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5, 7 or 10 kHz?

The NRSC studies listener perceptions of AM bandwidth changes.

Page 3



Shopping, Not Dropping

Veteran showgoers share tips for surviving NAB

Page 16

Radio World

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The Newspaper for Radio Managers and Engineers

March 28, 2007

Is Pay-for-Play HD-R Content On Horizon?

Conditional Access Is Tested; Reading Services Said to Benefit

by Leslie Stimson

For more than a year, Ibiqity officials have been working with NDS, a technology contractor, to develop a conditional access feature for HD Radio.

With field testing underway at a Florida public station, some proponents here believe conditional access is the next big step for HD Radio and think receivers that handle the capability may be available by the end of the year. Much is still open to make that a reality.

Regarding conditional access, the ability to see certain content on a digital channel is limited to consumers who have appropriately "unlocked" receivers. This technology is envisioned as a new service for stations' multicast channels, not just main digital channels, supporters believe. Several companies involved in test-concept work were part of the project to push multicasting to market.

Other potential uses for conditional access are cited. Stations could sell one-to-one access to audio events or program audio quality for existing reading services for the visually impaired. Stations could offer spectrum for emergency communications by responders. They could sell software for use by car navigation companies or other channels where parents could control access to content.

Access to reading services would still be available to listeners who qualify, backers believe. Whether regulators should allow commercial stations to charge for other content carried within their spectrum has not yet been decided.

See CONDITIONAL, page 6 ▶

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Engineers now have more than 1,200 HD Radio installations under their tool belts, and advanced services are coming. What's ahead? At NAB, tech sessions focus on connectivity, IP, audio solutions, multicasting and engineering management for the 21st century.

In This Issue:

- Broadcast Engineering Conference sessions
- SBE Ennes Workshop & PREC sessions
- Comprehensive booth listings
- Exhibit floor survival tips
- Trade shows & tax write-offs
- What to do after hours

HD Radio
 Multicasting
 Conditional Access

Show coverage starts on page 14

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More NAB
 previews
 next issue.

◆ NEWS WATCH ◆

News Roundup

ARBITRON also released the first “pre-currency” monthly audience estimates for Philadelphia produced by the Portable People Meter ratings service. It said it has taken another step in transitioning that market from diary-based radio ratings to electronic measurement. Programmers will be studying the numbers closely. This is the first release of two monthly “pre-currency” estimates that Arbitron is providing to let subscribing stations and agencies adjust to the differences between PPM- and diary-based ratings.

AM DAYTIMERS: The Audio Division staff of the FCC recalculated permissible pre-sunrise/post-sunset operating powers. The agency withdrew virtually all pre-sunrise/post-sunset authorizations and issued new ones. Many stations were told to use dramatically lower power levels. Daytimers that continue to operate under old authorizations could cause interference, the agency said.

DRE: Digital Radio Express hopes an alliance with a big Chinese consumer electronics maker will help establish its FMeXtra system as a digital radio player globally. DRE and TCL also announced a product development and cooperation

agreement using FMeXtra technology.

LUCINDA HUTTER CAVELL was named by American Women in Radio and Television as Outstanding Female Engineer of the Year, in partnership with SBE.

LOUIS KING of Kintronic Laboratories is NAB’s Radio Engineering Achievement Award recipient. At the University of Missouri he won his first patent, a pulse transformer design. With RCA he helped design the first air-cooled 50 kW AM transmitter and received the patent for the bistable multi-vibrator, the flip-flop circuit used in early computers. A PE

and broadcast consultant, in the early 1950s he started manufacturing AM antenna systems and components; the business grew into Kintronic, where he is chairman.

KCRW(FM) in Santa Monica, Calif., won a grant to help develop its online services. The station received \$600,000 from The Annenberg Foundation “to develop business models to sustain the station’s Webcasting activities and to further its innovative online music service.”

THE FCC is 80 years old. Its predecessor, the Federal Radio Commission, was created when President Calvin Coolidge signed the Radio Act of 1927 on Feb. 23 of that year, according to an online history by Fritz Messere, associate professor of broadcasting and mass communications at State University of New York - Oswego.

“The Act created a five-member commission with each member representing a different geographic region of the country,” he wrote. “Members’ terms overlapped and ran six years. The FRC was given licensing authority for only one year, after which licensing authority was to revert back to the Secretary of Commerce and Labor. The commission’s primary duty was to solve the interference problem which developed after the Radio Act of 1912 became unenforceable.”



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Index

NEWS	
Is Pay-for-Play HD-R Content on Horizon?	1
NewsWatch	2
Public Okay With Lower AM Bandwidth?	3
Merger? Two Words: Get Real	4
HD-R Advances Are Included in PREC Sessions	6
WUSF Testing Conditional Access	8
NAB2007 SPECIAL PREVIEW	
Radio Engineers Think IP, IT, RF for NAB	14
How Is NAB2007 Like Disneyland?	16
Saturday: Ennes Workshop Kicks off SBE Events	20
Sunday: Advanced Services Draw Nearer	22
Monday: STL Bandwidth Requirements	25
Tuesday: Facilities That Work, Safely	28
Wednesday: Surrounded by Emerging Tech	30
Thursday: Radio Technology Advances	35
More Highlights	36
Finding Business Services in Las Vegas	37
Booth listings	38-63
FEATURES	
ARRL Is Robust as It Nears 100	64
Workbench: Nice Weather if You're a Snow Goose	66
Houston Facility Routes WW1 Traffic	68
Fusing the Satellite Radio Babies	70
New Antenna Maximizes Metro Coverage	72
GM JOURNAL	
Trade Shows & Tax Write-Offs	74
New Job Title: Director, Digital Media	75
Stunts Gone Bad: Lessons to Learn	78
How to Win With Free Movie Tickets	80
OPINION	
Radio Industry in Moving Waters	84
Should FCC Adopt NFL's Rooney Rule?	85
Reader's Forum	84-86
Arrested Development?	86

Public Okay With Lower AM Bandwidth?

NRSC Studies Listener Perceptions Of AM Bandwidth Changes for 30 Receivers

Over the past two years, the AM Broadcasting Subcommittee of the National Radio Systems Committee has been studying the effect of reducing bandwidth on AM transmission systems, trying to determine answers to several questions:

- What is the current state of AM receivers in the general marketplace?
- Do today's analog transmission standards and limitations make the best use of the AM allocations?
- What does the listener perceive if AM transmission bandwidth is changed?
- Can we make changes that will reduce AM tune-out?

The AM Study Task Group, led by Omnia President Frank Foti and NPR Labs Senior Technologist John Kean, studied all of these questions and more. The results of that study are summarized here and the full report is available on the NRSC Web site at www.nrscstandards.org/AMB/default.asp.

The AM Broadcasting Subcommittee is now turning its attention toward the review and possible modification of the AM transmission and reception standards known as NRSC-1, -2 and -3. We request that interested persons join us in that task.

NRSC-1, -2 and -3 cover, respectively, AM broadcast preemphasis/deemphasis and audio transmission bandwidth; emission limitation for AM transmission; and audio bandwidth and dis-

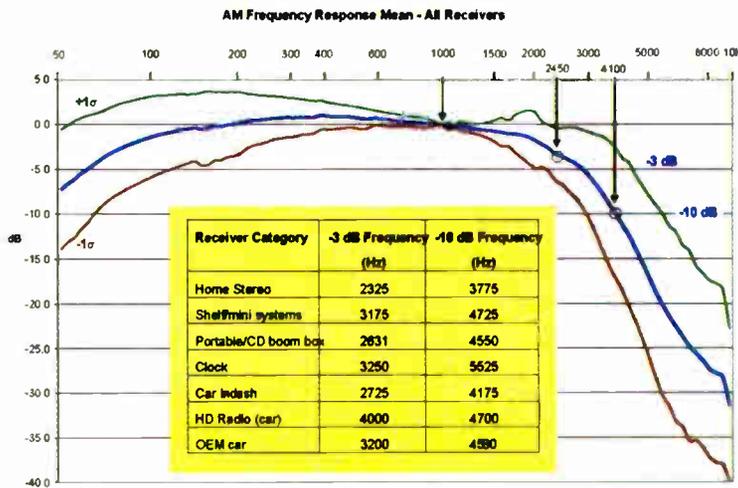


Fig. 1: AM Frequency Response Mean For All Measured Receivers

Group to determine whether consumers would reliably perceive the audio quality differences of AM transmissions at various bandwidths, recorded through commercially available receivers, and whether these perceptions would affect consumers' continued listening behavior. The AMSTG subsequently conducted a consumer subjective evaluation study of audio obtained from three prototypical receivers, as well as an objective evaluation of audio performance of a large number of current consumer analog AM receivers, including OEM and after-market car radios, shelf mini-systems, boom boxes, table radios and portables.

Before considering potential changes to the NRSC-1, -2, and -3 standards, the AMB is sharing the results of the AMSTG

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tortion recommendations for AM receivers.

Meetings are held via telephone and are open to any interested parties except the press. The AM Broadcasting subcommittee requests and encourages your participation in this important matter.

— Jeff Littlejohn

The author is co-chair of the NRSC AMB Subcommittee and executive vice president of distribution development for Clear Channel Radio. This is a committee summary of its report.

Background

The AM Broadcasting Subcommittee of the NRSC was formed in 2004 to maintain NRSC standards relating to analog AM broadcasting. The subcommittee is reviewing three standards: NRSC-1, NRSC-2 and NRSC-3. The subcommittee can reaffirm, modify or retire these standards.

Members noted that some broadcasters have already reduced the bandwidth of their analog AM signals from the 10 kHz specified by the NRSC standards to 5-6 kHz, in an effort to reduce the interference in the band, and with the understanding that most consumer receivers are band-limited to 5 kHz or less. The group considered a proposal that the NRSC consider reducing the bandwidth specification in NRSC-1, -2, and -3 to something less than 10 kHz, but the subcommittee agreed that before such an action could be considered, it should study analog AM receivers, characterizing, among other things, receiver bandwidth, and consumer reaction to reduced bandwidth.

In late 2004 the Subcommittee formed the AM Study Task

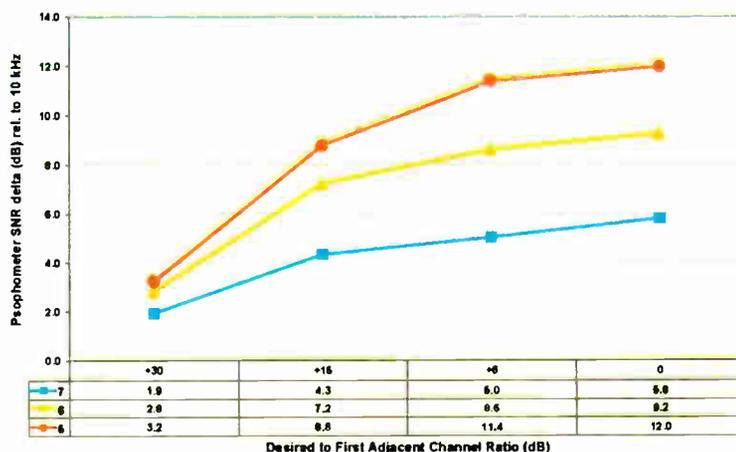


Fig. 2: Effect of Transmission Bandwidth on Received SNR

study and is seeking input from all interested parties. The following summarizes the methodology used and findings obtained from the AMSTG study.

AM receiver measurements

NPR Labs completed objective measurements of 30 consumer analog AM receivers in late 2005 with support from NRSC co-sponsors CEA and NAB. These laboratory measurements collected data in two areas:

- Baseline audio performance of the receivers, including frequency response, harmonic distortion, intermodulation distortion and signal-to-noise ratio;

See AM, page 5 ▶

Merger? Two Words: Get Real

The proposed satellite merger is an absurd idea and a waste of regulators' time.

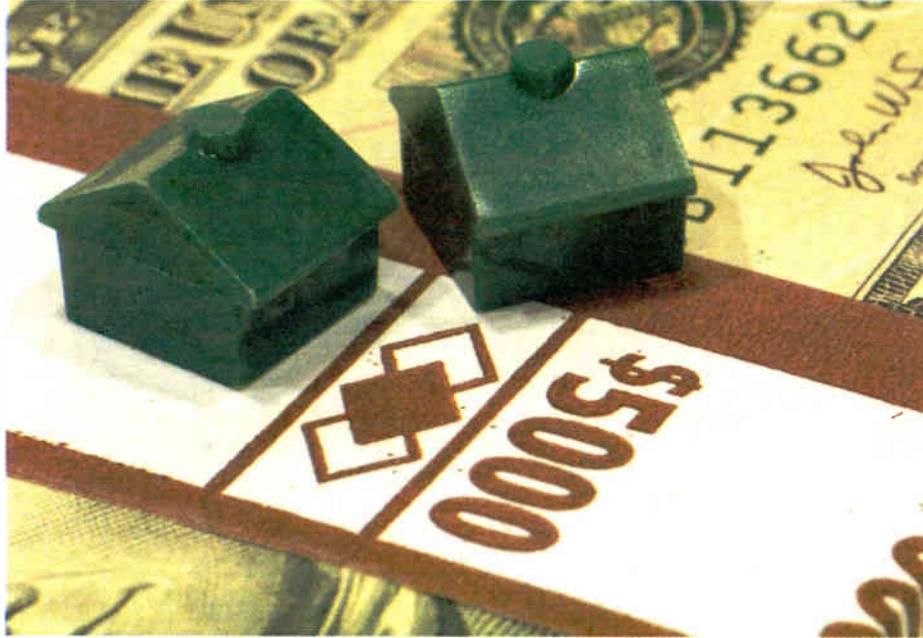
My reaction is not the jerking knee of a traditional radio guy protecting radio's vested interests. When satellite services were proposed, I wrote here that they should be approved, contrary to what most large broadcasters were then arguing, in part because I felt that competition would benefit traditional radio by pushing our industry to respond and innovate (as in fact it has). This is part of the FCC's job, to facilitate new and better services for consumers. I accepted the idea, although I was leery of the artificial limitation of allowing only two companies.

Satellite radio operators knew what they were getting into from the day they paid for and accepted these huge chunks of spectrum. FCC rules specified that the companies would have to remain separate in perpetuity. Regulators who made those rules knew exactly what they were doing. In fact, Sirius and XM enjoyed a special benefit, knowing in advance that each would only have a *single* direct competitor — at least for a long time. They were, and are, protected from real competition, which is a lot nicer deal than most communications companies, even startups, get when they enter a market.

That market has not changed substantially, so there's no justification for relief due to shifting conditions beyond the operators' control. Yes, the iPod has entered the American consciousness, but casting the competitive environment for satellite radio as being that broad is a slippery slope for regulators.

Meanwhile, it's not as though satellite's customer base hasn't been growing. Signing up nearly 15 million paying customers in five years is an impressive record, especially considering consumers' inherent initial resistance to paying for a service that traditionally has been provided for free.

The operators' plight is largely of their own making. I felt from the start that satellite radio was a no-brainer, a



sure-fire successful business concept — "Talk to any NASCAR or baseball fan," I argued, "and ask if they would pay \$10 or \$15 a month to have full-time racing radio or ballgames" — but my caveat was that the services would succeed *if* owners could keep costs under control.

Were it not for unwise content acquisition deals and high operating expenses, both companies would be well into profitability, and the current call for bailout-by-merger would never have had to be considered by a federal government that has better things to think about.

Some critics have pointed out that *terrestrial* radio has petitioned successfully for regulatory relief allowing consolidation and is asking for more. True, and those changes arguably have had a positive effect on terrestrial radio's fiscal condition. But there is little evidence that those moves provided significant benefit to U.S. consumers; neither would a similar move in satellite radio.

Anyway, even at its most extreme, terrestrial consolidation stops far short of allowing anything like a monopoly in any local market. The FCC took great pains to steer clear of such conditions when it amended its ownership rules in 1996, and will likely continue to do so if

further changes are enacted.

By the way, if we accept the satellite argument about competition with other media, why not accept the argument for terrestrial? Shouldn't we just eliminate *all* ownership restrictions within radio? After all, broadcasters essentially are in the same position relative to iPods and

Regulators who made those rules knew exactly what they were doing.

MP3s as XM and Sirius are; and the presence of an even bigger satellite competitor will only make that more true. Why not sound the cry, "Give all of radio regulatory relief!" RW does not advocate this path; but by approving a merger, regulators might be handing radio's biggest owners a powerful precedent for easing their own harnesses dramatically.

Saying no to the merger is also a matter of fairness. Satellite radio operators won access to their priceless spectrum, and were protected from full competi-

From the Editor



Paul J. McLane

tion in that space, by agreeing to certain assumptions and limitations. Other companies vied for that spectrum. Why not let them back into the game if XM and Sirius can't cut it under the conditions in place when they accepted their licenses?

And while we're at it, if regulators do allow XM and Sirius to merge, why not hand back half of that spectrum and let someone else use it? If we agree to toss our original assumptions and limitations, put *all* of them back on the table.

I was chatting about these questions with our Contributing Editor Skip Pizzi. He and I both feel cautiously confident that the FCC, the Justice Department or

both will block this merger because allowing a single licensee for an entire service with a national footprint crosses even the most business-friendly line of the current administration. This would be a proper judgment, one that would uphold the original spirit of the allocations.

Competition is good for the U.S. consumer, for terrestrial radio and yes, even for satellite radio in the long term. If satellite radio can't exist in even a minimally competitive environment, perhaps it shouldn't exist at all. 🌐

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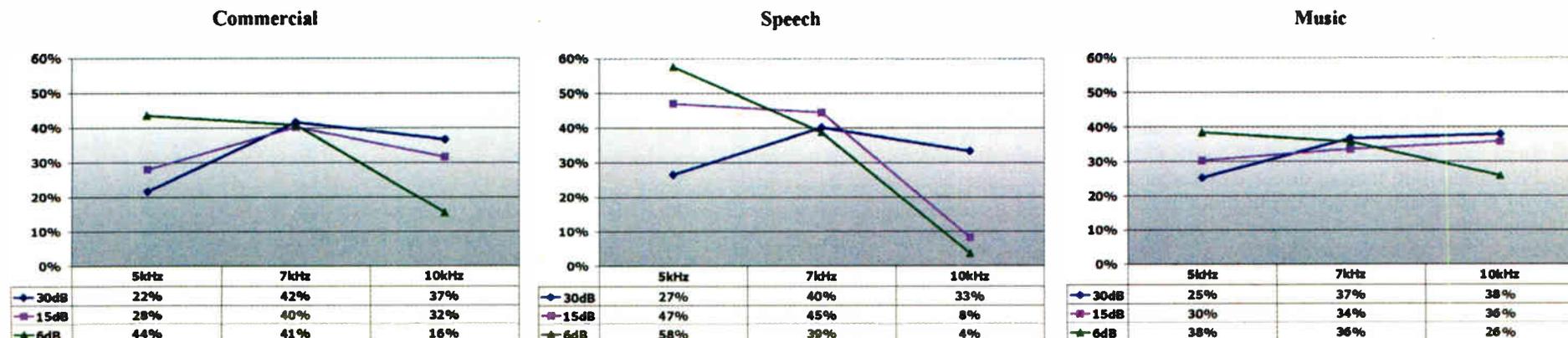


Fig. 3: Percentages of listeners who picked one bandwidth over another, by genre, with no first-adjacent channel interference (30 dB), moderate first-adjacent channel interference (15 dB) and heavy first-adjacent channel interference (6 dB). A chart of the sports genre is not shown.

AM

► Continued from page 3

- Objective noise level differences with signal interference at several audio transmission bandwidths (i.e., 5, 6, and 7 kHz), relative to the current transmission bandwidth standard of 10 kHz. Weighted quasi-peak noise measurements were taken to approximate the response of human hearing to audible noise. A first-adjacent channel (± 10 kHz) interfering signal was modulated with a pulsed frequency-shaped noise to simulate the characteristics of program audio.

These objective measurements established that the majority of current analog AM receivers have audio bandwidths of less than 5 kHz. In fact, with only a few exceptions, the frequency response of individual receivers falls off above 1 or 2 kHz.

Since consumers seem to be most critical of 'noise' and seem to tolerate more constrained bandwidth when they receive a clean signal, it's likely that lower bandwidths will satisfy consumers in most conditions.

As shown in Fig. 1, the combined frequency response of all receivers through the test bed (the middle curve, in blue) was -3 dB at 2450 Hz and -10 dB at 4100 Hz.

The overall variation in audio bandwidths was wide, as shown by the standard deviation for the entire test population ($+1\sigma$ in green and -1σ in brown): at 4100 Hz, the first-order standard deviation was approximately -2.6 dB and -17.2 dB, a range of 14.6 dB. The table inset in Fig. 1 lists the -3 dB and -10 dB bandwidths for the receivers by category.

Further, each receiver was evaluated for change in noise at the audio output with first-adjacent channel interference using audio transmission bandwidths of 5, 6, 7 and 10 kHz at desired-to-undesired RF signal ratios of 30, 15, 6 and 0 dB. The effect of transmission bandwidth on weighted quasi-peak SNR for the combined receivers is summarized in the Fig. 2, showing that reduced transmission bandwidth offers SNR improvements of up to 12 dB, relative to 10 kHz bandwidth, with first-adjacent channel

interference.

Based on the findings of the receiver measurements, Sheffield Audio Consulting and NPR Labs conducted subjective testing between February and May 2006, using audio recorded from three of the tested receivers. As a practical matter the number of bandwidths to be tested has to be limited. The AMSTG decided to use three bandwidths: 10 kHz, the current NRSC standard bandwidth and maximum bandwidth allowed under current FCC rules; 5 kHz, which represents the maximum bandwidth where adjacent channels do not overlap; and an intermediate bandwidth.

Industry, consumer testing

To establish this intermediate bandwidth, NPR Labs conducted a "phase 1" listening test that included 18 broadcast industry representatives and determined that 7 kHz was the best intermediate bandwidth to be included in the consumer test.

In the "phase 2" listening test, consumers judged (a) which transmission

bandwidth, 5 kHz, 7 kHz or 10 kHz, had the best quality, (b) the magnitude of the difference between the quality experienced using these bandwidths, and (c) whether they would continue to listen to the audio, given the quality of each of the samples. Audio samples used in this test included those impaired by first-adjacent channel interference in addition to unimpaired reception.

Audio source material consisted of material supplied by NRSC music test samples and NPR speech samples and Greater Media sportscast and commercials.

Forty-four listeners, distributed between ages 19 and 71, participated in the consumer test. Data from 40 qualified listeners — 20 female and 20 male — was collected.

From the pool of 30 receivers that were objectively tested, NPR Labs chose three from which to record audio samples: the JVC KS-FX490 car in-dash cassette (median-bandwidth); the Panasonic CQ-CB9900U in-dash CD/HD Radio (80th percentile bandwidth) and the Aiwa JAX-S77 portable

boom box (20th percentile bandwidth).

An A/B comparison was used to obtain listener judgments. Test participants listened to seven different samples, including female and male speech, voice-over (commercial), a sportscast, and rock, country and classical music.

Over the course of the entire test, participants listened to a total of 189 sample pairs. After listening to each sample pair, consumers judged which sample they thought had better quality, how big the quality difference between samples was and whether they would continue to listen to the audio for either or both of the samples.

The graphs in Fig. 3 show the percentage of participants who picked one bandwidth over another, such as 5 kHz over 10 kHz, at various D/U signal conditions, separated by genre and aggregated for the three receiver bandwidths

tested: 20th percentile, median and 80th percentile bandwidth.

Results

Notice in Fig. 3 that the findings for "speech" follow a significantly different pattern than findings for all other genres. Participants clearly favored 5 kHz and 7 kHz in speech, while in music and commercials preferences were not as clearly articulated. For sportscasts, participants demonstrated a slight preference for higher bandwidths under less impaired conditions.

Consumer subjective test results suggest the following:

- For music, commercials and sportscasts, little difference was heard between 7 kHz and 10 kHz bandwidths, regardless of first-adjacent channel

See AM, page 12 ►

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Conditional

► Continued from page 1

not been widely debated and the question could be contentious.

Proponents said they've discussed whether the FCC would need to approve the use of a multicast channel that involves charging the listener, but don't agree on whether it would be controversial.

Secure content

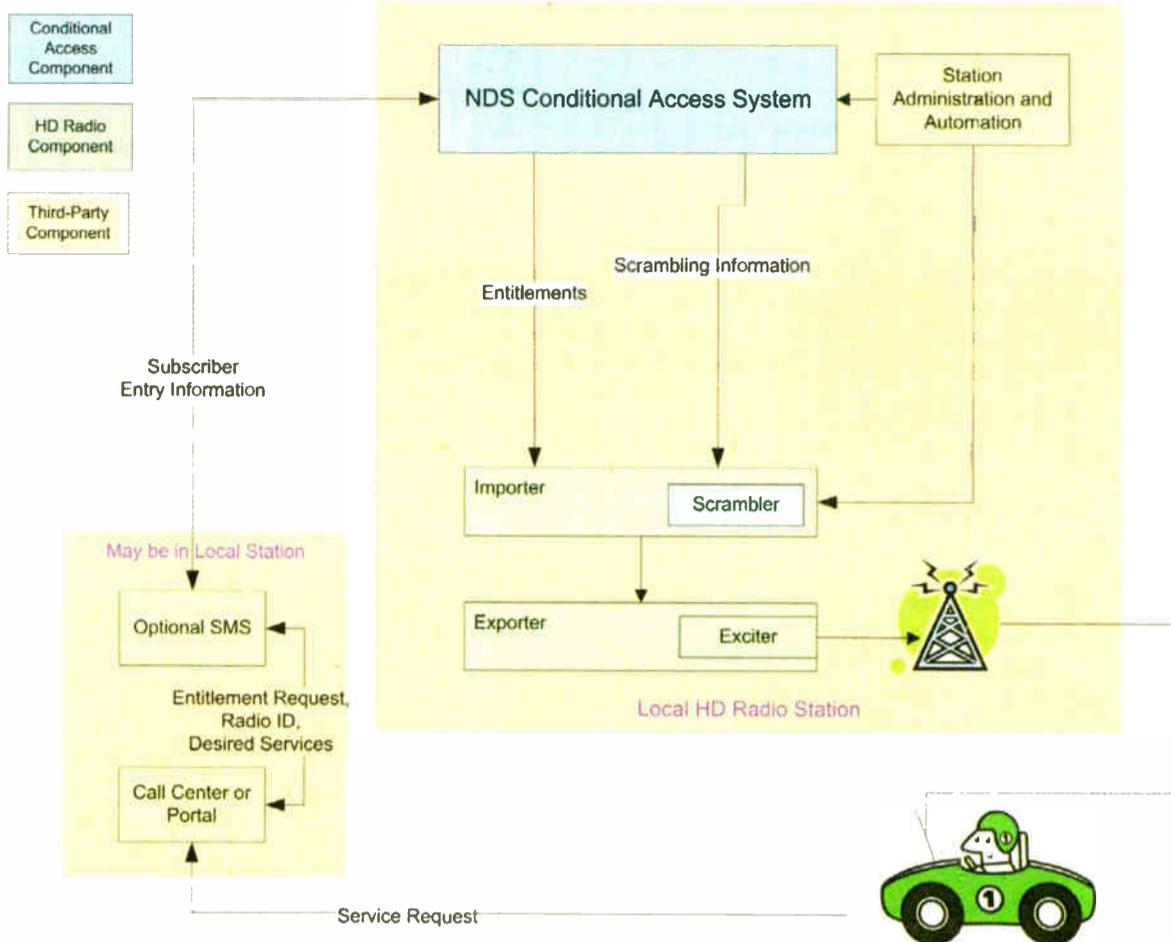
Several years ago, the International Association of Audio Information Services approached Ibiquity about ways to incorporate radio reading services onto the IBOC platform. Ibiquity, in fact, had been considering such a use and built the necessary "hooks" into its technology, several proponents said.

Radio World reported last summer that Ibiquity had contracted with NDS to develop conditional access capability for HD Radio. This is NDS' first foray into radio. The company specializes in secure content technology "any time, anywhere, for any device," according to its Web site.

Based in the United Kingdom, it developed conditional access technology for cable and satellite TV and has been deploying such systems since 1987; its clients have roughly 70 million subscribers. DirecTV in the United States and subscription television service BSkyB in the United Kingdom are notable customers, according to NDS Director of Data Applications Delivery Tom Rucktenwald.

While NDS and Ibiquity officials have been talking for roughly two years, they said development of a conditional access feature for HD Radio has been a priority for the last 12 months.

NDS will offer its system for purchase at the NAB2007 convention. The conditional access technology for HD Radio is considered NDS intellectual property, Rucktenwald said. It will provide enabling technolo-



How conditional access works as depicted in a graphic from NDS.

gy for the Importer to Ibiquity and equipment manufacturers for free, he said; that will be included in the next Importer release.

"We have agreements from NDS to make the technology available in perpetuity at fair, reasonable costs," said

D'Angelo. "We don't own their IP. The agreement allows us to commercialize their technology as needed to support this service."

The companies declined to estimate how much the technology would cost a typical station to implement. Product pricing had not been announced in early March.

As part of the development/commercialization process, Harris and Broadcast Electronics plan separate field tests of the technology (see story, page 10). Harris tests were planned to begin in March and continue through part of May; BE's were to begin after NAB2007.

NDS and Ibiquity said they are prepared to support any partners interested in similar tests and that software would be made available to them. In addition to Harris and BE, licensed vendors of Ibiquity transmission hardware include Nautel, Continental, Continental Lensa and R.V.R. Elettronica. The technology can be used with HD Radio worldwide, said Ibiquity Vice President of Advanced Services Joe D'Angelo.

What it is

Conditional access requires scrambling and descrambling a broadcast signal, then informing the receiver that it is capable of getting the programming.

"If I'm not entitled, I don't get the programming."

See CONDITIONAL, page 10 ►

HD-R Advances Are Included in PREC Sessions

Conditional access is one of several topics to be discussed at this year's Public Radio Engineering Conference, jointly presented by NPR Labs and the Association of Public Radio Engineers.



NPR Labs engineers will likely reference the issue when they discuss supplementary digital audio channels for reading services. A presentation on the WUSF tests was planned for the agenda.

Topics included in a draft agenda for the April 12-13 meetings include joint sessions with PBS on IT/Network security for broadcast, disaster preparedness and tower safety. Radio-specific sessions are planned on digital audio test and measurement, HD-R translators, equipment replacement and updates on the HD Radio technology roadmap, recent facility projects and the Public Radio Satellite System's ContentDepot.

Registration is open for the event at the MGM Grand in Las Vegas. To sign up, download the registration form at www.nprlabs.org/apre.

PREC registration includes admission to the SBE Ennes Workshop on Saturday, April 14. No NAB credentials are required; let NPR Labs know on the registration form that you plan to attend.

NPR Labs/APRE officials said they secured a discounted NAB registration rate for PREC attendees who plan to attend the full NAB2007 conference. Check the appropriate box on the registration form and include the additional amount with your PREC registration fees.

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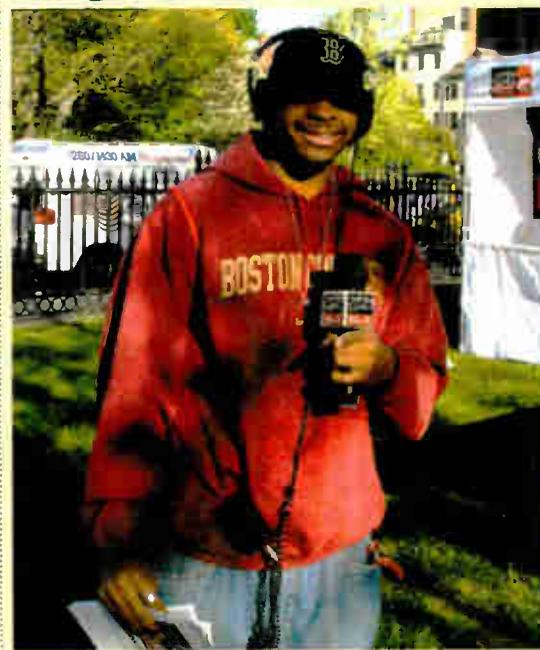
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➔ JAMN 94.5—Walk for Hunger



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World Radio History

WUSF Testing Conditional Access

by Leslie Stimson

WUSF(FM) in Tampa, a long-time IBOC test bed and the first public station to go IBOC, is the site of conditional access field testing for HD Radio this spring (see related story, page 1).

Tests were to begin March 19 and continue through early May, according to Tom Dollenmayer, station manager for radio and TV, WUSF Public Broadcasting.

The University of South Florida licensee holds a Special Temporary Authority to air an HD3 channel. It will transmit the conditional access test programming on that channel.

WUSF airs news programming on its HD2 channel and news and classical music on its main channel.

The station would use the extended hybrid mode for the test and continue to operate with a throughput rate of 48 kilobits per second on its main HD and HD2 channels.

Representatives from Harris, Ibiqity, NDS and NPR Labs plan to be on hand for the testing. NPR and Harris were two of the companies, along with Kenwood, in the original Tomorrow Radio project that helped push the radio industry to awareness of multicasting.

For the WUSF tests, Sangean HD Radio receivers will be used, though NDS says it's working with multiple receiver manufacturers in developing the technology. Sangean HD Radio tuners are being



HD SUV: The WUSF VW Touareg sports an HD Radio wrap.

used because they are close to the Ibiqity reference design, said Joe D'Angelo, Ibiqity vice president, Advanced Services.

The International Association of Audio Information Services will provide reading-service material for the WUSF test, according to Hal Kneller, senior manager of public radio initiatives for Harris. Kneller also sits on the IAAIS board.

WUSF expected to use a throughput rate of 25 kbps on the extended hybrid carrier for the HD3 channel, said Kneller.

NDS is supplying the hardware to support its conditional access software. The

units de-scramble the signal and allow a station to turn the feature on and off, said Tom Rucktenwald, director of data applications delivery for NDS.

Both units are installed ahead of the Importer in the air chain of a Gen 2 IBOC station.

Since WUSF went IBOC so early, it does not have the Gen 2 equipment configuration, with both the Importer and the Exporter located at the studio. For this test, Harris is loaning WUSF an Importer with the updated Ibiqity software. It, along with the Exporter, will be in the studio.

The station is using a T-1 telephone line

as its studio-transmitter link to transmit its multicast and main HD-R audio.

The tuners will be modified for the test so that the signals that are scrambled can be heard, said Kneller.

Addressing the receivers

During the tests, "We will be looking at all aspects of broadcasting and reception," said Rucktenwald. "In terms of entitlement, we will have the capability to individually address every radio and exercise them," meaning turning their conditional access capability on and off, he said.

The tests will be videotaped and audio-recorded so participants can use clips during Broadcast Engineering Conference presentations at NAB and demos on the show floor.

"We have to give the equipment back to Ibiqity, Harris and NDS at the end of May so we can put our HD2 back on the air as is without changing our configuration," Dollenmayer said.

He added he's curious to see how long the system takes to set up; he's been told it takes about an hour.

Before the test ends, participants hope to demo the conditional access feature for the IAAIS board, tentatively planned for May 9. The next day, the system is to be demoed for members of Florida SBE chapters, giving those who don't make it to the NAB a chance to see the system.

Broadcast Electronics plans conditional access field tests with some Emmis stations after NAB, according to spokesman Neil Glassman. He didn't specify the stations, saying plans were in flux before the show. 

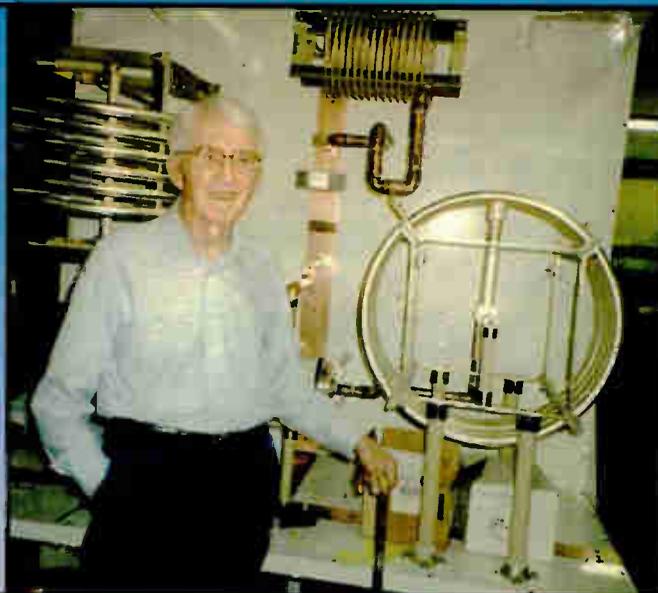
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World Radio History

Conditional

► Continued from page 6

because it's scrambled and my box is looking at it and saying, 'How am I going to figure this out?'" said Rucktenwald. One or more multicast channels can be scrambled, or "decrypted."

Stations that wish to use conditional access typically would need two pieces of NDS hardware to support the software, mating units called the Initiator and Protector.

The Initiator is something of an administrative control unit; the Protector scrambles the signal, Rucktenwald said. Both are installed ahead of the Importer in the air chain of a station with an HD Radio Importer of second generation or

later. The Importer would require a software upgrade to accommodate conditional access.

Each station involved needs a Protector to scramble the signal. A standalone station would have one Protector and one Initiator. A group owner might choose to place an Initiator at headquarters, controlling Protectors at each station, although it also could opt to install both units at all stations and use another device to control them, Rucktenwald said. He declined to provide further details prior to the NAB convention.

Radio is harder than TV

Designing conditional access technology for radio was challenging, D'Angelo said, because radio is a "distributed environment." In pay television, usually one service provider has nationwide reach and

can control all aspects of authorizing receivers.

Satellite radio companies also use such a system, though they contract it to third parties.

In terrestrial radio, the conditional access system would need to serve radio groups, standalone stations and program syndicators.

"This is why we're doing we're doing these pilots. We want to get it in the field and make sure all the backend systems hang together and that the transmission performs as expected," said D'Angelo. They also want to make sure the entitlements are delivered in a reasonable amount of time.

How stations would "permission" receivers and who would be involved in that process are among details to be worked out if conditional access flourish-

es. The mechanics, however, are in place. To present content to the user, a receiver would be "entitled" or "permissioned" via its electronic serial number to de-scramble the signal. Satellite radio receivers work in much the same way. The NDS system incorporates this function.

"With a PC networked to the NDS box, you will be able to turn the receivers on and off," said Hal Kneller, senior manager of public radio initiatives for Harris. Using a personal computer loaded with NDS software, a station can turn its conditional access capability on and off over an Internet browser window, Kneller said.

Possible uses

Proponents have bandied about potential uses for conditional access. Most often mentioned is the migration of radio reading services from FM subcarriers onto digital multicast channels. Presumably proponents will pitch the public service aspects of conditional access to the FCC when the concept is discussed with the agency.

The conditional access technology would enable reading services to maintain a copyright exemption for material volunteers read over the air because only qualified visually impaired or hard-of-hearing people could gain access to the programming.

Equally important, with conditional access, reading service users could listen on next-generation HD Radios instead of the specialized SCA-capable units they use now. Current HD Radios could not be retrofitted for this purpose, D'Angelo said.

In order to allow receiver makers to add conditional access to radios in the future, Ibiquity needs to add a security chip into its reference design. The chip is being finalized.

"We will have a reference module that has hardware designed into it," said D'Angelo. "We will make that available to receiver partners."

A number of receiver makers have expressed interest in making the new radios, he said. "In the future, we will work with our chip partners to remove the need for that external chip, and just make this standard functionality on all HD-R chips."

D'Angelo said the difference in cost would be nominal and he doesn't believe it would affect the retail price.

Sources said if chipmakers balk at the additional cost, receiver manufacturers might hold off until there's strong demand for the feature.

The back story

Reading services long have sought less expensive, more efficient ways of reaching their users. By being included in the IBOC platform, they would no longer have to buy and deliver specialized SCA receivers.

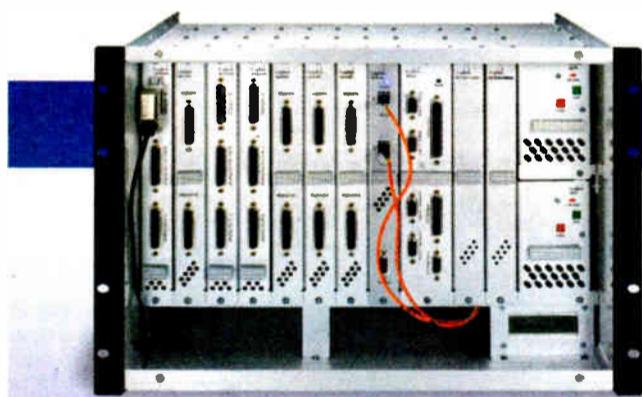
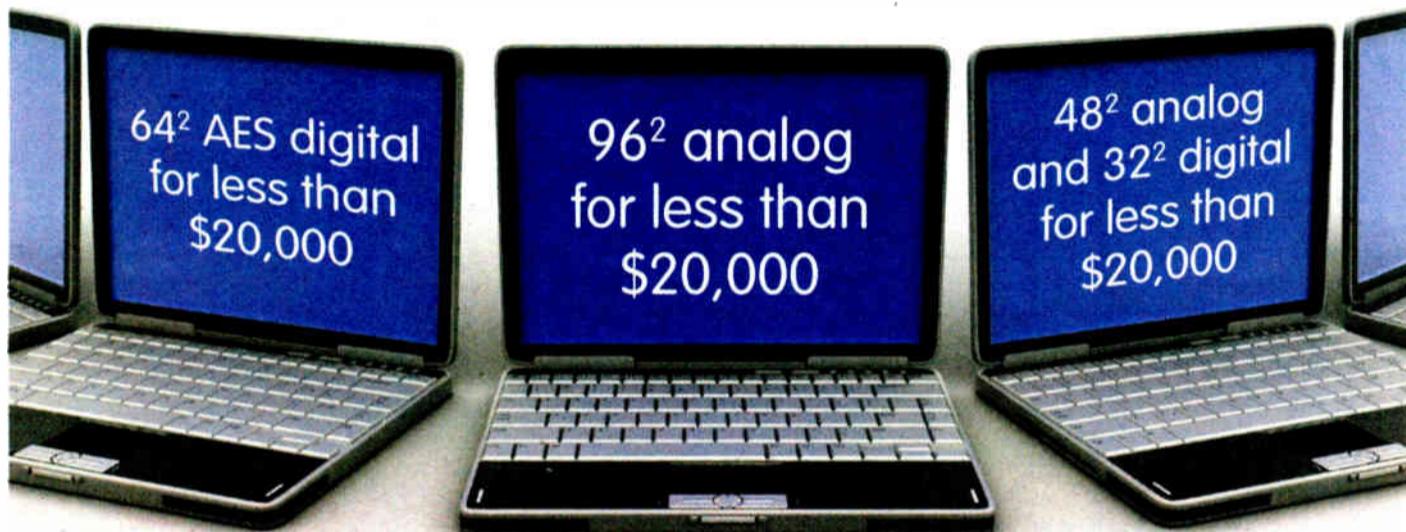
"To Ibiquity's credit they put everyone together to see how quickly they could do something" when reading services asked for this functionality, said Mike Starling, NPR chief technology officer and executive director of NPR Labs. "Reading services serve about 1 million handicapped users." Starling was honored by IAAIS in 2004 in part for representing its cause to regulatory bodies and ensuring the inclusion of reading services in digital radio services.

He mentioned another possible use of conditional access: Commercial stations could develop a "safe harbor" from indecency.

"I think pay channels are farther down the road. I think what would really happen is stations would be able to restrict channels that have content inappropriate to kids

See CONDITIONAL, page 12 ►

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AM

► Continued from page 5

interference conditions. For speech, which does not mask noise and interference, larger differences were perceived, based on impairment conditions;

- In unimpaired or moderately impaired conditions as determined by the desired-to-undesired signal ratio, people tended to prefer higher bandwidths to lower bandwidths. However, 7 kHz and 10 kHz bandwidths had equal preference;
- With speech in moderate to heavy impairment conditions, participants

preferred lower bandwidths, 5 kHz and 7 kHz, to higher bandwidths, despite a mutual reduction in transmission bandwidth on the desired channel.

In the majority of listening conditions, consumers preferred either 5 kHz or 7 kHz, and often reported that 7 kHz was equivalent to 10 kHz in unimpaired or moderately impaired conditions. These preferences were articulated most strongly in speech conditions, where noise from interference affected listeners the most.

In extrapolating this consumer data to general public listening, it is important to note that discerning background noise is easiest in speech conditions, and thus the speech testing represent the most critical results. This is impor-

tant for two reasons: (a) the majority of AM programming includes speech, and (b) consumers will hear more noise in any music, sports, and commercials that are qualitatively less "dense" than the programmatic material included in this test.

Since consumers seem to be most critical of "noise" and seem to tolerate more constrained bandwidth when they receive a clean signal, it's likely that lower bandwidths will satisfy consumers in most conditions.

The AMB Subcommittee welcomes additional participation and comments from interested parties. Read the full report at: www.nrsstandards.org/AMB/default.asp.

RW welcomes other points of view. Write to radioworld@imaspub.com.

Conditional

► Continued from page 10

... like a channel blocker," implying that racy content could be moved to a multicast channel with appropriate channel-blocking capability.

Or, Starling said, a noncom station could create a "pledge-free" channel whereby a generous noncom donor could access programming without listening to underwriting pitches at pledge time.

Tom Dollenmayer is station manager for radio and TV at WUSF Public Broadcasting in Tampa, the site of the first field tests. He noted the "pledge-free" concept and said executives at his station are discussing how to program a conditional access multicast channel the other 50 weeks of the year.

Another use, according to D'Angelo of Ibiqity: upgrading certain operational or consumer electronics systems for a fleet of cars. He cited the example of a navigation system.

Currently, when maps for many navigation systems change, it takes about 18 months to complete the updates and distribute them on DVDs at auto dealerships. That process could be simplified and faster using HD-R to transmit data directly to the permissible radios in the dash, D'Angelo said.

Yet another possibility involves first responders. "During an emergency, you may want to take over part of a multicast service and broadcast information only to first responders. This is something we think is infinitely doable."

At least one source said the technology could bring Howard Stern back to terrestrial radio, because stations could create two versions of the same content, a "smutty Howard" channel and a "clean Howard" channel.

Broadcasters would have flexibility in how they use the feature; a given channel could carry programming that is conditionally accessible at some times and free to air at others, Rucktenwald said.

Will FCC question it?

Beyond reading services, how might stations use conditional access without crossing regulators?

Early opinions were mixed on this question. Several sources pointed to the precedent of terrestrial TV stations offering pay services on some of their multiple digital channels.

Others feel the issue does raise policy questions, given the high value of spectrum. "The question is how do you tax that," one source said.

Ibiqity Senior Vice President/General Counsel Al Shuldiner said the company hasn't discussed the concept with the commission because the technology is still under development but that it has regular discussions with FCC staff.

"I'm sure when conditional access becomes available, we'll be available to come up with the right solutions. I'm not sure what concerns they'll have ... (however) we'll be ready to help work through that with them."

D'Angelo said the companies hope to complete field studies and have software and hardware available for transmission and receiver makers by August. If that timeframe holds, by the end of the year stations could be using conditional access, and receivers would be available.

Yet to be undetermined was whether Ibiqity would charge for the necessary Importer software upgrades.

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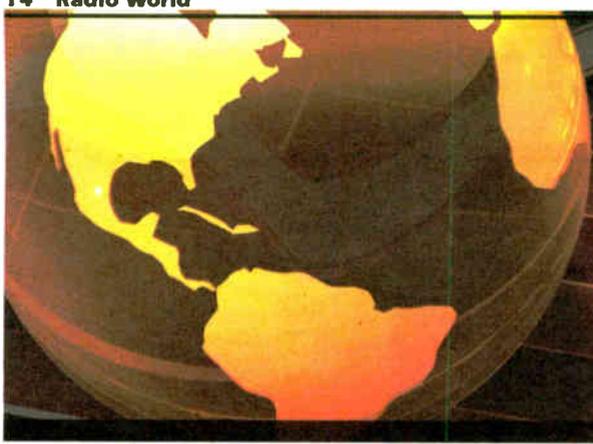
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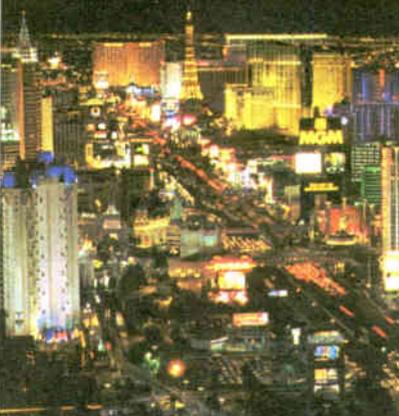
About This Section

The annual pilgrimage to Las Vegas is approaching. Some people call NAB "the World Series for radio engineers." RW has the industry's most comprehensive coverage.

This special section of Radio World previews the technical sessions and content of the show. It includes:

- Exhibit floor survival tips
- SBE Ennes Workshop sessions
- Broadcast Engineering Conference sessions
- "Sure bets" for what to do after hours
- Comprehensive booth listings

Look for other convention-related stories elsewhere in the issue.



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In upcoming issues we'll preview the Radio Management and Broadcast, Regulatory and Legislative Conferences. We'll meet the recipient of the NAB Radio Engineering Achievement Award. Our April supplement offers a Product Preview Guide to take with you to Vegas. Online subscribers also are receiving our weekly NAB Sneak Peeks of new product news.

During the show RW will present breaking and product news online at radioworld.com and in our weekly RW NewsBytes. We'll report the news afterwards in words and pictures, we'll announce the winners of Radio World's "Cool Stuff" Award and we'll wrap up the spring show season with a new products special report in June.

Let us know how we can improve our NAB convention coverage. Write to radioworld@imaspub.com.

Radio Engineers Think IP, IT, RF for NAB

Digital Planning and Purchases Are on The Minds of Technical Attendees

by Alan Carter

IT convergence, data management, systems integration, IP applications.

Not new issues for radio engineers.

But the subjects are front and center as they prepare for NAB2007 and as they evaluate and implement new operations for stations in the digital broadcasting era while still broadcasting in the day-to-day reality of analog.

Transformation stage

"The industry is in a transformation stage," said Michael Gay, national project manager of HD Radio and IT for Cumulus Media Inc. "There are very few opportunities to build from the ground up. More often than not, you are shoehorning the new into the old and dealing with how you can tackle those issues."

Gay's comments reflect a general trend in how radio engineers are thinking and planning as the NAB spring show approaches.

Cumulus has been "full speed ahead" at implementing HD Radio for the last two years, he said. With almost 350 stations in the group, approximately 50 are broadcasting HD, and he said 30 are planned to go online by the end of the year. Gay said all the regional engineers probably will be at NAB.

"I want to see how products that we saw last year, which were in the development stage, have come to fruition," Gay said. "I also want to see what's new."

Consoles, digital routers, IT gear — the list goes on for Gay.

"I'm always looking for something that is going to make things more efficient," he said. "You have to pick the right products to make things easier."

Milford Smith, vice president of Radio Engineering for Greater Media Inc., said NAB2007 is "terribly important" from a technical perspective, with the accelerated implementation of HD Radio and all that is involved.

"I look upon the show as more critical than ever on the technical side," he added.

Multicasting, VoIP, Web streaming

Issues Smith cites include multicasting with multiple channels, audio over IP, data applications with the potential for new revenue opportunities and Web site streaming.

"This is all pretty exciting," he said.

Smith, past chairman of the NAB engineering conference and engineering advisory committees, will take on the role of presenter in a radio management session when he talks equipment in "Building an HD Station: From Studio to the Bank." Smith

also is chairman of the NAB Digital Radio Committee and senior co-chairman of the National Radio Systems Committee DAB subcommittee.

Smith said the show is an opportunity for owners and managers from all

A key issue ... in implementing HD is how to get your data streams to the tower site.

— Steve Fluker



Michael Gay, national project manager of HD Radio and IT for Cumulus Media, says our industry is in a transformation stage.



Clark Dixon of Clear Channel in the mixing room at KMOD(FM) in Tulsa, with, from left, Sherry Borg, Cristi McLellend and Liz Chandler.

sizes of stations and ownership situations to learn more about digital.

"HD Radio can be intimidating," Smith said. "What they've got to do and how much ... These choices aren't always obvious." He's also moderating the session "STL Bandwidth Requirements for Radio."

The engineering and management sessions reflect technology developments that will be apparent on the exhibit floor.

Topics include audio over IP, RDS and the new RT+ that allows for better text support of artists and titles. Then there is the infrastructure required and the workflow setup; these are covered too.

Steve Fluker, director of engineering for

six Cox Radio stations in Orlando, Fla., said among issues on his mind is multicasting, which he will be implementing in his market.

Also, he added, "A key issue people have to think about in implementing HD is how to get your data streams to the tower site."

He expects all Cox Radio markets to be represented at NAB on the engineering side, some two layers deep.

One of the challenges Fluker noted for the industry is what managers expect from engineers and vice versa. "It's a whole new world out there," he said, adding there

See PLANNING, page 15 ▶

Planning

► Continued from page 14 remains a division in engineering between what is IT and what is RF.

He's moderating the sessions "RF Implementation for HD Radio" and "Surround Sound for Radio."

Newsgathering for 2008

Don Danko, vice president of engineering and operations for Cincinnati Public Radio, will be looking at developments regarding high-power HD transmitters; he also will be checking out newsgathering as his stations, which number five, get ready for the 2008 presidential election.

Danko said he wants to see what is on the market for audio on IP and, among other gear, any new audio recorders.

He said CPR has used FTP transfer for audio files in the past, but they were small files. He does not think FTP will be sufficient the next time around.

"We are concerned about getting the news coverage 'right,'" Danko said, technically as well as factually.

Danko believes product development is in line with how stations need to operate these days.

"I think flexibility is very important," he said. "We have to get away from the proprietary nature of the equipment and systems."

"Cross-compatibility is important in engineering," Danko said.

Open control and flexibility are evi-



Don Danko, VP of engineering and operations for Cincinnati Public Radio, will be looking up developments regarding high-power HD transmitters as well as audio recorders for newsgathering as the next presidential election approaches.

dent in remote-control capabilities, he continued. "It's starting to get really solid in the design and implementation."

For Jay Goldman, director of engineering for WXPN(FM), a AAA non-commercial station licensed to the University of Pennsylvania, transmission equipment is at the top of the list, both digital and analog.

He is looking at possibly replacing an analog transmitter and some ancillary

equipment. But he said he also will be looking for a new HD processor for his system.

Goldman said that the operation is running smoothly. "Actually, it is moving along better than I thought it would," he said.

"Our listeners are really curious about HD. Like anything with new technology, it will take some time."

Clark Dixon, Clear Channel director

of engineering in Tulsa, Okla., said he will be looking for some analog gear at NAB: a low-power, frequency agile backup transmitter solution to locate at the studio site. But otherwise HD is on his mind. "Things in that arena are changing very rapidly."

The six Clear Channel stations in his market are transmitting HD Radio, and the four FMs are multicasting HD2. There were a few bumps getting stations online, Dixon said, but the problems were in the early stages.

Dixon said digital transmissions of all aspects are becoming critical for radio.

"The more convenient that we can make it for listeners to find and hear the programming that they already enjoy," he said, "through streams, podcasting as well as the current broadcast method — we have a great guarantee that radio stays around for a long time to come."

And John Mathews, vice president of engineering for Radio One, said his focus for NAB is HD, specifically multicasting and HD data services. He wants to investigate further services that offer listener interactivity.

But he added, "It is one thing to offer 'neat' services; it is another to make money with it."

Of Radio One's 70 stations, Mathews said 34 are on in HD Radio, and 17 more plan to be by year-end.

That brings him to his NAB shopping list for test equipment. "We have the stations online," he said, "Now we are focusing on optimization."

Alan Carter is the former editor-in-chief of Radio World International.

this just in...



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World Radio History

How Is NAB2007 Like Disneyland?

Tips for Getting the Most Out of Your Booth Visits at the Big Show

by James Careless

How is walking the NAB show floor like visiting a theme park?

"Both NAB and Disneyland are just too big for anyone to be able to see everything," said Kris Bobo, managing director of Comrex, an exhibitor.

"So you have to make up your mind what you want to see — before you go! — to get the most out of your booth visits."

Deciding

Yes, this is common sense, but if you don't apply a bit of that, your feet may hurt more than they need to at the end of the week.

Broadcasters have problems. Various vendors offer products that can solve different problems. Hence, the vendors with whom you should spend your limited time are those who can actually help you.

This is the advice of Jefferson Davis, president of Competitive Edge Training, a trade show consultancy providing sales workshops for NAB exhibitors.

"Start by analyzing the challenges your company is facing before you go to NAB," Davis said. "Talk to your managers and engineers to prioritize what products you should be looking at. This will not only help you narrow down which vendors matter, but also to decide which NAB booths are 'Must Sees,' 'Should Sees' and 'Nice to Sees.'"

Diana Stokey, marketing manager for exhibitor Prophet Systems Innovations, which is now RCS, says, "We always recommend attendees have a plan to cover the show floor. There is so much to see it can be overwhelming."

There are many ways to map out your NAB travels in addition to the stories in this issue of RW. One is to sign up online for "MyNAB Show" to plan vis-

its electronically.

MyNAB is a Web-based tool that "allows the attendee to search the show prior to leaving their office, and will allow them to update their Event Plan even on site," said Justine McVaney, the association's senior vice president of conventions.

The tool is described as a personal assistant that mines through the NAB2007 "community" and finds events, people and products matched to your objectives. Visit <http://nabshow.com/mynab.php>.

Book ahead

The show floor is a very busy place. To make sure you meet the important people on your personal Must See list, it makes sense to book appointments ahead of time.

"Appointments are a must, especially for large companies like Sony and Thomson who have very large and crowded displays," says Frank Coll, senior vice president of operations for National Mobile Television. "An appointment with a vendor will ensure that you get some quality conversation time on your specific needs with that vendor's experts. In my opinion, making appointments is the only way to see the show and get full value for your precious time."

Adds Deanna Kennedy, a marketing specialist with VCI Solutions, "Appointments are best suited for the vendors you have a high level of interest in, so you can be sure the person you need to speak with is in the booth at the time of your visit. For all other vendors that you have a generic interest in visiting, it would be best to mark them and plan a geographical route of attack by hall."

If you can't book ahead, don't panic. "Visit important booths on Wednesday or Thursday morning, when the traffic has slowed down and people have more time

to talk," suggests Bobo.

Companies may not be where you're accustomed to seeing them this year. A new layout, one that occupies all halls of the vast Las Vegas Convention Center, attempts to group vendors by major categories of offerings.

The floor plan

NAB says this reorganization reflects growth of the show to include all electronic media across various platforms. Exhibits are arranged in a plan that aligns with how technologies for creating and delivering electronic content are evolving.

"The new layout will incorporate a categorization system designed to more evenly distribute the convention's anchor



Exhibitors are



Grant Paley, left, of OMT demos iMediaLogger Podcaster for Rich Habedank of C-R Media at a previous NAB convention.

Photo by Bob Kovacs

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exhibitors, making navigation of the show floor easier for attendees and providing better traffic distribution for all exhibitors," it said in a statement announcing the changes.

Companies can now be found in areas with names like Acquisition & Production, Post-Production, Management & Systems, Distribution & Delivery, Display Systems, Outdoor Media & Equipment, Content Village, RTNDA@NAB and Technologies for Worship.

Radio and Pro Audio companies do not follow the content-based categorization system and are concentrated in the North Hall again. Many however are now found on the opposite end of that hall, in space that had been unused in recent years. But as in the past, many suppliers of interest to radio can be found in other halls too.



Photo by Bob Kovacs

Webb, general manager of Tieline Technology. "You want to deal with someone who is truly interested in helping you, not some automaton who is eyeing the aisle for better prospects."

This said, mind your manners. Booth staff get tired too and must answer the same queries repeatedly.

"Rule #1: Be patient," says Frank Coll. "Our questions will get answered and you'll get to physically 'explore' the products if you're patient. Both the attendees and booth staff are very busy during the show, especially the first couple of days. But keep in mind that you both have complementary needs — attendees want to buy products and show staff want to sell them."

As for the swag ...

Swag, freebies, booty — these are pro-

motional giveaways for which the NAB floor is famous.

It comes in many forms (whether you believe the acronym stands for Souvenirs Wearables and Gifts, Stuff We All Got or some other variant). Says Coll, "Anything other than a simple plastic bag with a logo on it is considered of value by most. Small flashlights, key chain tools, T-shirts and hats are most sought after." Exhibitors, take note.

According to experienced NAB trick-or-treaters, the best stuff typically is available early, when the exhibition hall opens. Some exhibitors add giveaways to their booths each succeeding morning, so do a quick circuit, if that's your thing. Also, some swag isn't offered to everybody, just favored clients.

And if you keep your eyes open, you'll learn quickly who sets out bowls of candy

or provides water coolers to help you keep your blood sugar and hydration up.

So to get the most from your booth visits, figure out what you really need to see first. Make appointments with those vendors before the show. Plan your route efficiently.

Also remain mindful of your physical condition. Walking the floor or working in a booth can be draining. Take frequent breaks. Don't skip meals. Drink water often. Bring ibuprofen.

Avoid lugging paper; most vendors will happily take your contact info and mail you a brochure later. Or bring a roll-around case to hold literature as well as swag for family, friends and co-workers who didn't get to come.

Oh, and Rule No. 1, which we saved for last: Be sure to wear a comfortable pair of loose shoes. 🌐

standing by!



Photo by Paul McLane

Wear comfy shoes ... or get a Segway.

The exhibition's floor plan can be daunting, what with all the hall names and aisle numbers. NAB's McVaney explained how it works.

"Booth numbers begin with a letter denoting the exhibit hall, such as N=North Hall, SL=South Lower," she said. "In addition to the hall designation, the booth numbers are in numerical order. The first portion of the number tells the attendee the position from east to west, and the second half gives the attendee the north/south location, much like a map grid system."

So booth number SL6705 would be in the South Lower Hall; the number 67 puts it approximately in the middle of the exhibit floor (east to west) and 05 means it is along the north side of the floor.

Making visits count

When you get to your appointed booth, don't dither or waste time on small talk. "Be clear and bring questions," Kennedy advises. "If you are part of a general demonstration, don't interrupt and ask about your specific project. Better to find someone off to the side and make an appointment to discuss those later."

Use a digital camera or digital voice recorder to help document your visit.

To guarantee that a vendor is paying attention, "Make sure that they maintain eye contact with you and don't spend their time watching the floor," said Kevin

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Administer this • The beauty of the Web is that you can get information anywhere. Same thing with Axia: you can set up and **administer an entire building full of Axia equipment** – audio nodes, consoles, virtual routers, whatever – from your own comfy office chair. All you need is a standard Web browser (PC or Mac, we like 'em both). Put an Internet gateway in your Axia network and you can even tweak stuff remotely, from home or anywhere there's a Net connection. Mochachino, anyone?

Automation station • Wouldn't it be cool to have a **self-monitoring air chain with silence-sense** that can fix problems, then e-mail a status report? To be able to switch your program feed from Studio "A" to Studio "B" with one button? Or build custom switching apps and scheduled scene changes based on Boolean logic and stacking events? PathfinderPC software does all these things and more. But unlike HAL 9000, it doesn't talk back to you.

Ether Net • Hardly a month goes by without a story concerning someone getting knocked off the air by STL frequency interference or bandwidth reductions. There's also the headache of trying to add HD Radio™ program streams to already maxed-out transmission links. Luckily, Axia clients have a way around this particular roadblock: they've been using Ethernet radios from well-known manufacturers like Orthogon, Dragonwave and BE to construct a link between the studios and the transmitter that operates *above* the crowded 950 MHz band. Put an Axia AES/EBU Audio Node on both ends of that link and before you can say "Look! Up in the sky!" you've got an Ethernet STL, with room for multiple channels of program audio plus backhaul. And that's **uncompressed 48 kHz, 24-bit audio** — without nasty compression artifacts that degrade your lovingly-tweaked audio chain. Add a couple of Axia GPIO nodes to the mix, and your new STL link can carry remote control commands for transmitter and processing gear, too.

Brains in the box • The typical radio jock cares for studio equipment about the same as a five-year-old cares for a puppy: haphazardly, if at all. That's why we **took the CPU out** of our Element modular console and put it in here, with the power supply and GPIO ports. That means a greatly reduced chance of being taken off the air by a Coke spilled into the board. C'mon, don't you have better things to do than trying to dehumidify circuit boards with a hair dryer?

That's cool • Noisy fans in studio equipment? That's a major *faux pas*. You won't find a fan in any Axia Audio Nodes — they're designed to run **cool and silent** (unlike your morning show talent).

Let it grow • Growing your business computing network is easy: just add more PCs and hook them to the Ethernet switch. But with broadcast routers, adding more capacity usually means buying another frame, installing more I/O cards, pulling more discrete cable through conduit that's already full to the brim... Hope you've got stock in Grecian Formula! But since IP-Audio networks use standard Ethernet, **adding more capacity to an Axia system is as simple as plugging in an Audio Node** wherever you need inputs. And, should you need to move to new digs, you can just unplug your Axia system and take it with you. Try doing *that* with a big-iron router.

A node for every need • Someday, all broadcast gear will speak Livewire (so says our Magic 8-Ball). Until then, there are Axia Audio Nodes that turn analog and AES sources into routable 48 kHz / 24-bit audio streams.

It's not rude to point • Little kids tell mommy what they want by pointing — a pretty intuitive way of doing things. PathfinderPC software gives talent the same convenience. You can **build custom "button panels"** to execute complex operations with just one click. You can map these panels to controller modules on Element consoles or to turret-mounted controls, place mini-applications on studio computer screens, even run them on touchscreen monitors.

AES yes • You like your audio to stay digital as much as possible, right? We get that. That's why we have AES/EBU Audio Nodes that let you plug AES3 sources right into the network. Studio-grade sample-rate converters are inside: anything from **32 kHz to 96 kHz** will work. Oh, and there's 8 AES ins + 8 AES outs in each node. Digital distribution amp, anyone?



Orc slayer • Hooking up an Axia Audio Node may be the simplest thing you've ever done. All our I/O is presented on RJ-45 and adheres to the StudioHub+ standard, so connecting audio devices is as simple as plugging in an Ethernet patch cable. All of which gives you more time to play World of Warcraft with those guys from IT.

Level headed • These green, bouncing dots built into every Axia Audio Node are confidence meters. One glance and you know whether an audio source is really active — or just playing possum.

Push to play • Axia Router Selector Nodes are pretty cool. Think of them as **really advanced selector and monitor panels**; put one anyplace you need access to audio streams from the IP-Audio Network. Like newsrooms, where a reporter might need access to a satellite feed or a Zephyr connection. Or dubbing stations, where audio is captured and stored for later use. Or in the station's TOC, so you can monitor any of the hundreds – or thousands – of audio streams on your network at a moment's notice. Use the LCD screen to scroll through a list of available streams, or use the eight Fast Access keys on the front panel to store and recall the streams you use most. And Router Selector nodes have something standard X-Y panels don't: an input, for fast connection of an analog or AES device. Sweet.



« Thinking about Axia but waiting 'til we're 'more established?'. You might not know that there are over 400 Axia studios on-air around the world — and counting.



« An Axia system can expand or shrink as much as you want it to — the Ethernet backbone lets it scale easily, on-demand. Portable too: just take it with you if you move.



« Axia systems install in as little as half the time of hardwired routers — and without expensive, bulky multi-pair cable. Whatever will you do with all the time you save?



« Is IP reliable enough for 24/7 audio transport? Millions of VOIP business phone users with systems based on Cisco routers certainly think so. Coincidence?

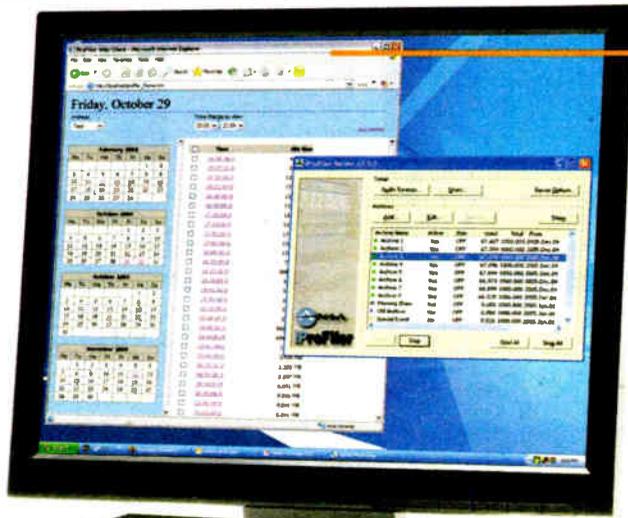
Nothin' but Net • Did you know you can plug a PC directly into an IP-Audio network and use it to send and receive audio? Can't do that with a mainframe router. Well, you *could* add more input cards to the mainframe, and then buy high-end audio cards for your PCs, and then run more wiring all over the place... but with Axia, you just install the **IP-Audio Driver** on any Windows PC to send and receive pure digital audio right through the PC's Ethernet port — no sound card required or additional router inputs needed. You get better, cleaner PC audio that's sharable right to the network. The single-stream version is great for audio workstations; the multi-stream version lets you send and record **16 stereo channels simultaneously** — perfect for digital automation systems.

CYA • Sooner or later, someone's going to ask for a hard copy of a specific broadcast. Whether it's a client looking for proof of play, a Group PD that wants airchecks, or a listener claiming your morning show did something naughty, you're going to need a way to prove what was said. Axia makes it easy to keep archives of your programming with iProFiler networked audio logging software. Just install iProFiler on a Windows PC with a NIC and connect it to your Axia network: tell it what audio streams you want to record and it goes to work, sucking audio out of your network like pimientos from

Martini olives. iProFiler can record **up to 16 channels of stereo audio simultaneously**, storing them as time-stamped MP3 files you can save to a network drive or FTP server for listening or re-broadcast. And since logic always follows audio in an Axia network, you can tell iProFiler to record only when the jock's mic is open (or vice-versa). And of course, you can listen to saved audio from any PC connected to the Axia network.

Put that in your pipe • How many discrete wires can a CAT-6 cable replace?

Well, a T-3 data link is pretty speedy with 44.7 Mbps of throughput. But Axia networks use Gigabit Ethernet links, with 1000 Mbps, between studios. That's more than 22 times the capacity of a T-3; enough throughput for 250 stereo channels per link — the equivalent of a **500-pair bundle on one skinny piece of CAT-6**. You can even use media converters and optical fiber for higher signal density if you want. Think that might save a little coin in a multi-studio build-out?



Heavyweight champion • This is an Axia StudioEngine. It works with our Element Modular Consoles (the fastest-growing console brand in the world, by the way) to direct multiple simultaneous inputs and outputs, mix audio, apply EQ, process voice dynamics, and generate multiple mix-minuses and monitor feeds on-the-fly. To make sure it delivers the reliability and ultra-low latency broadcast audio demands, we powered the StudioEngine with a fast, robust version of Linux — so fast that **total input to output latency is just a few hundred microseconds**. How can one little box do so much? There's a blazingly-fast Intel processor inside, with enough CPU muscle to lift a small building. Strong *and* fast: Ali would approve.

Hakuna matata • Axia networks are self monitoring and self-healing. Spanning Tree Protocol in the Cisco Ethernet switches we use combines nicely with PathfinderPC's automated program stream monitoring to help ensure that your studio network is **on the air 24/7**. And all Axia gear (like this StudioEngine, that mixes control room audio streams) runs real-time Linux for operation that's as bulletproof as Superman's boxers. Which means 'no worries mate

You got to have friends • Sure with network IP-Audio is cool. But it's even cooler that so many *other* folks think so too. Delivery system providers like ENCO, Prophet, BSI, BE, iMediaTouch, DAVIDSystems and more all have products that **work**

directly with Axia networks. So do hardware makers like AudioScience, International Datacasting, Radio Systems, Telos and Omnia. Check out the whole list at AxiaAudio.com/partners/.

Jammin' on the mic • Radio studios and microphones go together like Homer Simpson and donuts. Unfortunately, so do preamps, mic compressors, EQ boxes, de-essers — let's face it: most studios house more flying saucers than Area 51. Axia helps clean up the clutter by including mic preamps with our Microphone Nodes; not bargain-basement units either, but **studio grade preamps** with headroom enough to handle Chaka Kahn. Phantom power, too. And if you choose to use Axia Element consoles in your studios; you'll find world-class mic processing built right in: vocal dynamics (compression and de-essing) from the audio processing gurus at Omnia, plus three-band parametric EQ with SmartQ, available on every mic input. Rap on, Grandmaster.

Very logical, Captain •

Routing logic along with audio used to be almost as hard as performing the Vulcan Mind Meld. But Axia makes it simple, because machine logic can easily be converted to data and paired with Livewire audio streams. So **logic follows audio throughout the facility** on Axia's switched Ethernet backbone. Eight assignable GPI/GPO logic ports, each with five opto-isolated inputs and five opto-isolated outputs, are built into every Element power supply, so you can control on-air lights, monitor mutes, CD players, DAT decks, profanity delays, etc. If you've got more than eight audio devices (and who doesn't), just add a standalone GPIO node like this one wherever you've got gear.



AxiaAudio.com

Saturday Ennes Workshop Kicks Off SBE Events

SBE/PBS Put Their Attention on Audio For Both Radio and Television

by Fred Baumgartner
and John L. Poray

This overview of SBE activities at NAB2007 is provided by SBE for Radio World readers. Fred Baumgartner, CPBE, is trustee of the Ennes Educational Foundation Trust. John L. Poray, CAE, is executive director of the Society of Broadcast Engineers.

There are many good continuing education opportunities for broadcast engineers in North America. The Iowa DTV Symposium, the Broadcasters Clinic in Madison, Wis., and the Bos-Con SBE Regional Convention in Marlborough, Mass., come to mind.

From its first years, the Society of Broadcast Engineers has sponsored, encouraged and supported efforts to provide such education.

If you have put in a certain time in the business, you have a few Harold Ennes books on your shelves. He wrote the first set of engineering "manuals" for broadcast engineers; upon his passing, the

Indianapolis chapter of the SBE created a non-profit trust for the furtherance of the SBE's educational goals.

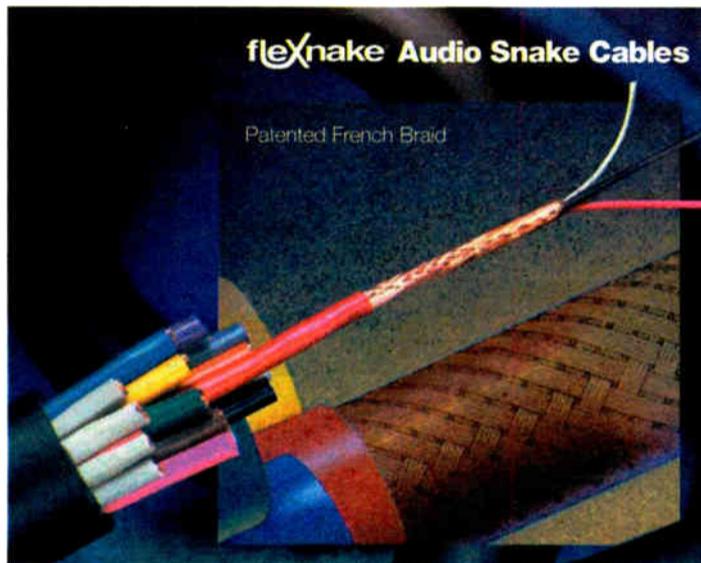
The Ennes Educational Foundation Trust is sponsoring one-day programs in Sacramento, Atlanta, New York, Boston

and Tampa this year. SBE members within 300-miles of an Ennes program receive a mail announcement before each program. Many of SBE's Sustaining Members provide presentations for these programs and underwrite the costs.

The centerpiece Ennes program of the year is the Saturday before the floor opens at NAB2007.

known for his interest and innovations in audio over his career. We asked him to provide a tutorial on the recent trend to build audio facilities not on shielded pairs but Internet Protocol connections, switches and commonly available IP infrastructure.

Tim Carroll, founder of Linear Acoustic, is familiar for his work on mul-



Belden's Steve Lampen will discuss audio wiring.



The SBE booth will be on the second-floor concourse of the South Hall near the NAB Broadcast Engineering Conference rooms.

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All things wiring

It's unlike anything else that happens at NAB. There is no call for papers; rather the Ennes and Public Broadcasting Service teams get together and ask themselves what it is that engineers can most benefit from. A topic is picked and speakers are recruited.

This year we go after audio. Interestingly, this will be the first year that National Public Radio will join the SBE/Ennes and PBS assemblage. No other gathering, anywhere, finds so many broadcast engineers in one place.

Attending the program requires a full NAB conference registration; but SBE members and those with a PBS or NPR affiliation enjoy a substantial discount for pre-registration. Look at www.sbe.org for Ennes information and NAB2007 registration.

Bright and early at 8 a.m. (that's Las Vegas Convention Center Time) on April 14, the "pre-program" starts with the traditional beginner's tutorial — Audio 101, as it were.

At 9 a.m., the program begins with Steve Lampen of Belden, an RW contributor, who covers 100 things you should know about audio wiring. A popular presenter, he is asked constantly to speak at Ennes road shows. He brings a new presentation focusing on audio, both digital and analog, from microphone to speaker. Of all broadcast engineering skill sets, the ability to design, construct and maintain the audio infrastructure is critical to the success of any radio, TV or newer media engineer.

It's difficult to have a program about audio without recognizing the role Dolby and compression in general play. Rocky Graham, the company's director of broadcast products, and Mike Babbitt, director of customer support, plan tutorials about digital technologies for audio and using metadata, respectively.

Steve Church of Telos Systems is

tichannel sound for high-definition systems, telephone interfaces and processing. Making the transition from stereo or mono to surround sound can be more complicated than making the digital transition. His presentation deals with our struggles to deal with the level and image shifts.

It's hard to get Birney Dayton, who founded nVision, to talk — unless he has something important to say. Along with Jay Kuca, director of product management, the pair will take on the trials and tribulations of bringing multichannel sound to a DTV facility.

Radio folks, do pay attention. While TV is arguably "nothing more than radio with a light," there are any number of movements afoot to bring multichannel sound to radio. Frank Foti has presented on this topic at Ennes road show sessions. Others have their opinions. The Ennes NAB program is designed for engineers who may be working in radio or TV today and streaming mobile or other new media tomorrow.

The program finishes the day with Roger Charlesworth, who has worked with Conan O'Brien and David Letterman and brings a futuristic view of what audio for broadcast will be.

It has been some time since the SBE/PBS Ennes program has addressed audio topics. Some years ago, we had the Sirius and XM chief technology officers on our dais. For radio, TV, mobile and all of the new media, this will be an interesting year for broadcast engineers, and so much of that is about maturing audio.

This is a good year to join 500 of your peers and spend a day immersed in the opportunities that a career in broadcast engineering brings.

Other SBE events

During the convention, members can See SBE, page 22 ►

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Advanced Services Draw Nearer

Multicasting Opens Digital Doors; RF Companies Learn From Real Installs

by Mario Hieb

In early days of the digital radio debate, proponents asked each other what the "killer app" might be that would put HD Radio into the "must-have" category. Multicasting was one candidate.

That app is here. A series of papers on Sunday at NAB2007 explores what could, in fact, be numerous killer applications spawned by the technology.

MULTICASTING FOR RADIO

"Multicasting for Radio," chaired by Jeffrey Smith, president of JRS Broadcast Engineering, begins at 9:30 a.m. on Sunday, April 15.

The session begins with "HD Radio Advanced Services — A Market Reality," by Joseph D'Angelo, vice president of advanced services for Ibiqity Digital. He will talk about developments in multicasting and comment on product evolution and the results of recent field trials.

New services to be described include time-shifting, electronic program guides, conditional access, real-time traffic and other multi-media services.

Raymond Miklius, vice president of Broadcast Electronics, will speak on "Implications of Advanced HD Radio Services on Station Workflow."

All too often, emphasis is placed on new equipment or software installation, while not enough thought goes into the resources necessary at the station to support these services on an ongoing basis. Within the next year, several services will be enabled for HD Radio stations, including conditional access, electronic program guides and data file transfers over the data bandwidth enabled within an HD Radio signal. Miklius said he will describe the additional infrastructure required for these services and will evaluate the station workflow implications for each of these new services.

"Automation and Playout in Multi-Stream Environments" by Eugene Novacek, chief executive officer of ENCO Systems, is a look at the "nuts and bolts" behind automation in multi-streaming situations. He takes a look at what is



Photo courtesy of Wes Whiddon, SRTG

ERI 973 Series nine-station constant impedance combiner system built for Senior Road Tower Group in Texas. This system provides combining for both the analog and IBOC digital signals.

involved in delivering audio, associated metadata and control in several such environments and discusses the aspects that need to be addressed in each case.

Novacek said he'll also outline the history of standards for streamed metadata, how system flexibility is critical in addressing rapidly changing requirements and what might come next.

Thomas Rucktenwald, director of data

• Sunday morning April 15:
"Multicasting for Radio"

• Sunday afternoon April 15:
"RF Implementation for HD Radio"

applications delivery for NDS, will speak on "HD Radio Conditional Access: What It Is; How It Fits In the Broadcast Station; and Why It Can Provide Outstanding Return on Investment."

Rucktenwald said he'll examine the possible implementations of conditional access within digital radio. This model, he said, works well for subscription pay TV. Conditional access equipment fits into the station, mates to other equipment that may be within the station, operates within the station's workflow and creates new operations that the station must perform.

How can conditional access work for terrestrial HD Radio? What programming works with conditional access? Does terrestrial HD Radio have advantages over other transmission media? Can subscription models work with the HD Radio multicast?

The final presentation is "Radio Engineering — Managing Multiple Formats Made Easy." Richard Darr, vice president of sales and marketing for RCS, will tell how the company has developed solutions to manage multiple formats, streaming, seamless in-stream commercial replacements, multi-station content and single database control.

RF IMPLEMENTATION FOR HD RADIO

Steve Fluker, director of engineering at
See SUNDAY, page 24 ▶

Las Vegas Hilton Hotel unless indicated:

- **Board of Directors Meeting**
Sunday, 8:30 a.m. to noon
Conference Rooms 1-2
- **SBE/NFL Game Day Coordinators Meeting**
Monday, 8:30 a.m. to 12:30 p.m.
Conference Room 1-3
- **SBE Frequency Coordinators Meeting**
Tuesday, 10 a.m. to noon
Conference Room 11-12
- **EAS Meeting**
Monday, 2-4 p.m.
Conference Room 4-5
- **Membership Meeting**
Tuesday, 5-6 p.m.
Room S226/227, LVCC
- **SBE Certification Exams**
Tuesday 9 a.m. to noon
(pre-registrants only)

Members of SBE can register for the NAB convention at a special "partner" rate, a savings of \$200 off the NAB non-member rate.

To get the discount, register using the regular online form found at www.nabshow.com/registration.asp. When you reach the "Profile" section, check the "Partner" box and select SBE from the drop-down box. The discount is only available using the online registration method. 🌐

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SBE

▶ Continued from page 20

connect with the SBE staff, Board of Directors and Certification Committee members at the society's exhibit booth.

The booth will again be on the second floor concourse of the South Hall near the entrance to the exhibit floor and NAB Broadcast Engineering Conference rooms.

It will feature the "CertPreview" exam preparation software programs that now include the AM Directional and 8-VSB SBE Specialist exam sections.

Also available will be SBE-published books including the "SBE Television Operators Handbook," "Handbook for Radio Operators" and the "SBE Chief Operators Handbook." The booth also will have a selection of broadcast engineering-related technical books at member-discount prices, and many SBE logo items including pins, shirts and hats.

Booth hours are Sunday 2-4 p.m., then Monday to Thursday during NAB exhibit hours.

In addition to the Ennes Workshop, SBE will present a number of meetings. On Tuesday, the annual spring Membership Meeting highlights the week. It will be held in Room S226/227 of the convention center. This year's Membership Meeting is sponsored again by Microwave Radio Communications (MRC), an SBE Sustaining Member.

The following meetings will be at the

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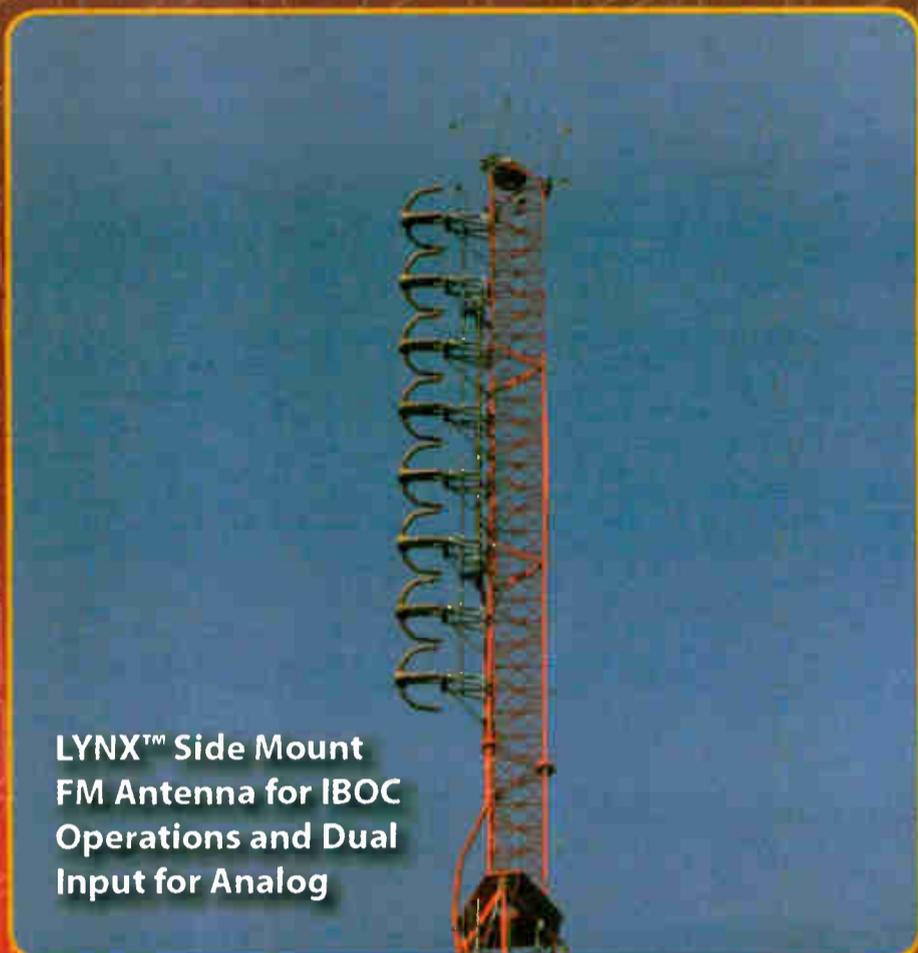
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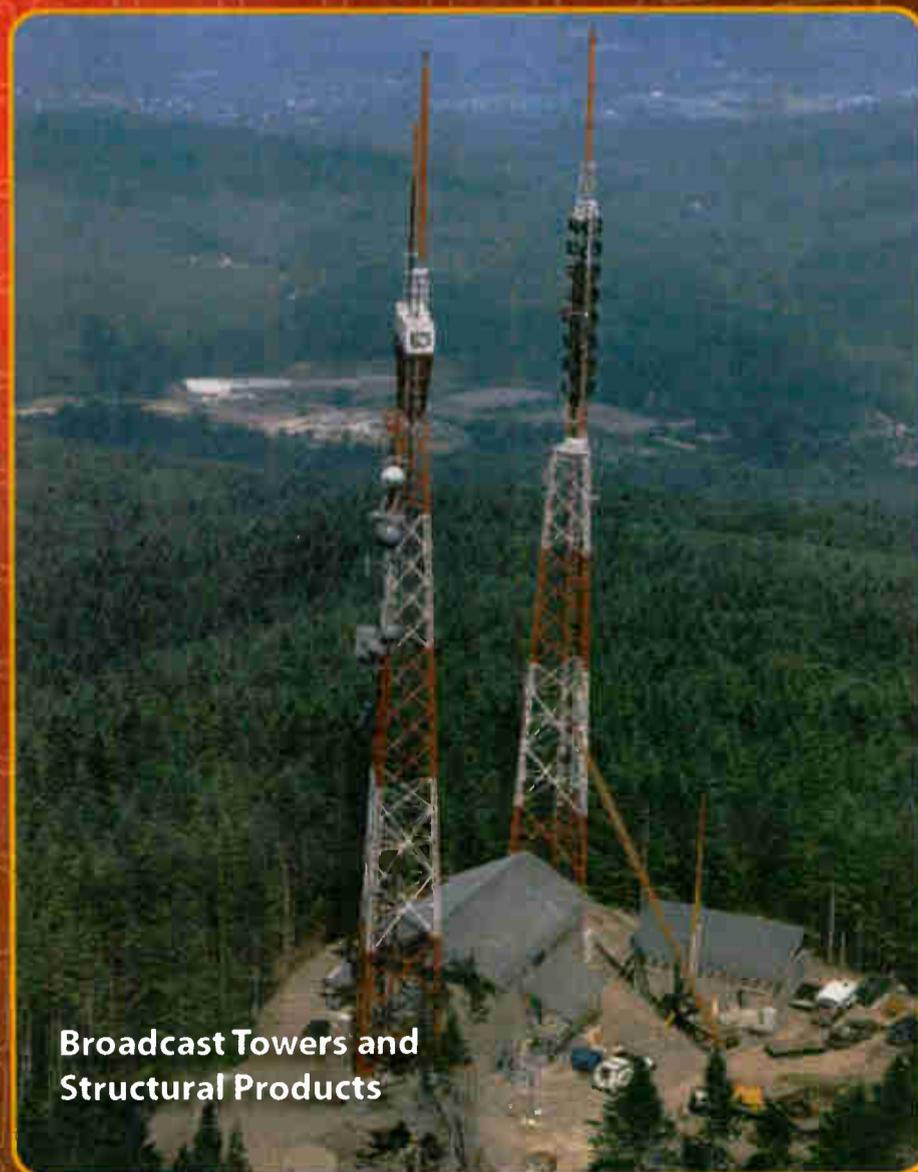
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Sunday

Continued from page 22
Cox Radio in Orlando, Fla., will moderate this group of presentations, which begin at 1 p.m. on Sunday.

The first session of the afternoon will be **"HD Radio Implementation Case Studies: Dual-Polarized Master Antenna,"** by Myron Fanton, chief engineer of RF technology for Electronics Research Inc.

IBOC high-level combining via orthogonal-polarized antenna elements is an established technique for simultaneous analog and HD Radio transmission. Fanton will address the performance and project parameters in a full-power, multi-channel HD Radio system. He'll talk about the master FM antenna and combiner system installed for Senior Road Tower Group in Missouri City, Texas, as an example of the implementation issues involved in dual-polarized IBOC combining.

Details of the system design are discussed, considering the key specification of radiation pattern symmetry, antenna impedance and isolation, and combining system isolation.

Spectral re-growth, inter-modulation products, transmission issues, power capacity and system measurements provide insight for the implementation of a successful HD Radio system, he said. The discussion will include the engineering design of antenna and transmission system components to achieve the level of performance needed for master anten-

na use; he'll also talk about lessons for single-station transmission systems.

Henry Downs, associate principal electrical engineer for Dielectric Communications, will deliver his presentation, **"Isolation in IBOC Multi-Channel Systems-St. Louis, Real-World Data."**

Downs said he will stress two main concepts. The first is that IBOC system isolation is critical. Any IBOC system has to be optimized as a system for isolation between the analog and digital transmitters, he said. His second issue is with respect to system monitoring. It's

critical to know how system changes due to icing, for example, affect the way reflected power is distributed within the system. He will present data to highlight these topics.

"Pre-correction Techniques for Radio Broadcast Transmitters" is to be given by Richard Hinkle, vice president of engineering and technical services for Broadcast Electronics.

He will focus on a systems approach to the pre-correction of radio broadcast transmitters. There are many types of correction schemes that have been implemented, each with its own advantages and disadvantages, he said. However, Hinkle argues, there are no "free lunches" when designing a linear transmission system. He will talk about how a manufacturer must take a system-level approach that includes all major components when pre-correcting a transmitter for spectral performance and efficiency. This will include the role that the power source, power amplifier and pre-correction type play in the overall performance of the system.

"Low-Loss FM Filters Employ Evanescent Modes" is by Derek Small, director of filter products for Myat Inc., and will appeal to cavity filter fans.

High-performance band-pass filter design for terrestrial TV applications use evanescent modes to decrease insertion loss, increasing power-handling capability, Small says. He'll talk about evanescent mode filter design for FM, and applications for IBOC mask filters and channel combining requirements. He'll also tabulate an outline of different cavity geometries, the associated unloaded Q and insertion loss.

Small said he will show how to take advantage of evanescent mode filter design techniques to produce lower-loss IBOC/FM filters. He will talk about applying these techniques to LPFM and larger high-power filters used in multi-channel combiners.

Kerry Cozad, vice president of engineering for Dielectric Communications, will deliver an **"FM Digital Radio Implementation Update."**

Cozad said he will present examples of installed systems and provide measured data on these configurations. An area of discussion will be the use of cir-

culators for both low- and high-power systems to improve isolation between the analog and digital signals as well as extending the usable bandwidth of existing antenna systems.

What's new in AM HD Radio land? Charles Cooper, partner at du Treil, Lundin & Rackley Inc., will tell us in **"Location Availability Coverage Analysis of AM HD Radio."**

The location availability of a subject HD Radio AM radio station is analyzed by employing a simple HD Radio car receiver, modified to sample when a digital signal is present, correlated with a GPS-derived location. This also analyzes the changes in location availability when the AM HD Radio transmission operates in non-optimal configurations including asymmetrical sidebands and mismatched load impedances.

"FM HD Radio Field Trial Results Under European Frequency Planning Conditions" will be discussed by Markus Ruoss of Ruoss AG, Rotkreuz, Switzerland.

Ruoss will explain how FM HD Radio in Europe can be used as well as in North America. Several countries have started investigating FM HD Radio. He'll discuss major differences and constraints for FM HD Radio implementation under European frequency planning standards.

From the folks who brought you the atom bomb: **"A Precision, Low-Cost GPS-Based Synchronization Scheme for Improved AM Reception"** is the latest development of Oak Ridge National Laboratory, Oak Ridge, Tenn.

This presentation promises a highly accurate carrier-frequency synchronization scheme for locking multiple, remotely located AM broadcast transmitters to a common frequency/timing reference source such as GPS. A tight frequency lock permits the effective elimination of audible and even sub-audible beats between the desired station's carrier signal and distant stations' carriers, usually received via skywave propagation during evening and nighttime hours.

Significant reduction or elimination of the beats and related effects can significantly enlarge the effective listening area of the desired station and simultaneously reduce the corresponding interference of the local transmitter to the distant stations. In addition, HD reception will clearly benefit via the reduction in beats from analog AM signals.

And from the Southern Hemisphere, the final presentation of the day is about **"HD Radio Technology Implementation in Brazil."**

In some Latin American countries the radio digital format debate is heating up. "In Brazil it would seem the decision is now almost a forgone conclusion, with 25+ stations on the air and hundreds in the process of planning," according to NAB's summary.

This presentation will include a discussion on why that populous nation is close to adopting HD Radio technology, how HD Radio is being marketed there, the status of HD Radio implementation and some of the technical and political obstacles Brazilian broadcasters have faced. Presenters are from Ibiqity Digital, Radio Globo Brazil and Harris Broadcast.



Ray Miklius of BE will show various screens to support advanced applications for HD Radio and other channels. One is a producer tool that allows a station to schedule messages for PAD/PSD, to develop EPG information and to auto-configure downstream applications for the importer.

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Monday STL Bandwidth Requirements

Connectivity Is Key; Sessions Also Look At Audio Solutions for Radio

by Tom Osenkowsky

By the first day of the workweek, NAB BEC sessions will be well under way.

Monday's papers discuss studio-transmitter links in the morning and new digital audio technologies that enhance broadcast requirements in the afternoon.

STL BANDWIDTH REQUIREMENTS FOR RADIO

The morning session is chaired by Milford Smith, vice president of engineering for Greater Media.

"In general, the three papers in this session deal with various aspects of connectivity in both the audio-over-IP arena as well as the integration of HD Radio, and particularly multicast applications, into the broadcast plant," he said.

"These are largely new areas to most broadcast engineers and the insights which will be offered should be valuable to almost any technical person working in radio."

"Audio Over IP: Can It Really Work?" — Kevin Campbell of APT, formerly European sales manager and now based in the United States, said, "We will look at IP links and the possibilities for broadcast-quality STL, contribution and distribution audio links. With the increasing amount of IP connectivity all around us, it is no surprise that broadcasters are looking to the medium to move their content around, be it for STL or remotes."

However, he said, there are a number of pitfalls along the way to IP STL Nirvana.

"Make sure the network is fit for purpose. make sure the hardware can deal with the network conditions thrown at it and make sure the audio compression algorithm is suited to deal with the inherent delay of the packetized medium."

With the popularity of IP as a medium for audio transport, the factors examined in this session are likely to be important in deciding if this avenue best suits a station's requirements.

"E2X Bandwidth and Bit Error Requirements for Ethernet Synchronization; Introducing a Reliable Real-Time Point-to-Multipoint E2X Transport Protocol" — The most recent radio systems broadcast architecture by Ibiqity Digital Corp. allows IBOC content transfer to an IBOC-enabled exciter via generic IP-based data streams.

The requirements for high-quality audio transfer are more stringent than for arbitrary data. Factors such as packet loss requiring bit error rates, congestion and throughput delay can affect audio quality. While the TCP/IP protocol can mitigate packet loss by Automatic Repeat Requests (ARQ) on a low-bandwidth system, they are limited to a point-to-point operation with full-time synchronization between the two points.

Philipp Schmid, digital design engineer at Nautel Ltd., will talk about a new point-to-multipoint ARQ protocol tailored for the Gen 3 system. This will allow multiple receivers to request data from a common studio source. There will be a

demonstration with main/standby IBOC exciter configurations and point-to-multipoint satellite networks which can be employed for IBOC distribution to multiple transmitter sites.

"Networking and STL Issues When Implementing Multicasting for HD" — A major benefit of HD FM is multicasting capability, which permits a broadcaster to offer additional programming. The rollout

of multicasting, still in its early days, has offered lessons. The requirements for networking and required STL bandwidth will be examined.

Richard Hinkle, vice president of engineering and technical services for Broadcast Electronics Inc., will discuss case studies of stations that have implemented multicasting. These are intended to serve as a guide for stations wishing to multicast. He'll talk about features and improvements in the latest importer as well as how it has addressed concerns of prior installations.

• Monday morning April 16: "STL Bandwidth Requirements for Radio"

• Monday afternoon April 16: "Audio Solutions for Radio"

AUDIO SOLUTIONS FOR RADIO

The Monday afternoon radio session at the NAB Broadcast Engineering Conference will be chaired by Talmage Ball, vice president of engineering for Bonneville International. (Also held that day will be a session on audio solutions for television.)

See MONDAY, page 26 ▶

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Monday

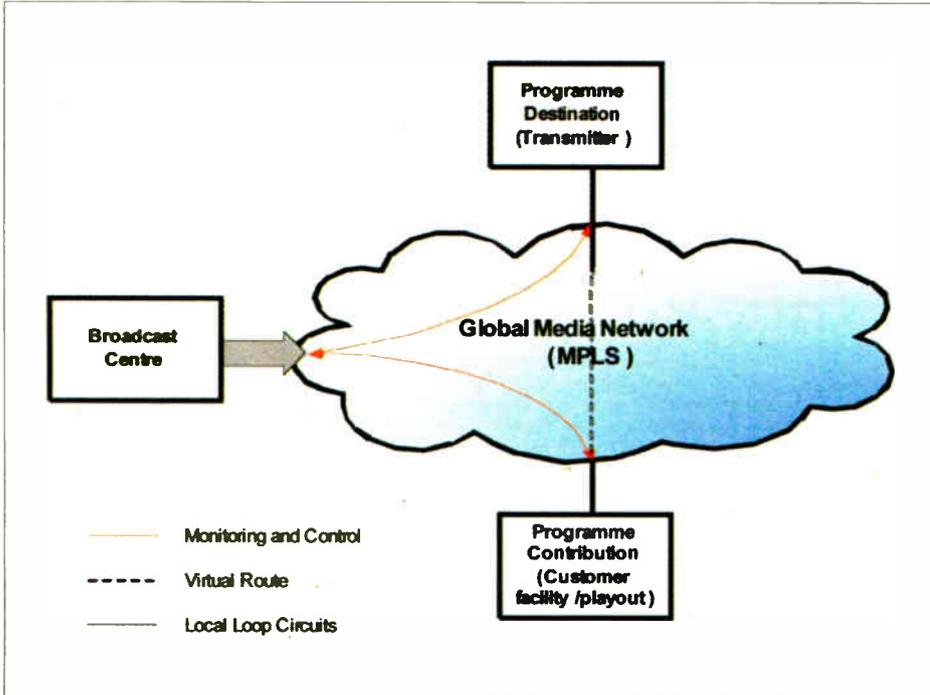
Continued from page 25

"The session will focus on new digital audio technologies that enhance broadcasting requirements," he said. "Digital audio is a mainstay in today's world. Presenters will discuss audio-over-IP networks, audio compression techniques, digital audio voice synthesis, use of new satellite technology and

improvements to blending made in time alignment."

"High-Quality Speech Synthesis System Using Speech Rate Conversion for Stock-Price Bulletins" — Hiroyuki Segi of NHK/Japan Broadcasting, based in Tokyo, will address the development of a speech synthesis system that produces natural-sounding speech for reporting stock price bulletins.

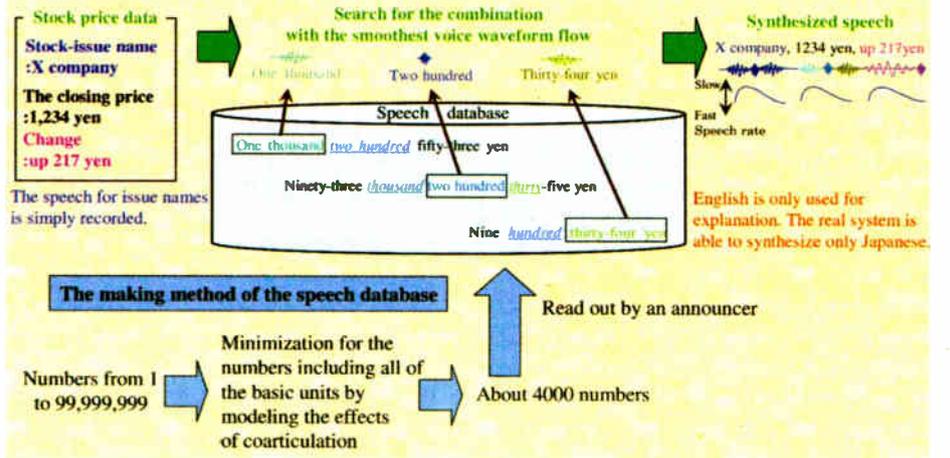
"By modeling the effects of co-articulation, synthesized speech of numbers



Audio contribution and distribution over MPLS, from a presentation by officials of Harris and VT Communications.

High quality speech synthesis system using speech rate conversion for stock-price bulletins

- 1) By modeling the effects of coarticulation, synthesized speech of numbers from 1 to 99,999,999 can be created from the voice waveforms of only 4000 utterances of numbers.
- 2) Applying automatic speech rate conversion enables the synthesized program to be fitted precisely into the allotted broadcast time frame.



Hiroyuki Segi of NHK will discuss a speech synthesis system that produces natural-sounding speech. A slide from his presentation is shown.

from 1 to 99,999,999 can be created from voice waveforms of only 4,000 utterances of numbers," said Segi.

Advantages of synthesized speech are the elimination of human speech errors and the ability to realize natural-sounding delivery in a specific time-frame. The modeling technique offers possibilities in automation systems and other applications.

"Reliable Audio Transport Over IP Networks" — Discussing the technical challenges posed in transporting live, real-time audio streams over networks that were designed for non-real-time file transfers will be Bob Band, business development manager at Harris Corp.

"I'll review the reliability-enhancing technical options available in the latest generation of audio codecs, as well as the different types of IP networks and which ones are best suited for carrying mission-critical traffic," he said.

Band will co-present with Josh Sparks, head of product and service development for VT Communications, formerly Merlin Communications. Sparks will discuss experiences in setting up an international IP audio transport network that provides reliability equivalent to traditional T1/E1 networks, using a combination of Harris's NetXpress IP audio multiplexer and Cable & Wireless's MPLS network. The session will address hardware concerns such as the available types of networks, suitable equipment, packet loss and comparison to T1 technology.

"Sonic Tonic for Audio Coding" — "Achieving great-sounding coded audio is easier said than done," says Frank Foti, president of Omnia Audio. "What are the critical elements that set apart great-sounding digital channels or streams, especially at lower bit rates?"

He says improving codec performance is accomplished through innovative signal conditioning and processing means. "Coded audio is now a way of life in the professional and consumer sound industry. It is commonplace in all forms of media that utilize sound in one form or another."

Foti's presentation will investigate what transpires within the coded transmission system, where the stumbling blocks are and methods that provide

smooth sonic sailing. Information regarding the causes of perceptible problems in audio coding and how to avoid them, along with a method that improves the sound quality of coded audio, are to be addressed. He'll play samples of sound that present codec challenges before and after proper conditioning.

"Digital Radio — Audio & Beyond" is to be the topic of Rich Redmond, director of strategic marketing for Harris.

He said he'll explore "the paradigm shift that radio is evolving from one program per transmitter to a multitude of programs per transmitter. This can mean multicasting such as HD Radio, DRM or DAB; it can be the distribution of data such as text like RBDS, with expanded capabilities on digital radio." This may also include multimedia distribution for content over radio such as Mobile TV on DAB/DMB systems, and enhanced graphics with HD Radio such as cover art, Redmond said.

"Audio Compression — Tradeoffs Between Quality, Data Reduction and Latency" — The ability to decrease file size while retaining fidelity is the major tradeoff in audio compression techniques and will be addressed by Guy Gampell, Asian sales manager for APT.

Compression algorithms vary from psychoacoustic to ADPCM-based. Gampell will talk about issues such as latency, loss and concatenation, and he'll present research data using theoretical and real-world latency figures, before and after compression comparisons of sample material and listening test comparisons after multiple encode/decode cycles.

He will examine new algorithms such as AAC HE and apt-X Live, as well as the question of whether compression is needed at all, given the popularity of IP and the availability of increased bandwidth.

"Radio Remotes Using New Satellite Technology" — Paul Shulins, director of technical operations for Greater Media Boston, addresses technology that can be used for radio broadcasters to get real-time audio from remote sites back

See MONDAY, page 29

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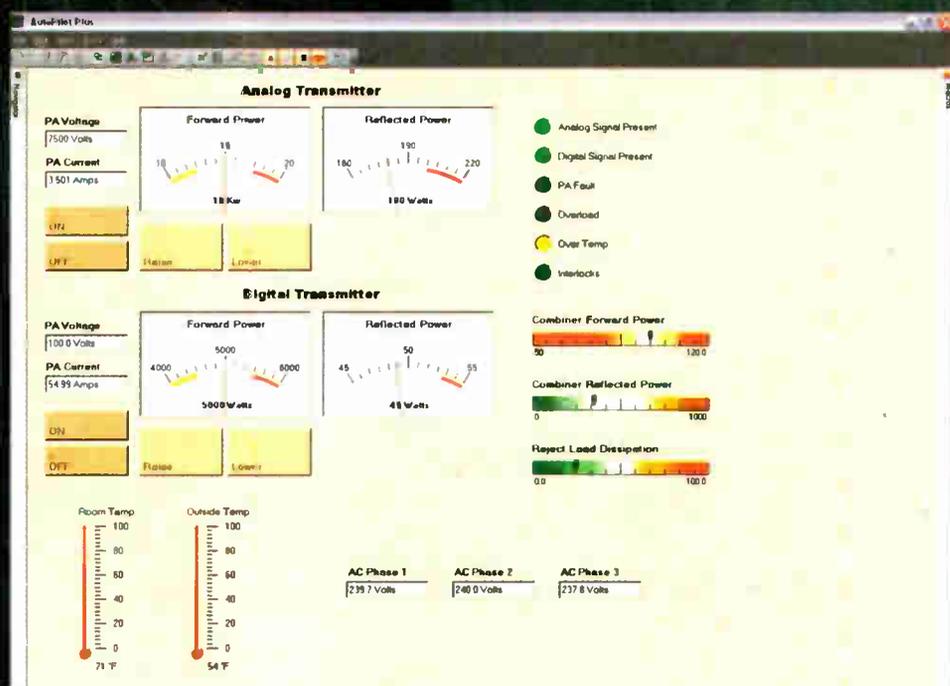
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Tuesday Facilities That Work, Safely

Compliance and Other Topics 'From the Tip Of the Mic to the Top of the Tower'

by Conrad Trautmann

Tuesday brings a look at radio facilities in the morning and, later in the day, two related topics: a session on facility safety and compliance, and another on technical planning for emergencies.

RADIO FACILITIES

The Tuesday morning session is chaired by Paul Shulins, director of technical operations for Greater Media's Boston radio stations.

"'Radio facilities' is a somewhat generic term that doesn't do justice to the exciting lineup we have in store," he said.

"*Rebuilding a Legend: Considerations in Rebuilding WOR Radio From the Tip of the Mic to the Top of the Tower*" will be presented by Tom Ray, vice president and corporate director of engineering for Buckley Broadcasting and an RW contributor.

Ray has been living on the bleeding edge of technology for the past few years and will share his experiences. WOR was the first AM station in New York City to implement HD Radio; the station

also was the first in the market to install an IP-based audio routing system at the new studios it built blocks from Ground Zero.

If that wasn't enough excitement, Ray also had to move the WOR AM directional array in northern New Jersey to a new site.

"We'll have many construction pictures, tips on things to watch out for, 'contractor follies' and why we made some of the choices we did," he said. Ray will finish his discussion with video of the collapse of the old WOR Lyndhurst towers, 681 feet in height and over 85,000 pounds in weight.

"*Working With the Free Software Community to Replace a Radio Broadcast Automation System*" — Frederico Grau, the systems administrator for Radio Free Asia, will discuss how radio stations on a limited budget can use free and open-source software to reduce capital and operating expenses.

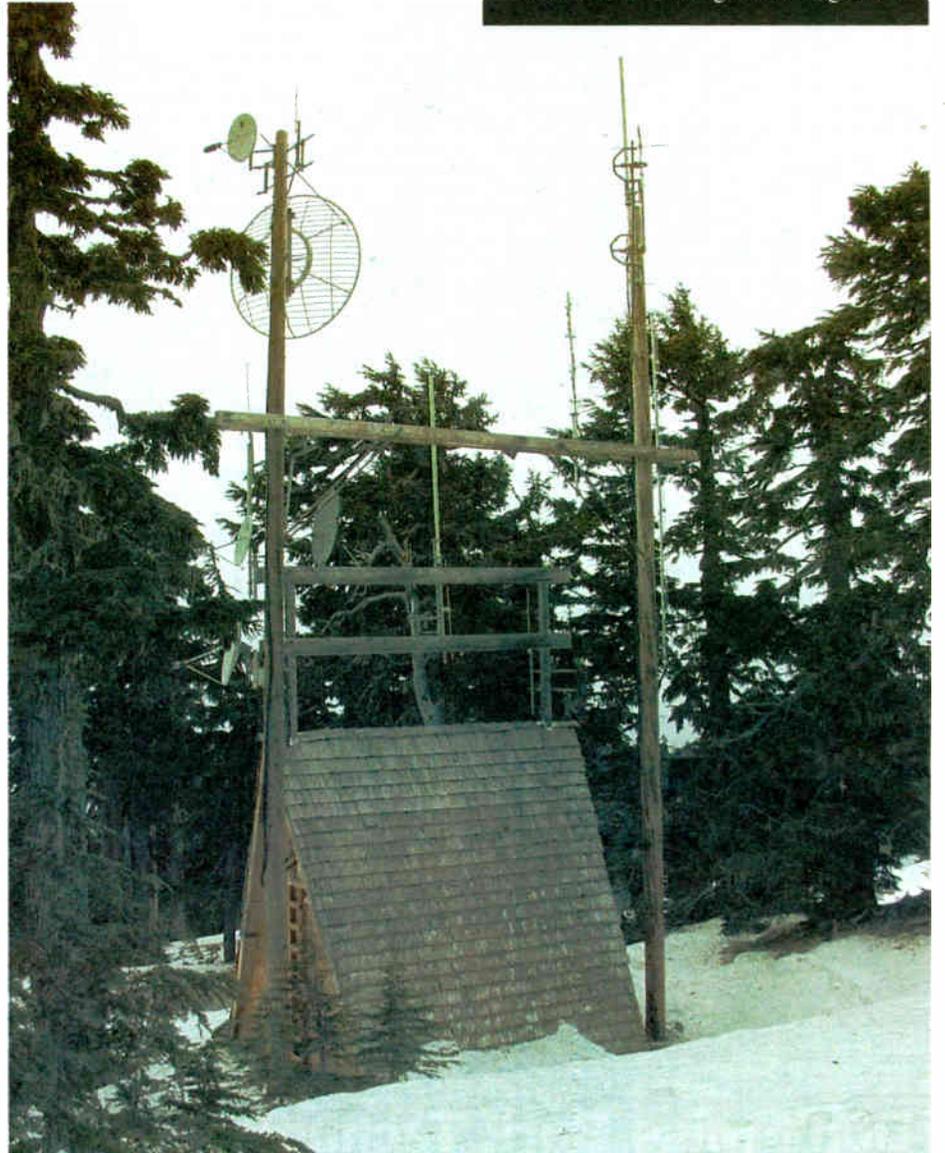
Grau, a software developer himself, has been working with the free software community to help develop automation solutions for RFA. He'll address concerns regarding reliability of the operating systems and support.

Mario Hieb, P.E., will present "*Systems Integration Techniques for Radio Engineers*." This session will cover all aspects of a large project including design, budgeting, planning, construction

• Tuesday morning April 17:
"Radio Facilities"

• Tuesday afternoon April 17:
"Broadcast Facility Safety and Compliance"

• Tuesday afternoon April 17:
"Technical Planning for Emergencies"



'A-Frame' transmitter building on Mt. Hood, from Jim Dalke's account of the installation of an FM transmitter facility at KPFR with 15 feet of snow on the ground and no landline telephone facility.

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and project management. Hieb takes television systems integration techniques and shows how they can be applied to radio projects. If you're facing a studio or transmitter move, this would be a good guide on how to approach the project. Like Tom Ray, he is an RW contributor.

"*An Embedded Systems Approach to IP-Based Broadcast Facility Remote Control*" — Stephen Dinkel, director of North American sales for Burk Technology, will demonstrate how new technology can be used to enhance your remote site monitoring.

He'll also describe how using this technology can improve alarm notification, share that data more efficiently and shorten response times to problems. This could benefit multi-station clusters, contract engineers who are on call for many stations and larger companies that have central monitoring points.

Stephen Lampen of Belden Cable, also a Radio World contributor, will remind you of the "*100 Things You Forgot*" about audio and video wire, cable and connectors.

Lampen is an entertaining presenter and takes what might not sound terribly excit-

ing and puts a fun, educational spin on it. He holds an FCC Lifetime General license and has had an extensive career in radio broadcast engineering and installations. He knows from experience what's important to the radio broadcast engineer.

In addition, with new IP audio systems and high-speed data flowing around your facility, it's a good idea to see the latest developments in the technology behind the wire and connectors that keep your station running reliably.

"*Packets Everywhere: How IP Audio and Ethernet Are Transforming Modern Radio Facilities*" by Martin Sacks will explore the latest advancements in IP audio and how you can apply it to your station.

Sacks, of Axia Audio, shows the advantages of IP audio, including machine control, transmission of program associated metadata (which is a must for HD Radio) and audio routing.

"We are constantly amazed by the many uses our clients find for IP audio," he said. "From soundcard replacement to STL systems, IP audio is found in many parts of a modern broadcast plant."

See TUESDAY, page 29 ►

Monday

► Continued from page 26

to the studio from just about anywhere on earth.

"One of the biggest challenges radio broadcasters have faced over the years is the reliability and lead times in getting telephone circuits installed for broadcast use. With the decline of telephone services that are available in many areas (such as ISDN and equalized analog lines), phone service just isn't what it used to be," said Shulins.

"A new satellite service from Inmarsat called BGAN, coupled with either an ISDN codec or an IP codec, is now offering broadcasters an option to do a remote from just about anywhere on the planet, on a moment's notice." But he said the flexibility comes at a cost. "My presentation will outline the pros and cons of this new technology, and will give a user report showing my experiences here in Boston."

Shulins also points out the need for HD Radio stations to transport pre-delay audio to the remote site.

"IBOC Analog-Digital Blend Time Alignment Quality" — A unique feature of HD Radio is digital-analog audio blend. This requires precise time alignment of both audio chains.

Michael Bergman, vice president of new technologies for Kenwood, said, "Proper time alignment appears to be a key factor for good performance in signal fading conditions. Poor alignment leads to audible level shifts during blend, echo and comb-filter artifacts."

His presentation looks at time-alignment measurement techniques and the resulting accuracy. It presents IBOC receiver alignment results across several brands, and considers audio quality issues.

Tom Osenkowsky is a consulting engineer based in Brookfield, Conn., and a long-time contributor to Radio World.



Paul Shulins of Greater Media will talk about use of the new satellite service from Inmarsat called BGAN. Shown, a publicity image for the Thrane & Thrane Explorer 500, foreground.

Tuesday

► Continued from page 28

BROADCAST FACILITY SAFETY AND COMPLIANCE

A one-hour session on safety and compliance will be held Tuesday in the early afternoon.

It is chaired by John Lyons, assistant vice president and director of broadcast and communications for the Durst Organization.

Lyons, Radio World's "Excellence in Engineering" award recipient in 2006, is intimately familiar with the topic at hand. He developed his own RF safety system for the roof of 4 Times Square, the newest rooftop broadcasting facility in the heart of New York. If you're involved in any way with a city skyscraper transmission facility, Lyons is someone you should meet.

"What Broadcast Tower Owners and Tenants Need to Know about 222-G" will cover the 10 most important developments of this new tower standard. You will want to attend if you have plans to add, modify or change anything on your station's tower, or if you need to install a new tower.

Thomas Hoenninger, vice president of operations and chief engineer of Stainless LLC, will explain how the code change treats things like design requirements and how transmission line load calculations will be figured differently. He'll point out that the materials from which towers are constructed have changed in the code. Changes also affect foundations because soil calculations are evolving. If you own, operate or rent space on towers, this is material you must know.

Hoenninger has case studies to illustrate things to look for between the current code and the new one. He'll also explain how to get your own copy of the new standard.

Matt Bruskotter of the University of Findlay in Ohio is presenting **"ENG and All-Hazards Safety."** When the term "first responders" is used, those who come to mind are fire, police and emergency health workers. But ENG crews also are first responders, usually on the scene at the same time as these emergency professionals during a disaster or major news event. Bruskotter will detail the training that ENG crews should have

See TUESDAY, page 30 ►

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Surrounded by Emerging Tech

Busy Day Includes Interactive & Multiplatform Topics Plus a Guide for Engineering Management

by Alan Carter and John M. Lyons

HD Radio is not just about sound quality.

Across the board, the engineering community is seeking answers to associated technology issues such as surround sound, interactive radio and data management.

Wednesday sessions at the NAB Broadcast Engineering Conference focus on these topics and others.

SURROUND FOR RADIO

Surround sound has grown beyond TV and the theater. Radio is exploring the possibility of offering listeners multi-channel audio as part of the HD package.

Broadcasters have the opportunity to hear the latest during "Surround Sound for Radio" on the morning of April 18.

"I want people to walk away knowing that surround sound is here today, and it works," said Steve Fluker, chairman of the session and director of engineering for six Cox Radio stations in Orlando, Fla.

"Implementing Surround Sound in a Broadcast Facility" is the lead presentation, given by Fluker.

He will report on the implementation section of the new National Radio Systems Committee surround paper, "Broadcasting Surround Sound Audio Over IBOC Digital Radio — Issues and Resources for FM Broadcasters."

"My presentation is a parallel complement to the paper," Fluker said. "Most important, the NRSC paper is an educational piece on surround sound."

He will review the different methods of surround and how stations can implement surround: from the basic music-only to a full-blown operation with a production studio that produces local elements and commercials in surround, including full discrete 5.1 production and master control.

"I think surround sound has become forefront in people's minds with home theaters and with movie theaters," he said. "Surround sound awareness is there." He also added that surround sound is a bonus "to sell" HD Radio.

The NRSC paper is available for download online at www.nrscstandards.org. The paper is a detailed description of surround for radio, Fluker said, and outlines the scenarios and the equipment available.

"5.1 for Radio: Too Much Too Soon?" is by Jon McClintock, commercial director of APT, which is based in Belfast, Northern Ireland.

McClintock will outline case studies in which APT worked with broadcasters to implement surround. He will address technical issues involving audio contribution and distribution.

"Surround Sound Radio Broadcasting Is Reality," the third in the series of topics, is from Don Danko, vice president of engineering at Cincinnati Public Radio in Cincinnati.

CPR station WGUC(FM) was the first station in the country to broadcast commercially available surround sound

recordings. The broadcasts are from a series of surround recordings at such venues as the Cincinnati Symphony Orchestra, the Cincinnati Opera, the Linton Music Festival and the May Festival.

Danko will discuss the station's evaluation and implementation of surround including encoding, on-air testing, implementation and ongoing broadcasts.

He said WGUC started conducting surround recordings in the late 1990s. With the recordings, he said the station had its own source audio, and it made perfect sense to put them on-air.

ROTATION SPEED



Slow? (7 days or more)



Fast? (1-3 days)

Andrew Janitschek says fast rotations help an employee's body clock stay in day-shift mode, although productivity can be affected at night. Slow rotations allow longer body clock adjustment times but the result can be fatigue due to more sleeping during daylight hours.

Tuesday

► Continued from page 29 and point out things the ENG first responders should be aware of.

TECHNICAL PLANNING FOR EMERGENCIES

Martin Hadfield, vice president of engineering for Entercom Communications Corp., will chair the second afternoon session, which follows the one above. EAS, backup power, disaster recovery and alternate transmission methods are topics.

He said speakers will address lessons learned during and after the Katrina and Rita hurricanes.

Digital Alert Systems will present a method to improve EAS by adding details to the message, including URLs that offer access to Web sites, making EAS IP-compatible.

"The solutions offered in these presentations have already found uses far beyond the devastated Gulf Coast region and should provide some pearls of wisdom which would be applicable to any size of radio and TV broadcast facility," he said.

Geoff Freed, project manager for the WGBH National Center for Accessible Media, will be the presenter for "Access to Emergency and Non-Emergency Information for People With Disabilities."

NCAM is dedicated to equal access to media and information for everyone; it is involved in technology, policy and program development to assure that media and technologies are accessible. Freed will describe how the organization is exploring solutions that will allow people with visual or hearing impairments to receive warnings

and alerts from local television stations.

Duncan Ayre, manager of media monitoring for Canada's Department of National Defense, will talk about how that organization works with reporters to collect, distribute and archive electronic information in "Media Monitoring by the Military in the Electronic Age."

Ayre is responsible for gathering media clips from local, national and international sources that are used to keep Canadian defense officials informed of situations around the world.

"Wireless Wideband Services Save the Day for a Mount Hood Transmitter Facility" is the story of how KPFR(FM) applied the use of cellular telephone wide-

band technology as a method to control and monitor a remote tower site.

James Dalke, a consulting engineer, will explain how conventional remote control methods were virtually impossible to use at this remote tower site. He will also give a live demonstration of the system and show how it was designed.

Bruce Robertson of Digital Alert Systems is the presenter of "Improve EAS by Adding Details to the Messages."

"In this discussion a method will be presented that demonstrates how to improve EAS by adding details to the entire message," he said. The process will show how the message can contain URLs that offer access to Web sites, making EAS IP-compatible. "This method does not change the protocol, does not violate

• Wednesday morning April 18: "Surround for Radio"

• Wednesday morning April 18: "Emerging Broadcast Technologies"

• Wednesday afternoon April 18: "Engineering Management for the 21st Century"

The reaction has been positive from listeners. But, he continued, the station had to educate listeners on which receivers to buy to match the station's encoding. "You have to find a happy medium of promotion," Danko said.

While Danko said there is "some cross-compatibility" among the surround encoding processes, for the full effect the receiver needs to match the decoding.

"Radio Surround Gets Ready for Prime Time: New Techniques for Surround Mixing" is next on the lineup from Alex Kosiorek, director of audio services at the Cleveland Institute of Music.

Kosiorek said he will present a primer on the entire surround process and delve into mixing for a live broadcast. He has recorded and produced events and groups

See WEDNESDAY, page 34 ►

the ruling, does not obsolete current equipment, and can be incrementally implemented where it will be most effective."

Robertson says implementation of this method by emergency operations centers will allow broadcasters to strongly consider participation.

Mark O'Brien, executive vice president of SpectraRep and 20-year veteran of the broadcasting industry, is going to speak about "Police Communications and DTV, Pushing Critical Data to the Field."

He plans a live demonstration showing how it's possible to use excess capacity in a digital television signal to get critical information to police squad cars.

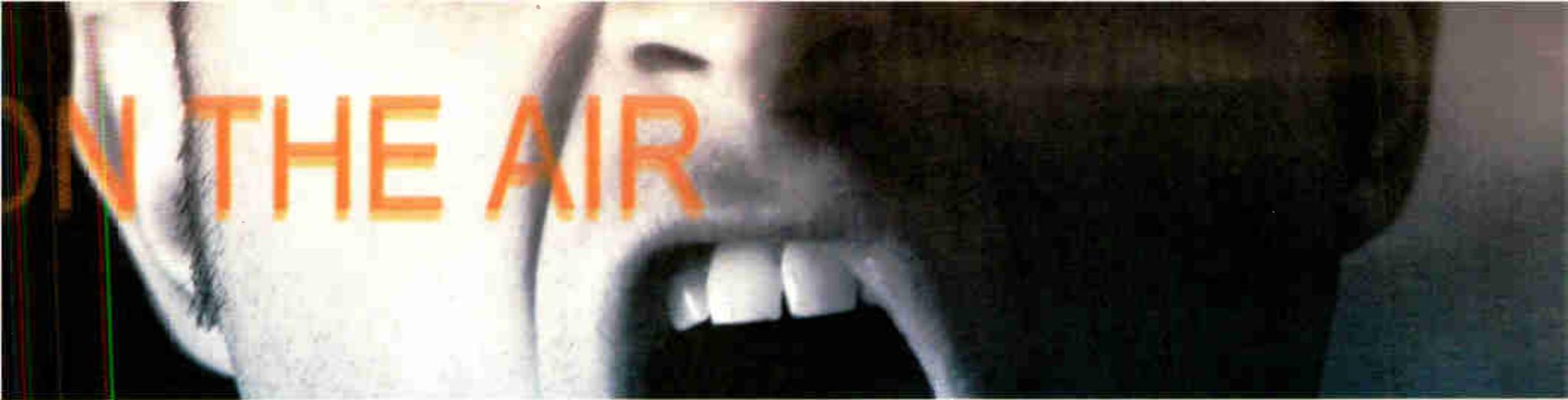
"MTV Networks' Disaster Recovery Facility — Case Study" will focus on disaster recovery plans that the big media entity has in place for its main uplink facility in Long Island, N.Y.

Lionel Hightower, vice president of engineering of Viacom/MTV Networks, will present and give details about its backup systems and disaster recovery plans.

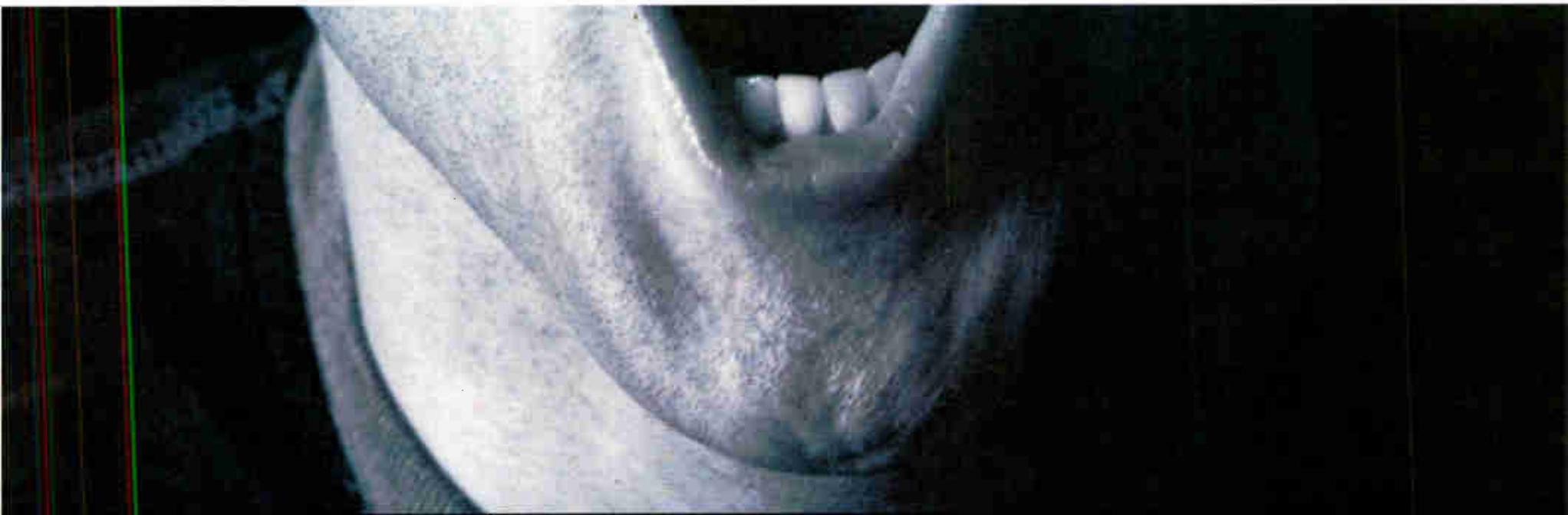
Winding up the day's emergency planning sessions is Gary Rackow, vice president of sales for Active Power, with a session called "Top Story: Broadcasters Discover Flywheel Technology as New Solution for Reliable, Continuous Backup Power."

Clearly, emergency power is critical to any broadcast facility. If you're tired of replacing batteries in your UPS, DC flywheel technology is an alternative. Used in conjunction with a standby generator, he says, flywheel technology is an environmentally safe and reliable method to provide uninterrupted power. Rackow will describe how broadcasters are putting the technology to use.

Conrad Trautmann is senior vice president of engineering & technology at Westwood One Inc. 



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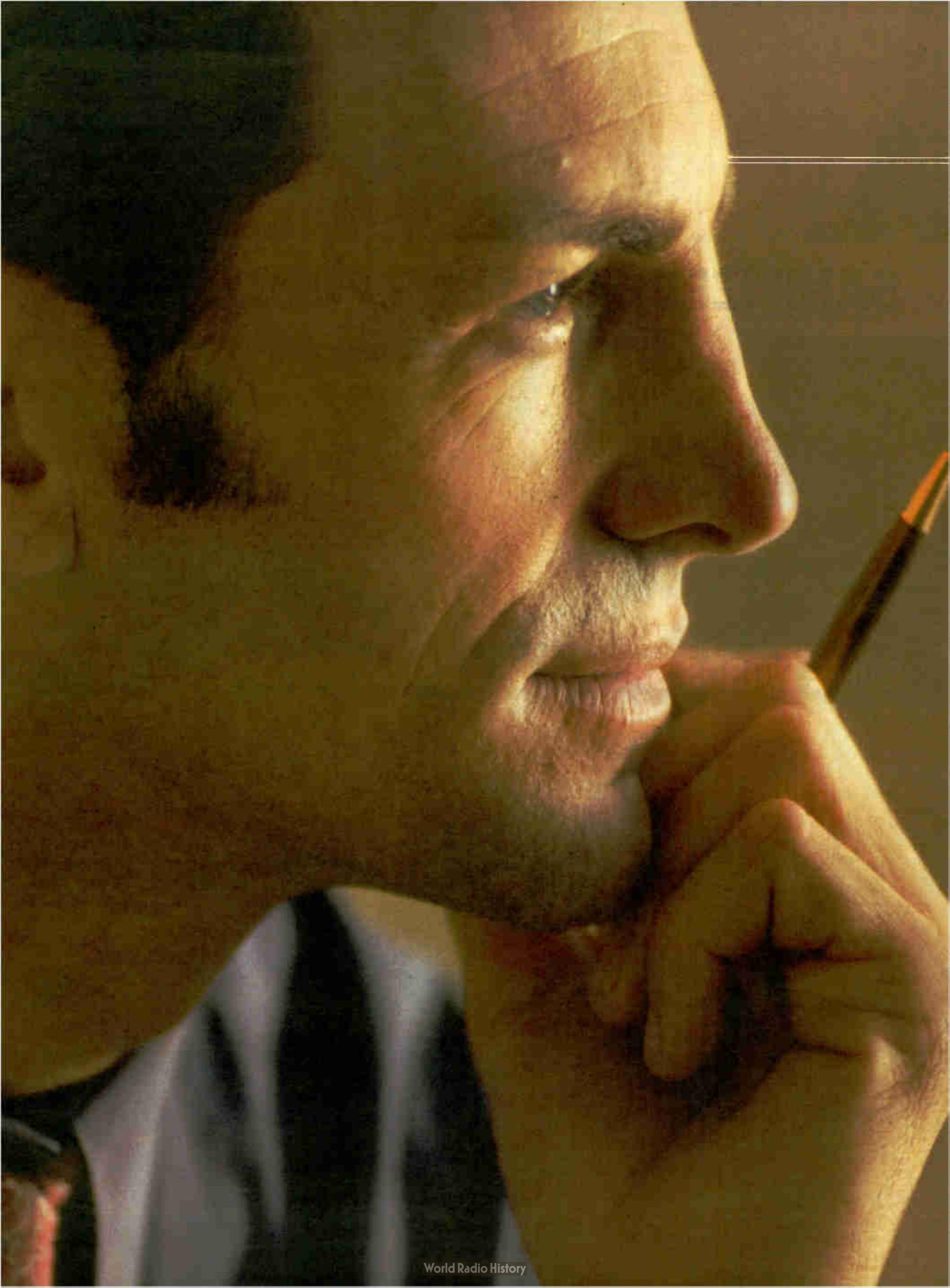
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World Radio History



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Wednesday

► Continued from page 30 including the Cincinnati Symphony Orchestra.

He will cover all aspects including mixing, mixing, transport protocols and broadcast facility requirements. He also will talk about new surround applications that can make these broadcasts more efficient, and he will cover surround mixers that allow for more creativity.

"I will speak on the entire gamut from front to back," Kosiorek said.

Among the factors high on his list that would make for a successful surround broadcast is format: rock, jazz, classical and "some" pop.

"With surround sound, the radio experience can be more fulfilling," he said. "The range of the listening experience increases."

"*Internet Radio in Surround Sound*" is the last program in the morning session.

Nikolaus Faerber, group manager for multimedia transport at the Fraunhofer Institute for Integrated Circuits IIS in Erlangen, Germany, will report on developments and testing in surround for Internet broadcasting.

EMERGING BROADCAST TECHNOLOGIES

From digital broadcasting for medium-wave radio to issues about data management for multi-platform radio, the "Emerging Broadcast Technologies" session, also on Wednesday morning, offers a broad overview.

"This program was designed to help people become aware of technologies that may not yet be mainstream but are emerging," said Graham Jones, chairperson of the session and director of communications engineering for NAB. Three presentations are of particular interest to radio attendees:

"*DRM Progress Toward Standardization in the Broadcast Frequencies Between 30 and 108 MHz*" leads off the session.

Donald Messer, technical committee chairman for Digital Radio Mondiale, said he will outline the progress made on the technical side during the past year for the digital broadcasting system. DRM is an open standard digital on-air system for shortwave, medium-wave/AM and long-wave.

In particular, Messer said he will discuss developments in medium-wave and outline applications for local use, which he said has been successful in Europe and Mexico.

"*Interactive Radio Has Arrived*" shifts the focus of the program for radio to data management and the wide-reaching applications.

In this presentation, T.A. McCann, CEO of Jump2Go, which is based in Bellevue, Wash., will demonstrate how the new RDS Radio Text Plus will offer added value.

The RT+ standard enhances the RDS text service by allowing broadcasters to tap specific text under a variety of categories such as title and artist, much like an MP3 player. Thinking forward, it can per-

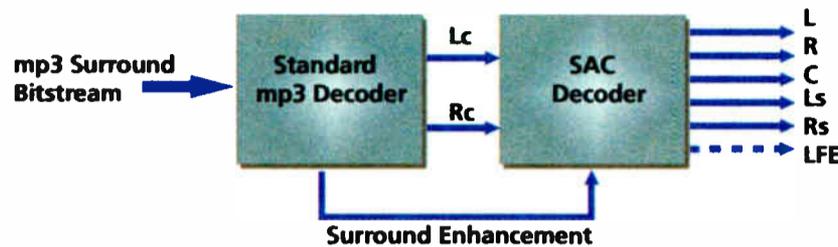
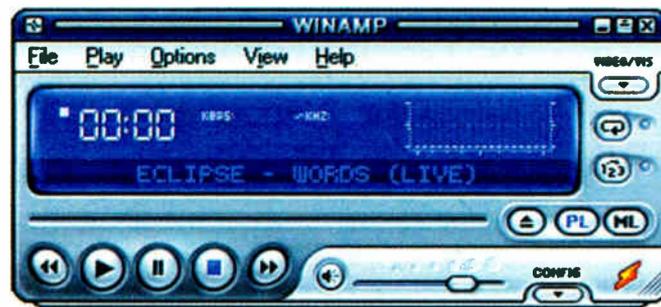
mit radio "users" to store telephone numbers directly to cell phones if they are listening to radio on a cell phone with a receiver, and access Web addresses directly if they are listening over the Internet.

"*Improved Data-Follow-Audio in Multi-platform Radio*" examines text and other data accompanying radio audio and its application in analog radio, HD Radio, Internet broadcasting and even for mobile phones and billboards.

The program is presented by Allen Hartle, director of development for Broadcast Data Services at Broadcast Electronics, and Neil Glassman, vice president of strategic marketing at BE.

Glassman said this whole area is a natural extension for radio.

While the program will be on the technical side, BE will present a similar but less technical and more application-oriented version at the NAB Radio & Audio Stage in the North Hall. That presentation's title sums up a main issue at stake: "Where HD Radio Meets Creativity, Revenue and Technology."



IPTC data: MP3 Surround Internet Radio based on Winamp. From the presentation by Nikolaus Faerber of Fraunhofer.

Said Glassman, "We're seeing new revenue potential."

ENGINEERING MANAGEMENT FOR THE 21ST CENTURY

The Wednesday afternoon Broadcast Engineering Conference session will be chaired by Steve Davis, senior vice president of engineering for Clear Channel Radio.

As a 30-year broadcasting veteran, Davis has been on intimate terms with engineering management changes in the later part of the previous century and the early years of the new one.

"The face of the broadcast media facility is changing, and we as the technology leaders must continually look beyond what is common today, to what will be most efficient, productive and effective in the new digital, networked era," he said.

Opening the session will be Benjamin Coe, managing principal of EYP Mission-Critical Facilities, on the subject of "*Media Facilities in Transition: Change Management Planning and the Mission-Critical Media Facility*."

Attendees will see planning exercises in engineering and risk management, digital workflow and content delivery, and digital asset management and its effects on facilities planning. Coe will present big-picture facility issues such as upgrading in place or moving out of an existing facility, and will discuss strategies for migrating to a new workplace environment. Also presenting is Stephen Newbold of Gensler.

The session continues with "*Good Asset Management Equals Smart Scheduling*" by Andrew Janitschek, director of production support for Radio Free Asia.

"Convergence brings technology and society closer together," he said. "Chief engineers and station managers must focus continually on their critical resources, especially people. Which is better for the human resource, stable or rotating schedules? Are firm or staggered shift times best? What are the fiscal effects? How does today's manager balance the needs of the employees with those of the company?"

He will examine benefits and the pitfalls of common staff schedules and those that promote or hinder professional growth. Janitschek hopes to arm attendees with a greater understanding of their employers' needs and a readiness to meet the other challenges of media asset management.

The afternoon agenda concludes with "*Capital Budget Plan: A Tool for the Chief Engineer*" by Mike Seaver, president of Seaver Management and Consulting Services.

"Nobody's more qualified than an engineer to put together a budget," he said. "Chief engineers need to become businessmen. They need to become multi-lingual. They need to speak engineer talk and money talk."

The engineer, Seaver believes, must learn to present his or her cap-ex plan in a concise manner so upper management can understand it. Material must be prioritized clearly.

This session gives an engineer tools to make the capital budget process less painful and intimidating.

Alan Carter is the former editor-in-chief of *Radio World International*. John Lyons is assistant vice president and director of broadcast communications for *The Durst Organization*.

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World Radio History

Thursday Radio Technology Advances

• Thursday morning April 19:
"Radio Technology Advancements"

*Presenters Explore RT+, Longley-Rice
And PRI's Program Service Data Project*

by John M. Lyons

Gary Kline, vice president of engineering and information technology for Cumulus Media, will chair a session Thursday morning about advancements in radio technology, "most of which we can implement today," he said.

The session will include the latest RDS technologies; updates to Longley-Rice for coverage predictions; an NRSC update; and digital trends in Europe, Africa and the Middle East.

Highlights will be on implications for digital services across that region.

Matthew Straeb, executive vice president of Global Security Systems in Lafayette, La., continues the session on radio technology advancements with his presentation on "FM-Based Technologies Now and in the Future."

"FM needs to support data systems for
See THURSDAY, page 36 ▶



A Kenwood RT+ receiver display with artist, title and traffic text from an analog FM broadcast.

RADIO TECHNOLOGY ADVANCEMENTS

Opening the session will be Michael Bergman, vice president of new digital technologies at Kenwood, on the subject of "RDS Enhancements: Artist and Song Title Through RT+."

"RT+ is a slender upgrade to RDS," he said. "It allows an FM station to put artist, title, station information and more on a car stereo or other FM receiver. If a station has already tied their automation text to RT or PS, adding RT+ is very cost-effective (read: cheap)."

Hardware makers — such as Kenwood with car stereos, Nokia with FM-enabled phones and Microsoft with Zune — have started supporting RT+ in products, and some large broadcast groups are converting over.

"As a bonus, it can interoperate with HD Radio, too. Text, especially artist and title information, have long been the domain of digital radio and iPod, but analog FM is getting this feature as well."

Next on the morning agenda is "Updating Longley-Rice for FM Reception Prediction" by Sid Shumate, senior appraiser and director of engineering for BIA Financial Network.

Today computers make it easier to deal with the large multitude of propagation points than the 1982 computers that were first used.

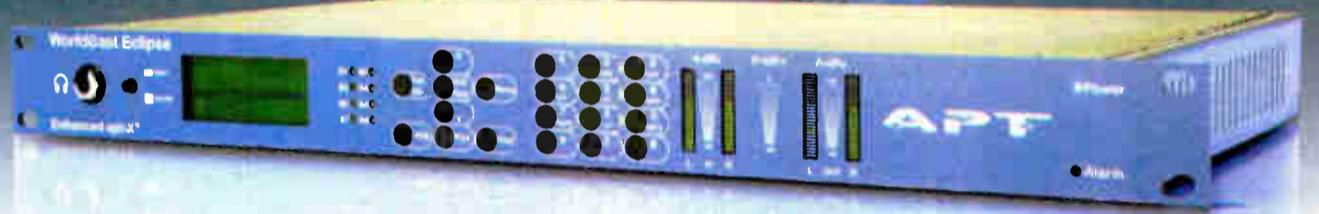
"Once the FCC accepted the use of Longley-Rice methodology, utilizing a 30 arc-second database, there has been a certain reluctance to experiment with, or change to improve, what is accepted as good enough for government work," he said. "Today's desktop PCs are far faster and more capable and have much larger RAM and hard-drive memory than the 1982 mainframe computers overcoming the stumbling block of the '80s."

"Planning of the Digital Terrestrial Broadcasting Service in Parts of Region 1 and 3, in the Frequency Bands 174-230 MHz and 470-862 MHz (RRC-06)" will be presented by Pham Hai, head of the Broadcasting Services Division of the International Telecommunications Union in Geneva, Switzerland.

He will discuss the results of the June 2006 meeting resulted in planning an "all-digital terrestrial broadcast service for sound and television" across Europe, Africa, the Middle East and Iran by 2015, coinciding with the target date set by the Millennium Development Goals of the ITU.

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More Highlights of NAB2007

Stories in this convention preview issue of RW focus on notable radio sessions in the Broadcast Engineering Conference. Look for previews of the Radio Management Conference and Broadcast, Regulatory and Legislative Conference next issue.

Here are other selected events of interest including keynotes, special events and supplier training. Some events require separate registration.

THURSDAY

PREC '07 — Public Radio Engineering Conference opens, runs through Friday. HD Radio, PAD data, ContentDepot, studio design, RF systems and other topics. See www.nprlabs.org/aprel/

FRIDAY

Podcasting Summit — Opens today, runs through Sunday. Includes Podcasting Boot Camp covering basics, plus two days of training in others areas.

SATURDAY

V-Soft Broadcast Allocations Training Seminar — Software/engineering training seminar, runs through Sunday, at the Excalibur. Cost \$495 including meals; discount for tech support subscribers. E-mail kmichler@v-soft.com or call (800) 743-3684.

Broadcast Electronics HD Radio Seminar — 2-4 p.m. at the LVCC. Lessons learned from the industry's first 1,000 installations. Free. Register at www.bdcast.com.



Kim Winking of BE, which will hold a free HD Radio seminar.

National Radio Systems Committee AMB Subcommittee— Time TBA

NRSC DRB Subcommittee — Follows the above

NRSC Full Committee — Follows the above

SUNDAY

RTNDA@NAB — Opens today, runs to Wednesday.

Rich Media Web Site Development Conference — Today and Monday. See nabshow.com

"From Anxiety to Opportunity: Managing and Leading During Times of Change" — 8:30 a.m.–1:30 p.m. Leadership competencies for managing change. Taught by Leading Edge Associates, a consulting group. Designed for students and alumni of NAB/NABEF Career Development programs but open to Broadcast Conference registrants. E-mail careerDVP@nab.org.

"Broadcast Engineering Conference Opening Keynote" — 9 a.m., Hirokazu Nishiyama, managing director of NHK, speaks about new services such as mobile, HDTV, IPTV and VOD.

Logitek User Group Meeting — Sunday, April 15, 1-4:30 p.m. at the Flamingo. Attendees get a sneak peek at product introductions and a copy of the new

vEngine simulator software. Advance registration required at www.logitekaudio.com/usergroup.html.

"Ownership Forum: Making Connections and Building Relationships" — 3-5 p.m. Resources for current and aspiring station owners and executives who will meet with brokers, financial experts, attorneys and other owners in a lounge-style setting.

MONDAY

"Washington Policy & Politics Breakfast" — 7:30-8:45 a.m.

Opening Keynote & State of the Industry Address — 9-10:15 a.m. NAB President/CEO David Rehr gives his second spring speech on the state of the industry.



David Rehr

Exhibit Floor — 9 a.m.–6 p.m.

Television Luncheon and Broadcasting Hall of Fame Award Presentation — 12:30-2:15 p.m. NBC's "Meet the Press" receives the NAB Broadcasting Hall of Fame award with Tim Russert on hand.

"Building an HD Station I: From Studio to Antenna to the Bank" — 1-3:30 p.m., part of the Radio Management Conference; details next issue.

Super Session: "Portable! Digital Media Content Anywhere, Anytime" — 2-3:30 p.m., CNET's Brian Cooley moderates a panel of content providers, distributors and consumer electronics gurus. What do consumers want from portable media devices?

HD Radio: Are You Ready? — 4-5:15 p.m. Part of RTNDA@NAB. Moderated by Andrew Lindenauer, vice president of operations, CBS Radio Digital Media Group. Panelists include John Hinnen, Buzz Knight and Glynn Walden.

Paul White Award Ceremony & Reception — 5:30-7 p.m. RTNDA honors CNN's chief international correspondent Christiane Amanpour.

Exhibit Floor Reception and Tours: HD Radio Focus — 4:30-6 p.m.



FCC entrance

TUESDAY

"FCC Breakfast" — 7:30-8:45 a.m.

Exhibit Floor — 9 a.m.–6 p.m.

"Building an HD Station II: Programming to Marketing and Beyond" — 9-11:30 a.m., part of the Radio Management Conference; details next issue.

Radio Luncheon, NAB Crystal Radio Awards and Broadcasting Hall of Fame Award Presentation — Noon-1:30 p.m. CNET.com Editor at Large Brian Cooley talks about the future of radio; Rick Dees is inducted into the NAB Broadcasting Hall of Fame.

"Third Annual Tuesday Night Party" — 5-11 p.m. in the Hilton. A Tex-Mex bash with live music by Augie Meyers from The Texas Tornados, Charlie Rich Jr. and Chad Watson. Presented by Orban/CRL, Broadcast Depot, RVR, Jampro and Staero Energy.

National Association of Gay and Lesbian Broadcasters Dinner — 6:30 p.m. socializing, 7:30 dinner. Info: lylehenry@hotmail.com

WEDNESDAY

Exhibit Floor — 9 a.m.–6 p.m.

Career Day — 9 a.m.–5 p.m. Produced by NABEF in cooperation with BEA & RTNDA.

Technology Luncheon and NAB Engineering Achievement Awards — Noon-1:30 p.m. Keynote speaker Tom Rogers, president/CEO of TiVo; presentation of the radio and TV engineering awards.

Louis King, chairman of Kintronic Laboratories, is radio recipient.

Amateur Radio Operators Reception — 6-8 p.m., door prizes, sponsored by Heil Sound.

THURSDAY

Exhibit Floor — 9 a.m.–4 p.m.



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Thursday

Continued from page 35 emergencies. Cell, satellite and cable are all trying to take this service from FM," he said. This paper will provide radio broadcasters the information needed to take a giant step for safety at little cost, in his view.

"Public Radio International's Program Service Data Project: A New Dimension of Local Service on HD Radio" — Riccardo Ruotolo, director of information technology for PRI, will report on its CPB-funded PSD Standards Project. Findings, tools and guidelines are included in a new "PSD Cookbook." The Standards Project has involved FM

stations including WGBH, KUVU, WFAE, WUSF and others; technology partners including Public Interactive, BE and ENCO Systems; and distribution partners PRSS and PRX, as well as others. PRI has provided project leadership and management.

Concluding the session with the latest "NRSC Report" are David Layer, director of advanced engineering at the National Association of Broadcasters, and Skip Pizzi, technical policy manager for Microsoft, who also is a contributing editor to RW.

Layer said: "The NRSC has been very active over the last year in two important areas: AM bandwidth and surround sound for IBOC." The presentation will focus on these areas and where NRSC expects to be heading in the coming year.

Finding Business Services in Las Vegas

by Terry Hanley

What do you do if you've forgotten your business cards, or you've handed out all the press releases on your big product launch and need more?

Business travel occasionally brings with it some logistical stress, and attending NAB2007 is no different.

From shipping and copying to next-day business cards and bindery of your presentations you can dispense of some of those difficulties by using the local services in Las Vegas.

You might even find it more convenient to upload your presentation documents to a print-on-demand service and pick up the finished copies when you arrive at the show, saving shipping charges in the process.

LVCC

Located in the Las Vegas Convention Center just south of the main entrance, Encore Productions Main Business Services offers a number of onsite services an attendee or exhibitor might need.

NAB will provide free wireless Internet services in two exhibit floor hot spots, the WiFi Restaurant and Lounge in the South Upper Hall and in the Cyber Café in the North Hall.

Encore offers black-and-white and color copying with a selection of special paper, if necessary. In most cases, signs, banners and business cards can be made the same or next day. Encore also carries office and shipping supplies, and accepts and ships small packages under 150 pounds.

The office also features a self-service area with PC, Mac and laser printer rentals, including all the standard business software. Customers with laptops can also access the Internet via modem.

The full-service facility is open 9 a.m.-5 p.m., Monday through Friday, as well as show hours.

Just beyond the escalators in the main foyer near the C-3 hall entrance is the Encore Productions Satellite Business Center. Along with black-and-white copying, office and shipping supplies and services, the satellite office also offers faxing services. Incoming faxes can be sent to (702) 732-4648. Hours coincide with exhibitor move-in and move-out hours and show hours.

Net access and more

A familiar face for office supplies, copying and shipping is Office Depot, and there are three locations in the Las

Vegas area: 3636 W. Sahara Ave., (702) 222-1890; 3247 S. Maryland Pkwy., (702) 892-9897; and 3265 E. Tropicana Ave., (702) 434-3555. Call ahead for hours of operation.

The company also offers print-on-demand services, making life a little easier for the business traveler. With print-on-demand a company can upload its presentation documents, brochures, press releases, etc., to Office Depot via the Internet in advance of the show. All major file types are accepted and users can "build" and preview an order online. Office Depot will have the final product ready to pick up when you arrive in Las Vegas.

Many business travelers need to stay in touch with clients and the home office while on the road. NAB will provide complimentary wireless Internet services in two exhibit floor hot spots at the convention center — the WiFi Restaurant and Lounge in the South Upper Hall and in the Cyber Café in the North Hall.



Access to the Internet is also available anywhere in the convention center for wireless-enabled laptops. The fee is \$5 per hour and is paid with your credit card when you turn on your laptop and enter the information. A weekly rate is also available. The Smart City desk in the Central Lobby of the convention center can help with any questions you might have or if you need assistance. And not least, though last: Don't forget to check with your hotel. Many hotels offer business guests Internet access, use of a computer and printer, as well as faxing and shipping services.

FREE HD AT NAB2007

Introducing a series of free HD technology and management presentations at NAB2007 in the North Hall.

Come, listen and learn about top innovations being unveiled for HD audio and HD radio broadcast. Presenting radio companies will discuss everything from applications for emerging revenue opportunities to managing your HD assets along with great new product demonstrations.

Many audio companies are pushing the aural envelope with ultra-high bit rates and latest digital audio formats for recording, storage and surround sound. You won't want to miss this opportunity to learn what tools and techniques are available today, putting you at competitive advantage. Get beyond the buzz with information you can use now and see what's on the horizon.

The Radio & Audio Stage will be open for morning and afternoon segments Monday through Wednesday and a morning-only segment on Thursday. Best of all, these presentations are free and you'll never have to leave the show floor. Be sure to make this your HD destination at NAB2007!

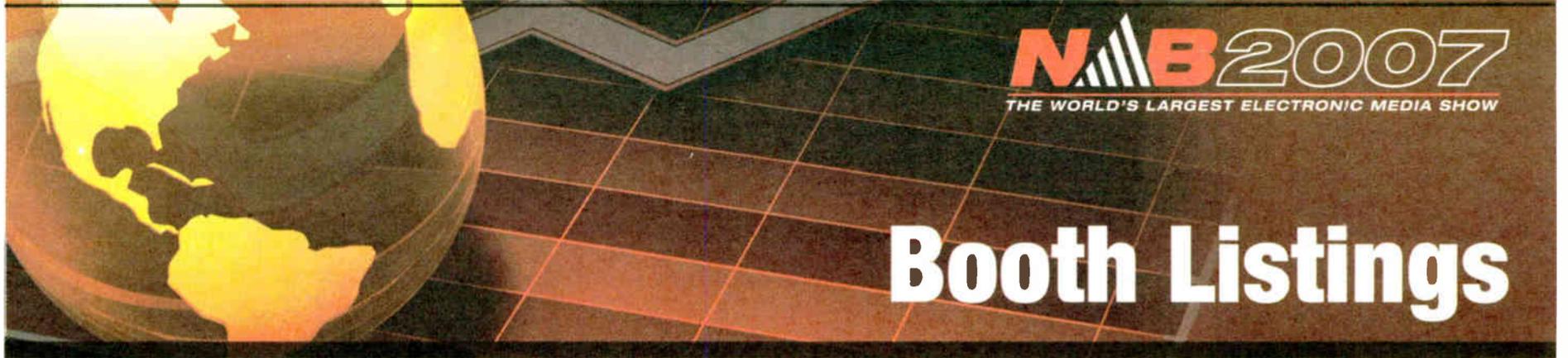
NORTH HALL Booth N6330

for EVERYONE	
SCHEDULE OF PRESENTATIONS	
MONDAY	April 16, 9:30 AM - 4:30 PM
TUESDAY	April 17, 9:30 AM - 4:30 PM
WEDNESDAY	April 18, 9:30 AM - 4:30 PM
THURSDAY	April 19, 9:30 AM - 11:30 AM

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THE WORLD'S LARGEST ELECTRONIC MEDIA SHOW

Brought to you by the National Association of Broadcasters in cooperation with the publishers of Pro Audio Review, Audio Media and Radio World.

**NAB2007****Exhibit Hours**

Monday April 16	9 a.m.–6 p.m.
Tuesday April 17	9 a.m.–6 p.m.
Wednesday April 18	9 a.m.–6 p.m.
Thursday April 19	9 a.m.–4 p.m.

RTNDA@NAB exhibits are at the Hilton, Monday through Wednesday, and hours vary.

This section contains a selection of exhibitors of interest to radio attendees. Highlights are paid for by exhibitors. Check on-site program for changes, late registrants and a full show list.

Booths preceded by the letter N are in the North Hall of the Las Vegas Convention Center. C indicates Central Hall, SL is South Lower, SU is South Upper, OE is Outdoor Equipment, L is Lobby. Booths preceded by R are RTNDA booths at the Las Vegas Hilton.

25-Seven Systems Inc. N7834
Established Products: The TiVo-like Audio Time Manager audio processor allows stations to pause a network feed, insert content and return where the program left off, seamlessly catching up to real time, with compression rates that can be adjusted on the fly, or the unit can be used to time shift programs by up to an hour.

360 Systems SU9120
Intro: Instant Replay 2.0 offers fast network transfer of WAV files to/from workstations, pro-

viding access to 1,000 audio clips, including music, sound effects or spoken word; Dash-E software includes new editing tools like head and tail trims, fade-in/-out and gain change, can be used to extract sound effects from a bed or make loops of music and ambient effects.
Established Products: DigiCart, Instant Replay, Short/cut Editor.

615 Music R121, SL8324
Established Products: Supplies 5,000 tracks of production music across seven libraries, including the 615 "Platinum Series," Promo Accelerator, Music Shop, AMP, King Size, Music Gallery and Zen with more than 20 new releases annually; custom division produces TV main-title themes and news music packages; staff includes composers, songwriters, engineers, sound designers and producers.

Acorn RF C1309
On display: Teracom Components and Acorn RF are leaders in the design and development of cable and RF components for the broadcasting and telecom industries. Our partnership offers you one source for a range of transmission line and components, simplifying the order process to save time and money.

Acoustical Solutions Inc. SU5020
Intro: The RPG Hemifusor W1 solid wood diffuser panel is based on two-dimensional QRD number theory sequences to provide a true hemispherical polar pattern with an omnidirectional response applicable for ceiling applications where even coverage of the floor area is desirable, also suitable for wall applications where its omnidirectional backscattering provides additional attenuation over a one-dimensional diffuser.

Established Products: Sonex Acoustical Foams, AlphaSorb Wall.

Active Power C1732
Established Products: CleanSource UPS, CoolAir UPS and GenSTART.

ADC N721
Intro: High-density coax patching system for AES audio, 5.1 and 7.1 audio applications available with 2 x 48 coax ports (1 RU) and 4 x 48 coax ports (1.5 RU) and patent-pending switchable termination feature that allows the user to select or deselect a 75-ohm termination function on each circuit pair; UniPatch GigE professional grade normal-through Gigabit patching system; Pro Patch programmable patching system for digital audio patching in Bantam and Longframe formats.

Adobe Systems Inc. SL3220, SL13100-MR
Intro: The Adobe Production Studio integrated video and audio post-production tool is available for both Macintosh and Windows platforms for film, video and Web professionals; Adobe Soundbooth audio software for creating and editing audio and fixing common audio flaws using visually-oriented tools.
Established Products: Adobe Audition.

Advent Communications C2907A
Intro: Advent FlyDrive 150 and FlyDrive 120 compact, lightweight, motorized satellite terminals designed for rapid deployment can be used as a traditional flyaway or as a semi-permanent vehicle-mounted terminal.

AEQ S.A. N6326
Intro: Phoenix portable codec connects through analog lines to deliver high-quality audio with support for POTS, GSM and future options of ISDN, satellite WiFi, 3G and IP; Arena digital console for radio and TV based on the BC 2000 D with presets, page swapping, a flexible monitoring selection system, programmable keys per channel and other improvements; PAW 120 digital field recorder with built-in speaker, operation from AA batteries, built-in mic and optional stereo XLR adaptor for external mic, records linear audio and connects as a Windows external drive; Course multi-codec with a 10-slot chassis now accepts POTS hybrids and IP cards, extending utility beyond current capability for ISDN lines, satellite links and digital point-to-point connections.

AKG N7715
Intro: Limited-edition C 414 LTD large-diaphragm condenser microphone features hand-selected capsules and components for optimum sonic performance, plus a classic nickel finish and brass grille screen; IVM 4 UHF wireless in-ear monitoring system with integrated dbx digital signal processing; five-model MicroMic Series miniature microphone line with two headset models, the C520 condenser vocal microphone and C555 microphone for dancers and backup vocalists.
Established Products: Perception 100, Perception 200, Perception 400.

AlterMedia Inc SL10226
Intro: Studio Suite 8 manages schedules, con-

tacts, communications, projects, inventories, libraries, labels, invoices and other complex organizational requirements of production facilities, supports integration with Pro Tools, QuickBooks and iCal and supports all forms of media production.

Altronic Research N5126
Established Products: RF dummy loads.

American Tower Corp. N6028

Anchor Audio N6313
Intro: The Beacon sound system stands on its own in a compact enclosure with no stand needed; Assistive Listening System designed to help the hard of hearing better understand speech, music and other sounds during a performance, lecture, movie, meeting or worship service; Liberty Sound System with speech-project mode; MegaVox Pro lightweight PA system with signal-alert button and shoulder strap; AN-130 speaker monitor system.

Andrew Corp. C4946

ANT Group Srl C2936
Intro: RDF 1U provides remote control and front-end monitoring, with redundant power supply, optional redundant CPU and optional redundant communication interfaces; ANT137 SNMP to ANTLAN proxy can act as an SNMP agent or NMS, performs translation from proprietary serial communication protocols (RS-232 or RS-485) to SNMP format making data available as user programmable OIDs over Ethernet, as an NMS it is useful in sites where no IP connection is possible, scanning a list of OIDs and maps readings inside the RDF where real-time alarm monitoring is performed and sent to the control room via phone, two-way radio, GSM, etc.; ANT131 RF power detector.
Established Products: NetPOD software, software plug-in modules, remote data front end.

Aphex Systems N6506

APM Music SL9227
Intro: The MyAPM online portal offers search and download technology and customized project management for digital music; tracks can be shared online or via e-mail; MyDrive portable drive that combines a search engine with a digital music delivery system, customized local server solutions available.

APT N4218
Intro: WorldCast Eclipse multi-algorithm stereo audio codec includes multiple interfaces — IP for WAN/LAN connections, X.21 for high-speed fixed synchronous networks and ISDN for connection over dialup digital links. Supports 16-bit apt-X and Enhanced 16- and 24-bit apt-X, as well as options for MPEG-1/2 layer II/ layer III, MPEG-2/4 AAC, G.711 and G.722; designed for STL and interstudio networking, the WorldCast Meridian codec offers a choice of main/backup telecom links, as well as a suite of coding algorithms; the WorldCast Horizon two-channel stereo codec is for real-time transport of broadcast audio over IP networks; WorldNet Oslo audio multiplexer is designed to transport compressed or uncompressed audio and data

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across digital networks, card-based expandable chassis, redundant power supplies, hot-swappable cards and automatic backup functionality.

APWMayville SU7220
See Stantron.

Armstrong Transmitter N7034
Intro: THX HD analog and HD-R FM translator is designed as a replacement for analog-only translators, the unit picks up both the full HD-R and analog signals and retransmits both at the assigned frequency.

Established Products: T Series FM single-tube transmitters, B Series improved solid-state amplifiers, FMX B exciters, E Pack emergency solid-state portable FM transmitters, FMA antennas and XL Link analog and digital STL systems.

Arrakis Systems N5421

ARRL—The National Association for Amateur Radio L1

ATA Audio N5528

ATS Communications C8112

ATTO Technology Inc. SL4326, SL1413Q

Audemat-Aztec N8614
Intro: Version 1.4 software for the HD Goldeneagle HD Monitor adds the ability to display the complete NRSC (5A) mask for AM and FM HD stations and monitor compliance, as well as monitor digital/analog audio time alignment with alerts via e-mail, SMS, SNMP trap or voice call, new modulation monitoring capabilities include peak weighting and filtering, as well as monitoring 67 and 92 kHz subcarriers.

Audio Precision N6917
Intro: APx586 audio analyzer tests 16 channels simultaneously, including Dolby and DTS confidence testing, CEA-2006 and CEA 490 testing and other new features for audio testing.

AudioScience N7331
Intro: ASI6585 is a PCI sound card. Supports the Axia Livewire protocol. Eight stereo streams of recording/playback, MPEG layer II and layer III recording/playback, time stretch/squeeze and sample-rate conversion.
Established Products: ASI6500 PCI and ASI6600 PCI Express sound cards, ASI8702 AM/FM tuner adapters and ASI6416 and ASI2416 CobraNet products.

Audio-Technica U.S. Inc. N4526

Intro: AT892 MicroSet low-profile omnidirectional condenser headworn microphone offers intelligible, natural audio for radio and television commentators with a capsule diameter of just 2.5 mm plus an ergonomic under-ear design that hooks behind either ear for a secure, comfortable fit with or without glasses, available in black, beige and cocoa wired and wireless versions and comes with a clothing clip, moisture guard, two windscreens, two elements covers and a carrying case; ATH-M50 professional studio monitor headphones offer maximum isolation and comfort for on-air radio and television field audio work with natural, well-balanced sound from proprietary 45 mm large-aperture drivers with neodymium magnet systems and CCAW voicecoils for ultraefficient signal transfer, efficient collapsible design provides space-saving portability and storage, while circumaural ear pieces swivel 180 degrees for easy one-ear monitoring.

Established Products: Stereo microphones and 40 Series, 30 Series and 20 Series studio production microphones.

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E-mail: mediaproduction@atus.com
Web Site: www.audio-technica.com

Avlx Corp. N4631
Intro: Mipro Act-81/82 wireless mic features proprietary 128-bit encryption, subband ADPCM algorithm, high SPL capability, equalization and microphone modeling; Mipro MA-808 portable PA includes high-efficiency Class D, 120 W RMS amplifier for the 10-inch woofer and a Class AB, 50 W RMS for the HF driver, as well as a luggage-pull design with a retractable handle and bottom wheels; HS-09 single ear-worn microphone features a rear-fitting, adjustable headband, cable and connector with frequency response range from 20 Hz to 20 kHz; DA-03 dual ear-worn microphone is waterproof and has a low profile.

AVT Audio Video Technologies C8828E
Intro: Magic TH2 POTS digital telephone hybrid with two POTS line interfaces enables two telephones to be connected for pre-talk and dialing, features analog and digital AES3 audio interfaces with separate sample rate converters, CLIP functionality; Magic AC1 XIP audio codec contains ISDN, X.21

and LAN interfaces that support G.711 and G.722 encoding, as well as MPEG-1/2 layer II and layer III, SIP protocol, analog and digital AES3 audio interfaces, operation from front keypad with graphical display or Windows-based software; Magic ISDN modular telephone hybrid system supports 16 caller lines and can now be connected to POTS lines, features include digital echo canceller, expander and automatic gain control for each caller.

Axel Technology Srl N3121, N5426

Intro: Falcon 50 six-band digital audio processor includes FM, HD Radio, DRM and DAB support with near-zero latency, density improvement, SuperBass feature, peak limiting system, built-in spatial stereo generator and automatic changeover between inputs; Soundtrack software for automated or assisted radio broadcasting and music background in public places integrates audio in MP2, MP3 and WAV formats and provides several levels of programming for automatic playlist creation, as well as integrates an interface for advertising programming and broadcasting.

Established Products: Oxygen mixer range, Falcon range, Boxel, Macrotel range, Shark range, Dolphin, Genius, Merlin, Matrix 42, Sat time synchronizer, Parrot and Koala.

Axia Audio N7726

Intro: Axia iProbe intelligent network maintenance and diagnostics software suite makes managing, updating and remote-controlling an Axia system easier, giving administrators information about and control over IP-Audio networks with an auto-documentation feature for querying and documenting configuration settings for every networked Axia device, organizer gathers Axia audio nodes into logical groups for management and single-point administration of group settings, works with any Axia IP-Audio network.

Established Products: Element modular console, AES/EBU node, analog line node, router selector node, GPIO node, Axia IP-Audio driver for Windows, PathfinderPC router control software, Axia iPlay PC software, iProfiler.

AzEP (Arizona Engineered Products) C8523

Intro: SureShot II-Mobile GPS-based 1 RU automatic antenna positioning system works with any antenna, pan-and-tilt and controller, automatically compensating for antenna skew, can be ordered with internal power to control pan and tilt, or without to work through an existing controller, configurations capable of remotely controlling the receive site are available, as are models with the ability to be remotely controlled from another location; Optimus mobile microwave antennas are built in the traditional offset-feed design for ENG applications; Optimus Performance Series lightweight, durable microwave antennas in three configurations — switchable quad polarization, switchable dual polarization and fixed dual polarization — with aluminum mounting brackets and construction; Optimus central receive antennas in traditional one-piece or clamshell radome designs, include a heater option and are environmentally sealed, may be ordered with continuous rotation for auto-tracking.

B&H Photo-Video-Pro Audio SU3006

Backbone Networks Corp. SL6709

Intro: Backbone Internet Radio v4.2 integrates an interactive revenue bridge with the iTunes music store, proving greater access to programming content and a mechanism for generating additional e-commerce revenues through the iTunes Affiliate program; Backbone Radio Hosting Suite is a low-cost, integrated service based on the Backbone Radio Pro client running on a Mac with a mic and a DSL connection.

Barix AG N8034

Intro: The Exstreamer 200 is a real-time audio decoder with amplifier that features open, documented interfaces and a USB port for flash drives; the Annunicom 100 universal intercom device encodes and decodes mono audio signals in real time and transmits to up to eight destinations; the Barionet universal and programmable network controller Ethernet interface includes eight digital output, four of which can be used as analog ins, four digital open-collector outs, two relay outs and RS-232/422/485 port and a temperature sensor bus interface expandable with R6, IO12 or X8 units; the Exstreamer 100 real-time audio decoder and Instreamer real-time audio encoder IP streaming devices feature multiple operating modes and control via a Web browser or open API.

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Beat The Traffic R135

Intro: BeatTheTraffic.com 2.0 includes online interactive maps showing traffic flow, incidents and camera images, point-to-point travel times overlaid on a map, peak times and best times to start a trip to "beat the traffic," personalized content offering includes real-time incident alert and delay alert notifications sent by e-mail or to a cell phone using text messaging; sponsored text messages can be inserted too.

Belar Electronics Labs N7722

Belden C9441

Bext Inc. N5731

Intro: FMeXtra Model Aruba radio receiver with wooden cabinet, hi-fi speaker, tuned port for bass enhancement, enhanced reception specifications, connection for external speaker to use in stereo mode, headphone output, digital optical output, programmable for conditional access, USB connection and planned support for MPEG-4 Player with SD card; latest-generation FMeXtra Encoder with enhanced audio quality and programmability for conditional access; FMeXtra Technology provides broadcasters the capability to broadcast additional digital channels, alongside standard analog FM programs, simultaneously and on the same carrier; TX 10000, TX 20000 and TX 30000 hot-pluggable, compact solid-state FM transmitters; FLX Series FM transmitters with optional built-in RDS Encoder, with 350 W, 600 W and 1.3 kW versions; FX 2500 2.5 kW compact FM transmitter; P 1000 portable, compact 1 kW FM transmitter approximately the size of a shoebox is a transportable spare or emergency unit.

Established Products: FM transmitters to 35 kW, FM exciters from 10 W to 1.3 kW, FM translators and boosters, STL systems, audio/stereo processors, FM antennas.

beyerdynamic N9014

Intro: Opus 900 wireless system; TS 900 M and TS 900 C pocket transmitters with rechargeable contacts, as well as three offering 99 pre-programmed frequencies, the NE 900 S single-channel, NE 900 D dual-channel and NE 900 Q quad-channel receiver; Headzone portable surround mixing system provides headphone-based 5.1 surround sound reproduction for studio, mobile recording and post-production applications, features Headtracking technology added to DT 800 PRO headphones to locate the orientation of the head with respect to the source material and adjusts the 5.1 audio accordingly.

SURE BETS

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OK we can't all look like Brad Pitt or Angelina Jolie. But in the case of "Bodies—The Exhibition," someone must be on to something with the old sayings about inner beauty.

An exhibition at the Tropicana features 21 preserved bodies that have had their exteriors stripped away, resulting in a display that showcases the beauty and complexity of the human interior. There are also 260 organs that allow visitors to dig deeper into anatomical systems like the circulatory or respiratory systems.

The exhibition, which has appeared in other cities, has generated controversy about the use of real, skinned human corpses. One headline asked: "Education or Freak Show?"

The peek into the body was achieved via polymer preservation, which replaces tissue and water with silicone rubber. The preservation approach has allowed exhibitors to "freeze" bodies into poses, for example of an orchestra conductor and baseball pitcher in stages of action.

If you show your NAB badge at the ticket office, the show's promoters will give you the group rate, which works out to about 20 percent off.

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World Radio History

BIA Financial Network/Dataworld N6817 streaming.

Bid4Spots N9231

Bird Technologies Group N5738
Established Products: TPM, BPME, Wattcher, water- and oil-cooled loads.

Bosch Communications Systems C5329

Bose Corp. C11629

Bridge Digital Inc. N705
Intro: Software packages for data management including Media Beacon Asset Management, Telestream Flip Factory, Rocket DVD, Pulse Digital DVD Select Net and Rimage CD/DVD publication systems; Bridge High Availability and Disaster Recovery Solutions; Quantum StorNext and StorageManager Software, Quantum Tape Libraries, Marathon EverRun Fault Tolerant Virtual Server Software, Atempo live backup continuous data protection and time navigator backup and archive software, Apple XSAN, ADTX Raid Systems, and other types of shared storage.

Broadcast Electronics N7106
Intro: TRE Producer, part of The Radio Experience Messagecasting suite, creates and publishes program text data for RDS, HD Radio and other delivery systems. Stations with TRE Message Manager may interleave local text with that of the network program; TRE Revenue Suite provides management of text advertising with accountability over RDS and HD Radio; IDi 20 HD Radio importer software version 2.0 incorporates Ibiqity's latest functionality, BE-exclusive Dashboard interface enhanced for ease of operation and flexibility; Fmi T Series high-power tube-based HD Radio transmitters feature Class C operation and patented folded half-wave technology; AudioVault Version 9.2 includes compatibility with Microsoft Vista, management of very large databases, a simple, non-administrator permission scheme and Digigram VX222HR support.

Established Products: 4MX AM transmitters, Fmi solid-state HD Radio transmitters, AM and FM analog transmitters, AudioVault radio automation, Big Pipe high-bandwidth STL, Marti RPU products and SoniXstream Internet

Broadcasters General Store N8322

Broadcast Microwave Services C1607
Intro: TCII Media Router offers extended network capabilities to mobile ENG field units using BMS Truck-Coder II digital microwave system, allowing operator to send prerecorded program segments as files to the studio over a digital radio link.

Broadcast Software International N8621
On display: Simian is an affordable playout and automation solution for small- and medium-market radio stations, Webcasters and in-store entertainment; WaveCart 4.0 is the latest version of our on-screen cart-machine replacement, now with 24 HotKeys, it displays up to 10 on-screen players, each of which can be sent to a different sound card output. It supports the newer 24-input USB Trigger Kit as well as older PCI, ISA and JoyStick inputs; also, Stinger provides instant playback of up to 288 audio files at the touch of a button, and V2.0.38 is now available.

Broadcast Store SU2820

Broadcast Tools Inc. N6908
Intro: ProMix12 compact mixing console for broadcast and audio production facilities; WVRC-4 1 RU solution for Web-based and/or recordable voice response dialup transmitter site control with each status, silence sensor and power failure input configurable to send alerts to up to four e-mail addresses; SCR-16 serial remote control offers connection through an RS-232 or RS-422 serial port with baud rates up to 38,400; ACS3.2USB three-input, two-output stereo switcher with USB audio interface and no need for a sound card; VAD-2Plus user-programmable two-input, multi-number voice/pager auto dialer designed for dial-out voice message notifications, two telemetry channels, two raise/lower relays and two status channels, offers power failure detection, temperature sensor and silence sensor.

Broadcast Warehouse N7328
Intro: DSPXmini HD processors optimize audio for digital radio transmission as an Internet stream or for HD Radio, IBOC, DRM and/or

DAB transmission; TX25-50 stereo FM transmitter suited for low-power radio stations with exciter, amplifier, power supply, stereo encoder and limiter included in 1 RU chassis, frequency adjustable, output power adjustable from 25 to 170 W; TX150-300 FM transmitters offer same benefits but with power levels of 25 W to 325 W; BW RDS range with three units of varying RDS capability: RDS 1 encoder for basic RDS information such as program service name (PS), program identification (PI) and program type (PTY), RDS 2 encoder adds scrolling text and timed text lists, and RDS 3 is a dynamic encoder with TCP/IP connectivity for the insertion of static RDS parameters including EON, CT, PTYN, SLC, PIN, LINK, Paging, IH, TDC, TMC, ODA, EWS; DSPXtreme broadcast audio processor features two LCD color screens, one of which is touch-sensitive, extended remote control capabilities, LAN and serial (RS-232) interfaces as well as WiFi, optional diversity delay, six bands of audio limiting, distortion controlled clipping and look-ahead limiting.
Established Products: DSPXtra, DSPX, TX1, TX5, TX600 and AMP1000.

Burk Technology N8611
Intro: AFD-1 interfaces with a remote facility management system such as the Burk Technology ARC Plus, ARC-16, GSC3000 or VRC2500 to notify personnel of electrical arcs and flame at transmitter enclosures, antenna tuning units, transfer switches, etc., reliably detects a pilot light, flame or arc from 15 feet; Adaptive Serial to Ethernet Bridge connects two LANs over a serial link, allowing easy network connection to equipment at remote broadcast sites for IP-based broadcast facility control, access to Web-based setup and monitoring GUIs for a variety of remote equipment and e-mail access at the transmitter site; Web-controlled AM/FM/RDS Receiver allows managers, programming staff, engineers and others to remotely tune any station in the market and monitor real-time field intensity, phase, RDS activity, L/R audio and other parameters via the Internet with RDS text logging, audio alarm archives and FCC database integration.
Established Products: ARC Plus, ARC-16, GSC3000 and VRC2500 broadcast facility control systems and accessories.

Burle Industries Inc. C4907

Established Products: FM tetrodes.

Burli Software Inc. N6028
Intro: Burli Newsroom System, version 201, includes expanded mobile and networked news production tools, enhanced support for NewsML data exchange and multi-tier cascading server redundancy, as well as newswire ingest and output, multitrack audio editing, news archiving, collaborative news editing, Unicode support, radio prompting, news audio logging and automatic podcasting.

BW Broadcast N7330
See Broadcast Warehouse.

Calrec Audio Ltd. N8529
Intro: Omega with Bluefin equips the smallest Calrec digital console with 160 mono DSP paths packaged as 48 stereo plus 64 mono channels, allowing up to 24 full 5.1 surround channels, features include eight 5.1 surround, stereo or mono audio groups, 20 auxiliary outputs as 20 mono or 10 stereo and 48 outputs for multitrack or general-purpose feeds, Surround Spill panel is for independent leg adjustment of 5.1 channels, with Bluefin providing 19.6 minutes of audio delay divided into 432 mono legs of up to 2.73 seconds each, three frame sizes — 24, 32 and 48 faders — and two main stereo or 5.1 surround outputs with equalization and compressor/limiter facilities; fixed-format remote I/O boxes ranging from 2 RU to 4 RU with PSU redundancy and single or optional dual IEC power connections, including the AD5603 analog I/O unit and JB5607 unbalanced AES I/O unit.
Established Products: Alpha with Bluefin, Sigma with Bluefin and Hydra.

Cedar Audio USA N4926
Established Products: Duo declickle and Duo auto dehiss.

Checkers Industrial Products C10817
Intro: Powerback non-metallic, flexible rubber duct systems organize and protect cords and cables in walkways or work areas while reducing trip hazards; FastLane drop-over cable protectors; Guard Dog cable protectors are modular and feature dog-bone-shaped connectors and protect cable sizes up to 2.25-inch diameter; LineBacker cable protector ramps feature T-shaped connectors and protect cable sizes up to 3.25-inch diameter; Cross-Guard ramps convert Guard Dog and LineBacker cable protectors into ADA-compliant protectors with a gentle slope.

Clark Wire & Cable C7025
Intro: Cat5-Flex tactile rated Cat5e cable for patch cables or remote applications where flexibility and durability are required; 712-Plen 12-channel 22 AWG audio cable for use where plenum cables are required, each audio pair is covered with a foil shield and individual color-coded jacket.
Established Products: Mic cable, digital audio snake cables, patchcords, patchbays and assemblies.

Clear Channel Satellite OE320
Intro: Two-way IP communication via satellite for audio, video, VoIP, high-speed Internet and data in a mobile application.

Coast to Coast Tower Service Inc. C1614
Intro: Broadcast tower and antenna specialist offers tower maintenance and erection, 24-hour emergency service.

Coaxial Dynamics N6315

Coles N4926
Established Products: 4104 noise-canceling microphone.

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Comet North America**N8406**

Intro: Comet Integrated Drive provides multi-functional motors, couplers and capacitors, eliminating the need to source and integrate components from multiple suppliers, dramatically reducing procurement and assembly lead times and providing a standardized, easy-to-install subsystem; Comet Variable Vacuum Capacitor includes a motor, coupler and tube to drive the capacitor, with a durable, backlash-free coupling and a bulkhead flange and adjustable end flange, features include optional memory chip that stores specific module information, such as capacitor type, serial number, measurement of capacitance curves and, on request, an integrated stepping motor driver and a micro controller for high-level commands.

Comrex Corp.**N5726**

Intro: ACCESS portable stereo BRIC IP/POTS codec uses Broadcast Reliable Internet Codec technology to deliver broadcast audio over the public Internet, features include integrated LCD/touchscreen interface, Web browser to simplify connections to WiFi access points that require log-in, built-in Ethernet port and rechargeable battery. Connection to a range of other data networks via integrated CardBus slot including modem connections, 3G cellular data links and WiFi or Wi-MAX, MPEG-4 AAC algorithms option and optional "clip-on" mixer; ACCESS rack-mount stereo BRIC IP/POTS codec delivers mono or stereo audio over POTS, DSL, cable, WiFi, 3G cellular, satellite and other services from a 1 RU box that can be mounted in a studio or remote vehicle, can be configured to connect automatically to a preset connection upon power-up, four contact closures end-to-end provide flexibility as a backup STL or for other emergency transmission scenarios, Web browser-based control panel can be accessed from virtually anywhere.

Established Products: STAC telephone talk-show system, Matrix POTS/ISDN/GSM codec system, and DH20, DH22 and DH30 digital telephone hybrids.

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Continental Electronics Corp.**N7706**

Established Products: 816R Series 11 to 38 kW FM transmitters; 816HD 10 to 30 kW FM+HD transmitters; 814HD and 812HD transmitters; 802B FM exciter; 418-DRM 100 kW HF transmitter; 419G/420C 300/500 kW HF transmitters; solid-state modulator; and LF, VLF, high-power and other products for special applications.

CPI / Eimac Operations**C2511, N7426**

Established Products: Design and manufacture of high-power amplifiers, klystrons, millitrons, TWTs and subsystems for satellite uplinks, as well as Eimac IOTs for digital television and triodes and tetrodes for FM and shortwave radio broadcasting. Rebuilds vacuum electron devices through Econco division.

Crown Broadcast**N6906**

Intro: HD translator capable of passing the entire FM envelope without demodulation, resulting in excellent audio quality with no need for a separate IBOC site license.

Established Products: FM transmitters from 30 W to 10 kW with audio processing or receiver for translator applications built into exciter.

CTE International Srl**N9020**

Intro: VL3 compact MOSFET amplifier with declared operational parameters assured

across the frequency range and in extreme environmental conditions.

Dalet**SL4305**

Intro: Dalet Enterprise Edition codec-independent workflow engine designed for open broadcast systems, based on a media asset management architecture to guarantee scalability, offers comprehensive set of media ingest, production and distribution tools for radio, television and interactive media within a single user interface; Dalet NewsPro for Omneon plug-and-play digital production and playout system for small- to mid-size newsrooms that use MOS-compliant newsroom computer systems; Dalet NewsWire 2.0 scripting and newsroom system.

Dan Dugan Sound Design**N5517**

Intro: Model E automatic mixing controller puts Dugan automixing into a compact package with minimal controls, eight-channel, line-level insert

device in a half-rackspace, 1 RU package, I/O is via TRS insert cables or ADAT optical cables.

Established Products: Models D-2 and D-3 automatic mixing controllers.

Davicom, a division of Comlab Inc.**N5413**

Intro: The MiniMAC remote monitoring and control unit for sites with just one transmitter has eight metering inputs, 16 status inputs, two audio inputs, eight physical relays and one reach-through serial port, bilingual voice and screen capability (supporting Unicode character sets), multiple alarm-call lists and a user-defined log, configuration and control through MacComm software version 5; SuperMAC scalable remote monitoring and control system allows MAC units to be networked for expanded I/O capacity and future growth, with version 5 firmware and MacComm software version 5.

Established Products: Davicom MAC for monitoring, alarm and remote control; audio switch-

er; dual audio presence detector; and FM power monitor.

D.A.V.I.D. Systems Inc.**N5431**

Established Products: Content management and digital delivery solutions to integrate assets, automate processes, maximize resources and deliver media across multiple platforms with metadata storage that supports graphics, video and text, as well as new features such as one-click podcasting, searchable station archives, news portal and playlist-to-the-Web, WAN architecture and Remote Reporter help consolidate multiple locations in real time.

DAWNco**C7841**

Intro: FSS-95F9 rack-mounted fiber-optic TX and RX units used with satellite downlink to pass signals long distances without loss; SFS16x1 satellite feed matrix switch system

The cash-machine formerly known as RevenueSuite returns to the airwaves as Google AdSense for Audio.

RevenueSuite, a source of additional income for radio stations, promises to be even more so in this incarnation as AdSense™ for Audio, thanks to the power of Google technology. And when you combine that with the industry's most innovative station automation products – SS32™ and Maestro™ – you'll understand why hundreds of stations in markets of every size are starting to talk about the future of radio stations with renewed optimism.

At Google, our commitment is strong and clear and unchanging: we're here to help you run your station more efficiently and profitably than ever before.

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HD and DRM are the Driving Forces behind

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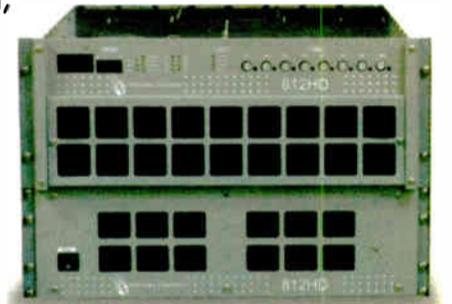
816HD

With more than 60 years of experience in designing cutting edge broadcasting technology, it's no surprise that Continental Electronics is leading the charge to bring next-generation broadcasting technology to the world. Whether broadcasting, military, scientific, government or industrial applications, people depend on the reliability of Continental Electronics' equipment to get the job done.

With dozens of HD/IBOC installations already on the air, Continental Electronics' 816HD Analog+HD FM transmitter is rapidly becoming the system of choice for broadcasters who want an easy, reliable solution for HD Radio. Using a small footprint,

single-tube transmitter, the single-box solution allows broadcasters to implement analog and digital simulcasting quickly and easily. The 816HD systems, available with either air or liquid cooling, provide TPOs of up to 28kW in a single transmitter and 55kW in a combined system.

Simply put: Continental delivers more high power level options than any other manufacturer. The 816HD ensures that your signal is clean, clear and strong while lessening the cost of HD/IBOC conversion and reducing ongoing operational expenses.



812HD



418DRM

Building upon the success of its solid-state modulator product line, Continental Electronics brings high efficiency DRM transmissions to the world with its 418/419/420 product line of shortwave broadcast transmitters. Whether the broadcaster is looking for a DRM upgrade, a brand new, fully compliant DRM transmitter, or even a fully configured DRM content server, Continental has your solution. Utilizing the RF Phase and Amplitude signals within the transmitter, Continental transmitters provide a high efficiency DRM signal that is spectrally compliant while still producing the full PEP capability of the AM transmitter.

At *Continental* We Do IBOC
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4212 South Buckner Blvd. Dallas, Texas 75227
phone: 800.733.5011 ■ fax: 214.381.3250 ■ www.contelec.com

allows satellite receiver to connect to any of 16 LNBs connected to the switch.

Established Products: Satellite antennas, LNB amplifiers, feedhorns, TI filters, L-band splitters and signal cable, satellite, audio/video, data and broadband fiberlink, fiber patch panels, fiber-optic cable assemblies, receivers and transmitters.

DaySequera/ATI Group N7323

DB Elettronica Telecomunicazioni N6031

Delta Meccanica Srl N6819

Denon & Marantz Professional N1831

Intro: DN-C640 network CD player reads CD-R/RW and DVD±R/RW discs, supports CD-DA, WAV, MPEG-1/2 layer III, MPEG-1 layer II and WMA files, ±12 percent pitch control, quick replay feature, end monitor and user-selectable finish mode features, cue to music (with dedicated button), program play and balanced audio output.

MHz band, using multi-layer parasitic patch technology (MPPT); broadband omni CP pylon antenna for MobileMedia solution for the lower 700 MHz band with a third of the radiators, feed system and connections typically used in a panel-style antenna for low RFR, VSWR of less than 1.2:1 and low windload; new filters and components for MobileMedia for LPTV, DVB-H and mobile TV markets.

Established Products: HD Plus antenna, HDR Dibrad combiner, HDFMvee antenna, DCR ring-style antennas.

Digigram N6518

Intro: The Visiblu Network Audio Operating System is the fruit of audio technologies developed by Digigram and its partners, unifying sound cards, sound processing software, audio on EtherSound or IP networks in a single platform for transparent solutions, reduced time and costs; LX6464ES PCI sound card provides convenient, effective way to bridge a range of computer audio applications to all channels of a 100 Mbps EtherSound network.

[E3] Engstler Elektronik Entwicklung GmbH C8431J

Intro: SB6432 programmable, RGB-backlit LCD pushbutton switch with 64- by 32-pixel display with extended command set and calibrated backlighting in more than 10,000 RGB colors; CP1204 custom control panels with 48 SB6432 switches.

EBS N6031

Eddystone Broadcast N5128

Intro: 7605C production version of the compact 5 kW 7600 Series previewed at NAB2006; XA300 2 RU LCD-monitored 300 W power amplifier with TCP/IP remote.

Established Products: XE50, XE300, XE150,7610 10 kW, 7602 2 kW.

Efron Computerized Studios LLC N9608

Intro: Efron Computerized Studios LLC (ECS) produces studios for AM/FM broadcast radio stations, Internet and satellite radio stations, as well as schools with setup on the same day as delivery to ensure facility is on the air right away. ECS Studios are custom-built including the furniture and no charge for engineering.

Edward Efron, President

10550 Habersham Ct.

Las Vegas, NV 89183

702-595-3147

Fax: 702-617-8759

E-mail: eefron@efronstudios.com

Web Site: www.efronstudios.com

Elber Srl C1628

Intro: The CPM compact portable microwave radio link uses COFDM and analog FM modulation schemes. The digital fixed microwave radio link system for STL/TSL applications consists of the T_SL transmitter and R_SL receiver indoor units, both housed in a 1 RU rack, connected to a DDM310 digital modem able to transfer data rates higher than 160 Mbps; RK210 digital versatile rack built around ASI multiplexer and demultiplexer boards to generate high data rate ASI signals for transport by a microwave radio link; SRS software radio system for processing and transferring FM audio signals.

Electronics Research Inc./ERI N1119

Intro: Several products for broadcast transmission and structural applications including a 4-1/16-inch connector for Andrew HJ11-50 4-inch air Helix. The connector is compensated for low return loss and can be assembled without special tools; it is available in both gas-pass and gas-barrier versions. The ERI Ultra Guy Anchor Rod is designed to allow non-destructive, non-invasive and easily reproducible testing of buried guy anchors. The guy anchor rod is designed with a unique window that allows for ultrasound testing to detect corrosion and stress cracks without requiring excavation of the guy anchor or resorting to temporary guys.

Electrorack Enclosure Products C1936

Intro: Barracuda 19-inch electronic equipment racks with integrated power, cable management, bus bars, grounding and other components; IP addressable power to access, monitor and control individual receptacles remotely via a Web browser.

Electrosys C3331

Established Products: FM transmitters.

Elenos N8319

Intro: ETG2000/3000 digital exciter providing 90 dB S/N, 0.01% THD, 60 dB stereo separation with ICEFET technology, built-in stereo generator and GSM alarms for dual drive, passive reserve, active reserve or n+1 operation; ET3000 compact solid-state 3 kW FM transmit-

ter featuring ICEFET technology and GSM alarms; ET6000 and ET31000 solid-state FM transmitters; ELT100-200 FM radio link for the 600-1,100 MHz, 1.5-1.7 GHz or 2.3-2.5 GHz bands with LCD graphic interface and micro-processor control.

Established Products: Exciters, transmitters, radio links and amplifiers.

Elettronika Srl N7337

Intro: Mizar FM stereo radio transmitter in 30 W (2 RU) and 300 W (3 RU) versions with simplified wiring, mechanized assembly, good distortion and high S/N specifications, telemetry on DB-9, RS-232 or RS-485 connection for remote control; STL FM link with 2 RU transmitter and 1 RU receiver, 90-250 V AC 50/60 Hz power supply or 24 V battery, multi-function display with five buttons, remote control by wired or serial (RS-232 or RS-485) connection.

Encore N2238

Intro: 2792 PRO audio/video/data fiber-optical link system for transporting baseband video signals, stereo audio signals and bidirectional data with EMI immunity via multi- or single-mode optical fiber.

ENCO Systems Inc. N6217

Intro: The newest release of DAD, the ENCO flagship product, features user interface enhancements as well as enhanced support for control and metadata, in both the radio automation and TV audio environments. It also features tighter integration with StreamLine end-to-end traffic and billing, music scheduling and automation/playout solution.

Established Products: DAD, StreamLine, PADapult, NewsBoss.

Don Backus, VP, Sales & Mktg.

29444 Northwestern Highway

Southfield, MI 48034

248-827-4440 ext. 130

800-ENCO-SYS

Fax: 248-827-4441

E-mail: backus@enco.com

Web Site: www.enco.com

Energy-Onix N6213

Intro: Tele-Link III system includes one encoder and one decoder in each terminal, each encoder can drive multiple decoders provided Ethernet connection has adequate bandwidth, runs under Linux; E-Caster system includes one encoder and one "cue talkback" decoder in originating terminal, second terminal of the system contains program decoder and a "cue talkback" encoder, can be used with any Ethernet connection, DSL, T1, ISDN or spread-spectrum wireless; DRE Aruba receiver receives any standard FM stereo broadcast, as well as FMeXtra broadcasts on stations carrying FMeXtra programming; SST-30FS FM exciter with high-performance stereo generator and fast-acting audio limiter for mono, MPX, stereo or simultaneous SCA operation, can be used with an external stereo generator and processor; Legend 5000C solid-state FM transmitter with frequency-agile exciter and hot-pluggable 1 kW drawer that can be safely removed or inserted while on the air.

Ergo 2000 SU5905

Intro: 23-inch panel-mount LCD flat-panel display with WUXGA 1920-x-1200 high-definition resolution, monitor swivels, tilts and rotates on a universal arm.

ESE C1839

Intro: ES-188 is a network time protocol (NTP) referenced master clock and time code generator providing the ability to offset local clocks from an NTP time server so that local events can occur at precisely the correct time, generates several types of time code (ESE-TC89,

SURE BETS

'You Know That Can't Be Bad'

Opening to boffo reviews and playing to SRO crowds, the \$150 million production of "The Beatles' Love" by Cirque du Soleil at the Mirage is said to combine inventively remixed and digitally re-mastered music of the group (with the blessing of its surviving members) by long-time producer Sir George Martin and son Giles. Soleil's elegant movements and acrobatics meld into the events that defined the 20th century's biggest rock band.

Jeremy Handel, public relations specialist for the Las Vegas Visitors and Convention Bureau, said, "It really has been a tremendous show. It's been pretty much sold out since it opened." Handel suggests you reserve tickets before coming to Las Vegas. If you can get 'em, you'll have to go early in your visit; the show is dark April 17 to 23.

"Love," *The Mirage*, (800) 963-9634, prices \$69-\$150. Dark Tuesdays and Wednesdays.



Dialight Corp. N8035

Intro: LED dual red/white medium-intensity beacons with life expectancy of more than eight to 10 years with no maintenance, meets or exceeds industry EMI/RFI standards, dramatic decrease in system complexity and dramatic increase in reliability; LED red beacon with proven field performance, 95 percent energy reduction, only 48 W and plug-and-play design, easily retrofit to existing lighting systems; LED single/double obstruction (side) lights with industry-standard LED fixture, proven field performance, multiple input voltages and robust design.

Established Products: LED single/double obstruction and LED visual signal lights.

Doug Woehler, Bus. Dev. Mgr., Obstruction

1501 Route 34 South

Farmingdale, NJ 07727

732-919-3119

732-991-2837

Fax: 732-751-5778

E-mail: dwoehler@dialight.com

Web Site: www.dialight.com

Dielectric Communications C1907

Intro: Low RFR pylon antenna for MobileMedia, available with horizontal, elliptical or circular polarization, for applications where downward radiation is a concern, such as atop buildings or short towers in residential areas. Design achieves 300 percent reduction in power density near the antenna; also, Broadband CP panel antenna for MobileMedia, circularly polarized UHF antenna with up to a 16 kW average input power rating and covers the entire lower 700

Established Products: EtherSound, HR and PCIe series sound cards, UAX220-Mic.

Digital Radio Express N5731, N6213

Intro: New FMeXtra multi-channel digital program FM radio broadcast system, now with conditional access and Open Standard Encryption. Production radios available now feature such additions as Visual Displays, Digital Optical Output, USB upgrade for future enhancements.

DK-Technologies America N1835

Dolby Laboratories N2513

Dorrough Electronics C5213

Established Products: Loudness meters with peak and RMS indications for accurate monitoring of audio signals for analog and digital applications.

Drama King Music Library SL7423

DSI RF Systems Inc. C1336

Intro: RF-IPMAX license-free audio and video microwave transmission system with a range of 50 miles line of sight or up to 49 Mbps throughput, shorter range for non-line-of-sight applications.

Established Products: Consulting and design services, transmitter facility design and implementation, microwave systems, combiner design and installations, microwave network design and installation.

DYMO Corp. C8236



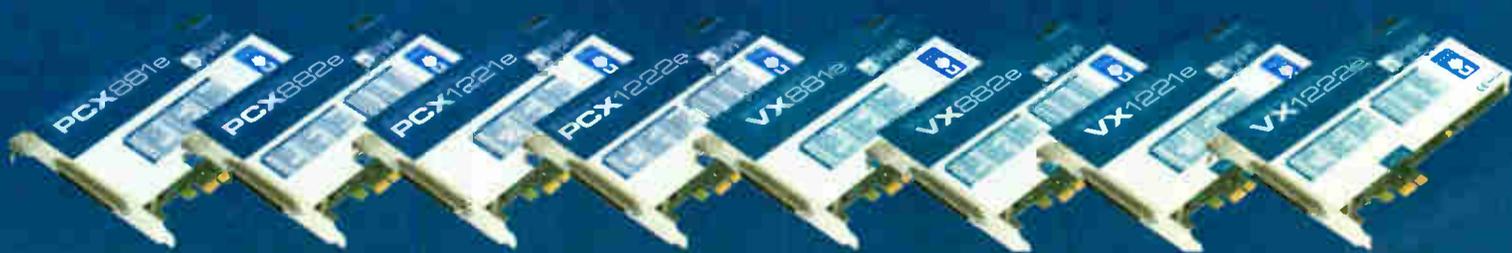
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**Exacting specs. Outstanding quality.
Absolute reliability. Total connectivity.**

The new PCIe bus PCX and VX sound cards are not only built with Digigram's expertise and commitment to quality, they are also network-ready, designed to blaze new routes for digital radio infrastructures. Thanks to Visiblu[®], the network audio operating system by Digigram, you're connected to the world of distributed IP audio. Combined with Digigram's legendary audio processing and encoding, these sleek pieces of technology will take you to all the right places...

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ESE-TC90, USB, RS232C/ASCII, SMPTE/EBU and IRIG-B), as well as 1PPS signal; ES-185U/NTP offers NTP output for network time synchronization, includes NTP output, IRIG AM or TTL time code, SMPTE time code selection through supplied software and USB connection for configuring setup features, on-board 12-channel GPS receiver assures performance.

Established Products: Master clock systems, audio and video distribution amplifiers, SMPTE/EBU time code products, audio level indicators and interfaces.

Eventide N6909

Intro: Version 1.5 software for BD600 and BD600E broadcast delays.

Established Products: BD600, BD600E, BD960 broadcast delays, DSP4000B+ broadcast and post-production processor, H7600 Ultra-Harmonizer, H8000FW eight-channel Ultra-Harmonizer, Eclipse, Reverb 2016 and Anthology II plug-in bundle for Pro Tools TDM.

EV Microphones N9617

EZ Quest Inc. N1833

Fairlight SL4010

FirstCom Music SL9820

On display: Seventeen libraries with 42,000 compositions, growing by 100 CDs a year, featuring award-winning composers and musicians creating a diverse repertoire of music from acoustic underscores to rage rock.

Flash Technology, a Dielectric Co. N7421

Intro: Additions to the line of M2M condition-monitoring solutions, including systems with the ability to monitor and manage non-IT-based assets such as HVAC units, backup generators, security access instruments, street lamps and cooling towers, helping with predictive maintenance to streamline operations and reduce operating expenses.

Fostex America N8734

Fraunhofer Institute for Integrated Circuits IIS SU6830

Intro: Live 5.1 surround sound for FM HD Radio demonstrated with ISO MPEG Surround standard combined with the HDC format, backward compatible with stereo or mono transmission, achieved audio quality very close to a fully dis-

crete surround system despite the fact that the surround image is represented by compact additional side information (down to a bit rate of 3 kbps); High Definition Advanced Audio Coding (HD-AAC) scalable lossless audio coding developed by Fraunhofer IIS in collaboration with I?R based on MPEG-4 AAC and MPEG-4 SLS for distribution of lossless audio via limited channels with high quality of service; and MPEG Surround Binaural added to DVB-H player SDK for Windows CE- and embedded Linux-based devices allowing for transmission of multi-channel sound at data rates currently used for stereo services and realistic playback of surround sound over regular headphones, integrated with ISMACryp encryption system for secure transfer of multimedia content.

Front Porch Digital SU14915, S209-LMR

Genelec Inc. SL11215

Intro: AOW312 three-way active on-wall loudspeaker built on 1037C technology but with an unobtrusive 7-inch-thick enclosure, includes 12-inch woofer, 3-inch midrange driver and 1-inch tweeter set into a Genelec waveguide, remote amplifier features protection circuitry and active crossovers. The bass amplifier is 180 W and midrange and treble are 120 W each, with a peak output per pair greater than 123 dB SPL; AIW25 in-wall and AIC25 in-ceiling active two-way loudspeaker systems in sturdy aluminum enclosures include 5-inch woofer and 3/4-inch tweeter with waveguide, remote amplifier features protection circuitry, active crossovers and 40 W per driver, with a peak output per pair greater than 110 dB SPL.

Gepco C7525

Global Security Systems LLC N9008

Intro: USB Stick for Emergency Alert plugs into any Windows PC supporting USB connectivity, connecting the computer to the GSSNet Public Warning and Alert System to present relevant alerts and messages with or without an Internet connection, built-in FM radio tuner supports FM/RDS; First Alert System Emergency Warning Receiver wireless, battery-driven receiver designed for mass distribution of alerting messages to the public via the national FM transmission network; Geo-Targeted FM-based mobile advertising delivering location-based identification for advertising purposes uses the FM-based data channel, separate from SMS

RF channels and protocol, to leverage FM signals to deliver mobile advertising data.

Established Products: GSSNet First Alert System, Mobile Advertising and Alert Handset Plug-in, GSS Mobile First Alert System Receiver and Emergency Operations Management Suite.

Google N6121

Intro: Google's business solutions for radio includes studio automation systems, AdSense for Audio and Audio Ads. Studio automation systems: the next generation of SS32 and Maestro are providing power, flexibility and stability. Google AdSense for Audio delivers advertising solutions that provide broadcasters with greater accountability, maximized revenues and tighter control over quality and operating costs. Google Audio Ads connects advertisers and agencies directly to radio stations with a robust online advertising platform that automates everything from sales and scheduling to delivery and near real-time reporting.

Greatway Technology N3835

Intro: AES/EBU digital audio fiber transmission system carries up to eight AES/EBU digital audio channels over one fiber, 20 dB or higher audio dynamic range, fiber transmission distance up to 100 kilometers, CWDM wavelength available.

Groove Addicts SL7823

Intro: Audio Network Music Library from the U.K., 162 CD library with more than 40 updates per year; Reliable Source Music Library; Warm News ID, Hard News ID and KNBC News ID packages composed by Grammy Award-winning composer Al Capps and recorded by the Prague Symphony Orchestra.

Hamlet N419

Intro: ReelCheck unattended video and audio analysis for video and audio files with error detection and logging; Pressision AR2-E8SHD 2 RU eight-channel audio monitor with integrated Dolby decoder; Monitor Scope MS/DS9000 for measurement and monitoring of all HD, SD and composite signals; Microflex provides handheld modular, measurement and monitoring of HD/SD or SD/composite signals.

Hannay Reels C9941

Established Products: Cable reels.

Harris Broadcast Communications Division N2502, N3100

Intro: ZX3500 FM transmitter, a 3.5 kW model from the ZX range of low-power transmitters, programmed for tri-mode operation for switching among digital, analog and hybrid modes. Can be delivered with one of three Harris excitors: FlexStar HDX-FM for HD Radio or analog FM, MicroMax low-cost analog exciter or DigitCD exciter; also, Harris DATAplus system allows for data transmission alongside audio channels in the HD Radio stream, opening revenue streams and interactive initiatives, accepts data management from multiple sources and stores, prioritizes and separately outputs the data to multiple sources including PAD for HD Radio or rich text RBDS information for analog receivers and Web; also, Intraplex SynchroCast3 third-gen simulcasting product with overlapping transmitters, uses Intraplex T1/E1 multiplexer or NetXpress IP multiplexer platform with GPS digital timing to increase coverage areas and reduce interference in a network of transmitters; FlexStar HDI-100 Importer with NeuStar SW4.0 pre-codec conditioning module.

Established Products: FlexStar HD Radio products, MicroMax low-cost FM exciter, Intraplex NetXpress audio-over-IP Platform, NetWave digital air console, VistaMax studio audio networking system, MasterLink-IP, DAX1 AM transmitter with DRM on-air upgrade kit, NeuStar 4.0 pre-codec conditioner, RMXDigital on-air console, StereoMixer Digital console, SmoothLine

furniture, Sage EAS Endec and DaySequerra Modulation Monitors.

Harrison Consoles N8122

Intro: AIR 24/7 broadcast studio production audio consoles for mono, stereo and optional 5.1 surround sound; Trion digital audio broadcast console for complex broadcast studio production and post production, supports all formats from mono to 7.1 surround, features Xrange signal processing and routing and IKIS control and automation; Xrange digital audio signal processing and routing system provides 32-/64-bit 48/96/192 kHz signal processing, MAD1 and audio-over-Ethernet interfaces, support individual or multiple digital audio consoles as well as facilities routing for multi-channel digital audio on AES3, analog and other signal formats.

Heil Sound N9420

Intro: Heil Deko Series Fin features the element found in the Heil PR20, fashioned after one of the great crystal mics of the Art Deco era, can be used live, on air, as a prop or anywhere a great-sounding mic is needed; Pink Pearl 20 PR20 Showcase Series colored microphone features the same element as the Heil PR20, with a Pink Pearl color and a pink ribbon pictured under the logo, 10 percent of the retail price will be donated to the Susan B. Komen Foundation for breast cancer research.

Established Products: PR20, PR30, PR40, PL2T topless boom, Classic Pro, Heritage.

Henry Engineering N7432

Intro: Multi-Phones II multi-user headphone distribution system now includes three-zone talkback feature, supports up to 12 Guest Pod listening stations that can be divided into three distinct zones for talkback (e.g., Host, Guest A and Guest B), producer or call screener can direct cues to separate headphone users, easy installation with Cat-5 wiring; AES USB Matchbox new USB-to-AES digital audio interface replaces computer sound cards with transformer-isolated AES I/O that eliminates ground loops and hum, connects to any PC via USB to provide full AES I/O, plus professional standard analog outputs on XLR connectors, Burr-Brown ADC/DAC, professional levels with exceptional headroom, powered by USB port.

Established Products: Matchbox-HD, USB Matchbox, USB Match Plus, PowerClamp, DigiMatch 2X6, Digital D.A. 2X8, AutoSwitch, Superelay, TwinMatch, USDA, MicroMixer, StereoMixer and StereoSwitch.

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HHB Communications Ltd. N7117

New: Combining a Sennheiser capsule with a broadcast-quality Flash recorder, the HHB FlashMic has become established as the portable recording device of choice for international broadcasters. Now HHB has expanded the FlashMic range with a cardioid version, the FlashMic DRM85-C, to accompany the omnidirectional DRM85. Both models have a comprehensive feature set, which includes 1GB Flash memory for more than 18 hours of recording, USB audio data transfer, high-quality preamplifier with manual or automatic gain control (AGC), illuminated LCD display and nine user templates that can be configured externally using the supplied software.

Holophone N6034

Intro: H4 SuperMINI 5.1 lightweight surround sound microphone with onboard matrix encoder outputs to stereo pair; H3-D 5.1 surround sound microphone for project studios, educational

Control Solutions

Model RFC-1/B Remote Facilities Contoller

- control transmitter from any telephone
- 8-64 channels of telemetry and control
- programmable control by date and time
- optional printer and modem adapters
- programmable telemetry alarms
- integrated rack panel



Model RAK-1 Intelligent Rack Adapter

- parallel printer interface
- internal modem for data transfer
- front panel status indicators
- battery backed power supply
- rack mountable chassis
- accessory package for RFC-1/B



Sine Systems .inc

615.228.3500

more information: www.sinesystems.com

installations and houses of worship, indoor sports and live music; Holophone SideWinder adapter connects 5.1 channels from an H2-PRO or H3-D to the Holophone SuperMINI matrix encoder, enabling surround sound capture to a stereo recording device, suitable for the field.
Established Products: H2-PRO 7.1 channel surround sound mic.

IABM C8847

IEEE Broadcast Technology Society L27

illbruck acoustic inc./SONEX N6919

IMAS Publishing N6827
 See Radio World/IMAS Publishing.

Independent Audio N4926
Established Products: Mixers, loggers, DAWs, microphones, noise reduction, telephone hybrids and fix-it boxes.

Innes Corp. N7735

Intro: Flashlog 6 logger compatible with Windows Vista includes Windows Media 10 Professional codec, up to 16 stereo/32 mono channels, integral Radcap support, optional log authentication, 18 kHz, 128 kbps bandwidth, serial ATA disk drives, hot-swappable RAID array and skimming.

Established Products: Six- or 24-channel FM radio tuner card, eight- to 20-channel AM radio tuner card, Windows-certified PCI cards (analog and digital) and DelayMaster time zone delay.

Inovonics Inc. N8226

Intro: Model 512 RDS low-cost, USB-powered scanning receiver for FM signal analysis, creates a computer screen spectrum display of the local market, analyzes and logs RDS info for each station with an RDS presence; Model 525 AM Mod-Monitor full-featured, off-air AM modulation monitor compatible with IBOC digital transmissions, full 10 kHz audio response yet gives accurate AM modulation readings in the presence of on-channel digital carriers.

Established Products: Working displays at NAB2007: Modulation monitors for AM, FM, FM/HD Radio (HD Monitor newly redesigned) and FM subcarriers; RDS/RBDS encoders (TCP/IP and serial addressable) and decoders for static messaging, scrolling song titles and advertising; a wide range of audio processing solutions for air chain and production applications; rebroadcast receivers for FM translator and other critical off-air monitoring uses; and always the best candy giveaways at the show.

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 Fax: 831-458-0554
 E-mail: info@inovon.com
 Web Site: www.inovon.com

International Datacasting Corp. C5541

Intro: Three new models of Superflex Suite DVB-S and DVB-S2 receiver/routers for IPTV, digital cinema, distance learning, VOD, streaming applications, digital signage, internet access and more in a variety of configurations.

IRTE SpA C3320

Intro: DVB-T/H mid-power transmitter, 250 W and 500 W RMS with TeamCast modulator; Harris Truepoint microwave link, from 2E1 to STM1 in particular on 10.0-10.7 GHz band all-indoor version.

ISIS Group Inc. SU3313

Established Products: Graham-Patten SoundPals audio building blocks, including de-

embedders and audio delay units; Graham-Patten digital edit suite audio mixers.

Jampro Antennas Inc. C2515

Intro: JLCP stainless-steel, omni-directional antenna for low-power FM, translator and booster stations is supplied with a 2-inch pole mount and field tunable from 88-108 MHz, helix design and higher V-Pol for better car reception and building penetration, stacking harness included when multiple bay arrays are ordered, features VSWR 1.5:1 or better ± 150 kHz; JTS Test Section, a compact replacement for the bulky tuned elbow complex, allows access to either the antenna or coax system without the need for a tuned elbow complex, available for VHF bands I, II, III and IV, comes with fixed bullets for I/O, plus one O ring, hardware set, pass-through connection and test turn, a port closure maintains impedance for

normal operation; RCPU low-effort, quick release patch panel with a positive lock mechanism for quick and easy re-directions of RF signal paths for patching RF feeds to an emergency antenna, alternate main/auxiliary transmitters, filter bypass, master station combiner reroutes and test point insertions, available in several sizes with optional signal-flow indicator panel, dual-line power splitter or power measuring VSWR.

Established Products: HD Radio Solutions, JMPC-HD antenna, JSHD-HD antenna and RCHA-323-10HD digital FM radio combiner.

Sonia Del Castillo, Sales & Mktg. Admin.
 6340 Sky Creek Dr.
 Sacramento, CA 95828
 916-383-1177
 Fax: 916-383-1182
 E-mail: sonia@jampro.com
 Web Site: www.jampro.com

JBL Professional N7715

Established Products: LSR4312SP, LSR4328P, LSR4326P.

JK Audio N9426

Intro: RemoteMix 4 four-channel field mixer with four headphone/IFB outputs for sending/receiving audio across phone lines, analog or digital PBX phone systems or wireless phones; Daptor Three Bluetooth audio interface with XLR and 3.5 mm send and receive I/O.

Established Products: AutoHybrid, ComPack, RemoteMix C+, RemoteMix Sport, THAT-1, THAT-2, Daptor Two, CellTap, QuickTap, Inline Patch, Broadcast Host, innkeeper PBX, PBXport, innkeeper 1x/1rx, Guest Module 1, innkeeper 2, innkeeper 4 and RIU-IP.

JLCooper Electronics N3114

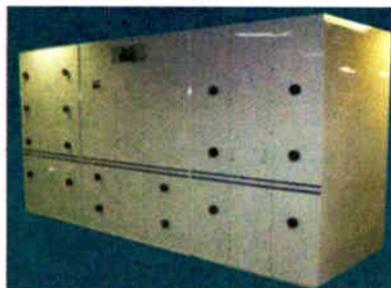
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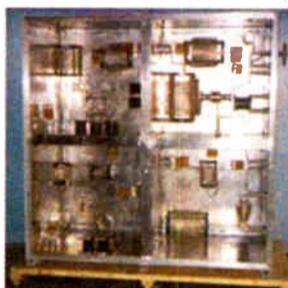
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 Email: jbrown@Lbagroup.com

www.Lbagroup.com



LBA
 SINCE 1963

Jünger Audio N3815
Intro: Level Magic LT two-channel audio level processor; d06 two-channel Level Magic audio level processor; C8702 frame controller card for C8000 audio processing frames includes new Web interface 1.0 for configuration and setup of C8000 system.
Established Products: d07, Level Magic.

Kathrein Inc., Scala Division C2213
Established Products: Antennas, combiners.

Kathrein-Werke KG C2213A
Intro: FM, TV, DAB, DVB-T, DVB-H and DMB antenna and combiner systems.
Established Products: FM and DAB broadcast antennas systems.

Kintronic Laboratories N5113
Intro: Model PS-C-1R/L-PC AM/medium-wave rack-mountable controller enables local or remote selection of the main transmitter to antenna/aux transmitter to dummy load or aux transmitter to antenna/main transmitter to dummy load; Model RCDA-X-Q-SD/SR AM/medium-wave rack-mountable directional antenna pattern-selection control system with programmable logic control and Web access.
Established Products: AM HD transmitter/antenna demonstration, HD-compatible directional antenna phasor cabinet, HD-compatible diplexer, KinStar antenna, isocouplers for hot AM towers, dummy loads, folded monopole kits, transmitter combiners and miscellaneous RF products.

Klotz Digital N5728
Intro: Decennium customizable digital audio console consists of modular surface and separate audio engine with router and DSP, designed to be placed on desktop without cutouts in compact or split-console arrangement, features four to 24 assignable faders (in groups of four), any source on any fader, VADIS audio router and DiAN network technology, pool of assignable GPIO, integrated DSP signal processors, including six-band parametric EQs and dynamics; also, Xenon "all-in-one" digital console offers audio I/O in analog and digital format, routing capabilities and free assignment to faders, DSP functions for audio treatment and processing and a pool of free configurable GPIO, six- or 12-fader versions; VADIS 212 compact audio router and DSP engine with integrated fanless power supply internally handles up to 256-x-256 I/O channels with 10 assignable slots for interface plug-in cards covering established analog and digital audio formats, decentralized signal processing, routing and fiber-optic audio networking with shared access to I/O and DSP functions; VADIS 888 router and DSP engine features improved aesthetics and enhanced display and a fanless power supply unit for silent operation, 21 assignable slots in 4 RU to manage up to 256-x-256 real-time I/O channels.
Established Products: VADIS scalable platform for audio applications, VADIS D.C.II on-air console, Aeon digital radio on-air console, Octo-Bus studio network, VariZone for broadcast studios and DiAN RCP.

KLZ Innovations Ltd. N5435
Intro: KLZ AudioFile consists of three primary programs: Server, Player and Monitor. AudioFile Server is a multi-channel audio recording engine packaged to run on a dedicated PC or "IP Appliance." The server provides long-term recording of numerous audio sources and includes silence detection, playback delay, MP3 streaming, remote access (Web server) on all sources. A variety of audio players and serial GPI make AudioFile suitable for many radio applications. Audio logger archive for general archives or for licensing and liability purposes, precise audio and GPI delay for rebroadcasts or time-zone shifting with local insertions, mic skimming (I/O box required) for talent quality/air checks or monitoring events, IP/MP3 listening to hear station

content, past or present via KLZ Web Server and MP3 streaming.

Established Products: NewsRoom 4, NR4 Remote Reporter, Wire Relay.

KOWA Co. Ltd. N5231
On display: PX10 Flash Memory Audio Player. Features include convenient USB flash memory drives and Compact Flash cards, six pages with 50 hotkeys each, instant playback from any of the hotkeys, drag-and-drop editing, easy interface from your PC screen. Edit heads, tails, fades and audio levels of each clip.

KPFF Consulting Engineers C1616
Intro: Civil/structural engineering firm offering consulting services, project management and turnkey services for communication and broadcast.

Larcan USA C1916
Established Products: FM Series of translators/transmitters.

Lawo AG N7030
Intro: mc290 high-end mixing console offers a modular central control section. External control devices can be integrated from up to 5 RU in a clever 19-inch rack integration to Danner modules that can be fitted in the meter bridge or surface. Iso Bay Access. Decentralized control allows you to transfer control of central functions to anywhere on the console. Also: Lawo mc266 for remote broadcast vans, studios, broadcast and live/theatre uses; HD Core and Routing Systems including high-capacity audio matrix for mission-critical signal transmission; 2.6 zirkon is improved, with surround operation (5.1+2), direct outs as well as the possible use of a Nova73 as external, remote-controlled matrix if the 384 I/O are not sufficient. Zirkon series offers IP-based integration, networking whole radio stations, including resource sharing and multiple studio operation. Also z4 Digital Mini Mixer, simple to operate, flexible and adaptable.

Lawson & Assoc. Architects N4538
On display: Design experts for the broadcast industry. Architectural services for media facilities including network affiliates, cable, radio and corporate clients. Master plans: We develop space, capital and phasing plans for major renovations or phased new construction. As a first step, a professional facility plan can assist decision makers with budgets, schedules and regulatory issues to position your media facility as part of your business plan. We provide due diligence for site acquisitions, lease assessments and capital improvement plans. Project Management: A major facility project could stretch the resources of your staff. Lawson serves as an owner's representative or project manager to assemble the best team, develop a budget, manage a schedule and advise the owner.
Established Products: Buildings, renovations, master plans, interior design, project management.

LBA Technology Inc. N9130
Established Products: Customized medium-wave antenna systems. Custom duplexers and triplexers provide broadcasters the ability to transmit two or three AM signals into one series-fed antenna. Each system is designed for the specific frequencies, transmitter output powers and antenna base impedance. Other customized products include antenna tuning units, directional antenna systems, multiplexers, combiners, PCS/cellular collocation systems, filters and radio frequency components for all power levels.

LEA International N3716
Intro: DS30S series TVSS for TV and radio transmitters sites from 400-5000 amp services; DS21S series TVSS for TV and radio transmitters sites for up to 225 amp services, also available in 150 amp DS21S-80 series TVSS for TV and radio transmitters sites for up to 80 amp services.

SURE BETS

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The Las Vegas 51s, a AAA affiliate of the Los Angeles Dodgers, play their Pacific Coast League home games at Cashman Field, 850 Las Vegas Blvd., a short cab ride from the strip. Thirteen dollars gets you a field-level seat.

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Las Vegas 51s, Cashman Field, (702) 798-7825, www.lv51.com. Tickets \$8-\$13.



Shown: Chad Billingsley

Lectrosonics Inc. N8116

Linear Equipamentos C1324
Intro: CHIARO is a modern FM transmitter solution, with digital modulator for analog signal.

Logitek Electronic Systems Inc. N6521
Intro: Artisan Digital Console is a digital control surface for Logitek consoles. Modular construction with multiple frame sizes; provides two master mix busses, eight sub-master mixes, four stereo aux mixes, 24 mix-minus busses; versatile input configuration including mono, stereo or 5.1; frame delay and blend functions; unlimited console presets with effects. Designed for small- to medium-market TV and advanced radio production applications.

Established Products: Audio Engine router; Mosaic digital console; Remora digital console; vMix "virtual" console; vScreen GUI; audio level meters.

LP Technologies Inc. C1112
Intro: Remote Control Spectrum Analyzer. A multifunctional, general-purpose 9 kHz-3 GHz full-band spectrum analyzer.

Mackay Communications C4643
Intro: The Inmarsat Broadband Global Area Network (BGAN) system has been specified to support point-to-point telecommunication services on portable and semi-fixed land mobile platforms with low- to medium-gain non-tracking antennas providing bit rates in the range 216 kbps to 492 kbps in downlink, and 72 kbps to 492 kbps in uplink, depending on type of terminal. BGAN is set to transform satellite newsgathering with a compelling combination: smaller, higher-bandwidth terminals that can be deployed rapidly all over the world and used by non-technical staff. Applications: Live video and audio broadcast, store and forward, broadband mobile office (e-mail, Internet, VPN, telephone), remote bureau supporting multiple users from a single device, ideal for rapid deployment.

Mackie SL9208

Magnum Towers Inc. N5122
Established Products: Radio towers and related hardware.

MAM-A Inc. (Mitsui) C11700
Established Products: Archive Grade 1X - 12X Audio 24K Gold CD-R Discs, Professional Grade Silver CD-R discs.

Manhattan Production Music SL9520
Intro: Five music libraries: MPM, Apple Trax, Live Trax, BRG and All Media Music. More than 400 CDs. Special library features include iPod and iTunes delivery, Split/Trax and music downloading.

Marantz Professional N1831

Intro: CDR310 CD Field Recorder offers digital hard-disk recording in a variety of formats. Instant CD burning, convenience and portability with one-touch record operation, flexible record modes (Pre-Record, Background Record, Silent Skip, Adjustable Auto Track). Professional hardware from input to output.

Marshall Electronics Inc. SU1926
Established Products: Audio racks, audio level monitoring.

Masterclock Inc. N3213
Intro: RC200 Up/Down Counter Control Unit provides remote up/down timer control for TCD-26R, TCD-46 and TCD-86 series II clock displays. Controls one or multiple clocks simultaneously for like events (up/down starting and stopping simultaneously), RS-485 communication allows distances up to several hundred feet using standard RJ12 or RJ11 flat phone cables. Can be controlled directly with computer.

Mayah Communications C8828B
Intro: Centauri II Audio Gateway Codec. Among new capabilities are support of the Session Initiation Protocol (SIP) for establishing, control, modifying and termination of the connections over IP, providing unique interoperability with IP codecs of other manufacturers with the standards-based implementation of Audio-over-IP; support of MPEG Transport Streams (TS) with a Forward Error Correction (FEC) for reliable connections and lots of broadcasting applications, in particular the MobileTV environment (DVB and DMB); ASI interface for integration into DVB installations; dual Ethernet for distribution of Audio-over-IP and remote control data streams over two separate logical networks or for redundant streaming; hot-swappable redundant power supply; 8x Opto In/Relay Out interface as an alternative to the 4x TTL IO. Also: Ganymed 1102 IP Audio Gateway Codec based on Centauri II family provides the same functionality within the IP world; MERK II Portable Audio Codec/Mixer is based on the Centauri Audio Gateway Codecs family. New support of SIP protocol for unique interoperability with the standards-based IP codecs of other manufacturers, as well as for higher mobility and flexibility of installations, and support of MPEG TS with Forward Error Correction over IP.

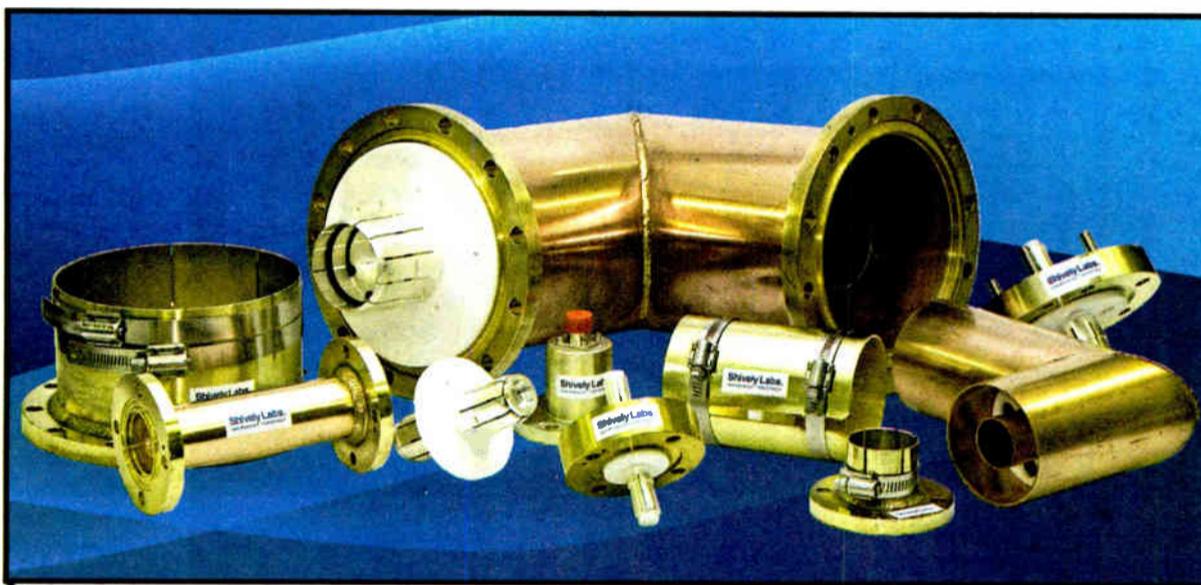
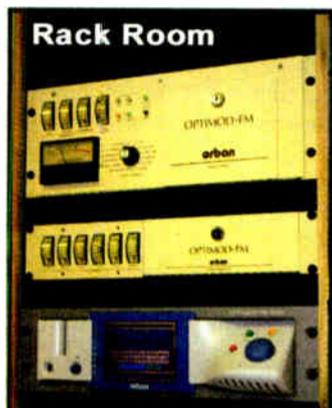
Established Products: FlashMan Portable MPEG/Linear Audio Recorder.

MCL Inc. C4741
Intro: MT3600 Ka-Band TWT. MCL doubled its Ka-Band product line by adding the lightweight MT3600 outdoor TWT amplifier. Newly designed, it is almost 20 pounds lighter than the MT3300, while offering the same features of its Ka-Band counterpart. Available for applications for 125, 150, 175 and 250 watts.

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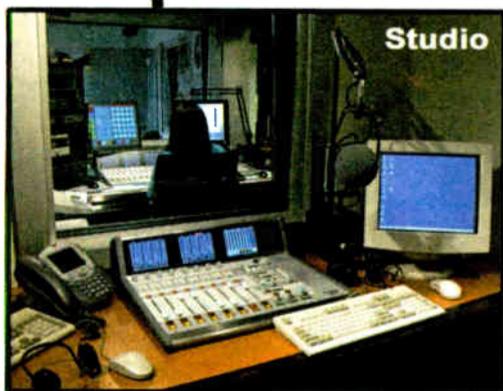
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Media Monitors

N8119

Megatrax Production Music SL8720, N5518

Intro: Beat Bites is a hip new library of "Snack-Sized Urban Music."

Established Products: Music libraries: Megatrax, Amusicom, Intervox, Sensación, The Scene & ARTS Classical. Radio ID/Jingle packages: News/Talk, Sports, Latin Rhythmic, Spanish Contemporary, Adult Standards. Reception FX Imaging package. Compact 500 GB hard drive with search engine to hold libraries. Custom scoring.

Philip Macko, Sales Manager
7629 Fulton Ave.
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818-255-7100
888-MEGA-555
Fax: 818-255-7199
E-mail: info@megatrax.com
Web Site: www.megatrax.com

Merging Technologies

SL4014

Established Products: Pyramix.

MGE UPS Systems

C6822

Intro: Pulsar MX 20 kVA Frame is an addition to our single-phase UPS lineup, providing high-efficiency, high-density power protection in an economical solution for mission-critical applications. True online, double-conversion technology provides highest UPS protection with continuously conditioned power and absence of transfer time to battery power during a blackout condition. Features include automatic and manual bypasses and hot-swappable power and battery sub-modules for high availability power protection for maximum uptime. Pulsar MX Frame uses electronics and battery sub-modules to make it a user-friendly, scalable and modular architecture with a capacity of 20 kVA in 16U of rack space. Common sub-modules used in the Pulsar MX Frame and the stand-

alone Pulsar MX 5000RT (5 kVA/3U) allow users to minimize initial investment yet incorporate into a long-term, scalable solution.

Established Products: Galaxy 3000 "parallelable" UPS, EXRT rack-mountable UPS.

Micro Communications Inc.

(MCI)

N6129, C2520

Intro: AT12-202 Band II 2 "V" Dipole Antenna, side-mount, circular polarization, omnidirectional; AT12-220 Band II 2 Dipole Panel, horizontal polarization, especially suitable for square mast, E-plane 70 degrees, H-plane 55 degrees; AT12-221 Band II 2 Dipole Panel, vertical polarization, especially suitable for square mast, E-plane 70 degrees, H-plane 55 degrees; AT12-303 Band II 2 Dipole Panel, circular polarization, especially suitable for triangular or round mast, Horizontal 92 degrees, Vertical 92 degrees; AT12-522 Band II Dipole Antenna, vertical polarization, side mount, E-plane 75

degrees, H-plane 220 degrees.

MicroFirst

SU727

Mid-Atlantic RF Systems

SU7826

Minnetonka Audio Software Inc.

N3215

Intro: Audio Tools Batch Processor provides an automated processing environment for many audio-related tasks including editing, format conversion, encoding, plug-in processing and processing through external I/O to sets of audio files in a batch mode, available in single machine and client/server configurations, client/server architecture allows for distributed processing in multi-machine, multi-processor environments.

Established Products: Surround encoders, DVD-Audio authoring tools and two-channel editing, including Fast Edit, as well as studio workflow consulting and application development.

Miranda Technologies Inc

SU5220

Intro: iControl RSM package offers visual and acoustic monitoring of multiple signals scattered across a wide geographical area with comprehensive signal probing to alert operators of signal faults, as well as instant access to signal information.

MOG Solutions

SU7230

Modulation Sciences

C1131

Moseley Associates Inc.

N7711

Intro: LanLink HS 900D opens the door for innovative IP-based applications and accessories at transmitter sites that save time, save money and protect valuable station assets. Backup servers, security surveillance, Internet connections, IP-based transmitter monitoring are a few examples of this enabling technology. LanLink provides a 1 Mb network connection at remote sites where no wires or cables exist. It operates in the free 900 MHz band without licenses, leases or new antennas.

Established Products: Starlink SL9003Q 950 MHz STL and Starlink SL9003T1 T1/E1 STL/TSL.

Motorola

SU1920

MultiDyne Video & Fiber Optic Systems

N3119

Intro: EOS-4000 series of electro-optical fiber switchers switches digital signals up to 4 Gbps with scalable matrix sizes from 32 x 32 to 288 x 288; CATV, L-Band and IF broadband fiber optic links; systems are available to transport 110 channels, analog and QAM digital CATV via fiber optic link; systems are available for 70 and 140 MHz IF satellite links and for 950-2150 MHz DBS satellite and L-Band links for single-mode fiber transport.

MUSICAM USA

N5418

Myat Inc.

C2220

Intro: Low-loss FM bandpass filters for digital and analog applications are tunable across the band, compact, temperature-compensated and exhibit consistently low VSWR.

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201-684-0100, ext. 220
Fax: 201-684-0104
E-mail: sales@myat.com
Web Site: www.myat.com

Myers Information Systems Inc.

N3219

Intro: ProTrack TV & Radio is a centralized traffic and billing software solution for television and radio stations, a tool for single- and multi-channel digital environments that accommodates multiple media assets and interfaces with

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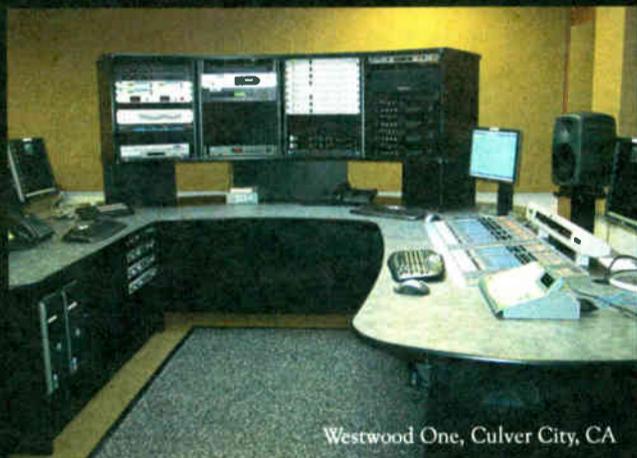
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existing automation, video server, archive, accounting and membership systems.
Established Products: ProTrack Radio.

Nada-Chair C6526

Nagra USA Inc. N2226
Established Products: ARES-M; Nagra-V; ARES-BB+; ARES-PII+.

National Assoc. of Tower Erectors C1633

National Weather Service N6806

Nautel Ltd. N8111
Intro: V1, V3.5, V7.5, V15 HD Radio transmitters. V1 provides a digital FM solution in 9 RU; V15 provides 10 kW FM+HD operating mode efficiency; designed for HD Radio; redundant architecture; broadband design; convenient operation and installation; NxLink for remote Web-based transmitter monitoring and control provides access to Nautel transmitters remotely over an IP network; Web-based remote monitoring and control of Nautel equipment; remote access to alarm/information logs; e-mail reporting of critical alarms; scheduled e-mail of status; data server for integration with existing remote control equipment.
Established Products: HD Radio, DRM, FM transmitters, AM transmitters, Nautel Secure HD Transport Suite.

Nemal Electronics International C2642

Netia N5721
Intro: Radio-Assist 7.5 range of digital audio software programs allows users to record, edit or prepare a playlist; tools for acquisition, sound-file editing, commercial and music production, newsroom systems, scheduling, multicasting and administration; modular structure; features that enrich production and playout processes; enables operation in high definition, with support for linear 24-bit sound at 96 kHz or 192 kHz; U-Share network management system integration for distribution of audio content from one site to multiple destination sites; U-Share automates the exchange of content over IP or DVB video transport platforms for management of content distribution; speech-to-text functionality integration; Multitrack XT with integrated VST standard for multi-track digital audio recording and editing; Radio-Assist 7.5 available bundled with customized Axia IP-Audio networking components that allow audio workstations running Windows to send audio to an Axia audio network from its network interface card; Media Logging range offers capture, indexing, transcoding and distribution of audio and video content.
Established Products: Radio-Assist.

Network Electronics US SU10605
Intro: AV-SD-XMUX audio embedder/de-embedder, suitable for high-end studios and outside broadcasting or mobile applications where timing is critical. Embeds/de-embeds AES audio streams in the video stream and can be equipped with high-performance optical fiber interfaces.

Neutrik USA N8526
Intro: DLX Series chassis connectors are enhanced version of popular DL XLR. An ideal match with EMC XLR cable connector, the DLX series features compact metal housing, offering RF protection and electromagnetic shielding. Its duplex ground contact provides excellent contact integrity between chassis and cable connector, as well as the option to solder chassis ground to Pin 1. Male connector has a metal retention bar for improved pull-out force. The series is available in 3- to 7-pole configurations with gold- or silver-plated solder contacts and nickel or black metal housing. Also: EMC-XLR Cable Connector for EMI protection.

Comprising three-pole male/female XLR cable connectors with integrated LC-filters, which avoid the RD interference and LF noise. There is a 360-degree shield contact on the female connector that ensures best shielding and chassis contact. Connector can solve a variety of problems such as ground loops, RF interference and Pin 1 problems. Suitable for radio stations, stage and lighting installations.

NKK Switches N1326
Intro: Compact SmartSwitch programmable LCD switches for systems where size is an issue and user interface is required; features the electrical and performance specifications of original SmartSwitch; available in versions featuring lower energy consumption than originals; features brighter LED illumination enabled by a redeveloped diffuser that allows a even distribution of illumination.

Non-Stop Music SL9220, R206
Intro: www.CUEgle.com, online tool for searching and download production music library; Amphibious Zoo Music Library, 10 CDs featuring contemporary sounds, aggressive rock, world music, hip hop, funk and blues; Bing Bang Boom, 14-disc music and sound design library with cues ranging from Funky to Underscores.

Norsat International Inc. C8547

NPR Satellite Services C7541
Intro: Full-service satellite solutions for distribution of audio, video or data content; coverage of the U.S. and parts of Mexico and the Caribbean.

Nvision SU9605
Established Products: Audio routers.

Obor Digital N6730
Intro: Zeus Team Edition is for smaller maintenance shops that need a solid but basic CTMS system to manage the work requests and repair history for their assets; Zeus Professional Edition is for medium- to large-sized facilities, adding features as well as optional plug-in modules; Zeus Enterprise Edition is for large-scale business, multi-group support.
Established Products: Zeus Web-based Centralized Technology Management System.

Octopus Newsroom Trading Ltd. N413
Intro: Octopus5 Newsroom Computer System for radio and TV; incoming information such as wires, Web feeds, media, faxes and e-mails are organized and ready to be used for last-second stories; global search engine; keyboard shortcuts can be assigned; recalls saved screen layouts; latest version has news desk module featuring calendar view and an option to group stories within folders according to topic; Octopus Field Reporter is a standalone remote finger of Octopus5; reporters prepare stories in the field and send them to headquarters once the connection is available; built-in prompter; package can be linked to the story and sent together with the script; runs on Windows, Mac OS and Linux; Octopus Track is a module featuring resource planning and cost tracking for newsdesk or management purposes; includes location and resource collision warning system.

Oldcastle Precast C1637
Intro: Contracting firm specializing in construction of broadcast and communication facilities; program management plans; equipment shelters are factory-built and available in standard and custom configurations. *Established Products:* Equipment shelters, construction services.

OMB C3324
Established Products: FM transmitters, STL, broadcast mixer, antennas.

NAB Booth N6906 Crown Broadcast The Best Just Got Better! Product Upgrades

- **New Power Levels**
 - 100 watt unit to 150 watts
 - 250 watt unit to 300 watts
 - 500 watt unit to 600 watts
- **New Features**
 - Front panel frequency Agile
 - SWR from remote control
 - Raise and lower power via remote.



New HD Translator

- **No Ibiqumity site license required as the entire FM envelope will be passed through with little or no loss in audio quality.**
- **Collaborative effort comprised of Fanfare FP-TRO Offset receiver and Crown LA series linear amplifiers.**
- **Power levels up to 300 watts all digital or 600 watts combined.**

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Omnia Audio**N7726**

Intro: Omnia.8X offers eight discrete three-band stereo Omnia audio processors in a single, networked box. Omnia.8X's processing architecture is designed to work ahead of bit-reduced audio coders to reduce artifacts and improve the sound audio destined for HD Radio, Internet and satellite broadcasting. Omnia.8X conditions and enhances audio to make sure the coded audio sounds as good to listeners as it does in the studio. Also use Omnia.8X to process headphone feeds where off-air monitoring is not possible; as multi-band level control for remote codecs or on-air telephone systems; to process and send multiple audio streams from a single studio complex to multiple transmitter sites; or on-demand for in-studio musical performances or commercial production applications. Omnia.8X uses the Livewire standard for professional networked audio over Ethernet; connect it directly to the Axia IP-Audio Network — a single Cat-6 cable is needed for eight channels of stereo I/O, plus remote control. *Established Products:* Omnia-6EX and 6EXi; Omnia-5EX FM; Omnia 3FMT; Omnia Multicast; Omnia ONE; Omnia-5EX AM; Omnia-5EXi AM; Omnia-3am; Omnia A/X; Omnia-3net; Omnia.sg; Omnia CD.

Omnimusic**SL9620**

Established Products: Omni/CDM; BlueDot; Flash*Point.

Omnirax**N5415**

Intro: Innova line combines modular components with tailored shapes to fit particular requirements of on-air, production and imaging studios; cable raceways are integrated into the structural design to facilitate wiring and create logical access points throughout; conventional casework and cabinetry can be provided so a facility has a unified look and feel.

OMT Technologies**N9011**

Intro: iMediaTouch has HD multicasting features, improved on-air interface, stellar satellite interfacing, non-proprietary architecture and console interfaces; iMediaLogger offers software-based audio logging, archiving, skimming, podcasting and storage; manage recording needs with one workstation.

Opticomm**N2931**

Intro: Optiva fiber optic communication platform; broadcast HD and other video/audio/data signals over fiber; Optilinx OLX-3000 optical switching platform is capable of switching digital signals up to 4.25 Gbps with any of its 144

ports. A 288-port version is available in an 8 RU chassis; accepts up to six modular port cards with up to 48 Small Form Pluggable (SFP) transceiver modules per card; RGB-4000 Series is a multi-functional KVM extender offering RGB H/V (VGA), stereo audio, keyboard/mouse and RS-232 serial data over one fiber; suitable for high-resolution video applications such as a CAD/CAM graphics workstations, plasma display screens, LCD projectors, military C3 and C41 systems, and theaters or stadiums.

Overly Door Co.**N9612****P.I. Engineering****SL12207****Paradise Datacom LLC****C7036**

Established Products: Compact outdoor and RM SSPA, satellite modem.

PatchAmp**N1226**

Intro: PatchAmp Lite integrated patching and distribution amplifier system consists of 32 distribution amplifiers with four incorporated 2 x 32 mini-weco normalling patch panels housed in 4 RU chassis; PatchAmp HD-I/C system uses an 18-channel 75 ohm miniature coaxial contact suitable for HDTV, SDI, AES and analog video signals.

Established Products: PatchAmp pre-wired patching and distribution amplifier systems.

Patriot Antenna Systems**OE103**

Intro: The Patriot 2.4 meter flyaway C-band antenna is for transmit and receive operation; the lightweight portable antenna system consists of a dual-skin inter-locking reflector and a quad-pod base mount; rigidity and high performance under wind loading conditions; shape and accurate reflector surface provide sidelobe and cross-polarization performance; repeatability is maintained with precision registration of the reflector segments and the feed support structure; the system, including a single feed, is packaged in six portable cases; the Patriot 1.0 meter backpack flyaway antenna is for transmit and receive operation in Ku or Ka frequency bands; consists of Dual Skin Sectional reflector and a low-profile tripod mount; system, including a single feed, is packaged a nylon case; the Patriot 3.8 M deployable trailer-mount antenna's stretch formed reflector uses kerf panels for surface accuracy; allows for easy deployment, operation and stow; extra link for hub station in VSAT networks, video uplink or an SPCC central station; stowed or deployed in less than one hour; the

Patriot 4.8 M deployable trailer-mount.

Pelican Products Inc.**C9125**

Intro: The Pelican 1690 Transport Case has more than 12,000 cubic inches of storage space and is suitable for transporting heavy equipment; transit-friendly features include two double-hand side-grips for team lifting, two sets of polyurethane wheels with stainless-steel ball bearings and nylon hubs for long wheel-life and an extension handle with release latch; stainless steel reinforced padlock protectors for defense against cutting and theft; 1640 Transport Case has nearly 8,000 cubic inches of possible storage space; 1495 Laptop Case has nearly 1,000 cubic inches of usable storage space; protects laptops up to 17 inches and holds accessories. *Established Products:* Pelican Protector Cases, Pelican Flashlights.

Phillystran Inc.**N5131**

Intro: HPTG-I Kevlar fiber non-metallic tower guys for AM, FM, TV and military towers and antenna systems; replaces steel guy cables with equal strength and low elongation; supplied as guy assemblies with factory-installed corona sockets ready for installation; vibration dampers also are supplied where required.

plus24/Sanken Microphones**N8826****Potomac Instruments Inc.****N6826**

Established Products: 1900 Series Antenna Monitor system, PI 4100 MW Field Strength Meter, AG-51 Audio Generator, SD-31/RX-31 Synthesizer-Detector.

Power Module**Technology Inc. (PMT)****N8134**

Intro: Targeting the large-tube market for radio broadcast transmitters in the FM band, over 5 kW, PMT offers a low-cost pallet/module providing up to 600 W of RF power from a single unit costing much less than other solid-state pallets and significantly less than even the tube it will replace. Also: The highest-power UHFV pallet/module 470-860 MHz on the market providing over 400W of Peak-Sync and over 200 W of digital power.

Established Products: High-power pallets/modules for the broadcast TV and radio market.

Prime Image**N4517**

Intro: Time Tailor Broadcast uses a time compression system based on patented time-reduction processes and the Fastrack TT control and automation packages to time-compress programming as downloads and set up the automation system for insertion of commercial breaks.

Primera Technology**SL12405**

Intro: Bravo SE Disc Publisher is an affordable, automated CD/DVD duplication and printing system. Priced at \$1,495 MSRP, Bravo SE records the disc and then inkjet-prints full-color, photo-quality images onto the surface of each disc. The Bravo SE is Mac- and Windows-compatible. A Blu-ray version, Bravo SE Blu Disc Publisher, is available at \$2,995 MSRP. Also: The only rack-mountable systems on the market, the Bravo XR, Bravo XR-Blu and Bravo XRP Disc Publishers automatically burn and inkjet-print CDs, DVDs and Blu-ray Discs. Bravo XR and XR-Blu produce 50 discs per job while the Bravo XRP produces 100 discs. Their robust, steel-gauge case allows for stacking of multiple systems including the option of a stacking a server for mission-critical applications. Also: TuffCoat with WaterShield and TuffCoat with AquaGuard surface CD and DVD media.

Established Products: Bravo II Disc Publisher, BravoPro Disc Publisher.

Pristine Systems/Summit Traffic**N7334**

Intro: Informant audio silence monitoring with eAlerts continuously monitors a station's audio

to detect silence. Upon silence detection, Informant e-mails/SMS text messages the personnel responsible for the station's audio. Available in two-, four- and eight-channel models. Also: Summit Traffic and Billing version 3.4 is now available for radio, television and cable industries; BlackBox digital audio logger, monitor and alert system; PodCast recorder, time shift recorder, alerts via TTL, e-mail, and COM; "Best of" show recorder; supports most Windows sound cards; virtual radio player; up to 16 stereo channels of logging; CDS32; satellite automation, music-on-hard-drive and live assist digital storage and delivery systems; with Auto Promo Builder no editing is performed; WAV/MPEG compatible; offers remote-control access, automation, live Web site content and FTP Internet file transfers.

Production Intercom Inc.**N2235**

Intro: IP 900 Connect Internet/intercom interface provides any Internet-capable device, such as laptop computers or smart phones, the ability to become part of an intercom system; Internet-capable devices can signal, call and listen to the intercom system; the remote party can communicate via a mouse, stylus or any input device; the remote computer can be equipped with the Production Intercom DMH220 USB communications headset, connected directly to the USB port; portable devices can be equipped with the Production Intercom SMH610 communication headset; AD 950 telco interface allows communications from the intercom system to a landline, cell phone, telephone network or conference phone device.

Professional Sound Corp.**N9322**

Intro: Elite series of boom poles are made using high-modulus carbon fiber tubes and locking mechanisms; available in various lengths and can be equipped with cables and optional accessories; the Promix 6 offers six input channels in a portable, ENG style mixer; Miranda audio mixer with strong exterior, array of signal mixing and routing options; soft touch knobs; video displays; PowerMax Ultra provides clean quiet DC power for digital audio recording packages; includes two high-output battery chargers, 12-way power distribution, EMI/RFI power filtering, multiple output voltages and power output overload protection; up to 30 amps of output power.

Established Products: Portable audio mixers, distribution amplifiers, antenna splitters, rechargeable batteries, power distribution systems, cables, equipment carts, microphone boom poles, microphones, shock mounts.

Promedia USA**SL13013**

Intro: Slim, clear polycarbonate multi-CD jewel case for nine CDs.

Established Products: CD-R; CD-RW.

Propagation Systems Inc. (PSI)**C1920**

Intro: FM and TV turnkey transmission systems including PSI antenna, PSI transmission line either rigid or flexible, transmitter of customer's choice, tower, building and commissioning; customer has the flexibility to use all or any part of the turnkey offering; PSI antenna models include directional and non-directional using panels, "Vs" and Power-Tiller for FM and IBOC, and panels and slots for television, at all power levels; also available are pattern optimization, customization, multi-station antennas, filters and combiners. *Established Products:* Power-Tiller; PSIFHR; PSIFMR; Slant-V; PSIFM; PSIFL.

Doug Ross, Pres.

719 Pensacola Rd.

Ebensburg, PA 15931

814-472-5540

Fax: 814-472-5676

E-mail: sales@psibroadcast.com

Web Site: www.psibroadcast.com

SURE BETS**Foodie Alert**

According to Jeremy Handel of the Las Vegas Visitors and Convention Bureau, the hottest food tickets in town are restaurants opened by two of the biggest names in French cooking, Joël Robuchon and Guy Savoy.

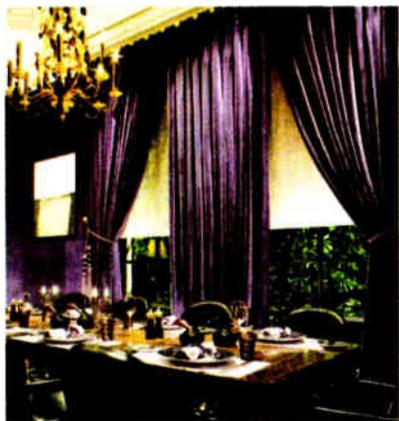
Robuchon is a Michelin Three-Star chef and "Chef of the Century." (He actually has two restaurants at the MGM Grand, Joël Robuchon and L'Atelier de Joël Robuchon.) Guy Savoy, another Michelin Three-Star heavyweight, has located his place, Restaurant Guy Savoy, in Caesars Place.

All serve exquisite French food.

Prices aren't for the faint of heart (average check for a six-course tasting menu at Robuchon is \$225 per person) but the food and atmosphere will definitely impress clients. Reservations are required or strongly urged at both. (And if your credit card isn't up to that tab, we hear the 24-hour Pink Pony at Circus Circus has a nice fruit plate.)

Joël Robuchon at The Mansion, MGM Grand, (702) 891-7925. Open daily, dinner only.

Restaurant Guy Savoy, Caesars Palace, (877) 346-4642, Open for dinner Wed.-Sun.



Shown: Private room at Robuchon. Courtesy: MGM Mirage

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Prophet Systems**N6511**

Intro: RCSnews is a radio newsroom system, providing solutions for news operations such as newscast gathering, writing and editing, on-air broadcast and story archiving; standalone newsroom software enables reporters to write newscasts, receive and revise wire copy and digitally record, edit and playback audio; NexGen Digital 2007 offers improved control room experience with new information available on the button bar; DRR module has been revised to make its logs work more like station logs, allowing staff to transition between tasks faster; less network traffic and a revamped logs screen; pooled hot-sparing allows any machine to take over in the event of a failure, and includes redundant WANcasting; PrizeWatch creates station contests, tracks prize inventory and is a central location for winners and their electronic confirmation signatures.

Established Products: NexGen Digital; PSI101; DigiLogger.

Neal Perchuk, VP Sales U.S.

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Web Site: www.prophetsys.com

QEI Corp.**N8408****QuStream****N3418**

Intro: PESA Distributed Routing Switcher (DRS); Fortel 603 Distribution/Signal Processing Frame.

Established Products: Cheetah DRS Audio Routers, Fortel Up/Down/Cross Conversion.

Radio Frequency Systems**C1913**

Intro: MS series RF monitor system provides monitoring functions for RF equipment; features 50 configurable inputs; supports up to 16 transmitters plus an antenna system with four main feeders; suitable for monitoring forward/reflected transmitter power and displaying switch configurations; the MS series also analyzes and stores collected data for up to three years; its microprocessor-based system enables it to independently evaluate non-linear multi-channel systems.

Established Products: CPF series side-mounted circularly polarized FM antenna; Heliflex air-dielectric coaxial transmission line.

Radio Systems**N8231**

Established Products: Digital and analog consoles, StudioHub+ Wiring System, DAs, phone interfaces, clocks and timers.

RadioTraffic.com**N5221, N5429**

Intro: RadioTraffic.com traffic, billing, advertising order entry system for radio stations; includes prospect contact manager, auto-transfer of prospects to orders, editing of logs and Internet customer service; RadioProduction.com centralized copy, production assignment and archive system for local and distant city stations; RadioAdChecker.com Internet portal for advertisers to hear commercial archives to

check/validate invoices and affidavits; UnattendedWeather.com radio weather for times when station is unattended (using voice tracks or satellite formats).

Established Products: TrafNet.com radio traffic and billing.

Radio World/IMAS Publishing**N6827**

Intro: "The Leslie Report," a bimonthly online newsletter by News Editor/Washington Bureau Chief Leslie Stimson providing an inside look at radio technology and other news; Radio World Digital Edition, now providing the complete contents of every issue of RW and RW Engineering Extra in an online version with active links and other multimedia content.

Established Products: Radio World is delivered bi-weekly in a unique, four-color, news-tabloid format recognized instantly by U.S. radio owners, managers and engineers who rely on us to provide the information they need to gain insight on industry directions, solve problems and advance in their careers. Independent surveys rank Radio World #1 in the eyes of radio professionals. Our successful new RW Engineering Extra gives you six more opportunities each year to reach highly targeted station/network engineers and group DOEs with the hard-core technical content they covet.

Claudia Van Veen, Adv. Coordinator

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703-998-7600, ext. 154

E-mail: cvanveen@imaspub.com

Web site: radioworld.com

bridging inputs that may each be wired balanced or unbalanced; ST-HP3 is suitable where line-level audio filtering needs to be provided at the input of a power amplifier for protection of public address horns against damage from low frequencies; has one input and two filtered outputs: 300 Hz high-pass and 500 Hz high-pass; replaces the ST-HP1 and ST-HP2.

RFMW Ltd.**N8134****Richardson Electronics****C1714**

Established Products: Power grid tubes, IOTs, klystrons, vacuum capacitors, and RF pallets.

40W267 Keslinger Road

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630-208-2200

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Fax: 630-208-2550

E-mail: broadcast@rell.com

Web Site: www.rell.com

Richland Towers**C2534****Riedel Communications US****C9428****RIZ-Transmitters Co.****N5222**

Intro: RIZ DRM Compact Audio Solution provides audio encoding and generates DRM multiplex and RF signals, with optional MDI stream decoding features; RIZ MDI Generator offers audio encoding and creation of an MDI stream that can be sent to different MDI modulators; RIZ MDI modulator provides decoding of the MDI stream and generation of RF signals.

Established Products: Turnkey systems; production, installation and maintenance of AM, FM and TV transmitters in stationary and mobile versions.

RJS Electronics**SU9305**

Intro: RJSTP615HML-7 RGB LED switches, tri-color RGB switches for visual color applications; eight colors from one switch; low-profile tactile action; RJSL-S soft-action LED switches with "quiet and soft" action; available in single or dual-color options.

Rohde & Schwarz**C2927**

Established Products: R&S UP300/315.

Roland Systems Group**SL8208**

Intro: R-4 Pro four-channel field recorder with time code, 80 GB hard drive for hours of record time; 16- or 24-bit; 44.1, 48, 88.2, 96 or 192 kHz; SMPTE time code in and out; AES/EBU in and out; USB host or slave; limiter; effects and wave editing; four-pin XLR, AA or AC power options.

Established Products: R-4; S-4000S; S-1608; AR-3000; AR-200.

Rosendahl Studioteknik GmbH**C8431-H****RTW Radio-Technische****Werkstätten GmbH & Co. KG****N3216**

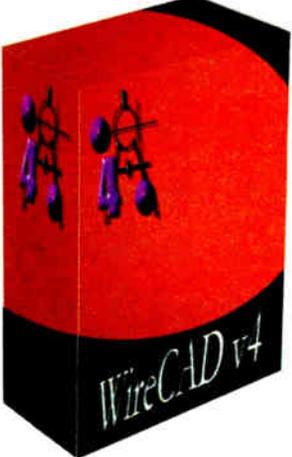
Intro: SurroundMonitor 10600 features the Surround Sound Analyzer, a method for visualizing surround signals; important aspects of a surround mix are presented at a glance; the 10600 can interface to professional digital production environments such as video editing suites, workstations or broadcasting studios; SurroundMonitor 10660-VID is a monitoring instrument for multi-channel radio and TV audio that features an integrated Surround Sound Analyzer and can be installed next to other instruments in the video rack; features display capabilities for both stereo and 5.1 surround signals; has three AES3 signal inputs for integration in digital studio environments; six multi-standard peak level meters, a ten-fold correlator display, RTA, SPL/LEQ Dial Norm meters, an AES status monitor and a stopwatch are present on the VGA display.

PTEK**N6126**

Intro: 700W IPA module, replacement power amplifier module; drop-in replacement for MM&D, Silicon Valley and others as used in Harris and Continental transmitters.

Established Products: FM25E; FM250E; FM1000; IPA700.

So a while back I was out walking my dog Hiccup when the thought occurred to me that what the planet really needed was a way to avoid the tedious, time-consuming, mind-numbing, error-prone process of single-line documentation. It occurred to me that we needed to make documentation so easy that it actually got done! Silly thought, I know, but that's what we set out to do. And by gosh, I think we got it! Come see me at the NAB show booth N2138 and tell me the name of my dog, and I'll give you ten percent off the really cool show specials that we'll be running there. Thanks, Christian Holbrook, President.



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RCS**N6511, R204**

Intro: RCSnews radio newsroom system; newscast gathering, writing and editing to actual on-air broadcast and story archiving; the standalone newsroom software enables reporters to write newscasts, receive and revise wire copy and digitally record, edit and playback audio; GSelector goal music scheduler suitable for radio programmers delivering satellite, HD, DAB or Internet; create a better log; eliminate unscheduled song positions with GSelector, as it considers every song for every position; the best song lands in the best slot; cross-channel protection; be alerted in advance to adjust schedules across a group of stations so none of them play songs simultaneously.

Established Products: GSelector; Selector XV; Linker; Master Control; RCS RadioShow; RCS Tracker; iSelector.

Neal Perchuk, VP Sales U.S.

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White Plains, N.Y. 10601

914-428-4600

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RDL**N3413**

Intro: The ST-PA18 is suitable for applications where a high-quality utility amplifier is needed to drive an 8-ohm speaker; features a balanced line-level input that may be connected unbalanced; gain control range will accommodate standard unbalanced levels as well as professional balanced levels; the module bridges the input signal; Loop Out terminals permit a balanced input to be fed to additional amplifier modules; Loop Out also may be used to feed a subwoofer amplifier; ST-PA18 output will drive an 8-ohm speaker or multiple speakers connected to present an 8-ohm load to the amplifier, and it is capable of driving 4-ohm loads; the RU-SMA1 is suitable for mounting a module in a cabinet or lectern; the ST-CX2S is a subwoofer signal equalizer in the Stick-On series; offers flexibility in equalization adjustment; ST-CX2S features two separate, isolated balanced



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Established Products: RTW metering products such as PPMs and audio vectorscopes.

RYMSA C2520A
Intro: Antennas; RF accessories.
Established Products: Channel combiners; patch panels.

Sabre Towers & Poles N6435
Established Products: Towers and tower components.

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Web Site: www.sabrecom.com

Salzbrenner Stagetec Mediagroup N4018

Intro: Prototype mini console is suitable companion for radio and TV broadcasting. The mixer is AURUS' little brother, with the same flat and compact design, dual encoders and arc indicators. Modular design offers 8 to 24 faders. Fixed layout comprises 32 input channels, eight groups, eight sums, eight aux paths and eight mix-minus sums. Easy routing to the mix-minus busses directly from the channel strip as well as clear indication of settings. Numerous miniature TFT displays were integrated into the master section. All are dedicated to a specific function: the equalizer or a dynamic function on the chosen channel strip, the selected layer, the routing or the aux settings. Snapshot memory simplifies controlling workflow and allows for stepping through snapshots. Available as desktop and rack-mount. Also: AURUS ver. 2.64 offers generic software functions for broadcasting, sound reinforcement, theatre and recording. For example, a switching contact triggered by pushing the fader knob of an already closed channel strip downwards beyond its stop, a functionality originally used for controlling PFL, can now be used for accessing external devices.

sbs N5128
Intro: PA500 compact 500 W amplifier based on the PA1000 model; PA300, the replacement for sbs PA250.
Established Products: FM50; FM250; FM150.

Scientific Atlanta, a Cisco company SU9613

Sennheiser Electronic Corp. N7117
Intro: The MD 5235 mic head for 5000 Series wireless transmitters is designed to provide clear sound while cutting through high on-stage levels; the light-weight EK 3241 true-diversity portable receiver is for location sound record-

ing, using a 36 MHz switching bandwidth that is tunable in 5 kHz increments to generate 7,200 frequency options.

Seratel N9620
Intro: FM transmitters for 5–10 kW; six 1 kW FM power modules; foldback protection; automatic control power; AGC, high efficiency greater than 70 percent; modular design; broadband design; output power measuring; module by module; modules with telescopic slides, removable modules, nonstop operation; 1–2 kW FM transmitters; modular design; wideband design; six free slots in 19-inch rack of 2 kW.

Shively Labs N7026
Intro: Model 2604 low-power bandpass filter provides the advantages of bandpass filtering and combining in a small package for stations up to 2.5 kW; suitable for combining digital signals; Model 2612 medium-power bandpass filter extends the 2600 filter line to stations with transmitters up to 10 kW; filter features a small footprint and is suitable for use in branched and balanced combiners.

Established Products: FM broadcast anten-

nas; filters; combiners; coax; and related equipment, including equipment for HD Radio implementation.

Shure N6921
Established Products: KSM9, UHF-R Wireless, KSM27, KSM32, KSM44, P4800, DFR22, FP23, FP24, ULX Wireless, SLX Wireless, MX412D/C, MX391, SM7B, Beta 58A and the entire line of Shure earphones and Personal Monitor Systems.

Siel Television Srl N8306
Intro: TB02-103 air-cooled 10 kW FM transmitter with hot-plug amplifiers and mains power direct from network for efficiency and reliability.

Sierra Automated Systems N4413
Intro: Intercom Panel ICM-24 integrates with the SAS 32KD Connected Digital Network. Connects conventionally, via dedicated LAN, or TCP/IP over the Internet. Twenty-four talk/listen switches with individual eight-character two-line displays, multi-listen mixing, programmable scenes/shows. Also: Rubicon-Dees Digital Console Control Surface with (yes) rotary

faders and real VU meters, custom designed for Rick Dees; SAS 20th anniversary celebration; and SAS has moved to new, much larger quarters.

Signex N4926
Established Products: PST96D25P.

Skytec Inc. N6434
Intro: Model 8400 high-intensity strobe lighting system; pulse forming network combined with laser-cut optics provide a salient beam of light for unparalleled marking of tall structures; Skytec monitor/controller 8364 provides dry contact alarms for each strobe light; PEC 8014 Universal Photo Electric Control features dual contacts for separate twilight/night operations; field adjustable with a universal meter socket four-pin plug-in mounting; field programmable for 64 combinations and adapts to most lighting applications; sun/heat shield; red light control panel controls and monitors standard 300 mm red beacons or new-style LED beacons; LED display panel for monitoring as well as dry contact N/C alarm outputs.

SmartJog SL14605

Society of Broadcast Engineers L28

Solid State Logic N2526
On Display: C Series digital consoles for broadcast, film, post-production and audio professionals. Users include Canadian Broadcast Corp., CBS, ABC, New England Sports Network and Comcast SportsNet. The C100 Digital Broadcast Console is a small-footprint, assignable console for on-air studio applications such as news and sports and live-to-tape talk and game shows; resource sharing capabilities with MORSE — Modular Resource Sharing Engine — is a partner product to the C100. Also: the C200 Digital Production Console has been installed in environments as diverse as London-based audio production company Floating Earth, Japanese broadcaster NTV Ikuta and Atlanta's Dozier Center for the Performing Arts.

Solutions Radio BV N8634
On Display: The WebRadio is a standalone device that can play out Internet radio streams, files and podcasts, but does not require a PC. Easy to operate by elderly, blind, partially-sighted or PC-illiterate listeners. A new feature is the interactive audible program guide. Audible prompt guides one through the range of available programs.

Sonifex Ltd. N4928
Intro: RB-SSML1 mic/line source selector with compressor/limiter, a 1 RU rack-mountable source selector for compressing or limiting an

SURE BETS

Great White Way Meets Neon Gulch

Hoping to cash in on the long-running success of Broadway import "Mamma Mia," two award-winning Broadway musicals, "The Producers" and "Monty Python's Spamalot" are now in Las Vegas.

Mel Brooks' musical comedy "The Producers" features the trials and tribulations of Broadway impresario Max Bialystock and his neophyte partner, Leo Bloom (with David Hasselhoff playing Roger DeBris). "Springtime for Hitler" is still politically incorrect and hilarious. The show was the recipient of the most Tony Awards in Broadway history including Best Musical.

The wild and wacky world of Monty Python, the popular British comedy troupe, comes to Las Vegas in the form of "Monty Python's Spamalot," written by Eric Idle and directed by Mike Nichols. It's a Broadway takeoff of the cult movie favorite "Monty Python and the Holy Grail." Sirs Robin, Galahad and Lancelot are joined by the Killer Bunny, Black Knight and the French Taunter. The musical comedy won three Tony Awards including Best Musical for 2004–05.

"The Producers," Paris Las Vegas, (888) 727-4758, prices \$75.50-\$143.50. Dark Wednesdays.

"Monty Python's Spamalot," Wynn Las Vegas, (888) 320-7110, prices \$49-\$99. Dark Thursdays.



Shown: "The Producers"

— Las Vegas tips in this section were compiled by Jackie Broo

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info@heilsound.com
618.257.3000

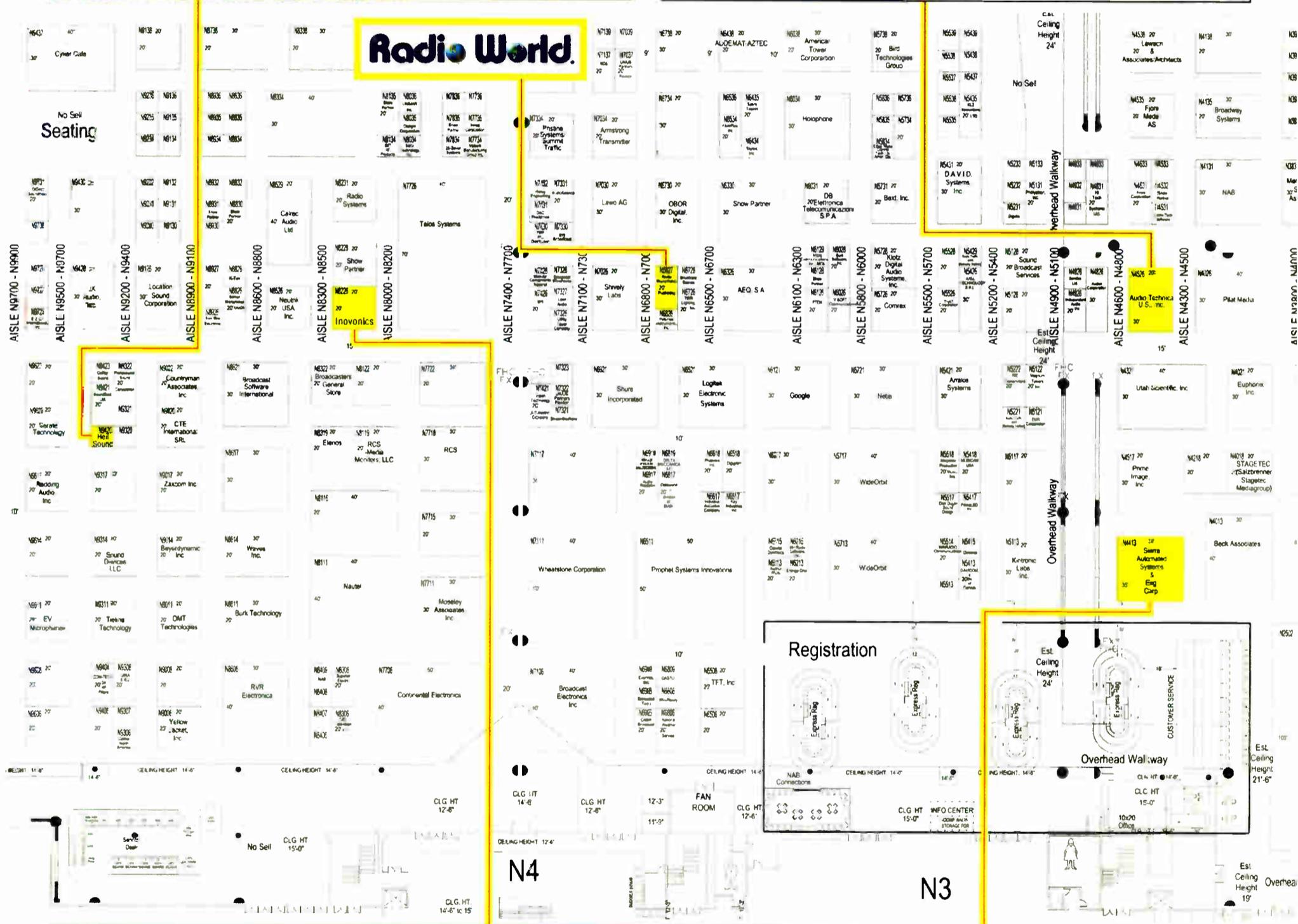



THE WHOLE TRUTH

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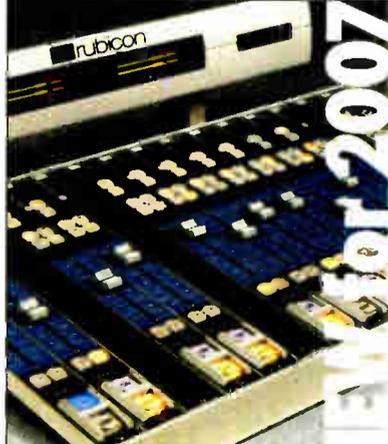
REDESIGNED! **Model 532 FM/HD Mod-Monitor**
Menu-driven off-air monitor with LCD spectrum display, RDS/PAD readouts, TCP/IP connectivity. **COME SEE IT!**

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NEW! **Off-Air AM Mod Monitor** - AM-only monitor uses synchronous detection to maintain AM measurement accuracy with IBOC carriers present.

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SAS ICM-24 Intercom
Full talk/listen for 24 channels each with VFD display, direct or internet connectivity

Rubicon-SL and RIOGrande
Stand alone, cost effective, integrated console/router, expandable in the future to a full router based system

Rubicon, SL, and Rubi-T Mini-Console
Many new features, including automatic shared mix minus

See us in Radio/Audio
North Hall Booth N4413



incoming microphone or stereo line signal and mixing this signal with a stereo monitor input, which can be metered and mixed to two headphone outputs; used in situations where level control is required, in voiceover applications for example; the DHY-03EC eurocard single digital telephone hybrid uses the same technology as the DHY-03 but is based in a card-style format for installation in a eurocard rack frame, or in certain broadcast mixers; the RB-OA3 is a 1 RU rack-mount, unity gain on-air switcher, capable of switching four stereo pairs among three studios; each studio can control the transmission path, two peripheral paths for equipment; the RB-ML2 is a stereo microphone and line-level limiter that operates in stereo or dual mono mode, so it can be used as a stereo line limiter, or dual mic limiter; D:Scribe transcription software v2.0 offers DVD/VOB playback with a video panel to the left of transcript space, a trackbar allows start and stop marks, a CD

Ripper, support for a USB foot pedal, dongle-based protection, variable play speed.
Established Products: Redbox, Net-Log four-channel network audio logger; S2 analog/digital radio broadcast mixer; HY-03 and DHY-03 telephone hybrids; talkback intercoms.

Sound Devices LLC N9314
Established Products: 702 and 722 portable digital recorders.

Sound Ideas SL7720
Intro: Ambience IV Series, recorded in 24-bit/96 kHz; 12-volume ambience collection offers not only 24 bit/96 kHz but also 24-bit/28 kHz and Red Book audio (16-bit/44.1 kHz) for each track; 10 royalty-free music CDs: Wacky Comedy, Workout Dance, Alternative Rock, Acoustic & Easy Listening, Olympic Sports, Extreme Rock, Hip Hop Dance, Lite-Emotional and Dramatic. Two CDs of Tribute Music. Ultimate SFX

Collection on Hard Drive delivers the sound effect and production element collections on one hard drive, representing more than 600 CDs and more than 117,000 effects in Broadcast WAV 16-bit/44.1 kHz format, provided on a 500 GB hard drive; includes Soundminer LE (either Mac or XP version) for quick search, audition and retrieval of sounds.

Soundcraft USA N7715
Intro: Soundcraft Vi6 processing card integrates Lexicon effects and BSS Audio equalization within the digital desk; card uses custom Lexicon DSP engines to provide eight mono or stereo effects units, which may be patched to aux bus outputs and back into a channel input, or inserted into input or output channels; effects are controlled via the desk's Vistonics II user interface screens; Lexicon devices offer 14 types of reverb, seven delay settings and eight other effects, including chorus, flanger, tremolo and

pitch shift; once selected, parameter controls appear on the Vistonics II screen rotary encoders; card also provides a 30-band graphic EQ on every output (35 outputs), controlled by the first 30 channel faders; FaderGlow system changes the faders to red and each fader controls one of the 30 frequencies; a composite EQ curve is generated and displayed on the Vistonics II screen for that output; the MPM Series is a compact range of multipurpose mixers available in two standard frame sizes.
Established Products: RM1ds and RM1d digital on-air audio consoles, B800, B400 and BB100 analog broadcast audio consoles.

Soundman OKM N4926
Established Products: In-ear stereo microphone.

Soundminer SL7723

Specialty Data Systems Inc. N2135
Intro: SDS eBroadcast Version 3 for Radio provides unified approach to sales, traffic, programming, operations and accounting; allows two-way flow of real-time data to be shared across departments; enables broadcasters with radio and TV stations to increase ROI by running radio and TV on the same system, delivering combined up-to-the-minute reporting for all stations.
Established Products: SDS eBroadcast Version 3.

Spinner GmbH C8828A
Intro: Four cavity L-Band dual-mode filter for DAB and mobile TV application; P=1600W, tunable and temperature compensated; coaxial switch 1-5/8-inch EIA; motor-driven 230 VAC; optical position indicator; emergency manual operation; signal and interlock contacts; compact design; live time; > 250,000 switching operations.
Established Products: Patch panels; loads; connectors; switches; rigid lines; direct access units.

SRS Labs Inc. N402
Intro: SRS CSD-06P Portable Circle Surround decoder, engineered to monitor 5.1 or 6.0 multi-channel audio captured in the field; paired with the SRS CSE-06P Portable Circle Surround encoder, which can capture multi-channel audio for recording on two-channel recorders and ENG/EFP cameras; includes headphone source selection for monitoring each channel of the surround mix as monaural positioning; allows for the monitoring of the rear surround information and the "composite" encoder signal as stereo positioning; CSD-06P belt-pack decoder is for surround capture and recording for the field, allowing SD and HD-capable cameras to transmit surround from their location; field recordings can be delivered for playback, editing and broadcast in surround through existing two-channel SD and HD infrastructures.
Established Products: SRS Circle Surround encoding and decoding hardware and software; stereo signal processing equipment.

Staco Energy Products Co. N3813
Intro: FirstLine UPS power protection for television and radio studios and tech centers; 10, 15 and 20 kVA; three-phase; online UPS with remote monitoring; internal battery pack that provides at least eight minutes of run time; optional external battery packs.
Established Products: Voltage regulators; UniStar Single Phase UPS; TreStar UPS.

Stainless/Doty Moore C1133

Stantron/APW Mayville SU7220
Intro: Stantron Presentation Rack contains vertical lacing bars for cable management; 24.75-inch rail-to-rail depth of shelf space; 360 degree swivel casters for mobility between locations; perforated front/rear panels to facilitate ventilation and diminish heat buildup; Plexiglas front door for line of sight to rack components, lami-

ZFR800 Digital Recording Handheld Microphone

CAMOUFLAGED KEYPAD

With the ZFR800, Zaxcom has combined the best of both worlds...

looks and functionality.

The ZFR800 gives you the professional look you deserve with an ergonomic camouflaged keypad for one-handed operation of all recording functions.

The ZFR is all you need on the go, it records on instantly removable memory cards so your audio can get where it needs to be in a flash.

With Zaxcom's fault tolerant operating system files are always recorded uncompressed, the file type and quality are selected later using ZaxConvert software. Format options include .WAV files in 16 or 24 bit resolution with a sample rate of 32, 44.1, 48 or 48.048 kHz or .ZTF (Zaxcom Transcription Format). .ZTF files have a compression ratio of approximately 20 to 1 for quick delivery to transcription houses over the internet.

Multiple ZFR's can be synched together through the optional internal time code receiver.

additional features

- Record up to 8 hours of uncompressed audio on a 2GB miniSD card
- Utilize any Shure® screw-on capsule
- Headphone monitor output for quality control

www.zaxcom.com

Zaxcom

nated solid graphite top featuring a 22.5-inch writing surface with cable port; numbered rack rails and multiple access holes included on innovative rack base; power, lighting and cooling accessories installed to customer specifications; E Rack, four uni-channels per side for a more rigid frame and increased mounting options; welded lacing bars support large cable bundles; lacing bars align with uni-channel mounting surfaces to provide straight cable runs; large open space between lacing tubes and/or uni-channels range from 6.8 inches to 13.25 inches to allow easy access and wiring.

Stockmusic.net SL9622
Intro: Maximum Edge v4.0 royalty-free music library; 1,000 music tracks in every genre; created by more than 75 composers; easy buyout license; no additional fees; search the library with custom player software, which searches the DVD by mood, genre or collection; demo tracks and save them to a hard drive; player is both Mac- and PC-compatible.

Studer USA N7715
Intro: Vista 5 digital live production desk for live sound reinforcement and broadcast production; controls up to 240 channels and can be configured to manage 1,700 inputs and outputs; portable; features Vistonics user interface; static automation with snapshot filtering and theatre cue list; configurable DSP and I/O structure; Harman HiQnet compatibility; SCore Live DSP backbone platform is configurable to maximize the use of the DSP in different applications; Dolby E card for Vista series and OnAir 3000 consoles; Dolby E is an audio coding technology that assists the conversion of two-channel broadcast to multi-channel audio by providing eight audio channels in the space normally used for two; audio encoded with Dolby E can be edited, decoded and re-encoded without audible degradation; an optional I/O card accepts any AES/EBU stream containing signals encoded with Dolby E or Dolby Digital, decodes the stream within the input stage, then provides up to two sets of eight channels to the console; Dolby Digital or Dolby E encoded signals may be connected to the card's front panel or patched via the console's internal software patch window.
Established Products: Vista 8 digital live production mixer; OnAir 3000 and 500 Modulo on-air audio consoles; CMS call management system.

Studio Network Solutions SL4830

Sumavision Technologies Co. Ltd. SU10928
Intro: IP Gateway, implement re-transmission function over UDP top layer, support for demultiplexing, broadcast, multicast and unicast, 1000BASE-T Ethernet.

Superior Broadcast Products C1312
Intro: AM solid-state transmitters of all power levels; solid-state FM transmitters.
Established Products: FM transmitters, FM antennas, AM transmitters.
 Jimmie Joynt, Sales
 5805 Farr Pak Dr.
 Plano, TX 75093
 972-473-2577
 800-279-3326
 Fax: 972-473-2578
 E-mail: jjsbp@msn.com
 Web Site: superiorbroadcastproducts.com

Superior Electric N8308
Established Products: Stabiline automatic voltage regulators, transient voltage surge suppressors, uninterruptible power supplies and power conditioners.

Sure Shot Transmissions C4641

Switchcraft Inc. C7507
Intro: StudioPatch Series Products, rack-mount-

ed XLR and 1/4-inch TRS pass-throughs with rear terminations to BD-25 connectors allow out-board gear connection to DAW applications.
Established Products: EZ Norm Series audio patchbays, AAA Series XLR connectors.

TASCAM SL4016
Intro: X-48 48-Track Hard Disk Audio Workstation, 96 kHz/24-bit recording with native Broadcast WAVE audio file support and AAF export for compatibility with workstations like Pro Tools, Nuendo and Logic, plus support for FireWire hard drives and Gigabit Ethernet transfers; FireOne Firewire Audio Interface, records and plays 192 kHz/24-bit resolution, features weighted and backlit jog wheel, transport keys and nine programmable shortcut keys for control functions, plus two mic inputs with phantom power, pad and line switches, a direct recording guitar switch and MIDI input/output; DV-D01U Rackmountable Single-Disc 1RU DVD Player,

with HDMI high-definition output, bi-directional RS-232 control, component, S-Video and optical outputs, HDCP compliance and both NTSC and PAL playback (region codes apply); DV-RA1000HD Hi-Res Hi-Def Digital Audio Recorder, supports recording to CD, DVD or hard-disk media at 192 kHz/24-bit resolution, or using Sony's Direct Stream Digital format, and includes DSP for EQ and dynamics processing, USB 2.0 connection, Minnetonka's discWelder Bronze1000 for DSD conversion and DVD-Audio disc; 202mkIV Professional Dual Well Cassette Deck, includes dual auto reverse, ±12 percent pitch control on deck one, a front microphone input with level control, Dolby B noise reduction.
Established Products: DM-4800, FW-1082, HD-P2, CD-160mkII, CD Duplicators.

TC Electronic N1931
Established Products: Dynaudio Acoustics monitors.

TEAC America Inc. SL13910

TeamCast C2639
Established Products: Modulators, gap fillers.

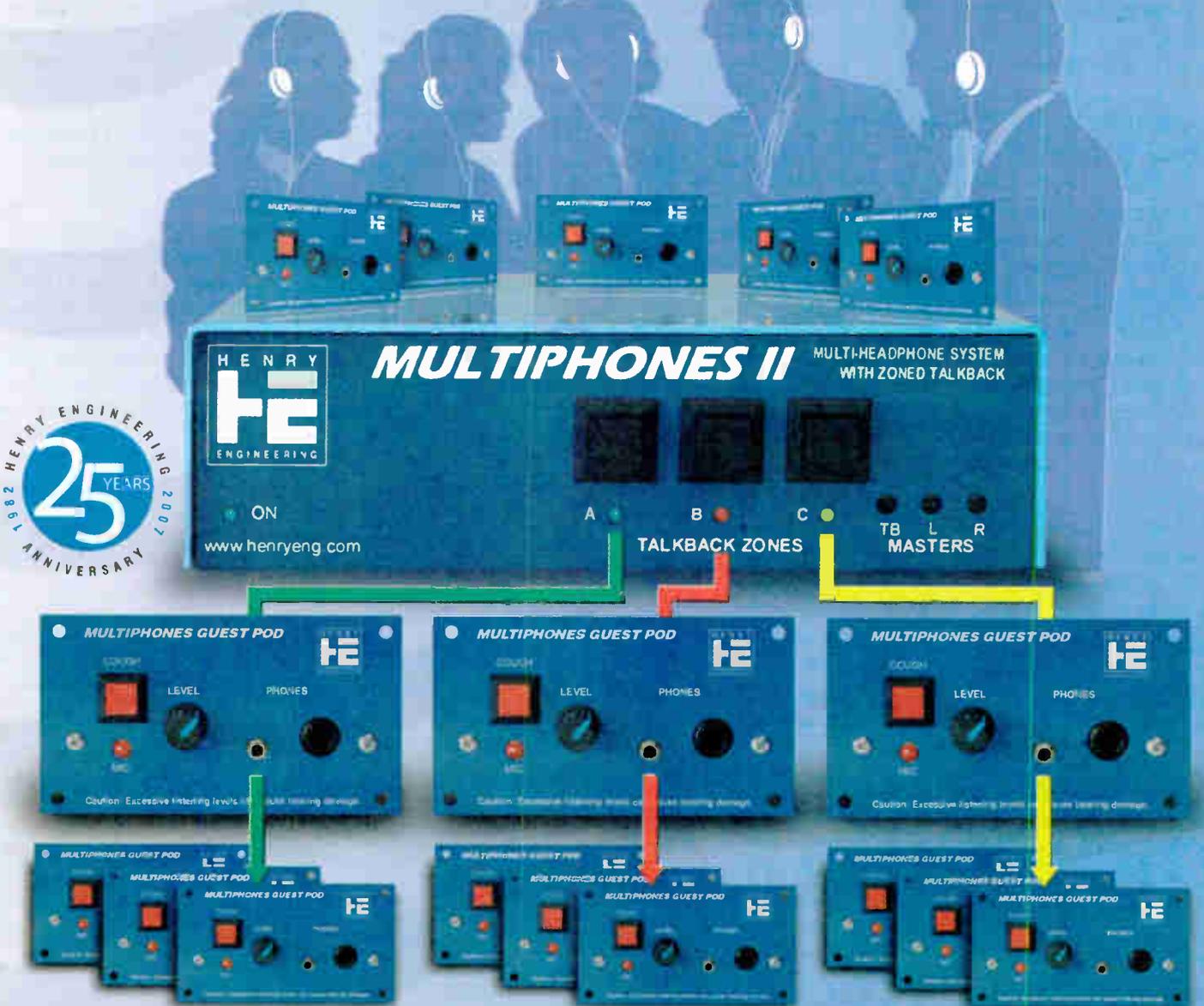
Tec Nec Distributing C2041
Intro: TN-5C4A45P Multiconductor AV Cable, includes coax, balanced audio, DC power and Cat-5e in one jacket; CRSX-1 Molded Cable Crossovers, quick-drop black polyurethane and gradually sloped, ribbed surface for grip footing and channeling water away.

Tektronix Inc. N2519
Intro: AMM768 Multi-format Audio Monitor offers scalable support to monitor analog, digital and Dolby audio, plus a four-tile picture display option to facilitate video and audio coordination.

Telecast Fiber Systems Inc. SU10213
Intro: Adder II Series Featuring Adder II

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The new **MultiPhones II** multi-user headphones system now has **Zoned Talkback!**

Use separate Guest Pod **Talkback Zones** for Host, A-Guests, and B-Guests. Talk to each group without bothering the others!

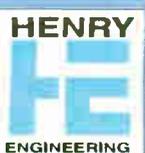
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- Uses cat5 cabling

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We Build Solutions

*Price is for MultiPhones II Master unit; Guest Pods sold separately.



BoothPak, single-box front-of-house/announce booth for larger point-to-point audio applications, handling/converting analog audio and digital AES, with an integrated signal generator and analyzer, plus facilities for data, intercom and optical redundancy.

Telex Communications Inc. C5329
See Bosch Communications Systems.

Telos Systems N7726
Intro: Zephyr iPort MPEG Gateway, codecs enabling the transport of eight channels of stereo audio across any network with guaranteed QoS, converting linear PCM IP-Audio into compressed IP-Audio and back again, and using the Livewire standard; Zephyr/IP, 16–256 kbit audio-over-Internet via UDP/RTP and TCP/IP, featuring 24-bit AD/DA, AES/EBU, Livewire IP and USB audio, network edge traversal (NAT) and directory assistance provided by ZIP Server technology, non-volatile audio storage on flash, wireless connectivity through Ethernet, PCMCIA and USB.
Established Products: Zephyr Xstream, Xport, Call Controller, Console Director, Telos Assistant Producer, Series 2101, NX12, ONE-x-Six, Telos ONE Digital Hybrid, ONE + ONE, Telos TWO, 100 Delta Digital Hybrid, Telos Profiler, NeoWinners.

Tempest Wireless C8725

Teracom Components C1309
On display: Coaxial and RF systems for broadcasting and telecom. The company has a history of experience dating to the emergence of broadcasting. The head office is located in Hörby beside southern Sweden's largest broadcasting station.

TextCaster C2844
Intro: TextCaster, a Web-based software application for a wireless communication infrastructure, FCC CAN-SPAM compliant, offering permission-based text message delivery to cell phones, PDAs and pagers on more than 65 carriers, optional support for e-mail and short code opt-in, target subscribers to specific five-digit ZIP codes, interactive polls/contests/surveys, Spanish-language version.

TFT Inc. N6508
Intro: Model 629, AES/EBU Digital Dual Audio

Insertion Unit; Model 619, AES/EBU Digital Single Audio Insertion Unit; V.870 EAS Software/Firmware, new Daylight Savings Time Dates, dual character generator operation; CAP (Common Alerting Protocol) Converter, decodes CAP emergency messages into its various components for video graphics, character generator crawls and closed captioning generators; Digital Six-Channel STL System, for international 200 MHz operation.

Established Products: Digital and analog STLs, AM and FM modulation monitors and Emergency Alert System systems and components.

Thales Components Corp. C5943
Established Products: Tetrodes/Diacrodes for analog/digital radio and TV transmission.

Tieline Technology N9311
Intro: Wireless UMTS/HSDPA IP World Compatible Module. Broadcast FM-quality stereo, dual mono or mono wireless remotes anywhere that Cingular and T-Mobile networks have broadband wireless data available. Audio is bi-directional. Uses standard SIM card or activated using unique IMEI number. Supports Quad-Band GSM and Triband UMTS making it compatible worldwide for most wireless networks. With unlimited data plans in U.S., broadcast wirelessly with a cost-effective solution. Never borrow another phone line or set up expensive ISDN line. Also: Wireless EVDO IP World Compatible Module allows you to broadcast FM-quality stereo, dual mono or mono wireless remotes anywhere Verizon and Sprint networks have Broadband Wireless Data available; SIP Enabled Universal IP Compatibility allows interoperability according to the specification of the European Broadcast Union with other IP broadcast codecs. SIP-enabled interoperability over IP networks using standard algorithms such as MPEG L2, G.722 and G.711 will enable broadcasters to dial between brands of codecs seamlessly. This opens the world to you over IP; AES/EBU Digital Input/Output Modules on Commander G3 studio units now feature choice of an analog two-in/two-out module or either an AES/EBU-3ID or AES/EBU-STR digital two-in/two-out module. Expand as needed.

Established Products: Tieline codecs are modular and feature broadcast-quality wireless and wired IP Audio as well as POTS, ISDN, GSM and X.21. Come listen to live FM-quality stereo

long-distance wireless connections from Las Vegas to Indianapolis and Australia.

Tower Innovations C1119

TransLanTech Sound N4931

Transradio SenderSysteme Berlin N9611
Intro: DRM DMOD 2 exciter with advanced pre-correction facilities for all kinds of broadcast and communications transmitters in the frequency range from 9 kHz to 26 MHz; TRAM+ medium- and low-frequency range of transmitters with advanced DRM broadcasting capabilities.
Established Products: TRAM 10 + MF transmitter.

Utah Scientific N4321
Intro: New frames for UTAH-400 routers, including the UTAH-400/288 large frame for up to 288 x 288 with automatic internal crosspoint redundancy, the UTAH-400/32 small frame for up to 32 x 32, and multirate I/O modules capable of handling data rates from 1 Mbps to 3 Gbps; the UCP-1 X-Y compact 1-RU control panel; and the UCP-DT, a desktop version of the UCP-MM multimode panel.

Valcom Manufacturing Group Inc. N7734
Intro: V33085AMCL2 freestanding fiberglass antenna for AM broadcasting use between 1200 kHz and 1400 kHz; V33075AMCL2 freestanding fiberglass antenna for AM broadcasting use between 1400 kHz and 1700 kHz; both tested for field-strength efficiency.
Established Products: AM broadcast and Traveler Information System antennas.

VCS Engineering N3415
Intro: dira! Cartplayer cartwall solution with single-press touchscreen playout and storage capacity of more than 4,000 audio items, four playout channels and the availability to create single- or dual-channel stacks/playlists; dira! Schedplayer lightweight automation system for any purpose, features A/B playout and integration with a server-based planning and scheduling environment; dira! Cross-Media content management suite provides a complete production environment for storing, managing and processing video, audio and other content in a unified, networked system.

VidCAD SU3805
Intro: VidCAD Engineer SQL 2 automated design tool for C2, television, audio, IT, AV and telecommunications infrastructures eliminates drafting and typing when generating schematics, rack elevations, cable plans and labels, equipment lists, power and AC requirements; VidCAD TecXpert (Technical eXpert) 2 system installation, troubleshooting, maintenance and reporting tool tracks signals and manages, disseminates and notes changes; VidCAD Thin Client 2008 provides secure cooperation among multiple sites, remote engineers and consultants via the Web; VidCAD Room Designer provides enhanced automation of design, documentation and maintenance of rooms within a facility.

V-Soft Communications N6026
Intro: AM-Pro 2.0 allocation and coverage mapping software now supports "grid-style" calculation of ground- and skywave field strengths and interference with the ability to remove overlap area over water for daytime allocation studies and full "clipping" studies for nighttime allocation studies; MW-Pro program for conducting frequency searches for new STL/microwave frequencies to detect usable frequencies in a given area and to draw desired paths and undesired or interferer paths; FMCommander Version 6.2 with Internet mapping integration software provides extensive frequency searching algorithms for spacing and contour-to-contour FM allocation studies, as well as new routines for U.S./Canada and U.S./Mexico cross-border relationships and Section 73.215 shortspacing and contour protection; Probe 3.5 RF propagation-prediction map-

ping software creates integrated coverage and interference maps using numerous propagation-prediction models and support for TV, DTV, FM and FM HD interference analysis modules.
Established Products: Plotpath, Terrain-3D and RFHazz.

Ward-Beck Systems Ltd. SU9211
Intro: MLC-8 multichannel level controller for powered speaker 5.1/7.1 monitoring environments, rotary shaft encoders to adjust level of incoming channels with a push-to-mute function, global volume control, LED VU/PPM meters for up to eight channels of audio and available in AES, analog, embedded and DolbyE/AC-3 input versions; M6202A multi-definition SDI/AES demultiplexer accepts an SD or HD signal and extracts the AES/EBU signals from the SDI signal, optionally a DolbyE/AC-3 decoder can be integrated to decode Dolby signals as discrete PCM outputs; D6201A AES/EBU distribution amplifier designed for use in 75-ohm, unbalanced, coaxial cable installations, features cable equalization and data reclocking to recover incoming digital signal reliably.
Established Products: AMS4, AMS8-1 & AMS8-2, XTM4, Serialboxx, IMP Series, PODS Series, 8200 Series, ABB-1 and ABS-1.

Wegener SU7915
Intro: The fourth-generation Compel II Network Control system is built upon an open architecture operating system with SQL database access to all internal functions and integration with network traffic and automation systems; Compel also offers integrated control for video, audio and data to Internet and WAN locations.
Melanie Charles, Marketing Manager
11350 Technology Circle
Duluth, GA 30097
770-814-4000
E-mail: info@wegener.com
Web Site: www.wegener.com

Wheatstone Corp. N7111
Intro: Evolution Series consoles; networked audio systems; Audioarts Air-2 console; and Vorsi signal processors.
Established Products: Generation Series consoles and digital AES routing systems. From Audioarts division: AE-Net router and D-75, R-55e and A-Line furniture.

WhiteBlox C1059
Intro: The WhiteBlox Interactive Media Player V4 integrates video with an array of interactive features, allowing programmers to build a broadband network that helps monetize video assets. For example, IPTV broadcasters can engage audiences through custom-branding, live broadcasts, event and community interaction, multiple video windows, targeted ad insertion, multilingual subtitling and e-commerce transactions. The WhiteBlox solutions suite has been extended to include WhiteBlox Media Manager, WhiteBlox Digital Signage and WhiteBlox Kiosks. Features of the WhiteBlox Interactive Media Player V4 include live broadcasts and on-demand video programming, interactive advertising targeted by demographics and geography, chats, polls, surveys, tickers, games, geography and time-code ad insertion, live multi-camera video options, e-commerce, ticket sales, subscriptions, donations, digital rights management and statistics.
Laura Haworth, Dir. of Public Relations & Marketing Communications
1201 Lake Woodlands Dr., Second Floor East
The Woodlands, TX 77380
281-210-5013
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F. Keith Trantow
Rawhide Communications Ltd.
Tucson, Ariz.



Shown: Heil CLASSIC PRO offers a retro look of the '40s with the dynamic sound of today.

Will-Burt Co. C8423
Established Products: Pneumatic telescoping ENG antenna masts, D-TEC II and accessories.

WINRADIO Communications N5514
Intro: The WR-G33WSM receiver and spectrum analyzer provides sound engineers and performers working with wireless microphones and other wireless audio devices with a real-time spectrum analyzer (linear and logarithmic), audio recorder, spectrum sweeping, printing and user annotation, and channel and environment memories.
Established Products: WR-PFSL portable field-strength logger, WA-0811 antenna distribution unit, DRM receivers and the MS-8108 multichannel radio monitoring system.

Winsted Corp. SU3316
Intro: Winsted acquires and renames Technical Interiors to Winsted Technical Interiors. WTI custom manufactures consoles and workstations for all environments.

WireCAD N2138
WireReady N6808
Established Products: NewsReady, WebReady, ControlReady, StormReady, SalesReady, CallTaker and MpegReady.

Wireworks Corp. C7617
Intro: LumaVue Custom Plates and Panels are suitable for in-studio and remote broadcast applications. They can be rear-illuminated for instant identification. Effective in low-light studio and broadcast truck interfaces, and provide maximum electrical isolation between connectors. LumaVue can be used for connection panels, switch panels and diagrams. Available in a variety of sizes and shapes, including standard gang plates, wall plates and rack panels, and in 1/8- or 1/4-inch thickness. UV-stabilized for outdoor use, LumaVue features non-metallic cell cast acrylic for durability. Panels can also be used as informational signs. Panels are rear-engraved so markings cannot be marred or destroyed. The engraving is readable and visible without the use of the rear illumination feature. Will not rust or tarnish. Offered in 10 colors to match or contrast a studio's décor. Designs can include company name and logo.

Wohler Technologies N3426
Intro: VAMP AC-3/M 4.3-inch widescreen LCD monitor that is NTSC/PAL auto-sensing and supports Dolby digital, AES/EBU and HD-SDI/SDI video and audio monitoring; ATSC/DVB-3/M Dolby digital, AES/EBU and HD-SDI/SDI audio monitor with the ability to isolate individual channels of Dolby digital and to decode Dolby digital and AES/EBU embedded in HD-SDI/SDI streams along with a tri-LED phase indicator.
Established Products: AMP1A-2S, AMP1A-LP4S, AMP1-DA/106, AMP1-V2DA, AMP2-AMVU, AMP1-VS, AMP2-E8MDA, AMP2-DA, AMP2-S8MDA, AMP2-S8SDA, AMP2-SDA, AMP2-VSA, AMP2-VSD, AMP2-VSDA, AMP2-VSDA/AVU, ATSC/DVB-3/SDI, EMON-1/M, LM106-6, LM53-16M, SPM-3, SPM-2, SPM-1, VMMA-SUM8, VMMDA-1, VMSDA-1 and VMQ-2D.
 Milton Garcia, Director of Sales
 31055 Huntwood Ave.
 Hayward, CA 94544
 510-870-0810
 888-596-4537
 Fax: 510-870-0811
 E-mail: sales@wohler.com
 Web Site: www.wohler.com

Yamaha Commercial Audio Systems Inc. SL5710
Intro: The DM2000VCM processor with Virtual Circuitry Modeling technology simulates analog circuitry characteristics like resistors and capacitors, but emulates the sounds of the analog 1970s and vintage gear, including classic compression, EQ and even analog open-reel tape machines; LS9 Series 32- and 64-input consoles for sound reinforcement requirements in houses of worship, regional sound companies and corporate audio/video presentation installations, can also be used as auxiliary mixer/channel expanders for M7CL and PM5D consoles; DME Satellite Series products offer DSP power and CobraNet capabilities, including the eight-input DME8i-ES, the eight-analog-output DME8o-ES and the four-in/-out analog DME4io-ES; the NAI48-ES network audio interface converts up to 48 channels of AES3 (AES/EBU) to AuviTran

Ethersound and can route via a single Cat-5 cable up to 325 feet; the DSP5D expands the capabilities of the PM5D to 96 mono plus 16 stereo input channels, includes two additional card slots and more effects and dynamics processing.

Z Technology Inc. C3039
Intro: The R-507 field-strength meter offers NIST traceable measurement and PC-based spectrum display capabilities, as well as digital television signal analysis for DTV, DVB-T and/or ISDB and measurement of field intensity of analog television and FM broadcast signals; the unit can be extended to cover the AM band.
Established Products: S5007GPS AM and FM Drive Test System.

Zaxcom Inc. N9017
Intro: The IFB800 transmitter transmits time

code, IFB audio and remote control commands to Zaxcom TRX/ZFR products to synchronize time code between the recorder and camera or other device and as a remote control to adjust the TRX/ZFR without interfering with the user's body pack; the TRX700 plug-on transmitter/recorder for shotgun-type microphones in boompole or ENG applications, records up to 12 hours of time code-referenced audio to a miniSD card; the new STA100 stereo adaptor integrates with ZFR/TRX units to provide a balanced stereo audio input that eliminates ground loop problems; the TRX800 and ZFR800 handheld wireless recording system is built around the TRX800 handheld wireless microphone using digital modulation and producing a time code-referenced recording that serves as a backup.
Established Products: TRX900, TRX990, TRX900AA, ZFR100, Deva and Mix-12.


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and communications
for broadcasters

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ROOTS OF RADIO

ARRL Is Robust as It Nears 100

by James Careless

When amateur radio enthusiasts established the American Radio Relay League in 1914, Morse Code was king. Long-distance telephone calls were too expensive for the vast majority of Americans, and commercial broadcast radio didn't exist.

Some 93 years later, most modern "ham" operators use voice rather than Morse. Nearly everyone can afford long-distance phone calls and commercial radio has become senior partner in a media world that includes television and the Internet. Nevertheless, the ARRL is thriving, with 150,000 dues-paying members and a staff of 100 full- and part-timers.

The League continues to publish its long-running "QST" magazine, hosts a detailed Web site at www.arrl.org and plays a big role in aiding government and other emergency responders during natural and manmade disasters.

But isn't amateur radio on its way out? "There are almost five times as many 'hams' today as there were in the 1950s," said Allen Pitts, ARRL's media and public relations manager. "The number of amateur radio license holders in the U.S. has gone from 144,000 back in 1955 to 653,452 in February 2007. Predictions that the Internet, computers, cell phones and other developments would be the end of amateur radio were obviously mistaken."

Beginnings

In 1914, "ham" radio operator Hiram Percy Maxim, inventor of the "silencer" for handguns, was trying to send a message from his 1 kW station in Hartford, Conn., to one in Springfield, some 30 miles away. Although Maxim's station had a range of 100 miles, "some peculiar transmission condition ... made direct ground-wave radio communication between Springfield and Hartford difficult if not impossible," wrote Clinton D. DeSoto in a history of the ARRL, "200 Meters & Down," published in 1936.

To bridge the gap, Maxim arranged with a ham in Windsor Locks — between his station and the one he was trying for each in Springfield — to "relay" his message. Maxim transmitted in Morse Code to Windsor Locks, who then retransmitted his message to Springfield.

"The feat done, Maxim sat back in his operating chair, puffing his familiar pipe and pondered more," DeSoto wrote. Eventually, Maxim realized that a national association of hams that could relay messages across the country, station to station, could be of profound social benefit. From this inspiration, and with the help of the Radio Club of Hartford, the ARRL was born.

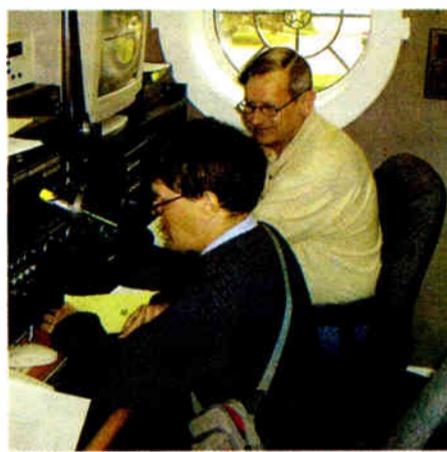
"By August 1914, more than 200 relay stations had been appointed, from Maine to Minneapolis and Seattle to Idaho," DeSoto wrote. By the end of 1915, "Amateur stations were accomplishing what were in those days unbelievable feats in transmission and reception. With homemade equipment, often not exceeding \$100 in total cost, and in the despised 200-meter region, they were frequently out-performing government and commercial stations representing investments of hundreds of thousands of dollars."



'Angel of the Seas' Bharati Prasad, VU4RBI, operates a demonstration at the Science Center near Port Blair, Andaman Islands in the Bay of Bengal, to introduce amateur radio to local navy cadets. Emergency contact among the Andaman and Nicobar Islands was maintained by groups of hams following the 2004 tsunami.



Radio has long held fascination for young people.



At the mic of W1AW. John Hennessey and Charles Skolaut are shown.

Soon after, the ARRL marked Washington's birthday on Feb. 22, 1916 by relaying a message through its member stations across the United States. "The Pacific Coast got the message 55 minutes after it started at 9XEI; the Atlantic Coast, 60 minutes after; New Orleans and Canada each had it in 20 minutes," wrote DeSoto.

This early success proved how effective, fast and useful amateur radio stations could be in relaying messages nationwide and to other countries. For an unpaid volunteer radio network to deliver such performance in 1916 was unprecedented.

Making a difference

Any time disaster hits, proponents say, amateur radio operators are there to help, backed by a wealth of fixed and portable radio systems. This is why local authorities turn to hams when regular channels of communication fail, as was the case during 9/11 and Hurricane Katrina.

Providing emergency communications is a big part of the Amateur Radio Service and written into the FCC's reasons for its creation. Besides making a difference during disasters, ARRL members help enhance homeland security. In fact, they've been doing so since the beginning.

The year was 1915. The United States officially was neutral at this stage of the Great War, and the U.S. Secret Service

was keeping an eye out for foreign nationals who might be violating its neutrality while on American soil.

Some of their suspicions were focused on the German-owned Telefunken radio

station WSL, which was based at Sayville on Long Island. Secret Service Chief W.J. Flynn was sure that the station was feeding intelligence back to Germany, but was unable to find proof. He had an inspiration: Why not ask a ham to listen in on WSL's broadcasts? So Flynn recruited ARRL member Charles E. Apgar, who lived in Westfield, N.J., to listen in. Using a home-brewed recorder consisting of a Dictograph and a telephone receiver diaphragm, Apgar recorded WSL's transmissions between 11 p.m. and 1:30 a.m., then rushed the recordings to the Secret Service for analysis.

"It soon became apparent that the station was sending information concerning

Allied and neutral shipping to submarines at sea," wrote DeSoto. Based on this evidence, the U.S. government seized WSL and interned its top managers.

The ARRL today

Given its rich past, it is not surprising that the ARRL puts a lot of emphasis on radio history. This is one of the reasons it still runs an amateur station, W1AW, in its headquarters in Newington, Conn. Dubbed the Hiram Percy Maxim Memorial Station, in honor of the man whose call sign was W1AW, this station maintains both antiques and the newest digital computerized equipment in working order, and broadcasts using both.

Local legend has it that Maxim's ghost haunts W1AW, albeit in a friendly way.

Still, today's ARRL is nothing if not



'When All Else Fails' is an ARRL promotional logo for Amateur Radio Emergency Services, a program of the ARRL.

modern. Most members have long traded in their Morse Code keys for microphones and computers, and have done their best to stay at the leading edge of RF technology. This, proponents say, is why hams are such a resource during disasters. They provide an unmatched combination of equipment and experience to government authorities, for free.

In the aftermath of Hurricane Katrina, "Over 200 amateur radio operators from 35 states and Canada were processed and deployed to the field" from Montgomery, Ala., wrote Greg Sarratt, ARRL Alabama

Predictions that the Internet, computers, cell phones and other developments would be the end of amateur radio were obviously mistaken.

— Allen Pitts, W1AGP

section manager. More served at refugee centers and other locations around the country. "Amateurs in the field and at Montgomery worked long hours each day, working many consecutive days with no time off." After 9/11, he said, hundreds of hams came from as far as Texas, California and Canada to New York to provide emergency communications. In particular, hams provide a communications lifeline for the American Red Cross and its teams.

As for the future? "Whenever Americans need us, we'll be there," said Pitts. "No matter how times change, the fascination of radio remains undimmed for our 150,000 members." 🌐

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Workbench

Radio World, March 28, 2007

Past columns are archived at radioworld.com

Nice Weather if You're a Snow Goose

by John Bisset

Bob Perry is chief engineer for Citadel's Maine and New Hampshire stations. This includes WHOM(FM), with facilities atop Mount Washington, one of the most inhospitable places on earth.

There's a Web site for the Mount Washington Observatory, also on the summit. Go to www.mountwashington.org for a sample of the weather. Let me know of your own interesting Web sites or Web cams at broadcast locations.

Fig. 1 shows the WHOM antenna and transmitter building during one visit Bob made this winter. He writes that the roads normally open some time in May!

Snow and ice can threaten broadcast engineers. From iced antennas to fallen power lines, the list of problems is endless. Read on to see how one engineer fought back.

Steve Callahan is with the WBUR Group in Boston and contributes to RW Engineering Extra. For several years, Steve has found that regular spraying of the windshield treatment Rain-X, a brand of glass treatment, on a satellite dish really keeps ice and snow from building up in the dish.

Sleet and freezing rain won't lodge in the bottom half of the dish. With the Rain-X treatment, the icy mixture just slides out. Thanks, Steve, for a great tip to keep those syndicated programs on the air.

We predicted that a mention of using Belden 8451 to run AC would make Steve Lampen cringe but not surprise him. We were right.

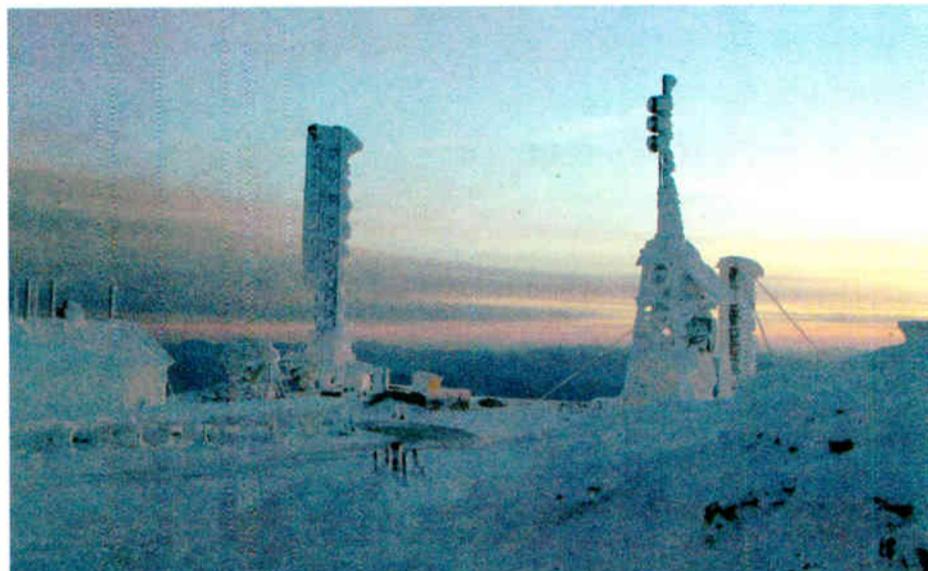


Fig. 1: What were you saying about 1/4-inch radial ice? This view is atop Mount Washington.

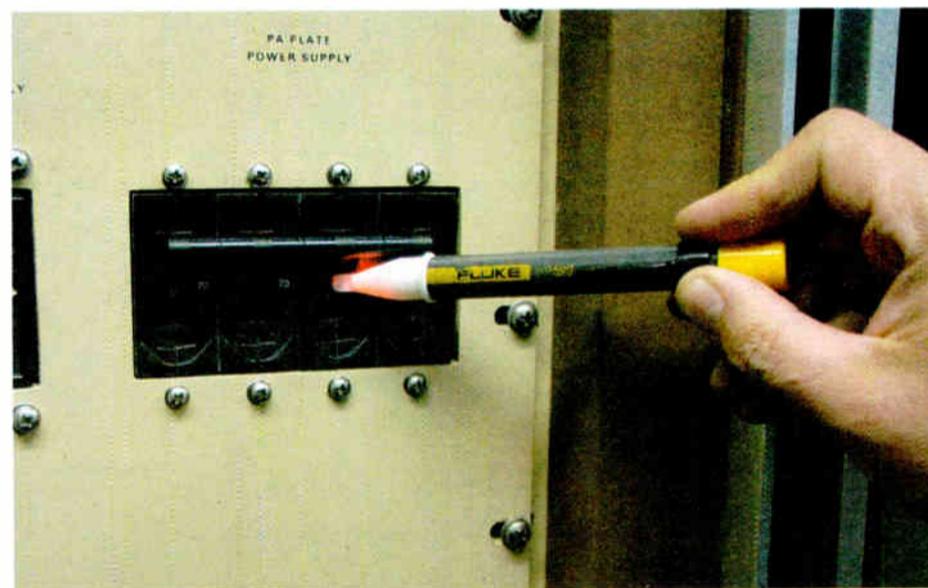


Fig. 2: Invest in your safety. Buy a Volt pen like the Fluke model shown here to detect hazardous voltages.

Steve adds some interesting facts. Look in the Belden catalog and you will find that 8451 is rated to 300 volts. On page 22.4 of its Master Catalog, and also online, is a table that shows current limit of any cable based on (1) the gauge of the conductor, (2) the number of conductors, (3) the ambient room temperature and (4) the melting point of the jacket.

For 8451 the specs are 22 AWG, two-conductor. Let's say room temperature is 70 degrees Fahrenheit or 21 Celsius. The melting point is 167 F/75 C. These easily allow a rise in temperature of 95 F/35 C on the wire, and it won't be even near its melting point. The Belden chart shows a decent 5 Amps.

Yes, a 600-watt, 120-volt light bulb!

Steve's caveat is that this does not address safety considerations, but the cable could work and wouldn't melt or otherwise fail. Amazing, isn't it? What's more amazing is that people have used the shielded audio cable in this manner.

Lampen, who contributes to Radio World, can be reached at Belden. E-mail him at steve.lampen@belden.com.

Brian Edwards is engineering and operations manager for New World Radio in Washington. Reading about unique uses for Belden 8451 and West Penn 291 brought a bad flashback to a Richmond station where he was doing some side work.

Brian found 8451 in use in a rack as a power line for a 120V on-air light. "Thank goodness for insulated dikes," he writes, adding that since that flashing experience, he's carried an inductive voltage detector in his tool bag, as seen in Fig. 2.

The tip of this handy tool glows red when substantial AC voltage is sensed. It makes for a quick check before wires are cut or removed. Thanks, Brian, for the jolting memory that many of us have

See EXCEL, page 67 ►

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World Radio History

Houston Facility Routes WW1 Traffic

by Ken R.

Crash!

A semi has just rammed into a minivan on the George Washington Bridge between New York and New Jersey. Long before the police arrive, radio listeners across the state know all about it thanks to Metro Networks.

Internet maps and digital devices such as smart phones and GPS units get that same information from a facility in Texas. The information flashes instantly via cameras and road sensors to Metro's new Data Monitoring Center in Houston. From there the details are made available in seconds to users of Shadow Traffic, Metro Networks, SmartRoute, RealTraffic, OnStar Systems in automobiles and the new 5-1-1 traffic service, accessible by phone.

Metro is a Westwood One company. Conrad Trautmann, senior vice president of engineering and technology, was responsible for bringing together the human resources, equipment and design necessary to make this newly remodeled epicenter of traffic data run smoothly.

"We had a tough time deciding whether to put it in Houston where Metro's old corporate office was, or in Detroit, where we could show it off for our automotive clients," he said. "We decided on Houston because that's where all our servers are and it was where our people are already onboard working on data streams."

Trautmann was promoted to the job of overseeing IT functions for Westwood One at the beginning of 2006; one of his first projects was cleaning up the data. He performed an evaluation of existing systems, then upgraded the software to help his operators. But he knew one more big step was necessary.

"Because I come from a radio network background, I remembered that we always had a master control area that was

manned around the clock," he said. "It was where the aggregated programming came in and was distributed. What we were missing in traffic was a similar model. I came to that conclusion very quickly and we finished the project in September 2006."

Not too big, not too small

Primary suppliers of equipment and

services included Dell for servers and Sony for eight 40-inch flat panel monitors. Omnirax provided cabinetry customized for the project (see sidebar).

"We needed to build a facility where our operators could see all of the traffic data centers across the country," he said. "The application shows us when the last feeds were entered for all markets and if there is too long of a time gap, we're

alerted. We installed video cameras on top of our computer workstations, which allows us to make contact with any of our offices. We can have real-time, two-way communication via Skype," a voice-over-Internet application.

Construction went smoothly (though a supplemental air conditioner had to be installed to run 24 hours a day because the designated office building shut its system down at night).

Traffic data acquired and distributed through Westwood is also used via the Internet by TV and radio stations sub-



The big picture: Metro Networks employees in Houston monitor data from around the country.

Westwood One in 3-D

Westwood One's new operations facility in Houston is not its first project to receive the Omnirax touch. The supplier has furnished studios in Boston, Culver City, Calif., and Jacksonville, Fla., for the company.

"By that point we had a good relationship with the client," said David Holland, designer for Omnirax. "We understood what they were looking for in terms of ergonomics, functionality, deadlines and price point. But when they told me they needed a DMC in Houston, my reaction was, 'What is a DMC?'"

DMC stands for Data Monitoring Center, and unlike the typical radio studio, the facility is a dedicated master control center for traffic reports generated in markets across the country by many sources.

"Our job was to figure out how to create a comfortable position where the operators could work at close range on their own computers and still see the big monitors at a distance," said Holland. "And then we had to determine how best to situate it in the room itself. From an engineering standpoint, we had to provide a support structure where the eight big monitors could be angle-adjusted along a curved wall.

"We designed the whole project in 3-D on the computer, then rendered it so we could view it from all sides," he said. "The client got to see and approve it before the cabinetry was built in sections, then assembled. Everything was fit-tested and photo-documented. The project manager for Westwood One was Trevor Marriott, whom we had worked with before in Jacksonville and Culver City."

The materials used included a high-pressure laminate with a plywood core for strength and stability. As the monitors each weigh 60 pounds, the trick was to build a powerful cantilevered support structure.

"Our array was built in four stands," he said. "We were hanging ourselves off that thing before we put any TVs on it. You have to over-engineer something like that or you end up with \$40,000 monitors on the floor and an angry customer."

Once the structure was built, Omnirax disassembled it and flat-packed it before shipping it to Houston for reassembly.

"What was exciting was that neither Westwood One nor our company had done anything like this," said Holland. "But I think the ability to present it in 3-D ahead of time eliminated any surprises."



An Omnirax computer rendering of Data Monitoring Center

scribing to RealTraffic, an Internet application that shows maps and plots the traffic incidents. These can be embedded into a station Web site while retaining the station's brand.

The same data is also used to plot incidents on television graphics packages. "In the old days the person doing the on-camera standup had to put a red 'X' on the crashed car site and rush to get the incidents plotted between breaks, which is a challenge in big markets," said Trautmann. "Now the data coming from that market can automatically populate those maps. We subcontract with Weather Central Inc. for their traffic graphics that take our XML feeds in."

NAVTEQ is another client that uses the data collected in the Westwood Houston facility. The map company provides in-car navigation systems. "They also use our data to provide real-time information to newer GPS systems."

Westwood one employs a fleet of fixed-wing aircraft and helicopters to help gather traffic information. There are 150 land-based cameras, 30 of which are in New York City. The company works with departments of transportation in many markets. It is a complex operation, but for Westwood One, all roads lead to Houston.

Ken R. is a former announcer and program director.



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Fusing the Satellite Radio Babies

The Wisdom of Solomon Will Be Required in Deciding Whether to Allow XM and Sirius to Merge

Had your fill of discussion about the satellite radio merger? Well, better get used to the topic. It will probably be kicked around for some time before it goes away — including on these pages. This is mainly because, despite initial appearances, the proposed merger is in many ways different than anything ever confronted in the digital media environment.

Let's consider the unique features presented by this proposal and what makes handicapping its outcome so difficult.

Lack of precedent

On its surface, the merger seems similar to that proposed by DirecTV and EchoStar, the two satellite television services in the United States. That deal was ultimately rejected by both the FCC and the Justice Department in 2002. But there are important differences between that proceeding and this one.

First, a fundamental argument made in the satellite TV case was that the operators were just competing as two among many Multichannel Video Service Providers (MVSPs), and that the proposal should have been considered just like a merger of two cable companies. All these operators provide essentially the same content (other than some differentiated pay-per-view offerings), and are thus pure delivery services — nearly commoditized, in that they

compete mostly on the basis of price. Efficiencies generated by a merger in such a case would allow lower costs to consumers, and the merged service could better compete against other (cable) services.

While this argument might seem compelling, it ultimately failed to persuade regulators, at least in part because in rural areas satellite TV does *not* have any competition from cable services, so moving to a single satellite provider would have eliminated the competitive market in those large zones of the country.

In the satellite radio case, however, this argument doesn't apply, because the two services are not providing identical content. While their respective music services may be similar, they are actually exclusive to each, and most third-party content is also exclusive to one or the other service (e.g. NFL and Howard Stern on Sirius, MLB and Oprah on XM,

etc.). Thus satellite radio services are not pure service providers, but *content* creators/providers, as well.

Thus the only "competing-in-the-broader-marketplace" argument that satel-



Part of NAB's PR campaign against the merger is a print ad in Capitol Hill publications.

The Big Picture



Photo: Gary Hayes, BIC

by Skip Pizzi

either licensee from subsequently acquiring or merging with the other.

More recently, FCC Chairman Kevin Martin has taken the even more unorthodox step of publicly commenting on the merger and its unlikelihood of approval. (The commission rarely voices its opinion on controversial issues likely to come before it in advance of their official consideration, although Martin claims he was just citing the existing rules in this case.)

Nevertheless, all that would be required for the FCC to reverse itself on this position would be a rules change — something that the FCC has historically done in response to changing market conditions, and a point that even Martin noted as possible in a postscript to his earlier comment. So it could happen.

Antitrust issues

A larger hurdle than FCC approval may be the antitrust proceeding that the U.S. Justice Department will pursue, as a matter of normal practice for any such proposed action (under the Hart/Scott/Rodino Act).

This takes the form of a business analysis conducted largely by economists, which will take a hard look at the numbers, facts and private vs. public interest benefits of the case, ultimately rendering a judgment on whether to allow it — independent of whatever decision the FCC should make.

It is likely that the two regulatory processes will proceed in parallel, but probable that neither agency will issue its decision until both are at least close to completion. Of course, the merger needs approval from *both* departments to proceed, but only one denial to be disallowed. (As difficult a time as XM and Sirius have had on Wall Street recently, one wonders what will happen to their stocks if the merger is not approved.)

Another more remote possibility is that the merger would be allowed, but a legal monopoly would be declared, requiring additional regulation to be placed on the merged entity — similar to that imposed upon utilities or cable companies, by which all pricing and service changes must be approved by an oversight process. Recent trends in regulatory philosophy have tended away from this model, however, so such a move would be quite "retro," and therefore unlikely.

Already sub-merged?

The satellite radio operators are portraying the merger as necessary to the survival of satellite radio and thus in the public interest. As with any such merger, elimination of redundant corporate infrastructure and reduced promotional expenses would improve the financial condition of the converged company. Yet streamlining the two services into one could also reduce content

See MERGER, page 71 ►

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lite radio can make is that together they compete with the amalgam of audio services from terrestrial radio, Internet radio, MP3 players, media-enabled phones, etc. — some of which did not even exist when satellite radio services were initially licensed.

Much of this broader space is beyond the scope of FCC jurisdiction, however, and in any case all these players offer distinctly differing services, which although they may ultimately "compete" at a conceptual level for listeners' ear time, they do not offer truly competitive services from a strict regulatory or business-model analysis.

Taking the competitive argument to that high a level is almost like saying TV competes with print because consumers use their eyes to consume both mediums.

So by this analysis, the closest thing to actual, direct competition to satellite radio is terrestrial radio, but even here, the national vs. local service footprint and the subscription vs. free model differentiate the two formats. And from a purely regulatory perspective, the two media are covered by different rules (both at the FCC and the Copyright Office), which also makes it difficult for regulators to consider them in the same market space. In particular, the FCC looks at these two licensees as the sole recipients of Satellite Digital Audio Radio Service (SDARS) allocations, and the commission tends to avoid placing an entire regulated service's future into a single entity's hands.

Recall also that satellite TV started with several players, who *were* allowed to merge down to two entities, but then could consolidate no further. In contrast, satellite radio *began* with only two licensees — already at the minimum to ensure competitive service — which the FCC recognized by adding an unusual, proscriptive rule in its original satellite regulations explicitly disallowing

Merger

► Continued from page 70 offerings and consumer choice.

Also consider that to keep legacy receivers of both services working, not much could be changed in either service's delivery architecture. Both of the very different satellite systems used by the two operators would have to be kept operational, including terrestrial repeaters — at least for a significant period of time. So the requisite retention of both distribution systems limits the technical efficiencies that the merger can achieve, at least in the short term.

The two head ends could be combined into one, providing significant savings, but probably resulting in a net reduction of content origination facilities. Meanwhile, both operators' expensive content acquisition deals would have to be kept in force (no net savings there) or cut back (again causing service reduction).

It's not yet clear if or how the converged operation's channels might be remapped to allow both legacy delivery systems to access the combined companies' content (which the operators have promoted as another consumer benefit of the merger). Future receivers and/or a revamped transmission system could eventually eliminate this problem, but not without substantial new development costs and high capital expenditures.

On the other hand, the two services could be retained in their current form by the merged operator for legacy customers, with new dual-system receivers and a higher-priced, "full-access" subscription tier offered as an upsell and to new customers. This would be the simplest arrangement to achieve, and would minimize the impact of the merger to existing customers, but also provide them no benefit. Meanwhile, it would also constrain the cost savings to be achieved via reduced redundancy of content offerings.

Meanwhile some analysts have questioned whether the merger really will help the new entity reach profitability, given its forebears' spending habits. They believe that the continued red ink suffered by XM and Sirius is not a result of a weak market for their services, or an artifact of promotional battles between them, but due instead to purposeful (and in their view, unwise) business decisions resulting in excessive costs for certain high-profile content deals — all of which seem likely to be carried over to the new company.

Thus they believe that the sum of the parts will still show red, and the DNA of the new company could tend to keep things that way.

Others have taken a similarly dim view of the merger — and in particular the urgency with which it's been painted by its proponents — pronouncing it more like a circling of the wagons or a retreat strategy, rather than a move forward to increased strength.

Consumer impact

As with any monopoly, the obvious risk to consumers of a single satellite radio operator is lack of pricing constraints. But it could also be argued that the broader marketplace will exert its own self-limiting forces here, and if the value proposition is exceeded by increased subscription fees, churn will increase and audiences will decline, regardless of the number of players.

Moreover, even in the existing competi-

tive market, prices have not declined, but in fact increased. (You may recall that the initial monthly subscription price differential between the services was erased in 2005 — and not by the more expensive service dropping its price, but by the cheaper one raising its price to match the other's. So much for competition keeping prices low.)

Instead, the more realistic risk of the merger to consumers may be that a sole operator would have greater freedom and ability to increase the commercial load carried by the services — a move that's already been hinted at by the operators.

Note also that to most users, satellite radio is already an effective monopoly, because once a consumer decides which service to go with, the purchase of a receiver and subscription locks them into that one service — at least for a significant

period of time. The lack of interoperability in current receivers guarantees that this would continue almost indefinitely under the status quo (despite the FCC's long-stated preference otherwise), but ironically, a merger could reverse this situation.

Another way to look at the merger portrays it simply as two "premium-content" or "pay-radio" services merging, as if HBO and Showtime were to merge and thereby offer expanded service via the same cable box that previously only received one of the two services. Of course, this approach might also include justification for an increased subscription price for the new, expanded service.

Finally, consider the impact that satellite radio has had on terrestrial radio. Would the latter's current initiatives toward HD multicasting, reduced commercial clutter and the addition of title and

artist data to radio displays have happened if satellite radio didn't provide competitive incentive? In that respect, even though the results are still in progress, satellite radio has made terrestrial radio better, thereby benefiting consumers — even those that are not currently its customers.

Thus whatever happens, the demise of satellite radio is arguably not in the public interest. What, if anything, regulators should allow or disallow toward that end remains to be seen. Either way, their decisions will be difficult to reach, generate great interest and discussion among many observers, and ultimately have strong resonance throughout the digital media marketplace for some time to come.

Skip Pizzi is contributing editor of Radio World.

Comment on the satellite merger or any topic to radioworld@imaspub.com.



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The back panel of the RemoteMix 4 shows how flexible it really is. Its tiny footprint (9.5 x 8' x 3') lets it easily fit into your audio toolbox.

XLR output is pre-limiter (full range), meaning you have a feed for every need. Bass boost adds a bit of low end before sending the signal down the phone line to provide that "how'd you get it to sound THAT good over POTS lines" nudge. There are convenient 3.5 mm send and receive jacks for recording the show or mixing in your MP3 player.

We think we've done our homework with RemoteMix 4. And we're going to have it out in plenty of time for the fall sports season.

See it at NAB in booth N9426.

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NEW TECHNOLOGY

New Antenna Maximizes Metro Coverage

Top Spin Polarization Is Said to Reduce Cliff Effect; Demo Scheduled April 1

by Milton Silam and Dirac Newel

Just up the road from Oakridge, Tenn. — a community with one of the highest concentrations of Ph.D.s in the world — is a small antenna shop in Appalachia that has recently produced a revolutionary antenna for broadcasting.

We have designed this new antenna using finite element analysis (FEA) methods to ingeniously translate the rotation of a circularly polarized signal in order to achieve Top Spin Polarization, or TSP. The Poynting vector that defines the direction of propagation of the quadrature electric and magnetic components of the electromagnetic wave in the far field has been transformed so that the rotation is more like the rolling waves of the ocean in an end-over-end fashion. This transformation is accomplished in the near-field reactive region using anisotropic dielectrics and is the basis of the TSP method.

The inventors, Milton Silam and Dirac Newel, have produced test results showing the ability of this new polarization technique to transmit a signal that arches downward as the signal propagates away from the antenna. This antenna is the ultimate design for urban canyon settings where tall buildings otherwise cause extensive shadowing. The transmitted signal effectively can curve over the top of obstacles such as tall buildings in an urban environment. Other implementations are being investigated that may provide similar capability to curve around obstacles in a horizontal plane.

The common problem of cliff effect may also be eliminated with this antenna design.

“By applying TSP, we are able to curve the propagation path much like a pro baseball player can deliver a sinker,” said Newel. In fact, one version of the antenna that provides Extreme TSP (ETSP) has been dubbed “The Titanic,” though Newel is quick to point out that this moniker isn’t popular with the sales and marketing staff.

Cliff effect tests

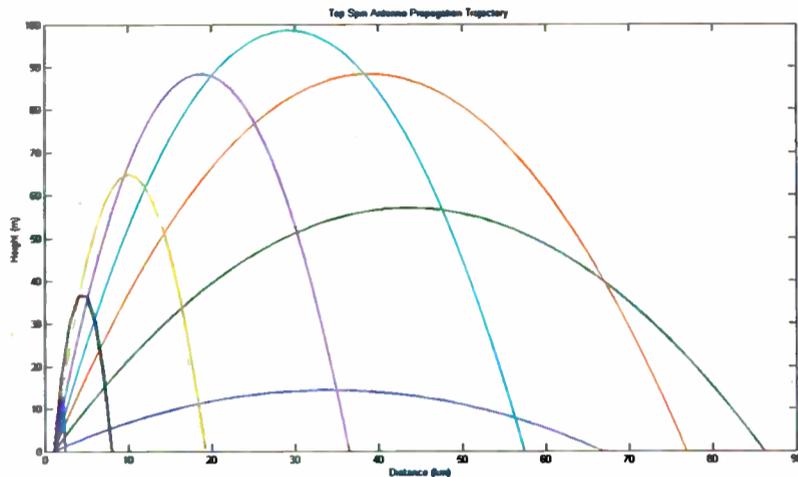
Tests have been conducted in real-world settings — including a location with a steep drop-off near a bluff near their shop in Norris, Tenn. — that demonstrate the unique characteristics of the antenna. Actual signal levels recorded on the ground using a calibrated signal strength meter were taken for both a normal circularly polarized antenna as well as for the TSP antenna. These bluff tests show a marked increase in signal level in the area immediately below the bluff, which otherwise exhibits shadows when using the normal antenna.

While prior work with broadcast customers may be lacking, we do understand some of the pitfalls that might be encountered.

“You do have to watch the feeds on the quadrature elements of the antenna,” Silam said. “We reversed them in one test at our outdoor range and had trouble getting a good pattern reading. At the same time, we were getting a poor match on the input to the antenna. We realized that we were actually applying bottom spin (BS) polarization, and the signal was arching into the sky, curving around in a huge loop and illuminating the antenna from the back! The level of self-coupling should have been a big clue, but it was the first time we encountered the problem, so it left us scratching our heads for nearly a week.”

The amount of curvature resulting from the top spin polarization is easily varied either by adjusting the power ratio of the quadrature feeds or by varying the length and angle of the individual radiating elements. We use a technique known as the knife-edge test in an anechoic cham-

ber to precisely measure the amount of top spin and to produce a map of effective radiation on ground as a function of elevation and distance by measuring direct and diffracted signal patterns beyond the knife edge. These results can be imported into some of the popular propagation modeling software tools for further characterization vs. terrain using Longley-Rice or other propagation models. Characterization of the antenna still includes the typi-



Top Spin Antenna Propagation Trajectory

cal horizontal plane pattern, but the vertical plane pattern, which usually describes the relative field strength as a function of angle, is replaced by a vertical plane plot that is a function of both elevation and horizontal distance.

While we will need to perform some additional experimentation to empirically validate these models, we have found that the paths of the electromagnetic emissions from the TSP antenna appear to follow the equation:

$$y = x \tan(\theta) - \left(\frac{TSF_Coef \times x^2}{2F^2 \cos(\theta)^2} \right)$$

where theta is the elevation angle from horizontal (zero) to straight up (pi/2), F is the field strength as a function of theta and TSF_Coef is the Top Spin Fractal Coefficient.

We have also found that we can vary the Top Spin Fractal Coefficient as a function of theta. It is interesting to note that when the Top Spin Fractal Coefficient is equal to zero, the electromagnetic radiation behaves in the classical straight-line propagation. By setting the TSF coefficient to zero (or nearly zero) at low angles of inclination, we can ensure good coverage at an unobscured horizon. Likewise, by increasing the TSF Coefficient for higher angles of inclination, we can “bend” the Poynting vector over obstacles located near the antenna.

Fig. 2 shows a typical trajectory profile that can be designed by simple adjustments to vary the Top Spin



Fig. 1: Milton Silam adjusts the Top Spin Fractal Coefficient prior to making field-strength measurements with a sheet-copper prototype of the TSP antenna. A special receive antenna was attached to an FIM-71 for collecting data.

Fractal Coefficient. Note how the increasing TSF coefficient tends to “pull” the high-angle emissions back to the ground. While this does not represent field strength on the ground, the field strength can be calculated from the value of F(theta) and from the total length of the propagation path. The trajectory profile combined with the radiation level vs. angle produce the resulting radiation level on the ground. There are several degrees of freedom in this antenna that we should be able to exploit to great benefit.

We have contacted two large broadcasting groups that have stated an interest in the new design, but it has been slow going to establish credibility due to the small size of the company and the lack of experience in the broadcast market. The business is located about four miles out of Norris, on Laerton Lane, a small gravel road taking its name from near where we grew up together in the United Kingdom. A field test for industry observers is planned on April 1, and an exhibit is also planned at NAB2007 in Las Vegas. The Web site address is www.topspinantenna.com.

RW welcomes first-person accounts from engineers with experience of TSP. 

MARKET PLACE

Talking Alert Targets Workplace Accidents

Towerswitch introduced Talking Alert, a digital audio device that provides automatically triggered loud audio safety messages and emergency alerts.

It is based upon a product intended to prevent mishaps by workers on broadcast towers.

The solar-powered system is packaged in a weatherproof housing that measures 8 by 6 by 3 inches. It provides up to 10 minutes of customized messages by pressing the Information Button. The Emergency Button notifies staff and security.

Features include a microphone jack to record messages, which can be erased. Audio playback is initiated by front-panel button or external input such as an optional motion detector or magnetic contact on a door to the rooftop.

An on-board relay can be set to notify security or set off alarms. The solar-power feature has battery backup for redundancy, or the unit can be powered by AC electricity. A Datalogger records activations to verify scheduled maintenance and inspections; site visits can be logged manually with a watch-key. Data is downloaded to a laptop or PDA. An economy model without the Datalogger is planned.

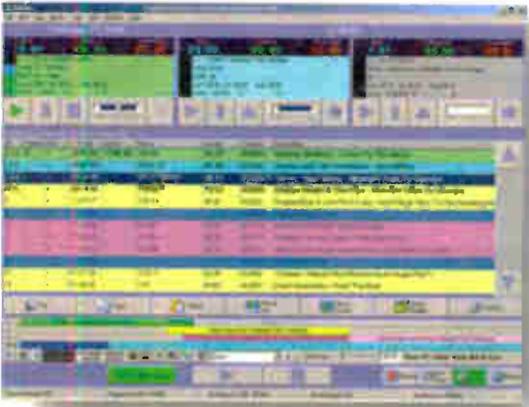
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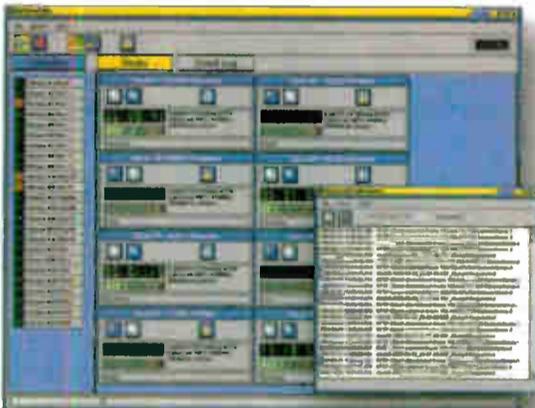
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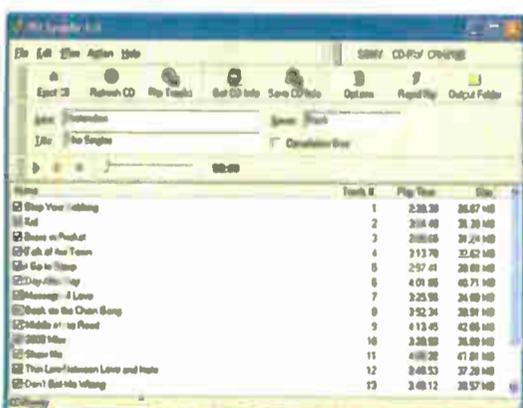
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MONEY MANAGEMENT

Trade Shows & Tax Write-Offs

Don't Miss Out on Savings. Know the Rules About Convention Deductions

by Mark E. Battersby

Imagine an enjoyable — and educational — vacation, with Uncle Sam picking up part of the tab in the form of our tax laws.

That's right, every radio station, the owner and employees of that broadcasting business (even someone who is a shareholder/employee) can legitimately claim an income tax deduction for the expenses paid or incurred in attending trade shows, conventions and meetings such as the upcoming NAB show.

Naturally there are restrictions. A major downside to the convention expense deduction is that it is not available for the expenses of attending a convention or meeting related to investments or other income-producing property.

On the plus side, the Internal Revenue Service recently updated the rules for deducting the expenses incurred while traveling on business. Those revised guidelines contain an optional method under which both self-employed radio professionals and station employees who are not reimbursed can utilize the per-diem allowances.

Thanks to our tax laws, the government will pick up the tab for a sizable portion of your expenses while attending a trade show or convention — if you follow the rules. Usually all that is required to qualify for convention-related tax deductions is that you be able to demonstrate, if asked, that attendance at the trade show, meeting, convention or other event benefited your radio station or broadcasting business.

Essentials

The expenses incurred while traveling to the site of that convention, trade show

or event are, as mentioned, tax-deductible.

Tax-deductible travel expenses include such expenditures as the cost of traveling by plane, train, bus or car between your home and the site of the meeting, convention or trade show. Also included are the expenses of taxicabs, commuter bus and airport limousines, baggage and shipping costs for samples or display materials, lodging and meals, cleaning, telephone and even tips. And, of course, the costs associated with attending the convention itself.

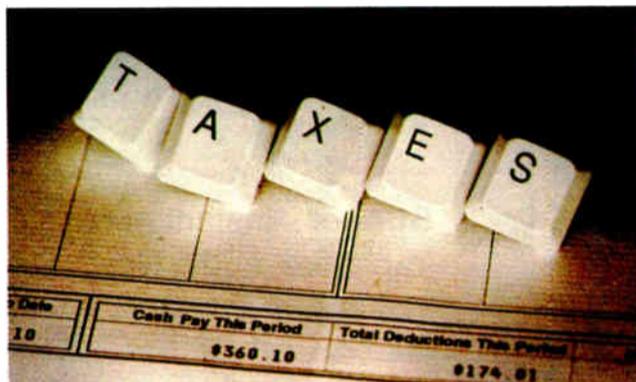
Entertaining

Part of the fun associated with attending a trade show or convention is the meals. Well, maybe not in the meals themselves, but the fact that those meals offer a station manager, engineer or supplier the opportunity to entertain potential customers or vendors seems to make them more enjoyable. Even when those convention-related meals do not involve entertainment, the tax deduction for the expense of those meals frequently makes them taste better.

Unfortunately, when it comes to meals, the tax rules contain quite a few restrictions — as well as a number of loopholes.

Generally, expenses for meals include all amounts spent for food, beverages, taxes and related tips. The tax deduction for meals is labeled by the IRS as "entertainment," however, and is generally limited to 50 percent of the amount actually spent.

Under the tax rules, those attending a trade show or convention, away from home overnight, are permitted to use



either the actual cost of the meals or a standard amount to compute the tax deduction for convention-related meals. If you, as an individual, are reimbursed for those expenses, how you apply the 50 percent limit depends on whether your employer's reimbursement plan was accountable or non-accountable.

Bringing company

Should any attendee's spouse, family members or others accompany them to a trade show or convention, either the attendee or his or her broadcasting business can deduct their travel expenses. But only if that individual:

- (1) Is your employee;
- (2) Has a bona fide business purpose for the trip; and
- (3) Would otherwise be allowed to deduct those convention expenses.

In order for a bona fide business purpose to exist, the broadcaster must prove a real business purpose for the individual's presence. Incidental services such as typing notes or assisting in entertaining customers is no longer enough.

Consider a radio station owner, Michael Peters. He drove with his wife Mary to Vegas to attend the convention. Because Mary is not Michael's employee and even

if her presence serves a bona fide purpose, her expenses will not be tax-deductible.

Michael pays \$115 per night for a double room. A single room costs \$90 per night. He can deduct the total cost of driving his car to and from Las Vegas, but only \$90 per night for his hotel room. If he uses public transportation, he can deduct only his fares.

As mentioned, as an alternative to the actual cost method, both self-employed business owners and employees can deduct a standard amount, a so-called "per-diem allowance" for their daily meals and incidental expenses while attending a convention.

However, even when this standard meal allowance is used, records must be maintained proving the time, place and business purpose of any travel or convention attendance. If your employer is related or is an incorporated broadcasting business in which you are more than a 10 percent owner, the standard meal allowance cannot be used.

The standard meal allowance is the official Federal Meals and Incidental Expense (M&IE) rate. After Oct. 1, 2006, the standard meal allowance varied between \$45 and \$58 per day, depending on the area traveled to. Maximum per-diem rate, including lodging, varied between \$148 and \$246 per day during the last quarter of 2006 and into 2007.

Optional method

The IRS's new Revenue Procedure provides an optional method for self-employed broadcasting professionals as well as employees who are not reimbursed to use in computing the deductible costs paid or incurred for business meal and incidental expenses. The optional method also covers incidental expenses only if no meal costs are paid or incurred while traveling away from home.

The term incidental expenses means fees and tips given to porters, baggage carriers, bellhops, hotel maids, transportation between places of lodging or business and

See WRITE-OFFS, page 76 ▶

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RADIO & NEW MEDIA

New Job Title: Director, Digital Media

Radio Groups Are Putting More Resources Behind Their Web Efforts

by Ken R.

Greater Media did it. ABC Radio Networks did it. Others have too. More organizations likely will add to their payrolls a position with a title like "director, interactive division."

As broadcasters explore ways of monetizing the Internet, they're putting more resources behind their efforts.

John Rosso is senior vice president, affiliate relations for ABC Radio Networks. The company recently added "and digital media" to his title.

"We are extending all of the ABC radio brands into the digital world," he said. "The first thing we want to do is increase the quantity and quality of the Internet content for all our shows. When you go to (syndicated talk host) Mark Levin's show site, it's good, but there is a long way we can go to provide the audience with a deeper interaction. Then we will build a platform that will allow us to share that content with all our broadcast affiliates."

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"The biggest obstacle we face is fear," said Rosso. "Broadcasters fear we will cannibalize our on-air audiences, although that fear is fading. Next is the fear of cost, and third is the whole intellectual rights issue. We need to be very careful with this content to make sure we have the proper rights to all the components because the potential liability is huge. Given the litigiousness of our world, it's important for every company to consider this."

Connecting with the listener

Paul Krasinski is newly appointed director of Greater Media Inc.'s digital interactive division, having joined the company in January.

"People still spend five times as much time with the radio as they do with the Internet," he said. "So radio will be a great platform for what we're trying to do. Our goal is to enable listeners to use our brand. And with the thousands and thousands of people we reach, new communities are emerging."

By communities, Krasinski is referring to sub-groups



John Rosso

within the traditional demographics.

"When we say 25-34, that's covering a broad spectrum," he said. "The younger audience might be interested in sharing travel tips or having a discussion about relationships. The slightly older end might want something entirely different. The magic is that we'll be able to target the subsets within our mass reach."



Chad Burtch, marketing manager of the Greater Media Digital Media & Interactive Division; Paul Krasinski, director of the division; Cailin O'Connor, content manager; and Ed McCormack, company IT director.

See NEW MEDIA, page 80

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Write-offs

► Continued from page 74

places where the convention, trade show or meeting is held or meals taken.

In lieu of using actual expenses in computing allowable incidental expenses paid while away from home, employees and self-employed individuals who do not pay or incur meal expenses may use an amount computed at the rate of \$3 per day. Thus, while attending a convention or trade show under an all-inclusive plan where meals are included, employees and self-employed broadcasting professionals may claim a legitimate tax deduction for incidental expenses of \$3 per day without the need of substantiating that claimed amount.

Further enjoyment

The tax rules clearly state that all travel expenses are tax-deductible if the trip to the convention or trade show was entirely business-related. Suppose, however that an attendee decides to combine that trade show attendance with a vacation?

So long as the trip is "primarily" for business purposes and, while at the convention or trade show, you extended your stay for a vacation, made a non-business

side trip or had other non-business activities, you may still deduct your business-related travel expenses. Among the expenses directly related to attending a trade show or convention are such things as the travel costs of getting to and from the convention destination and any business-related expenses at that destination.

If, however, the trip was primarily for personal reasons, such as a vacation, the entire cost of the trip is a nondeductible personal expense. Naturally, you can deduct all expenses incurred while at your destination that are directly related to attendance at the trade show or convention.

Backing it up

In order to claim any tax deductions, every broadcast facility owner/manager must be able to prove that the expenses were actually paid or incurred. In fact, the following expenses, which have been deemed by the IRS as particularly susceptible to abuse, must generally be substantiated with adequate records or sufficient corroborating evidence: expenses with respect to travel away from home (including meals and lodging), entertainment expenses and business gifts.

Meals and incidental expenses while away from home on business, especially those related to attending a trade show or convention, are a legitimate tax

Selling Your Business or Wares

Almost everyone can attend a trade show or convention and claim the expenses as an income tax deduction. Similar tax deductions are available where a station or a supplier has a promotional or sales booth at a trade show. In other words, the expenses of exhibiting or selling at a trade show or other event are also tax-deductible business expenses.

Under our income tax laws, it is immaterial whether the booth is set up at a show for the purposes of promoting your business, your products or your services, or for selling your goods, products or services.

Remember, however, expenses incurred in creating a unique display or booth may not qualify for an immediate income tax deduction. If that display or booth is for one-time use only, if it is not adaptable to other events or venues, then perhaps an immediate tax deduction as an expense for property with a useful life of one year or less might be in order. Otherwise, depreciation rules come into play.

If depreciation is the route that must be taken, do not overlook the tax deduction for abandonment of a business asset for the entire book value of any asset that is no longer useful to the broadcasting business. Naturally, that asset must actually be abandoned or disposed of (not merely stored).

The tax rules governing the deduction of travel, meals, lodging and entertainment also apply. The standard or per-diem deduction is also available to every radio station and business that uses trade shows, conventions and meetings to sell their products or services.

deduction — either the actual amounts spent or the standard M&IE rate provided by the government.

Remember, however, although the actual amount of the deduction can be taken from tables provided by the IRS, it remains necessary to prove, through adequate records or sufficient corroborative evidence, the time, place and business purpose of the convention travel.

Education, fun and business

It should be evident that every station owner and manager can write off or deduct the expenses of attending a trade show, meeting, convention or other event. Under our tax rules, all that is required is a legitimate business purpose for attending

that meeting, convention or trade show.

In reality, the agenda of the convention does not have to deal specifically with your broadcasting business; it is enough that you reasonably can be expected to gain some business benefit from attending that event.

Imagine reaping business benefits, an education and enjoyment wrapped up in one trip to NAB or any convention, trade show or meeting. Best of all, thanks to our tax rules, those expenses may qualify as a legitimate tax deduction.

Mark Battersby is a tax and financial writer based in the suburban Philadelphia community of Ardmore, Pa. He wrote about the impact of tax law changes on radio stations last summer. 

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STATION SERVICES

Identity Programming Launches 'A Touch of Class'

Gary Begin & Stephen Bianchi have opened a radio programming consultancy. Among its initial offerings is a format targeting women 25-54, called "A Touch of Class."

Identity Programming specializes in adult formats including AC, country, oldies, standards, classic rock, AAA and smooth jazz. Begin and Bianchi have experience in programming, management and on-air and are promising a "personal touch" for small- and medium-market broadcasters who want to stand out. Begin is a contributor to Radio World, which is not involved in the venture.

The company is offering strategies and tactics that improve revenue and ratings, including NTR. It will offer air talent coaching, station monitoring, recruitment, market and audience research, station critiques and promotions.

Its formats include "A Touch of Class," a modern easy-listening format for women 25-54 who are "tired of contemporary homogenized play lists." The format features artists like Harry Connick Jr., Tony Bennett, Sade, Rod Stewart, Michael Buble, Nancy Wilson, Ray Charles and others.

"Pop Radio" is a "tailored old-style top 40 format" featuring hits from the 1980s through today, and aimed at women 25-44. It was created by Prairie Radio Consulting.

The company also offers "All '80s Hits," available with personalities, promotions and imaging. It is accompanied by a copy-written rotation, which the company says keeps the music fresh while eliminating listener burn-out.

The firm also announced a Talent Services Division. "Air personality development is crucial to stations increasing and growing audience shares," Begin stated. Identity will work with morning shows as well as air talent in other day parts. Identity works on a market-exclusive basis and rates are based upon market size.

For information call (731) 424-5025 in Tennessee, e-mail or visit www.identityprogramming.com.



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Connecting with the listener

Paul Krasinski is newly appointed director of Greater Media Inc.'s digital interactive division, having joined the company in January.

"People still spend five times as much time with the radio as they do with the Internet," he said. "So radio will be a great platform for what we're trying to do. Our goal is to enable listeners to use our brand. And with the thousands and thousands of people we reach, new communities are emerging."

By communities, Krasinski is referring to sub-groups



John Rosso

within the traditional demographics.

"When we say 25-34, that's covering a broad spectrum," he said. "The younger audience might be interested in sharing travel tips or having a discussion about relationships. The slightly older end might want something entirely different. The magic is that we'll be able to target the subsets within our mass reach."



Chad Burtch, marketing manager of the Greater Media Digital Media & Interactive Division; Paul Krasinski, director of the division; Cailin O'Connor, content manager; and Ed McCormack, company IT director.

See NEW MEDIA, page 80

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Write-offs

► Continued from page 74

places where the convention, trade show or meeting is held or meals taken.

In lieu of using actual expenses in computing allowable incidental expenses paid while away from home, employees and self-employed individuals who do not pay or incur meal expenses may use an amount computed at the rate of \$3 per day. Thus, while attending a convention or trade show under an all-inclusive plan where meals are included, employees and self-employed broadcasting professionals may claim a legitimate tax deduction for incidental expenses of \$3 per day without the need of substantiating that claimed amount.

Further enjoyment

The tax rules clearly state that all travel expenses are tax-deductible if the trip to the convention or trade show was entirely business-related. Suppose, however that an attendee decides to combine that trade show attendance with a vacation?

So long as the trip is "primarily" for business purposes and, while at the convention or trade show, you extended your stay for a vacation, made a non-business

side trip or had other non-business activities, you may still deduct your business-related travel expenses. Among the expenses directly related to attending a trade show or convention are such things as the travel costs of getting to and from the convention destination and any business-related expenses at that destination.

If, however, the trip was primarily for personal reasons, such as a vacation, the entire cost of the trip is a nondeductible personal expense. Naturally, you can deduct all expenses incurred while at your destination that are directly related to attendance at the trade show or convention.

Backing it up

In order to claim any tax deductions, every broadcast facility owner/manager must be able to prove that the expenses were actually paid or incurred. In fact, the following expenses, which have been deemed by the IRS as particularly susceptible to abuse, must generally be substantiated with adequate records or sufficient corroborating evidence: expenses with respect to travel away from home (including meals and lodging), entertainment expenses and business gifts.

Meals and incidental expenses while away from home on business, especially those related to attending a trade show or convention, are a legitimate tax

Selling Your Business or Wares

Almost everyone can attend a trade show or convention and claim the expenses as an income tax deduction. Similar tax deductions are available where a station or a supplier has a promotional or sales booth at a trade show. In other words, the expenses of exhibiting or selling at a trade show or other event are also tax-deductible business expenses.

Under our income tax laws, it is immaterial whether the booth is set up at a show for the purposes of promoting your business, your products or your services, or for selling your goods, products or services.

Remember, however, expenses incurred in creating a unique display or booth may not qualify for an immediate income tax deduction. If that display or booth is for one-time use only, if it is not adaptable to other events or venues, then perhaps an immediate tax deduction as an expense for property with a useful life of one year or less might be in order. Otherwise, depreciation rules come into play.

If depreciation is the route that must be taken, do not overlook the tax deduction for abandonment of a business asset for the entire book value of any asset that is no longer useful to the broadcasting business. Naturally, that asset must actually be abandoned or disposed of (not merely stored).

The tax rules governing the deduction of travel, meals, lodging and entertainment also apply. The standard or per-diem deduction is also available to every radio station and business that uses trade shows, conventions and meetings to sell their products or services.

deduction — either the actual amounts spent or the standard M&IE rate provided by the government.

Remember, however, although the actual amount of the deduction can be taken from tables provided by the IRS, it remains necessary to prove, through adequate records or sufficient corroborative evidence, the time, place and business purpose of the convention travel.

Education, fun and business

It should be evident that every station owner and manager can write off or deduct the expenses of attending a trade show, meeting, convention or other event. Under our tax rules, all that is required is a legitimate business purpose for attending

that meeting, convention or trade show.

In reality, the agenda of the convention does not have to deal specifically with your broadcasting business; it is enough that you reasonably can be expected to gain some business benefit from attending that event.

Imagine reaping business benefits, an education and enjoyment wrapped up in one trip to NAB or any convention, trade show or meeting. Best of all, thanks to our tax rules, those expenses may qualify as a legitimate tax deduction.

Mark Battersby is a tax and financial writer based in the suburban Philadelphia community of Ardmore, Pa. He wrote about the impact of tax law changes on radio stations last summer. 

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STATION SERVICES

Identity Programming Launches 'A Touch of Class'

Gary Begin & Stephen Bianchi have opened a radio programming consultancy. Among its initial offerings is a format targeting women 25-54, called "A Touch of Class."

Identity Programming specializes in adult formats including AC, country, oldies, standards, classic rock, AAA and smooth jazz. Begin and Bianchi have experience in programming, management and on-air and are promising a "personal touch" for small- and medium-market broadcasters who want to stand out. Begin is a contributor to Radio World, which is not involved in the venture.

The company is offering strategies and tactics that improve revenue and ratings, including NTR. It will offer air talent coaching, station monitoring, recruitment, market and audience research, station critiques and promotions.

Its formats include "A Touch of Class," a modern easy-listening format for women 25-54 who are "tired of contemporary homogenized play lists." The format features artists like Harry Connick Jr., Tony Bennett, Sade, Rod Stewart, Michael Buble, Nancy Wilson, Ray Charles and others.

"Pop Radio" is a "tailored old-style top 40 format" featuring hits from the 1980s through today, and aimed at women 25-44. It was created by Prairie Radio Consulting.

The company also offers "All '80s Hits," available with personalities, promotions and imaging. It is accompanied by a copy-written rotation, which the company says keeps the music fresh while eliminating listener burn-out.

The firm also announced a Talent Services Division. "Air personality development is crucial to stations increasing and growing audience shares," Begin stated. Identity will work with morning shows as well as air talent in other day parts. Identity works on a market-exclusive basis and rates are based upon market size.

For information call (731) 424-5025 in Tennessee, e-mail or visit www.identityprogramming.com.



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BROADCAST LAW REVIEW

Stunts Gone Bad: Lessons to Learn

by Harry Cole

It is said there's no such thing as bad press, that the mere focusing of public attention on you — regardless of the context — is an inherently good thing.

We here at Cole's Law beg to differ with that conventional wisdom.

And in support, we offer two recent promotional gambits that appear to have succeeded beyond the dreams of their respective creators. These two publicity-grabbing stunts generated nationwide buzz, headlines, commentary and plenty of word of mouth. But a comparison of the up- and downsides suggests that the companies responsible for the promos would have been better off taking other courses.

Headlines

Unless you've been engaging in a long-term sensory-deprivation experiment, you have heard of both incidents.

The first was a promotional contest staged by KDND(FM), Sacramento, Calif. Subtly dubbed "Hold Your Wee for a Wii," it promised a Nintendo Wii game system as the grand prize to be awarded to the contestant who could consume the most water over a three-hour period without urinating or vomiting.

The contest was conducted on-air in the station's studio. According to one source, the on-air talent repeatedly acknowledged — in a manner apparently intended to be humorous — that they were aware that excessive consumption of water could be dangerous and possibly even life-threatening. They reportedly were dismissive and derisive when contestants began to show the ill effects of their water intake and when a nurse phoned in to warn all concerned about the dangers of the contest.

Tragedy occurred when a contestant died.

In the second promo-gone-wrong, the

Cartoon Network hired some folks to deploy throughout the streets of various cities, including Boston, battery-powered LED placards featuring the image of characters from the "Aqua Teen Hunger Force," a cartoon segment from the network's Adult Swim programming block.

The units vaguely resembled "Lite-Brite" toys, except that the images were flipping the bird, something we, at least, don't normally associate with "Lite-Brite." Police attention was called to one

Interestingly, neither of these promotions appears to have violated FCC rules, regulations or policies. With respect to broadcaster-conducted contests, the commission requires only that the station announce all of the material elements of the contest and that the station then conduct the contest according to those elements. As far as we are aware, the Sacramento station properly announced its contest rules and ran the contest as advertised.

Involve all decision-makers at the station — not just the 'creative' programming types, but also the sales folks, overall management and legal counsel.

of the placards and, when the unit was removed, the police observed that it shared some characteristics of improvised explosive devices.

Accordingly, authorities shut down major portions of the Boston transportation system as they located and removed the promotional items.

While the Boston episode didn't result in a fatality, it cannot be said to have ended happily. Turner Broadcasting, parent company of Cartoon Network, and the PR crew which set the promotion in motion, agreed to cough up \$2 million to settle civil or criminal claims that might have been brought against them. Turner also apologized and the general manager/executive vice president of Cartoon Network resigned.

The costs of fame

Where were the problems here? After all, the primary goal of these two stunts was publicity, and that's one thing that they both most certainly generated.

The Cartoon Network promotion did not involve any "contest" at all, but arguably brushed up against the rule (Section 73.1217) which prohibits broadcast hoaxes. Under that rule, it is unlawful to broadcast "false information concerning a crime or a catastrophe" if the broadcaster knows the information to be false, if it is foreseeable that the broadcast will cause "substantial public harm," and if the broadcast does in fact cause such harm.

That section does not apply to the Cartoon Network promotion for at least a couple of reasons. First, the Cartoon Network is not a broadcaster. Second, no information about the mysterious placards was broadcast — indeed, the whole point of the exercise appears to have been to generate word of mouth buzz, not broadcast coverage.

But if no FCC sanctions are issued for the Sacramento or Boston incidents, that does not mean that these promotions were a good idea.

The station is looking down the wrong end of an ugly wrongful-death lawsuit filed by the victim's family, seeking compensatory and punitive damages. At the FCC, Chairman Martin has called for an inquiry into the matter, notwithstanding the fact that there does not appear to have been any rule violation. It has been reported that as many as 10 station employees were fired.

Meanwhile, at Cartoon Network, the company (or its parent) is millions of dollars out of pocket to make nice with the folks in Boston, and a head honcho is out on the street.

Sure, the Sacramento station and the "Aqua Teen Hunger Force" may have been on the nation's lips for a day or two. But as RW columnist Mark Lapidus has noted, those lips were saying something like, "What were those guys *thinking*?" Others may have wondered how a company could possibly have concluded that a little buzz would be worth putting individual lives (in Sacramento) or the overall public convenience (in Boston) at serious risk.

And while we don't want to let the folks responsible for these promotions off the hook by any means, we do think it warrants at least a passing observation that there has been only the mildest reaction at the FCC to the death of the Sacramento contestant. By contrast, three years ago when Janet Jackson's partially covered right breast was broadcast for approximately one-half second, the commission — and Congress — acted as if the world were coming to an end.

One may legitimately question the priorities reflected in these disparate reactions.

What we learn

What helpful tips can Team Cole's Law provide?

Only the obvious. Foremost, plan and think through any and all possible twists and turns your promotion might take. In particular, think in terms of worst-case scenarios — what is the absolute worst thing that might happen; what are the chances that it will happen to you — and could you afford it if the worst case were to happen?

Second, in the design of any such promotional activity, it is best to involve all decision-makers at the station — not just the "creative" programming types, but also the sales folks (who may have something to say about how the station's advertisers might react to a promotion gone bad), overall management (who probably have a better handle on what the station's insurance covers) and legal counsel.

Third, if the station decides to go forward with a promotion which has at least some significant potential downside, try to design the promotion to minimize the likelihood of unpleasant results. And in any event, be prepared for the worst-case scenario.

The Sacramento and Boston incidents may reflect an unfortunate perception on the part of some that any publicity is good publicity even if it involves preventable death or massive public inconvenience. I strongly encourage anyone involved in the PR industry to exercise judgment and restraint to avoid such a perception.

Harry Cole is a member of the law firm of Fletcher, Heald & Hildreth, P.L.C. Reach him at (703) 812-0400 or via e-mail to cole@fhhlaw.com.

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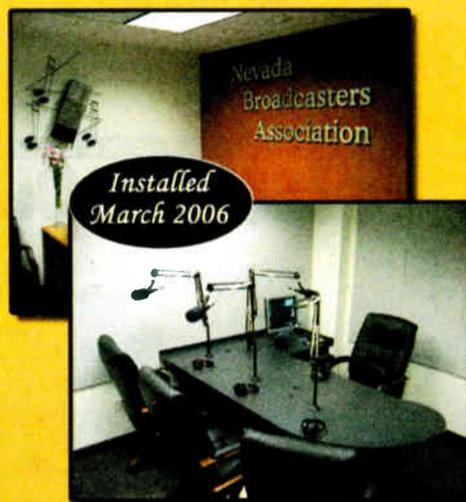
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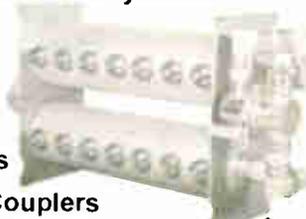


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How to Win With Free Movie Tickets

Generally, people make two kinds of comments as they leave a movie theater and brush bits of popcorn off their shirts: 1) They loved the movie. "Wow! A life-changing experience!" 2) They couldn't stand it. "What a waste of time!"

Either way, if the movie was free and hosted by a radio station, there's another comment you'll hear: "I'm glad we didn't have to pay to see that."

Because the price of a movie has reached a new high, this entertainment experience is more valuable than ever to listeners.

Make a little list

When a couple goes out to see a movie, it can cost 'em \$18 for tickets, \$12 for food and \$25 for a babysitter. When we offer free tickets, we're putting smiles on faces.

Even so, fewer stations seem to be doing free movie promotions. Perhaps part of the reason is that the major studios are offering fewer promotions than they were five or six years ago; if the phone isn't ringing as often with screening opportunities, perhaps they've become less top-of-mind for promotion and program directors.

Are you planning properly for movie action?

There are many Web sites that offer movie release dates. Start by printing a list of what's coming up in the next three months. Then — at least once a week —



update it to make sure you don't miss anything.

Pick the movies that best complement your format, but remember you're shooting broad here, looking for films that fit the wide demo of your listeners, not just the narrow target.

If you're not getting calls from an agency representing movie companies and you're in a major city, find out why. Perhaps at some point a sales manager threw a fit when a station did a promotion for a movie studio and that agency hadn't purchased commercial airtime to promote the movie.

If you're not being approached to do movie promotions, don't let that stop you. It's not difficult to find another avenue.

Nearly every film — regardless of theme or target — will purchase 12-34. If your station doesn't fit that demo, you don't stand a chance of getting money out of a movie studio. Sometimes they'll tell you it's because they've got a hip soundtrack they want to peddle to a younger demo even though the movie is made for older adults.

Don't ask me to explain the logic; I've never understood it. I only know that it's nearly impossible to fight.

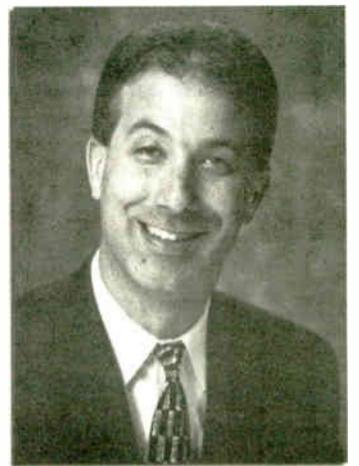
This means you may have to convince your sales manager that you should be doing the promotion as a service to your listeners and that there are other ways to make money by doing movie promotions.

Make it count

For starters, do movie ticket raids. Your sales department finds a retailer that wants foot traffic. They purchase the promotion. During a limited one-hour window, you give away movie tickets at that location. Everyone wins.

Perhaps you could have a non-com-

Promo Power



by Mark Lapidus

petitive ticket raid "Title Sponsor" as well. "The 95X Ticket Raids are brought to you by Budweiser." Your sales department may also benefit by receiving an allotment of tickets to hand out to special clients so they can go for free. Diplomatic goodwill goes a long way.

If you're not being approached to do movie promotions, don't let that stop you. It's not difficult to find another avenue.

Start by calling a local chain. It's a competitive business and if you show favor toward one chain over another, you often can develop a relationship for "run of show" tickets — meaning, they can be used whenever a customer wants and wherever they want. Because of their ease of use, these passes are even more valuable to listeners than a single-evening showing.

Sure, it's fun to be at a premiere, but if you ask people, you'll discover most would prefer to see a movie at their convenience somewhere near where they live or work.

If the local chain says no, target a theater in a central location and approach that theater manager directly. Even when the chain passes, it's still possible for a local manager to make his or her own decision about whether or not to do special promotions. Giving away tickets to only one theater is far from ideal, but it still gives you the on-air image you're seeking and lucky winners will still get to see a free flick.

Don't forget to take on-air credit the day after a movie showing. Even if it stank, have a few listeners offer their opinions on the air during your morning show. When they do so, offer them tickets to your next free movie!

Mark Lapidus is president of Lapidus Media. E-mail him at mlapidus@cox.net.

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New Media

► Continued from page 75

Krasinski said people want to feel "connected."

"They might wonder how they can participate in their favorite station if they are not near a radio or a computer," he said. "They're asking how they can use instant messaging or cell phones so we want to take these ideas into the market. We can have a farm team of new technologies."

Krasinski knows some older people may not want to be pushed into new media.

"And we don't want to artificially put

them there," he said. "There will be different opportunities for the various communities."

Greater Media owns 20 AM and FM radio stations in Boston, Detroit, New Jersey and Philadelphia. The company has appointed local directors of integrated marketing in each city.

"I want to empower our local resources that are just diving into the water," Krasinski said. "We're extending everyone's comfort zones into the new world of interactive, but radio is still a big component. It's not a huge leap; it's a good segue from mass-market appeal to online appeal."

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GUEST COMMENTARY

ADVERTISER INDEX

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PAGE	ADVERTISER	WEB SITE URL
34	25-Seven Systems, Inc.	www.25-seven.com
79	Acorn	www.acornrf.com
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58	Altronic Research	www.altronic.com
35	APT	www.aptx.com
26	Armstrong Transmitter Co.	www.armstrongtx.com
24	Audemat-Aztec Inc	www.audemat-aztec.com
77	Audion Labs	www.audionlabs.com
20	AudioScience Inc.	www.audioscience.com
59	Audio-Technica U.S. Inc	www.audio-technica.com
18-19	Axia - A Telos Company	www.axiaaudio.com
65	Balsys Technology Group	www.balsys.com
36	Broadcast Depot	www.broadcastdepot.com
17	Broadcast Electronics	www.bdcast.com
75	Broadcast Warehouse	www.bwbroadcast.com
73	BSI	www.bsiusa.com
3	BSW	www.bswusa.com
27	Burk Technology	www.burk.com
74	Burli Software	www.burli.com
79	Circuit Werkes	www.circuitwerkes.com
77	Coaxial Dynamics	www.coaxial.com
22	Comet North America	www.cometna.com
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7	Comrex Corporation	www.comrex.com
44-45	Continental Electronics Corp.	www.contelec.com
53	Crown Broadcast IREC	www.crownbroadcast.com
57	DAWNco	www.dawnco.com
79	Dayton Industrial Corp	www.daytonindustrial.com
47	Digigram Inc.	www.digigram.com
55	Digital Radio Express	www.dreinc.com
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23	Electronics Research, Inc.	www.eriinc.com
69	Enco Systems, Inc.	www.enco.com
42	ESE	www.eseweb.com
31	Eventide	www.eventide.com
39	Global Security Systems	www.gssnet.us
43	Google Inc.	www.google.com/ads/asaudio
77	Gorman Redlich Mfg	www.gorman-redlich.com
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67	HHB Communications U.S.	www.hhbusa.com
66	Inovonics Inc	www.inovon.com
59	Inovonics Inc	www.inovon.com
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25	KOWA	www.proaudiokowa.com
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13	Omnia - A Telos Company	www.oniaaudio.com
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Radio Industry in Moving Waters

by Ken Dardis

The problem with traffic reports is that a reporter discussing a backup on the east side of town is totally ignoring listeners west, south and north of town.

Now, change the subject used in the preceding sentence to "radio industry professionals" and restructure it like this: While radio trade publications are discussing who's promoted, which stations are flipping formats (or owners), and the latest person who's been hired to run some group's Internet stations, they're ignoring people interested in new ways to program radio.

Some say radio is at the pinnacle of opportunity, and I believe that to be true.

that auctions are, at the very least, placing radio advertising in the news again. (You can bet that media buyers are looking at auctions, carefully.)

The radio industry is moving to recapture lost ground from its years of apathy. There's enormous opportunity, and partners in each new venture are starting to feel each other out, hoping "this is the deal that moves us forward."

But (there's always a "but" to this type of story), conversations on new programming techniques, or on programs that are making waves, are not happening within or outside the industry. It's time radio reintroduced the "show," as in a program created by an individual, and one that reflects enter-

It's time radio reintroduced the 'show,' a program created by an individual that reflects entertainment or information in the way the show's host sees fit.

The industry is ready for a different approach. Radio professionals are hungry for a chance to show that they haven't lost their touch. And best of all, the audience is in the middle of reshuffling its audio habits, meaning there's still an ongoing race for ears. This new media dance is nowhere near over.

Recapturing lost ground

Exciting times. Opportunity exists. It's an open field where options are being offered to stations in numbers that haven't been seen in a decade. No, check that. Make it "that haven't been considered in a decade." Today's thoroughfare to the masses has been available since 1995 and ignored by radio through 2005.

Online has grabbed the top spot for conversation in radio today. Topics range from improving radio Web site content, through on-air and online inventory being repositioned as adjunct properties, to building a station's audience outside of its locale.

Recent news about online radio advertising auctions (Google, SMWX and Bid4Spots) is just a prelude to the revamping of radio ad pricing. Before considering this to be a negative, digest

tainment or information assembled in the way the show's host sees fit.

Within this process be prepared for failure, which isn't a lot different than what's been happening in radio of late. Then promote these new "talents" within each community by making an effort to improve the community — to bring fun into living there, or knowledge to the curious, or help to the unfortunate.

Reading about stations that attach to communities cannot possibly be considered a normal routine today. Nor is reading about ways to attach to communities in radio industry trades.

The positives of radio need to be written about with frequency, in radio trade magazines and in the local press. So, it's idea time, when an industry needs to conceive and nourish a relationship built on programs it airs to ears that are seeking something new.

This race is just beginning. Opportunities do exist. Radio is changing, and there's a long way to go. So, start programming like it matters, like you matter. Give someone something to write about.

Ken Dardis is the founder and president of Audio Graphics. This commentary appeared on www.audiographics.com.

Letters to the Editor

Radio World welcomes your point of view on any topic related to the U.S. radio broadcast industry.

Letters should be 100 to 300 words long; the shorter the letter, the better chance it will be published in full. We reserve the right to edit material for space. Longer commentaries are welcome but may not reach print as quickly.

Include your name, address and contact information, as well as your job title and company if appropriate.

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GUEST COMMENTARY

Should FCC Adopt NFL's 'Rooney Rule'?

by Eric J. Shoars

One of the most talked-about stories leading up to the National Football League's Super Bowl XLI was the fact that Chicago Bears head coach Lovie Smith and Indianapolis Colts head coach Tony Dungy were the first black head coaches to appear in the Super Bowl.

In the history of the NFL, there have only been 10 black head coaches — the others are Fritz Pollard, Art Shell, Ray Rhodes, Marvin Lewis, Romeo Crennel, Herman Edwards, Dennis Green and Mike Tomlin — and one of Mexican heritage, Tom Flores.

Both Smith and Dungy have credited the NFL's "Rooney Rule" for increasing opportunities for blacks to serve as head coaches in the league.

One for all

The "Rooney Rule" was instituted in 2002 by the rule's namesake, Pittsburgh Steelers owner Dan Rooney, who was the chairman of the NFL's diversity committee. The Rooney Rule requires that every NFL team interview at least one minority candidate for any head coaching vacancy.

Since the Rooney Rule was implemented, one team — the Detroit Lions — hired a head coach in 2003 (Steve Mariucci) without interviewing a minority candidate. The Lions organization was fined \$200,000 by the National Football League as a result.

Lovie Smith observed that not only did the Rooney Rule provide the means for his hiring, it sped up the process for other black coaches to achieve head coaching positions. "I would like to think owners would hire the best coach," Smith said during a Jan. 29 press conference in Miami, "but I am here because of the Rooney Rule. I definitely think we need to keep it in place."

Recruiting is stressed but not the actual interviewing of those women and minorities applying for the open upper-level category positions.

In an era where diversity has been given a lot of lip service, we should look at other industries, such as radio and television, and consider whether or not instituting the Rooney Rule would speed up the process for minorities to be hired for executive positions.

Consolidation in broadcasting has decreased the number of upper-level category positions and further slowed the ascent of women and minorities to those positions. For this reason, the FCC should take a page from the NFL's playbook and institute a Rooney Rule for broadcasters.

Job scarcity

Head coaching positions in the NFL are scarce, as there are only a total of 32 head coaching jobs. However, the NFL's Rooney Rule pertains to those jobs only and not front-office positions. A Rooney Rule for broadcasters should go further than that. Current EEO regulations for broadcasters specify that radio and television stations must actively recruit minorities to fill positions, but do not specify how many candidates, if any, need to be interviewed in filling executive position vacancies.

Current EEO guidelines for broadcasters state that active recruiting for full-time positions must be done, including a variety of outreach activities. Many of these full-time positions are entry- or mid-level jobs. For "upper-level category" positions, a listing of each of those openings must be included in a job bank or newsletter of media trade groups whose membership includes substantial participation of women and minorities. Again, recruiting is stressed but not the actual

interviewing of those women and minorities applying for the open upper-level category positions.

I believe there should be a rule for broadcasters that pertains to positions including market managers, vice-presidents, CFOs, COOs and CEOs. If the FCC were to adopt the Rooney Rule, broadcasters would be required to interview at least one minority candidate (female or ethnic minority) for open upper-level category positions. Those groups (corporate and private) that did not interview at least one female or ethnic minority candidate for open upper-level category jobs would be subject to sanctions determined by the FCC.

The Rooney Rule is not an automatic cure-all to level the playing field for minorities in the NFL, nor would it be for broadcasting. It does, however, accelerate the process by which minorities are interviewed and, potentially, hired. It's not enough to have a pool of candidates for open positions, but candidates actually being interviewed

Three things would result for the minorities being interviewed under broadcasting's Rooney Rule: 1) minorities would hone their interviewing skills for upper-level category positions; 2) minorities might

actually impress the interview committee and get offered the job and; 3) broadcasting's upper-level category positions would start to reflect the diversity we've been encouraging our listeners and viewers to embrace.

The NFL is basking in the glow of the plaudits it's receiving for this forward-thinking initiative. Wouldn't radio and television also benefit from the same accolades afforded the National Football League by adopting a Rooney Rule for broadcasters?

By nature, I favor initiatives by the individual broadcast groups (corporately and privately owned) to handle this type of an issue. However, there has been slow progress on this issue. We broadcasters are shortchanging ourselves by denying opportunities to some of our best and brightest people for upper-level category positions because of their gender or skin color.

We as broadcasters would be wise to live the lesson provided to us by the NFL.

Dr. Eric Shoars holds a Ph.D. in organization and management from Capella University in Minneapolis. He has done research on glass ceilings and is writing a book on his findings. Contact him at eshoars@rconnect.com.

◆ READER'S FORUM ◆

Fessenden, 1902

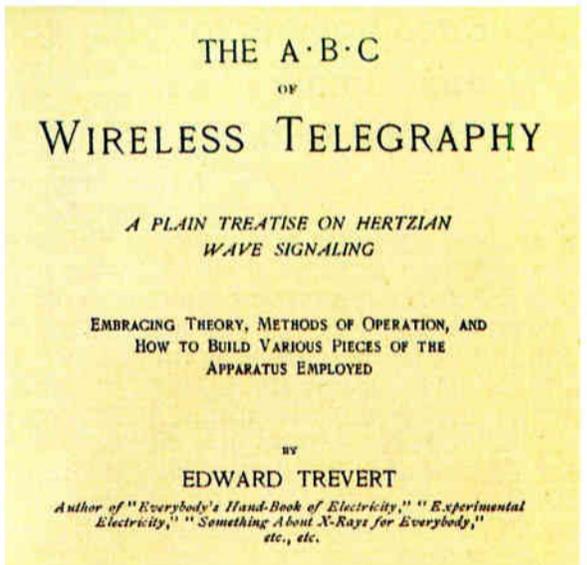
The fascinating story of Professor Fessenden by James O'Neal ("Fessenden: World's First Broadcaster?" Oct. 25) prompted me to re-read a book I've had for some time called "The A-B-C of Wireless Telegraphy" by Edward Trevert, published in 1902.

I was surprised to see that this primer on wireless telegraphy mentions Fessenden on page 75 in regards to his "experimenting with wireless telegraphy under the direction of the United States Weather Bureau."

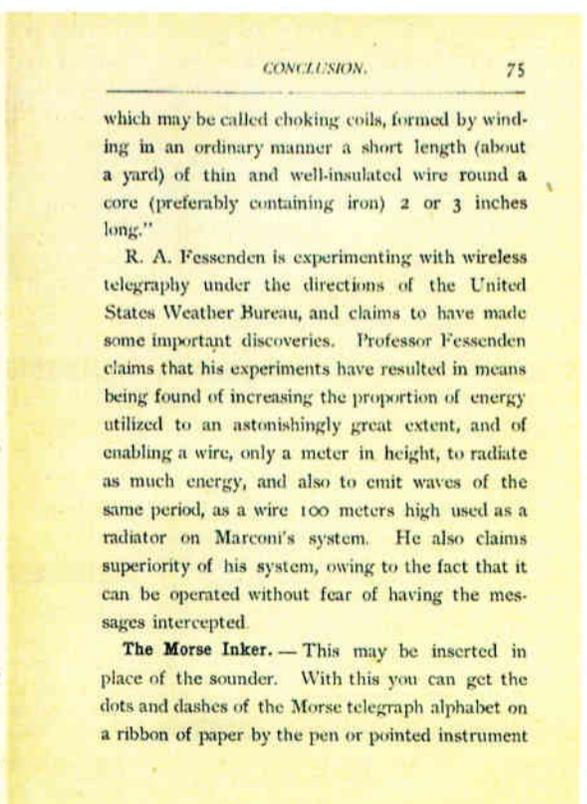
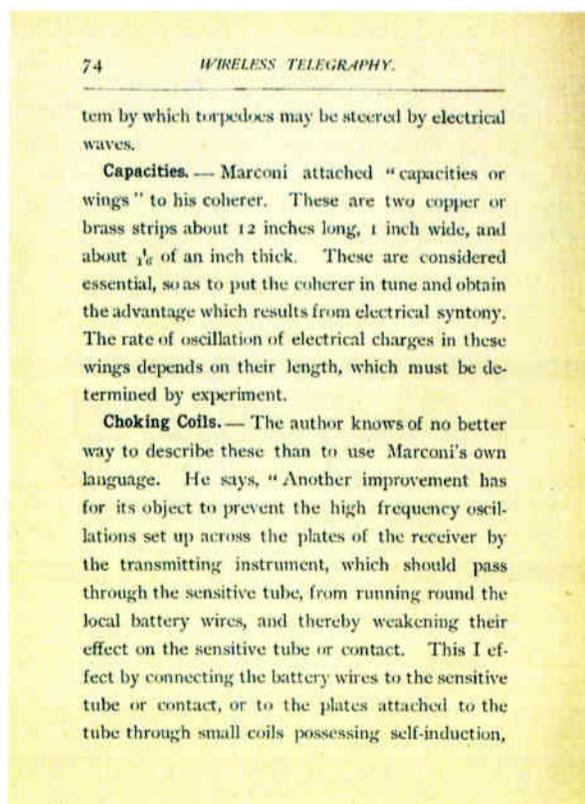
"Wireless Telephony" was in its infancy, with only "claims" of success.

Thought this might be of interest in light of Fessenden's earlier work and his claim of "System Superiority" to Marconi's.

Marc R. Mann
San Diego



'Wireless Telephony' was in its infancy, with only 'claims' of success.



Edward Trevert's 'The A-B-C of Wireless Telegraphy' mentions Reginald Fessenden.

◆ READER'S FORUM ◆

Getting the Runaround

As I read "A Quickly Dying Field?" by Scott Ensley (*Reader's Forum*, Jan. 17), it was not unlike a rapid descent down a rabbit hole in a parallel universe. I scarcely know where to begin.

Mr. Ensley, who claims to be seeking training in the engineering side of broadcasting, describes being sent from one station to another, recalls encounters with engineers who "guard their experience" rather than sharing it and tells of an entire sector of an industry that is underpaid and under-appreciated. He is particularly critical of Clear Channel and generalizes in the extreme with regard to some tired old arguments that from a front-line perspective seem trite and clichéd.

Countless incumbent engineers in this area have prepared dedicated trainees to thrive in our technical field.

I have been engineering radio stations for about 40 years in the San Francisco Bay Area, which includes Santa Rosa, from which Mr. Ensley hails. I learned the trade from those who went before me, and never once did I encounter anyone who could not resist sharing (not guarding) experiences to a fault.

I have known, as a personal friend, the director of engineering at the Clear Channel San Francisco cluster of radio stations for nearly 30 years. In that time he has trained over a dozen engineers. Some are working at Clear Channel stations in the area; some are working in other areas now, and some are with other companies. Never to my knowledge did he ever pass anyone on to anyone else. As a matter of fact, I do contract work for one of his former protégés, who is now himself chief at a cluster of stations for another company in the area.

I have trained young apprentices who have gone on to do well in the broadcast engineering trade, just as countless incumbent engineers in this area have prepared

interested and dedicated trainees to thrive in our technical field. This is standard stuff; we take our obligation to "pass it on" seriously. I would like to hear from Mr. Ensley and have him tell me to whom in this region he refers in his tale of neglect and indifference.

Santa Rosa is not another planet; it is 40 miles away. I have a difficult time believing things are so much different there than they are in San Francisco and the East Bay. Furthermore, Mr. Ensley's remarks about compensation, raises and the like are pure fantasy, at least as they relate to this region.

I hope that anyone interested in working in the technical side of broadcasting is not taken in by the misleading statements found in Mr. Ensley's letter.

*John Higdon
Chief Engineer
Coast Radio Co.
Pleasanton, Calif.*

Goodbye, Friend

It's with a very heavy heart that I write to share word that Jim Somich has passed on to the big audio processor in the sky. He was 65. Jim was a successful broadcast engineer as well as product developer. His career spanned radio, television, photography, movies and just about any form of media imaginable.

Jim worked at KFI(AM), KMET (AM), WMMS(FM), WHK(AM), WHTZ(FM) and WJW(AM), just to name a few of the radio stations. He built quite a number of UHF TV stations for Malrite Communications, where at one time he was director of radio engineering. He was also involved in a few ventures: Somich Engineering, MicroCon Systems and I'm sure a host of others. Jim kept a private life and ventured into some interesting and alternative aspects of it.

He was also the person who took a chance on a goofy, long-haired, 22-year-old kid, stuck him under his wing and taught him the ropes of radio engineering. If not for Jim Somich sticking his neck out for this passionate overachiever, Frank Foti would never have seized the opportunity to follow an exciting path in this industry.

More important, he was, and will always remain, my friend. While there are many wonderful memories of him, sadly we will not be able to create new ones.

Be at peace, Jim. Life and our industry lost a good friend.

*Frank Foti
Cleveland*

Arrested Development?

The slow start HD Radio is experiencing hasn't been helped by its continued operation under interim FCC Rules. The radio industry's most important change in a lifetime labors in a lengthening shadow of tentativeness.

The uncertainty this creates, however slight it may seem, is enough to keep some potential players on the sidelines. It could also be causing substantial development funds and venture capital to be held aside or invested elsewhere.

We wonder why this is still the case. Certainly the FCC grasps the importance of this issue, so the longer the delay continues, the more it leads us to believe that it is not simply procedural, but that there may be unresolved substantive items still under active discussion at the commission.

We can further speculate that these may be both technical and political matters. The former likely revolve around AM-IBOC and continuing reports of interference, while the latter probably include consideration of added responsibilities for broadcasters on any new multicast channels.

While we recognize that these are important issues, the industry's future is involved. We fear a chilling effect is creeping over the rollout, even those already actively engaged in the conversion, who would take the next steps in pushing the transition forward were there more clarity. This includes new audio and other services that might benefit from easy movement to FM-IBOC's Extended Hybrid mode, and new formats or other infrastructure improvements that could proliferate in a full-time, higher-fidelity, local and regional digital AM broadcasting environment.

As long as the interim rules remain in force, we worry that these and other possible applications will be kept on hold and fail to reach their potential in U.S. radio broadcasting — or worse, that their purveyors will take them elsewhere. There is no shortage of other new distribution technologies under development, so the window of opportunity for digital radio broadcasting to establish its market is growing smaller. Some of these alternatives also seem to be moving through the regulatory process at a far faster rate than digital radio is.

We don't advocate hasty consideration of anything as important as the future of radio broadcasting in this country, but we are loath to see the natural maturing of nascent technology thwarted by excessive regulatory delay. We also acknowledge that there is plenty on the FCC's plate, but that is a permanent condition.

As good stewards of the public interest, the commission should end the doubt surrounding U.S. digital radio regulation and stimulate progress by finalizing its IBOC rules as soon as possible. They are already long overdue.

— RW

'Vast Wasteland' of Ham Radio

In "Hams Strive to End Antenna Bans" (Nov. 8), it was made clear that ham radio operators are trying to get highly restrictive antenna covenants lifted so they can erect antennas for communication. As a radio amateur since 1959 (K1OIK), it is clear to me that 99 percent of hams use the hobby — and it is a hobby, not a service — for their own self-enjoyment and do nothing in the way of public service.

Listen to the vast wasteland that ham operators use. Virtually all conversations are devoid of anything technical or related to public service. A recent "SS" contest had hams exchanging fabricated signal reports and locations by the thousands like so many notches on a belt. There was no redeeming information exchanged.

If you listen on 14.230 MHz where Slow Scan TV resides, you will see what you saw 20 years ago: pictures of Disney characters, albeit in color. Why transmit pictures (not really television) that take a minute when you can do the same thing on the Internet in seconds? Ninety percent of all international contacts are worse, where the only communication is name, inaccurate signal report, location, equipment and maybe weather.

If someone can *prove* public service, then giving them a pass to erect an antenna has some merit. Otherwise let them live where they will not infringe on neighbors. I guarantee you will get a huge response citing the merits of ham radio, from the few who actually are worthy of a public license. However the truth is in listening on the ham bands.

Newton Minow called television the vast wasteland. He had not yet listened to ham radio.

*Burt Fisher
Cape Cod, Mass.*

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Vol. 31, No. 8 March 28, 2007

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NEXT ISSUE OF RADIO WORLD APRIL 11, 2007
NEXT ISSUE OF ENGINEERING EXTRA APRIL 4, 2007

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Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by IMAS Publishing (USA), Inc., P.O. Box 1214, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church, VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church, VA 22041. REPRINTS: For reprints call or write Emmilly Wilson, P.O. Box 1214, Falls Church, VA 22041; (703) 998-7600; Fax: (703) 998-2966. Copyright 2007 by IMAS Publishing (USA), Inc. All rights reserved.

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