rides. In fact, his was only the second "real" hotel on the Strip, (the first being the El Rancho).

The Strip itself was not even part of Las Vegas back then. The actual town was centered around Fremont and Main Streets, the current bubble-topped "Casino Center." The population was only around 20,000 in 1947.

Bugsy, as he was called, had plenty of time to take up a hobby. He chose gardening. That pastime had a distinct advantage for a guy with Bugsy's background, who could always use a few extra holes in the ground into which he might occasionally throw things other than flowers. Legend has it that some of those plantings were nocturnal.

Las Vegas history can be divided roughly into chapters that include wagon trains, Rat Pack, family entertainment and Sin City. Early Fremont Street is shown above.

The rose garden was still beautiful when I saw it for the first time in 1969. Even though it is gone now, it lasted much longer than did the gardener.

After a conflict with a partner in 1947, Bugsy went back to L.A. for a showdown, whereupon, not unlike his prized roses, he was himself pruned, apparently by one of the guys he should have planted back at the Flamingo.

An early contradiction of the idea that what happens in Vegas, stays in Vegas.

24/7

Las Vegas is the original 24 hour city. The strip doesn't shut down. Nuclear holocaust? That'll have to wait. I've doubled down here.

The culinary workers went on strike in 1984 and thought they would force the casinos to close — who wants to mess with several thousand guys carrying knives? — but even then the lights stayed on and the cards were dealt. (The buffet lines, however, suffered greatly; no doubt several thousand head of beef owed their lives to that strike, as the hotels were forced to substitute lasagna and brussel sprouts for prime rib.)

Since the first NAB convention in Vegas in 1974, the lights on the strip have been doused only once that I know of: when Ol' Blue Eyes died in 1998. Even then the darkness was fleeting; about 15 minutes is my recollection, because after all, blackjack waits for no man.

At least until recently. The city decided it should extinguish the lights on the Strip — even the famous "Welcome to Fabulous Las Vegas" sign at the extreme south end of Las Vegas Boulevard — for 60 minutes in honor of Earth Hour 2009, an event to place focus on climate change.

So, what the Strike of a Thousand Knives could not do, Al Gore accomplished. I am amazed; I would've given 2-to-1 on the workers.

THE CURSE OF MT. POTOSI

There is a mountain about 25 miles southwest of town that is home to a couple of FM transmitters and used to be a microwave site for two of the Las Vegas TV stations. It is called Mt. Potosi, (which the locals pronounce POE-tuh-see).

I'm told that Potosi means "lead" in Spanish and that the mountain got that name because of the discovery of the metal there, but do not be fooled; I believe it is really an obscure Indian word that roughly translates to "The Mountain of Frigid Death" or maybe "The Mountain of Scorched Death" depending on the season.

Several people have, in fact, died on the mountain; the most famous was Carole Lombard, Clark Gable's wife. Ms. Lombard was on a military goodwill mission selling war bonds throughout the Southwest when her C-47 airplane took off one dark night, zigged when it should have zagged, and crashed into the mountain at about the 7,500-foot level.

According to local lore, the airplane itself was in such an inaccessible spot that after all who had perished were removed, the plane simply was dynamited and the pieces left, to be covered up by time.

I myself have had more than one close call on the mountain. In 1973, on my way up to work on a microwave system, a snow bank gave way and my snowmobile went over the side. I jumped and rolled into a stand of scrub pines, crawled back up and finally walked out, postholing up to my waist every few feet, as I broke through the crusted snow cover. Several hours and

(continued on page 64)

SHOWCASE

VEGAS, BABY

(continued from page 62)

miles later, I reached the Pioneer Bar in Goodsprings, Nev., where I quickly was revived by a few cold beers and the heat of its potbelly stove.

As an aside, on that stove sat a large chunk of something that looked like a cross between pocked metal and dull ore. The bartender claimed it was a piece of the fused airframe from the doomed C-47.

But for a few well-placed pine trees, there might also have been a smashed snowmobile engine resting beside it to commemorate my demise.

FAMILY AND CONVENTION DESTINATION

Until around 1975, there wasn't much in Vegas except gambling. Nothing else mattered.

There were the shows, of course, and the 99 cent steak and eggs breakfasts (of which I have had more than my share), but the whole deal was set up to push gambling, which paid for everything else. Junkets, high-rollers, the Rat Pack groupies and even Ma and Pa from Dubuque all came to roll the dice and take in an R-rated revue, about which they could titillate their friends when they got back home.

This is still true, of course, but as the town grew up, it added all sorts of peripheral attractions. This seemed to start with a place called Circus Circus. When built around 1968, it was a stand-alone casino — no hotel attached — and sat unfinished and empty for over a year. Apparently no one at the time could get their arms around the idea of serious gamblers dropping a couple of grand on a table directly beneath some trapeze guy swinging through the air with a flaming sword in his mouth.

The famous Landmark is demolished in 1995.

Monkeys, clowns, jugglers, highwire performers, it was (and still is) all there in the faux circus tent just down Riviera Boulevard from the Convention Center, complete now with a thousand room hotel and an RV park.

Eventually, this idea of "family entertainment" caught on, and Las Vegas entered its era of roller coasters, canal rides, animatronic displays and of course, the pirate show and the volcano. In recent years the feel has shifted again as promoters play on the "Sin City" reputation more blatantly.

Through it all, the convention business has cycled along with the economy; and here we are again, packing up to head to the NAB.

Why Vegas? Simply because there is no other town in the world that can attract, transport, house, entertain, feed and finally send back home (minus a few hundred bucks left at the tables), the 6+million conventioneers who attend one of the 23,000 conventions each year. The Rose Garden is long gone — replaced by a waterpark, of all things — but Vegas rolls on and on. Bugsy would be astounded.

Numerous online resources offer detailed histories of Las Vegas, including www.lvol.com/lvoleg/hist/lvhist.html.

WHO'S BUYING WHAT

Russ Berger Design Group designed a facility for the **University of Nevada Las Vegas**. It is home to the Greenspun College of Urban Affairs.

RBDG designed the 28,000-square-foot, digital, high-definition broadcast facility to include two television studios, three radio production and performance studios, video and audio production control, editing bays, post-production suite and a broadcast newsroom, organized around an equipment hub of servers and broadcast gear. The facility houses UNLV TV, the campus cable station and KUNV(FM). Radio studios have **Axia** consoles and **ENCO Systems** automation.

Instructional environments include labs for writing, nonlinear editing and convergent media. The complex has a 200-seat auditorium for production and presentations. Greenspun Hall was designed by **Robert A.M. Stern Architects** with **HKS Architects**. One of the features is an outdoor plaza above the ground-level studios covered by a canopy of photovoltaic panels to generate energy (shown below). ...

Wheatstone said **Atlantic Broadcasters Ltd./CJFX(FM)** installed a Wheatnet IP audio network including two E6 control surfaces, four IP-88a Analog Blades, six AOiP Drivers for sound card replacement on **iMediaTouch** PCs, Navigator system configuration software, Vorsis FM-5 and two Vorsis VP-8 processors, sold through **Ron Paley Broadcast**. The operations manager is Barry MacKinnon, the consultant was Chad Jackson. They're using the VMI PC-based control surface, which eliminates need for a hardware surface. The system was installed by Ted Clarke of **TRC Systems** using a Cisco Catalyst Gigabit Ethernet switch. ...

Digigram said **HRT**, national public broadcaster of the Republic of Croatia, used the Version 1.0 IQOYA V*MOTE audio-over-IP codec with SIP software at the Winter Olympic Games.

'RF Leash' to Solve HD Interference?

Author Says the Technology Also Could Benefit Cellular and Wi-Fi

BY DR. MEAD CITRON

Broadcast station spacing and transmitted power levels are based on maximizing coverage to the community of license while minimizing interference to other stations outside of the service contour.

The introduction of digital service to both television and radio has given rise to a modern in-depth study of both the coverage and interference aspects for RF propagation. For FM radio, the interference issues are more acute since the current implementation of digital radio broadcast actually employs first-adjacent-channel spectrum.

To restate the problem: How do you transmit sufficient power to provide adequate reception within your market while limiting the interference that is caused to stations (such as the first-adjacent stations) just outside of your market?

This problem has had no perfect solution, and in fact many broadcasters seem content to allow the interference as a necessary evil. However, a new technology — in fact, it seems a new physics — promises to provide a deterministic solution to this problem.

CLEARLY DEFINES COVERAGE BOUNDARY

A recent discovery of the magtron, the missing magnetic particle that has eluded scientists for centuries, has prompted a reformulation to the original Maxwell's equations.

For example, we all know that if we take the surface integral over a closed surface of the vector cross product of the time varying electric field and the surface normal vector, we will get the electric charge contained in that closed surface. Since Maxwell didn't know of the existence of the magtron, his original formula was del dot B = zero. Now, all this has changed with the finding that the magnetic particle, the magtron, actual exists.

It was found by the researchers that by imparting opposite spin polarity to alternate magtrons in a signal emission, the magtrons repel and are ejected from the Poynting vector. The real breakthrough came when it was found that the magtrons repel only at quantum spin rates and that the spin rate diminishes over time. This means that the spin rate can be set higher than a quantum repellant level, and the disintegration of the Poynting vector will occur at a later time defined in addition by the spin rate deceleration.

It turns out that the spin rates can be set to slow to the level of repellant after a time of up to a millisecond, which is more than sufficient for a transmitted signal to reach the borders of a coverage area.

The technology, which has been dubbed RF Leash, provides the capability to define how far the radiated signal propagates.

Instead of a continual degradation in signal strength as would typically be governed by distance squared losses as well as terrain and atmospheric losses, a new mode of propagation is now possible that modifies the typical Poynting vector.

A newly discovered particle, the magtron, interacts with the photon much like a gyroscope, which maintains a stable transmission path in a direction normal to the plane of the rotating electric and magnetic vectors. The magtron is the glue that maintains this quadrature relationahip. It has been shown in lab tests that if the magtron is removed, the quadrature relationship falls apart, and the photon propagation behaves randomly. Since millions of these particle make up a typical RF radiation stream, the combined effect is to null the energy being radiated. An implementation of this technology has been developed in the lab in the form of an RF Leash antenna.

The box shows the differential form of Maxwell's equations modified to include the magtron magnetic particle flux density, ρ_M.

$$\nabla \times E = -\frac{\delta B}{\delta t} + \rho_M$$

$$\nabla \times H = \frac{\delta}{\delta t} D + J_T$$

$$\nabla \bullet D = \rho_T(t)$$

$$\nabla \bullet B = \rho_M(t)$$

Modified Maxwell equations for magtron flux density

STILL IN RESEARCH

The application of this technology is not perfect. When one reaches the point in space where the radiation from the RF Leash antenna changes from propagation to disintegration, there is a conversion to thermal radiation with an associated localized warming. Too much thermal radiation may result in the possibility of injury to birds, animals and humans. There is additional concern that an increased impact on global warming will result if this technology is deployed widely.

In related research, an article in the November 2009 issue of Scientific American discusses the existence of a magnetic monopole with experiments by French and German scientists. It was found that an increase in temperature led to head-to-tail flips of these monopoles. This result seems to be related to the thermal radiation phenomena found by the RF Leash researches, but the full implication is not yet known.

While this has been a fairly technical review of ongoing research, the reason we bring it to you is that it might lead to a broadcast antenna product that allows the broadcaster to select the distance of radiation, as which point the radiation stops. This will completely eliminate interference beyond the coverage area and will eliminate the problems currently being debated surrounding digital radio power increases.

Dr. Mead Citron also wrote the article "Researchers Propose Energy Harvesting" in the April 1, 2009 issue of Radio World.

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

The technology, dubbed RF Leash, provides the capability to define how far the radiated signal propagates.

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Equipment Wanted: obsolete, or out of service broadcast recording gear, amplifiers, preamps, outboard, radio or mixing consoles, microphones, etc. Large lots acceptable. Pickup or shipping can be discussed. 443-854-0725 or ajkivi@gmail.com.

I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR, KSFX, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc, I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at ronwtamm@yahoo.com.

Looking for a broadcast excerpt of a SanFrancisco Giant's taped off of KSFO radio from 1959, interviews with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a homerun by Willie Mays and Felipe Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or ronwtamm@yahoo.com.

Looking for KFRC signoff radio broadcast from 1930 Andy Potter, running time is 0:22 & also the KLX kitchen the program guest is Susanne Caygill, a discussion of women's affairs with a long promotion for Caygill's appearance at a local store. Anne Truax, Susanne Caygill, running time is 13:44. Ron, 925-284-5428 or email ronwtamm@yahoo.com.

Looking for KTIM FM radio shows from 1981-1984 if possible unscoped. R Tamm, 925-284-5428 or ronwtamm@yahoo.com.

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Good On-Air presence, or behind scenes support positions, plus Creative Copywriting abilities. Catches on quickly. Enthusiastic team player. Industrious, determined, extremely dependable. Torress, 817-902-7715 or tc_crowder@yahoo.com.

Enthusiastic, friendly and outgoing persona, with good on-air presence. Notable show prep/copywriting. Able to relate to listening audience. Reliable, team player. Cerone, 972-821-6875; cerronb05@yahoo.com.

Good on-air presence and digital abilities. Enthusiastic, jovial, and dedicated. Organized and knowledgeable show prep. Modeling/acting experience to boot! (Without the drama!) Steve, 469-835-2040 or cjfd128@yahoo.com.

Good production voice, and announcing skills. Strong creative writing and copy ability. Musically inclined. Honest and dependable. Handled PR/negotiated contracts for bands. Samuel, 817-253-7608 or llymbass@yahoo.com.

Strong announcer abilities, or behind scenes support positions programming/sports. Good copywriting talent, plus digital and production skills. Organized and reliable. Quincy, 972-310-6862; gbrown101@yahoo.com.

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READER'SFORUM

ANOTHER FINE MESS

When we bought our new transmitter only a few years ago, we were assured that it had adequate power to take us into an all-digital era of radio transmission.

No one lied or deceived us, our transmitter can do that. But it does not have the headroom to broadcast analog FM and –10 dB IBOC. Unless we get a new transmitter at considerable expense we will be stuck at –14 dB.

Of course all these problems, including the possibility of digital interference with our own analog signal, would go away if we were simply mandated to move to an all-digital mode. I think it has been demonstrated that the existing receiver stock could be replaced at reasonable cost and that the added transmission capacity could be used by parties wanting to enter the broadcast market with audio or other services.

The hybrid compromise is not working. The scenarios whereby pure market forces we evolve into an all-digital transmission mode evolutionary are fantasy. We are stuck with flawed compromises that may even doom IBOC.

As for the leadership in the radio industry that got us to where we are today, I feel like saying, "That's another fine mess you've got us into Ollie."

Tom Ammons
WQED(FM)
Pittsburgh

THE WRONG DASHBOARD PLAN

To Bob Struble, regarding your commentary "The Race for the Dashboard Is On" (Jan. 1):

Agreed that there's a lot going on in cars and trucks nowdays (OK, some of that we can't talk about here), but watching TV isn't what the vast majority of drivers are doing.

That's because most cars are inhabited only by a single driver, and there are even laws around here that make watching video illegal for the driver. Radio works in cars because you can enjoy sound and not be unduly distracted.

We've learned that most of this new technology you tout is a dangerous distraction to a driver, who is usually the only occupant of the vehicle.

The other issue I have is that you totally dismiss web radio; you don't even mention it, except to predict "mobile Internet connectivity."

The future of the development of what we now call radio is the Internet because of the bottleneck that OTA radio ownership/programming represents. The only reason anyone would buy an HD-capable radio is access to additional programming; but corporate radio gives us "repurposed" programming from other streams as its HD2 and HD3 content. They still refuse to experiment with new content.

Once web radio with all its problems and limitations hits dashboards as appliances, radio, HD or analog, will never be the same. That's the dashboard war we should be getting ready for; but since "we" are mostly owned by corporations that have no use for anything they can't control, most of "we" will be left behind like we were in the '60s when Grace Slick suddenly boomed out of early FM radio speakers.

Those of us who have never been part of corporate anything can hardly wait for that day.

Gary O. Keener
Keener Technical Services
San Antonio

A VOTE OF NO SUPPORT

I have, since 1957, attended every NAB convention.

My absence from this convention is an expression of "non-support" for the HD Radio system promoted by the NAB, iBiquity, CBS and several of the large radio groups.

You must be aware that the IBOC system promoted by NAB has not been supported by a number of international broadcast organizations. I am ashamed to be associated with the NAB in their promotion of this inferior system.

I am sure that the "IBOC emphasis" has reduced international and exhibitor attendance.

Bernard Wise
President
Energy-Onix Broadcast Equipment Co.
Valatie, N.Y.


FEATURES

The Race for the Dashboard Is On

AM/FM Can No Longer Take Its Position in the Automotive Infotainment Space for Granted

BY BOB STRUBLE

COMMENTARY

Car buyers will see factory installed iTunes Tagging in cars in 2010.

OPINION

Radio 2010: Challenges … and the Solutions

BY KEVIN SHEA

The author is managing director of Loughlin Meghji + Company, a bankruptcy and restructuring advisory firm.

The year 2009 was an inauspicious one for local television broadcasters, marked by several high-profile bankruptcies and other out-of-court restructurings. Ion Media, New Vision, Young Broadcasting, Equity Media, Pappas Telecasting and Freedom Communications all spent the better part of 2009 in bankruptcy court. Other broadcasters are still due for a

COMMENTARY

restructuring (either in-court or out-of-court).

Bankruptcy court may well be even more crowded in 2010. Research conducted by Loughlin Meghji + Company over the past two years, coupled with our deep involvement in the radio and television industry, indicates that 2010 will be the bankruptcy/restructuring year for radio broadcasters.

It was not surprising to the LM+Co team when, at the end of 2009, both Citadel and NextMedia filed for bankruptcy protection — not because of the rumors swirling around the industry since mid-2009, but because the industry as a whole has been hurtling toward insolvency since the onset of the advertising recession in 2007.

That said, at some point advertising spending must rise again; however, it is doubtful that a rebound in advertising spending will be the panacea for the radio industry.

AD RECESSION AND CASH FLOW

There are two separate events that have ushered the radio industry to its current, economically unstable state: first, the ongoing advertising recession and its devastating effect on cash flows; and second, an excess of available advertising airtime.

Total advertising revenues for radio broadcasters will have fallen approximately 20 percent between 2007 and 2009 and are expected to drop by a total of 27 percent over the four-year period ending 2011, according to Zenith Optimedia. In 2009 alone, radio advertising revenue is projected to decline 14 percent, which translates into $2.7 billion less revenue for the industry.

The radio broadcasting industry is characterized by high fixed costs. While this is a very attractive economic characteristic in a rising revenue environment, it is equally or more economically unattractive in a falling revenue environment. LM+Co research reveals that approximately 78 percent of a radio operator's costs are fixed (at least in the near term). This means that for each dollar of revenue lost, a broadcaster loses about 78 cents of cash flow — absent cost-cutting measures.

Radio station managers, CEOs and owners have not been sitting idly by over the past two years. Very much the contrary — they have been actively cutting operating costs and capital expenditures; but in a high fixed-cost business, it is impossible to save one's way to solvency.

Most managers with whom we've spoken over the past year now feel that further cost-cutting will only harm the local feel of the radio franchises, which is a recipe for value destruction.

A bankruptcy and restructuring advisor says radio must stabilize its unit pricing.

It is doubtful that core radio revenues will improve in 2010 (ex political advertising) as the domestic economy struggles to regain its footing. In addition, the historically strongest radio advertisers — automotive, financial services and entertainment/ dining — remain deeply challenged.

It was refreshing to hear Mary Quass, president and CEO of NRG Media, opine at the Dickstein Shapiro panel at the fall NAB Radio Show that the industry is suffering from an excess of advertising capacity.

Our research, based on traffic system data, shows that radio stations are selling between 40 percent and 60 percent of available advertising time with the remainder of the time allocated to sales incentive airtime for bundled pricing, internal promotions, public service announcements, barter, charitable contributions, etc. This "sell through" figure has been fairly stable over the past two to three years in the middle-market stations we evaluated.

On a stand-alone basis, a stable rate of advertising inventory sell-through is good news. In reality, viewed in an industry context, the data reveals that the industry is gripped in a nonsensical — and apparently unstoppable — price war.

Seasonally adjusted, real pricing for radio advertising has fallen by 20 percent to 30 percent over the past two years. The impact of price deterioration is exacerbated by increased competition from, for instance, TV and the Internet. This revenue-per-minute deterioration is ongoing, and getting worse in some markets.

Radio broadcasters have tried to fight back through price competition. In virtually every radio market, excess inventory is leading competitors to lower pricing. Radio operators making pricing decisions based on the actions of their competitors, not on their own seasoned business judgment.

But that's not proven to be a winning strategy. This response, meant to preserve existing inventory sell-through rates (problematic as they are), only worsens a bad situation.

STABILIZATION

So what is the outlook for radio broadcasting in 2010?

Whether radio advertising spending will be up, down or flat in 2010 is not the issue. The advertising recession has already deflated industry cash flows, inflated leverage ratios and left many highly regarded station owners, operators and general managers with more than their share of sleepless nights in 2009. More are to follow in 2010 … unless new strategies are pursued.

The key solution to an industry turnaround is breaking the deflationary price-war cycle. If the war doesn't end soon, local radio will continue to disappear, leaving only jukebox formats. This will create another step-down in value and, therefore, pricing power as well. Sooner or later, as this course is pursued, interest expense will exceed cash flow … and more bankruptcies and restructurings will follow.

The most effective course of action is to draw a line in the sand and stabilize unit pricing. Other solutions could include inventory reduction, either by reducing advertising slots or taking nonperforming stations dark.

Will radio operators have the courage to pursue these solutions? Only time will tell.

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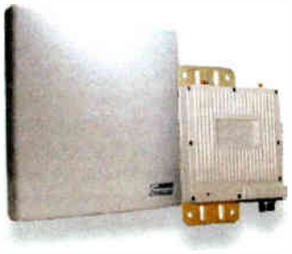

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