Shortwave Believer
Jeff White says the band still has a lot of life left in it.
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Your Next ATV?
Engineers ride like cowboys to get signals back up.
Page 8


Photo by Roger Adams, WPR

Radio World

$2.50 The Newspaper for Radio Managers and Engineers March 26, 2008

NCE Applicants Have Big Dreams

Wanna-Be Noncom Licensees File for New Frequencies; Patience Is Advised

by Randy J. Stine

WASHINGTON Now that hundreds of non-profits have filed thousands of applications for new FM educational channels, communications lawyers say the filers have begun a protracted, sometimes frustrating and certainly expensive process of being awarded a non-commercial broadcast license.

Described as being "put through the legal wringer" by one attorney, applicants face the arduous task of gaining approval of the FCC, which is likely to take years in many cases.

Last fall's filing window resulted in 3,630 applications, according to the commission, with Texas producing the most (332) and Delaware the fewest (nine). An analysis by Radio World shows that educational institutions, religious groups and a variety of community-based groups make up the majority of the applicant pool.

Most frequency applications filed were for areas outside major urban areas, or at least on the fringe of larger markets. Experts say since many of the 3,630 are mutually exclusive, meaning multiple applicants applied for the same frequency, the total number of new channels assigned is hard to predict.

"Until the FCC sorts out all of the mutually exclusive groups and starts to winnow through them, we can't speculate with any reliability at all as to how many may ultimately be granted," said Harry Cole, communications attorney with

See NCE, page 12 ▶

NEWSWATCH

Arbitron, Nielsen Declare Apollo DOA

NEW YORK Arbitron and The Nielsen Company terminated "Project Apollo," which linked audience exposure to advertising with purchasing behavior.

The companies had been working on the concept of a single-source national research service since 2005 but said in February they didn't have enough client commitments to make the project economically viable.

The service would have been based on Nielsen's Homescan technology for measuring consumer purchase behavior, combined with Arbitron's PPM system measuring electronic media exposure.

Analysts: It's an Ad Recession

NEW YORK Radio ad revenue will fall 3 percent this year.

That's according to JP Morgan analysts John Blackledge and Aaron Chew, who wrote to clients that radio is being driven by continued downward pressure, with audience losses leading to loss of ad share. Radio is also affected by cyclical pressures as soft macro trends lower demand for advertising on the medium.

"We believe the radio industry is already amidst an advertising recession" given declines in the second half of last year, they said.

The industry has underperformed nominal gross domestic product by 5 percent on average annually since 2004, they said, but in recent months it underperformed by about 9 percent. "We believe the below-average underperformance will likely persist for most of 2008, offset to some degree by political spending" in the second half.

They also noted that the radio industry underperformed real GDP by about 8 percent during the 2001 recession.

CEA: Buyers Prefer Non-Permanent In-Vehicle Electronics

ARLINGTON, Va. Consumers are more likely to buy CE products for their car that are not permanently installed. The Consumer Electronics Association says drivers value flexibility and multi-location use when it comes to buying such products.

Sales of in-vehicle consumer electronics will grow at a rate of 13 percent in 2008 to more than $12.8 billion, according to a CEA study, "Automotive Electronics — What Consumers Have and What They Desire."

CEA said a typical American spends nearly 17 hours a week in a car. As a result, 38 percent of the driving-age population intends to buy and install an in-vehicle CE product over the next year. Topping the list are remote vehicle starters (15 percent), in-dash navigation systems (13 percent) and car alarms (12 percent). But there are also strong purchase intentions for technologies like HD Radio, satellite radio and DVD players, CEA said.

Index

Pubcast Engineers Plan Rockin' PREC

Broadening Their Event's Scope, Organizers Look at Audio Quality, Production, Distribution, Transmission

by Leslie Stimson

LAS VEGAS This is the third year of collaboration between NPR Labs and the Association of Public Radio Engineers in planning the Public Radio Engineering Conference.

Both groups are working with PBS on a lot of the logistics, and the event will be held in the Las Vegas Convention Center this year, rather than the MGM Grand as in past years.

The PREC will be held on Thursday, April 10 and Friday, April 11 in Rooms N249 and N251 of the North Hall. Participation in SBE/Ennes sessions on Saturday, April 12 is included with PREC registration.

APRE Vice Chair Dan Mansergh, director of engineering for San Francisco's KQED(FM) and a Radio World contributor, said the program is more diverse this year, as the focus of the 2008 sessions breaks away from the ContentDepot/HD Radio focus of the early years.

"We've tried to include sessions on all the different aspects of radio engineering, from audio quality and production issues to distribution and transmission."

Photo by Leslie Stimson

Tom Dollenmayer, station manager for radio and TV at WUSF Public Broadcasting in Tampa, discussed conditional access field tests at PREC 2007.

Although details of sessions were still being worked out, subject areas had been decided upon in a draft agenda.

Keep it on the air

Thursday topics include updates on projects being conducted by NPR Labs and a discussion of audio quality and level monitoring technologies.

Roger Karwoski, assistant general manager and chief engineer for KBIA(FM), Columbia, Mo., planned to talk about multicasting redundancy.

"Now that we are at the beginning of a time where we actually have listeners to our HD-R multicast signals, it becomes important to deliver a reliable digital signal to those listeners. Taking down a multicast station in the middle of the day because an importer needs re-booting or has failed will result in a loss of confidence (and satisfaction) in those who have bought an HD Radio," said Karwoski.

As HD-R equipment for HD Radio starts to assume a "mission-critical" status, the installation of redundant systems for IBOC signal generation becomes a desired goal.

Karwoski said he plans to present a case study of KBIA's main analog FM and three HD-R signals, including the recent installation of redundant equipment and its configuration including importers, exporters, STL, audio routing, EAS routing and digital synchronization.

Organizers intended to have a Thursday luncheon speaker from outside the broadcast industry address the realities of HD Radio in the overall competitive environment from a high-level perspective. The working title is "HD Radio Present and Future."

Friday morning consists of joint sessions with PBS covering "green" facilities, lessons learned from recent tower catastrophes and an IT security roadmap on a shoestring.

Doug Vernier, president and founder of V-Soft Communications and a contractor to the Corporation for Public Broadcasting on several technical projects, plans to follow these topics with an update on the status of applicants seeking NCE frequencies in the recent filing window.

The Friday luncheon keynote, with a speaker to come from an online or new media perspective, is to focus on how digital distribution platforms are changing production and broadcast work.

Mansergh will moderate a panel titled "PAD Practicalities" to discuss what is needed for the next steps for system-wide data services to be deployed, and what stations can do to prepare and to improve the quality of their own data services in the meantime.

Players in the pubcasting metadata space on tap to speak so far include representatives from the NPR Public Radio Satellite System, Public Radio International, NPR Labs and others, Mansergh said.

Representatives from Dielectric, Shively, APT and ERI plan a discussion on RF technology to round out the day. The annual engineering dinner takes place Friday evening.

For more information, see *www.nprlabs.org/apre*.

— Leslie Stimson

Taking down a multicast station in the middle of the day because an importer needs re-booting or has failed will result in a loss of confidence (and satisfaction) in those who have bought an HD Radio.

— Roger Karwoski

Particularly Now, You Ought to Go

From the Editor

Paul J. McLane

Never have the offerings of a Broadcast Engineering Conference been so rich. I hope engineers will be there to see it.

The last few months have been a time of pessimism in radio and the economy at large. As a result this could be an NAB of low expectations.

The nation's business situation is soft. Radio revenue dropped last year. Clear Channel isn't sending top radio engineers to the show. CBS and Citadel have laid off employees in recent months. HD Radio transmitter sales seem to have plateaued. Apple and Avid pulled out of the show on the TV side.

"Old media" and old ways of "conventioneering" both can seem dated in this age of online marketing, social networking, personal audio devices and super-tight bottom lines.

What a shame to not take advantage of the exceptional educational opportunities offered by the convention.

More broadly, what a shame if radio, a $21 billion industry, can't figure out how to thrive in this evolving environment.

The two goals are connected.

Losing ground

BEC organizers have again created what I consider the best educational track in this industry.

I could see the themes quite dramatically as I compiled the pre-show contents of this issue of RW, which focuses on the engineering conference.

Consider:

If you are responsible for radio technical facilities but you're not getting hip to the language of IP, you're losing ground.

If you have a horse in the HD Radio race and you aren't informed about the implications of the possible FM power increase, you can't plan wisely.

Some of the most important research in radio today — maybe even all of it, beyond that done by private manufacturers — is being done by NPR Labs. Have you met John Kean or heard him discuss his findings about digital radio coverage?

We report on all these topics in RW better than any competitor. And you might talk about them in listservs or at local SBE chapter meetings.

But you'll only get part of the story that way. Nothing can replace several hours in a room with an expert delving into the deep nitty-gritty, then talking to the guy sitting next to you about his own experiences in the field.

Beyond the engineering track, consider that your future as an industry technology professional will depend in part on your understanding of the new media that compete with radio and are part of radio's developing master toolkit.

Do you manage a technical strategy that includes multiple platforms like HD2 streams, text, RDS, alerting? Who doesn't these days? But are you current on them? More important, is your company making decisions about new platforms and not including you in the discussion? Are you pushing to be part of that and educated in that?

(I do wish the Radio Management Conference, which we'll preview next time, could be half as useful and informative as the BEC. That agenda is again this year thinner and less detailed in advance of the show, and less inspiring.)

I suck it up every year. You should too, if you have any say in it or can find the dough.

Direct impact

It's clear to anyone paying attention that the next few months and years will see a growing investment by traditional radio owners in new ways of reaching consumers.

What could demonstrate this more dramatically than the way CBS Radio, that old foot-dragger online, has reinvented its new media strategy in the past couple of years? Now it is powering AOL Radio and driving ad sales for those "stations." Do you understand why this affects you?

In fact the very meaning of the phrase "working in *radio*" is evolving. Managers (technical and otherwise) must learn what it means to promote through podcasting (and even why that term is already dated), to develop online video, to encode for the new age of "secondary" data services that now are growing in importance.

Our industry brought in $1.7 billion in off-air revenue last year, up significantly from the year before. Your company might not pay your way to NAB, so have you invested a few hundred dollars to teach yourself more about the tools being used to gather this new revenue?

Make no mistake. I find the convention process wearying.

I have worked most spring and fall NAB events — as an exhibitor, and then as a journalist — for two decades now. Seeing old friends is a big recompense for the pain, but I have to push myself to find energy for the long flights, the longer days, the sore feet, the cynical aisle prognosticators and the endless, repetitive booth conversations (not to mention dealing with disgruntled suppliers who are just absolutely sure their product deserved a "Cool Stuff" Award). And the overall cost is expensive.

But I suck it up every year. You should too, if you have any say in it or can find the dough.

In both our technology and our revenue base, the radio industry is going through an important time of transition. Seems to me it's unwise not to be there, listening in on sessions and talking to other people in the aisles and booths, to be part of the discussion.

★ ★ ★

I asked Marvin Collins recently for an update on his health; he wrote in our opinion section last fall about his prostate cancer.

"I am delighted to report that a November blood test showed my PSA to be 0.1, which could not be better. It appears so far that the TomoTherapy at City of Hope National Medical Center has worked."

Less than a year earlier, as he told us earlier, his PSA test had been 4.55, up from 3.29 the year before, and a subsequent biopsy showed early-stage prostate cancer. Marv opted for a new non-invasive treatment called TomoTherapy.

After getting the good news from the doctor in November, he decided to take a walk around the beautiful gardens of the California hospital.

"I had never done this during the hot weather of summer while I was undergoing daily radiation therapy. Nov. 26 was a cool clear day. The nearby mountains were beautiful, as were the City of Hope gardens. I enjoyed walking for an hour. It was a great day."

Marv also commented on a follow-up letter by Jerry Puffer in our Dec. 5 issue.

"His letter is pro-surgery. I considered surgery; but I am aware people can die or get infections. The incidence of incontinence is higher with surgery. I have a longtime friend who had prostate cancer 12 years ago. He elected to have radiation therapy and 12 years later his PSA is running at 0.2, and he has remained cancer-free.

"These are factors that pointed me in the direction of non-invasive radiation therapy," Marv continued.

How you might proceed in a similar situation is a matter for you and your doctor. But Marv and I repeat the advice from his earlier article: If you are an adult male, talk to your physician about whether and when you should have an annual PSA blood test.

Station Recovers From Fire Yet Again

by Randy J. Stine

AUSTIN, Texas As KOOP(FM) rebuilds from fire for the third time in less than two years, what truly makes this a community radio station has become evident.

Hours of effort from hundreds of volunteers reflect the nature of what a grassroots radio station can be, station officials say.

Ironically, they had already learned that in 2006. Now they're being reminded again.

KOOP (the staff pronounces it "KOH-op") suffered substantial damages to its studios and offices in early January. Arson investigators determined the fire was set deliberately and police arrested a former volunteer about three weeks later. The suspect, 24-year-old Paul Webster Feinstein, is charged with arson, a second-degree felony punishable by up to 20 years in prison and a $10,000 fine, according to Austin police officials.

This year's fire was déjà vu for most KOOP staff. The station had suffered damage from two fires in early 2006. In the first, a tenant in a second-floor apartment in the same building was blamed after a misplaced cigarette ignited the apartment. The station suffered substantial smoke and water damage but returned to the air in the same location after nearly a week.

A second fire less than a month later in 2006 destroyed the station's main studio. The fire, which began in a nightclub in the same city block as KOOP, forced officials to look elsewhere to rebuild.

Now this third fire will mean yet another major rebuilding effort for KOOP.

The radio station, funded by the nonprofit Texas Educational Community Broadcasting and founded in 1994, returned to the air 19 days after the January fire, broadcasting from donated studio and office space at Entercom's Austin cluster.

KOOP officials say Entercom contacted them immediately after the fire to offer help.

Melissa Forrest, market manager for Entercom Austin, said, "We felt we had to step up and help. It's a terrible thing to see

See KOOP, page 6 ▶


OPINION

KOOP Rebuilds After Back-to-Back Fires

Photos by Andrew Dickens, KOOP(FM)

Studio 1 was a total loss from the latest fire.

KOOP

▶ Continued from page 5

a voice in the community silenced. We are here to serve the public just as they are."

Forrest said KOOP is welcome to stay in her facility as long as necessary until their facility is rebuilt.

Vendors have also been helpful, KOOP officials added, specifically mentioning Broadcasters General Store, Tieline and Graham Studios for their help.

Targeting June

KOOP officials say they expect rebuilding to be complete by June but had just begun cleanup efforts in early February because of the arson investigation.

"This was a crisis situation that became worse when we learned of the arson. We were unable to begin cleanup right away because of the investigation. The folks at Entercom have been especially gracious," said Kim McCarson, executive director of KOOP, and one of only three paid staff members.

The fire destroyed several studios, including the main on-air studio. Other broadcast and office equipment suffered heavy damage by smoke and water. Insurance should cover a good deal of the rebuilding costs, McCarson said. Fire marshals estimated the damage to contents and the building at $300,000, though the cost to rebuild and replace equipment will likely be closer to $200,000.

The station programming aims to offer a diverse mix that is reflective of the community, which is 25 percent Hispanic. The schedule has music and talk programs, including Spanish-language and Native American shows. McCarson helps oversee a volunteer programming staff that typically numbers in the hundreds.

"People are so committed to this station. We have over 68 weekly independently produced programs that are cleared by an elected programming committee. Some hosts spend up to six hours putting their hour show together," McCarson said.

Pledged funding

KOOP shares its 91.7 MHz frequency and broadcast license with KVRX(FM), the student-run radio station for the University of Texas at Austin. McCarson said the unique arrangement allows KOOP to broadcast from 9 a.m. to 7 p.m. weekdays and until 10 p.m. on weekends. KVRX is on the air the remaining hours. The stations broadcast at 3,000 watts.

The Loss

Equipment lost in the fire:

Axia Element Consoles
Axia Livewire Nodes (Microphone, Analog Audio, AES Audio)
Axia Pathfinder Router Control Software
StudioHub wiring adapters
StudioHub headphone amplifiers
ENCO DADPRO32 system
Airtools 6100 Profanity Delay
Aphex Compellor 320D
Telos 2x12 Phone system
Telos Desktop Director controllers
Denon DN-635 CD Players
Denon DN-780R Cassette Recorders
Audio Technica AT-PL120 Turntables
ATI PS100 Phono preamps
ElectroVoice RE27 ND Microphones
Shure KSM27 Condenser Microphones
Shure SM57 Dynamic Microphones
Luxo Mic Booms
Moseley Starlink SL9300Q
Mark Antennas 4' Parabolic Dish
ElectroVoice EVID 6.2 Studio Monitors
Alesis RA300 Power Amplifiers
Gorman-Relich EAS Encoder/Decoder
Sage Endec EM3-VAF EAS Receiver Frame
Neutrik Minilyzer M1-1/MR-1
Tieline Commander G3 Codecs
Orban Optimod 5300

McCarson said non-commercial KOOP receives the majority of its funding through local pledge drives with some additional monies coming from several federal grants. The radio station's annual budget is approximately $170,000.

The technical test of operating a community radio station with a limited budget is challenging, said Matthew Daley, chief operator for KOOP.

Daley supervises a staff of about six volunteers who fix everything from the phones to CD players and audio routers.

"We have an extremely dedicated staff on the volunteer tech team. Most come from non-broadcast engineering backgrounds, of course, and some are still students in college," said Daley, who typically logs about 20 to 30 hours a month at the radio station.

"Community radio stations typically have to do more with less technical equipment and KOOP is no different. We seldom have money to replace broken equipment ...we fix things."

An Axia Element control surface was the heart of KOOP's main studio, but it was destroyed in the fire. However, the hard drive survived, said KOOP President Andrew Dickens, which allowed for investigators pinpoint the start time of the fire.

"Axia Pathfinder software was logging all kinds of events at the time the fire started. Interestingly, it also showed that the Axia Element console continued to respond for quite some time after the fire started. Since gasoline had been poured directly on it, that's kind of remarkable," Dickens said.

Also lost in the fire were a number of Denon DN-C635 CD players, Audio Technica AT-PL120 turntables, ElectroVoice RE27 microphones, Denon DN-780R cassette recorders and ElectroVoice EVID 6.2 studio monitors.

"We did have a few items in the tech

See KOOP, page 10 ▶

Shark, shown interviewing BERT MCCRACKEN, lead singer for THE USED, says: "When Comrex told me that their internal code name for ACCESS was "THE NEXT BIG THING" I got it right away. This IS BIG -- I was live, on the air, in places I could NEVER have gone with regular old technology. THANKS COMREX!"

Impossible Remote? Nah, You've Got ACCESS.

Meet Another Real-World Super Hero...

Live coverage of *Next Big Thing 7*, Tampa's 15-band, two-stage, 20,000 screaming fan concert, seemed daunting. But it couldn't have gone smoother for *Shark*, Cox Radio's 97X Program Director and afternoon host. When covering an event like this, *Shark* would normally be battling for a frequency with all the wireless mics, and getting back stage to interview all 15 bands with a live wired mic was just impossible. ACCESS pulled it off without a hitch. *Shark* went live with the push of a button and not a care in the world. Covering even the gnarliest live event is a natural for ACCESS.

ACCESS delivers mono or stereo over DSL, Cable, Wi-Fi, 3G cellular, satellite, POTS (yep, ACCESS is a full featured POTS codec and works seamlessly with Matrix, Vector and Bluebox)—plus some services you may not have even heard of. Given the challenges of the public Internet, it's no small boast to say that ACCESS will perform in real time over most available IP connections.

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Put Comrex On The Line.

COMREX

The New 4WD? Site Access Via Horse

Wyoming Engineers Ride Like Cowboys To a Thermopolis Site to Get Signals Back Up

by Leslie Stimson

COPPER MOUNTAIN, Wyo. What can you do when one of your transmitter (and its two program streams) is off the air, the site is too snowed under to drive up to the tower, and tracked equipment like a Sno-Cat is unavailable when you need it? Why, ride horseback, of course.

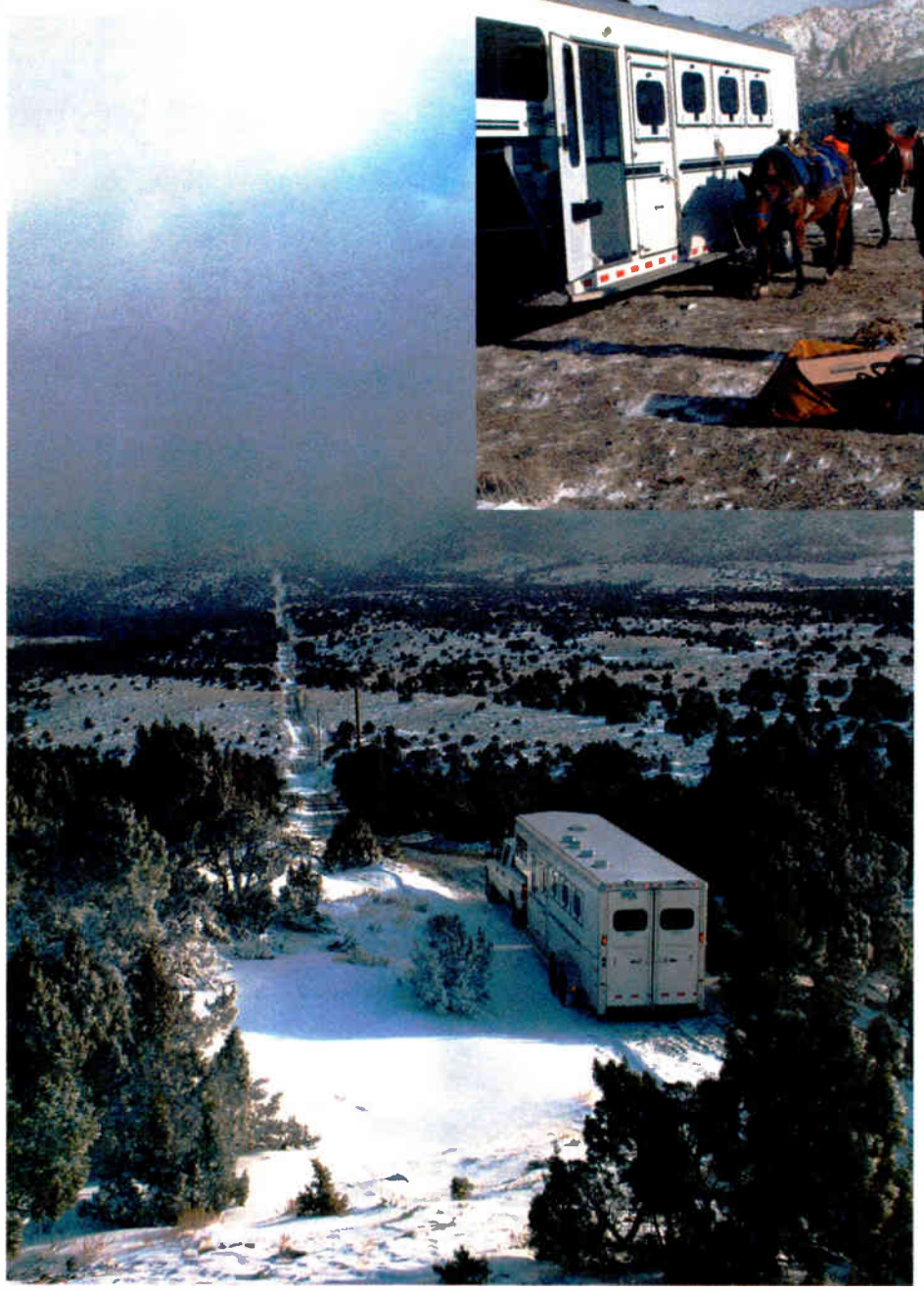
It may not be the way to access a transmitter site atop a mountain that first comes to mind, but it works. So say Wyoming Public Radio personnel who recently employed an Old West method of accessing a hard-to-reach site in difficult circumstances.

While ranchers do it all the time, it's a seldom-considered alternative for tech types, said Chief Engineer Reid Fletcher. He and WPR Engineering Coordinator Shane Toven believe this may be the first time horses have been used to access a broadcast tower site in that area of the country.

They say they may use this method again if circumstances warrant.

Photos by Roger Adams, WPR

Reid Fletcher unloads the horse trailer and gear.



Truck and trailer at Birdseye Pass.

WPR

Wyoming Public Radio is part of Wyoming Public Media, which operates four broadcast streams as well as Internet audio streams, podcasts and Web site content.

The first of those streams is The Wyoming Public Radio network, a statewide grouping of 14 transmitters and eight translators. The second is Classical Channel HD, an HD2 stream carried on three transmitters: KUWR(FM), Laramie/Cheyenne, KUWC(FM), Casper and KUWJ(FM), Jackson, Wyo.

The third is KUWY(FM) in Laramie, a classical-format analog station; the fourth is KUWL(FM), also Laramie, a jazz-format analog station.

WPM is a licensee of the University of Wyoming; broadcast headquarters and studios are on the university campus at Laramie.

Several factors led to the unusual fix in which the engineers found themselves.

On a day in February after a bad weather front went through the area, FM transmitters for Wyoming Public Radio at two tower sites were knocked off the air, those serving KUWT, Thermopolis and KUWZ, Rock Springs. The outage took down an HD2 channel as well. Over the past two years, WPR has converted all of its station transmission equipment to HD Radio, according to Toven.

Toven and Fletcher, based in Laramie, could drive to the Rock Springs site despite the snow and get KUWZ back on the air. But getting up Copper Mountain to access the tower site for KUWT was trickier. The engineers wanted to get there as soon as possible and they weren't sure a Sno-Cat was available, nor how much it would cost.

Even if one could be obtained, there was no guarantee a tracked vehicle would get to the site. In a previous instance, Reid said, WPR had arranged for a tracked vehicle; after they waited a week for it to arrive, the operator at the last minute said additional snowfall on the trail was too much for the vehicle to handle.

Snowmobiles present their own problems because operators have trouble keeping them upright on powder over hard packed snow, Reid said.

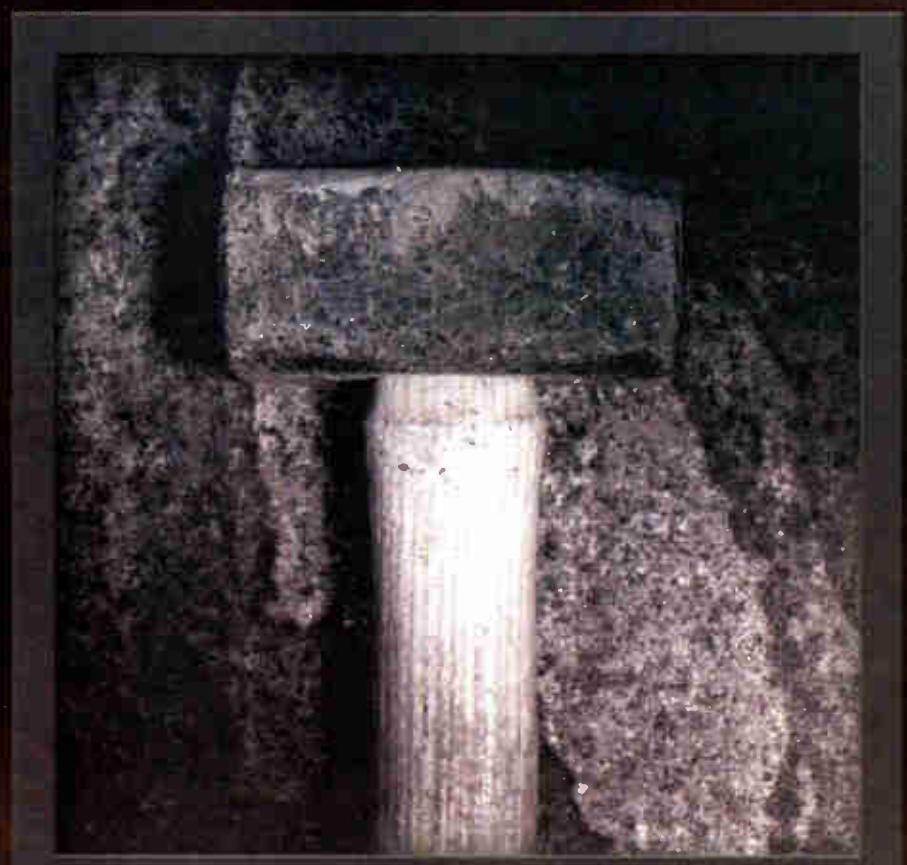
Time was critical. "We had a transmitter that was on, but KUWT had no audible signal. This required getting up there and getting it fixed," said Reid, hired as the tech for WPR a year ago after working in IT for the university's geology department for 25 years.

Troubleshooting the situation from Laramie, Fletcher and Toven believed something was wrong with either the satellite receiver or the dish on Copper Mountain.

(WPR previously had three engineering positions to handle all the stations and translators. Toven came to WPR as CE in 2006 from Minnesota Public Radio and was promoted to engineering coordinator last year upon the retirement of Larry Dean, who held the position previously. Reid recently was upped to CE at WPR after Toven was promoted. Toven said WPR hoped, by the end of this month, to advertise for someone to fill the tech position.)

See HORSES, page 10 ▶

Omnia 6EXi is:



AND EVERYTHING IN BETWEEN

Omnia
A Telos Company

Horses

▶ Continued from page 8

Program Director Roger Adams previously had offered use of his horses; this time the equine solution seemed like the right one.

Spread out

The decision came down to several factors, including availability and cost.

"I had looked at other options and they weren't viable for various reasons," said Toven, who approved the horseback trip. Things in Wyoming are so spread out, it takes a while to get anywhere, he said, noting the FY 2007 engineering travel budget of some $14,000 for WPR is 80 percent depleted.

"We purchased a new engineering truck last year and put 18,000 miles on it in four months," he added.

Adams owns seven horses; he selected three to lend for the trip; two for him and Reid to ride, the third to pack gear, such as a spectrum analyzer, satellite receivers, laptop, hand tools and food. He said the gear totaled well under 200 pounds.

The horses were Billie, a five-year-old mare quarter horse; Buck, a seven-year-old gelding Percheron draft horse; and Pepa, a seven-year-old mare paint. Adams said his daughter rides Pepa in barrel races so he had to convince her to allow him to use the mare for the trip.

Adams prepared the horse trailer and bunked the horses overnight at a corral close to Thermopolis. The next morning, Adams and Fletcher were able to drive between half and three-quarters of the way up the central Wyoming mountain, which has an elevation of more than 8,000 feet.

When they began the ride up the mountain trail, the weather was cloudy, with temperatures in the teens and a steady 49 mph wind. Fletcher said the wind went "right through" all four layers of his clothing.

It was a painstaking trip up for the horses as they picked their way on the trail, looking for soft snow to walk on rather than hard rocks, he said. The wind was in their faces all of the two-hour trip up the mountain.

At the tower site.

Horses at the tower base.

The men dismounted and walked the horses in at the summit; they tied up them at the base of the tower, where the transmitter shed provided a wind-break.

Once at the transmitter site, the men were able to see that, because of high winds, the satellite dish was no long aligned with the orbiting geosynchronous satellite WPR uses to feed its signal to KUWT and its translators.

'Blown apart'

"The feed point on the satellite dish had blown apart. Screws had come loose and parts were dangling," said Fletcher.

The feed horn and low-noise block downconverter had come loose, causing the outage. He tightened everything back up, including the low-noise block amplifier, and realigned the feed point while, inside the shed, Adams watched readings on the satellite receiver and spectrum analyzer. Adams and Reid had to shout at each other to be heard over the wind.

They got the station back on the air, though Fletcher said a more permanent fix will need to be performed this summer to prevent the problem from recurring.

The group spent about two hours on top of Copper Mountain. The ride back down was easier. The sun had come out and the wind was at their backs; the horses stepped livelier and shaved about 30 minutes off the return trip.

Back at the trailer, the men removed the saddles and brushed, watered and fed the horses, which got to go back into the warm trailer for the rest of the trip.

Asked whether he would do it again, Reid said yes. "It was *better* than fun."

KOOP

▶ Continued from page 6

room that escaped the fire and are in the process of being cleaned, but the essential studio contents were lost," Daley said.

The station actually lost two Axia Element consoles, one brand new that had just arrived before the fire as KOOP technicians were nearly ready to bring a production studio online that would have been a mirror image of the main on-air studio. Daley said that it would have made it easier for volunteer programmers to produce their programs.

"These are not trained broadcast professionals, so any time we can streamline the systems and have them appear the same is important and easiest for the volunteers to use," Daley said.

Station officials say the volunteer suspected of starting the fire had left KOOP in December 2007 after having a disagreement with another programmer regarding specific music loaded in the station's digital library.

"The idea that something as minor as a dispute over what music to put in our digital library could possibly trigger someone to set fire to our radio station is unfathomable," Dickens said.

KOOP recruits volunteers during several periods each year. They must complete orientation and a six-month training and apprentice program. Volunteers are also asked to submit references. Station officials say they are reviewing their processes and controls and will take steps to implement changes if necessary.

Reflecting upon the fact KOOP has been burned out three times in two years, Dickens said staffers do not feel jinxed.

Wireless Broadband Internet Remotes

"The first time out with the Tieline was a brilliantly simple experience for everyone involved. For lack of a better phrase, the codec just worked."

- Christian Vang
Chief Engineer
Clear Channel St. Louis

"The codecs sounded great. My management was very, very impressed with the demos"

- Grady Jeffreys,
Technical Manager,
Mackay Communications

"The remote was a spectacular success, in no small part thanks to the flawless sound which the Tieline G3 provided over the public Internet"

- Mike Rabey
Chief Engineer
Entercom Indianapolis

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800-750-7950

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See Us at NAB Booth N8817

NCE

▶ Continued from page 1

Fletcher, Heald & Hildredth and a Radio World contributor.

The FCC limited to 10 the number of applications any one party could file, to prevent a repeat of the aftermath of the FM translator station filing window in 2003, when it was hit by a flood of more than 13,000 applications.

The applicant pool is varied and includes organizations such as the WAY-FM Media Group, a Christian broadcaster, as well as the Native American Seminole Tribe of Florida, which filed two applications in that state.

Culture

"One surprise is that there were initially only 250 applications that were not mutually exclusive with at least one other application. That means over 90 percent of the apps filed will require settlements or technical adjustments if they are ever to be granted," said John Crigler, a communications attorney specializing in public media with Garvey Schubert Barer.

Technical adjustments could include accepting a decrease in the requested power level.

The FCC did offer an expedited settlement opportunity for NCE FM mutually exclusive applicants; it expired in early January. Crigler believes relatively few settlements were filed with the FCC before the deadline because of a short window of opportunity.

Michael Richards leads a local conference in the New Bohemia Art and Cultural District.

The vast majority of applications remain tangled in mutually exclusive — or competing — groups.

Richards, left, interviews Angela Clark, an exhibitor at a recent Conference in the New Bohemia Art and Cultural District.

That means the vast majority of applications remain tangled in mutually exclusive — or competing — groups, Crigler said.

NCE applicants contacted by Radio World said they are eager for the opportunity to serve their communities.

One is the New Bohemia Group Inc., a neighborhood-based art and cultural district in Cedar Rapids, Iowa, which filed an application for a channel in nearby Coggon.

"We want a community-based radio station to capture all of the culture in our neighborhood. We will represent what community radio is all about," said Michael Richards, founding board member of The New Bohemia Group. "We will truly be the voice for the community."

New Bohemia

Richards described New Bohemia as an area of several city blocks in Cedar Rapids originally settled by Czech and Slovak immigrants and inhabited by a culturally diverse population, including Lebanese, Bosnian, Asian and Sudanese immigrants.

"We are concerned about the consolidation of media. There are very few openings for alternative voices. Typically, radio stations don't reflect what we are about here at the street level," Richards said.

The organization is launching an Internet station in the next few months, Richards said, which should help in preparations to launch a 5 kW radio station at 88.7 MHz if and when the FCC grants the non-profit group a broadcast license.

"We have gone through several fundraising campaigns. We have tower space in Coggon. We should be able to hit the ground running," Richardson said.

Bob Naismith, president of Korkee Inc., a non-profit based in Charlevoix, Mich., had envisioned a network of non-commercial stations across Michigan's sparsely populated Upper Peninsula when he applied for 10 frequencies there. However, eight applications are mutually exclusive, meaning other applicants are vying for the same frequencies.

"We will see how it all works out and which ones we receive construction permits for. The technology is there to operate a group of stations across a geographic region at a reasonable cost. That was what we had hoped for," he said.

Naismith, who has previously owned commercial radio and TV properties, said he envisioned a "middle of the road music format" on the stations with underwriting supplied by local businesses.

"We will negotiate with the other groups" that are competing for the same frequencies with us "to determine what we can do. Sometimes just tiny technical adjustments can clean up conflicts," Naismith said.

Other groups were less sure of their plans if they are granted construction permits. For example, Muncy Hills Broadcasting, Inc., near State College, Pa., filed 10 applications for licenses in Pennsylvania, New York and Maryland, but will make programming decisions based on how many stations it winds up with and where those are located.

A company spokesman said, "Decisions on direction and intent will be decided later. The big question still remains, 'How many stations will actually be awarded?'"

The FCC declined to speculate on how many new NCE channels may eventually be handed out from last year's filing window. Of the 9,083 FMs in this country, 2,817 are designated as non-commercial, according to the FCC Web site.

The discussion also is not to be confused with an application limit eventually imposed on FM translators. While the last translator window opened in 2003, it wasn't until late 2007 that the FCC announced a "post hoc" limit — meaning a number of mass filers had to choose which of their still-surviving, mutually-exclusive applications they wanted to continue to push for. The most recent ruling was made before the NCE filing window in October.

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NEWS WATCH

XM, Sirius Slim Losses

XM and Sirius narrowed losses in the fourth quarter. Executives said financials were helped by subscriber increases. Both XM and Sirius continued to hope regulators would approve their year-old proposed $4.3 billion merger.

Sirius President/CEO Mel Karmazin told analysts the company is prepared to continue on its own if the deal is not approved.

XM posted a fourth-quarter net loss of $238.8 million, compared with a year-earlier net loss of $255.5 million. Revenue rose 20 percent to $307.7 million from $257.1 million for the quarter.

Sirius posted a net loss of $166.2 million in the quarter, comparing with a year-earlier net loss of $245.6 million. Fourth quarter 2007 total revenue increased 29 percent to $249.8 million from fourth quarter 2006 revenue of $193.4 million.

XM added 460.000 subscribers in the recent quarter to end the year at just over 9 million paying customers. That compares to 8.3 million for Sirius, who reported subscriber growth slowed 38 percent in the quarter.

Merger Lobbying Increases

WASHINGTON Lobbying from broadcast and consumer groups seemed to intensify at the FCC as the satellite merger proposal passed its first anniversary.

Clear Channel CEO Mark Mays met with Chairman Kevin Martin to discuss Clear Channel's concerns in February, according to an ex parte filing. Georgetown Partners visited the commission several times in that month to buttonhole commissioners and staffers, according to filings.

Georgetown Partners has proposed that, as a partial remedy to competitive effects of the proposed merger, Sirius/XM lease a portion of their infrastructure and at least 20 percent of their channel capacity to a minority-controlled entity to create competition and diversity in the satellite radio marketplace.

Public Knowledge has been pressing its case too, reiterating that the commission subject XM/Sirius to four conditions as a requirement for deal approval: That it offer a la carte or tiered programming pricing choices; make 5 percent of its channel capacity available to noncom programming; not raise programming prices for three years; and open technical specs of its devices "to allow manufacturers to develop, and consumers to use, any device they chose without interference."

NAB to FCC: Keep Non-Rated Market Definition

WASHINGTON NAB asked the FCC to retain its current definition of non-rated radio markets when determining how many stations to attribute to each owner in a market.

According to filings in MB Docket 03-130 in February, NAB says small-market members support keeping the modified contour overlap methodology that the FCC has used since 2003 to define radio markets in areas not rated by Arbitron.

The commission developed the modified approach for unrated markets after it changed its methodology for rated markets, seeking a more accurate way to count market owners. The new methods could account for distant signals reaching into a metropolitan area.

In summaries of their meetings, NAB legal experts said that the modified contour-overlap approach "properly identifies radio stations that compete against each other for listeners and advertisers and, thus, properly defined radio markets in areas outside of Arbitron metros." The methodology is preferable to any arbitrary geographic approach unrelated to the radio marketplace, NAB said.

Quantegy Plant Auctioned

OPELIKA, Ala. An auction of the Quantegy Recording Solutions manufacturing facility in Alabama started at the end of February and was due to close in early March, Pro Sound News reported.

Equipment available for auction included Ampex and Studer tape machines, Sony and Panasonic digital VCRs, test and measuring equipment and the contents of multiple workshops. These include computer equipment, oscilloscopes, signal generators, noise and amp meters and test equipment.

Quantegy ceased production of magnetic tape and stopped accepting orders a year ago February.

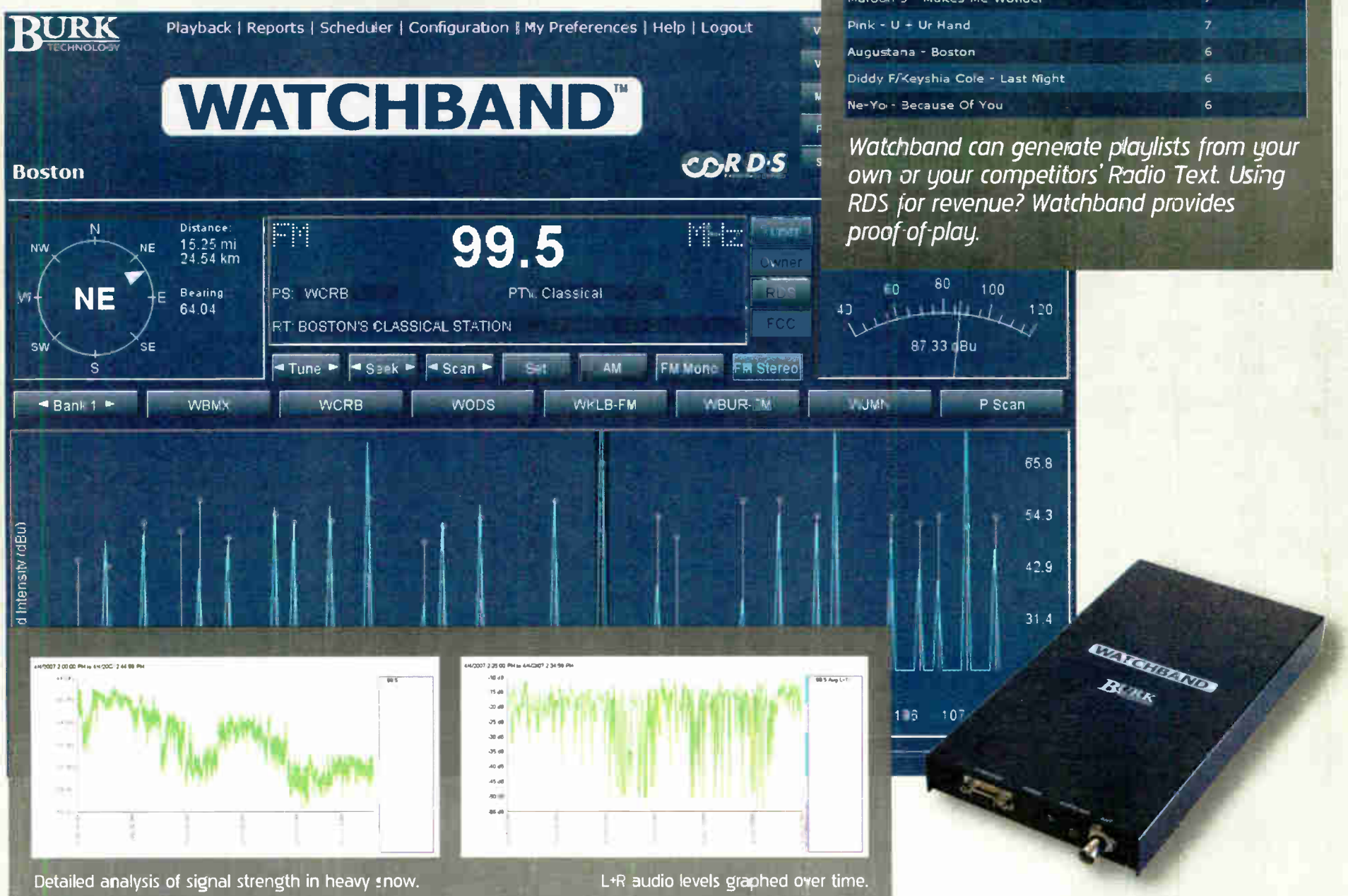
News Roundup

MORSE CODE: In December, the FCC decided to drop the Morse code requirement for amateur radio license classes. The agency now says it's sticking by that decision and denied two requests from individuals who asked the commission to reconsider. When the FCC decided to drop the Morse exam, it said emergency communication today is performed using voice, data or video modes — all much faster than telegraphy. Two petitioners asked the FCC to reconsider. The commission was not persuaded that eliminating the telegraphy exam would affect national security or emergency communications. The agency said it received roughly 100 comments about the petitions, which were "overwhelmingly" negative on the idea of reviving the exams.

Market Monitoring Made Easy

Radio Text	Count
Rihanna - Umbrella	10
Justin Timberlake - Summer Love	9
Gym Class Heroes - Cupids Chokehold	8
Avril Lavigne - Girlfriend	7
Carrie Underwood - Before He Cheats	7
Maroon 5 - Makes Me Wonder	7
Pink - U + Ur Hand	7
Augustana - Boston	6
Diddy F/Keyshia Cole - Last Night	6
Ne-Yo - Because Of You	6

Watchband can generate playlists from your own or your competitors' Radio Text. Using RDS for revenue? Watchband provides proof-of-play.



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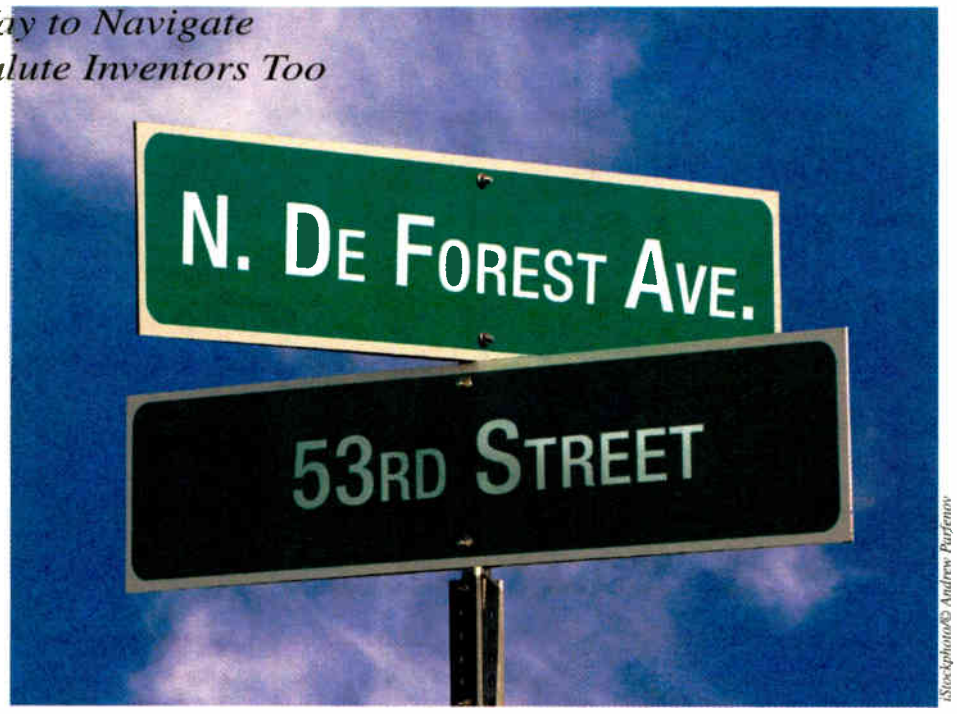
WIRED FOR SOUND

On the Street Where You Live

A Proposal for a Better Way to Navigate The Show Floor — and Salute Inventors Too

by Steve Lampen



iStockphoto© Andrew Parfenov

I have a great idea. And this idea, as most great ideas, comes from frustration.

In my case, it's my poor sense of direction. My brother can stand in the middle of nowhere and point north. I get lost as soon as I exit my garage. I am "geographically challenged."

So what does this have to do with wire and cable? Well, not much until you put me in the middle of the NAB convention.

Don't get me wrong. I love the NAB Show. Where else can you see 1,600 vendors, hawking everything you can imagine for audio, video or broadcast? I sell more wire and cable by simply visiting potential customers, manufacturers, system integrators, than any other show. Where else can a wire and cable (or anything else) vendor get over 100,000 potential customers in one place? Nowhere except every April in Las Vegas.

Where am I?

Then there's the NAB booth numbering scheme.

At least, I suppose there is a scheme. I've never figured it out. And I have wandered aimlessly, looking in vain for a specific booth. In more than a few cases, I have wasted what little spare time I have trying to find someone. And being "geographically challenged" sure doesn't help.

So here's my solution (and, yes, I have sent this to the people who make the floor plan at NAB).

Make an imaginary grid of 10-by-10 squares on the floor of each hall. Across the width, these 10-foot divisions are named. Booths can be big and small, with the big ones covering many of these imaginary squares. Wherever these "streets" do not fall in a booth space is a name. Since the halls are not as wide as they are long, I suggest a full alphabet of streets across the width (maximum 26 x 10 ft, 260 feet). Down the length of the hall the grid is numbered, so there's no limit there.

And the alphabetic grid is not just letters, but names. I suggest names of famous figures in audio, video, radio, television and other electrical pursuits.

Here's one possible list for the North Hall:

Armstrong	Nipkow
Bell	Ohm
Crosby	Poniatoff
De Forest	Quadrature
Edison	Ranger
Farnsworth	Sarnoff
Ginsburg	Tesla
Henry	U-matic
Ince	Volta
Jenkins	Westinghouse
Kellog	XLR
Lamarr	Yagi
Marconi	Zworykin

The cross streets are numbered from 1 to as far back as the hall gets.

So if I tell you that my booth is at the corner of Tesla and 53rd, you pretty much where it is before you set off to find it. Actually, I would say North Tesla and 53rd, just so you start in the right hall.

Sure, I have many alphabetic lists of famous names that don't repeat, so you could even figure from the show book that Tesla Street only appears on the North Hall.

Big booths could take up many squares, so you could even tell them where in the booth you want to meet them Jenkins and 13th might be the corner of the Sony booth. Hey, I get lost in the Sony booth by itself. If someone told me, "Oh, that new Sony mixing console is at Kellog and 17th," I'd bet I could find it.

Whether or not vendors have street names inside their booth is up to them, but it would sure help us wanderers.

I suggest names of famous figures in audio, video, radio, television and other electrical pursuits.

And did you look at that list? Do you know who those names were? (Or what the non-names mean?)

Give yourself a little test. Go down the list and tell yourself who each person was and why you should know them. Bet you don't know them all.

And I have a different list for every hall. I would ask the NAB for a small section in the show book where I could have a paragraph on each name. Without these guys, you wouldn't have a job!

What do you think? Do I have a workable idea? Tell the folks at NAB.

Of course, it would take a couple of years before this could be implemented, so there's no hurry. And, in a couple of years, you could meet me on the corner of Zworykin and 115th (at the very back of the hall) and we'll discuss other names that should be added next year.

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

Steve Lampen's latest book "The Audio-Video Cable Installer's Pocket Guide" is published by McGraw-Hill. He can be reached at shlampen@aol.com.

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AMERICAN SHORTWAVE

Jeff White Is a Study in Persistence

Commercial Shortwave Broadcaster Says The Band 'Still Has a Lot of Life Left in It'

by James Careless

At first glance, Jeff White's résumé appears to tell a story of smooth radio success.

He graduated with a journalism degree from Northern Illinois University and then worked as news manager at WNIU(FM), the university-owned public radio station. He was a news freelancer for National Public Radio, NBC Radio Network News, Christian Science Monitor Radio and Radio Netherlands.

In 1989, he and engineer Kiko Espinosa co-founded Radio Miami International, a commercial shortwave broadcaster that sells air time blocks to organizations targeting the Americas. White is now the station's general manager; he also subsequently became involved with the National Association of Shortwave Broadcasters.

Today, at age 48, he is in the second year of his second term as president of NASB. He is fluent in English and Spanish.

Among the successes, the self-confessed shortwave fanatic has experienced setbacks. Yet his love of shortwave radio has not flagged, nor has his effort in promoting the medium at shortwave fan conventions.

White and his wife Thais "have always been very faithful about coming and setting up a display and participating," says Rachel Baughn, editor of the radio hobbyist newspaper Monitoring Times.

"Jeff came out to represent Radio Miami, but it was evident he cared very much about shortwave broadcasting in general. And he still does: It is not at all surprising that Jeff is now president of NASB because he always had an interest in getting broadcasters together."

Early days

"In 1972, I was a high school student living in Indianapolis, and I was very interested in learning about other countries and cultures," White recalled.

"One day I happened to be playing with a multi-band radio that my parents had bought, and I discovered the shortwave band. I was amazed to hear the Voice of Germany with an English-language program ... While tuning through the dial, I found Radio Prague, Radio Netherlands and HCJB from Ecuador, plus I came across Radio Moscow and Radio Peking — all broadcasting in English.

"I was hooked, and began listening to my shortwave radio every day."

Once in college, it struck White that "a worldwide medium like shortwave would be a perfect advertising medium for multinational corporations, travel-related business. And I'm not the only one who was thinking this. CNN investigated getting into the commercial shortwave business, and the Christian Science Monitor experimented with commercials on its shortwave World Service. And of course there was WRNO in New Orleans, the first modern' commercial shortwave station to go on the air in the U.S. in the 1980s."

Eventually, White and some friends decided to found their own commercial shortwave station, which they called Radio Earth.

Initially, Radio Earth bounced from station to station, buying whatever SW airtime it could find. Then "we convinced the government of Curacao in the Netherlands Antilles to sponsor a daily one-hour commercial shortwave program which we broadcast from a 50,000-watt station called Radio Clarin in the Dominican Republic.

"Programming-wise, it was something entirely different from what was on shortwave at the time, and the listeners loved it — commercials and all. We had a mixture of news, features, music, interviews, and all of it specially geared toward a shortwave audience."

Thais and Jeff White on the Greek island of Mykonos.

Unfortunately, a lack of measurable audience ratings made it impossible to win sponsors in large numbers. To offset Radio Earth's losses, some of White's group founded a small station in the Dominican Republic called Radio Discovery. Then the presidential candidate who had backed this station's temporary license lost the election, and White subsequently lost the station. Mortally wounded, Radio Discovery went dark.

Meanwhile, dissension in the Radio Earth camp eventually resulted in its demise.

Comeback

After these defeats, White needed a job.

"So I went back to my freelance reporting work, covering mostly the Caribbean and Latin America," he said. "I eventually based myself in Miami, where as you know there are many Cuban exile organizations. Some of them asked for my help to get them on shortwave to air programs to Cuba.

"One thing led to another, and in 1989 I co-founded Radio Miami International."

At first the company paid for airtime via other stations. Eventually it obtained its own FCC license. Boosted by its airtime sales to Cuban exile groups, WRMI has been on air since 1994. You can hear it on various shortwave frequencies (see *www.wrmi.net* for details) or streamed online.

"Miami is truly the gateway to the Americas," states the station's Web site. "It is only natural, then, that Miami should be the home of an international radio station broadcasting to all of the Americas and beyond." The operation positions itself as strengthening ties between Miami and its "hemispheric neighbors."

The online pitch continues: "We invite interested organizations, companies and individuals to take part in this effort by sponsoring our information and entertainment programs, and by purchasing air time to transmit their own programs — political, religious, commercial, cultural, etc. And we invite overseas broadcasters to use WRMI as their relay to the Americas. If your organization has a message for the Americas — in any language — WRMI can get it there for you."

Airtime blocks cost as little as $1 per minute for bulk airtime purchases.

Asked how much revenue the operation might bring in each year, White replies, "Shortwave has been called 'crisis radio.' When there's some sort of crisis or some important political event going on in Cuba or Latin America, it could be tens of thousands of dollars a month. When there's not, sometimes we can just barely meet our expenses. So it's quite variable."

Although Cuban exile groups still buy a lot of WRMI's airtime, White also sells to religious groups and other international broadcasters.

"For example, the Czech government broadcaster Radio Prague buys airtime on WRMI to relay its daily news and features programs in English and Spanish to the Americas." WRMI also carries its own show, "Viva Miami."

Back, and ahead

"The Cold War was really the heyday of shortwave, when governments couldn't spend enough money on international propaganda broadcasts," White says.

"But the fall of the Berlin Wall and subsequently of communism put an end to all of that. Many governments saw no more need to spend large sums of money on ideological propaganda, so they started drastically reducing or eliminating their shortwave services." Ironically, some of these cutbacks have been good for WRMI, since it can sell them airtime for around $100 an hour.

WRMI's main office and studio are in suburban Miami, while broadcasts come from WRMI's transmitter site in Hialeah, northwest of the city. The station staff of five includes White's wife Thais, the office administrator, who also oversees Radio Miami International's new travel business. The radio technical operation is computerized, with programs being sent to the transmitter site as MP3 files via Gotomypc or an FTP site.

Station co-founder Espinosa was the operation's chief engineer; he died in 2005. Now Espinosa's son in law, Jose Raul Mena, is technical director. The station uses a 50,000-watt Wilkinson AM50,000B transmitter. "This in fact used to be the transmitter we used for Radio Earth broadcasts at Radio Clarin in the Dominican Republic," White says.

WRMI has a corner reflector antenna beaming 160 degrees toward the Caribbean and Latin America, with a yagi-style log periodic antenna beaming 317 degrees toward North America.

The station uses a 50,000-watt Wilkinson AM50,000B transmitter, a corner reflector antenna beaming 160 degrees toward the Caribbean and Latin America, and a yagi-style log periodic antenna beaming 317 degrees toward North America.

The two are used at different times of the day. In some hours, the signal is pointed to North America, at other times to the Caribbean and Latin America. The station's Web site proudly reports listener reception as far away as Japan, Germany, Russia and the Northern Mariana Islands as well as Brazil, Mexico, Argentina, Colombia and the United States.

The station also is conducting DRM test transmissions through relay facilities.

What is the future of shortwave radio in the age of the ever-expanding Internet? For his part, Jeff White isn't worried. He's weathered the ongoing lack of listener ratings and the end of the Cold War; chances are he'll weather Fidel Castro's inevitable departure too.

"I think shortwave still has a lot of life left in it," White said, "and that there are many things we can still do with Radio Miami International."

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Radio, By Any Other Name...

Engineers See Both Promise and Dangers in the Blossoming Choices for Alternative Delivery

by Tom Vernon

As broadcast engineers contemplate their annual sojourn to Las Vegas, RW talked to several about what's going on in their worlds and what's on their minds.

John Marino, vice president of science and technology for the NAB itself, sees an urgent need for broadcast engineers to align themselves with the changing corporate culture.

"One of the most important challenges is learning to work with company strategy. Businesses are challenged to keep up with trends and they must move in directions for growth. It's important for engineers to meet with their management on a regular basis, to stay informed and educated on ways they can improve the business outlook, and most importantly demonstrate their value to the overall business strategy."

Reflecting on the FCC's proposal to require 24/7 attended operations at stations to assure timely emergency response, Marino feels it is unnecessary.

"As long as stations remain responsible for providing their communities with emergency messaging, there does not seem to be a need for 24/7 required staffing. Today's broadcast equipment is extremely reliable with very little need for babysitting."

What are some of the design criteria for equipment manufacturers today? Marino feels the trend seems to be toward increased reliability and interoperability.

"Manufacturers are constantly striving to bring additional value to their customers. Products that can 'fit in' with existing equipment and interoperate with station hardware and software systems are becoming increasingly popular."

As the digital media revolution spreads from streaming on the Web to cell phones, iPods and blogs, Marino notes radio is responding, but feels more should be done.

Dan Schroeder of KOSU says his biggest concern is handling the RF, IT and cost issues associated with IBOC installations.

"The radio industry is slowly moving toward all-digital. An immediate benefit of digital technology is its flexibility. Broadcasters who are multicasting, providing digital traffic data, etc. are showing manufacturers that radio is evolving and embracing digital technology.

"Alternative platforms offer opportunities for broadcasters to capture listeners who not only use traditional radio receivers, but also tune in on computers, PDAs and other portable devices."

Keeping current

Jon Blomstrand, director of engineering for Hubbard Broadcasting, said one of his most pressing concerns is training and education.

"Everything made now has an IP address. It's hard to stay current."

While there have been some concerns about the economy, Blomstrand remains optimistic for the long term. "We are cutting back for the immediate future. The mood within the company is good, and we see the current situation as a temporary one."

He adds his company is moving forward with new media. "We are streaming, podcasting and have a very strong Internet presence. We are texting with our music station with great success."

Blomstrand is shopping for new studio equipment but not sending staff to NAB this year. "I have been to the show the last six years running and want a break," he said. Regarding the proposal for 24/7 staffing, "This will not impact us much since

See ALTERNATIVES, page 22 ▶

About This Section

The following pages provide a preview of sessions, booths and themes of interest to radio engineers and technical managers at the 2008 NAB Show.

Next issue we'll look at sessions and topics related to broadcast management, law and regulation, and other prominent show events.

What: NAB Show

Theme: "Where Content Comes to Life"

Where: Las Vegas Convention Center

When: April 11–17

Who: Attendance approx. 108,000 last year, including 27,000 international

How: www.nabshow.com

How much: BEC conference registration varies from $495 for NAB members registering in advance, up to $995 for non-members on-site. Price includes several related broadcast conferences. Students, spouses and exhibits-only rates available.

Las Vegas News Bureau

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Alternatives

▶ Continued from page 20

we are staffed 24/7 already but it will certainly hurt the small-market stations."

Dan Schroeder, chief engineer of KOSU(FM), Oklahoma Public Radio, says his biggest concern is handling the RF, IT and cost issues associated with IBOC installations.

He worries that the current economic situation might impact negatively on HD rollouts.

"I remain very concerned that IBOC will not pay for itself, even with the low-cost licensing for NCEs. In order for HD Radio to catch on, it must be 'sellable' and installed as standard equipment in new cars. Dealers are afraid to do that now because of the poor performance of HD2 without an analog backup, like HD1."

Schroeder isn't planning equipment purchases this year, but thinks the most important technical trend in broadcast gear is IP connectivity of remote transmitter sites, used for remote control and HD data.

He votes thumbs down on the 24/7 staffing proposal.

"This will impact the bottom line of many NPR automated stations in a very negative way. The minimum wage level of operators we could find to pull the overnight shifts would not be more reliable than the EAS methods we have now."

Good dividends

In Keene, N.H., Ira Wilner is director of the Saga Communications cluster. He feels the biggest industry challenge is converting both FM and AM stations to HD.

John Marino of NAB Science & Technology, left, with colleague David Layer. 'Today's broadcast equipment is extremely reliable with very little need for babysitting,' Marino said.

Each medium faces unique challenges, but over time these can be overcome. "FM radio took a long time to take off, as later did FM stereo."

He adds that four stations in the Keene cluster are broadcasting HD, and Saga Communications as a company is committed to the technology.

An all-digital plant is the most important trend he sees: "The economies of labor, copper and flexibility are huge driving forces." His wish for manufacturers is that they work as a group to produce single standards for device interoperability, and ensure devices support different protocols.

While there are no formal "green" initiatives at Saga, Wilner notes the company has cut back on paper consumption through the use of copiers that send e-mail and convert paper documents to PDF files.

Saga is developing streaming and interactive Web sites, but holding off on delving into mobile phones.

"With the overall reliability and number of dropped calls, it just doesn't seem viable." While some worry that the younger audience has abandoned terrestrial radio in favor iPods, Wilner is quick to point out that "the most sought-after accessory for iPods is an FM tuner."

Wilner runs a one-man engineering shop in Keene and will not be attending the convention. "I've got way too many projects underway."

Clarence Beverage, a consultant with Communications Technologies Inc., feels the biggest challenge is planning for future technology.

"How do you decide on the best HD transmitter configuration when there is potential for the HD carrier level to be increased? Or how can you effectively increase the station presence and market penetration through streaming and blogs?"

He adds that the outlook for clients is positive despite current economic conditions, and said enthusiasm for HD continues. "Probably the NCE client base adoption is greater than that for commercial stations. The big problem is lack of receiver penetration followed by HD signal that is not as robust as the analog inside the 60 dBu contour."

Beverage said his company has been working with clients to develop alternative delivery streams, and he believes this will pay good dividends.

"As years pass I think we will see changes in how stations are valued that relate to their ability to tie into alternative methods of program delivery."

Beverage will be traveling to Las Vegas and has his wish list for NAB in order. "I want to see the latest in HD for FM, and also new solutions for AM digital that we have not fully discussed before. Additionally in the AM field, I'm interested in the FCC adoption of computer modeling and the benefits that will bring to AM directional operation."

Bob Culver and his wife Cathy relax at Wind River Lake on a road trip in the Togwotee Pass area in Wyoming. 'There are lots of uses for the digital data stream and it is not to supply the same old programming stuff in Lo-Fi,' he said.

User orientation

Guiding licensees in how to engage with HD and develop a profitable business model tops the list of challenges for R. Dale Gehman, owner/operator of Gehman Compliance & Consulting of Akron, Pa.

"There is a lot of confusion and apprehension about where things are going." He feels the most important technical trend of recent years is solid-state transmitters. "They have solved many ongoing problems and deliver much better reliability."

Gehman has strong opinions about the pitch for 24/7 staffing. "They're not going about it the right way. The solution is to fix what is wrong with EAS. A fully functional EAS CAP system will provide timely alerts without the need for human intervention, and will be more reliable."

Bob Culver of Lohnes & Culver Consulting Communications Engineers notes the lack of qualified personnel as a major concern of engineering heads.

"I would think they are worried about getting engineers who actually understand some of the fundamental science and engineering of broadcasting. I hear a lot of strange questions and comments from 'engineers' at stations."

He adds that digital technology is the most important trend, but it hasn't yet realized its potential.

"The full digital revolution will take place when a few things happen. Specifically, when 'updates' to software stop fixing bugs and changing the way a program works, and instead start incorporating new and additional useful operations into the existing base software."

Stations that are pursuing alternative delivery streams, according to Culver, need to think carefully about the business they're in.

"There are lots of uses for the digital data stream and it is not to supply the same old programming stuff in Lo-Fi. Give the consumer information he can use. He is already entertained to tears."

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SATURDAY SBE and File-Based Workflow

by John Poray and Holly Essex

The authors are the executive director and communications manager of SBE.

The Ennes Engineering Program, held in conjunction with the National Association of Broadcasters Convention in Las Vegas, has been the single largest gathering of broadcast engineers in one room for many years.

Ennes is the not-for-profit Educational Trust under the auspices of the Society of Broadcast Engineers. The workshop is supported by and attended by members of PBS and NPR, among others. Ennes also conducts a series of traveling one-day programs around the country.

Last year the Ennes program traveled to Sacramento, New York, Boston, Tampa and Atlanta. The programs are both radio and TV. If your SBE chapter is interested in an Ennes program, or your company wishes to volunteer a speaker, contact the SBE home office while this year's programs are coming together.

Ennes also provides for scholarships and support of the SBE Education Committee's efforts, SBE publications, and more. Check out *www.sbe.org*.

The NAB event is held Saturday, two days before the exhibition floor opens. This year's "early bird tutorial" begins at 8 a.m. on April 12. Admission requires full convention registration, available at a discount to SBE members; or PBS admission.

Fred Baumgartner is shown moderating last year's workshop.

EARLY START

"File-based workflow" is the topic for the SBE's Ennes Workshop at NAB. This is the last NAB convention in the analog TV era, and that means virtually everyone is looking at their workflow as the world of multichannel, multimedia and the all-digital facility come into view.

Admittedly, of all the topics presented in the past, this is the most TV-centric. On the other hand, nothing in broadcast workflow is entirely TV or radio.

Likewise, the people who put these programs together are all broadcast engineers, and almost all have worked in both radio and TV, some in even more specialized forms of broadcast. Broadcast engineers need to be proficient in skills and knowledge of workflow basics, IT in general and the issues surrounding station operations, no matter what branch of the industry one is working in at the moment.

The Ennes program is unusual in the industry in that it actively seeks and invites specific speakers, rather than asking for volunteers. The presenters spend a great deal of time and energy putting together their programs.

The Ennes Engineering Program at NAB has been the single largest gathering of broadcast engineers in one room for many years.

Because they are all tutorials, this work is done with education as its objective. It is a great testament to the industry and the support of broadcast engineers that so many busy people are willing to go to such lengths to support this program.

Many of our presenters can be found in the pages of various trade journals and are involved in advanced and exciting broadcast projects.

PRESENTING ...

The day begins with a full hour of the basics at 8 a.m., with the traditional tutorial, *"File-Based Workflow 101,"* presented by Harlan Neugeboren.

Neugeboren is the CEO of The Workflow Technology Group and consults a large number of clients in creating and fine-tuning their operational workflows.

Following at 9 a.m., Jim O'Brien presents *"Cross-Platform Work Flow"* dealing with the practical reality of facilities with Macs and Windows, MXF and QuickTime and the other legacy and station-specific pieces that make up a real-world facility.

He is the president of Building4Media and among other things designed and built 14 TV networks and assisted in another 125 TV networks in 31 countries.

Al Kovalick, a strategist and Pinnacle Fellow who has spoken at Ennes before, returns to present *"Video Timing and Synchronization in a Web Services Environment"* at 9:55 a.m. Al wrote what most consider the first book on the subject of tapeless workflow.

Next at 10:35 a.m., Brad Gilmer, the executive director of the Advanced Media Workflow Association, presents *"Understanding and Describing File-based Workflow."* Brad is also the editor-in-chief of the File Interchange Handbook and authors a monthly trade magazine column.

At 11:20 a.m., Chris Lennon, chairman and founder of SMPTE's S22-10 group, presents *"Broadcast eXchange Format."* BXF is a part of almost any discussion of workflow

"Implementing Workflow Changes," presented by John Luff, follows at 1:30 p.m. Founder of Synergistic Technologies Inc., now part of Azcar, his work has been implementing workflow changes for a number of facilities. Luff will describe a holistic approach for managing the change.

Continuing at 2:15 p.m., John Footen, vice president at National TeleConsultants, presents *"Business Process Analysis."*

Next, Mike Wellings, the engineering director for the ResearchChannel Consortium, leads the presentation *"Codec Performance"* at 3 p.m. He has done extensive research into HD codec performance. This visual presentation will give you an opportunity to see the effects of various codecs and compression on content, an integral part of the file-based workflow process.

OmniBus Systems' John Wadle will explore the impact and benefits of deploying a software-based transmission system in conjunction with file-based content workflows at 3:45 p.m. with *"File-Based Transmission Process."* This presentation follows the acquisition, preparation and storage of content, and the important execution of secondary events.

The day is finished with Pathfire's CTO Joe Fabiano with *"Pathfire's Distribution of Files and the Impact on File-Based Workflow."* The last piece of the workflow puzzle is getting the content and metadata distributed to the playout facilities. Fabiano was a member of Pathfire's original start up team, and a name associated with content distribution from the beginning.

Toss in Al Kovalick's *"History of the Second"* at lunchtime — a history of the development of timekeeping from water clocks to cesium fountain clocks to GPS and SMPTE 12M — and it becomes one full day of tutorials on the key pieces of file-based workflow with many of the most knowledgeable and experienced players in the field.

For a broadcast engineer, whatever the specific responsibilities, this workshop is the place for beneficial learning. Past feedback shows attendees agree that the NAB Ennes Workshop is well worth the time and effort to attend.

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SUNDAY Radio's Changing World

What Does It Mean for an Engineer That Radio Is Moving to Multiple Platforms?

by Tom Osenkowsky

The Broadcast Engineering Conference gets underway in earnest Sunday, and the day's agenda is crowded with sessions concerning the opportunities provided by digital radio and other developing technology.

This is also the only BEC day when you don't have to choose between sessions and exhibit floor time.

THE NEXT STAGE

"Digital Opportunities for Radio" occupies the morning; its presentations are chaired by Greater Media Director of Technical Operations Paul Shulins.

"I am very excited to be able to host this session," he said. "To me it is where the technology gets interesting."

"Conditional Access: The Next Stage in HD Radio Evolution" explores how NDS Radio Guard Conditional Access technology can provide new programming and revenue opportunities for HD Radio FM broadcasters.

Thomas Rucktenwald, director of data application sales for California-based NDS, explains how this technology, embedded in the new HD Radio ICs slated for release this spring, allows a broadcaster to target a specific demographic or individual listener.

"Conditional Access really means providing public service to those intended to receive it," he said. "An example is reading services for the visually handicapped. Some of the material that is read is copyrighted. CA allows only those authorized to receive such material to access it, thus protecting the integrity of the copyright."

CA doesn't necessarily mean "pay radio." It incorporates encryption, entitlement and addressability. Encryption ensures privacy, entitlement tells each receiver what is can receive and addressability permits the broadcaster to talk to and deliver content to individual receivers and receiver groups.

With additional storage capability in receivers, the technology can be extended to target specific advertising to specific receivers.

"Technology is the vehicle for creativity. Targeted advertising is worth more revenue dollars. The soccer mom may be targeted a child learning center ad whereas the retired male may receive a golf club spot," said Rucktenwald.

Metadata is an additional benefit of digital radio broadcasting.

Taking advantage of the rich descriptive metadata information that accompanies the audio portion will be discussed by Daniel Mansergh, KQED's public radio director of engineering and a contributor to RW.

"Listeners have already cultivated an exposure to metadata from satellite and cable audio services, portable media players, computerized music libraries and podcasting," he said. *"Managing Radio Metadata for Multiplatform Digital Distribution"* reviews metadata standards, tools and efficient practice methods as well as proposing an integrative approach to data systems architecture drawing from a number of fields.

"The Future of Radio in a Changing World" examines modern consumer technology and expectations for the electronic media and their effect on free local radio broadcasters.

Dave Wilson, director of technology and standards for the Consumer Electronics Association, is presenter.

"It may be necessary for radio's technical infrastructure to be realigned to maintain pace with competing technologies," he said. "This may include, but not be limited to frequency allocation rules.

"Consumers want personalized information and this cannot be provided effectively with real-time audio streams. To retain and grow its customer base, free local radio should become a provider of timely audio files containing well-defined information that consumers can select or ignore to customize their listening experience. These files should complement, not try to compete with, portable audio players. In effect, radio needs to become a wireless downloading service that adds timely local information and entertainment to a consumer's portable media player."

"Seeding the Internet — Automating Podcasting With Open-Source Tools" opens some new doors for revenue generation, listener attraction and retention as well as a promotional vehicle.

Fred Gleason, president of Paravel Systems LLC, said, "Podcasting works well with stations that feature unique content unavailable elsewhere. Examples include talk programming, local news, event coverage, etc."

Using open-source tools to automate podcasting will be examined. Methods to implement procedures and practices that require little technical or manual intervention allow broadcasters to realize the potential of new territory and better compete with non-traditional broadcast alternatives, Gleason argues.

Open-source tools use code that is freely available, unlike commercial software that is proprietary and fixed in nature. Radio broadcasters as well as program syndicators can benefit from podcasting using open-source tools such as the Rivendell automation system, he says.

"Work Smart, Not Hard — Positioning Your Content for Multiple Platforms" educates broadcasters on "convergence," making your content effective in multiple media platforms.

Addressing user experiences navigating and adjusting workflows to embrace these changes is one of the elements of this presentation.

Podcasts, online video, cell phones, smart phones, ubiquitous wireless, broadband growth and HD Radio present a challenge and an opportunity for content producers to serve audiences in new ways.

A flavor of the public radio industry is provided by Melinda Driscoll, new media manager, marketing and channel distribution for American Public Media; Laura Jensen, deputy director of business architecture for National Public Radio, and Nick Kereakos, manager of broadcast production and operations for American Public Media group.

They feel that placing new media and virtual audience at the "tail end" of your production "consciousness" creates limitations and diminishes your potential for connecting with audiences.

NOVEL APPROACHES

Of the afternoon sessions that make up "Radio Technology Advances," its chairman Milford Smith, vice president of engineering for Greater Media, said, "The wide variety of topics embraced by these presentations demonstrates the rapid pace of technology evolution that affects radio broadcasters." He called these presentations "novel approaches to new challenges."

"Radio Broadcasters: Building File-Based Networks" examines the technology behind the next generation of satellite-delivered programming.

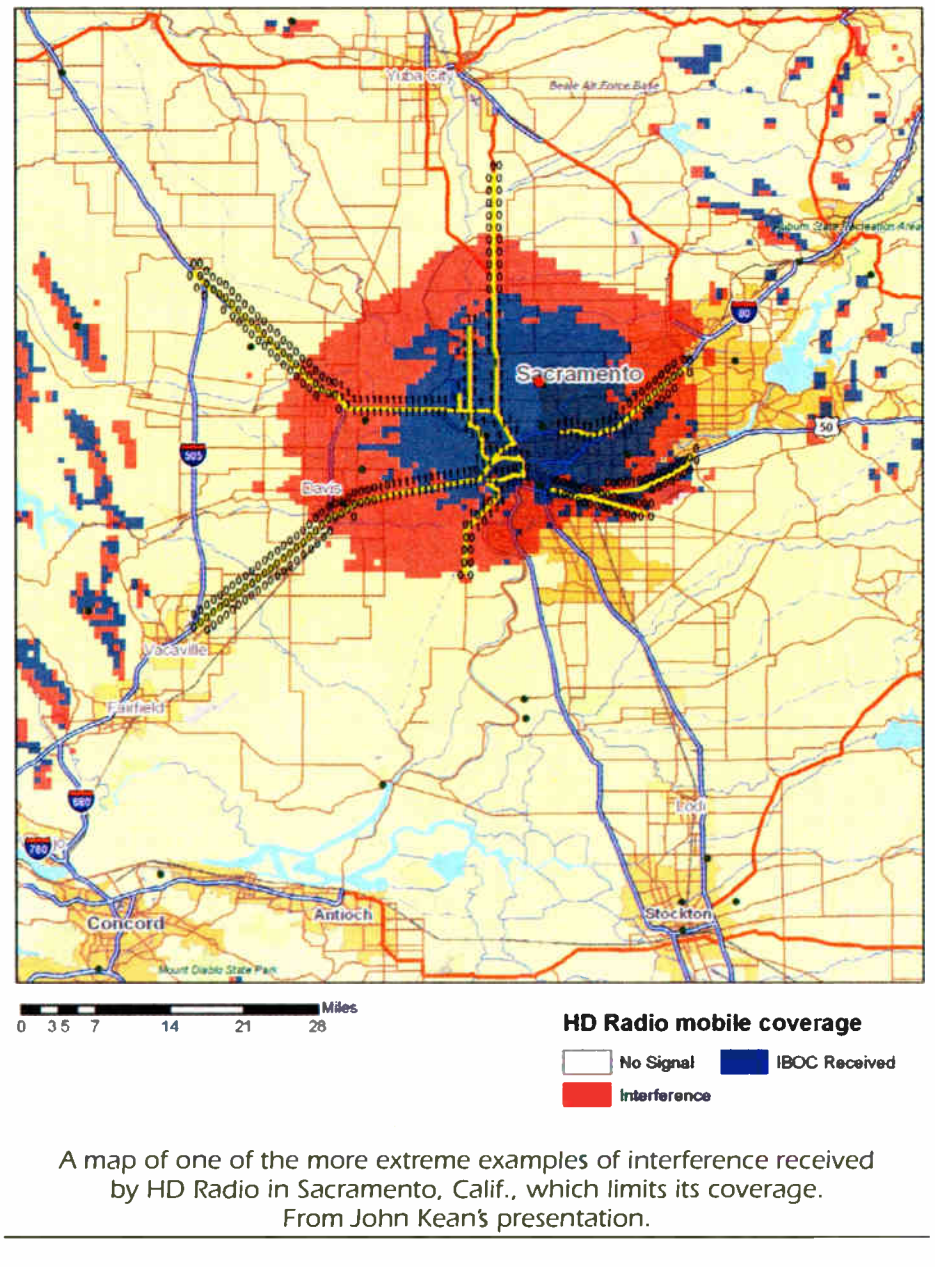
Providing listeners and advertisers with a sense of local presence can be accomplished by transitioning to file-based delivery to each affiliate station to deliver more local ads, promotional announcements and station identifiers.

See SUNDAY, page 28 ▶

Broadcast Engineering Conference

- Sunday morning April 13: "Digital Opportunities for Radio"
- Sunday afternoon April 13: "Radio Technology Advancements"

John Kean, front, of NPR Labs will discuss coverage prediction methods for HD Radio. Also shown are Kyle Evans, Mike Starling and Jan Andrews; Dr. Ellyn Sheffield is not shown.



A map of one of the more extreme examples of interference received by HD Radio in Sacramento, Calif., which limits its coverage. From John Kean's presentation.

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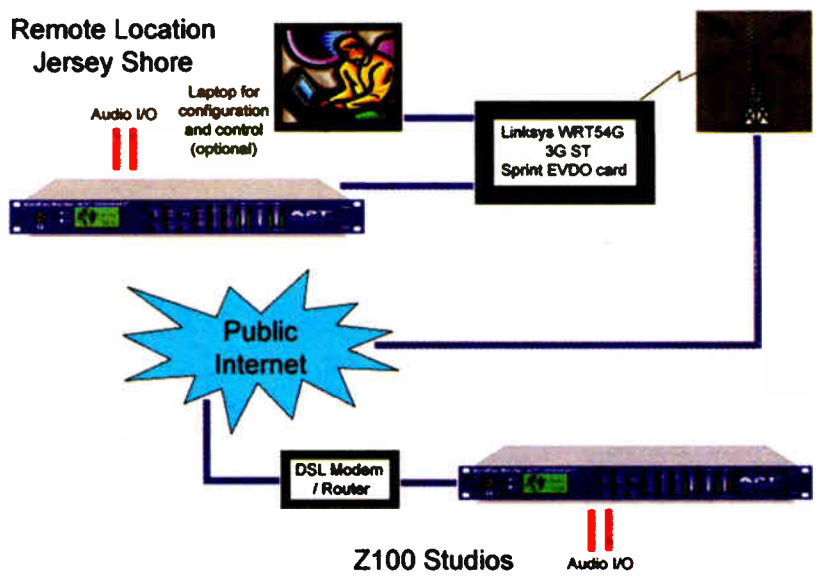
Sunday

▶ Continued from page 26

Eric Wiler, vice president of technology for Jones Radio Network, and Gary Pelkey, system architect for Wegener, discuss how addressable media servers receive live audio broadcasts, store regionalized to local content and combine them into a final product where the listener perceives a local program.

An intelligent centralized control and distribution solution allows national radio networks to provide targeted ads to specific markets through media server management.

A one-time distribution of repetitive material to addressable media servers can be used to enhance national live programming. This technology is employed by Jones, with other networks planning rollouts.



APT case study of WHTZ's use of the Internet for a recurring remote.

"HD Audio Quality and Netcasting" are important considerations in today's environment.

Greg J. Ogonowski, VP of product development at Orban/CRL, said, "The way consumer audio is being consumed is changing rapidly. This includes retail music and broadcast radio. The main driving forces are the technological advances in delivery mechanisms, ranging from new portable music players for downloadable music to new streaming players and wireless mobile devices.

"These devices have become mainstream and are now frequently overlooked features of electronic components like home theater receivers."

Internet streaming has matured and broadcasters have embraced this technology to enhance revenue generation and expose a worldwide audience to their programming.

Ogonowski says careful choice of audio processing and coding are important to presenting a quality product to impress and maintain listeners. He said he'll talk about the requirements for delivering high audio quality with bit-rate-reduced streams in a digital listening world, and discuss the streaming formats required to reach all streaming devices.

Accurate prediction of a station's coverage is essential to the broadcaster. Computer modeling tools allow selection of an optimum transmitter site, tower height and antenna type.

One such tool is the Longley-Rice Irregular Terrain Model. A recent release of version 1.2.2 was found to contain seven sets of errors in the NTIA core set of subroutines.

"From ITM to ITWOM: Correcting, Completing and Updating the Longley-Rice Irregular Terrain Model" is presented by Sid Shumate, president of Givens & Bell. He discusses the corrections made to provide proper response to three-arc-second terrain databases.

According to Shumate, "The original ITM subroutines are corrected, and completed to properly consider major obstructions. Updates include replacing line-of-sight diffraction with Radiative Transfer Engine (RTE) equations." The results include accurate, precise prediction of propagation in irregular terrain environments.

Using the Internet for broadcast applications is a timely topic. Most broadcasters are familiar with streaming their programming; however, employing the Internet to deliver audio from remote locations or as a studio-to-transmitter link are functions for which many vendors have products.

"Can the Public Internet Be Used for Broadcast?" will examine the possibilities. Simon Daniels, sales manager-Europe for APT, said, "With IP audio networking moving into the mainstream of audio broadcasting, radio station engineers are faced with a wide choice of IP links over which to transfer their content. Options include dedicated IP LANs, contended lines and the public Internet using DSL, FiOS, WiMAX and 3G.

"Issues such as network latency, connections and protocols arise and examples of various approaches in different circumstances can help us make informed choices."

Actual examples of Internet use as well as definitions of connections, network and transport protocols, data rates, packet loss, jitter, bandwidth and latency will help inform engineers how to use the Internet for daily broadcast applications more effectively.

Nautel will discuss a novel method that can help HD Radio transmitter deployments that "low-level combine" the FM signal with the IBOC signal, to achieve increased IBOC carrier power and higher transmitter efficiency.

Unlike traditional FM transmission, the IBOC signal presents the transmitter with a widely varying signal envelope, the company notes. The peak power compared to the average power in the signal is defined as the peak-to-average-power ratio (PAPR).

The ideal IBOC signal exhibits a PAPR of over 12 dB, requiring significant input back off (IBO), seriously limiting the transmitter's output power capability and efficiency. Ibiquity Digital has a standard PARR reduction method in its modulator which reduces the PAPR to approximately 7 dB.

It may be necessary for radio's technical infrastructure to be realigned to maintain pace with competing technologies.

— Dave Wilson, CEA

In the presentation *"A New Approach to Peak-to-Average-Power Reduction for FM IBOC Transmission,"* Nautel will detail the standard PAPR reduction method and discusses a novel approach to PAPR reduction that is optimized for low-level-combined FM+IBOC transmission.

In particular as broadcasters are looking to increase IBOC carrier power by up to

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Sunday

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10 dB, this method allows a transmitter's output power to be increased by 35 to 70 percent. Transmitter efficiency equally benefits from this method, Nautel says. It is applicable to existing hybrid transmitter installations, where the newly obtained gains can be applied to increasing IBOC carrier power.

"We are excited to share our research results on PAPR reduction with the broadcast community at large as Nautel believes that providing broadcasters with effective solutions to increase IBOC carrier power will further the adoption of HD Radio," said Philipp Schmid, research engineer for the company.

A different approach to digital broadcasting is offered in *"Field Tests for Service Area and Handover Service in T-DMB."*

According to Kim SangHun of the Korean Broadcast Service, "In order to provide seamless high-quality services on various radio channels, the T-DMB system has been tested in Korea. Before launching commercial broadcasting services, the objective of the field tests is to measure and analyze the quality of the T-DMB system in order to derive optimal transmission and reception parameters.

"In the digital broadcasting system, various types of services can be simultaneously carried in one channel. T-DMB can also carry video, audio and data services in one channel. Therefore, the additional handover information needs to be defined for handover service and they need to be efficiently carried to the receivers."

T-DMB standards were approved as ETSI standards in 2005, and also approved as ITU standards in 2007. One of the methods being employed to extend the data service coverage to the level of video service is adopting channel coding such as the Reed-Solomon method. In Korea the commercial handover service will start in 2008.

With HD Radio a reality on the broadcast landscape, one important factor is the accurate prediction of the station's coverage area.

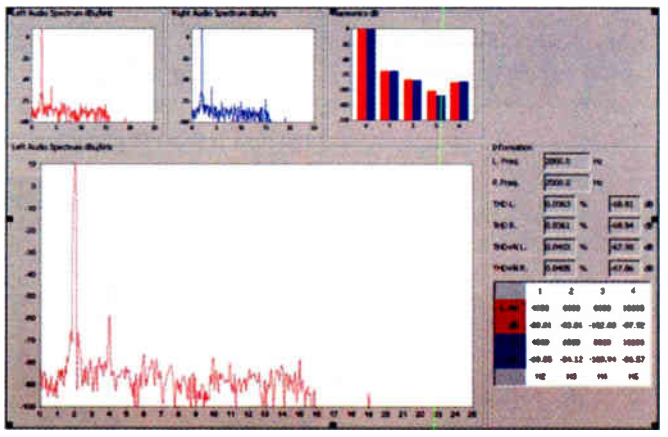
John Kean, senior technologist at National Public Radio's NPR Labs, highlights this in *"An Improved Coverage Prediction Method for HD Radio."*

"HD Radio and analog FM are very different radio technologies, on the basis of modulation and spectrum occupancy," Kean said.

"As a result, their interference susceptibility and interference-free coverages can be quite different, even on the same station. What NPR Labs has done is extensively test receivers in the laboratory and examine the system technical design, to develop an interference and coverage model."

In addition to development of computer software to perform the interference and coverage prediction maps, NPR Labs performed measurements of actual stations to verify the model; it also did a perceptual study of audible noise by FM listeners, to determine what levels of noise (or interference) would result in their deciding to turn off the radio or change the station.

The researchers say this was an all-encompassing study from the transmitter to the listener, addressing all aspects of transmission and reception.



Audio distortion measurement. From Audemat's presentation 'Advances in Digital Measurement Techniques for FM Broadcast.'

NPR Labs is completing thousands of maps for the Corporation for Public Broadcasting of the 850 CPB-qualified public radio stations in the United States.

While the United States has adopted IBOC, Brazil is in the process of evaluating several digital radio standards.

Under consideration are DRM, DRM+, DAB and DAB+ and HD Radio. Presenter AcÃ¡cio Luiz Costa, general director of the Mix TV Network in Sao Paulo, outlines Brazil's technical tests and implementation status in *"Brazil's Digital Radio Technology Choices."*

While the selection process is underway, networks and organizations have made it clear that they wish to move much faster than did their TV counterparts. Addressing the commercial and technical issues of the selection process provides an insight to the process and how the final choice affects broadcasters and listeners.

See SUNDAY, page 31 ▶

MONDAY Technology and Management

STLs, Digital Radio and How to Talk With (or as) the Boss

by Bob Kovacs

"Communicating With Management" would at first seem to be mundane. After all, virtually everyone has communicated with a manager, so what more can be said on the subject?

TALK, TALK, TALK

Quite a bit, actually — a successful radio operation is not the same as selling furniture or refining oil, and an experienced broadcast manager has valuable insight worthwhile to other broadcasters.

"Having worked in radio for almost 40 years, I've seen a number of changes," said Paul Tinkle, president of Thunderbolt Broadcasting Co.

"Management today has to be more involved with technology than ever before and must have a passion to learn about changing technology."

The latest approaches to broadcast management will be reviewed in this session.

Love it or otherwise, HD Radio is changing the landscape of broadcasting and new rules are being written as the technology rolls out. Techniques and tools for managers have to keep pace with the technology to keep broadcasters afloat in a changing, competitive environment.

"It's very difficult knowing when to pull the trigger on HD in a small market, especially because of costs and programming, but being aggressive is the key to being successful in this business," Tinkle said. "You can't sit back here — there is no more spectrum."

Other participants in this 90-minute session include John Bisset, northeast regional sales manager for Broadcast Electronics and RW's *Workbench* columnist; David Israel, vice president and general manager for WFYV(FM) and WMXQ(FM); Don Kelley, vice president and director of programming for Greater Media; and Gary Kline, VP of engineering and IT for Cumulus Media. The moderator is Chriss Scherer of Radio magazine, recent past president of the SBE.

Getting the right equipment and systems in place for the best sound and most efficient operation is only part of the game. Management's ability to forge a team from different personalities is an essential part of the creative process of radio, including engineering management.

Tinkle has spent 40 years in broadcasting, starting as a janitor at stations he now owns. Coming up through the ranks, he dealt with every fad and new technology since the heyday of top-40 radio — and the personalities associated with it — in the 1960s.

Paul F. Tinkle, president of Thunderbolt Broadcasting Company, is among the participants in 'Communicating With Management.'

"Anyone who has not spent at least 10 years in radio and doesn't have a good engineer or consultant to be able to be an important resource will likely be left behind," Tinkle said. "Engineers and managers must be constantly thinking of how to improve their facilities and how to do it with the available resources."

Broadcast Engineering Conference

- Monday morning April 14 "Communicating With Management"
- Monday afternoon April 14 "Alternative STL Technologies"
- Monday afternoon April 14 "Digital Radio Summit"

Like any area of study, there are always new things to learn and veterans who have priceless experience. *"Communicating With Management"* will bridge the past with the present in a fast-changing radio world.

GET IT THERE

"Alternative STL Technologies" will examine the evolving requirements for studio-transmitter links. Radio in a digital world is making demands on STLs that are just as dramatic as the switch from mono to stereo.

"With the advent of HD Radio, the bandwidth requirements have gone up exponentially," said Paul Shulins, director of technical operations for Greater Media. "No longer will a simple phone line or single T1 suffice."

Making the most of your current STL and planning for the future will be discussed.

With radio stations now broadcasting multiple streams of programming, stations are being squeezed by listeners expecting more content at the same time competition from satellite services is bringing into broadcasters' budgets. Making the most of current technology for your STL is not only necessary to handle additional programming, it will help hold the line on costs.

"Having an IP link to the transmitter site is the wave of the future," Shulins said. "In fact most equipment manufactured today either requires or offers some kind of network connectivity — if not for operation, then for installation and maintenance."

However, different broadcasters have different needs, and another approach may fit your requirements best.

"There are emerging technologies offering different solutions at widely different costs, and offering widely different reliability," Shulins said.

The presentation will kick off with Bob Band from Harris Corp., who will discuss HD Radio and its need for increased STL bandwidth.

Band will review technologies such as spread-spectrum radios, T1 radios, IP links and traditional 950 MHz links. His presentation is *"The HD Radio STL: Issues, Options and Technologies."*

Formerly with Intraplex, where he was technical communications manager and webmaster before moving into international sales and marketing, he now works in business development for Harris.

It's very difficult knowing when to pull the trigger on HD in a small market, especially because of costs and programming, but being aggressive is the key to being successful in this business.

— Paul Tinkle

Guy Gampell from APT will present what many consider to be the future of audio transport: audio over IP. His talk is *"The Best of Synchronous with the Best of IP."*

Although it is a major advance in capabilities, this technology is still developing, and today's users must be aware of its limitations, benefits and requirements. Gampell promises to give an overview of the most important issues that broadcasters need to consider before embarking upon IP migration.

Finally, in *"Robust HD Radio Exporter to Exgine Architecture,"* Tim Anderson from Harris will examine the new generation of I2E and E2X HDP data-stream protocols.

This compression technology can improve the robustness of the UDP/IP-over-Ethernet protocol that allows broadcasters to use simplex and lower-bandwidth STLs.

See MONDAY, page 31 ▶

Monday

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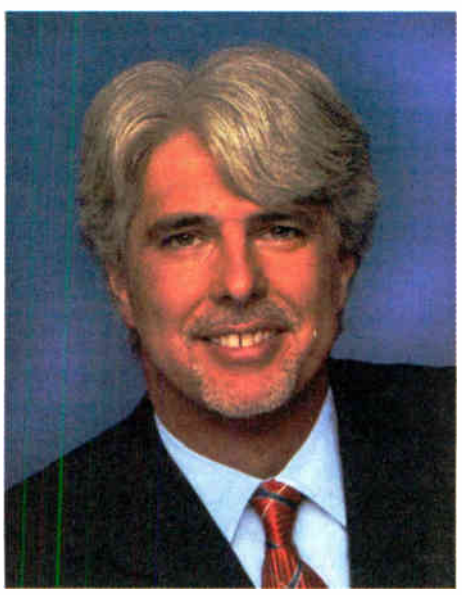
The choices are diverse: radios or IP? Phone company or fiber? "Alternative STL Technologies" will give an understanding of how these technologies affect your station.

AT THE SUMMIT

Capping off Monday's radio sessions is the two-hour *"Digital Radio Summit."* Chaired by Barry Thomas, vice president of radio engineering for Lincoln Financial Media and president of the SBE, this session will cover a range of radio-related topics, from technical to regulatory.



Barry Thomas, vice president of radio engineering for Lincoln Financial Media and new SBE president, chairs a 'Digital Radio Summit.'

"These [presentations] will be an important resource in understanding digital radio's challenges and opportunities in the U.S. and overseas," Thomas said.

Presentations begin with *"Bandwidth & Frequency Allocation Issues in International Digital Radio AM & FM Broadcasting,"* by Chuck Kelly, director of international sales for Nautel.

Kelly will examine how broadcasters and regulators are dealing with issues of occupied bandwidth, and the impact of DRM and HD Radio implementation on co-channel and adjacent-channel interference. Theoretical and real-world examples from domestic and international broadcasters will be presented.

"New Standards and Codecs for European Digital Broadcasting" is by Olaf Korte from the Fraunhofer Institute for Integrated Circuits in Erlangen, Germany. This presentation will review the background of DAB, DRM and DMB, and their operational appeal to both public and private broadcasters in Europe.

Although there are efforts being made to introduce HD Radio to Europe, the fragmented European market makes it difficult to establish a common digital radio standard for the entire continent.

"Mobile Coverage Optimization by Polarization Diversity in VHF and UHF Propagation," by Myron Fanton, chief engineer for RF Technology at Electronics Research Inc., will discuss how different transmission antenna polarizations can affect channel capacity and performance.

With the correct antenna design and proper modulation, two independent signals may be transmitted and received on the same frequency. At the receiving end, dual-polarized antennas have been found to dramatically increase mobile signal reception and virtually eliminate signal loss, both in digital television and radio IBOC broadcasts.

A somewhat lighthearted look at the evolving lingo of broadcasting is the focus of *"Does Your Yotta Byte?,"* by Andrew Janitschek, director of production support for Radio Free Asia.

Terms such as gigabyte, terabyte, 1080p, HD Radio, HDMI and voice-over-IP are now part of our everyday engineering language, despite being virtually unknown just a few years ago. And as analog NTSC television faces a government-enforced sunset, will quaint terms like AM, FM and subcarrier be the next to disappear from the lexicon of broadcasting?

Janitschek will examine some new broadcast technologies and the associated terms we will all use in the future.

Bob Kovacs, a former DJ and radio engineer, is a regular contributor to TV Technology magazine whose photography has also appeared in RW.

Sunday

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Advances in digital signal processing, commonly referred to as DSP, allow new techniques for measurement and analysis of FM RF, composite and audio signals.

The RF signal measurements include modulation, RDS, occupied bandwidth and pilot stability. Composite measurements include spectrum analysis, modulation and density. Audio measurements could include frequency response, distortion and separation.

"Advances in Digital Measurement Techniques for FM Broadcast," presented by Frederic Allard and Tony Peterle of Audemat, explores the differences between a demodulator and receiver, ideal vs. real-world equipments and DSP applications in broadcast measurement.

One of the novel concepts in digital measurement techniques to be explored is undersampling and how it relates to the Shannon theorem. Theoretical mathematical and practical evidence will demonstrate that undersampling a signal for analysis can produce excellent, accurate results, Audemat says.

Understanding how digital measurement techniques can be applied to FM broadcast signals can result in superior signal quality, which is especially important in the digital broadcast arena.

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

TUESDAY

IP Makes the Grade

Sessions Explore New Tech Including Audio Over IP and PPM's Implications

by James G. Withers

With HD Radio in bloom as the 2008 NAB Show draws near, the technical sessions at the Broadcast Engineering Conference are particularly topical.

NEW TECH

Tuesday morning's offerings are grouped under the general heading of "*New Technologies for Radio Listening,*" chaired by Steve Fluker, director of engineering for the Cox Radio cluster in Orlando, Fla. Fluker says the topics to be presented are timely, considering the level of interest in, and rapid adoption of, HD Radio.

"This session is all about introducing engineering and operations personnel to real-life issues that will have to be faced when implementing IP and other new technical systems."

"For example, Junius Kim's presentation titled '*Utilizing IP Networks for Seamless Simulcasting Over Multiple Transmitters*' is all about keeping various multicast sites in sync. In an all-analog world, this was not even a consideration, but with blended HD and analog signals, plus stations' frequent reliance on boosters and translators, synchronization cannot be ignored."

Even better, Fluker said, is the affordability of the solution. "Coupling IP connectivity with the accuracy of the GPS system for timing is an extremely reliable and cost-effective answer to a brand-new issue for engineers."

Broadcast Engineering Conference

- Tuesday morning April 15: "New Technologies for Radio Listening"
- Tuesday afternoon April 15: "Audio Over IP"
- Tuesday afternoon April 15: "Next-Generation Public Alerting"

Kim is a senior engineer with Harris Corp. His presentation focuses on the problems that can arise when several transmitters all within range of a consumer's receiver are not precisely synced up.

"Without a seamless handoff from one signal to the next, the receiver will update erratically, with predictable listener complaints," Fluker said. The ubiquity of broadband IP networks, along with GPS enhanced timing, solves these problems.

Ask any program director what he or she lives and dies by, and the answer will almost always be "The numbers we got in the last book."

With the rollout of Arbitron's new Portable People Meter technology starting in Philadelphia last year, the new answer is likely to be "the accuracy of our PPM encoding signal."

Fluker is particularly excited to host Larry Paulausky's presentation on this topic. In "*Practical Considerations of Radio Broadcast Operations in an Arbitron PPM Market,*" Paulausky, chief engineer of Greater Media, shares issues and solutions to monitoring and correcting problems with the Arbitron encoded signal.

A portion of two racks of equipment monitoring silence and Arbitron PPM encoding on some of Greater Media's 22 audio streams in Philadelphia. From Larry Paulausky's presentation.

PPM technology is intended ultimately to replace the diary methodology and utilizes pager-sized receivers, carried by survey participants, that decode sub-audible signals superimposed on a station's main audio. The decoded signal is translated into a rating for the station and reported back.

"Everyone knows about Arbitron's PPM technology, but less well known is

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Tuesday

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what happens when the encoder goes off-line," says Fluker. "What are the practical implications? How quickly should an engineer address the problem, especially if the failure occurs coincidentally with a major transmitter outage?"

Fluker believes most engineers would address the transmitter issue first and work on the encoder later, but he says that would be a mistake.

"Engineers in PPM markets need to know that the PPM encoder is just as important to the station's operation as the transmitter, and that is what this presentation is all about."

"Can you hear me now?" is more than just a tag line for a cell phone commercial. It's the main question most engineers would like to ask the listening public with regard to their station's signal.

To that point, NPR Senior Technologist John Kean and Dr. Ellyn G. Sheffield of NPR Labs and Towson State University conducted an in-depth study on this subject, drilling down to specifics such as overall sound quality, annoyance of background noise and whether or not the conditions presented would result in "listener fatigue." Their presentation is *"Consumer Ratings of Impaired Audio at Various Signal/Noise Ratios."*

Everyone knows about Aribtron's PPM technology, but less well known is what happens when the encoder goes off-line.

— Steve Fluker

Again, Fluker expects information that might be counterintuitive to the broadcast engineer.

"As a group, I suspect we are way more attuned to audio degradation," he says. "I personally cringe at some MP3 audio our stations get, but the listeners don't even seem to notice. I also hope to see the effects of digitally induced noise on the analog signal, because let's face it, that signal is still where the lion's share of the money is made today."

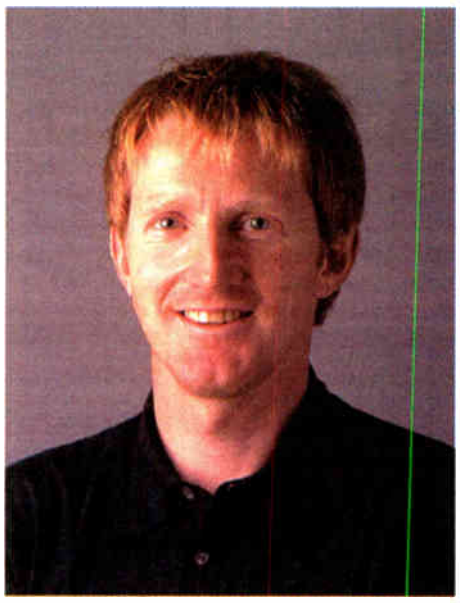
The data presented by the NPR team will provide engineers an opportunity to see how objective SNR measurements correlate with actual listener opinion under controlled conditions.

Providing data services to paying customers is one avenue to the elusive "second revenue stream" broadcasters openly covet. Alexander Zink of Fraunhofer IIS will outline the current deployment of datacasting in the United States and Europe in a session titled *"Data Services for Digital Broadcasting."* As well, Zink will detail his company's partnerships in maximizing the revenue potential of such services.

"More and more stations are going to be providing data services," Fluker said, "but right now, no one seems to know how to monetize the investment in the technology." What will consumers want, and more importantly, what will they pay for?

And in a presentation that could be called "Phone Lines Are So Last Century," the morning rounds out with a presentation that is actually *"Affordable IP-Based Remote Monitoring and Control of Transmitter Sites."*

Johannes Rietschel, CEO and founder of Barix AG, states that, in addition to stations no longer needing dedicated phone lines for remote control and monitoring, neither do those stations or groups need to install and maintain completely redundant servers along with peripherals and static IP addresses.



Johannes Rietschel of Barix

"Cox is a very big proponent of this technology," says Fluker, whose own cluster in Orlando relies on it. Customized applications running on off-the-shelf hardware can be paid for by the month, and offer a variety of alarm and notification options.

"We not only monitor traditional transmitter functions," he said, "but we also have developed a whole suite of additional features, right down to streaming back monitor audio from the sites for better troubleshooting capability." It's a tutorial on 21st century command and control alternatives.

IP AUDIO

Tuesday afternoon at the Broadcast Engineer Conference highlights *"Audio Over IP"* with session chair Talmage Ball, vice president of engineering for Bonneville Broadcasting.

Sending audio streams over the Internet is a core application for radio stations these days. The ubiquity of broadband Internet connections coupled with powerful compression algorithms available in high-quality codecs make using the Net as a general-purpose transport mechanism a vital tool for radio broadcasters.

Johannes Rietschel of Barix resumes the podium with *"IP-Based Audio and Control Distribution Over Internet Satellite and Wireless Platforms."* Focusing on the details of synchronizing metadata with main stream audio and the plethora of secondary applications this technology supports, he will discuss pros and cons of using RTP vs. Shoutcast methodology.

Rietschel explores limitations of relying

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WEDNESDAY

A Digital Power Increase?

Sessions Include Walden and Others on Implications of Elevating IBOC Power

by John M. Lyons

Wednesday's Broadcast Engineering Conference presentations turn to the practical problems of monitoring and measuring in the morning, and a broad range of RF-related topics in the afternoon. Two presentations in the afternoon address the proposed increase in HD Radio power.

MEASURE UP

"Monitoring and Measurements in the Broadcast Plant — Radio" at the Wednesday morning NAB Broadcast Engineering Conference will be chaired by Talmage Ball, vice president of engineering for Bonneville International.

"The premier engineering expertise NAB has gathered into this session on monitoring and measurement of broadcast transmission facilities demands a 'must attend' for broadcast engineers that want to be fully prepared as we move into the HD Radio era," he said.

Ball said the session combines experts in test equipment, receiver technology, antenna and power measurement.

Opening will be John Howard, vice president of Lyncole XIT Grounding, on the subject of *"Grounding Systems: Why They're Important & Why Testing Is Invalid 95% of the Time."*

"Although everyone seems to agree that grounding is very important, most do not realize that 95-plus percent of ground systems tests are invalid," he said.

Howard served in the Navy for 22 years and had extensive training in electricity and electronics; he maintained navigation, communications and radar systems. He was an instructor and supervisor at the Naval Submarine and Naval Guided Missiles Schools. He also has worked with telecommunications carriers and municipalities in developing grounding standards and electrical protection designs.

Next on the morning agenda is *"Practical Considerations in the Measurement of VSWR in Broadcast Transmission Systems"* by Tim Holt, director of systems engineering for Bird Corp.

"Broadcast antenna and transmission system health is indicated by VSWR and return loss measurement. Critical components in these measurements will be identified and important parameters associated with these components will be reviewed during this session."

"Spectrum Analyzer Uncertainties in Digital Radio Measurements" will be presented by David Maxson, managing partner of Broadcast Signal Lab.

"You really can't know if your IBOC measurement's right until you have wrapped your brain around what goes on inside a spectrum analyzer," he said.

"Welcome to the digital world. Modern digital spectrum analyzers can be more accurate measuring digital signals, although you may wish you had an older analyzer that erred in your favor."

Myron Fanton, chief engineer of RF technology for Electronics Research Inc., continues the session on radio monitoring and measurements with a presentation on *"RF Measurement Techniques for Broadcast Engineers."*

Broadcast Engineering Conference

- Wednesday morning April 16: "Monitoring and Measurements in the Broadcast Plant-Radio"
- Wednesday afternoon April 16: "Radio RF & Transmission Systems"

"Learn how to use state-of-the-art tools to measure and interpret measurements of antennas, transmission lines and the complete broadcast transmission system."

This session on AM and FM continues with John Kean, senior technologist of NPR Labs, bringing you *"RF Signal Performance Measurements of Consumer FM Receivers and Coverage Effects."*

"This session will provide new insight into receiver sensitivity and interference susceptibility from co-channel through third-adjacent," he said. "I'll be showing interference test data and maps for both analog-to-analog and IBOC-to-analog conditions. It impacts your audience."

Concluding the morning is *"Fiber Optic Antenna Monitoring for Computer-Modeled AM Directional Arrays"* by James Dalke of Dalke Broadcast Services.

"An important part of adjusting and maintaining a directional antenna system is accurately monitoring the phase and amplitude of the RF current in each directional element in the antenna array," he said.

His presentation will focus on having a fiber optic monitoring system replace the traditional coaxial sample lines with fiber optic lines and the elimination of the need for decoupling at the base of each antenna element. "Installation of the small fiber optic cable is easier than coaxial cable," he notes.

IT'S ALL ABOUT RF

"Radio RF & Transmission Systems" at the Wednesday afternoon NAB Broadcast Engineering Conference will be chaired by Gary Kline, vice president of engineering and IT for Cumulus Media.

"Even as IT and IP technologies continue to gain dominance in the broadcast plant, RF and transmission systems are still the core technology that keeps the business of radio 'on the air,'" he said.

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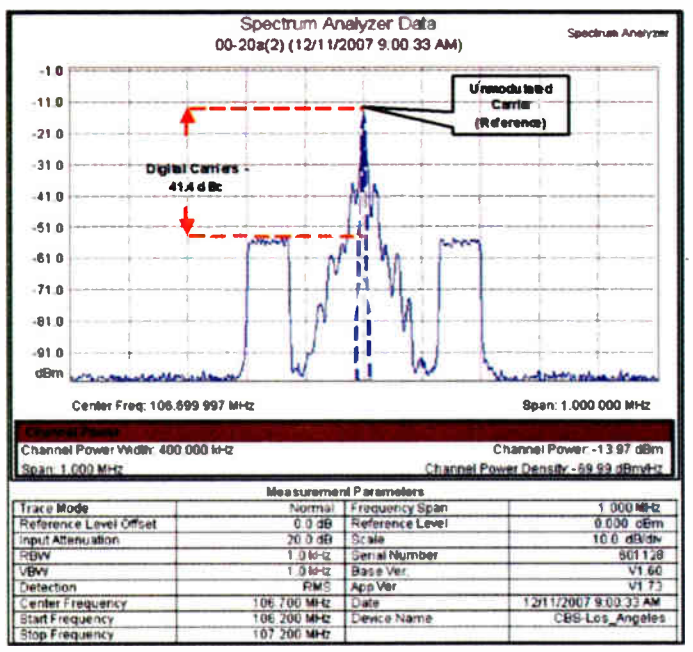

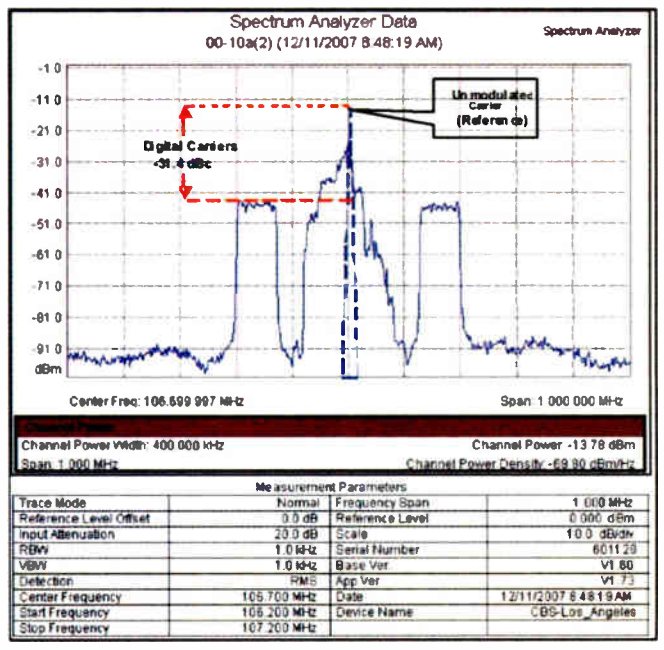

At left, a Harris Z16-HD-Plus transmitter with options, operating with IBOC carriers at –20 dBc. Right, the same system operating with IBOC carriers at –10 dBc. From Glynn Walden's afternoon presentation.

Tuesday

▶ Continued from page 33

on third-party public servers, given the somewhat unpredictable bottlenecks these portals have exhibited in the past. If you are a current IP audio distributor or just want to check out the advisability of putting your airstream on IP transport, this is a session to attend.

RRDP-EE is not a new specialized electrical engineering degree. Rather, it stands for *"Rapid Radio Deployment Pack — Emergency Edition,"* and the ins and outs of this new technology will be discussed.

The concept is designed to bring the horsepower of a full-featured news operation into the field with minimal notice. Also, in an age of unexpected evacuations, having facilities that can be moved and assembled with ease can help an operations engineer sleep better.

Pierre Robidoux, senior engineer with CBC Canada, will discuss considerations that must be addressed when assembling a RRDP-EE package, which are more significant than might be assumed.

Switching between network feeds and local programming, allowing for special news bulletins and maintaining contact with other remote locations are among the programming issues involved. The presentation also will cover technical aspects of the project such as designing modular audio production units for different needs; command and control issues; and the correct IP transport strategy using public or private networks. An interesting session for the post-9/11 world.

Steve Church, president of Telos Systems, presents *"Advanced Tech for IP Remotes."* Not long ago, broadcasters had few choices when deciding how to transport audio from the field back to the studio, mainly telco POTS lines or VHF/UHF radio. POTS lines, of course, were the lowest of low fidelity, and narrow-band FM radios required licenses and the all-important "line-of-sight" shot. Then along came ISDN and remotes grew up.

As Church explains it, ISDN has served broadcasters well. In fact, he says, it was a small-scale revolution when it appeared. For the first time, the dial-up network could be used for high-fidelity remotes. Compared to equalized analog "broadcast loops" that had been the only high-fidelity telephone service, ISDN was a miracle.

Still, ISDN has some drawbacks, and technology has moved on. Church discusses the pros and cons of managing remote audio via IP transport over the Internet. Broadcast codecs, taking advantage of new technology and optimized for the real-world conditions on IP networks, make this practical.

ACTUALLY, THIS ISN'T A TEST

The nation's emergency alerting system, in its various incarnations, has had a checkered past, going all the way back to the Nuclear Cold War days of the 1950s, when it was known as CONELRAD (which stood for CONtrol of ELectromagnetic RADiation).

"Next-Generation Public Alerting" is a session that will focus on where this system is going and how the implementation will affect broadcasters and the public.

The chairman is Clay Freinwald, corporate engineer with Entercom. Given the problems with the manual and semi-automatic systems of the past, as well as the fact that EAS violations are high up on the FCC's list of station fines, this session is topical.

Scheduled to take part in the one-hour panel are Edward Czarnecki, senior vice president of SpectraRep, Jerry LeBow, co-chairman of Sage Alerting Systems and Darryl Parker, senior vice president of TFT.

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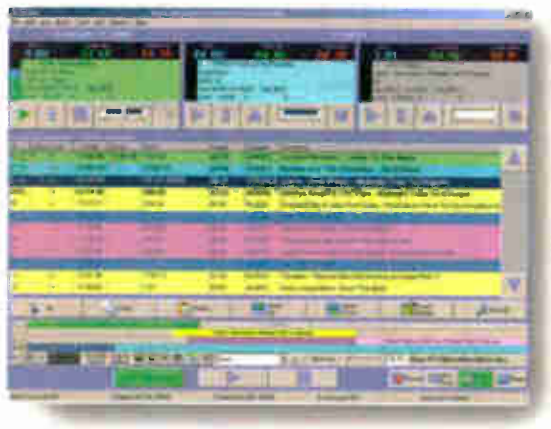

Simian - radio automation and digital playout system.

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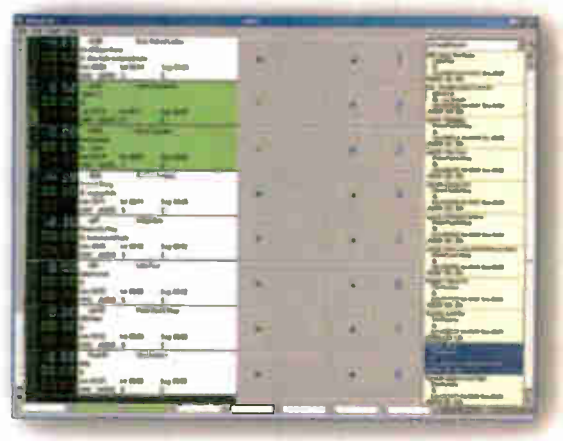
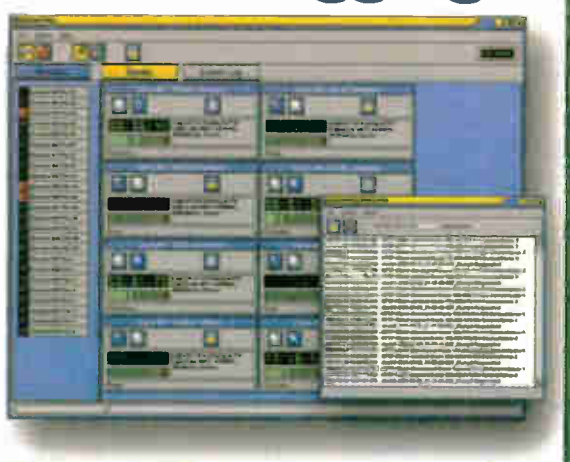
Digital Cart Player



WaveCart - the original on-screen cart machine replacement.

Audio Logging



SkimmerPlus - skimming and audio logging with web playback.

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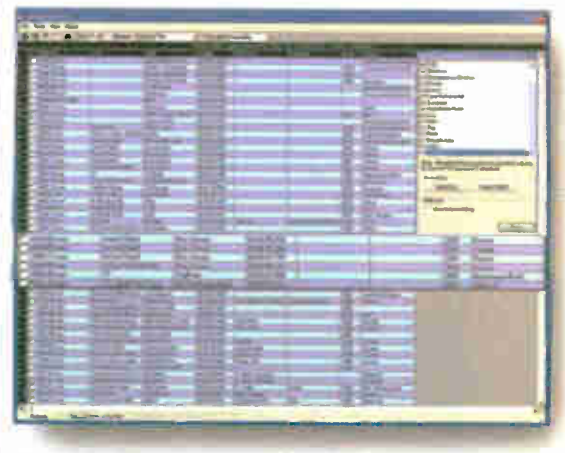

MusicStore - select from over 48,000 ready-to-play songs.

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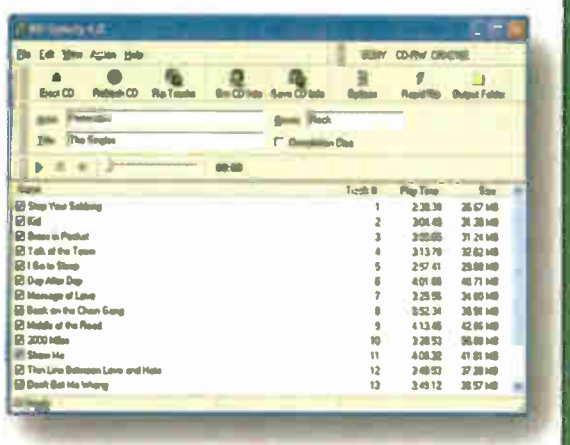

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BSI

Wednesday

▶ Continued from page 34

"This session will be highly beneficial to today's broadcast professionals in that it will provide insight as to new directions this technology is going, how to maintain it, how to correctly measure it, how to avoid disaster and how to save your company money."

Opening the session will be Anne Gabriel, technology editor of Current, the newspaper about public TV and radio, on the subject *"Save That Tower."*

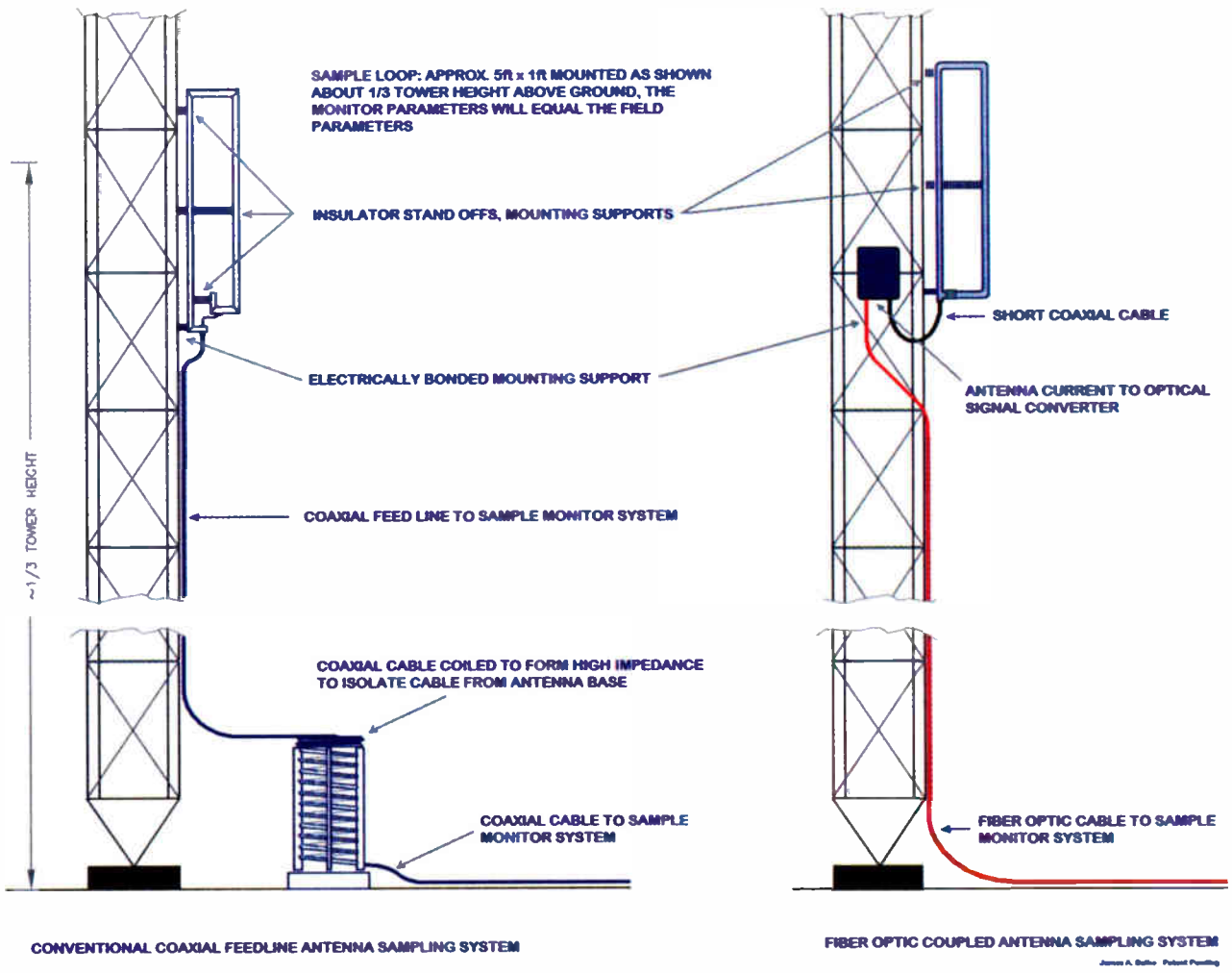
"Write a contingency plan, negotiate written transmission agreements, conduct a complete structural analysis, get a second opinion, ask relevant questions, never skip scheduled maintenance," she said. "This and more will be discussed in this presentation."

The Wednesday afternoon session continues with *"AM Co-location — Money on the Table?"* by Lawrence Behr, CEO of LBA Technology Inc.

"With thousands of towers suitable for co-location of cellular antennas, AM broadcasters are sitting on a goldmine. Now the technology is at hand to extract that gold," said Behr.

Paul Shulins, director of technical operations for Greater Media, presents: *"Radio Transmitter Site Maintenance: Back to Basics."*

"I will be discussing practical basic radio transmitter maintenance techniques for the 21st century, as well as reviewing some commonsense practices." He will also discuss a unique computerized system that he developed for transmitter maintenance logging that allows engineers to statistically analyze transmitter performance and recognize trends using computer analysis tools that Shulins believes will help save time and money by being able to predict difficulties.



Comparison of conventional sample loop and coaxial feedline with the fiber optically coupled antenna sampling system for antenna monitoring. From Jim Dalke's morning presentation 'Fiber Optic Antenna Monitoring for Computer-Modeled AM Directional Arrays.'

"Implications of IBOC Injection Levels Above –20 dB" is next on the afternoon's agenda. This presentation is by Gary Liebisch, regional sales manager for Nautel.

"Stations that have already invested in HD Radio want to know what their options are for a digital power increase, while preserving as much as possible the investments they've already made," he said. "Stations contemplating conversion in the near future want to know how the decisions they make today will impact their ability to take advantage of this increase in the future."

Keeping with the theme, E. Glynn Walden, senior vice president of engineering for CBS Radio, presents *"FM IBOC Building Penetration Tests at Elevated Digital Subcarrier Levels."*

CBS conducted a study of HD Radio penetration in the L.A. market. Ten buildings were identified of various types and construction. Measurements were made inside and out to determine the buildings' attenuation; tests were then conducted to determine the extent of HD reception at the authorized –20 dB digital power level and at an experimental 10 dB digital power level. In addition recordings were made of the analog signal quality at the point of failure for each digital power levels.

"When operating at a digital power of –20 dBc, hybrid IBOC signals are difficult to receive inside most structures except when they are located close to the transmission site," Walden said. "This session will show that by elevating the IBOC carrier levels to –10 dBc that the hybrid IBOC system can provide equivalent indoor reception with better quality than analog while providing additional digital channels and services.

"The power increase will promote the widespread adoption of digital radio."

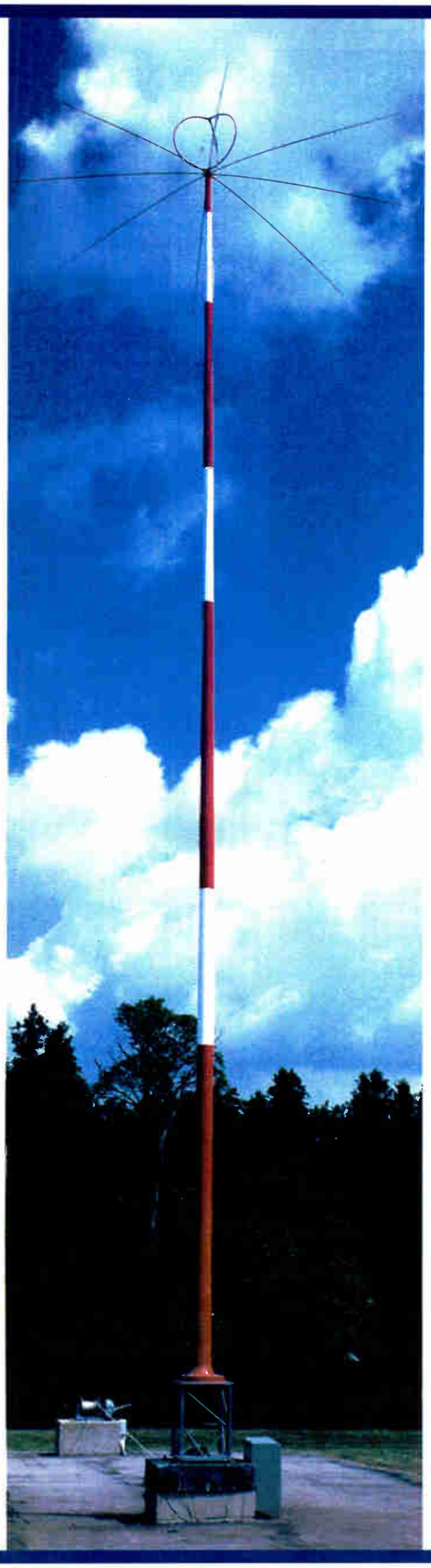
"Linear Effects of AM Narrow-Band Antenna Systems: Characterization by Direct Measurement and Transmitter-Based Equalization" follows, by Ben Dawson, managing partner of consulting engineers Hatfield & Dawson, and Tim Hardy, head of research for Nautel.

"Mitigation of linear bandwidth effects in the AM antenna system through the use of correction in the transmitter, quite a mouthful," said Dawson. "We plan to discuss the limitations of a spectrum-only measurement technique, use of directional couplers to improve the accuracy of spectrum verification, transmitter equalization and bandwidth limitations. If you want to see real-world measurements and how to go about getting them, this is the session for you."

The afternoon agenda concludes with *"Free Software Tools for Design of AM Antennas"* with Van Richards-Smith, chief engineer of Radio TAB Network in Brisbane, Australia.

"Many engineers employed in AM stations never get to design an antenna system. This is usually done by a consultant but they (the station engineers) are expected to maintain the system. I will show you how using certain software tools may help you, the station engineer, to understand the effect of changes to components in the system."

John Lyons is assistant vice president and director of The Durst Organization.



Free Standing AM Broadcasting Antenna

FCC Media Bureau Adopts Simplified Application Procedures for AM Nondirectional Valcom Antennas

By this Public Notice, the Media Bureau ("Bureau") announces simplified procedures for AM station construction permit applications which specify Valcom antennas. Based on its review of the Valcom field tests and internal reports submitted to the Commission for evaluation, the Bureau announces that it will not routinely require the submission of a proof of performance, current distribution measurements, or a formula for the vertical plane radiation characteristic for nondirectional AM facilities which utilize these antennas.

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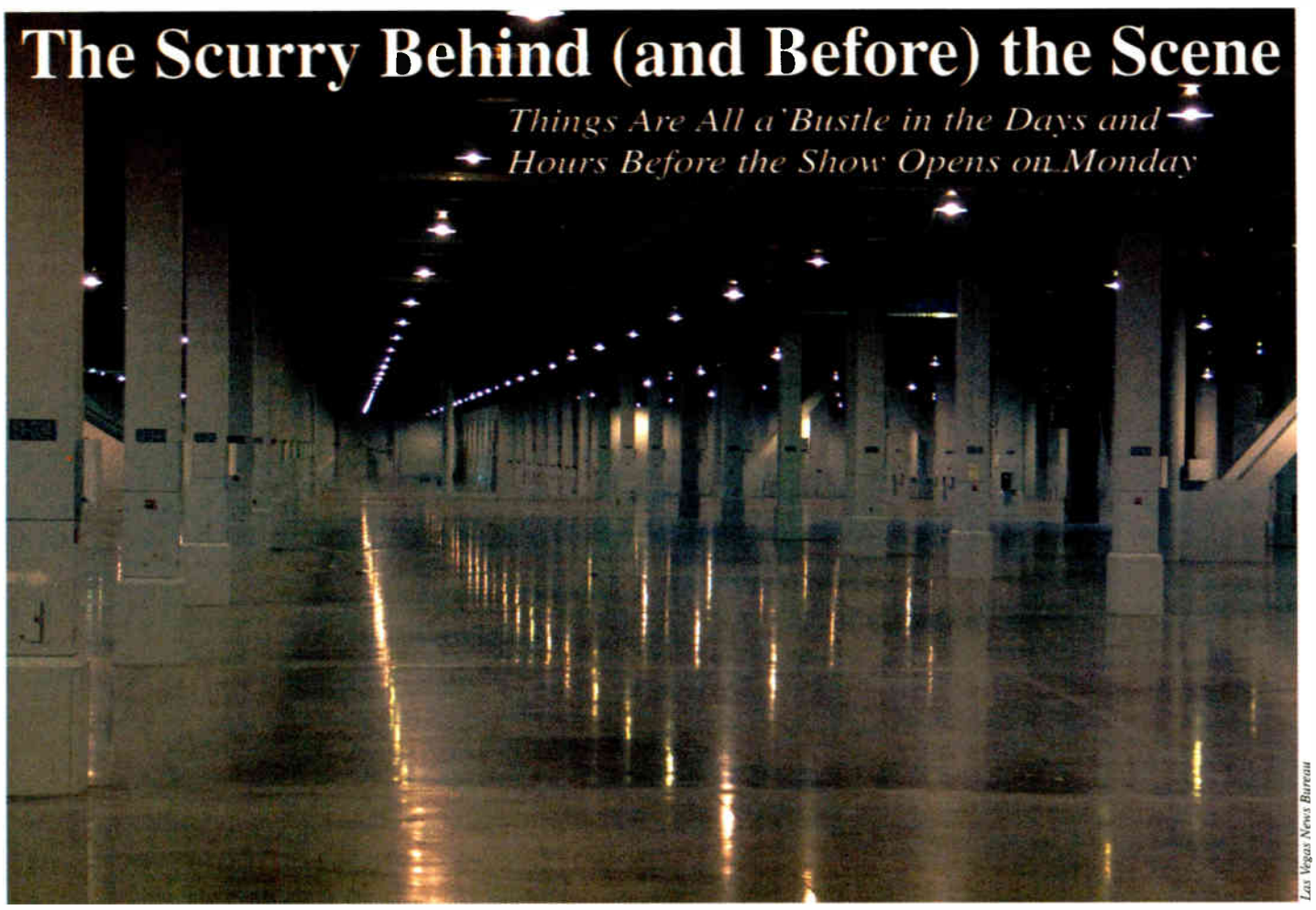
The Scurry Behind (and Before) the Scene

Things Are All a'Bustle in the Days and Hours Before the Show Opens on Monday



Las Vegas News Bureau

The interior of the LVCC, stripped of its show trappings.

by James G. Withers

In any given year, 100,000 people or so pack up their bags and head to Las Vegas for the annual NAB Show.

If you are one of those, you probably get on the airplane excited to network with friends, see the latest gear and hear the latest advice from industry experts. Then, four or five long days later, your friendly flight attendant pours you off the return flight so you can trudge home to catch up on some sleep.

Such is the convention experience for the attendees, but what about for the exhibitors?

I've been on that end of the deal a few times myself, and can tell you, it's not all three martini lunches and reserved seats at Cirque du Soliel.

Booth points

To begin with, if you're merely attending the convention, preparation is pretty simple. You plan your "dance card," make up a "to-do" list in the PDA, book flights, hotels rooms and register for convention credentials online.

Finally, you might sneak off to the ATM, pull out $100 and pledge — absolutely *pledge* — to lose no more than that shooting craps.

The exhibitors, on the other hand, have a whole different level of prep to do. In fact, the process starts during the previous year's show.

During this year's show, each exhibitor, in turn, has to make the first decision regarding booth space for next year. How big and where to locate are the two major issues.

Seniority is all-important, and the Harrisses of the world (who have been exhibiting almost as long as there has been an NAB) get first strike at space and location.

Once the booth space has been locked in, companies assess product lines, scope out the competition and loosely put together the marketing plan for the next show.

This part of show planning is a big deal. A major supplier will spend in the low six figures just for booth space. Add in the logistics of moving maybe a million dollars worth of equipment across country, staffing a 15,000 square foot booth for four days, lodging and food for all those folks, and the budget for the NAB Show can make even the most calm CEO blink. (A couple of large companies

See FLOOR, page 39 ▶

More BEC

The stories in this issue focus on topics of interest to radio within the 62nd annual Broadcast Engineering Conference. For a full agenda see *www.nabshow.com/2008/conferences/bec.asp*. Next issue RW will feature management sessions.

Registration for the BEC provides access to sessions in the Radio Management, Television Management and Broadcast Regulatory & Legislative Conferences as well.

Here are selected other events of interest in the BEC:

SATURDAY

✓ IEEE Broadcast Technology Society Tutorial: "Proposed ATSC Mobile/Handheld Systems"
1 – 5 p.m.

SUNDAY

✓ BEC Breakfast
8 – 9 a.m.

✓ BEC Opening Session
9 – 9:30 a.m.
"We Can Work Together: Advice to DTV and HD Radio Engineers From the Consumer Electronics Retail Community," with Diane Warren of the HD Digital Radio Alliance and Marc Pearl of Consumer Electronics Retailers Coalition

✓ BEC Reception
5:30 – 7:00 p.m.

TUESDAY

✓ BEC Breakfast
8 – 9 a.m.

WEDNESDAY

✓ Technology Luncheon
Noon – 1:45 p.m.
"Funny, You Don't Look Like Your Avatar: New Media Conquers Old Problems," with radio/TV science journalist Ira Flatow and presentation of Radio Engineering Achievement Award to ERI's Tom Silliman.

✓ Amateur Radio Operator's Reception
6 – 8 p.m.
Shop talk, a party atmosphere and door prizes galore.

The ham reception is an annual BEC hit.

Floor

▶ Continued from page 38

did just that this year. They made the radical decision to pull out. Only time will tell if that was a good choice.)

In any event, once the decision to exhibit has been made, and the booth deposit sent in, one fine fall day a three-ring binder that is about the size of the federal budget shows up from the NAB.

In it is everything the well-appointed exhibitor needs to know to finish off preparations for exhibiting. There is an amazing amount of detail work that has to be addressed, even for a small booth of 100 to 400 square feet, let alone the small condo complexes that some of the big guys erect inside the Las Vegas Convention Center.

Power drops; overhead signs; special needs; carpeting; furniture, chairs; tables; even wastepaper baskets and shredders: there is a check box for everything. An oversight at this point will make the booth setup folks very angry in April.

Beep-beep-beep

Regardless of booth size, the Las Vegas Convention Center has very strict rules (union and otherwise) regarding shipping procedures and equipment arrival times, so companies routinely have staff on hand a few days, maybe even a week to 10 days, prior to the convention.

The LVCC is enormous, and no more so than when it is essentially empty. Vegas more or less invented the process of moving stuff and people in and out of a major convention facility, and it is a lesson in logistics to watch it all happen.

As booth materiel arrives, beginning about a week prior to the show, the LVCC starts looking like a customs warehouse. Pallets, crates, carpet rolls stacked like cordwood, all intersected by wide, yellow striped aisles with periodic signs warning of "Caution! Forklifts Operating!"

Hundreds of people mill about. Fast food bags, shrink wrap, thousands of boxes; everything is strewn all around, and everyone looks vaguely confused. It is organized chaos on a grand scale.

At first, very little progress gets made. Crews erect the giant overhead signs by which most of us navigate the floor, using massive "cherrypickers" that barely fit between the booths ("Ahh ... the XYZ sign. That means I'm in Aisle 6800 headed away from the Hilton"). Walls go up, furniture is stacked and the power is turned on.

Slowly, racks are assembled and the occasional audio board lights up, with a crew's favorite rock song blasting out to check the monitor performance.

As the setup progresses, small stuff is invariably missing and begging and borrowing is allowed ("Do any of you guys have an XLR gender changer?"), but good form demands a personal recompense. I have found Krispy Kremes effective at getting almost any engineer to grub around in the catch-all duffel bag, and every setup guy knows the location of every Home Depot and RadioShack in Vegas.

Eye contact

Anywhere from two days to a week prior to the opening bell, the sales guys show up.

In the big booths, protracted meetings are held while LVCC workmen and company engineers continue to scurry around setting everything up. Slowly, the pallets, boxes and all the extra stuff gets shrink-wrapped and carted back out to the staging area. The booths start to look like booths rather than recycling centers.

On the last day (and continuing well into the night), the professional models show up and begin rehearsing their pitches and their eye contact. (This usually slows things down a bit, as most of the engineers are male and most of the models are female). Carpet is rolled out in the aisles and you know things are getting close. The final touches are put on the booth. Literature racks are stocked, baby spots are strategically aimed at the latest greatest gadgets, and the final engineer scoots out from underneath the last piece of stubborn equipment.

I have been in the Radio Hall at 6 p.m. the night before opening day, though, and have been amazed at the amount of work that still being done. Somehow, at 9 a.m. on Monday, it all comes together.

It's the annual NAB Show. Book your flight; hit the ATM. See you in Vegas!

Power drops; overhead signs; special needs; carpeting; furniture, chairs; tables; even wastepaper baskets and shredders: there is a check box for everything.

Jim Withers owns and operates KSIX(AM) in Corpus Christi, Texas. He has contributed numerous articles to Radio World. Reach him at (314) 345-1030 or by e-mail to jim@espn1230ksix.com.

Exhibit Hours

Monday April 14	9 a.m.–6 p.m.
Tuesday April 15	9 a.m.–6 p.m.
Wednesday April 16	9 a.m.–6 p.m.
Thursday April 17	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 at the 2008 NAB Show. Highlights are paid for by exhibitors; information is from the companies. Check on-site program for changes, late registrants and a full list of exhibitors.

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, MR is Meeting Room, L is Lobby. Booths preceded by R are RTNDA booths at the Las Vegas Hilton.

25-Seven Systems **N7936**
On Display: Audio Time Manager, standard analog/digital version and new Axia LiveWire IP/Audio version. This unique time compressor-time shifter continues to pick up converts among program directors and operations managers. Audio Time Manager has been described as "an audio TiVo on steroids." It allows stations to pause a network feed, insert content, then return where the program left off, and seamlessly catch up to real time. Time compression rates can be adjusted on the fly, or the unit can be used to time-shift programs by up to an hour. Advanced algorithms leave speech and music sounding natural. The front offers simple, two-button operation. Remote control is available through an 8x8 GPIO, RS-232 or over a LAN or WAN utilizing a built-in Web server.

Abaltat **SL9610**
New: Abaltat Muse, the first video-driven soundtrack composer, is available for the Windows platform. Intended for use by video editors, this professional software application creates original, royalty-free, broadcast-quality soundtracks in minutes.

AccuWeather **C6428**

Acoustical Solutions Inc. **SL2417**
New: Expansion of the AlphaSorb Acoustical Wall Panel line with the addition of level II fabric selection. Nine fabric choices are added to the existing list of 300+ available colors and fabrics. AlphaSorb Acoustical Wall Panels reduce unwanted noise and sound reverberation in a variety of applications. Available in many sizes, shapes and thicknesses.

AEQ **N5429**
New: Phoenix IP audio codecs have two slots for optional communication modules per unit. POTS will be the first available module. ISDN, X.21, V.35 and GSM are planned. Phoenix Mobile includes a digital mixer with four analog inputs, internal Li-Ion battery and 12V DC power supply/charger. Phoenix Studio is a 1 RU rackmountable unit with stereo analog inputs, digital I/O and a universal power supply (90–250 VAC). In addition to the main program and return, the Phoenix can provide a backup (or coordination) channel utilizing optional communication modules. Also on display: Bravo is an analog audio mixer for radio at a price suitable for small- and medium-sized stations. The Bravo has two program busses, four mic/line channels, eight stereo line inputs, dual telephone channels with integrated telephone hybrids, cue bus with integrated loudspeakers and headphone outputs and an amplified monitor output. Arena is a digital mixing console designed for on-air but adaptable to other situations. Normal Mode and Bus Send Mode. Also: Live 20 is an FCC-approved portable bidirectional broadcast wireless microphone system with high power, extended ranges and enhanced flexibility. The system allows a reporter to send audio to the control booth or studio while simultaneously receiving cue and talkback information. MAR4Suite Pro is a third-generation automation system based on AEQ's MAR4Win platform. New architecture has been built around the Microsoft SQL Server database engine, and incorporates complementary functions to maximize broadcast and data security. New features include multitrack editing module and Mix-Editor, a module that lets users graphically mix sound on the playlist itself

Aeta Audio Systems **N4624**
New: Scoop 4+, the first professional codec with SIP implementation. SIP has been selected by the EBU as the standard for IP audio codecs. Scoop 4+ can work over leased lines, IP and optional ISDN. AES/EBU format in standard. AAC ready. Mixy is three-channel stereo mixer with analog, M-S, digital I/O; measuring a 171 x 49 x 131 millimeters and weighing 2.7 pounds. An internal rechargeable battery provides 10 hours of power. Features include high-pass filters (50 Hz/120 Hz/300 Hz). Master mode in 96 kHz/24 bits available.

AEV S.P.A. **C12219**

AKG Acoustics **N8229**

Aldena Telecomunicazioni **C4521**
New: AQP0402420 is an antenna panel with four dipoles, mixed polarization with reflecting grid and a directional radiation pattern. The dipoles and grid are hot-dipped galvanized steel. Suitable for FM medium- and high-power stacked-array systems or 90-degree coupling. EMLAB software enables design of transmission systems, made up of an indefinite number of elementary antennas, to assess overall radiation and the environmental impact for health purposes and to preview coverage on terrain.

Altronic Research **N5523**
On Display: Convection-cooled resistor loads for outdoor applications.

American Tower Corp. **N7238**

Anritsu Co. **N7320**
On Display: Broadcast measurements in a lightweight package. Serving telecommunications, optical and wireless industries with instruments for R&D, manufacturing, field test, installation and maintenance that address AM and FM broadcast proofing, 2.5G/3G wireless, 802.11 WLAN, 10 Gb Ethernet/IP, SONET/SDH/OTN, and a spectrum of RF/microwave solutions.

ANT Group Srl **C3335**
New: ANT131 is a small but high-precision RF power probe with RS-485 or 0 V – 5 V output, measured in watts or dBm. Readout is possible on a local display. Programmable locally or through RS-485. ANT137 is a serial to simple network management protocol (SNMP) proxy + Web server that can connect any type equipment with contact closures, RS-232 or RS-485 to an SNMP network management system (NMS). NetPOD NMS control center software is scalable and can manage any type equipment connected to the remote data front ends (RDFs) or directly to SNMP equipment data from the field.

Aphex Systems **N5617**
On Display: The Anaconda digital snake system consisting of the 1788A Remote Controlled Preamplifier and 1788AR-C Remote Controller, 828 Anaconda 64 channel bi-directional snake, 824 Anaconda Distribution Hub, 141 D/A converter, 142 A/D converter and 144 bi-directional ADAT/AES converter. The advantages are open architecture (any manufacturer's products can be used with the system), low latency (42 microseconds plus the speed of light), complete isolation from EMI and ground differentials, distance up to 10 miles, audiophile performance and low cost.

APT **N8811**
New: WorldCast Horizon HD is an audio codec for HD Radio applications in small- to medium-sized markets. It is a stereo codec offering T1 and IP ports to deliver both FM and HD1 content from studio to transmitter site. Broadcasters can use existing T1 links for the FM analog transport while sending their HD1 content as a UDP stream. As a fully duplex device, it allows off-air monitoring or an independent channel to backhaul RPU feeds. An RS-232 port is available for PAD and contact closures for remote control. Also, APT will show a linear STL system. The WorldNet Oslo increasingly is becoming the STL system of choice for synchronous and IP circuits among major U.S. broadcast networks. NAB sees the launch of the linear audio module offering uncompressed audio quality over IP and T1 links. The Linear/PCM audio option is in addition to the existing MPEG L2 option and the pro-grade, low-delay Enhanced apt-X coding utilized in hundreds of STLs and studio links. The modular platform is available as a custom solution or in pre-configured system packages for IP STL, T1 STL or HD Radio applications. Anywhere from two stereo to 14 stereo pairs can be multiplexed through a single chassis using analog and AES/EBU audio modules. When operating over IP networks, unicast, multicast and multiple unicast configurations can also be achieved using the WorldNet Oslo and APT's range of IP stereo codecs. In T1 operation, backup transport modules can provide cross-connect functionality (also between IP and T1) and advanced network features such as drop and insert, drop and copy, and backup schemes, in addition to simple unprotected point-to-point links. New CMS Software enables monitoring and control over audio and network variables such as Quality of Service, jitter buffers, packet size and latency over IP networks and simplifies complex timeslot

SURE BETS

Eh, Paesano. Go Italian!

Food Channel fans know Mario Batali, star of the "Molto Mario" show and the Iron Chef-Italian on "Iron Chef America."

Batali, shown, has opened two restaurants in Las Vegas, Carnevino and B&B Ristorante, at the new Palazzo Resort.

With Carnevino, Batali and business partner Joe Bastianich present their interpretation of a classic Italian steak house set in a royal villa. The menu includes a special brand of organic prime beef; it also features Batali hand-made pastas, antipasti and side dishes.

Batali's B&B Ristorante has the pastas but offers a more casual atmosphere in a setting that the company says "captures the soul of an Italian grandmother dancing the tango with pop rock hipsters." The establishment features more than 3,000 wines.

Batali apprenticed with London's Marco Pierre White and spent three years of culinary training in the Northern Italian village of Borgo Capanne.

Another New York-style Italian restaurant of note is Il Mulino in the Forum Shops at Caesars, which features the cuisine of the Abruzzi region. Dinner in the swanky Old World dining room starts with complimentary appetizers including Italian salami, imported Parmesan cheese and bruschetta. The restaurant serves renditions of scampi oreganata, bresaola con arugula, pork chop pizzaiola and veal saltimbocca.

If you are on a tight budget, there is the old standby, Battista's Hole in the Wall on Audrie Street. A supposed favorite of one Francis Albert Sinatra, the 30-year-old restaurant serves casual Italian food in dining rooms filled with celebrity pix. The one-price, '50s-inspired meals of pasta, seafood or veal include soup, salad, spumoni, a sweet cappuccino and unlimited red and white house wine.

The restaurant is a little worse for wear, but that's part of the charm — all this and a strolling accordionist.

Carnevino, (702) 789-4141, www.carnevino.com;
B&B Ristorante, (702) 266-9977, www.venetian.com/BBREST.aspx;
Il Mulino, (702) 492-6000, www.ilmulinonewyork.com;
Battista's Hole in the Wall, (702) 732-1424, www.battistaslasvegas.com.

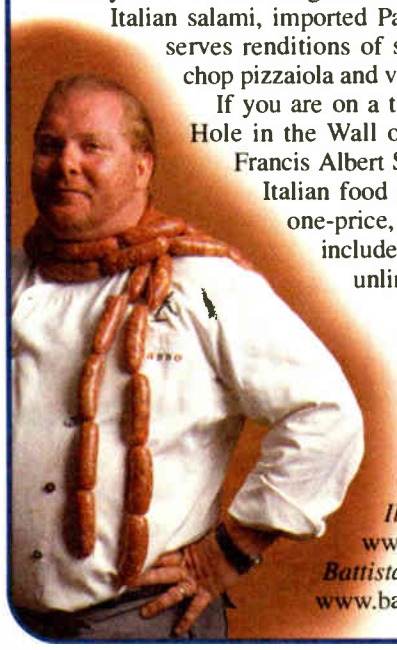


Photo by Melanie Dunea

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allocation and configurations over T1. Also: APT IP codecs now are N/ACIP compliant with support for both SIP and SDP protocols.
Established Products: WorldCast Codecs for IP, leased line and ISDN networks, WorldNet Oslo IP & T1 STL System

Armstrong Transmitter **N8814**
New: FM650B, 650 watt and FM1300B, 1300 watt Solid-State FM Amplifiers. These are "turbo-charged" versions of the FM500B and FM1000B. We're using powerful FETs in these amplifiers. The new configuration allows us to provide amps with more headroom; and the FM1300B is being used as the building block for our new 4000C, 5200C and 6000C Solid-State FM Transmitters. As with all Armstrong products these are covered by a one-year part and labor warranty and free loaner program.

Arrakis Systems **N6129**
New: Arrakis is displaying four major new product series: consoles, automation, furniture and networking. The ARC series of advanced radio consoles are 10 and 15 channels with built-in PC interfaces for play and record. Two new Xtreme automation products for small markets and Internet are being introduced. A new line of studio furniture called Accent features a contemporary blend of brushed metals, pleasing colors and interesting textures. MARC-NET is an introduction to Arrakis Ethernet audio distribution for radio facilities.

ARRL **Lobby 1**
On Display: ARRL is the national organization for amateur radio. We acquaint attendees about the community service that amateur radio provides and greet "hams" who attend the convention. Amateur radio has been in the forefront of developing wireless communication since the beginning. These frequency bands are the last place in the usable radio spectrum where you as an individual can still develop and experiment with wireless communications. We are the learning ground for hundreds of electronics engineers and NAB members in the real-world, practical skills that launched their careers. Also, "hams" provide emergency communications to government and recovery agencies and show up in news story after news story about disasters. Volunteer amateur radio operators will staff the booth.

Associated Press/ENPS **C161**

ATI **N5229, N5129**
New: ATI Digital Audio products. Featured will be the ADAC-2, a 192 kHz A/D, D/A and Sample Rate Converter, a line of 192 kHz Digital Distribution Amplifiers, a Master Clock Reference and Sync Distribution Amplifier, and an AES3 Digital Audio Monitor and D/A Converter. ATI and sister company DaySequerra will have separate booths as ATI reemerges with new products. The companies will be back-to-back in the Radio Hall.
Established Products: Distribution amps, MatchMaker format converters, preamps and small mixers.

Audemat **N7932**
New: Digiplexer 246 with audio backup and FM transmitter option is a 3 RU unit that includes a digital audio processor (two-/four-/six-band), RDS and stereo generators, transmitter remote control capabilities, new backup audio-over-IP capabilities and a built-in FM exciter (1 W to 100 W). Audio processing (4-band version): 2.8 gigaflops of processing power with a sampling frequency for processing of 192 kHz. Sampling frequency for the final clipper is 1.5 MHz. Basic RDS functions are standard: artist name, song title, PS scrolling. Optional advanced RDS: TMC, ODA, Scheduler, etc. Also included is a digital stereo generator, extremely accurate and stable and capable of expanding audio bandwidth to 17 kHz without affecting pilot; three levels of audio backup (all versions); user-defined timing and crossfades; silence detection: If digital audio fails switch to analog input; if digital and analog fail switch to web stream and if all fail play audio stored on internal hard drive; remote control and optional 16 digital inputs and eight relay control outputs. Delivered with new version of SCRIPTEASY V2 graphic control software. API available for transmitter remote control over serial connection. Includes Ecreso 20 W or 100 W exciter with low distortion (< 0.05%), best FM S/N ratio (> 80 dB), very good channel separation (up to 50 dB within the whole band), PLL controlled by microprocessor, adjustable power from 2 W to 20 W or 10 W to 100 W (depending on version). RELIO and Scripteasy V2 — Packaged in a rugged 1 RU, 19-inch rackmount enclosure, the unit provides 64 digital inputs, 64 digital outputs and 24 analog inputs, four serial ports (RS-232, RS-422 and RS-485), two Ethernet ports, four USB ports and a phone line connector. It is now delivered with new SCRIPTEASY V2 software that includes the new MASTERVIEW viewer. MASTERVIEW is a graphic user interface that allows fast and flexible creation of multiple "views" where users can see information from and control remote equipment over a network connection. Also new at NAB 2008, the voice DTMF interface with an included library of more than 700 words and the capability to upload user created voice files. Goldeneagle HD software/firmware version 1.5 offers enhanced AM capabilities and 1 kHz effective resolution bandwidth for the spectrum analyzer.
Established Products: FMB80 RDS encoder, IP2Choice, FM-MC4, Navigator 100.
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(305) 249-3110
E-mail: lion@audemat.com
Web Site: www.audemat.com

Audio Precision **N6125**
New: Version 2.0 of the High Speed Tester (HST) application for the 2700 Series and ATS-2 audio analyzers is available. Reduces audio test time for broadcast to 1.5 seconds. Ideal for rapid audio test; allows for complete characterization of amplifiers, digital audio converters, MP3/CD/DVD players and broadcast transmission systems.

AudioScience **N5230**
New: The ASI8914 is the first HD Radio-capable tuner card from AudioScience. It provides four channels of AM/FM HD Radio and analog reception on a full-size PCI adapter. Monitoring of HD Radio PAD data as well as analog FM RDS/RDBS is supported. Also: The ASI8920 multi-channel tuner card takes ASI8700 series cards and puts them in a half-size PCI card. Power dissipation is reduced tremendously by the use of silicon radio tuners, which replace the can tuners on the ASI8700 series. The FM tuners now receive and decode RDS/RDBS data in real-time. The -2200 version contains eight AM/FM/RDS/RDBS tuners, while the -2000 contains four. Also: The new 64-bit Windows Vista WDM audio driver provides 64- and 32-bit application support for all current AudioScience sound cards. Also supplied with the driver install are both 64- and 32-bit versions of ASIControl, an application used to set up and control the sound cards.

Audio-Technica U.S. Inc. **N4529**
New: AT2020 USB Cardioid Condenser Microphone plugs into your computer's USB port, offers studio-quality articulation and intelligibility, and functions with your favorite recording software. Equipped with a USB digital output, the AT2020 USB is suitable for podcasting, home recording, voiceover use. It is based on the design of Audio-Technica's AT2020 cardioid condenser mic and features a low-mass diaphragm, extended frequency response and superior transient response. The AT2020 USB is also compatible with Windows and Mac. Also: Audio-Technica's new AT8004 and AT8004L omnidirectional dynamic microphones are ideal for on-location interviews, sports broadcasting and as the "mono" mic when used in conjunction with a stereo microphone. With rugged housings and hardened-steel grilles, these mics stand up to field use while their omnidirectional polar patterns provide natural reproduction of surrounding ambience. Their internal shock mounting minimizes handling and cable noise. The AT8004L mic features an extended-length handle that will easily accommodate most microphone flags. Also, offering a natural, smooth frequency response optimized for vocal articulation, Audio-Technica's PRO 92cW omnidirectional condenser headworn microphone is ideal for lecturers and other applications requiring clear, articulate projection. The mic features a small condenser capsule; a lightweight, contoured earpiece; a flexible boom design that is easily repositioned for a comfortable fit on either the right or left side; and a rugged construction designed to stand up to the challenges of day-to-day use. Terminated to fit Audio-Technica UniPak wireless systems, the PRO 92cW is available in black or beige. Includes storage pouch and clothing clip.
Established Products: Stereo microphones, 40 Series studio production microphones, 30 Series studio production microphones, 20 Series studio production microphones, AT2020 USB cardioid condenser USB microphone, ATH-M50 professional studio monitor headphones
Mr. Dan Montecalvo, Marketing Manager
1221 Commerce Drive
Stow, OH 44224
(330) 686-2600
E-mail: mediaproduction@atus.com
Web: www.audio-technica.com

AVT GmbH **C9619B**
New: Magic POTS & ISDN Telephone Hybrid System for up to 16 callers can not only be connected to ISDN but also to analog telephone lines. The modular system can be expanded from four callers to up to 16 caller lines. In the maximum configuration, the system provides eight digital or 12 analog audio channels. For each caller line a digital echo canceller, an expander for noise reduction and an AGC are implemented. The system can be networked and operated via LAN and a user-friendly screening software makes the system into a powerful phone system. All software modules are optimized for Touch Screen operations. Also: Magic TH2 POTS Telephone Hybrid; Magic AC1 XIP Audio Codec; Magic E1 Audio System consisting of a Magic E1 MUX Multiplexer and up to 10 Magic AC1 XIP RM Audio Codecs or AD1 XIP RM Audio Decoders; Magic AE1 DAB+ Audio Encoder.

Axel Technology **N6629**
New: Wolf is an FM station monitor and decoder. It gives broadcasters the capability to monitor individual stations and the whole transmitter network at one time. Wolf also performs the largest and most precise range of measurements and helps keep transmission always running. Also: Shark is a comprehensive RDS/RBDS coder UECP-compliant and integrated with a state-of-the-art stereo coder with audio limiter. It has been specially designed for FM networks. The Sat Time Synchronizer is an ideal tool for any application (e.g. on-air automation systems, wall clocks) requiring a full synchronization of a PC clock to a GPS reference clock. Now available in USB version, the Sat Time Synchronizer keeps time up-to-date in a smooth way. On Air Clock software helps to transform inexpensive wall-clocks into TV and radio studio clocks by configuring them to show time, date, timer, remote control. DJ-PRO offers a range of software solutions for automation and scheduling of radio broadcasting: traffic, billing, music, songs, jingles, sound bases, programs, voice announcements,

news bulletins, advertising, commercials, etc. Now available with a completely new graphic interface, the DJ-PRO range of products includes tools for commercial management, verification and logging, administrative/accounting process.
Established Products: Oxygen 3, 4, 5, 7 mixing consoles; Falcon 15, 35, 50 audio processors; Macrotel telephone hybrid range; Mr. Light on-air lamp; Forget and DML audio loggers.

Axia Audio **N7620**
New: Latest additions to the line of IP-Audio gear. The popular Element broadcast console will be shown with modules available in three color offerings: bronze on charcoal, silver on charcoal and original gray on silver; Element is the only radio console in the industry available in a choice of colors. Axia will also show the latest additions to the line of in-studio accessories: the Element Touchscreen Timer Panel, which gives studio guests, producers and show hosts access to a full-featured timekeeping suite of clocks, lap timers and event timers; and new nine- and 17-button SmartSwitch Studio Control Panels with dynamic-text LCD buttons that provide one-touch activation of router salvos, studio switching operations, audio equipment control, custom intercom functions and more.

Azden Corp. **N4924**

AzEP Arizona Engineered **C7037**

Barix AG **N8036**
New: Exstreamer 110 IP audio decoder includes HE-AAC v2 compression. The inexpensive Exstreamer-110 is ideal for radio broadcasters who require point-to-multipoint distribution and wish to take advantage of the reduced bandwidth or higher audio quality afforded by HE-AAC v2. Compared to other distribution methods and decoding products, broadcasters can significantly reduce costs distributing program audio over the Internet to Exstreamer-110 decoders at multiple destination points (such as studios, transmitter sites) by taking advantage of the lower bandwidth consumption of HE-AAC v2. Alternatively, broadcasters who had previously used MP3 transport can significantly improve audio quality using HE-AAC v2 coding at the same bit rate. The Exstreamer 110 also adds a 2 x 16 backlit LCD display for station/artist/song title info, and a built-in relay to trigger EAS alerts, station ID or other audio information.
Established Products: Annuncicom 1000 for STL, two-way voice over IP communication; Instreamer 100 and Exstreamer 100 for STL, RPU, Internet transport; Annuncicom 100 for intercom.

Beat the Traffic **R326**
New: BeatTheTraffic.com 3.0 is our latest online offering. It includes new, interactive, draggable AJAX maps showing traffic flow and incidents with detailed, mouse-over information. A user-friendly Blackberry/PDA/Mobile Web site is available for cobranding opportunities, featuring camera images in selected markets. BeatTheTraffic.com provides unique features, such as streaming, animation of the on-air 3D graphics, point-to-point travel times for key routes and real-time speeds, providing a valuable, decision-making tool for commuters and traveling professionals. One-screen access to information provides simplicity and fast access for users.

Belar Electronics Lab **N7629**

Belden **C8828**

Bext **N5620**
On Display: RF equipment for radio and television broadcasting. FM transmitters, exciters, translators and boosters, amplifiers, receivers; STL; FM antennas; RF filters and combiners; FMeXtra digital radio; and digital/analog TV transmitters.

beyerdynamic **N7917**

Bid4Spots.com **N8038**

Bird Technologies **N6138**

Bose Corp. **C3448**

Broadcast Bionics **N9024**
Established Products: PhoneBOX Solo.

Broadcast Electronics **N7007**
New: A new digital automation platform that enables broadcasters to do more with less. BE's new platform is based on the latest open automation model for repurposing content for new channels on the air and on the Web, and includes new capabilities such as double-donut segue editor, personalized studio "mashups," interactive talent collaboration and sophisticated asset management. Also, new and expanded functions for The Radio Experience, the company's text automation and messagecasting system. Opportunistic insertion of text ads for high-impact exposure plus online text plug-ins from weather, sports and other information providers are among the list of new functions expanding radio text beyond "now playing" song and title information. Also on display: transmitters for FM and medium-wave broadcasts, as well as new applications for messagecasting.

Broadcast Software International **N9111**
New: Op-X radio automation has been years in development and it is time for the public to get its first look at this multi-tiered radio automation software designed for heavy network and market cluster stations.
Established Products: Stable and cost-efficient options for the automation market. BSI Simian, SkimmerPlus, WaveCart and other supporting software.

Broadcast Tools **N8120**
On Display: Affordable and innovative problem-solving tools for the radio and television broadcast industries.

Broadcasters General Store **N8120**

Burk Technology **N6920**
New: For the ARC Plus, new software and firmware provide expanded data analysis tools, and mobile Web connectivity to the ARC Plus now allows access from Web-enabled cell phones and PDAs. Also, the Plus-X AC-8 provides management of eight independent 120V outlets, allowing remote rebooting of servers, PCs and more. The hardware connects directly to the Burk ARC Plus remote control via Ethernet, or to any remote control using general purpose inputs. A built-in Web server allows stand-alone connectivity. Also, the PlusConnect HZ and the PlusConnect HDX bring hundreds of parameters from the Harris Z and the Harris DX transmitters to the Burk ARC Plus remote control, with remote management via Web, software, dial-up and front panel. A single serial connection reduces installation time and allows detailed monitoring of parameters not available via external parallel wiring. And for the GSC3000 and VRC2500 systems, a free firmware upgrade adds selective alarm dial-out. Directing alarm calls to the most appropriate personnel allows better fault response coordination.

attached a picture in white contact me for more info. big_plans #221542

STEADY SEEKING LADY

I am looking for a male partner (38-50)who is willing to be exclusive with me for a long term relationship. Not asking for marriage. I am of average build, dark hair, brown eyes and am an Indian female. I have a wonderful job and attend some classes a couple of nights a week. I have two kids who stay at home with me. They are very precious to me. And they are not going to be a hindrance to our dating. I have a full and busy life. Therefore, the expectation is to see each other on a steady basis, and at the same time, being flexible. precious_me #331252

I LOVE MUSIC. YOU LOVE ME

I'm an indie/hipster girl who adores music and going to clubs and shows. Some of the bands that I'm into are Interpol, The Arcade Fire, Blonde Redhead, Bauhaus, The Smiths, Morrissey, etc. I'm into indie rock, electronica, punk, pretty much anything. I drink and smoke occasionally. I'm 21, 5'8", light-skin, dark brown hair/eyes. I work, am well-educated, funny, spontaneous, nice. #2215234

299685

HANDSOME RAKE

Out of work leaf raker/bagger seeks whimsical beauty with un-kempt auburn or chestnut hair, cool coarse hands and a penchant for whistling. mellow_mo, 28, #101318

LET'S CONNECT

Radio engineer seeks stable long distance relationship. Need to connect immediately. Everywhere I go, I see broadband internet, but I just never hook-up. I need to meet that special someone that will plug me in so I can be heard. Must be reliable, connect easily, forgive errors and adapt to change. Should come from a good family. easy_going #101352

SIMPLICITY HERE

Simply put, I'm looking for a fun, casual relationship with only one person. That means one person for me and one person for you. :-) Every woman wants to feel safe with a partner, whether it's serious or not. It's key to her feeling comfortable to express her more intimate nature. I don't ask for much other than to hang out, enjoy your time with me and be available to chill.

MR. RIGHT

I'm actually posting this on behalf of a friend. Since she's been single she hasn't found the right guy and I'm doing this in hopes of helping her find Mr.Right. After you and I talk, if you are chosen then you will get to go on a date with her and who knows, it could be the perfect date and start of a new

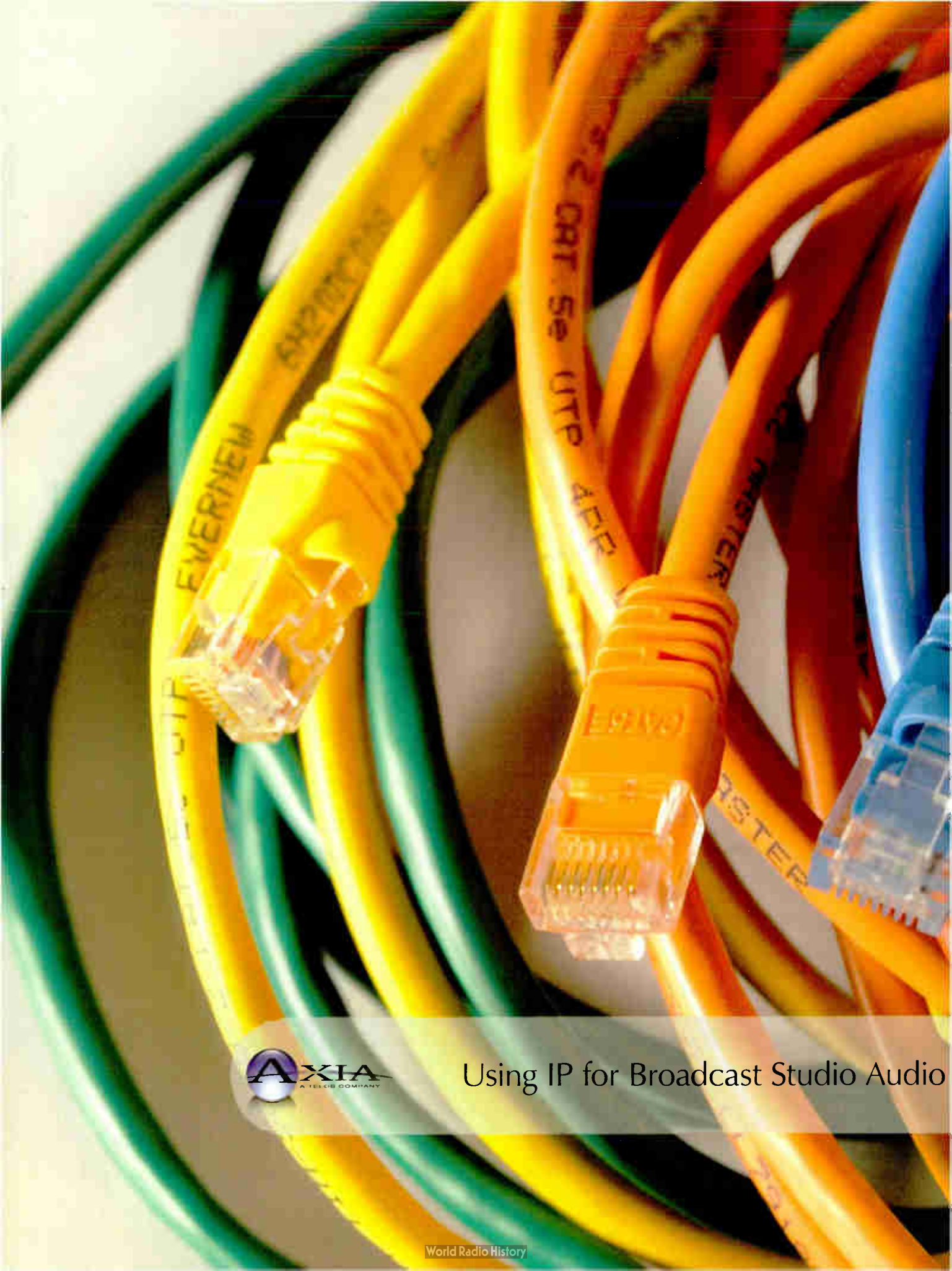
for women 5'4

IN LOVE

Visiting LA thi
to meet a Cla
must be easy
Please send
response :)

CALL ME

Hah are you



www.AxiaAudio.com

Using IP for Broadcast Studio Audio

Skip Pizzi

Introduction

This paper considers the replacement of traditional forms of audio signal transport in the broadcast studio with networked audio carried via Internet Protocol (IP). It examines the value and process of such conversion, the challenges to doing so, and the likely future of this environment.

This study was commissioned by Axia Audio in early 2008.

Executive Summary

A revolution is currently taking place in the field of audio studio design. It involves a fundamental rethinking of the way signals are distributed and managed throughout the broadcast facility.

A new approach to this process utilizes a digital transmission format similar to that used on the Internet for purposes of transport and distribution of content around an audio production environment.

This format is known as the *Internet Protocol*, generally referred to as "IP," and it is the very core of the Internet. IP is the common format used for any kind of data that flows on the Internet (including streaming media), and on private extensions of the Internet, such as the LANs employed in enterprise networks and small office/home office (SOHO) networks, both wired and wireless. It sets the rules for this entire data networking infrastructure, both hardware and software, which has emerged and been so broadly embraced over the last quarter century or more. Since most audio facilities have already converted to digital audio, it therefore makes sense to now examine the use of IP there, as well.

Given that IP is the *lingua franca* of contemporary data networking, it can provide significant economies of scale for specialized applications such as professional digital audio distribution. This exploits the same process that has made the general-purpose desktop computer an efficient and cost-effective platform for the creation and storage of professional audio content. IP Audio distribution is simply an extension of that thinking and technology, replacing the purpose-built (and relatively expensive) mixers, routers and switchers that have traditionally been used by audio studios for managing multiple audio signals as they pass through a production or broadcast facility. IP also allows the full and continuing force of Moore's Law to be applied to audio distribution, just as the PC has done for other audio processes.

Beyond simple cost-effectiveness, however, IP Audio offers other important benefits. These include high scalability (i.e., the ability to easily accommodate growth and other configuration changes), convenience (i.e., easy and fast installation) and "future-proofing" (i.e., high likelihood of fitting well into any scenario

for future facility requirements). Putting all these elements together creates a value proposition that is hard to ignore when considering options for new facility designs or existing studio upgrades.

Many other industries have already converted their legacy communications processes to IP-based replacement systems. Studio audio systems using IP-based technology are now sufficiently mature to allow audio producers and broadcasters to do the same, providing them with substantial savings while simultaneously positioning them well to accommodate indeterminate future needs.

A Brief History

The broadcast audio studio has a long legacy relationship with the telecommunications world. The earliest audio facilities and standard practices were developed by Bell System and Western Electric engineers in the early 20th century, and the two worlds have never strayed far from each other since.

In particular, broadcast audio has retained a close connection to the telecom environment, since so much of broadcasting's content comes and/or goes from the studio via telco-provided paths.

Thus it is not surprising that the next generation of studio audio technology should once again follow a path blazed by telecommunications technologies.

In this case, the technology involves digital networking – specifically using the popular and now nearly ubiquitous *Internet Protocol* (IP). This protocol, coupled with either the *Transmission Control Protocol* (TCP) or *Universal Datagram Protocol* (UDP) data transport format, provides the bulk of data communication carried on the Internet. Its popularity for that purpose has also made it useful for other localized, non-Internet data networking purposes. This is primarily due to the volume of development and resulting hardware and software that supports TCP/IP or UDP/IP, and the great economy of scale that results.

For a little background, note that a "protocol" in the data networking context is simply an agreement on the format of data that will be passed between devices. Therefore it specifies a set of rules for various parameters of that data, such as the data rates allowed, the error checking algorithms employed, any data compression formats that might be used, how the start and end of individual messages will be determined, how confirmation that a message has been successfully delivered will be communicated, and so on.

It's also helpful to review some of the early development that led to IP's particular popularity. In a nutshell, the IP approach is a simplification of the canonical seven-layer networking architecture[1] down to a stack consisting of only four layers, as shown in Table 1.

[1] The *Open Systems Interconnection* (OSI) reference model, established in the late 1970s, included Application, Presentation, Session, Transport, Network, Data Link, and Physical layers.

APPLICATION	HTTP, RTP, FTP, SMTP, TELNET
TRANSPORT	TCP, UDP
NETWORK	IP
LINK	Ethernet, WiFi

Table 1: The four layers of Internet data transmission, with some examples of each layer's protocols.

The Internet process also includes an addressing protocol for each of its data packets, the *IP address*. Any device attached to an IP network is assigned an IP address. Until recently – i.e., using IPv4 – an IP address was specified as a numeric string of four one-byte numbers (or *octets*, since one byte is eight bits), each expressed in decimal form (from 0 to 255) and separated by periods (e.g., 169.10.206.2). [2] This implies that the number of possible addresses in IPv4 is that expressed by a 32-bit number (4 x 8 bits), meaning that 2^{32}, or approximately 4.3 billion (4.3×10^9), unique IP addresses are available. This may sound like a lot, but many of these are reserved for specific uses (more on this below).

Today, the IP world is converting to IPv6, which specifies its IP addresses using 128-bit rather than 32-bit numbers. [3] The numerical expression of IPv6 addresses also differs from IPv4's, in that it generally uses hexadecimal numbers in the form hhhh:hhhh:hhhh:hhhh:hhhh:hhhh:hhhh:hhhh, where each byte (or octet) is represented by a hexadecimal pair of numbers (from 00 to ff, e.g., e7), and each pair of bytes is separated from the next pair by a colon. An example is 30c1:0ab6:0000:0000:0000:8a2e:0370:2f8e. For awhile, there may be a lot of zeros in IPv6 addresses, and they can be skipped with the insertion of a double-colon, as in this notation of the previous address: 30c1:0ab6::8a2e:0370:2f8e.

One of the primary improvements of IPv6 over IPv4 is its allowance of far more IP addresses. This is a real issue given the expectation that so many devices in the future will require unique IP addresses. IPv6's 128-bit range provides more than 3.4×10^{38} possible addresses, or more than 5,000 addresses per square micrometer of the Earth's surface – probably enough to last for awhile.

Nevertheless, it is expected that IPv4 will remain the standard format of the Internet for some time to come, while IPv6 support is gradually deployed worldwide.

The reason that IP addresses are important to this discussion is because they essentially replace the audio crosspoints in a traditional, circuit-switched environment. In an IP Audio system, all traffic flows along a single, serialized path, and each packet of data gets to its intended destination via the IP address in its header, rather than by its being sent along a dedicated wire by a switcher.

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[2] IPv4 has been in use since 1981, established with the publication by DARPA of the seminal RFC 791 document, generally cited as the original specification for the Internet. Although other protocols preceded it, for most of us, IPv4 is the only version of IP the Internet has ever used.

[3] If you're wondering what happened to IPv5, it was ascribed to a version that was originally intended to be used for connection-based (rather than packet-based) streaming media on the Internet, but work was abandoned on it as streaming media became possible with the development of new protocols over IPv4.

IP Beyond the Internet

As noted earlier, IP is used today on many local area networks that are not connected to the Internet. This is why there are a large number of IP addresses that are reserved for non-Internet uses on private networks.[4] A number of IP address ranges are internationally agreed to be reserved for this purpose, the largest contiguous group of which spans from 10.0.0.0 to 10.255.255.255. This group alone provides some 16 million possible addresses that are not accessible from the Internet (routers are programmed to ignore the addresses on incoming Internet traffic), and are only available from within a local network. This also implies that a private IP address has no need to be globally unique, and so these same addresses can be used by any entity on its internal network, thereby conserving the number of IP addresses required worldwide.

Devices assigned such private addresses can still access the Internet if necessary, via a *proxy server* or *Network Address Translation* (NAT) device.[5]

The private address space is particularly useful for studio audio applications of IP, since the devices so interconnected are typically not intended to be accessible directly via the public Internet.

"IP but not Internet" is also the case for another major emerging technology called *IPTV*, which uses IP for distribution of television programming, but over dedicated networks operated by telcos (providing a multichannel service competitive with digital cable and satellite TV), not the open Internet.[6]

Streaming Changes All

Although originally developed for standard data communication, subsequent enhancements to the Internet allowed it to be used for media transmission, as well, which is well known as the process called *streaming media*.

This development fundamentally altered the usage of the Internet, and has subsequently had significant impact on all facets of the media industry, as they struggle to cope with the changes it brings, and to take advantage of the new opportunities it engenders.

Besides spawning many currently burgeoning on-line media businesses, streaming technology is also the basis for IP studio audio. This allows the audio studio environment to leverage several key properties of an IP-based environment, which provide substantial improvement over more traditional approaches:

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[4] These networks use addresses in the private IP address space, as specified in the Internet Engineering Task Force's (IETF) RFC 1918, and administered by the Internet Assigned Numbers Authority (IANA).

[5] Note that in IPv6 there will be no private address space or NAT, given the far greater number of globally unique IP addresses it provides.

[6] Meanwhile, TV content sent via IP that *does* travel via the open Internet ("Internet TV") is also soaring in popularity, increasingly used for distribution of broadcast content as well as content created by consumers (*user-generated content*, or "UGC").

- **Scalability:** Perhaps the most fundamental change between IP-based audio systems and traditional approaches – analog or digital – is the ability of IP architectures to adapt to change and growth. For example, a traditional audio environment must have its spatial or imaging format (e.g., mono, stereo or surround) predetermined, along with the number of simultaneous audio channels it will requires (e.g., one, two or more). An IP Audio environment has no such requirement, and can easily adapt to any format. Similarly, a traditional "crosspoint" audio routing switcher must have its input and output (I/O) configuration fixed in its hardware design. In this way, such a device reflects *circuit switching* and parallel design, whereas IP Audio systems implement *packet switching* and serial design. This allows great flexibility and responsiveness in accommodating changes in I/O configuration. Just as telcos have moved away from the circuit-switched paths of their earlier years for similar reasons, studio audio systems can now enjoy the same advantages of scalability and flexibility to implement expansion in any dimension. This comes not a moment too soon, given the competitive pressures coming to bear on broadcasters for increased content and listener choice.

- **Cost-effectiveness:** At almost any reasonable size, an IP-based audio system will compare favorably with the cost of a traditional system – both in terms of hardware/materials pricing and installation cost. The reduction in wire alone provides substantial economy.[7] Maintenance expenses are generally also lower. These cost differentials increase with the size of the facility, which is why so many larger installations have already moved to IP-based solutions as their needs have called for new technical plants.

- **Convenience:** The small physical footprint, low operating cost, ease of reconfiguration or upgrade, and fast installation of IP Audio systems make them extremely convenient for engineering and operations alike at the audio studio facility. From initial design to implementation to daily operation, IP-based systems make life easier.

- **Future-proofing:** Nothing strikes fear in the heart of the engineer or manager more than making a poor major purchasing decision. Moving to an IP-based audio architecture takes a lot of the pressure off, since it offers such flexibility and allows broad ability for reconfiguration down the road. Provisioning for unforeseen changes is much less problematic and cheaper.

Note that the above advantages only fully apply to systems that utilize standard IP in their architecture. Not all audio systems that use computer networking (over Ethernet and/or on RJ45 connectors) for interconnection are necessarily true IP-based systems. Some simply use Ethernet as a physical layer with a proprietary data format above it,[8] while others may use more IP-like formats but with non-standard

[7] Remember that a packet-switched system like IP does not require individual wiring paths to each input and output of every device. For example, an audio mixing console or multitrack recording device can have all of its inputs and outputs interfaced to the rest of the facility via a single cable in an IP Audio environment.
[8] e.g., *Cobranet*

protocol variations. Some of these non-standard approaches may have offered some value in the past (such as reduced overhead and latency over standard IP networking), but given the capacity, speed and performance of a properly configured, standard IP system today, the penalties paid by working in a non-standard environment generally far outweigh any advantages that such variations might provide, particularly when considered over the long term.

IP-Anything

In terms of critical mass behind this trend, studio audio is certainly not alone in its movement toward IP-based processes, as already noted. Numerous other industries have already embraced a transition to IP for similar reasons to those cited above for studio audio.

One such development that is closely related is *Voice-over-IP* (VoIP), which is rapidly gaining ground in the telephony space as a replacement for traditional voice service, in both consumer and enterprise applications. Again the leveraging of IP as a mechanism to use *generalized* systems and transport paths for various *specific* tasks has undeniable appeal, and this argument is also finding favor in a wide range of other industries, from hotel TV systems to health care. Emerging digital TV systems (including new mobile variants) are also favoring an IP distribution model.

IP is fast becoming the *lingua franca* of digital technology and content, allowing anything expressed in its terms to be carried and processed through increasingly available and cost-effective infrastructures. Just as the PC became the general purpose computing platform (delivering unprecedented processing power, speed and cost-effectiveness), IP has become the general purpose data transport format.

For engineers, familiarity with digital networking technologies, including IP, has become a near-requirement of the job anyway (for implementing the on-line services of a radio station), so why not apply this knowledge to studio audio, too?

It's becoming clear that IP is truly the way of the digital media world, particularly for any industry that values connectedness, agility and cost effectiveness. In the radio environment, it's not an overstatement to say that IP Audio is the future of studio audio signal flow. Arguing otherwise is difficult: There is and will continue to be so much development within the IP environment, it only makes sense to harness the power of that effort, while also letting Moore's Law have its full effect on the hardware side for studio audio equipment, just as these forces' effects are being enjoyed by so many other industries today.

What's the catch?

This is not to say that there aren't some challenges to the optimal use of IP for studio audio transport. Primary among these is the latency that the encapsulation process of audio data into IP packets can cause, and their serial routing through a packet-switched network prone to data collisions. As mentioned earlier, various methods have been put forth by developers to ameliorate this, but proper

configuration of available devices used on today's high-speed Ethernet networks is usually adequate to resolve any such difficulties in IP Audio systems.

Such configuration of standard IP equipment (e.g., Ethernet routers and switches, buffer sizes and network speeds) can be set to optimally serve the specific needs of a studio audio system, rather than generalized Internet data traffic. For this reason – as well as for obvious security purposes – it is important to use a separate, dedicated network (either physical or virtual) for all studio audio IP applications. This network can carry all audio content, control signals and metadata related to production, but should be isolated from the general data network of the facility. In addition, there generally should not be a direct connection of the studio audio system to the public Internet. When Internet connections are required for access to off-site audio sources or destinations, they should be routed through a proxy server or other isolating path. Some vendors will also set IP packet prioritization at a higher level for audio content packets than for general network data. This helps IP Audio performance even on networks that are not dedicated to IP Audio usage only.

Another issue is a simple one of connector standards. Since IP Audio generally travels on CAT5 or better[9] Ethernet cables, the RJ45 connector is used for all terminations. But some IP Audio system implementers also use RJ45 for analog or AES3 digital audio I/O and patching. While this can minimize the number of different connector types used in a facility, and reduce the physical space required for connector panels, there is no standard for the configuration of an RJ45 connector for this purpose. So individual IP Audio implementers have designed their own unilateral formats, again possibly limiting broadcasters to the use of only certain manufacturers' products in an IP Audio facility, or requiring the use of adapters.

Of course, the need to retain compatibility with analog and AES3 digital audio will likely remain for some time to come at any IP-based audio facility. At the very least, live microphone signals will need to be converted from their native analog audio (or in some cases, perhaps AES3) format, and in some cases analog or digital audio from other devices or remote sources will also have to be accommodated. How this conversion process is accomplished is a key factor in the design of an IP Audio system.

For the time being at least, the above optimization processes argue for the selection of a single vendor for the supply of IP Audio equipment to a given broadcast facility, or at least the verification that compatibility among different vendors' IP Audio equipment is assured. Working with a single supplier also ensures that updates and upgrades will be delivered in a timely fashion, and even special fixes for a particular problem encountered at a given facility can be quickly provided.

[9] CAT5e or CAT6

Implementation and integration

This brings us to actual IP Audio system considerations. Given the advantages of scale provided by these systems, it makes sense to make the IP Audio domain as large as possible within a given facility. That implies that audio signals in other forms should be converted to IP packets as soon as possible.

The best place to do this in most studio configurations is at the central patch bay and/or the studio mixing console(s). Microphone outputs and signals from other "legacy" audio sources can be immediately converted to digital audio form (if they aren't already) and packetized as IP. Once in the IP domain, these signals can be addressed and routed to any other location on the network. This can include destinations within the confines of a facility via LAN, or anywhere in the world via WAN.

Another advantage of this approach is that a mixing console can act as a router. In other words, because any input on the console can have a unique IP address, it can be connected to any IP Audio source on the network. (Even more amazing to veteran audio engineers is that this can be accomplished even though the entire console is connected to the network via a single cable.) A central switching control unit (typically a PC) can assign these I/O connections, or the mixing console itself can have a control interface for this purpose. In addition, standalone hardware switch controllers can be distributed around the facility, essentially duplicating the appearance and function of traditional router-control panels. In all cases, however, all that is being done to achieve the routing is the addition of appropriate IP addresses to the headers of IP Audio packets on the network.[10]

Of course, the mixing console can also be equipped with traditional analog (mic/line) or AES3 inputs on some inputs as well, to accommodate local audio source devices. These sources are in turn converted to IP by the console, and via their routing to the console bus or direct outputs, these signals may in turn be made available as IP sources to the rest of the network – again via the single cable connecting the console to the network. (See Figure 1.)

Consider also how PC-based audio playout/automation systems can be interfaced to such a system. Rather than their audio outputs being directed through PC sound cards to traditional audio inputs, the automation system can be fitted with an IP driver that provides a software interface between the PC audio and the IP network directly in the IP Audio domain. This not only maintains high audio quality, but cuts costs in the automation system since no (or at least fewer) sound cards are required. The IP interface can also carry control data and PAD as well, eliminating the need for separate data links between devices.

[10] Ideally, the IP feeds to/from any mixing console in an IP Audio system are used only for those items that need access to the console's audio manipulation features. Simple input-to-output connections can be handled by the core IP Audio architecture without taking up console resources (or even using up a crosspoint, in traditional switching terms). The console can be considered as an IP appliance or "audio engine," which can host any sort of audio level-adjustment, mixing, processing or coding/transcoding that the facility requires, applying all such processes efficiently and within the IP domain.

Moreover, a *single* IP driver interface between an automation system and an IP routing architecture can carry many independent audio channels (perhaps up to 24), whereas a traditional switching system would require a crosspoint (plus wiring) for each sound card input and output. The combined hardware savings (soundcards + crosspoints + wire + installation) in a large facility could be substantial.

Any IP Audio system today will also include one or more standard Ethernet *switches*, which are used to interconnect the Ethernet connections from each facility or device that provides audio I/O via IP. These switches are standard telecom devices, which replace the more common Ethernet *hubs* or *routers* used for similar RJ45 terminations in typical home or small office situations. Switches are preferred in IP Audio applications because they have more intelligence than hubs, which allows them to inspect data packets to determine their source and destination, and forward them appropriately. Through this intelligent control, each message is only sent to the intended device, thereby conserving network bandwidth and providing better performance (including reduced latency).

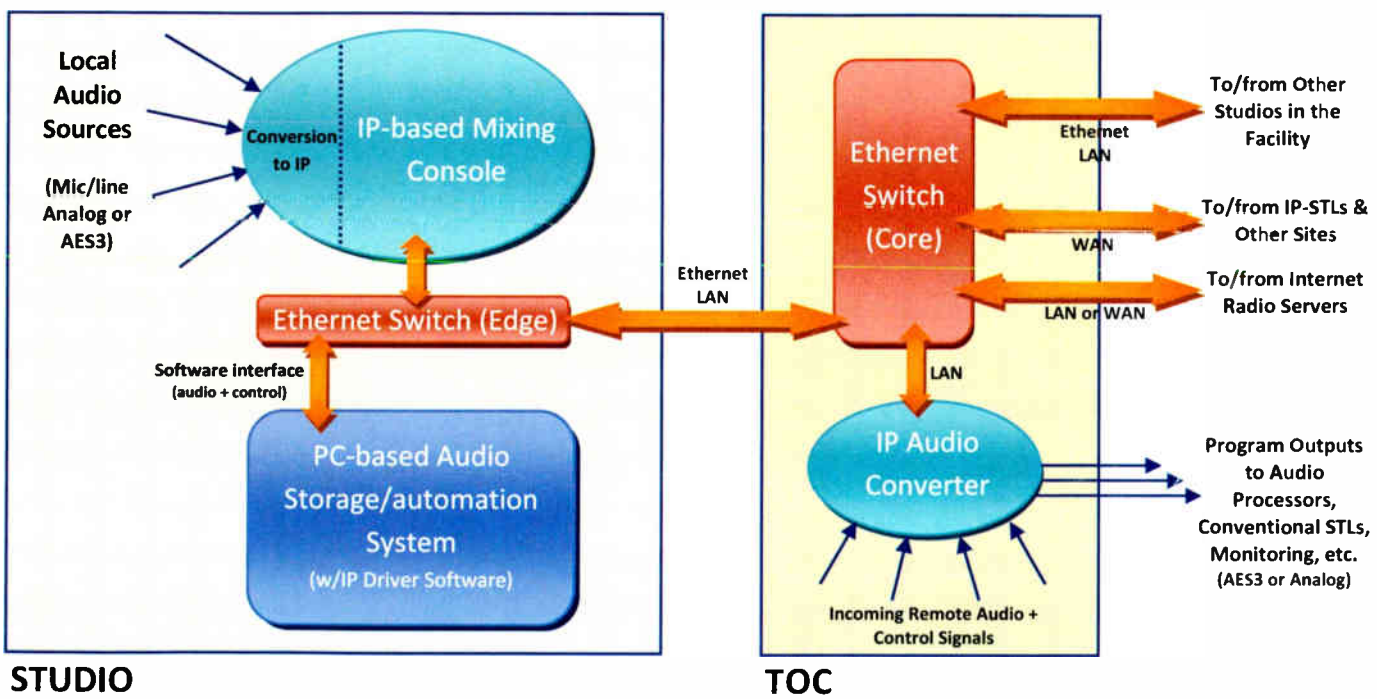


Figure 1: **Conceptual block diagram of a typical IP Audio-based broadcast studio facility, showing one studio and Technical Operations Center (TOC).**

Ethernet switches come in *unmanaged* or *managed* forms, the latter allowing user configuration of various parameters of the switch's operation. In smaller IP Audio facilities, unmanaged switches can perform adequately, while larger facilities may benefit from managed switches. Some switches also

include remote administration capability. Today's fastest switches operate at Gigabit speeds, using CAT6 cable, and these are the most appropriate for low-latency IP Audio applications.

As Figure 1 indicates, a typical IP Audio facility includes *multiple* switches, usually arranged with one large ("core") switch in a central room, and smaller ("edge") switches placed as needed in other rooms around the facility. Such distributed routing intelligence improves performance, and also provides redundancy in case of switch failure.

Note also that the proliferation of VoIP and other realtime applications via IP have spawned broad implementation of *non-blocking* architecture in recent Ethernet switches. This approach virtually eliminates data collisions within a switch, while maintaining cost-effectiveness, by ensuring just-adequate capacity for *n* x *n* connectivity[11] through the switching fabric. Mission-critical performance is thereby maintained by using Ethernet switches that implement non-blocking design, and when properly implemented within an IP Audio system, switch capacity should never be exceeded. Most IP Audio vendors recommend only non-blocking Ethernet switches, and this is one reason why users should heed vendors' recommendations for all switches used in their facilities. (Again, the economy of scale driven by broad uptake of these switches today provides such advantages to IP Audio implementers at very attractive prices.)

The use of Ethernet switches by mission-critical and other high-reliability telecom operations has driven major manufacturers to provide excellent 24x7 and overnight-replacement support. Note also that as a facility grows, it may need to replace older switches with newer models; the fact that Ethernet is a ubiquitous standard means that all upgrades will remain backward compatible. Meanwhile, Moore's Law ensures that as such new hardware becomes available, price/performance ratios will continually improve.

The IP Audio domain is also extending beyond the studio. Figure 1 shows how IP Audio is converted back to AES3 (or even analog) for program outputs' connection to conventional Studio-to-Transmitter Links (STLs), but the diagram also indicates that an STL could carry IP Audio to the transmitter site (via WAN or other dedicated link). Whether leased from telco or using a station-operated RF path, if adequate bandwidth is available, multiple audio channels, control and metadata can all be carried via IP on the link – bidirectionally, if desired – with minimal latency.[12]

IP Audio in Use Today

The advantages of IP Audio have been noticed by broadcasters and studio owners around the world. It is fair to say that the engineers designing every new broadcast studio facility built today (and from this point forward) are at least considering the use of an IP Audio architecture – and many of them are deciding to take the plunge. Speaking with them afterwards will find almost unanimous agreement that

[11] In other words, any input on the switch can always be connected to any output on the switch, under any usage.
[12] Bidirectional links can substantially decrease jitter and latency compared with unidirectional IP paths.

it was the proper choice, and there's no looking back. In many cases you will hear that the transition process was far easier than they expected.

The installation of an IP Audio system makes many people at the operation happy, from the CE to the CFO. The total cost of building and operating an IP Audio facility is significantly reduced, and yet this can be accomplished without giving up flexibility – in fact it, too, is greatly increased. Operations are often minimally interrupted, as well, due to the small footprint and quick installation of IP Audio systems.

This is why broadcasters of all stripes, and with budgets large and small, have moved to IP Audio systems. On the commercial side in the U.S., broadcasters from Clear Channel to Greater Media have recently installed IP Audio systems, while non-commercial operators from Minnesota Public Radio to WYMS, Milwaukee have done the same.

In fact, the clientele for this emerging technology almost defies characterization. It includes small independent stations, college radio (including numerous rural and community colleges), ethnic and religious broadcasters, satellite radio services, radio and telecom network operators, content production and broadcast origination sites, corporate facilities and government agencies – along with some of the largest and most respected stations in the country.

Neither is adoption is by any means limited to the U.S. IP Audio is already well ensconced around the world, from Spain to South Africa, from Italy to Israel, from China to the Czech Republic, and many other places in between.

Clearly the technology has a lot of unique advantages to offer, and these have been noticed by many of the leading purveyors of audio content and delivery throughout the planet.

Conclusions

It's not often that a new technology offers considerable technical improvement, easier installation and maintenance, greatly enhanced flexibility and scalability, *and* reduced cost when compared with its predecessors. Yet these are the attributes of a properly implemented IP Audio system.

Broadcasters have always been a cost-conscious lot, and rightly so, but given today's increasingly competitive landscape, efficiencies in capital expenditures and operating costs have become even more critical and desirable.

Meanwhile, it's become quite clear that the radio industry will face substantial change in the near future, and much of it will likely involve quantitative growth in services. More streams, more audio channels, more data, more responsiveness to audience demands, and probably more still, are all on the path that lies ahead for broadcasters. An IP Audio platform provides a legitimate platform to most realistically accommodate these many challenges.

It behooves any broadcaster faced with the opportunity to confront these uncertainties to seek the counsel of experts in the field of IP Audio, and to benefit from the experience of those who have recently undertaken similar projects. You will likely hear strong encouragement to make the move to IP, just as much of the rest of the world is doing, with good reason.

Fairfax, VA
February 2008

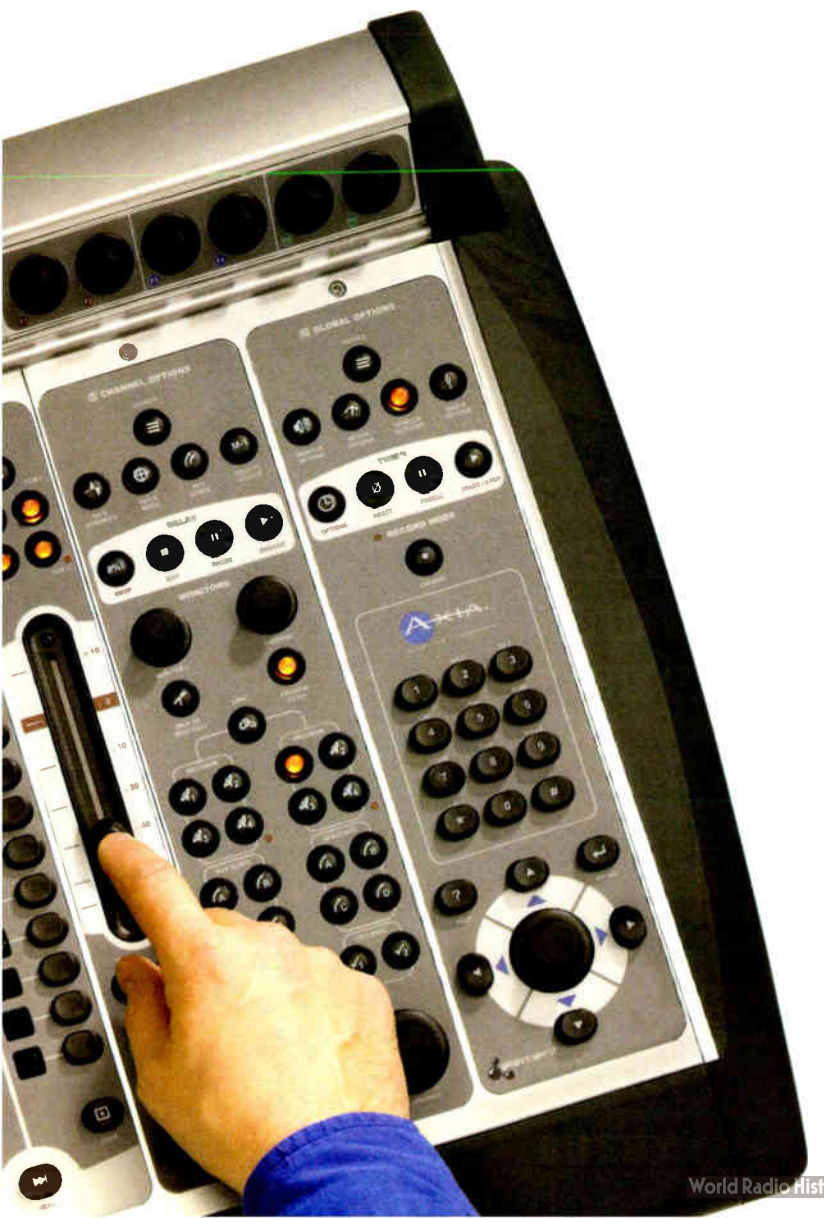
700 ~~500~~ studios already?

Time flies when you're having fun!

Hard to believe, but we passed the ~~500~~ 700 studio mark recently. We're told that it's a major milestone, but we prefer to call it a good start.

In fact, our clients have made Axia the **fastest growing console company** in radio. To you, we say "thanks" for your trust and enthusiasm. And to those of you who aren't yet clients: we're ready when you are.

Okay, back to work now. (Consoles don't build themselves, you know.)



AXIA
A TELOS COMPANY

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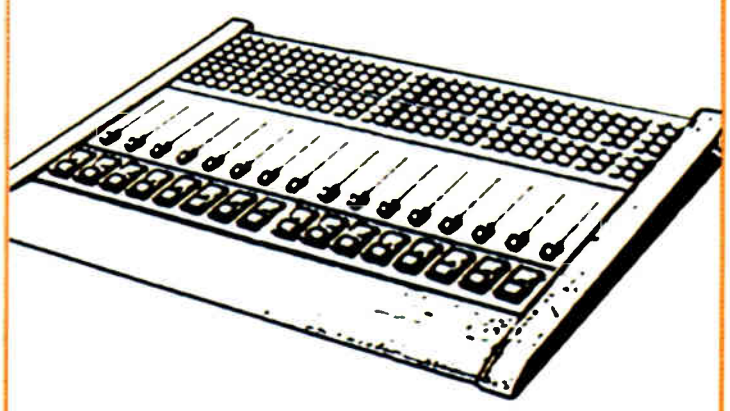
Nobody knows what the future holds.

(But there's a reason our logo is a crystal ball.)

Comdial Executech® PBX phone, *ca.* 1996. Comdial was one of the leading PBX companies in both sales and technology, with a million-square-foot assembly facility and over $7,000,000 in reported earnings. Comdial continued with traditional PBX tech and declining sales until filing for Chapter 11 bankruptcy protection in 2005, when all assets were acquired by **Vertical Communications**, a VoIP company.[1]

Cisco® 7970 IP Phone, *ca.* 2006. Founded in 1984 as a manufacturer of multi-protocol routers, Cisco began, in 1998, to promote VoIP technology to Fortune 500 companies as a more cost-efficient, feature-rich alternative to PBX phone systems. In just 10 years,VoIP effectively killed the traditional PBX; VoIP revenue is projected to reach $48 billion by the end of 2010.[2] Cisco annual revenue reached $35 billion in 2007.[3]

Axia Element broadcast console, *ca.* 2008. Founded in 2003, Axia is a division of Telos Systems, worldwide leaders in broadcast audio equipment. Axia was launched with the mission of bringing proven technology from the computer world – switched Ethernet, audio routing via IP, distributed network architecture – to radio. Using open standards and bulletproof Cisco routing technology, nearly 1000 Axia consoles have been built in just 5 years, making Axia the fastest-growing console brand in radio.



Generic TDM console, *ca.* 200*x*. Some radio consoles and routing systems are still based on Time-Division Multiplexing, developed in 1962. TDM was once the basis of most (if not all) digital PBX telephone systems. Consoles and routers based on TDM employ centralized "card cages" that require all inputs and outputs to be wired to a single location. Like traditional PBXs, TDMs typically rely on closed, proprietary code, and cannot be easily or economically changed or expanded when new operating criteria arise.

Santayana famously noted "Those who cannot learn from history are doomed to repeat it." Some people change when they feel the heat; others when they see the light. With that in mind, a quick comparison of telecom and broadcast technology reveals some common trends that broadcasters are finding hard to ignore.

Nearly 1000 Axia studios are installed around the world — more are added every week. And while our clients probably don't think too much about the technology inside our consoles, they know they won't have to worry about it in the future.

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Technology

Burli Software N5838
New: We've added the Burli Integrated NewsFeed to our computer newsroom software. Burli NewsFeed automatically shares content from affiliated newsrooms as a "newswire" of their own material, harnessing content from newsrooms group-wide into a single news stream. The feature allows broadcast groups to leverage existing content and gives each newsroom the newsgathering resources of the entire broadcast group. Already in use by broadcast groups in Europe and North America, Burli NewsFeed distributes text and audio data in open-standard formats.
Established Products: Burli Newsroom System helps journalists manage, edit and broadcast the news on traditional and emerging platforms.

Burst Electronics Inc. C9032
New: GPI-20 is a GPI to RS-232 converter. It changes momentary contact closures to RS-232 data streams. Up to 40 unique commands can be recalled with simple GPI triggers. This is an upgrade to the GPI-10 that is commonly used but with twice the capabilities. Custom programming of data streams are available, 12 V DC (polarity insensitive) power supply and RS232 interface cables are included.
Established Products: ADA4, AS4x1, AS8x8.

C Crane Co. N9124

Calrec Audio Ltd. N8723
Established Products: Alpha with Bluefin, Sigma with Bluefin, Omega with Bluefin, Hydra.

CGS InfoGraphics Automation R316
New: CloseNow for Radio automates the collection of closings using both phone and Web automation, and outputs to multiple Web sites. The closing information is organized and reviewed by on-air talent using a browser. Also includes e-mail alerts to subscribers of closing information.

Chyron SL3713
New: Chyron Online is an Web-based service that integrates with Chyron's broadcast products and expands its reach to include clients such as newspapers, radio stations, mobile phone and digital media producers and anyone producing content for the Internet. Chyron Online provides a one-stop platform to create, composite and distribute graphic content over the Internet for traditional and new media markets. Features: FastMaps is a broadcast mapping tool that integrates with a client's graphics packages. FastMaps offers street-level maps to international maps. FastQuotes gives broadcasters, Webcasters and anyone needing near real-time quotes the ability to build stock market charts from HD to Web insert. Connected to real-time market data, news producers can create local, national and international business segments with ease. FastCharts allows reporters, producers and directors the ability to create HD-quality bar graphs and pie charts, using their own data from almost anywhere, with a Web browser. FastWX uses real-time weather information to build quality weather maps complete with Doppler radar where available, anywhere with an Internet connection.

Circuit Research Labs/Orban N8536
See listing for Orban/CRL

Clark Wire & Cable C7519

Clear Channel Satellite OE316

Clear-Com Communication Systems C5908
New: Concert is a multiple user conferencing and intercom system. Based on voice-over-IP technology, Concert offers audio over a standard Internet or intranet between local and remote users. Drag-and-drop functionality makes ad hoc communications possible, and features such as the ability to monitor the availability of participants mean users can communicate in demanding and collaborative settings. A secure and redundant system for mission-critical applications, it is scaleable to hundreds of users. It supports a variety of codecs including wideband and ultra wideband for sound that captures more components of the human voice for speech-quality enhancement. Eclipse digital matrix acts as a central switching unit for communication across a broadcast operation in the studio or in the field. Eclipse links Clear-Com's Concert desktop, V-Series panels and CellCom wireless beltpacks and headsets for cost-effective and ubiquitous communication. Version 5 offers increased connection through robust E1/T1 coax connection, fiber linking and now IP connectivity for ease of installation in any broadcast environment and flexible communication between local and remote locations. An AES-6-RJ interface card allows the user to control remote V-Series Panels through AES-3 stereo digital audio routers and consoles where the Eclipse intercom is required to talk over audio feeds, as typically occurs in OB vans and studio environments. Also: V-Series Desktop product series brings the functionality and ease of V-Series Panels to the desktop. Also: CellCom10 V1.5.7 brings broad wireless connectivity to party line and digital matrix intercom systems and allows for beltpack-to-beltpack conversations or small group conferences.

Coaxial Dynamics N4626

Comrex N2125
New: A digital telephone hybrid to adapt to the changing requirements of broadcasters. The DH42 accommodates two traditional POTS lines, as well as two voice-over-IP lines in a single RU enclosure. Essentially a four-line conferencing hybrid, the DH42 allows callers to be put on-air with separate send and receive paths, filtering, AGC and control functions. VoIP telephone lines offer a low-cost alternate to traditional analog POTS lines, and VoIP technology also is found in SIP-based PBX telephone systems. The DH42 offers broadcasters the ability to interface their Internet-based VoIP lines or VoIP PBX lines with audio consoles and other broadcast audio equipment.

Continental Electronics N7607
On Display: Dallas-based Continental is a premier provider of digital and analog radio broadcast solutions, with 24/7/365 support, for the global market. Specializing in the design, development and manufacture of leading-edge RF broadcast systems, we offer a full range of products for FM, HF, LF, VLF, high-power and scientific applications.

CPI N7220, C2611

Crown Broadcast N6912
On Display: FM broadcast transmitters from 30 to 10,000 watts, units can come complete with optional audio processor/stereo generator. FM translators from 30 to 500 watts and upcoming HD Passthrough translator. Units include three-year warranty and service support 24/7.

CTE International N8125
New: VL series FM modular amplifiers range up to 20 kW and hot-pluggable.
Established Products: FM radio transmitters up to 20 kW, fully modular and MOSFET.

Dalet Digital Media Systems SU8520

Dan Dugan Sound Design N4217

Davicom, a div. of Comlab N6935
New: MAC2 SuperMAC firmware allows networking of up to four MAC216 units for a super capacity of 64 metering channels, 128 status channels and 128 relays; MAC2 integrated Web browser for PC and Blackberry, new firmware adds PC and Blackberry Web browser support to Davicom MAC2 products; Also new firmware version adds full SNMP capability to Davicom MAC2 products.
Established Products: MiniMAC2, MAC2, MacNet, Scientel Accessories

D.A.V.I.D. Systems Inc. SL6129
New: Newsroom Integration: DigaToolbar is a dashboard to centralize communication and launch other applications. It can be used to set up and recall certain screen configurations and it keeps users aware of important events such as story assignments, new and updated entries, and reports from newswires. DigaToolbar is a modular system with a plug-in structure which allows certain third-party systems to use the toolbar as a platform. It uses little screen space and its placement can be selected according to personal preference. Wherever a user logs in, DigaToolbar loads individualized settings from the DigaSystem registry. The DigaToolbar also enables the display of a real-time clock on the screen as well as one that shows the time in another time zone. Also: Newsroom Integration: The Story Editor is a universal pre-production tool for combining text and audio in a single application. The look and feel is similar to the Reporter Box, a familiar component of D.A.V.I.D. Systems' audio editors. The story consists of audio and text elements as well as commands. Additional features are spell and grammar check, a thesaurus, notes, clip lists, durations and features like drag-and-drop functionality between StoryEditor and news feed or DigaSystem editors. Also: Transfer Solutions: For the fast and secure transfer of media files via IP connections including firewall support and automatic resumption of aborted broadcasts, the latest version of DigaTrans IP sends data as "named accounts" and converts them automatically if required.

DAWNco C7237
On Display: Satellite antennas, receivers, LNBs, position controllers, fiber-optic broadband links, satellite and data links.

DaySequerra N5229, N5129
New: ATI and sister company DaySequerra will have separate booths as ATI reemerges with new products. The companies will be back-to-back in the Radio Hall. DaySequerra will demonstrate its HD Radio-Ready Analog Modulation Monitors for AM and FM that can be upgraded to full HD Radio capability. Performance upgrades for all HD Radio Modulation Monitors and Professional HD Radio Tuners. Improvements include new features in Remote Dashboard remote control, including 100 station scanning and RBDS logging, improved alarm relay functionality in the M2.2R and M4.2R, and improved SCA measurement resolution in the popular M2.2R. The award-winning M2, M3 and M4 HD monitors will be on display.

DB Elettronica Telecomunicazioni N8233
New: DB Elettronica's new generation of liquid-cooled transmitters are easily installed, use regular water and eliminate the need for air conditioning.
Established Products: Analog and digital, air- and liquid-cooled transmitters; analog and digital microwave links; antenna systems and turnkey solutions.

Denon & Marantz Professional N4833

DG FastChannel SU10213

Dialight Corp. N3222

Dielectric Communications C1918
New: 700-MHz DR Filter. This 700-MHz Stringent Mask band-pass filter is designed to provide a cost-effective solution for broadcasting in the mobile media market. It is based on Dielectric's specialized design techniques, which provide electrical performance with low insertion loss compared to other filters of its size. It exhibits less than 0.6 dB of integrated insertion loss over the band. The 700-MHz DR filter provides up to an 800-W power capacity in a rack-mountable, compact design. Dielectric also offers an option to integrate other typical system components (such as couplers or harmonic filters) to create a complete RF system in a 3-RU space. Also: 700-MHz 150-W Filter is a new 150-W repeater filter that provides a compact, cost-effective component for broadcasters working in the 700-MHz spectrum. The filter supports up to 150 W of power and exhibits less than 1.5 dB of integrated insertion loss over the band. The unit is rack-mountable and integrates with other existing components to create a complete RF system. Also: RF Scout XLT monitoring system combines the features of the RF Scout with the benefits of touch screens, enhanced Web server applications and networkability. Dielectric's Dual Switch Controller has been re-engineered to offer touch screens, enhanced Web server applications and networkability.
Established Products: HD Plus Antenna, HDCBR Antenna, HDFMVee Antenna, DCR Ring-Style Antennas, 10 dB Switcher Combiner, DFM Manifold Combiner, FLEXLine Air or Foam Cabling.

Digigram N9025
Established Products: Visiblu and FluidIP are tools for building AV/IT-based audio systems around the block or around the world. Broadcasters and system designers can create audio and data routing, transport, encoding

SURE BETS

Fish Please

Looking to feed your inner Tiki god? Look no further than Roy's. Founded by Roy Yamaguchi, this upscale restaurant with two locations serves innovative Hawaiian fusion cuisine with a focus on fresh fish.

Roy's signature entrées are macadamia crusted mahi mahi in lobster cognac butter sauce, Hawaiian-style misoyaki butterfish and the popular melting hot chocolate souffle.

The Las Vegas version of Koi Restaurant of New York and West Hollywood at Planet Hollywood Resort & Casino is another pick for Asian cuisine and fish.

Koi guests enter through hand-carved Indonesian doors passing giant copper temple bells and three Buddhas. Koi is known for its fresh sushi and signature dishes such as miso-flavored black cod and the Kobe beef filet mignon.

Trend-setters looking for sushi head for Sushi Roku in the Forum Shops at Caesars. This restaurant was a City Search winner for sushi in 2006. It is a tranquil Zen-like oasis and thus a relief from the usual Las Vegas sea of glitz, though it has a great view of the Strip.

Fish is flown in fresh daily. The menu features California sushi and such modern Asian cuisine as monkfish pate wrapped in salmon and topped with caviar and uni, Japanese mushroom salad and mixed vegetable or seafood tempura. Sit at the sushi bar and get a peek at how sushi is made by crack masters (they welcome questions if you are newbie).

Roy's Las Vegas, 620 E. Flamingo Rd., (702) 691-2053 and 8701 West Charleston Blvd., (702) 838-3620, www.roysrestaurant.com

Koi Restaurant, at Planet Hollywood Resort & Casino, 3667 Las Vegas Boulevard S., (702) 454-4555, www.koirestaurant.com

Sushi Roku, at Caesars, 3500 Las Vegas Blvd. S., 702-733-7373, www.sushiroku.com/sushiroku.


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IP AUDIO IS NOW READY FOR TAKE OFF.

At NAB 2008, Digigram will introduce a range of solutions that will change the way broadcasters hear IP audio transport. Hardware or software-based, local, national or global, Digigram will help broadcasters make the move to IP transport infrastructure with confidence.

These solutions are all based on FluidIP™, a rock-solid N/ACIP (EBU Tech 3326) compliant IP codec engine running on dedicated devices, or as easy-to-integrate software, with unrivaled stream integrity and legendary Digigram audio quality.

Superb control, processing, and reliability. It's your turn to get onboard.

FLIGHT INFORMATION:
LAS VEGAS, APRIL 14TH - NAB 2008, BOOTH #N9025

Digigram

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and processing solutions across wide areas using standards-based network protocols. The patented EtherSound protocol takes advantage of established technologies to create real-time audio networks using standard Ethernet cabling and components easily and economically. Available to audio manufacturers via various licensing programs, EtherSound technology adds networking and remote control capabilities to pro audio products and enables audio networks incorporating products from multiple vendors. Also: PCI Express range of PCX and VX soundcards offer exacting specs, outstanding quality, reliability and total connectivity, a new generation for pro audio manufacturers and software vendors. These sound cards are Visiblu-ready. Get connected to the world of distributed IP audio.

DK-Technologies A/S **N1533**
New: MSD100C-Loudness meter is designed for use in production, post-production and transmission facilities, provides stereo monitoring of loudness as set out in ITU specifications BS.1770 and BS.1771. The meter has AES3 and stereo analog inputs and user selectable scales. Also: MSD Audio Meter 5.3 software upgrade is a new version of the respected MSD Audio Meter software. Version 5.3 is available providing loudness metering with graphical display, PC interface and meets ITU specifications BS.1770 and BS.1771. In addition this software provides the BLITS tone as established in Europe for channel identification of embedded audio.
Established Products: MSD600M++, PTO660M, PTO660M-LS meters.

Dolby Labs **N1814**

Dorrough Electronics **N8211**
Established Products: Audio Loudness Meters featuring Peak and Average indications for accurate monitoring of audio signals. Dorrough ballistics are featured on a full line of models for both analog and digital applications.

DPA Microphones **N730**

DSI RF Systems Inc. **C4537**
New: DSI, which was founded by a chief engineer, is equipped to take on transmitter facility build-outs from concept to completion. Its staff of construction, project management and RF engineers can design, configure, integrate, install and service DTV/FM/AM transmitter facilities. Also, Wireless Digital Transmission: DSI is exhibiting the RFIP Max II, a licensed wireless digital transmission technology for audio and video. It builds on the RFIP Max for unlicensed digital wireless transmission using IP technology. DSI complements both product lines with the new MGB-822 switch. Designed for the RFIP Max application, the MGB-822 provides switching between audio/video codecs and the RFIP Max I or II. Use RFIP Max I and II in combination to create wireless video or audio links many miles apart.

Econco **N7220**
New: Econco, sharing a booth with Eimac, will talk about the repair of newer high-power tubes that run in IBOC transmitters. We are also now remanufacturing IOTs for television broadcast. Deal direct with Econco.

Ecreso, an Audemat Co. **N7932**
New: RADIO ALL IN ONE – NEXT FM with new built-in audio backup and two-/four-/six-band digital audio processor. Audemat introduces at NAB 2008 a 3U unit that includes FM exciter (1 or 20 or 100 W), RDS and stereo generators, transmitter remote control capabilities, new backup audio over IP capabilities and a digital audio processor (two-/four-/six-band) optional. Ecreso 20 or 100 W exciter, low distortion < 0.05% , Best FM S/N ratio > 80 dB, very good channel separation up to 50 dB within the whole band, PLL controlled by microprocessor, adjustable power from 2 to 20 W or 10 to 100 W (depending on version). Basic RDS functions standard: artist name, song title, PS scrolling. Optional advanced RDS: TMC, ODA, Scheduler etc. Digital stereo generator is extremely accurate and stable; expand audio bandwidth to 17 kHz without affecting pilot. Three levels of audio backup (all versions), user-defined timing and crossfades. If digital audio fails, switch to analog input. If digital and analog fail, switch to Web stream (new). If all of the above fail, play audio stored on internal hard drive remote control. Optional 16 digital inputs and eight relay control outputs. Delivered with new version SCRIPTEASY V2 graphic control software. API available for transmitter remote control over serial connection, audio processing specifications (four-band version) optional, Processing power = 2.8 Giga flops, Sampling frequency for processing = 192 kHz, Sampling frequency for final clipper = 1.5 MHz.
Established Products: 20 W to 10 kW air-cooled transmitters, water-cooled 5 and 10 kW.

Elber S.r.l. **C3327**
Established Products: Point-to-point radio links.

Electrosys S.r.l. **C3331**
New: FM digital exciter.

Elenos **C12124**

Elettronika s.r.l. **C1311**

Empire State Building **C2844**
New: The Empire State Building, one of the pioneers of FM radio broadcasting, will be showcasing at NAB for the first time. As the tallest structure in the region, "Empire" has the largest FM combiner system in the Western Hemisphere and is home to 19 FM and 25 television stations. These stations broadcast in both digital and analog formats and take advantage of The Empire State Building's 1,504-foot height to reach the maximum potential audience in the nation's No. 1 market. With over 100 antennas, the Empire State Building also provides a variety of radio and data communications services to utility companies, telecommunications providers and public safety agencies.

ENCO Systems **N6512**
New: DAD Version 8.0, the latest version of DAD, provides significant interface and workflow enhancements and new features for radio and television users. PADapult provides the ability to create and manages data from "now playing" info to messagecasting for HD Radio, RDS and station Web sites. It also allows "instant" messaging using the PADLive! applet. DADmin is a user management and system maintenance utility for DAD networks of all sizes.
Established Products: DAD, NewsBoss, StreamLine.

Energy-Onix **N8708**
On Display: Tube and solid-state transmitters for AM, FM, shortwave and industrial applications. Microwave and Ethernet STLs, LPFM, translators, RPU and audio processing equipment.

ERI Electronics Research Inc. **N6929**
New: Low/medium-power constant-impedance FM combining module, suitable for either analog or digital applications, including reverse-feed combining of both analog and digital IBOC signals. To complement ERI's line of FM channel combiners the company will introduce a low-level group delay compensation module to economically optimize group delay performance in closely spaced FM combining systems. Also, new EIA flanged coaxial connectors for 1-5/8 inch, 3 inch and 4 inch air cable products. For TV, the company will show new VHF and UHF panel antennas.

ESE N3121
New: ES-188, an NTP (Network Time Protocol) referenced master clock and time code generator, is designed to simplify locking local facilities to external time sources when a slight time offset is required. The ES-188 provides users the ability to offset local clocks from an NTP time server so that local events can occur at precisely the correct time. The ES-188 is a 1RU black anodized unit that displays nine digits (day of year, hour, minute & second) of time as received via a user-selected NTP server. Several types of time code (ESE-TC89, ESE-TC90, USB, RS232C/ASCII, SMPTE/EBU and IRIG-B), as well as a 1PPS signal are generated by the ES-188 and output on the rear panel, allowing the ES-188 to interface with new or existing computers, automation systems and third-party clock systems. The ES-188 features rugged construction, automatic correction for Daylight Savings Time and 4-hour battery back-up.
Established Products: Master clock systems, audio and video distribution amplifiers, SMPTE/EBU time code products, audio level indicators & interfaces.

EV Microphones N9325

Eventide N6914
On Display: The new flagship BD600 offers expanded remote capability, 80 seconds of delay and precision delay capability for HD Radio applications. Digital effects processors and plug-ins for Pro Tools TDM.

E-Z Up International N9318

Federal Communications Commission N9114

Flash Technology/SPX N3114

Fraunhofer IIS SL7424
New: MPEG Surround, the ISO standard for high-quality multi-channel sound, enabling surround broadcasting at stereo bit rates. MPEG Surround is suitable for almost every digital radio and TV system including HD Radio, DAB+, satellite radio, DVB, MediaFLO and ATSC-M. For an easier transition from stereo to multi-channel sound, broadcasters can use SX Pro upmix technology to enlarge their surround catalog by upmixing stereo content to multi-channel. Also: Journaline, a text-based news service standard designed for digital broadcasting. It provides up-to-date textual information similar to teletext that can be accessed from mobile devices. Also: new MPEG standard Enhanced Low Delay AAC for POTS/ISDN/IP studio codecs and HD-AAC, the scalable lossless audio codec for studio-to-studio and satellite transmissions. Fraunhofer USA Digital Media Technologies, a division of Fraunhofer USA Inc., promotes and supports the products of Fraunhofer IIS in the U.S.

Gefen SL2312
Established Products: Audio processors, analog/digital converters.

Genelec SL9220

Gepco Intl. Inc. C6918

Global Security Systems N9307
Established Products: Alert FM is an FM-based digital alert and messaging system that allows state and local government and private sector officials to create and send emergency information before, during and after a crisis. This single-to-multi-point radio broadcasting system uses Radio Broadcast Data System (RBDS) technology based on our country's nationwide FM broadcasting network. Targeted alerts and messages are delivered by satellite to FM transmission towers and can be received on Alert FM receivers, wall units and other mobile devices, including PDAs, cell phones and other specialized receivers equipped with FM chips. Broadcasters receive the RBDS encoder at no cost to the station along with the added ability to transmit non-emergency information — song titles, call letters and slogans — that ultimately allows them to monetize listenership with the MySimBook application. Emergencies are local as is broadcasting; the deployment of Alert FM gives broadcasters a new opportunity to help safeguard their communities.

Google N6607
New: Google Radio Automation, the world's first third-generation automation system, combining the simplicity of SS32 and the power of Maestro into one product. Beyond simplicity and power, Google Radio Automation gives you unprecedented flexibility with an open interface to other systems. The interface allows other systems to exchange data with Google Radio Automation, control it or be controlled by it. With a customizable widget-based User Interface at their fingertips, users will enjoy unmatched integration with other systems such as music schedulers, EAS equipment, phone systems and more. If your needs include Webcasting, podcasting, remote voice tracking and content sharing, Google Radio Automation provides complete solutions for those applications, as well.

Hamlet N1531

Harris Broadcast Communications N2502, N4202, N4206
New: The ZX5000 transmitter is the latest in the range of ZX transmitters, comprising five models ranging from 500 watts to 5 kW of power. The Harris ZX5000 offers a compact size for a 5 kW transmitter for analog FM and HD Radio broadcasting, and comes in a single-rack solution with an exciter and signal processing gear. Supports tri-mode operation with on-the-fly switching between analog FM operation, HD Radio digital-only operation or FM/HD Radio common amplification broadcasting. Also on display, VistaMax Software Tools enhance everyday accessibility of the Harris VistaMax Network Audio Management System. VistaTouch is a Windows Computer Client Application that expands the access of common show-specific and day-part tasks for studio personnel. The presentation is simple and visually oriented, and provides a secure democratization of control to everyday users. Also: Harris will introduce the SynchroCast3 and IP simulcasting capability to its Intraplex NetXpress IP multiplexer. With SynchroCast3, Intraplex NetXpress customers now have the ability to use Harris' SynchroCast3 Single Frequency Network (SFN) simulcast technology on their IP transport networks. When used with NetXpress, SynchroCast3 allows broadcasters to create SFNs over IP links, which allows them to expand their coverage area and listener base. SynchroCast3 consists of upgraded hardware modules plus new software that interfaces SynchroCast3 technology with the Intraplex NetXpress audio over IP networking platform. Until now, SynchroCast3 has only been available on Intraplex multiplexers, which use dedicated, wired T1/E1 telco circuits. The addition of network interface module redundancy to the NetXpress IP multiplexer platform for the NIM-1 control module and MIU-201 interface module, and other modules virtual-

ly eliminates the potential for system-level hardware failure, especially when combined with existing power supply redundancy features. Also: The Harris DMB 670 air-cooled VHF Band III DAB-DMB transmitter is available in a new power level. The DMB 670-4000 provides high power density in a compact, lightweight package. DMB 670 series transmitters are versatile, providing simultaneous transmission of DAB digital radio and T-DMB mobile TV channels; and allowing multimedia broadcasters to convert to new mobile platforms.

HD Radio **N6724**
On Display: The HD Radio system allows AM/FM stations to broadcast digital signals in tandem with analog, offer crystal-clear sound, scrolling text, graphics, multiple channels of programming in a single FM frequency, and advanced services such as iTunes Tagging, traffic, all subscription free. 1,600+ U.S. HD Radio stations are now on the air, with 700+ offering additional content via multicast channels.

Heil Sound/Transaudio Group **N7039**
New: The PR 35 Dynamic Microphone is a large-diaphragm handheld. Drawing on technological advancements within the PR 30, it is designed for handheld interview or vocal use and produces unparalleled natural articulate sound over a wide frequency range. The PR 35 features a large 1.5-inch-diameter dynamic element on an internal sorbothane shock mount. New Heil technology features a unique dual wound voice coil with a magnet structure of neodymium, iron and boron, which create a magnetic field 10 times stronger than traditional magnets of other microphones. Coupled to the large microphone diaphragm, the results are sonically stunning. It is based on requests from FOH mixers for a version of the PR 30 that a singer could use in a traditional handheld manner. Users include Joan Baez.

Henry Engineering **N9023**
New: SixMix, a compact and comprehensive USB broadcast audio console, is the "missing link" that turns a PC or laptop computer into a complete broadcast studio. SixMix is a 10-input, six-channel broadcast console that's about the size of a laptop computer. The most important (and unique) feature is its integral USB digital audio interface. Connect a USB cable to any PC or laptop, and it's ready to record, edit and play digital audio with superb audio quality. This makes SixMix ideal for use with radio automation, digital production, news editing or Webcasting or as a self-contained emergency studio. Features include a Cue bus with Cue speaker, Monitor system with mic-on muting, a Mix-Minus output and Guest headphone facilities with full Talkback. SixMix offers the reliability of an analog console with the convenience and sound quality of digital audio. Retails for $1,195.

HHB **N8207**
New: HHB UDP89 universal disc player; HHB CDR882 dual burner CD recorder and player; Flashmic DRM85LI digital recording microphone with flash drive and line input.

Hitachi Kokusai Electric America Ltd. **C5018**

HME **C3022, SU10626**
New: DX300 Two Channel Digital Wireless Intercom System is a two- channel digital wireless intercom system that can support 17 users per base station in broadcast, live event and remote productions. Four-wire and auxiliary I/O are provided, allowing users to interface to most any wired intercom system. Remote users can operate up to 1,000 feet away on the BP300 programmable beltpac or the WH300 All-in-One Wireless Headset. WS200 Wireless Speaker Station is a digital wireless speaker station for the broadcast and production industries. The WS200 is compatible with the DX100 and DX200 Digital Wireless Intercom Systems. Powered by an internal battery sled or external power supply, the WS200 has an internal speaker and both an internal microphone and a headset connector to support most any intercom requirement. With an operating range of up to 1,000', the WS200 eliminates the need to maintain and integrate to a hard-wired intercom system. Also: HS15/HS15D Lightweight Noise Canceling Headsets.
Established Products: DX Series of digital wireless intercoms, PRO850 Multi-Channel Wireless Intercom Systems.

Holophone **N6438, N6435**
Established Products: H2-PRO, H3-D

IEEE Broadcast Tech. Society **Lobby 29**

Independent Audio **N4920**

INOVONICS INC. **N5829**
New: Model 720 RDS/RBDS Encoder — This product features USB and serial interface and works with any station automation system. The front-panel LCD screen shows incoming and outgoing data on the fly. Built-in diagnostics are included for easy installation and operation. *Model 525 AM Reference Receiver / Mod-Monitor* — This frequency-agile receiver is supplied with an outdoor antenna. Features include a simultaneous display of positive and negative modulation peaks. The unit retains AM measurement accuracy with hybrid-IBOC operation. Synchronous detector and selectable audio cutoff and alarm tallies are included. *Model 261 Digital Audio Processor - Rev. 2* — This "utility" stereo processor includes AGC, compression, limiting and independent pre-emphasis protection limiting. Rev. 2 software includes separate HF limiting function and is available as a no-charge upgrade for existing units.
Established Products: INOVONICS will demonstrate their entire range of radio broadcast products. These include analog and digital audio processors for airchain and production, AM and FM modulation monitors, RDS/RBDS encoders and decoders, and off-air translator receivers.
Mr. James Wood, Pres.
1305 Fair Ave.
Santa Cruz, CA 95060
(831) 458-0552, (800) 733-0552
Fax: (831) 458-0554
E-mail: jim@inovon.com
Web Site: www.inovon.com

International Datacasting **C8437**
On Display: Solutions for the distribution of broadband content via satellite with installations around the world. IDC products are used in radio and television networks, distance learning, digital cinema and IPTV distribution.

ISIS Group Inc. **N602**
New: Sonarae Audio Monitoring System from Graham-Patten Systems is an audio monitoring system for NLE operators who must provide critical monitoring of the audio associated with a video edit session.

Jampro Antennas **C2607**
Established Products: Penetrator HD Radio antennas; JLCP Antenna for Low-Power FM, Translator and Booster Stations; JTS Test Section; RCPU Patch Panel; JMPC-HD Antenna; JSHD-HD Antenna; RCHA-323-10HD Digital FM Radio Combiner.
Ms. Sonia Del Castillo, Sales & Marketing Administrator
6340 Sky Creek Drive
Sacramento, CA 95828
(916) 383-1177
Fax: (916) 383-1182
E-mail: sonia@jampro.com
Web Site: www.jampro.com

JBL Professional **N8229**

Jetcast **N8336**

JK Audio Inc. **N7929**
New: BluePack Wireless Interview Tool allows live man-on-the-street interviews through a cell phone equipped with Bluetooth wireless technology. This sleek belt pack provides a professional look and feel to field reporters and remote talent. BluePack pairs to your cell phone like a Bluetooth wireless headset. This professional microphone preamp and powerful headphone amplifier make sure the message gets through. A 3.5 mm stereo line input jack allows recordings to be mixed into the broadcast. The 3.5 mm stereo line output jack provides your full-bandwidth microphone signal on the left channel and Bluetooth audio on the right. The 1/2 watt stereo headphone amplifier will cut through any crowd noise. BluePack also pairs to Bluetooth-equipped sound cards and music players in full bandwidth stereo A2DP mode. Also: RemoteAmp Two Stereo Headphone Amplifier provides a listen-only connection for mono IFB or full-bandwidth stereo music listening. Separate volume controls for the XLR and 3.5 mm line input jacks allow a simple mix of mono and stereo sources. The 1/2 watt, 1/4 inch stereo headphone jack will cut through any crowd noise. Connect an IFB earpiece to the 3.5 mm earpiece jack for mono operation.
Established Products: AutoHybrid, ComPack, Broadcast Host, innkeeper PBX, PBXport, RemoteMix C+, RemoteMix Sport, RemoteMix 4, innkeeper 1x, innkeeper 2 & 4, THAT-2, Daptor Two, Daptor Three.

Junger Audio Studiotechnik GmbH **N2636**
New: C8086 M — Level Magic Surround with Meta Data Generator (for Dolby encoding); C8601 — Dolby E Decoder for the C8000 Audio Processing System; C8611 — Dolby E Encoder for the C8000 Audio Processing System; C8612 — Dolby Digital Encoder for the C8000 Audio Processing System

Kathrein-Werke KG **C5508B**
New: FM, TV, DAB, DMB, DTV, DVB-T, DVB-H broadcast antenna systems.
Established Products: Transmitting antenna systems, combiners & filters.

Kintronic Labs Inc. **N6816**
New: Web-accessible Transmitter and Pattern Controllers, customer-specified Web-based interface for remote operation, configurable application security, alarm notification via e-mail, alarm history, automatic pattern switching with atomic clock synchronization, custom reports of controller operation in various formats, key-operated interlock bypass to permit transmitter operation into dummy load, provisions for transmitter RF mute, antenna safety interlock and dummy load air interlock, failsafe switching logic to prevent switch movement with RF applied, adjustable duration switching window for solenoid protection and to permit operation of any type of RF switch; Also, FM Translator Isocouplers for AM station re-broadcast. Model FMC-1.5 isocoupler permits the co-location of an FM translator antenna on a hot AM broadcast tower; Array Solutions Model PowerAIM120 Vector Impedance Analyzer for commercial broadcast, measures RF parameters, VSWR and return loss; parameters can be measured at the PowerAIM RF jack or referred to the end of a transmission line, plots can be linear data plots, Smith charts and dual Smith charts, great for IBOC network adjustment applications, line lengths and phase delay of transmission lines, operates with up to 50 volts peak-to-peak RF input to the instrument, instrument is self-protected against RF input overload, calibrates to NIST standards, large selection of software tools, outputs can be saved, printed and imported into spreadsheets.
Established Products: AM/MW HD-ready omnidirectional, directional and multiplexed antenna systems for fixed or mobile applications; AM/MW dummy loads rated from 1 kW to > 1 MW; AM/MW transmitter combiners; tower folded unipole kits; pre-fabricated tuning houses; RF switches; RF components, including fixed and variable inductors, wall feed-through assemblies, ELF, VLF and LF antenna systems; HF antennas and baluns.

Klotz Digital Audio Systems Inc. **N5925**
New: Vadis Shared Control Management module manages the use of sharing resources through a LAN infrastructure, such as central play out systems, freely assignable announcer booths, remotely controlled MIC preamps, pools of telephone hybrids and codecs, central devices and devices in other studios or areas. It provides access to all device-specific parameters, functions and attributes to allow a quick operation. Vadis Remote Source Assignment module allows the studio console selection of remote router sources in the same manner as local sources. It provides the communication between a mixing console and a central router. Router sources are assigned to the console on a need to use basis. Vadis Air Chain Management (ACM) — Intelligent management of the workflow from studio to air chain from anywhere in the station. ACM features automated management of the main outputs of a system; it enables each room, studio, etc. to request any available transmission feed. There's seamless assign of the appropriate output to the feed. Vadis Return Line Management module manages the access and control of central resources with associated return lines (mix minus lines), such as central telephone hybrids, ISDN codecs, bi-directional outside broadcast van feeds, satellite links, etc. Features include conflict resolution and routing of return line output for a flexible automated and or manual selection of the return feed content. Vadis Time Switch Software is a powerful software tool for radio stations that require the automation of audio switching. It allows the connection of single or multiple sources to destinations based on a schedule. A database is used to store the connection information, along with date and time info. It is possible to create connections which recur daily or weekly. Different routings can be stored as a group for precise switching in real time.
Established Products: Vadis, Vadis D.C.II On-Air Console, Decennium Customizable Digital Audio Console, Aeon Audio Networking Console, Xenon - Digital Stand Alone Console.

Kowa Optimed **N6938**
Established Products: The PX-10 is an audio hotkey player that can play audio clips at the touch of a button. By using either a USB or compact flash card to store up to 2 GB of audio clips, the PX-10 eliminates the burden of a hard drive. Using an easy software program (included) to set up playlists on a PC, simply save them on a USB drive or flash card and plug it into the PX-10. Then have the luxury of controlling six pages of 50 instant playback keys with programmable effects such as faders and volume control. Since playlists are stored on a USB drive or compact flashcard, radio broadcast users may share the same PX-10 itself yet use their own personalized playlists.

LARCAN USA **C2618**
Established Products: FM Series of translators/transmitters.

Lawo North America Corp. **N8720**
Established Products: mc²90 - No Compromises, mc²66 - Inspired by your Needs, zirkonXL - Perfect on-air.

LBA Technology Inc. **N8733**
New: CAMI AM Tower Isolator simplifies future AM/FM translator installs, new-concept broadband medium-power isolators for AM towers; CAMI isolation systems permit other antennas to be mounted on "hot" AM towers; CAMI systems are targeted to isolate single auxiliary broadcast coaxial cables for STLs, FM translators, low-power FM and television translators; also have the advantage of passing AC or DC current to tower top amplifiers, and are more resistant to weather and lightning. Also: RF Vacuum Contactor, a new generation of RF power contactors that responds to the needs of broadcast, communications and industrial radio frequency users of heavy-duty RF relays; VC-1 vacuum contactor system permits a wide range of operating voltages, and can be configured at any time for 1PDT through 4PDT operation; a direct replacement in many broadcast applications up to 50,000 watts.
Established Products: High-power ATUs, filters, diplexers, triplexers, combiners, directional antenna and grounding systems.

Linear Acoustic Inc. **C2151**

Linear s.r.l. **N4831**

Logitek Electronic Systems **N7124**
New: Mosaic console enhancements — For Logitek control surfaces, the vScreen Software suite has been updated to provide support for 5.1 metering. The free heads-up display utility, vChange, has also been updated to include 5.1 meter displays. The number of virtual LEDs in the meter stacks has been increased to provide smoother, more accurate audio level displays. Logitek's Supervisor Software has also been updated with expanded trigger tables. Other products are to be announced at the show.
Established Products: Mosaic and Remora control surfaces; vScreen configurable GUI; Audio Engine router; full line of audio level meters

Masstech Group Inc. **SU13813**

Mayah Communications GmbH **C10619D**
New: Flashman II Portable Audio Recorder & Codec has two mic/line inputs (XLR, 48V phantom powered) and a headphone/line output. It records to SD cards or USB sticks in three basic formats: PCM WAV (BWF), MPEG Layer 2 and Layer 3 or using the advanced MPEG-4 HE AACv2. Basic connectivity of Flashman II is provided over IP/Ethernet interface for any type of IP network or Internet access. With optional cards the device also supports WLAN/WiFi or UMTS/3G wireless networks. MPEG-4 HE AACv2 for high quality at the lowest bitrates and AAC ELD (Enhanced Low Delay, implementation from Coding Technologies) for high quality with very low delay are offered for audio transmission. Conventional broadcasting algorithms such as MPEG Layer 2, Layer 3, G.711, G.722 and linear are also available. Fully compliant with EBU Audio-over-IP Standard, Flashman II uses a combination of SIP/SDP/RTP for automation of the IP connections and thus secures the highest mobility and interoperability. Also: Sporty Reporter Codec — Sporty can transmit audio over IP/Ethernet, as well as over optional UMTS/3G or WiFi/WLAN interfaces. Also available is ISDN with worldwide standards support and MAYAH Flashcast technology for automatic recognition of virtually any ISDN codecs. Sporty also can communicate over analog telephone lines (PSTN). Automation of the IP connections, real mobility and interoperability are secured by SIP/RTP according to the EBU recommendations. For live transmission Sporty offers MPEG-4 HE AACv2 and AAC ELD (Enhanced Low Delay, implementation by Coding Technologies). Standard algorithms such as G.711, G.722, MPEG Layer 2, Layer 3 and linear audio are available as well. Integrated SD card or USB interfaces can be used for audio logging in MPEG-4 HE AACv2 as well as in the conventional formats, PCM WAV (BWF), MPEG L2/L3. Sporty is an tool for any reporter or commentator.
Established Products: Centauri II Multichannel Audio Gateway Codec for IP, ISDN X.21/V.35 & DVB ASI networks with a range of coding algorithms.

Microsoft Corp. **SL14500MR**

Microwave Radio Communications **C1807**

Middle Atlantic Products **SU10205**

Minnetonka Audio Software **N3215**

MOG Solutions **SU7530**

Moseley Associates **N7112**
On Display: Starlink digital STL solutions featuring AES digital audio and Ethernet data transport required for HD Radio broadcasting. Starlink SL9003Q-2SLAN & SL9003Q-4SLAN are the first digital STLs to provide Ethernet data channels. Lanlink HS900D LAN Extender/Data Link which provides bi-directional Ethernet and serial data link in the license-free 900 MHz band. Starlink SL9003T1 for T1 circuits transport digital program audio, Ethernet, control data and telephone voice circuits over bi-directional T1 lines or license free 5.8 GHz links.

MultiDyne Video & Fiber Optic Systems **SU3411**

Musicam USA **N5825**
Established Products: High-performance audio codecs for connection over IP, ISDN and digital leased networks. The Suprima offers universal connectivity over IP, ISDN and X.21 in one package. Coding algorithms include MPEG2 AAC, MPEG4 AAC LD, AAC-HE, MPEG Layer 2, 3 and APT-X Standard and Enhanced. SIP/SDP/RTP protocols are supported according to the standard for IP compatibility Tech 3326 defined by the N/ACIP project within the EBU group. The RoadWarrior gives you the features of the Suprima in a compact, travel-friendly package with a five-channel input mixer. The SupriMAX is a multi-channel IP codec capable of holding up to 14 Suprima codec modules in a single 3 RU rack for high-density applications. The SupriMAX-1U holds up to four Suprima codec modules in a single 1 RU rack, perfect for medium-sized applications.

Myat Inc. **C2215**
New: FM Switching Combiner, high-power handling in a more compact design; FM Low-Loss Digital/Analog Combiner, provides low loss of digital power when using high-level combining without wasting 90 percent digital power; DAB bandpass filters provide critical or non-critical filter response.
Established Products: IBOC, HD Radio, bandpass filters, combiners, coax switches, ejectors.

Nagra USA Inc. **N3214, R203**
New: Nagra VI six-channel portable digital recorder features four microphone inputs, digital I/O, full time code and iXML compatibility, battery operated, internal hard drive and removable CompactFlash media, 3.5 inch color, sunlight-readable TFT display, 24/96 recording capability; NAGRA LB two-track portable broadcast recorder with editing facilities, color displays, USB 2.0 and Ethernet connections, offers Bluetooth communication, designed for broadcast but is suitable for other applications.
Established Products: ARES-M, ARES-MII, ARES-PII+, ARES-BB+

Nat'l Assn. of Tower Erectors **C1431**

Nautel **N7116**
New: Nautel will demonstrate additional applications of its Reliable HD Transport Suite (which won a "Cool Stuff Award" at the 2007 NAB show) including multi-site satellite distribution of HD Radio content and options to transport the main analog audio channel on a low-bandwidth link. In addition Nautel will unveil announcements addressing AM, FM and digital solutions. Our expanded engineering team has been busy over the past 12 months and will present four presentations at NAB touching on topics such as "the implications of IBOC injection levels above –20 dB."

NDS **N6812**

Netia **N5433**
New: Radio-Assist 7.5 digital audio software enhanced with Web-based capabilities that allow journalists to browse, access and edit audio clips from their station's database, streamlining the workflow processes of content creation and production; new audio switcher for Radio-Assist that manages switching from national to regional broadcasting; audio switcher includes an audio input for national program content and an internal sound card that allows regional commercials to be cut into the national program; Radio-Assist U-Share Integration automates the exchange of content over the latest transmission platforms — IP transport or DVB video transport — for management of content distribution; U-Share optimizes the exchange of video and audio content through autonomous and automatic management of its transport network; Radio-Assist 7.5 is bundled with Axia IP-Audio networking components that allow audio workstation PCs running Windows to send audio to an Axia audio network from its network interface card, bypassing the need for PC sound cards.
Established Products: Manreo, Feed-in IP Mode, Warehouse Web 2.0, Media Logging.

Neutrik USA **N9029**
New: IP65-rated OpticalCon fiber optic connector system has upgraded for dust-tight and water jet protection; upgrade extends outdoor capabilities of the OpticalCon, making it suitable for mobile trucks and other outdoor broadcast settings; seals the connector against dust and protects against water jet, useful when weatherproof extensions are required; additional seals and gaskets have been employed on the chassis connector and cable ends to achieve a water-resistant IP65 connection; upgrade kit is offered for earlier versions of OpticalCon so it can be combined with the upgraded NO2-4FDW chassis connector or NAO2-4S75W coupler; cable ends are backwards-compatible and work with existing chassis installations; 32 Amp PowerCon is a locking 3-conductor AC connector system with contacts for line, neutral and pre-mating ground, suitable for high-power distribution systems, replaces appliance couplers wherever a rugged solution, in combination with a locking device, is required to guarantee a safe power connection; system consists of two connectors: a chassis receptacle and an in-line cable connector with locking mechanism.

NewBay Media **N4930, SL10229, C11837MR**
New: Parent company of Radio World, NewBay Media provides professionals in audio, musical instruments, video, broadcast, systems installation and recorded media/storage with the information they need to excel in their business and craft, and make vital business connections. Built upon an information network of award-winning magazines, online communities and news wires, conferences and events, and marketing services, NewBay Media reaches more professionals worldwide than any other information resource.

Non-Stop Music **SL10615, R306**
New: Version 2 of Non-Stop Music's online search site, CUEgle.com; new features include ability to preview tracks in QuickTime, Windows Media Player or flash; instant access to CUEgle.com upon registration; stronger searching and advanced searching and organizational tools, and ability to download high-resolution MP3 or WAV files.

NPR Satellite Services **C4237**
Established Products: NPR Satellite Services is a full-time C Band satellite space segment provider specializing in building and designing radio and video net-

SURE BETS

A Little Bit of New Jersey on the Strip

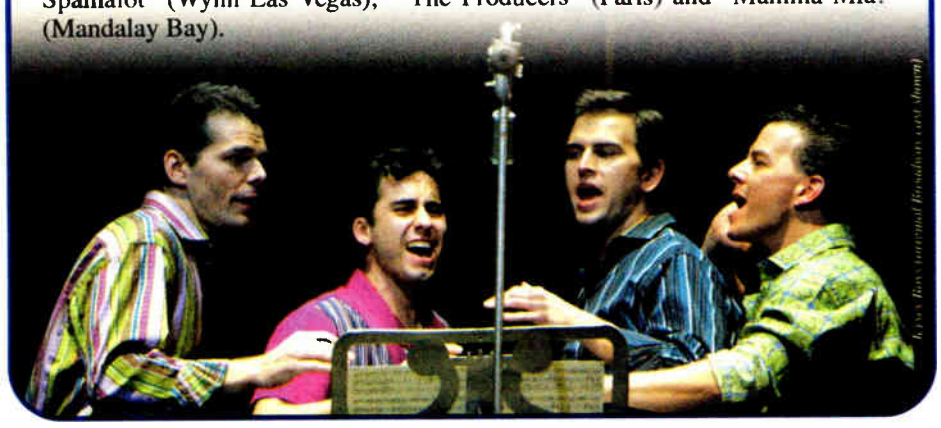
The Broadway musical "Jersey Boys" has come to the strip at the city's newest resort/casino, The Palazzo.

The 2006 Tony Award-winner for Best Musical is the biography of four working-class guys from the streets of Newark who formed the Four Seasons featuring lead singer Frankie Valli. A "feel good" story, it chronicles the group's musical odyssey from singing harmony on their neighborhood street corner to creating such hits as "Sherry," "Walk Like a Man," "Big Girls Don't Cry," "Can't Take My Eyes Off You" and "Oh, What a Night."

New York Times critic Ben Brantley called the show a cross between "Dream Girls" and "Goodfellas." Jeremy McCarter in his review said, "The real source of the show's power — obvious as it sounds — is the songs. Des McAnuff (the show's director) shows a rare, laudable willingness to stick his finger in the electrical socket of pop music, to take full advantage of the band's potent catalogue."

Show time at the Palazzo Theater is 7 p.m. April 11–18 with additional 10 p.m. shows on Saturday and Thursday. Advance reservations are suggested.

If the '60s aren't your bag, you can try for tix to a number of popular Broadway shows such as "Phantom of the Opera" (Venetian), "Monty Python's Spamalot" (Wynn Las Vegas)," "The Producers" (Paris) and "Mamma Mia!" (Mandalay Bay).



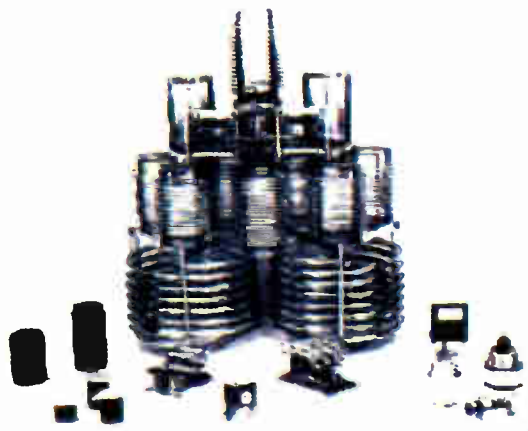
AM Antenna Solutions

LBA Technology - your trusted supplier of digital engineered AM antenna systems. LBA customized products include **Directional Antenna Systems, ATU's, Multiplexers, Combiners, Cellular/PCS Colocation Isolators, and RF Components** for all power levels. We offer complete RF project design, management, procurement and installation services.

Directional Antenna Systems

Diplexer/Triplexer Systems

High-Power Antenna Tuning Units



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SINCE 1963

works. NPRSS, with more than 25 years' experience, helps broadcasters reach new markets while providing cost-effective solutions. NPRSS offers the satellite capacity to meet your broadcasting challenges. We provide system designs using the newest compression methods to save bandwidth while lowering your costs. Talk to us about HD Radio over satellite and custom-designed solutions.

Oldcastle Precast Services **N2532**
On Display: Equipment shelters and turnkey construction services, suitable for transmitter sites, in a variety of sizes including designs for large square footages.

OMB Sistemas Electronicos **C3024**
On Display: FM radio transmitters (15 W up to 10 kW), TV transmitters (15 W up to 10 kW), STL systems, antennas for FM radio and TV. Headquarters and factory in Zaragoza, Spain, with its International Division located in Miami.

Omnia Audio **N7620**
New: Latest addition to the family of Omnia One audio processors is the Omnia One AM. AM stations no longer have to choose between budget and big-market audio performance; Omnia One AM features the latest advances in DSP hardware and manufacturing techniques, packing an advanced four-band AM processor in a single rack space. Omnia One AM gives stations the "Omnia Sound," utilizing a wideband AGC/leveler, four-band AGC and an independent four-band limiter section with shared precision linear crossover. Omnia One AM also gives broadcasters Omnia's advanced NRSC toolkit and distortion-managed final limiter/clipper that includes selectable low-pass filters for AM HD transmission installations.

Omnirax **N4517**
New: At press time we are putting the finishing touches on two major projects in New York City. WNYC Public Radio is relocating its facility to a new location in the West Village. The scope of this project comprises upwards of 40 rooms, including six air and five production studios. Omnirax is also furnishing Clear Channel's consolidation of five stations under one roof on the Lower West Side. This is our first large-scale design utilizing Corian solid-surface, featured in the design of 10 futuristic air studios. This project will total nearly 30 rooms when completed.
Established Products: Innova line of broadcast furniture offers a welcome departure from the usual "off-the-shelf" studio design. We work directly with chief engineers, program directors, architects and station owners to provide unique, ergonomic custom solutions at near-production prices. This service is perfect for stations designing a single room or a multi-room facility.

OMT Technologies **N8420**
New: Fifth-generation release of iMediaTouch includes 20 new features and user interface enhancements for touch screen and "Drag 'N' Drop" functionality. On-Air v3 features include audio backup at the tertiary level (operate off local hard drive or redundant server) with restoration of configuration settings and database entries for added peace of mind in a "server down" emergency; sports broadcast affiliates can benefit from fully automated baseball, NASCAR and even local remote sports broadcasts, all done in one daily log; automated hooks builder for airing "Coming Up Next" front sell and promos; "Cart Style" screen display with static cart decks within the on-air module, user selectable; Enhanced Phone Bit Recorder and WAV form editing features within the on-air screen; "On-Air Screen Audio Library" display with Drag 'N' Drop feature into the main On-Air log; "CanCon" feature for Canadian broadcasters that displays a "play percentage" of Canadian content or emerging artists for CRTC requirements; and Enhanced Dual LCD Monitor On Air capability for Showlog Hot Buttons, Audio Library, Copy on Screen, Production, On Air Voice tracking (just add a second LCD monitor).
Also *New:* iMediaLogger v3 and its new SQL database backend WebSecure+.

Orban/CRL **N8536, C3447**
New: Optimod 8585 Digital Surround Audio Processor. Starting with the technology of the Optimod 6300 two-channel processor for digital transmission media, the 8585 takes this technology to the next level by incorporating multichannel processing that reflects the latest psychoacoustic research into loudness perception. Also: Autogram/CRL AudioBridge features a multi-format audio interface with analog, AES/EBU, USB 2.0 and IP Audio connectivity. Each input can be routed to virtually any output. Features high-resolution 24-bit analog-to-digital and digital-to-analog conversion with selectable conversion rates up to 192k samples per second. CobraNet IP audio allows real-time, high-quality digital audio transmission over an Ethernet network. Other IP Audio standards will be available soon. The AudioBridge's USB port supports streaming audio to or from Windows or Mac PCs. Its AES/EBU output can be synched to an external AES-11 digital audio reference signal or to the AES/EBU input. The AudioBridge offers an integral headphone amp to monitor any source and an intuitive menu interface for configuration and status information, in a compact 1U rack-mountable chassis.

P+S Technik GmbH **C10319**

Patriot Antenna Systems **OE103**

Phillystran **N5132**

pinta acoustic **N6814**

Potomac Instruments **N6226**

Power Module Technology **N9109**
New: The LCFM-350 is a linear, Class AB, pallet amplifier designed for FM and HD Radio broadcast applications. Providing 350 watts minimum CW output power and featuring a patented, rugged design. This high-power pallet is matched for 50 ohms input and output. The LCFM-350 building block provides an excellent value for the transmitter integrator with high performance and low cost. Also: The LCFM-100 is a low-cost, 100 W, linear, Class AB pallet amplifier for FM and HD Radio broadcasts in the 88 MHz to 108 MHz range with 11 dB gain. Superior performance offering high efficiency and power in a small pallet footprint, matched for 50 ohms input and output. Also: The LCFM-50 is a low-cost 50 W Class AB, pallet amplifier with 11dB gain for 88 to 108 MHz applications.

Pristine Systems Inc. **N8831**
New: CDS32 version 4.5. Features include support for ID3 tags, RDS Radio Text, XML (podcast) item creation, interfaces to streaming services and automatic Web site content generation; Smart Promo feature automatically produces professional-sounding "Coming up next"-style promos. Also: BlackBox version 2.0 digital audio logger, monitor and alert system is a radio and television audio logging product designed to meet compliance, proof, audit, programming, management and engineering needs; up to 16 stereo (or 32 virtual mono) channels of logging; choose from various WAV audio devices, and AM, FM and TV tuner boards; most popular audio storage formats are supported; advanced tools help the program director or consultant review or analyze the market; time-based and microphone skimmer modes are included; a "virtual radio"-style player allows switching between multiple stations during playback; real-time monitoring of audio level and RF signal strength (when equipped with ASI tuner boards) with an alarm system provides quick alerts to help avoid lost air time; alert e-mail and audio file Web server included.

Propagation Systems Inc. (PSI) **C2324**
Established Products: Power-Tiller, Slant-V, PSICB Series for FM, PSIFLV.
Mr. Doug Ross, President
719 Pensacola Road PO Box 113
Ebensburg, PA 15931
(814) 472-5540
Fax: (814) 472-5676
E-mail: sales@psibroadcast.com
Web Site: www.psibroadcast.com

PTEK **N9008**
New: Low-cost, high-quality Kilowatt Series of power amplifiers and transmitters designed and manufactured in San Jose, Calif. The Kilowatt Series includes a number of 1 kW power amplifier modules, a combiner, an exciter and a 19 inch rack cabinet. The new lightweight 1 kW modules can be operated independently, giving the user greater flexibility. Features include redundant solid-state power modules, remote control, hi-load VSWR turndown, over-temperature protection and built-in low pass filter. PTEK designs and manufacturers all products in San Jose and provides a three-year warranty.

QEI Corp. **N6223**

Qualcomm/MediaFLO C2946

Quintech Electronics and Communications Inc. **C8737**

Radio Advertising Bureau **Lobby 2**

Radio Frequency Systems **C2321**

Radio Systems **N6516**
On Display: Digital and analog consoles, distribution amplifiers, clocks and timers and StudioHub+ CAT-5 wiring solution.

RadioTraffic.com **N6123**
New: Scott Traffic, a traffic, billing and customer relationship manager for radio; E-mail My Times, automatically sends scheduled times for future commercials, works with most traffic and billing systems and studio automation.
Established Products: RadioWeather.com

Radio World **N4930**
New: Now part of NewBay Media, Radio World is the industry's most trusted source of news and technology analysis, now in our 32nd year. New columns and features include Green Radio, profiling innovators in environmentally friendly broadcasting facility management; Radio Road Warrior, with tips for the field reporter; and special Survival Guide supplements on topics like radio in the post-iPod era. If you sell transmission equipment, studio gear, infrastructure products or management services, use RW to reach engineers, independent consultants, corporate capital managers, station owners, IT experts — highly qualified readership and purchasing decision-makers.
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(703) 852-4600
E-mail: cvanveen@nbmedia.com
Web: radioworld.com

RadioSoft **N7736**

RCS **N5917**
New: RadioShow — Keeps your station in front of the listener — no matter where they are, what they are doing or which digital platform they are using. Enhance your station's programming on the air, in the car, on the Web or on a handheld device with RCS RadioShow. Use today's latest technology to reach more listeners in more ways. RCS RadioShow creates a reason for listeners to come to your station's site with their Web browser, cellphone or other digital platform to see valuable information like song titles and artist names of the music playing on the air. RCS RadioShow shows what is on the air in real time, synchronized to your terrestrial station's audio. Dazzle your audience with animated graphics and information from artist notes to RSS feeds. With RCS RadioShow you can add visuals synchronized to your audio stream. From CD covers and artist graphics to station photos and sponsor logos, the branding matches your station look. Now your advertisers can be seen as well as heard. RadioShow gives you the opportunity of selling visual advertisements synchronized to your existing audio inventory; *Visual Radio* — RCS is working with Nokia, the world's largest cellphone company, to bring Visual Radio to mobile phones all over the world. Now

you can order RadioShow for the Internet and Visual Radio for the cellphone and use the same creative content for both platforms; *RCS HD Importer* — Radio has truly become interactive with the recent news that tagging will allow listeners to select songs on HD Radio for later review and purchase on iTunes. To take advantage of this technology, RCS HD Importer supports the recently launched HD Radio application of iTunes Tagging. The RCS HD Importer enables advanced radio capabilities, like multicasting and datacasting. As a stand-alone module, it can work with any automation system and integrates seamlessly with NexGen.

Established Products: GSelector, NexGen Digital, Selector, RCSNews, Master Control

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Web Site: www.rcsworks.com

RDL Radio Design Labs **N6429**

Rohde & Schwarz **C1933**

Rohn Products, Div. of Radian Communication Services **C2632**
Established Products: Broadcast structures anc broadcast antenna mounts.

RTNDA Showcase **R311**

RTW GmbH & Co. **KG N3223**
New: RTW overhauled its SurroundControl family of eight-channel surround monitoring controller systems with downmix matrix for professional production, post-production and broadcast that controls, monitors and analyzes surround sound using RTW's Surround Sound Analyzer; SurroundControl 31900SD (19 inch/1U case) and 31960SD (half 19 inch/3U rack-mountable module for standard 19 inch installation racks for waveform monitors) features an HD- and SD-capable SDI de-embedder interface, and analog and digital audio in- and outputs. SDI interface can access the 16 (4 x 4) audio channels implemented in SDI streams, and use them for visual display and audio monitoring. Standard and SDI versions of SurroundControl are available with a Dolby E and Dolby AC-3 decoder option, giving access to coded data streams for analysis and control without external decoding; SurroundMonitor 11900 system analyzes digital and analog multi-channel, and 3.1, 5.1, 6.1, and 7.1 surround sound, using Surround Sound Analyzer, suitable for displaying stereo, multi-channel and surround sound, scalable and flexible enough to handle future hardware and software expansions, adds an HD- and SD-capable SDI de-embedder interface for visualizing channels implemented in SDI streams.

RVR Elettronica S.P.A. **N5220**

Rycote **N8511**
New: The InVision "lyre" suspension isolates small, high-quality microphones where a discreet low profile is important, can be used for "compact" microphone series, "remote capsule" systems and some short- to medium-bodied small-diaphragm microphones; InVision Suspension Series is for studio and installed sound use and does not have the ability to be used in conjunction within a windshield; The Duck Raincover is a waterproof roof for the Modular Windshield and S-Series windshield systems, for use in static outside broadcasts such as sports stadiums and golf courses, reduces rain noise and keeps the microphone dry; Windshield 10 Kit, for use with the Sennhesier MKH 8000 Series with MZX 8000, kit consists of a small modular suspension, Windshield 10 and Windjammer 10.
Established Products: Modular Windshield system, Modular Suspension, Windjammer, Connbox, S-Series Windshield System, Softie System, Softie CCA Mount, Smoothies, Mini Windjammers, UnderCovers, OverCovers, Stickies, Lavalier Furries, Hot Shoe Extension.

Rymsa/Micro Communication **C2624A**

Sabre Towers and Poles **N5938**
Established Products: Designs and manufactures broadcast towers for AM, FM or TV; our in-house, licensed engineering staff can design a tower for your specific needs. From custom FM support sections to turnkey AM installations, we deliver quality products at competitive prices with the shortest lead times. Sabre Site Solutions, our components division, offers pre-engineered lightweight towers along with a broad selection of tower parts and accessories.

Sennheiser **N8207**
New: EM3732 Receiver; MKE400 mini camera mount microphone; MKH8000 TWIN stereo capsule condenser microphone.
Established Products: MKH Series, Shotgun microphones, wireless microphones, broadcast boomsets

Shively Labs **N6424**
New: Band-pass filter offering four-pole response in a three-pole package. See our 10 kW balanced combiner using these filters and our new compact hybrids designed to fit within the tightest spaces. New universal mounting system offers versatility for the range of Shively side-mount arrays and our improved range of coaxial components will include new coaxial switches rated up to 850 MHz and offering fast, 3 second cycle times. Our expertise as a directional antenna designer is well established, but we also certify yagi arrays regardless of manufacturer for FCC compliance. Our two test ranges are operated daily by our full-time technician with over 14 years of experience under the direct supervision of Bob Surette. Visit our booth for information and sample measured patterns.

Shure Inc. **N2830**
Established Products: Wireless systems, microphones, in-ear monitoring systems, earphones, mixers and digital signal processors, field production products, wireless accessories.

Siel Broadcast S.p.A. **N9323**
New: Siel Broadcast S.p.A. is the result of the merging of Siel S.r.l. into Siel Television S.r.l., company offers FM, TV, DAB, DVB-T and DVB-H broadcasting equipment; EXCXXX5GT FM Transmitter Series, designed to comply with the latest international standards and requirements of advanced broadcasters, meeting tight specifications at an affordable cost, hi-fi-quality modulated signal with low residual noise and distortion, RF signal is free from spurious and harmonic components; TB02-XXXFL FM high-power transmitters with liquid cooling system.
Established Products: FM transmitters (TB02 series) are normally provided in solid state (liquid or air cooling system), with power up to 40 kW.

Sierra Automated Systems SAS **N6520**
On Display: Audio routing, mixing, console control surfaces and intercom systems for radio, networks and television. SAS Connected Digital Network routing can be expanded to up to 8,000 inputs and outputs, analog or digital. New TCP/IP connectivity to interconnect via Internet or WAN. Rubicon series of broadcast control surfaces handles everything from a large all-talk facility to a small voice-over booth.

SIRA Srl **C1328**

Society of Broadcast Engineers **Lobby 27**

Sonifex Ltd. **N4919**
New: Reference Monitor series rack-mount audio monitors including the RM-2S4 Reference Monitor (two LED meter, four stereo channel audio inputs), the RM-2S10 (two LED meter, 10 stereo channel audio inputs) and RM-4C8 (four LED meter, eight channel inputs, dual selectors). Each 1U device offers loudspeaker monitoring and high-resolution metering of four or 10 stereo audio sources (more with optional expansion card). Sources may be in any mixture of analog and AES/EBU digital formats, with sample rates up to 192 kHz accepted and a five-band parametric EQ to tailor for the room. Sources selected via rotary encoder. A pair of line-level audio outputs, configurable as analog or AES/EBU digital, follow selected source at fixed level or mirroring loudspeaker volume. Open-collector alarm outputs provide hardware indication of sustained underlevel, overlevel and phase errors. Also: Redbox RB-PD2 Stereo Profanity Delay featuring analog and digital I/O and an automatic audio stretch algorithm that allows between 2 and 55 seconds of delay to be built up while "on air" while maintaining correct pitch. Higher delay durations available at lower sample rates. The delay can also be acquired while playing a preselected audio file on a Compact Flash memory card. Also: Redbox RB-SC2 Dual Sample Rate Converter (192 kHz) is a 1U rack-mount that produces AES/EBU, S/PDIF and TOSlink optical level digital audio outputs from a balanced AES/EBU, S/PDIF and TOSlink optical level digital audio inputs. The sample rate of the outputs can be set by an internal clock or from external synchronizer sources. This is an enhanced version of the Sonifex RB-SC1. Also now shipping is the RB-OA3 unity gain on-air switcher.
Established Products: Redbox range includes digital audio converters, word-clock, audio and headphone distribution amplifiers, microphone and matching amplifiers, mixers, source selectors, silence detectors, limiters, a power controller and stereo to mono converters. The Net-Log 4 channel network audio logger records multi-channel audio for playback across a network. S2 analog/digital radio broadcast mixer, HY-03 & DHY-03 telephone hybrids, D:Scribe transcription system, talkback intercoms.

Sonnet Technologies **SL13808**
Established Products: Fusion D400Q and Fusion R400Q

Sound Devices **N7235**
New: Wave Agent Utility Software provides comprehensive metadata editing tools and file playback for sound files recorded with our 7 series digital recorders — the 702, 702T, 722 and 744T models. Compatible with Mac and Windows platforms.
Established Products: 702, 702T, 722 and 744T digital recorders, 302, 442, 442N field Mixers, MM1, MP1 microphone preamps.

Sound Ideas **SL9616**
New: World Series of Sound, a wide-ranging ambience collection. A single CD is devoted to a single country and a major city in that country. Each provides the audio essence of the country and city through its markets, malls, bazaars, countryside and urban sounds. Ambiences are recorded at 24 bit/96 k. The initial release features recordings from Bulgaria, France, Germany, England, Scotland, Ireland, Czech Republic, Greece, Italy, Netherlands, Portugal, Spain and Switzerland. Also New: Mix XII, featuring eight CDs designed for broadcast and delivering great music in the following broadcast categories: Corporate, Easy Listening, Jazz, Rock and News music. A CD of Music Elements will be included. It features music-genre specific stingers, intros, extros and transitions. Music will be available in Broadcast WAV format on the included DVD. Also, Production Elements Toolkit #4 is a selection of 600 imaging and production elements featuring Musical Accents like Arpeggios, Atmospherics, Beds, Hits, IDs, Rhythmic, Sweeps and Stops, Elements including Electro Acoustic, Vinyl Style, Bubbles, Drones and Transitions, Accents such as Sweeps, Swipes, Whooshes, Alarms, Beeps, Explosions, Impacts and Zaps. Also, royalty-free music, 19 full-length music CDs including Classical Favorites, Classical Music for Mellow Moods, Corporate Power, Corporate Success, Country Music, Percussive Dance Music, Adventure Music, Dramatic Film Score Music, Mystery and Suspense Music, Positive Easy Listening Music, Snappy and Smooth Jazz Music, New Age Landscapes, Hybrid Rock, Energized Rock, Romantic Emotions, Competitive Sports Music, Hi-Energy Sports Music, World Fusion and World Music.
Established Products: sound effects, production elements

SoundField **N7037**
New: DSF-1 digital microphone system. DSF-3 digital surround processor.

Spinner GmbH **C9619A**
New: Four-Cavity L-Band Dual Mode Filter for DAB and mobile TV applications; P=1600W; tunable and temperature compensated; coaxial switch 1-5/8 EIA, motor driven, optical position indicator, emergency manual operation, signal and interlock contacts, compact design, lifetime: > 250,000 switching operations; 60 kW UHF U-Link for Patch Panels with interlock contacts.
Established Products: Patch panels, loads, switches, connectors, rigid lines, direct access units.

SRS Labs **N4824**

Staco Energy **N4218**

Stantron **SU5613**
New: Rack-mountable shelf options. These sturdy shelves are available in clamp or cantilevered styles and come in a range of sizes. Our clamp shelves are used to rack-mount products not originally designed to be rack-mounted. There are two styles, one to support up to 25 lbs. and one that supports 50 lbs. Both boast installation-friendly features like adjustable top and bottom clamping hardware, low compression set foam padding to ensure a secure grip and pre-installed studs that eliminate fumbling with tiny hardware pieces. Cantilevered shelves are manufactured from steel or aluminum material and are available in solid, vented and mini-cantilevered design. Also new, aluminum and steel filler panels designed to block open spaces and provide a continuous and clean look. They come in a range of styles and sizes and are compatible with Stantron's E-Rack and Presentation Rack. Stantron manufactures both varieties in solid, perforated, vertical slotted or horizontal slotted styles as well as solid flat designs without flanges. The aluminum filler panels come in a variety of finishes to complement equipment and rack configurations.
Established Products: Stantron E-Rack, PowerOptions thin power strips, PowerMount system, LightingOptions, CoolingOptions.

Studer **N8229**
New: OnAir 3000 with improved features. Founded by Willi Studer in 1948, the company has become synonymous for broadcasting and recording equipment.

Studio Network Solutions **SL8208**
New: Evo, an advance in shared storage solutions for video workgroups, enables a team to share projects, media and other large files using connectivity options including 4 Gbps Fibre Channel and up to 10 Gbps iSCSI and NAS. Also, Ellipse Enterprise HBA — The new Ellipse Enterprise Fibre Channel Adapter delivers the ability for Mac servers and workstations to use the high-availability multipathing features in enterprise-class storage systems from IBM, EMC, LSI, Sun and others.

Summit Traffic **N8831**
New: Summit Traffic version 3.3 is a traffic, sales, inventory and billing system for radio, TV and cable. Real-time avails and dynamic spot scheduling mean inventory and sales reports are current. Up-to-date reports can be generated anytime without processing constraints. Horizontal/vertical spot and copy rotation with integrated script and automatic media numbering saves valuable time and reduces errors. Copy orders have an array of rotation specifiers and run time parameters and can be linked to multiple contracts easily. For maximum flexibility, spot placement can be specified by time, program or user-defined daypart. Helpful troubleshooting reports for missing copy, makegoods pending and schedule discrepancy. Multi-level user security settings, so each employee sees only the data they need.

Superior Broadcast Products **C1107**
Established Products: Transmitters, antennas and associated equipment.

Superior Electric **N8807**
New: Stabiline DIN2R & DIN3 Series Din Mount Transient Voltage Surge Suppressor Series. DIN2R and DIN3 Series offer maintenance-free, low-profile din rail-mountable, single-pole protectors that provide line to neutral, line to ground, line to line and neutral to ground protection. The L-N, L-G and L-L models utilize MOV technology, N-G models utilize Gas Tube Technology. All incorporate internal thermal disconnect systems with time-delayed Class J, 30A-125A over-current fuses. The DIN2R models are parallel connected devices that provide 40 kA surge current capacity. They feature a replaceable plug-in surge protection module and fixed base for easy installation and maintenance. DIN3 models can be connected in parallel or "in-line" with the load. Connected "in-line" they can provide 50A maximum continuous operating current protection. Models are available with surge current capacities of 70 kA, 100 kA or 165 kA. All meet UL 1449, 2nd Edition, ANSI/IEE C62.41-2002, CSA-22.2 & CE Marked and come with a 10-year warranty.
Established Products: Stabiline CS3 Series TVSS units use a hybrid parallel design, with individually fused MOVs that provide superior protection and continuous operation. Thermal disconnects protect against sustained over-voltage events. A 200 kAIC short circuit current rating allows for direct bus connection without the need for upstream over-current protection. CS3 units provide all-mode protection (L-N, L-G, N-G, L-L) and are housed in Nema 4 steel enclosures. Units are available in 50 kA, 80 kA, 100 kA and 200 kA per mode surge current capacities for single-phase and three-phase electrical configurations. Standard monitoring includes status indicator lights, service indicator light, form C contacts, audible alarm with silence button and surge counter. All are UL1449, Second Edition listed as well as cUL and UL 1283; 10-year warranty.

Switchcraft **C7508**

S.W.R. Inc. **C1133**

TASCAM **SL10328**

TeamCast **C3020**
Established Products: Modulators, gap fillers

Tektronix **N2520, C1051**

Telos Systems **N7620**
New: The Telos Audio Networks will be hosting live presentations Monday, Tuesday and Wednesday during NAB 2008. Along with Telos, Omnia and Axia product spots, we are excited to include guest speakers on industry topics such as studio integration, IP for studio broadcast and advanced tech for IP remotes. Telos Systems continues to show its leadership in talk show and codec products, showcasing the new Nx12 12-line Talkshow System, the Zephyr iPort MPEG Gateway that hosts six stereo MPEG AAC codecs in one box, and the 2007 "Cool Stuff Award" winner Zephyr/IP.

Teracom Components **C1318**

TFT Inc. **N7617**

Tieline **N8817**
New: The latest auto jitter buffer and IP stability management software for the Tieline G3 range of codecs. New auto jitter buffer software automatically samples the IP link then maximizes the audio quality and minimizes the delay over wired and wireless connections. The Internet is a lossy network which means some audio packets arrive in different order and some never arrive. Tieline's new stability management software uses multiple strategies for ensuring that the original audio from your live remote broadcast makes it to the studio with unrivalled quality, stability and continuity over the Internet. Tieline set the standard for audio stability over POTS and has evolved the technology into IP networks including the Internet and wireless 3G broadband networks. These enhancements for the G3 range of audio codecs mean that radio talent can get on with delivering superb quality content without having an engineer around to get connected.

TransLanTech Sound **N6124**
New: Ariane A+ automatic gain controller.
Established Products: Ariane Sequel AGC.

Southern Comfort in Las Vegas

The House of Blues Restaurant pays tribute to music and culture of southern blues. The décor features an eclectic mix of memorabilia and artwork.

"HOB" serves such southern and Cajun specialties as Creole Jambalaya, slow smoked Tennessee-style Baby Back Ribs and gumbos. On Sundays, the House of Blues gets Jesus with their Gospel Brunch, including food and music to "feed the body and the soul."

But it is blues and rock that keep bringing music fans in. Seven nights a week, the HOB offers a range of music with rock, reggae, rap, rockabilly, jazz and blues.

The Los Angeles punk band X will be featured on Saturday, April 12 at 8 p.m. X, formed in 1977, have achieved limited mainstream success but are considered one of the more accessible L.A. punk bands. Its hard-driving sound incorporates elements of country and blues.

San Diego heavy metal band Ratt takes the stage on Thursday, April 17. The band has sold an estimated 10 million records in the U.S. and is ranked 79th on VH1 "100 Greatest Artists of Hard Rock."

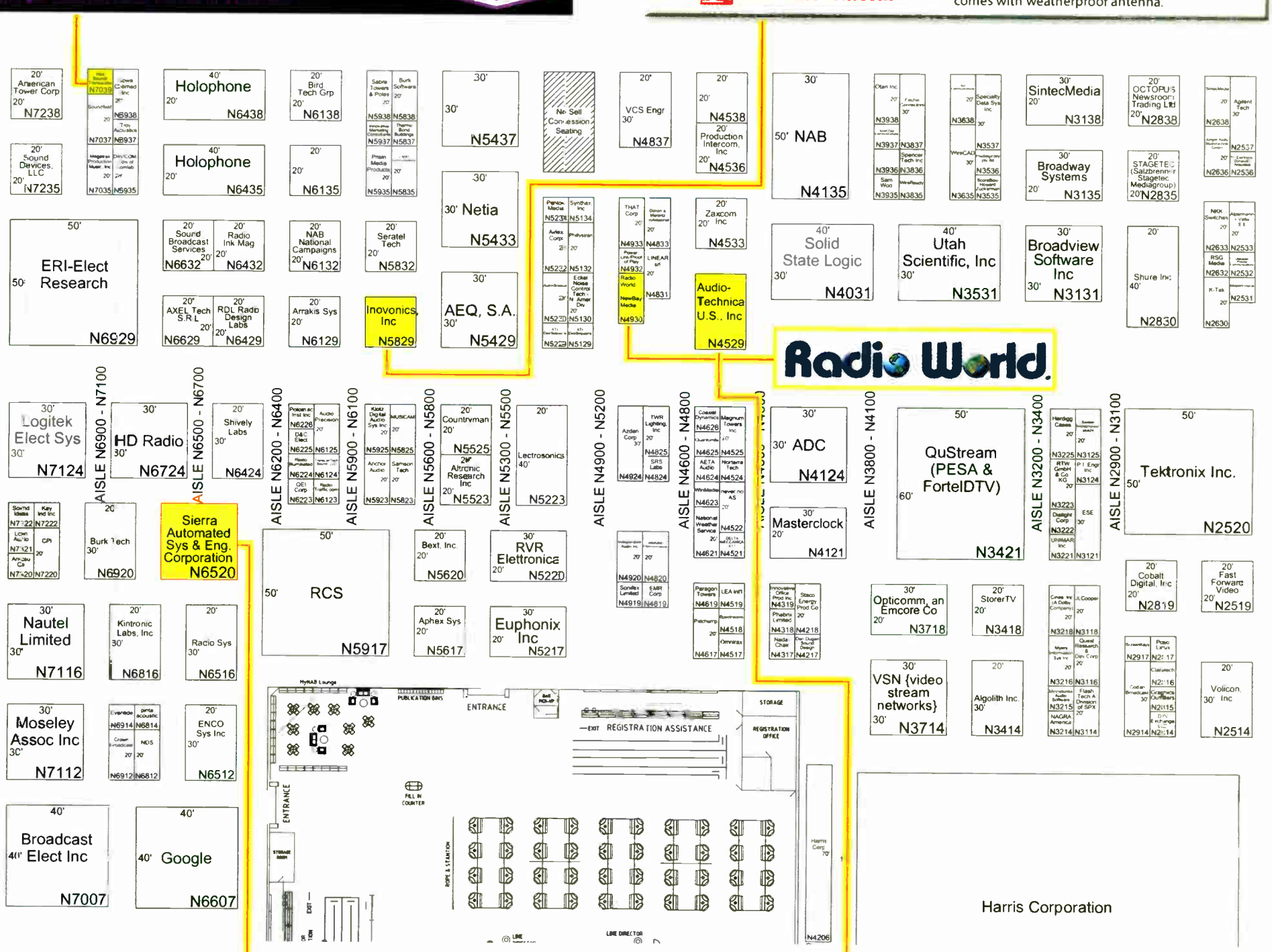
Doors open at 7 p.m. for both events.

The House of Blues Restaurant (HOB), Mandalay Bay, 3950 Las Vegas Blvd., (702) 632-7605.

NAB SHOW

Where Content Comes to Life™

North Hall
N2 and N3 Exhibits



SURE BETS

Fore!

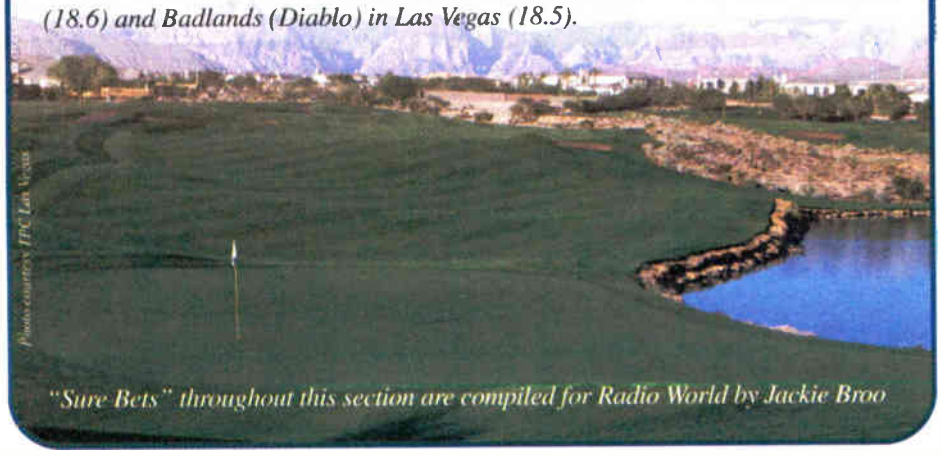
Las Vegas courses offer great layouts, beautiful scenery and the chance to improve your score. The site *www.lowerscoregolf.com* recently came up with a list of the best public courses in Nevada. Ratings are out of a possible 20.

Reflection Bay – Lake Las Vegas Resort (19.2)
1600 Lake Las Vegas Pkwy., Henderson
(877) 698-GOLF
www.lakelasvegas.com/golf.asp
Designed by Nicklaus, it boasts an impressive landscape (crystal-blue lake, beautiful mountains and the desert floor) and stunning views of Lake Las Vegas.

Las Vegas Paiute (Snow Mountain), Las Vegas (19.2)
10325 Nu-Wav Kaiv Blvd., Las Vegas
(800) 711-2833; in town (702) 658-1400
www.lvpaiutegolf.com
At the base of the Spring Mountains, this resort has three championship courses designed by Pete Dye. The Wolf Course is one of the toughest runs in Las Vegas, if not the Southeast.

TPC at the Canyons, Las Vegas (18.9)
9851 Canyon Run Dr., Las Vegas
(702) 256-2500
tpc.com/lasvegas
Owned and operated by the PGA Tour, this 7,063-yard course maximizes the beauty of the mountains and canyons with the backdrop of the Vegas skyline. The TPC Las Vegas has hosted the Senior PGA tour's Las Vegas Classic.

Also check out Wildhorse in Henderson (18.8), Rio Secco in Henderson (18.6) and Badlands (Diablo) in Las Vegas (18.5).



"Sure Bets" throughout this section are compiled for Radio World by Jackie Broo

Transradio SenderSysteme Berlin AG N9123A
New: DRM DMOD3 is a complete system with all necessary features for DRM broadcasting in the AM bands. The aim is to offer automated configuration procedures, maximum reliability, low power consumption, low operating temperature and a compact and ergonomic design. Core features of the new DRM exciter are the automatic equalizer adjustment and the integrated voltage standing wave ratio (VSWR) measurement of the antenna, which offer a precise and fast method to set up DRM equipment. The DRM DMOD3 is designed for mounting in standard 19 inch racks of 4U height. It eliminates the requirement for a separate RF processor and offers a significant reduction in external wiring. Low power consumption, reduced operating temperature and a higher MTBF have been achieved by implementing mobile technology components and a hard disk-free design. In order to improve the ergonomics, the DRM DMOD3 has an increased display size of 8.4 inches, which provides a wide viewing angle and a high resolution of 800 x 600 pixels for easy reading. It is comfortable to operate with the integrated keys and toggle wheel.
Established Products: TRAM, DRM DMOD2, T327X, TP328X, T325X

Trilogy Communications Ltd. C8122
Established Products: Commander and Orator matrix intercoms; Mercury VoIP intercom with SIP; radio and telephony interfaces.

TSL SU14615
New: The AVMU2-3G V Series audio video monitor is capable of decoding all standards up to and including 1080p/50, /SDI audio metering with integrated 4.75 inch, 16:9 LCD; Monitor Plus audio family of rack-mount confidence monitors with passive, active, analog and AES digital options; MDU Series power distribution units including the Power Manager with Ethernet SNMP alarms, e-mail alerts and latching relays, Power Alert with SNMP alarms, Power Change Over dual-input auto-changeover with 14-way fused outlets and Power Standard 14-way mains distribution; AMU1-3G HD 1080p/50 rack-mount audio monitor and Dolby decoder designed for comprehensive, intuitive and compact metering of Dolby E bit streams from HD/SDI video formats up to and including 1080p/50;
Established Products: AMU2-8HD Dolby eight-channel HD/SDI and Dolby decoding rack audio monitor.

TV Magic Inc. N2136
Established Products: Systems integration/design services.

V-Soft Communications N5835
New: Microwave-Pro computer program, with a large collection of microwave antenna patterns, will search for and identify BAS frequencies for STL and R.P. It allows the user to look at the geometry of the path and those of the interfering stations together on one pop-up window. Path profiles can be examined and graphed over terrain and loss, due to knife-edging and other factors, calculated using the guideline standards expressed in TSB-10. When a workable frequency and path is identified, the program will produce a mailing list of stations within the path footprint for purposes of "prior notification." Also: new features of FMCommander.
Established Products: AM-Pro 2 which won Radio World's "Cool Stuff" award for 2007, and Probe 3 which won the award in 2006.

Valcom Mfg. Group C2539

Volicon N2514

Ward-Beck Systems SU7420

WEGENER SU7911
New: Terrestrial Delivery Module for COMPEL Network Control system to manage hybrid networks. Hybrid network control provides operators seamless control over both satellite and terrestrial paths for delivery of television and radio programming. With the accelerated growth of digital file-based workflows, Wegener has re-engineered the COMPEL Network Control system to optimize nonreal-time distribution of video and audio programming. Flexibility in distribution path allows our clients to manage the distribution of their media assets to significantly reduce long-term operational expenses. Wegener's COMPEL Hybrid Network Control offers robust support for distributing advertising content and targeted regional content deliveries. It is the same Wegener platform used to drive content to 100,000s of receivers in sporting, multilanguage and retail networks with over 150 million ad-insertions per month. Wegener's fourth-generation network control system, COMPEL II, retains all patented features of Wegener's industry-leading COMPEL Network Control system while adding new functionality to enhance the user experience. The result is a flexible, open architecture system that provides simplified operations for dynamic media distribution to multiple locations for content providers, private network operators, and TV and radio broadcasters among other professionals. Built upon an open architecture operating system, COMPEL II offers SQL database access to all internal functions. COMPEL II is highly modular in design, providing extensive scaling and tailoring to fit the needs of specific networks. The Web browser user interface allows multiple, individually permissioned operators to simultaneously take control of their individual responsibilities for network operations. Deployed Wegener network control systems are used to manage targeted content delivery, disaster recovery and blackout/embargo enforcement. They provide enhanced control over receive devices to enhance the delivery of regional content and ad-insertions.
Established Products: Wegener's iPump 6420 Media Server is specifically designed for regionalizing affiliate radio broadcasts, combining the efficiencies of large network operations with the customized listening experiences offered at the local level. It is an integrated digital satellite receiver, IP router and multimedia server. Customized playlists, network control commands and audio programs transmitted to targeted iPump Media Servers can be stored to internal hard drives or output.
Mr. Ken Leffingwell, Director of Sales
11350 Technology Circle
Duluth, GA 30097
(770) 814-4000
E-mail: globalsales@wegener.com
Web Site: www.wegener.com

Westar Music SL9612
New: Star Trax contains more than 5,700 tracks of broadcast-length production music, tags, bridges, production elements and segues in digital 16 bit/44.1 kHz Broadcast WAV format on 10 DVDs with embedded metadata for use with any asset management software; the Westar Music Hard Drive contains the complete contents of the Westar Music Library, including all tags, bridges, production elements and segues, more than 8,100 tracks occupying more than 100 GB on a 160 GB hard drive equipped with USB

and FireWire connections.
Established Products: Production Music Library

Wheatstone Corp. **N7612**
New: Evolution Series radio consoles can operate independently or share sources and mixes through the E-series Network Switch without traffic limitations, audio latency or machine control delays; Glass E software application allows the user to control any Evolution control surface from a remote location via a LAN or WAN; Audioarts Air 1 ultracompact console retains the features and interconnect system of much larger consoles suitable for on-air, production, news, remotes and podcasting; Audioarts W-12 Console targets small- to mid-market radio stations with high-end features such as three stereo main busses, 10 A/B dual source stereo line inputs (analog or digital), two microphone preamps, uncompressed 24-bit operation (44.1 or 48 kHz), switched VU meters, built-in cue speaker with level control and headphone jack with built-in amp; Vorsis AP-1000 31-band digital spectral processor with the Vorsis Bass Management System algorithm in the FM limiter/clipper section and new five-band AGC; Vorsis FM-5 audio processor features a proprietary five-band Multiband Dynamics Controller along with a precision 10-band final limiter with distortion masked clipper.
Established Products: Generation Series networked audio systems, Audioarts D-75N and Vorsis HD-P3 audio processor.

Whirlwind **C7733**

WhisperRoom **SL10220**

WinMedia Software Inc. **N4623**
New: WinMedia Software Suite offers a group of user-friendly tools for broadcasters including WinRadio, WinTransfer and WinLogger. WinRadio is a turnkey solution for production, voice tracking, music scheduling, ad scheduling, statistics and reports, intranet server, automated or assisted broadcasting, Internet streaming, data transmissions for RDS, Web or digital radio, can be adapted for stations of all sizes and configurations. The WinLogger archiving tool for radio and television broadcasters records up to four stereo channels with various sampling qualities, can be scheduled to record satellite feeds, FTP audio file downloads and audio failure detection. WinTransfer to transfer audio via Internet and FTP, well suited for podcasting; WinWeb collaborative and secure extranet customized for radio workflow process and its management.

Will-Burt **C7922**

Winsted Corp. **SU5616**
New: Slight-Line Console Series designed for broadcast, security, NOC and control room environments, designed to ISO 11064 standards for operator efficiency with recessed viewing angles, proper monitor distances and adjustable flat-panel screens.

WireCAD **N3635**

WireReady **N3835**

Wireworks Corp. **C7924**
New: Wireworks AV2000 HD/SDI MultiMedia Cabling is compatible with high definition as well as serial digital interface signals, and is ideal for multimedia and audio/video projects such as mobile broadcasting, post production as well as a wide range of other integrated broadcast applications. Also: Wireworks LumaVue Custom Plates and Panels are ideal for remote broadcast applications. These products can be rear-illuminated for instant identification for use in low-light broadcast truck interfaces. UV-stabilized for outdoor use, Wireworks LumaVue features non-metallic cell cast acrylic, which provides maximum durability and efficiency in mobile broadcast applications. The panels will not rust or tarnish even under sustained extreme weather conditions. Panels are rear engraved so its markings cannot be marred or destroyed. LumaVue provides maximum electrical isolation between connectors and are available in a variety of sizes and shapes, making it suitable for interface panels of any kind. Wireworks LumaVue panels are offered in 10 colors, including red, burgundy, blue, navy, almond, white, grey, black, gold and silver. Panels are also available in gloss or matte with no-glare finish. Design possibilities are unlimited and can include company name and logo for a personalized look.

Wohler **N1314**
New: Wohler Plus line of audio products for processing and monitoring tailored to the needs of digital broadcasting, for terrestrial broadcasting, video-over-IP, cable or satellite. The system offers a variety of DSP options so that each unit can be configured for the functions required by a facility. This flexibility eliminates the need for all-or-nothing boxes, helping broadcasters lower operational costs. The modular system features flexible inputs (16 channels or 8 AES pairs) and outputs, alarms, monitoring, and metering, along with multiple channel synchronizing and shuffling of channels for 5.1 or 7.1 surround sound signal confidence. Optional inputs include AES and multi-rate serial digital embedded audio with Dolby encoding. The 2 RU Wohler Plus features a high-resolution TFT screen and onboard menu system for control, as well as Ethernet, RS-232 and GPIO interfaces.
Established Products: AMP2-E8MDA multiformat audio monitor.

Xytech Systems **SL4326**
New: Xytech Systems Enterprise Version 11 software provides an end-to-end solution for creation, management, scheduling, tracking and delivery of physical and digital media assets with a new Web-based Service Request module that allows users to browse through media assets, preview, select and order media assets, as well as request related services such as editing work, and special delivery instructions.

Yamaha Commercial Audio **SL5710**

Zaxcom Inc. **N4533**
New: Fusion high-resolution audio recorder/mixer optimized for use in reality television, surround recording and ENG applications, can mix together 16 inputs to eight output busses for recording up to eight tracks, records to two CompactFlash cards simultaneously, ensuring solid-state recording with redundancy and flexibility, four balanced AES inputs with sample rate conversion allow eight channels of audio to come from four devices with varying sample rates or unlocked sample rate clocks; Deva 16 16-track hard disk audio recorder with eight hardware faders plus an integrated hard drive, DVD-RAM and CompactFlash memory card slot; TRX family of digital wireless microphone transceivers optimized for use in ENG and other broadcast applications.
Established Products: TRX700 plug-on recording transmitter, IFB100 2.4 GHz Transmitter, Deva hard disk recorders and Mix-12 control surface

What's Inside Box No. 1?

by John Bisset

Tim White, market engineer for the Clear Channel cluster in Sarasota/Bradenton, Fla., writes about a transmitter that had a nasty habit of blowing a power supply module every time there was a bump in the AC power.

Tim was pretty confident it wasn't the transmitter; and in December, he had 2-1/2 days to investigate as the tower lights, conduit and cable were completely replaced and the site was down.

Tearing into the building's electrical system, he found a large unfamiliar box in the middle of the AC feed to the transmitters. Labeled the "Kleen Line Filter," its purpose was to eliminate transient energy.

All three orange lamps glowed on the front of the box. Inside, the fuses never blew, so no one ever took the cover off the device.

Once inside, Tim noticed a loose lug on one of the inductors, shown in Fig. 1. Pretty ugly; but when the lug was removed, the condition of the wires was even uglier, as seen in Fig. 2.

Tim removed the box completely, and the score is several thunderstorms (with lots of power bumps), and the transmitter runs beautifully — like he knew it would. Isn't it funny how a piece of loose hardware can cause 30 years of heartache?

Tim White can be reached at *tim.white@webweather.com*.

★ ★ ★

The following device is a little pricey unless you have lots of temperatures to monitor, but the company has a broad line of products that may be useful to the broadcast engineer. Check out *www.cyberresearch.com*.

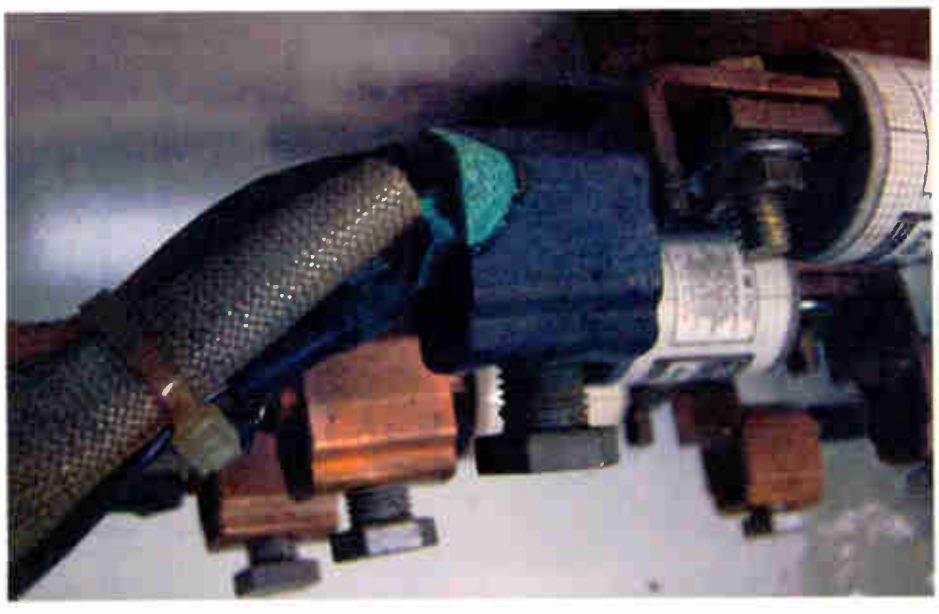


Fig. 1: Check for corroded lugs behind electric panels.

Fig. 2: Damaged wires after removing the lug.

The company is known for rugged industrial PCs. They have just completed a series of modules that connect directly to temperature detectors and send the results back to your PC via the 2.4 GHz radio band. Gone are the troubles associated with long-distance cabling.

The maximum distance for clear communication depends on building construction and on the number of intervening walls, but 30 meters is typical. Visit the site, you may come up with an interesting application.

★ ★ ★

OK, I admit my age is showing. Steve Schuh wrote to remind me that the National Electrical Code does not permit running wire across the top of dropped ceiling panels (Jan. 2). I know this, and should have added that the motorized car simply transports the cable — which should be plenum rated.

After the wire is run, Steve clarifies that it needs to be secured *above* the panels. If there aren't enough pipes or ducts to keep it up and out of the way, it must be fastened to the structure.

According to the Minnesota inspectors, this means you cannot fasten the wire to the ceiling support wires. You can use support wires as long as *you* add the support wire and tag it as being installed by the electrical installer as a support wire.

Steve points out that there are other interesting codes as well. One example is that you are not allowed to tie your cable to the outside of electrical conduit unless it is a conduit provided for communications wiring and not power.

Another requirement is that any communication cable must be "listed." Yet another requirement is to remove any abandoned cable. This means that if cable is installed that is not in use, it must be tagged on each end designating it as a "spare" for future use, or it must be removed.

See CRACK THE CODE, page 62 ▶

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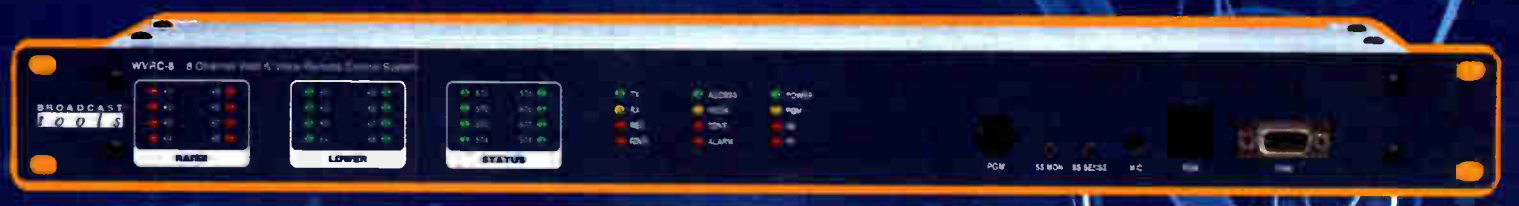

WVRC-8 8 Channel WEB and Voice Dial-up Remote Control System

The WVRC-8 provides a cost-effective, one rack-unit solution for web based and/or recordable voice response dial-up transmitter site control. The WVRC-8 was designed from a users point of view, so all of the basic functionality you need is included to control your site equipment, while

ACS 8.2 Plus Audio Control Switcher

The Broadcast Tools® ACS 8.2 Plus provides matrix audio switching of 8 stereo inputs to 2 stereo plus 2 mono outputs. Any input assigned to output tone has fading capabilities.

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Visit the Broadcasters General Store Booth N8120 at NAB 2008.

SUPPLY SIDE

Dynamax Is 'Alive and Well' at Sandies

David Strode is owner of Sandies, based in Fairless Hills, Pa.

You've started a company on your own?

Effective last June, Sandies assumed manufacturing and service of the Dynamax Console line from LPB Communications Inc. in Camden, N.J.

I assumed Dynamax Consoles under a mutually beneficial parting of the ways with LPB; this whole process took three days from initial offer to finished deal.

Sandies is solely owned by me and Christine Ferello, my other half. Operations were immediately moved to Fairless Hills. Sandies will initially base its operation on the console line; however other broadcast related products are on the drawing table.

Where were you prior, and how long have you been with the company?

Officially I was VP of sales and marketing. In a practical sense I was more technical sales and support. How long? Let's just say I started with Fidelipac in 1985 with cart machines and moved to consoles in 1990 with the acquisition of Broadcast Audio out of Rancho Cordova, Calif. I was involved in initial design and manufacturing of the Dynamax console in 1991; I held production management positions through the early 1990s and moved to sales in 1995.

Fidelipac was sold to Amplifonix Inc. in Philadelphia in 1997, where I continued as sales and marketing until the sale to LPB in May 2000. So, Technically seven years with LPB. But 16 years with Dynamax Consoles.

Have you purchased parts and products? Are you selling new gear, support parts, service?

SANDIES

All parts were moved to our new facility, where production and service began immediately. LPB has been forwarding inquiries as they receive them and word is slowly getting out through the dealer network that Dynamax is alive and well.

If I have learned anything in my 22 years of manufacturing, it's that to be successful in this business you need to do two things: 1) Pick up the phone. 2) Ship yesterday. It sounds simple but any manufacturer will tell you, it's not.

Nothing is more frustrating than a service customer forced to leave a message when they need help or a potential new customer who needs information and can't ask a live body a few simple questions.

Above all, broadcast customers usually need it yesterday. It's a joke in the industry, but what it really means is that they just got tagged by a lightning storm and they have no backup on the shelf.

Contact

David Strode
Sandies
225 Lincoln Hwy., Suite 167
Fairless Hills PA 19030

(215) 547-2570
Fax (215) 701-9197
www.sandiesusa.com

"*HEEEEEEEEEEEEELP.*"

I've been making suggestions to previous owners for years. Most involve improving customer service and delivery times. Now I have no one to answer to but myself. Now it's my turn.

"Supply Side" is an occasional series of interviews with industry suppliers who are new or are otherwise making news.

Crack the Code

▶ Continued from page 60

I think readers are beginning to see why electrician's rates are so high! That NEC code book is full of amazing, and hard-to-interpret, language.

In Minnesota, Steve is required to have a technology contractor license in order to install wiring as a contract engineer. To get the contractor license, he must have at least one full-time licensed Power Limited Technician, and he or she must be on the job site and can supervise no more that two additional installers.

In addition, Steve is now required to take 16 hours of code training every two years to renew his license. In Minnesota, the licensing agency is the same agency that licenses and regulates the electrical contractors.

It's apparent the codes are catching up with us in the radio business, and Steve thinks that is a good thing. Years ago when Steve and I started in this business, it wasn't unusual for me to find lamp cord carrying 115 volt AC run around buildings for warning lights and other control uses — even Belden 8451!

Steve Schuh can be reached at *sschuh@hbci.com.*

★ ★ ★

John Sims of RF Specialties of Missouri sends in this tip from his good customers at Entercom Kansas City.

They have had a problem with a spring mounting stud on the LPB Silent Boom mic arm coming loose. When this happens, the stud becomes a projectile flying across the room — in the general direction of the talent!

Assistant CE Kirk Chestnut and his crew came up with a solution to the problem, pictured in Fig. 3, using common hardware store parts. An 8-32 thumb nut and pan head machine screw now securely hold the springs, as seen in Fig. 4.

If this assembly still comes loose, I imagine you could use those locking nuts, with the plastic inserts, too.

Kirk Chestnut can be reached at *kchestnut@entercom.com.* John Sims can be reached at *rfmo@uniteone.net* or visit the RF Specialties Web site at *www.rfspec.com*, where you'll also find some useful free engineering software.

Fig. 3: Simple hardware prevents flying projectiles

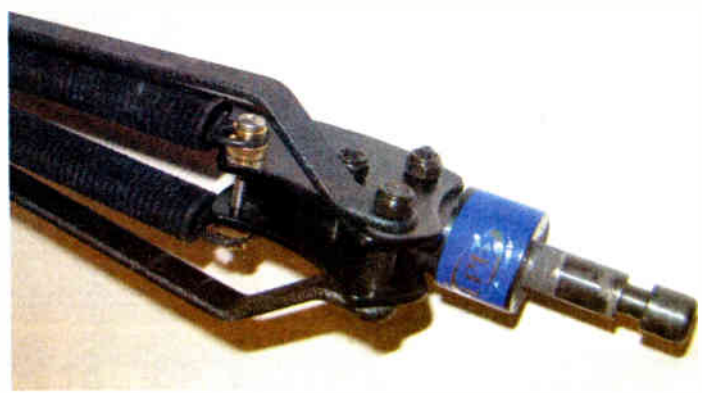


Fig. 4: The new bolt and nut cap keeps everything secure on this LPB Mike Boom.

John Bisset has worked as a chief engineer and contract engineer for 39 years. He is the northeast regional sales manager for Broadcast Electronics and in 2007 received the SBE's Educator of the Year Award. Reach him at (571) 217-9386 or jbisset@bdcast.com. *Faxed submissions can be sent to (603) 472-4944.*

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

Lawo won an order from **CBC/Radio-Canada** for a new central audio router and control system for CBC/Radio-Canada radio production and distribution in Montreal. The manufacturer calls the job a "massive undertaking" that is targeted for completion by May.

"Subsequently, the system will expand to four regional stations that will be integrated into the system by October, with more stations integrating after this. The year-long, multistage deployment is targeted for completion in December," Lawo stated. Lawo makes digital audio networking systems and consoles; it is based in Germany. ...

The company also won a contract from **ABC Melbourne** late in 2007; it will deliver and configure 16 on-air studios for the ABC by the end of this year. ...

Wheatstone secured a sale to **Clear Channel** in Washington. The cluster's stations will add five Generation 4 Control Surfaces and Bridge Satellite I/O frames to an existing Bridge Audio Network System.

The expansion will include additional Bridge I/O frames and dual redundant Wheatnet Audio Network Switches to integrate the facility-wide network. The system will then consist of nine G4/Satellite equipped studios, 4 5200D Rackmount News Mixers, a 256x256 Bridge I/O frame in TOC, and Dual Redundant Wheatnet Audio Network Switches. ...

APT has a new licensing deal with a manufacturer of Bluetooth products. **Wearnes Tech Solutions** makes headsets, USB adaptors and Bluetooth AV devices; it will license apt-X coding technology as part of a Bluetooth module it sells to manufacturers of consumer electronics, communications and computing equipment.

APT said WTS modules are used in portable car-kits, Apple iPod accessories, headsets for mobile phones and MP3 players, and stereo audio transmitters and receivers. ...

Nautel was awarded the contract for deployment of three NX300 high-power MW transmitters for the **Turkish Radio-Television Corp.** It also will provide site survey work, installation, ventilation, transmission line, commissioning and site testing. Mete Coskun is technical director for TRT.

TRT, based in Ankara, is the public service broadcaster in Turkey and provides four national, one regional, two international TV services and one local, eight regional and four national radio services. Voice of Turkey provides programming in 27 languages including Turkish on SW. TRT radio and TV programming is available on the Internet, satellite and cable as well as terrestrial services. ...

Klotz Digital Australia won a bid to rebuild of **Austereo Melbourne.** It will provide Vadis D.C.11 mixing consoles and Vadis 888 frames for on-air studios, pre-production studios and news booths. The company also will provide signal routing for the MCR as well as a Varizone digital public address system.

A **Klotz** Digital Xenon console was installed last year in the **University of Newcastle's** media production facilities in Callaghan, Australia. The facilities enhanced its Bachelor of Communication and the major areas of Video, Sound, Radio, PR and Journalism.

Funding allowed for the replacement of an old analog broadcast console which had been in use in teaching of radio and journalism courses for 12 years. George Hyde is the technological officer (audio) of the university's school of Design, Communication and IT. ...

Holophone's H2-Pro is in use by Church of Jesus Christ of Latter Day Saints Senior Audio Engineer Trent Walker on the "Music and the Spoken Word" TV and radio broadcast of the **Mormon Tabernacle Choir** to create a surround mix.

Ian Jones of HHB Communications, center, with, from left, the National News Bureau's Sudkhet Juntana, Panthip Sunantiyakul, Phanawan Jitsamut and Chartchai Rumpueing.

The H2-PRO is hung upside down from the ceiling in the tabernacle; its signal feeds into **Millennia** HV-3 preamps, then a **Euphonix** AD and into the core. The broadcast is mixed in Euphonix System 5 and monitored on **Wilson Audio** Watt/Puppy System 8 loudspeakers. As a single-point source, the Holophone is able to provide Walker and his crew with all the "audio height" that the Tabernacle naturally creates without the use of a multiple mic setup. Walker is using 60 mics to cover the broadcast. The space has five to six seconds of reverb empty and drops to two to three seconds when full. ...

The **National News Bureau,** Channel 11 Public Relations Department of Thailand purchased 22 **HHB** FlashMic digital recording microphones for use by its radio reporters.

"Who's Buying What" is an occasional column about recent purchasing decisions made by radio and related industry professionals. Information is from suppliers and/or the users. E-mail radioworld@nbmedia.com.

DAB on the Up and Down Track

Eureka DAB Found Success in the U.K., But Now Even Those Prospects Are Dimming

The Big Picture

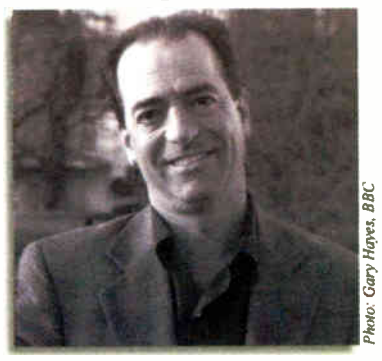


Photo: Gary Hayes, BBC

by Skip Pizzi

Some 25 years since its development and nearly a decade since its first real service introductions, DAB is still experiencing a roller-coaster deployment.

Developed in Europe during the 1980s as the Eureka-147/DAB format, it was placed into initial service in the mid- and late 1990s in several (mostly European) countries with much excitement. Since then, the only place where it has achieved widespread adoption by consumers is in the U.K., starting in the early 2000s.

The U.K. experience with DAB has been unique for several reasons. Primary among them has been the broad availability of inexpensive receivers there, plus the introduction of numerous DAB broadcast channels that are largely non-duplicative of content available simultaneously over AM, FM, satellite or Internet radio.

The success of DAB under these conditions (over 6 million receivers sold in the U.K. to date) has shown how the combining of new, well-promoted, digital-only services with cheap, widely available receivers can drive consumer uptake. Compare this with other markets in which DAB has been positioned as an "analog replacement" service (meaning it carries only simulcasts of AM and FM simulcast).

A good example of the latter is Canada, where DAB now is widely considered a failure.

Recent U.K. setbacks

But all is not well of late in DAB's promised land.

Recent U.K. activity indicates that even in such a fertile environment, the successful launch of digital radio remains difficult. Starting late last year, a series of circumstances have indicated that DAB's apparent buoyancy in the United Kingdom may be fleeting.

The process is worth noting for the general lessons it can provide in the ongoing deployment of IBOC, or for that matter, *any* prospective successors to existing broadcast formats. Let's recount these recent snags:

First, the cost of providing DAB services — particularly those carrying exclusive, DAB-only content — is apparently becoming prohibitive for some U.K. broadcasters.

While the BBC has persevered with its several DAB-only services (along with DAB duplication of its popular analog radio services), several commercial broadcasters recently have dropped or curtailed some of their DAB-only channels, and additional similar cuts may be forthcoming. A few of these services had been in place for some eight or nine years, so this does not appear to be a frivolous decision, but rather a more considered, strategic move.

Stacy Braswell/stock.xchng

Coincidentally, however, Ofcom, the U.K. telecom regulator, has arranged for *more* spectrum to be made available for DAB services across the U.K., with a new national commercial multiplex launching later this year.

So just as the existing DAB spectrum is losing services, new spectrum is being added — a double whammy devaluation. This could cause the bottom to drop out of the DAB service market, and while this might allow some new, marginal broadcasters to enter the space, it likely won't retain the major players (who are increasingly concerned with CPM), and the end result could be an overall loss of DAB listenership, with a significant dampening of momentum in consumer receiver deployment.

And speaking of receivers, while there has been a proliferation of tabletop and portable DAB designs, there is an almost complete lack of DAB car radios in the U.K. Although radio listening in the car is not quite as prevalent there as it is in the United States, this is still a significant failing of the format to date. It persists in the U.K. several years after DAB designs have been outselling analog radios in other form factors.

This is because most European car manufacturers will not develop new systems until there is a broad, pan-European call for them. Since DAB has only become popular in the U.K., and not yet in the remainder of the continent, there are few DAB radios in the cars there. (To date, factory-installed DAB receivers are only available as an option on a very few high-end German vehicles.)

Remember also that because DAB operates in Europe in either the upper VHF band or L band, a DAB tuner requires its own antenna system, separate from the AM and FM aerials, making its automotive application far more complex and costly than mobile analog (or IBOC) radios.

For this reason, aftermarket mobile DAB radios also have not proliferated in the U.K. Thus the format's excellent mobile performance notwithstanding, it has remained largely a fixed or portable service, even in its most popular environment.

This clearly is a lost opportunity for greater penetration of the format in the U.K., but the market appears unable to garner the critical mass required to move the European automotive radio market toward widespread adoption of DAB.

Another concern voiced in the U.K. regards the current audio quality of DAB there. Because the DAB format uses an older audio codec — MPEG-1 Audio Layer 2, or "MP2" — it is not as bandwidth-efficient as more recently developed systems. The DAB transmission format is quite fungible, however, allowing a range of bit rates to be used to squeeze as many audio and/or data channels as are desired (and practical) into the 1.5 MHz occupied by each RF "ensemble" or multiplex.

This is but one of many examples of the digital conundrum pitting quality vs. quantity, similar to the decisions U.S. broadcasters grapple with over IBOC multicasting.

Pressure to make DAB more appealing to listeners has caused U.K. broadcasters to drop audio bit rates to accommodate more services. Unfortunately, the MP2 codec doesn't sound very good below about 192 kbps for stereo, and when some broadcasters dropped down to 160 kbps or lower on some services, many listener complained.

(Remember most of the audience is listening on headphones or on a tabletop radio in a quiet home, so artifacts may be fairly noticeable — especially if you've gotten used to hearing a service in high fidelity and suddenly things change.)

See DAB, page 68 ▶

RVA Takes 'Software-Centric' Approach

ENCO Installation Is First Commercial Use of Digigram Visiblu for Routing Audio Over IP

Officials of ENCO Systems and Digigram are noting what they describe as a unique installation in the Philippines that is the first commercial use of the Visiblu audio/control over IP technology.

For the first time, they say, the audio stream contains both the audio payload and embedded automation control for both source and destination.

Radio Veritas Asia airs various language services, producing programming that shares time on multiple shortwave transmitters. Programming is recorded and produced at the studio, stored on a local file server and sent via WAN to the transmitter site 90 miles away for storage on a local file server, then played to air.

"What makes the situation unique is that any of the language services must be able to go live on the air on any or all of the transmitters in the case of a major news development without interfering with the operation of the rest of the network," wrote ENCO Vice President of Sales and Marketing Don Backus, describing the installation.

Further, he said, there was no dedicated audio line between the sites or any budget for an audio router; and the client needed a new digital storage and automation playout system after working with reel-to-reel for many years.

'Soft' solution

RVA chose ENCO's DAD digital automation and playout system and hired the company to design a studio system for the Quezon City studio complex. Fifteen language services along with ingest, voice capture, production and administration feed a programming file server.

"When the quality control department approves completed programs and has prepared the appropriate playlists and schedules, the files are marked as approved, which triggers an automatic transfer to the remote air server," Backus said.

"That server in Palauig is synchronized using ENCO's Gateway smart file transfer program via a data connection. The schedules and playlists then play to the desired transmitters completely unattended. Also, each of the on-air workstations feed two Web streams to a Helix Real Audio server for Internet radio listeners."

Audio cards at the studio and transmitter sites are Digigram PCX-924HR professional DSP-based cards. The ability to route audio automatically from any of the language service workstations to any of the transmitters is accomplished in software.

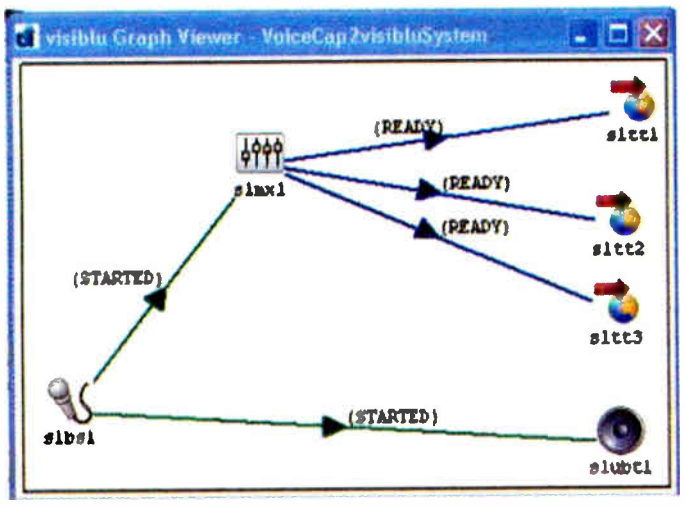
ENCO had been working with Digigram as the latter company developed the Visiblu audio/control over IP product.

Visiblu is defined by Digigram as a network audio operating system and allows for a great deal of audio routing and processing power with a modular software approach, he said.

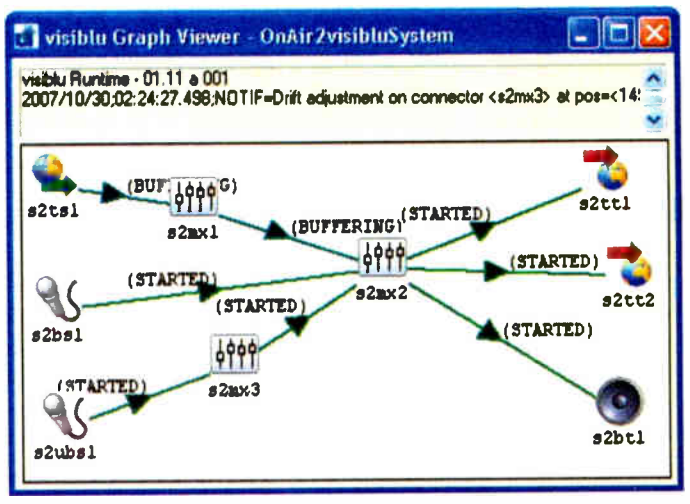
"What was most interesting to ENCO for this project was the ability to route live streams of audio over IP and to control both the source and destination, but also embed control of the automation system itself — thus making the desired action of taking control of a transmitter audio stream from one of the language service studios seamless and professional-sounding," Backus continued.

Using a set of user-configurable buttons within the DAD interface, an operator at any of the language services can instruct the system to allow that studio to go live on one or more of the remote site transmitters. The selected on-air DAD system fades the currently playing material and provides a feed from the studio to the transmitter.

"When the emergency feed is complete, pressing another button on the DAD interface reverts to the previously scheduled programming resuming from where it left off."



Visiblu display of Voice Capture (head end) workstation with ability to route input to remote transmitters as well as record locally.



Visiblu display of transmitter site showing local and remote sources feeding the transmitter and Internet streams.

The ability to route audio automatically from any of the language service workstations to any of the transmitters is accomplished in software.

Distinct, routable

The system also allows for directing the output of a satellite receiver from Vatican Radio to air without using an audio switcher or router. Visiblu and ENCO's control software use the PCX924HR inputs and outputs as distinct and routable audio streams.

"Visiblu and DAD combine to provide a seamless method of providing a real-time studio/transmitter link on demand, all in software via WAN," Backus said.

Backus said the DAD/Visiblu combination is capable of providing other configurations, linking many remote sites and allowing an "unprecedented" level of audio and control routing via IP.

He said the DAD system works with various audio over IP products on the market. "These other systems provide an AoIP driver in the automation workstation and distribute audio via standard networking components but require the use of proprietary hardware for audio to enter or exit the system. The typical application for these systems is in replacement of console mixing and audio routing systems within a broadcast facility.

"Visiblu doesn't directly compete with these types of products, but allows using the AoIP technology in different ways, like over a WAN, for example. Also, being software-based allows for a greater level of flexibility regarding interoperability of existing equipment."

Visiblu also can work with Digigram and non-Digigram soundcards to allow for a mixed environment that can be configured in a number of ways, Backus said.

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DAB

▶ Continued from page 64

Compare this to more recent codecs that perform well at 96 kbps or less, as used in IBOC and other digital audio services.

One attempt to resolve the problem in the U.K. was to run some DAB services in mono, which only begged the question of why many of these same channels were concurrently available in stereo on *analog* FM.

Finally, another recent pullback also reflected on DAB's U.K. fortunes, when the deep-pocketed British Telecom fairly abruptly pulled the plug on its Movio service after hardly a year of full operation.

Movio had provided mobile TV service over DAB, using a recently standardized enhanced format (a system called DAB-IP, which increased error correction in a backward-compatible manner for robust delivery of IP packets containing video and audio; see the Sept. 12 and Sept. 26, 2007 editions of this column at *radioworld.com* for more on this).

This service took up a fair amount of national DAB bandwidth, and when it finally ceases broadcasting later this year, excess DAB spectrum will be even more plentiful, perhaps further devaluing it.

Not dead yet

Of course, the U.K. DAB story is far from over.

The changing economics of the transmission space there may attract new players that turn things around yet again. Meanwhile, the stewards of the DAB format have been busy trying to update their standards to remain viable.

The recently approved DAB+ format includes a new codec (HE-AAC), spectrally efficient surround-sound capability (MPEG Surround) and increased error correction, but these improvements are not backward-compatible and require new receivers, which are not yet available.

DAB's apparent buoyancy in the U.K may be fleeting.

DAB+ may be useful in attracting countries where digital radio service has not yet been established (or even places where DAB has failed to flourish), however.

Another application that can ride on DAB's COFDM RF layer is Digital Multimedia Broadcasting (DMB), first developed in Korea, and now trying hard to move into other environments.

It allows mobile TV and other multimedia content to be distributed to DMB-capable receivers over the original DAB transmission architecture. Hopes are so high for this format to revitalize DAB that its standards body, formerly known as the WorldDAB Forum, has changed its name to WorldDMB.

On the other hand, competing formats for digital radio from Digital Radio Mondiale (DRM and DRM+) and even a fledgling European IBOC movement, along with mobile TV/multimedia competition from DVB-H (a handheld version of the highly successful European DTV format DVB-T) will keep things interesting for DAB as it struggles for continued relevance. Some preferences for these other systems have been shown by broadcasters and regulators alike across the European Union of late.

In the UK, Ofcom has tried to up the ante by offering longer terms on FM licenses if a broadcaster agrees to also provide DAB service. Of course, this seems in conflict with the simultaneously held regulatory premise that DAB is the replacement radio format of the future, but such is the peril that DAB seems to face in the short term there.

Interestingly, two audience segments that have strongly engaged with DAB in the U.K. are the geriatric and special needs communities.

Apparently the simplicity and low cost of DAB tabletop receivers appeal to these listeners, for whom Internet and WiFi are often not a workable option.

While a commendable result, this is hardly a ringing endorsement toward a "format of the future."

Waiting on the world to change

Clearly there is much for U.S. broadcasters to learn from the ongoing DAB experience in the U.K., where tightening economic conditions coupled with gradually expiring patience of broadcasters have turned what looked like a clear success story into a mixed picture. Whether this is a brief stumble or the start of a long downward trend for U.K. DAB remains to be seen.

Differences between the U.S. and U.K. systems also are highlighted by this analysis. For example, the U.S. has no *portable* IBOC yet, and the U.K. has no *mobile* DAB to date. Conversion and ongoing operational costs are also somewhat different, as are the regulatory, commercial vs. noncommercial, and national vs. local contexts.

Thus the use of the U.K. experience as a bellwether for U.S. digital radio prospects requires significant filtering and a nuanced analysis. Nevertheless, a primary lesson to be learned is that the introduction of enhanced (let alone replacement) services for radio broadcasting is a tricky business, and one that will take a long time to run its course.

Skip Pizzi is contributing editor of Radio World. He thanks Simon Parnall for assistance with this article.

Nautel Ltd. won a contract for the deployment of high-power FM transmitters in the United Kingdom for **National Grid Wireless.** The client is a provider of large-scale transmission infrastructure for broadcasters and mobile network operators.

Orders include Nautel's V15, V10 and V7.5 transmitters. Nautel also will provide deployment services. The manufacturer said it has also won recent notable contracts in Mexico and the Philippines. ...

Broadcast Electronics and **Ka You Communications** are promoting a collaboration they say will expand local outreach of religious broadcast groups and other cluster stations. Ka You is a supplier that targets distribution needs of Christian broadcasters. The technology pairs IP addressable satellite delivery with "TiVo-like" automation.

"The solution lowers the cost of entry of satellite-delivered content and is a first to address audio delay issues associated with voice-tracking over satellite," the companies said. BE's Ray Miklius called it an affordable way for operators in smaller or niche markets to send shared programming to remote towers without having to give up a local feel.

The firms implemented satellite networked AudioVaults for Family Life Network in Bath, N.Y. for automating programming and voicetracking content to transmitter sites in New England. Eleven tower sites each have their own computers, spots, weather, news and sponsorships. ...

Telos Systems shipped Zephyr Xstream codecs to customers including **WKLS(FM)** in Atlanta, **Sirius Satellite** in New York and **Salem Radio Network News** in Arlington, Va. Sister company **Omnia** sold Omnia One processors to **WGAR(FM)** in Cleveland, **KKWY (FM)** in West Jordan, Utah, and **WKKQ (FM)** in Barbourville, Ky. And **Axia Audio** announced new users at **WFIU (FM) Indiana University** in Bloomington, Ind.; **United Stations Radio Networks** in New York; and **KTSA(AM)** in San Antonio, Texas.

BE AudioVaults, networked via satellite, are serving Family Life Network, including this studio.

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GUEST COMMENTARY

A New Concept in AM Radiator Design

A Provocative Research Idea Leads Field Observers Onto Likely Solution

Dr. J. Parcfolluf IV and R. Langison, P.E.

For the past year, engineers at AM Virtual Antenna (AM-VA) have been developing a radical new antenna concept for use in commercial AM broadcasting.

AM-VA began working toward the ultimate AM antenna solution when a commercial broadcaster retained AM-VA to find a solution to an AM antenna problem. Specifically, their AM towers were condemned by their city of license, and they didn't want to abandon their antenna site.

The problem was simple. How could they continue to broadcast without their towers?

We knew that the electric field (E) that would be produced from a current flowing in a vertical antenna element is

$$E = 59.96\ I\ (1 - \cos(G))\ mV/m$$

Where G is the electrical height of the element in electrical degrees and I is the current at the current loop in amperes.

So, our objective was to come up with a new design that would produce an equivalent electric field intensity at one kilometer without the use of a tower as the antenna.

New antenna installed below ground

The solution we chose was based on the use of a virtual antenna.

We knew that an antenna above a ground plane could be modeled by creating a virtual tower underneath the ground plane. Using this theory, we built a test facility where we could put the virtual portion of the antenna above the ground plane and put the metallic portion of the antenna below the ground plane.

As shown to the left in Fig. 1, the usual mode of operation for a monopole above ground results in a virtual antenna below the ground plane.

By exchanging the positions of the real antenna structure and the virtual antenna structure, we are able to accomplish the configuration as shown to the right in the figure.

Notice also that the actual length of the buried monopole is reduced as a result of the increased permittivity of the ground, which serves to increase the electrical length of the antenna.

In the test phase, we initially decided to use a pile driver to drive a metallic pile into the ground below a ground plane as the test antenna.

This proved impossible due to the layers of rock below the ground. Each test pile would stop at the rock layer. The breakthrough came when we went to an oil drilling rig which could drill through the rock.

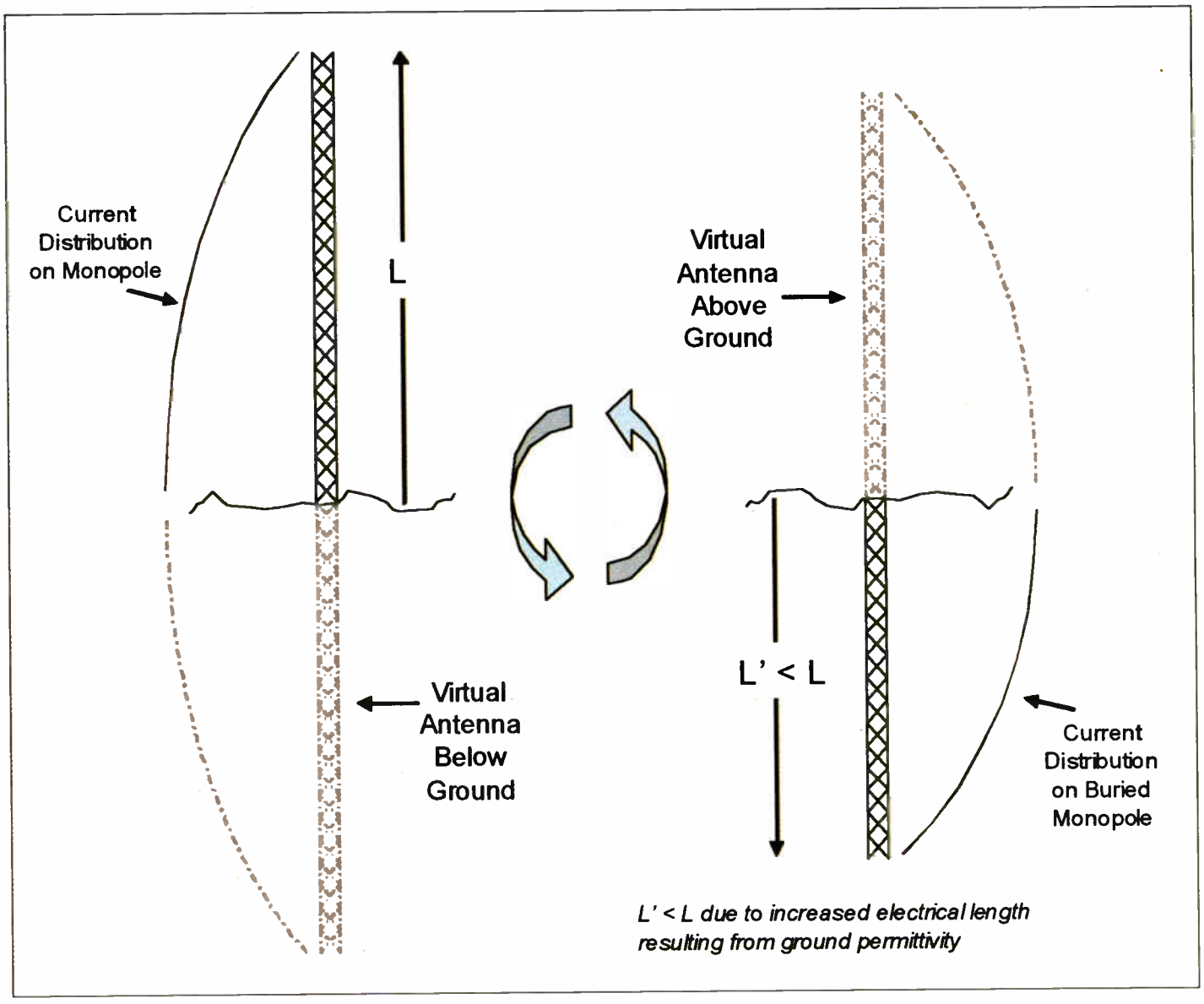
This also allowed us to drill multiple holes in a triangular pattern creating an underground virtual tower. The large face size of this tower gave us an opportunity to improve the base impedance bandwidth of our virtual tower model for use with AM digital IBOC tests.

In order to feed the test model of our AM-Virtual Antenna we installed an insulator on top of the virtual antenna by attaching a top plate to the top of the three oil well pipes that were installed one quarter-wave into the ground. On top of this plate, we installed a three-foot-tall glass insulator.

Finally, we installed a one-quarter-wave radius circular ground plane above the ground and attached it to the top of the insulator. We fed the AM-VA at the junction of this ground plane and the top plate of the oil well pipes.

In order to monitor the performance of the AM-VA, we installed two sampling loops underneath the ground plane to sample the induced current in the ground system. In this way, we could look at the base impedance of the AM-VA and the effective current in the virtual monopole above the ground.

See RADIATOR, page 71 ▶



Fib. 1: Illustration of AM-Virtual Antenna (AM-VA) Concept

Radiator

▶ Continued from page 70

Prior to installing the AM-VA, we installed a temporary antenna above the ground plane in order to make measurements of the ground conductivity along eight radials. This allowed us to make predictions of the field values that we hoped to measure once the AM-VA was tested.

We knew that the field at one mile for our AM-VA above a perfectly conducting earth would by 194.9 MV/M if we fed one kilowatt into the antenna. With known conductivity, we were ready to make field trials.

Using seven-and-one-half-minute USGS Topographical Maps, we established a set of measurement points for our initial field trial. We were fortunate to find a used AM Field Intensity Meter (FIM-41, serial number 105) and an impedance R – F bridge (General Radio type 1606-A, serial number 1115) which had been previously owned by a broadcast consulting firm.

Initial results were not as good as were expected. Upon further investigation, we realized that by utilizing the virtual portion of the antenna, we had to modify the architecture to make use of perfect magnetic conductors (PMCs)

One unexpected result of our field test involved the cattle that were grazing on the pasture nearby.

rather than the perfect electrical conductors (PECs) as are used for the standard antenna radiators.

PMCs, which reflect the magnetic component of the electromagnetic (EM) wave with a phase reversal while not modifying the phase of the E-field, were first conceptualized for theoretical analyses, but physical realizations approximating PMCs have recently been synthesized using metamaterial approaches. We have applied these concepts in a novel treatment of the ground surface where ground radials would normally be installed.

The results with the PMC modifications in place have so far been above our expectations.

For example, we found that our AM-VA produced excellent coverage in underground environments (e.g. urban underground facilities, tunnels, subways, mines, shelters). This unexpected advantage of the AM-VA is being studied now by the United States government as a way to better communicate with miners in times of emergency. A DoD initiative relating to use of the AM-VA for submarine communications is also pending.

One interesting and unexpected result of our AM-VA field test involved the cattle that were grazing on the pasture where our field tests were performed.

The owner of the cattle herd indicated that his animals grazing on top of our AM-VA installation increased in body weight and weekly body weight gain when compared to similar animals in different locations on his ranch.

We were surprised by this unexpected positive result, but then found an article in the IEEE Antennas & Propagation magazine (Volume 49, No. 4, August 2007) written by James C. Lin wherein Mr. Lin found this same result from the magnetic fields near 735 KV AC high-tension power-transmission-line exposure.

One wonders if the use of the AM-VA in heavily populated communities will have a similar health benefit to the local community living near the antenna.

With our initial tests results in, our next step will be to formally file the test results with the FCC and to ask for approval of this new technology. We hope to have this accomplished by the end of the year and will post updates as they are available at *www.am-va.com*.

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

GM Journal

Radio World — Resource for Business, Programming & Sales — March 26, 2008

Trade Secrets About Tickets
Page 76

WGBH to Open 'Studio' in Second Life

Station Does a Little Virtual Anthropology With the Help of a CPB Grant

by James Careless

WGBH Radio Boston is going boldly where no public radio station has gone before, by opening a "virtual studio" on the Second Life Web site *secondlife.com*.

Established in 2003, Second Life is a user-created 3D virtual world. Similar in style to the popular "Sims" computer games, Second Life offers "residents," its users, the chance to recreate themselves as avatars or 3D customizable beings, then buy virtual properties to construct buildings and engage in whatever virtual lifestyle appeals to them.

"Using a grant from the Corporation for Public Broadcasting's Public Media Innovation Fund Program, we are going to construct a virtual music studio based on the actual Fraser Performance Studio," said WGBH radio producer Gary Mott.

"It will have an auditorium space where Second Life avatars can go to hear live concerts modeled on those we broadcast on WGBH 89.7. Our goal is to see how Second Lifers react to this opportunity: Will they attend concerts? Will we reach people who do not usually listen to public radio? We will only find out by doing it."

Its world

Take a quick look around Second Life and you will see that this is not just another computer game. In fact, it is a place where users can create their own "second lives," trying personas and lifestyles that, for one reason or another, they can't attain in reality.

In this alternative world, each avatar can move about, interact with objects and other avatars, and generally conduct itself as if it were living here. This is where the genius of WGBH's experiment comes into play: By purchasing "land" in Second Life and building a concert hall, the station is creating a destination for Second Life gamers.

Gary Mott in the control room for the Fraser Performance Studio; and his avatar.

According to site statistics, there were 12.2 million "residents" or unique avatars in use at Second Life at the end of January.

Intriguingly, land is not free in Second Life. You have to pay for it using Linden dollars, which have a 270:1 exchange rate with real U.S. dollars. Linden dollars are purchased through the Second Life site.

To purchase the 16 acre private island needed for its virtual studio, WGBH will have to pay $1,675 to the site, plus an additional $295 to maintain the "land." Apparently, even unreal estate has real value in today's market.

Considerations

"The building we have planned will look like the Fraser Performance Studio on the outside, with the letters 'WGBH' branded on it," said Mott.

"Avatars will get to it by teleporting, the preferred form of transportation in Second Life. They can go inside and sit down for the performance, which will be in real-time at a virtual Steinway."

"We haven't decided whether we will be using avatars on stage that resemble the actual performers. There is also the issue of coordination; do we try and make the avatar's hands move in time with the music, or disguise what they are doing by placing the piano at a different angle? And do we do our Second Life performance at the same time as our on-air live broadcast, or after the fact?

"These are all points that need to be worked out."

Ironically, the degree of realism afforded by Second life could pose problems for WGBH.

In this virtual world, there is nothing to stop the avatars from talking to each other during the performance, or getting up and interfering with the performer. Such is the versatility of this world, in fact, that the station may need to define certain limits into its program, to keep the avatar audience away from the stage; sort

See SECOND LIFE, page 77 ▶

Beyond the Dial

WGBH is one of several public broadcast entities to receive funding for new media initiatives from the Corporation for Public Broadcasting. CPB's Public Media Innovation Fund Program encourages experiments with emerging platforms. Grants are for up to $20,000. Results will be shared with the public broadcasting system.

Other recipients:

KET/The Kentucky Network — "Connectivity, Choice and Participation" will test Web 2.0 strategies to increase secondary school student proficiency and engagement in the study of German.

Oregon Public Broadcasting — "Invasive Species Online Hotline" will employ user-generated content and social networking tools to connect the public with invasive species experts to help stop the spread of invasive plants and animals in Oregon.

WFUV/New York — "WFUV Online Local Music Network" will create an online social network for musicians and music lovers to access independent, emerging music.

Penn State Public Broadcasting — "Back from Iraq: The Veterans' Stories Project" will use a course-based model and Web 2.0 strategies to empower and train Iraq veterans to complete in-depth audio and text portraits of fellow Iraq veterans.

Northwest Public Broadcasting — "Our Northwest News" 2008 will test the use of online game-playing, blogs, wikis and other strategies to engage the audience with regional news stories in Washington state.

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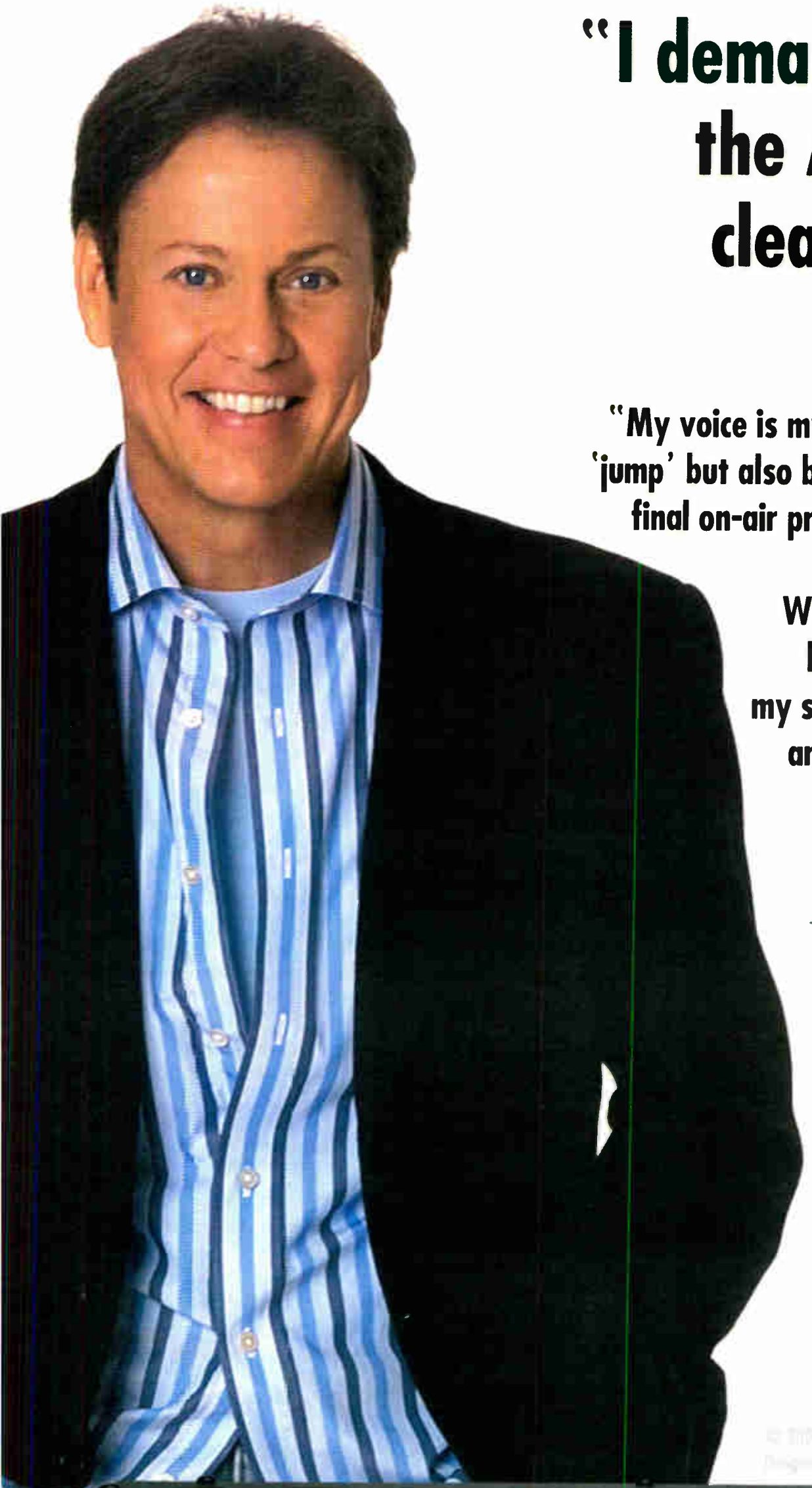

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Hiring Mistakes and How to Avoid Them

by Sean Neumayer

You thought you asked all the right questions before hiring the new engineer. And you *know* you verified the credentials and references of that impressive-looking salesman way before you took him on board.

But neither is working out, and too many longstanding staff members are already starting to grumble. What happened?

Mistake #1 — Managers often overlook the fact that specific jobs call for specific innate traits, and those that might be highly desirable in one scenario may be far less so in another.

Hiring that confident, apparently very creative engineer might have seemed like a good idea at the time. What you probably didn't realize, though, is that this free-spirited, ingenious individual would also prove to be quite self-directing — to the point where he insists on doing things his way and skirting around commonly adhered to station policies.

Most technical jobs need to be filled by people who are detail-oriented and focused. These are usually the ones who stick to protocol and follow subscribed methods, as they tend to be perfectionists and want to avoid making any mistakes. When hiring IT personnel, engineers, controllers or administrative aides, look for people who demonstrate the ability to spot inaccuracies or omissions. Devise simple tests or ask questions about how meticulous your candidate sees him or herself as being.

Mistake #2 — Managers focus too much on credentials, references and the interview itself, not realizing that someone who looks perfect for the job may have a personality that clashes with the existing team.

The impressive-sounding salesman might come with stellar recommendations and seem like a great guy to know. He may tell you all about his sales successes and seem lively and interesting, but beware!

There are plenty of fake sales personalities who are really more networkers than closers. They like meeting and impressing others and can talk endlessly about their goals, plans, and intentions — and then do nothing. Networkers tend to hop from job to job and cite a range of reasons for their supposed "bad luck."

These individuals can also over-talk, under-listen and become a boisterous distraction to your job-focused staff members. They often work well in promotional roles, public relations or hospitality, but monitor their sales aptitude closely and, whatever you do, keep them away from your workers who need peace and quiet to be productive.

Mistake #3 — Managers make hiring decisions without knowing how a person is apt to respond in stressful situations. When a crisis occurs, a whole new side of someone you think you know can emerge.

Sean Neumayer

A sales assistant applicant may respond well to your open-ended interview questions, and she might seem superior to other candidates in every way. If her qualifications are sound, her references stellar and your instincts tell you to hire her, you should, right? Wrong!

Dig deeper. Find out how this person might respond if rushed, required to fill in for someone else, or forced to attend to several problems simultaneously. Any of these situations can trigger stress in workers, and responses to stress vary greatly from person to person.

You might be exasperated to find, for example, that your newly hired sales assistant slows down when under pressure and needs constant support and reassurance. Or she may sulk, become quiet or make frequent mistakes.

Being able to read and anticipate the reactions of your workers is critical. Keep in mind that many behavioral traits and actions are difficult to detect unless a thorough analysis of an applicant's personality is undertaken.

Mistake #4 — Managers provide candidates with vague job and culture descriptions.

The more information an applicant has about you, your management strategies, the job and the work environment, the better it will be for everyone at your station.

One of the greatest challenges facing employers today is employee retention. While the lure of bigger salaries or greater responsibilities can be the reason some workers leave, it's often something far less obvious that is the driving force: unwelcome surprises about the existing company, its managers or the job itself.

During the interview process managers can ask questions, delve into backgrounds, speak to references and trust their instincts. The problem is there are probably still "little things" left unsaid, facts would-be workers don't know about their new employees or that their new employees don't know about them. And too often it's the "little things" that cause the most pain.

Be honest. Encourage them to ask any question, as often it's something seemingly incidental that can drive an employee away.

Provide your candidates with written, explicit job descriptions. Let them get a feel for what it would be like to work at your station. Show them where they'd be working, if possible, and point out all the aspects of the job — both good and bad.

Be honest. Encourage them to ask *any* question, as often it's something seemingly incidental — like having to complete daily activity sheets or fill-in for the receptionist — that can drive an employee away.

As a decision-maker you have the power to enhance productivity and boost morale by making a conscious effort not to just detect personality traits but also to anticipate how those traits might affect a worker's performance.

It's up to you to make the effort to understand the different needs of different workers. By doing so you'll not only free yourself and gain extra time but also make your station one that employees want to work in — not leave.

The author is a senior consultant with The Omnia Group. He helps clients hire compatible workers and maximize performance of employees by offering behavioral assessments, generational evaluations and team analyses. Contact him at sneumayer@omniagroup.com.

Brooks Visits Troops

Radio host Kix Brooks of music duo Brooks & Dunn aired a special edition of "American Country Countdown" following his return from a USO tour to Iraq and Kuwait to visit and entertain troops.

The show featured commentary from Baghdad, greetings from service members and accounts of his trip. It was carried by ABC Radio Networks affiliate stations of "American Country Countdown with Kix Brooks" and featured an interview with songwriter Bob DiPiero, who joined Kix on the tour.

Brooks flew into the region in January and traveled to several military installations. He met with some 1,800 service members.

For information on the USO, see *www.uso.org*.

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Trade Secrets About Tickets

PROMO POWER
BY MARK LAPIDUS

I was watching our afternoon guy do a live remote broadcast from a Paul McCartney concert outside the stadium when I saw the concert promoter approaching me.

This was completely uncharacteristic because I had never seen him approach *anyone*. People were always approaching him.

He was chewing his unlit cigar as he said to me, "Kid" (this was 20 years ago), "Kid, how would you like to give away 20,000 tickets to tomorrow night's show?"

I looked behind me to make sure he wasn't talking to someone else. "Excuse me," I replied. "Did you say 20,000 tickets?" He nodded. "To Paul McCartney?" I stammered.

He looked at me like I was complete moron and said, "Yeah." I replied affirmatively. He gave a snort and as he walked away, he said over his shoulder, "Good. Try to figure out how to give 'em all away by 4 p.m. tomorrow to people who'll really use them."

Of course, it hadn't yet hit me that handing out *one* thousand pair of anything takes time. In fact, I still hadn't gotten my brain around why he wanted to give away so many tickets that until a few minutes earlier had been worth so much money.

The answer is at the end of the article. First let's examine a few unique ticket giveaways and discuss how you get tickets to events when ordinary sources aren't offering them to you for free.

Beg and cajole

There is no substitute for a close relationship with people who work in the concert, sports and entertainment industries. It's these relationships that enable you to pick up the phone and ask, cajole and sometimes beg for tickets.

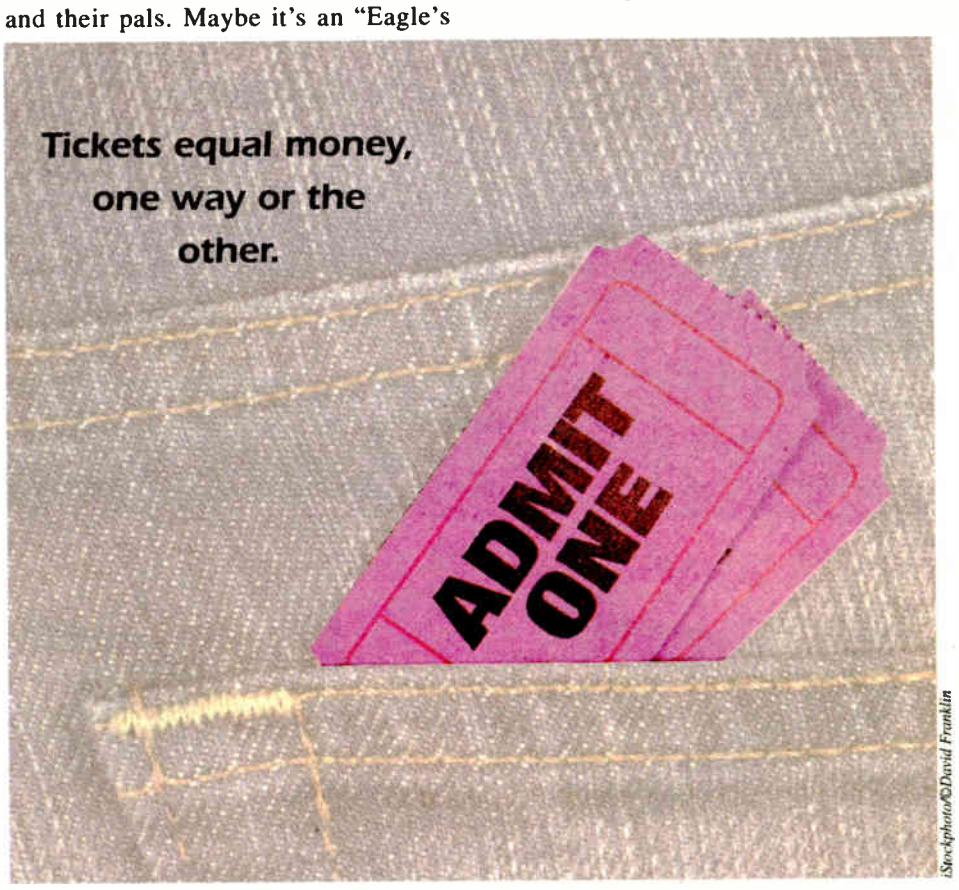
Also important is having close relationships with people in the ticket-brokering business. Ticket brokers always have tickets!

Fortunately, concert promoters nowadays often put shows up for sale months before they happen so you have plenty of time to plan out tactics.

I'm not going to waste time outlining how to execute normal promotional trades for tickets. It's the out-of-the-ordinary — tickets to sold-out shows, front-row seats, blocks of seats, or suite tickets — that are the difficult moves.

Blocks of tickets: Want to give away a bunch of seats together to one office or a special group? You'll likely have to settle for nose-bleeds, but don't let that stop you.

If you make it sound cool enough on the radio, there are many people who would want to win them for themselves and their pals. Maybe it's an "Eagle's Nest" or "The Mile-High Club."



iStockphoto©David Franklin

When you've got a prize this big, you'll be able to bring more promotional muscle to the table — perhaps an on-air promotion that lasts a week, instead of the standard weekend or 10-second announcement during an ordinary weekday giveaway.

Another nice angle is to auction the block off to the highest bidder, with the money going to the artist's or team's favorite charity. Note: When negotiating this deal, ask for more than the block of nosebleeds. For a longer promotion and greater voice on your station, you can angle for a pair of front row, or a meet-and-greet after a game or performance.

How do you nail a suite for a game or show? Wheel and deal!

Obtain a list of suite holders from your friend at the venue or ask around your business community. You've got something many suite holders want: airtime. Have them give you one Suite Night.

What do they want? Trade them commercials. Cover their product on a talk show. Do a Web story. Give them access to a DJ to host one of their events. Give them autographed items they can use for their pet charity auctions.

What's the deal with ticket brokers? They're legal in many cities and have become so common that even teams and concert promoters often do deals with them. They want access to your airwaves. You want tickets (many of which they're stuck with at the last minute) that are sold out to the public. Work out a plan that makes you both winners!

No luck with brokers? Try your listeners.

The message boards on your Web site are great way to do trades with listeners. Got plenty of tickets for one show and not enough for another? Let's make a deal!

Since you've read this far, you may be curious as to why anyone would give away 20,000 tickets to a concert. An artist may require a promoter to use "best efforts" to fill every seat in the house. Secondary reasons are purely financial. If a promoter knows he can't possibly sell the seats, he may at least wish to generate greater parking fees ($20 times 20,000) or concession fees (two beers/two T-shirts per person equals a gazillion dollars).

Tickets equal money, one way or the other.

Contact Mark Lapidus at mark-lapidus@verizon.net

George Whitaker wrote in to People News, "I was wondering how many people still have their lab coats from the 1989 SBE convention in Kansas City. I still have mine in my shop and wear it during certain projects. Even though I am retired from radio I still love to design and build things. One of my sons took this picture of me in my lab coat recently while I was piddling with a board out of an electronic bingo game I designed and built. Just in case people have forgotten, we were given the lab coats with our lunch stuffed in the pockets. I have always thought it was quite a unique idea and just pretty darn cool."

NewsRadio 1020 **KDKA(AM)** introduced **Bill Rehkopf** as its new morning news anchor. He took over for **Bob Kopler,** retired on Dec. 28 after 19 years with KDKA. Rehkopf began his position after the first of the year. He was news director and morning news anchor at WPOC (FM) in Baltimore, a position he had held since 1999.


Bill Rehkopf

Radio broadcasting veteran **Buzz Casey** was named director of operations for **Clear Channel Radio's** Indianapolis radio group, which includes WFBQ(FM), WRZX(FM) and WNDE(AM). He is responsible for the programming of WFBQ and oversees the station group's on-air and online programming and marketing. Casey led programming for KDKB(FM), Phoenix; WKLS(FM), Atlanta; and WNRQ(FM), Nashville.


Lamar Smith

Entercom named **Lamar Smith** director of engineering and chief engineer for its three stations in Austin, Texas: KJCE (AM), KAMX(FM) and KKMJ(FM). Smith joined the company in 2000 as director of engineering in Wilkes-Barre/Scranton, a market where he had served in various engineering positions since 1993. At Entercom Austin, he serves in a similar role, directing engineering operations for the cluster. ...

Entercom also named **Dan Pregnar** as DOE of its four FM stations in Wilkes-Barre/Scranton, Pa.: WDMT, WGGY, WILK and WKRZ, replacing Lamar Smith. Pregnar joined Entercom in 2001 as chief operator in the Wilkes-Barre/Scranton market. Prior to his role at Entercom, he served as chief operator for a local. Pennsylvania-based radio group.

Glenn W. Ferguson, who served as the third president of the merged **RFE/RL Inc.** from 1978 to 1982, passed away on Dec. 20. A former ambassador to Kenya who also had served as the first director of Volunteers in Service to America (VISTA), Ferguson headed three universities before succeeding Sig Mickelson as head of RFE/RL Inc. After leaving the "Radios," he served as president of the Lincoln Center for the Performing Arts in New York, and as president of the American University of Paris.

Steve Redisch joined the **Voice of America** as executive editor, supervising daily operations and activities of news, programs, language services, broadcast operations and Internet departments. Redisch joins VOA after a 20-year career with CNN.

Harris Corp. named **P. Harris Morris** to the new position of vice president of software systems in its Broadcast Communications Division. He is responsible for the software, server, newsroom and editing businesses that manage digital media workflow for global broadcast and other media customers. Morris had been chief strategy officer for the Thomson Learning Division of Thomson Corp. He will be based in Denver.

Radio Disney named **Kelly Edwards** director of music. She serves as the radio network's liaison to the music industry and oversees on-air playlists as well as music and artist strategy. Edwards joins Disney from CNN and Radiovisa, where she was national director of sales and marketing. Prior to that she was director of music and promotions for Premiere Radio Networks and vice president at Prism Entertainment.

Salem Communications appointed **Sean O'Neill** to general manager of its two New York Christian talk stations, WMCA(AM) and WWDJ(AM), where he leads all areas of operations including sales, programming, engineering and online. O'Neill was general sales manager for more than four years at CBS-owned KFWB(AM) 980 and the Dodgers Radio Network, and was VP/GM of Big City Radio's Spanish pop station KLYY(FM) in Los Angeles.

Beasley Broadcast Group appointed **Susan Freeman** communications and events manager. Freeman most recently was the copy director and a creative director at AdvertisingWorks Inc. ... **Chuck Maylin** joined Beasley as vice president/market manager for its five Las Vegas stations: KKLZ (FM), KFRH(FM), KCYE(FM), KDWN (AM) and KBET(AM).


Susan Freeman

Second Life

▶ Continued from page 72

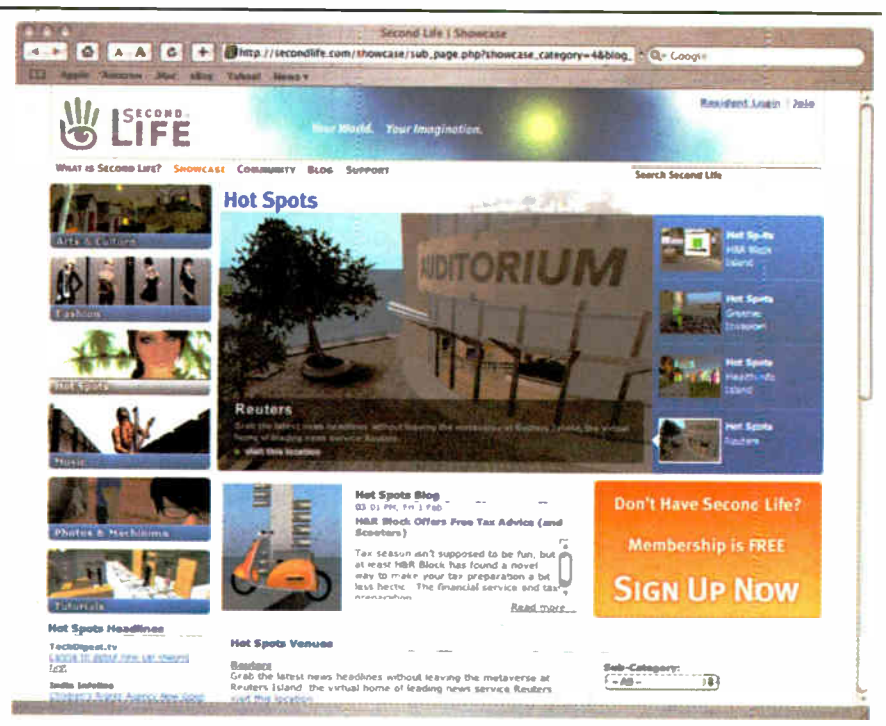
of cyber-security, if you will.

It's not hard to see why WGBH, or indeed any radio station, would want to get a stake in Second Life. Foremost, it's part of a medium that is drawing people away from time spent with radio and TV. To keep up with them, it makes sense to follow them.

Second, Second Life represents a chance for WGBH to promote its traditional services to non-listeners. If they like what they hear in Second Life, perhaps they'll tune to the real radio station at home, in their cars or on the Web.

This said, WGBH is heading into its Second Life experiment with its options open.

"We simply want to get into Second Life, to see what happens for us there and how people react to it," Mott said. "Basically, we're going in as virtual anthropologists, to find out what we can learn about this Brave New World. Besides, live music has a proven cachet for Second Lifers," he added. "WGBH-89.7 broadcasts more than 100 live events annually. This is something we already do, that could bring us new devotees from a different space."



WGBH won't be the first media organization with a presence in Second Life. Here, users are invited to 'grab the latest news headlines without leaving the metaverse at Reuters Island, the virtual home of leading news service Reuters.'

SMALL BUSINESS MANAGEMENT

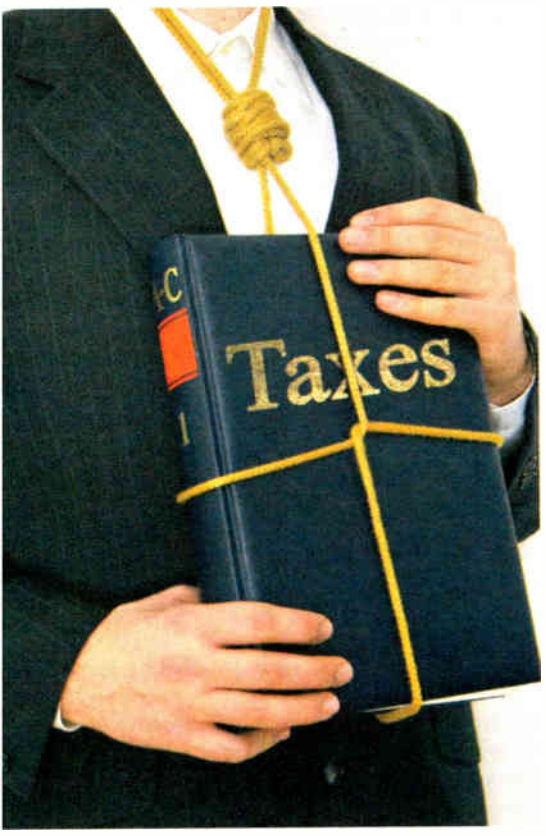
Caught, Audited = Home Free (Maybe)

With Tax Season Here, Some Things for Small Businesses to Keep in Mind About Audits

by Mark E. Battersby

For many years, the children's chant "Who's afraid of the big, bad wolf" was more of a threat to many business owners and managers than the Internal Revenue Service. Today, however, it appears that the risk of an IRS audit is noticeably increasing.

In fact, the IRS's tax cheat dragnet brought in a record $47 billion during the 2005 fiscal year. Audits of individuals are up by about 20 percent, while small business audits have more than doubled. The complexity of our tax laws and the confusion most broadcasters and other businesses face trying to keep abreast of those ever-changing rules have all contributed to the increased success of the IRS's auditors.



Avoiding audits

Who would not like to ensure their tax returns — or those of their broadcast business — are not targeted for examination by the IRS? A few companies have discovered one way: do not file one. At the opposite extreme, a sure-fire way to ensure that your return is selected is to take big-time losses, operate as a cash business and keep sloppy records.

Fortunately, the returns of most broadcasters presumably fall between these two extremes. There is no justification for sacrificing valid deductions, even if large or unusual. Also, keep in mind that income earned from third-party payers is usually reported to the IRS. Obviously, all income and deductions must be reported, and reported truthfully. If that means a higher chance of audit, so be it.

An excellent strategy for avoiding an audit is to point out "oddball" items on the tax return. Give the IRS the answer before they ask the question. Attach a note, a brief statement, documents and explanations for all unusual transactions.

For large transactions that may fall into one of the innumerable "gray areas" of our tax laws, there is yet another tax form. Form 8275, "Disclosure Statement," may help avoid penalties by disclosing questionable deductions, positions or investments. Few experts think using this form will increase the chance of an audit.

When offense is no enough

What happens if, despite your best efforts, the IRS requests your presence to review your tax returns?

It goes without saying that the worst thing that any business owner can do if they receive an audit notice is to ignore it. The best bet is a quick response. It also helps if the business owner works with the IRS to resolve the matter.

If a small station or business has kept organized records, including bills, receipts and cancelled checks, and has in place the proper internal controls, there is little need to worry. The IRS may interpret the operation's situation differently, but there is no crime in having differences of opinion.

Thanks to the IRS Restructuring and Reform Act of 1998, small businesses now have many new protections in the audit process. First, the IRS's ability to conduce so-called "lifestyle" or "economic reality" audits has been diminished.

Also, keep in mind that the use of an office in the home can substantially reduce or even eliminate the unique home office exclusion. That exclusion allows up to $250,000 ($500,000 on a jointly-filed return) of gain from the sale of a residence to be excluded or ignored. An owner cannot claim the exclusion for gains that result on any portion of that residence that is not used as a "personal residence."

Taxpayer rights

The Taxpayers Bill of Rights, part of the IRS Restructuring and Reform Act of 1998, requires the IRS to explain a taxpayer's rights and the IRS's obligations during the audit, appeals, refund and collection processes.

A taxpayer is also guaranteed the right to be represented by any individual currently permitted to practice before the IRS. What's more, any interview must be suspended when the taxpayer clearly requests the right to consult with a representative.

Audits of individuals are up by about 20 percent, while small business audits have more than doubled.

Today, the IRS generally is prohibited from asking for extensive information about a taxpayer's financial status, standard of living and other information to determine the existence of unreported income. The IRS can only ask for that information if it has a reasonable indication that there is a likelihood of unreported income based on the tax return and information reports from third parties.

What the IRS looks for

Many experts agree that an improperly prepared tax return is a good way to ensure an IRS audit. Sloppy returns are also hazardous.

Those business owners who fail to report all income send up an instant red flag in today's computerized business world. Information mismatches produced by erroneous Form 1099 received by some professionals often creates disparities in reported income. If the amount reported on the Form 1099 is wrong, the individual or firm that sent the form should correct it and file an amended Form 1099. Intentionally mismatching the information of the tax return can only draw attention.

The biggest problem for most operations — as well as their owners — is a lack of good expense records. The use of an automobile for business purposes is a classic example. Although the vehicle may have been used 75 percent of the time to call on advertisers, many operations fail to keep a detailed record and, thus, are unable to state that clearly on a tax return. Records can be easily kept in the form of a log.

Those professionals who use an office in the home to conduct business, keep records or perform management chores may discover that the risk of an audit is not worth the small tax deduction. The home office tax form (Form 8829, Expenses for the Business Use of Your Home) has, for some time, been a definite audit flag.

If the owner of a business has only a minimal amount of deductible home-office expenses and poor records, the risk of an audit may not be worthwhile.

Among the more important rights given any individual whose returns are targeted for further examination, is whether to be represented by a tax professional or whether to attempt to answer the IRS's questions alone. However, unless it issues an administrative summons, the IRS cannot require the taxpayer to accompany the representative to the interview.

An important consideration for every owner or manager being audited is where to hold that meeting. Should the meeting be in the accountant's office where all of the working documents are easily accessible? Should it be at the broadcaster's place of business, the place where all the records are kept, in order to demonstrate to the IRS auditor that there is nothing to hide and that the operation is a legitimate one? Or, should the station owner and/or his or her representative trudge down to the IRS office armed only with the specific documents and information requested by the IRS auditor? There is no one right answer.

Ignoring the IRS does not work. The IRS may issue summons to third-party record keepers (attorneys, enrolled agents, banks, brokers, accountants, etc.) for the production of records concerning the business transactions or affairs of a business — and its owner. Of course, the taxpayer must be notified of the summons and has the right to intervene. The taxpayer can, in fact, begin a proceeding to quash the third-party summons.

Appeal after appeal

As mentioned, the majority of operations file relatively honest returns. The occasional error, misinterpretations or honest disagreements of "gray areas" may result in additional tax assessments. However, from the initial screening for accuracy that each return receives until the final appeal is exhausted, mistakes in the favor of the taxpayer have been discovered in about 25 percent of all cases.

The IRS usually is quite sympathetic to honest mistakes and more than willing to

See AUDIT, page 80 ▶

Products & Services

SHOWCASE

Canadian Radio Looks Ahead With Trepidation

by James Careless

The future of commercial radio in Canada appears uncertain, because the medium continues to be burdened with governmental regulation while Internet content providers run free and unfettered.

That is the view of top commercial radio executives, as aired during last fall's Canadian Association of Broadcasters convention.

"Any regulation that causes Canadians to use Canadian media less is detrimental to our broadcasting system," declared John Hayes, president of the radio division of Corus Entertainment, summing up the industry's discontent with Canadian content quotas and similar regulations laid down by the Canadian Radio-Television and Telecommunications Commission.

"We have to run the race with the cement shoes our regulator has provided for us," Hayes told CAB delegates. Meanwhile, "Sixteen percent of the time Canadians spend with media is now spent online, where the consumer is completely in charge of her media."

Emerging artists

The CRTC has announced that it will now require radio stations to provide specific proposals for promoting "emerging artists." These proposals will have to be offered at license renewal time, with the implicit threat that noncompliant stations will be penalized.

As of yet, exactly what constitutes an "emerging artist" has yet to be specified by the CRTC. It is a semantic challenge that worries Elmer Hildebrand, president and CEO of Golden West Broadcasting.

"You put 100 people into a room, and chances are they would come up with 100 different definitions of what an emerging artist is," he said.

The CRTC's insistence on radio regulation while the Internet is left alone is just one issue alarming Canada's commercial radio broadcasters. Another is the push by record companies to increase royalty fees paid to them by Canadian radio stations.

Currently, "Four percent of all radio revenues currently go to music labels," Hayes said. This works out to about $70 million (Canadian) annually across the entire industry. But if rights holders convince the Copyright Board of Canada to boost their music royalties, "this could rise to 17 percent to 20 percent," warned Jacques Parisien, president of Astral Media Radio. The only way radio stations could pay such increases is by "cutting our costs, and 70 percent of our costs are people."

While all this is playing out, young listeners are deserting radio in favor of the Web, cell phones and other new transmission media. Effectively, this means that Canadian radio is "in danger of losing the distribution system," said Gary Miles, CEO of radio for Rogers Media.

"We are worried about losing transmitters when we should be worrying about high-speed data distribution download." Miles then held his cell phone up to his microphone: It was streaming audio from Toronto's 680News radio station.

You put 100 people into a room, and chances are they would come up with 100 different definitions of what an emerging artist is.

— Elmer Hildebrand

"That's what I've got to be on," he said. "We can compete due to the strength of our content; if not, I'll change the content. But I have to have an equal platform to compete on."

"Our biggest change is that we have to be relevant," added CHUM Radio President Paul Ski. "We have to go digital."

However, judging by the words of Canada's top radio executives, "digital" means cell phones, Wi-Fi and Internet with over-the-air digital alternatives such as Eurkea-147 DAB or HD Radio being of little importance.

In fact, the whole digital radio standards debate that has wracked Canadian radio for years was hardly mentioned at the CAB convention.

At best, "IBOC is only a temporary fix anyway," said Hildebrand. The real action is on the Web, which is why Golden West has "launched local Internet portals fed by our radio stations. We see that revenue stream growing faster than our broadcast revenue stream."

At the end of the session, it was clear that Canadian commercial radio broadcasters want the CRTC to loosen its regulatory reins significantly, if not let go of them altogether.

"There are a bunch of guys in suits trying to set up rules when young people have already left us," complained Paul Ski. Following up on this complaint, Corus' John Hayes issued a call to arms, challenging Canada's radio stations to take the offensive against CRTC regulations.

"We need to be unreasonable; we need to be strident," he said. "We have to stand up for ourselves to give us the chance to remain relevant to the consumer."

Audit

▶ Continued from page 78

discuss underpayments of taxes that may result from the many so-called "gray" areas of our tax rules. On occasion, they will negotiate the amount of tax due.

But they do not like fraud.

Deal with it

Changes to our tax laws in recent years have resulted in tax professionals generally taking a more conservative approach to the tax advice they render and the tax returns they prepare. After all, should a transaction be labeled as incorrectly structured or if the tax laws were ignored, the professionals as well as the taxpayer face penalties.

Despite the ultra-conservative position now taken by many tax professionals, however, no broadcasting business, or any business owner, should forego or ignore valid tax deductions. Often, disclosing those transactions or deductions on the tax return will be enough to pass the scrutiny of the IRS, eliminating a full-blown audit. At worst, disclosure may help avoid the levy of numerous penalties for taking a "frivolous position," or claiming deductions that result in accuracy-related penalties.

Honesty and clarity can go a long way toward preventing and dealing with an IRS audit. Obviously, every radio station owner and manager needs an audit strategy as well as a fallback position should those strategies fail.

Mark Battersby is a tax and financial writer based in the suburban Philadelphia community of Ardmore, Pa.

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2	Wheatstone Corporation	www.wheatstone.com
87	Wheatstone Corporation	www.wheatstone.com/W12.htm
75	Wheatstone Corporation	www.wheatstone.com

◆READER'S FORUM◆

HD Radio: Truly a Failure

I have dedicated my entire life to providing transmitters to the broadcast industry. For the past several years, I have read with disappointment the fallacious performance reports on the successful implementation and operation of HD Radio in both the AM and FM applications.

HD Radio is truly a failure. Its implementation is causing undue financial strains to broadcasters who erroneously listen to equipment salesmen whose only motivation was the commission due them by selling the equipment, with no concern to the economics and technical performance of their system.

Energy-Onix shipped 255 broadcast transmitters in the year 2007. This number includes 205 FM and 50 AM transmitters. None of these customers had an interest in HD Radio. The most common reasons given for FM stations were as follows:

• The equipment price for an HD Radio transmitter and antenna system is prohibitively expensive. The average HD Radio package is a minimum of $100,000, and can be as high as $250,000.

• The system has been promoted to have an acceptable signal as far as the 55 dB contour. We have found that the signal is useable in practice to the 75 dB contour.

Energy-Onix shipped 255 broadcast transmitters in the year 2007. None of these customers had an interest in HD Radio.

— Bernard Wise

• Fifty percent of the digital spectrum is a repetition of the FM analog stereo channel. In a reasonably matched system, the FM analog is of comparable quality to the digital when the digital is within its limited range. There is no incentive for the consumer to use "HD Radio."

• We have reports from our customers that HD Radio has caused major interference with existing FM stations that operate on the adjacent channel to an HD Radio station. It is well known that their FM "IBOC stations" operate from 130 kHz to 200 kHz from their analog center frequency.

• Ibiquity has a monopoly on the HD Radio system. This system cannot be used without paying an annual licensing fee, which can be determined by the management of Ibiquity. It is difficult to understand why the FCC would establish a standard controlled by a proprietary source.

The most common reasons given for AM stations were as follows:

• HD Radio has an audio frequency response of only 5,000 Hz. A normal analog AM transmitter has a 10,000 Hz response.

• An HD Radio exciter and additional broadband may cost the AM broadcaster an additional $50,000.

• HD Radio occupies the adjacent broadcast channels. Thus, in the evening, the high reflection of medium frequencies from the ionosphere cause severe interference to adjacent channels, essentially destroying their "nighttime" service.

• HD Radio cannot modulate more than 95 percent. A conventional analog AM transmitter can modulate 125 percent. Thus, in many major markets where major stations may operate with HD Radio, they are the lowest-sounding stations in the market. Medium- and low-power AM stations have much higher audio volumes since they modulate at 125 percent.

Rumor has it that Ibiquity has been pressuring the FCC to modify the digital standards to increase the digital subcarriers by a 10 dB factor. This is obviously intended to overcome the limited range of their present coverage. If this is ever implemented, the resultant interference between HD Radio and their adjacent broadcasters will be substantive and will reduce the service available from these adjacencies. Hopefully, the FCC will refrain from this digital power increase.

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

The Power Of One

Basketball great Charles Barkley once said he didn't want to be a role model. Well, that's really not an option. That was the mantle thrust upon him by his job.

At one time broadcasters saw being responsive to their community as a duty, or at least a cost of doing business. Take the Clear Channel Dayton, Ohio, cluster. There are seven stations. Is it too much to ask that one person is there 24 hours a day to handle emergencies ("FCC Should Not Require 24/7 Staffing," Feb. 1)? For the public, weather warnings or toxic fumes from a damaged tanker. What if EBS malfunctions? It's just one minimum wage person.

Forget the public (again). What about their own self interest?

The building is an old brick and wood warehouse. Don't you think they should have someone stationed there in case the comedy club next door catches fire? Wouldn't that be the responsible thing to do to keep the stations on the air, providing what little public service they do provide?

I'm having trouble sympathizing with a conglomerate that cares so little about "operating the public interest as a public trustee." Hey, what is that phrase from? Oh, yea, the stations' licenses.

John Terhar
Chantilly, Va.

GUEST COMMENTARY

BBG: Nostalgia Doesn't Get the Job Done

Though Shortwave Remains Valuable, The Right 'Media Mix' Is the Only Way To Reach a Global Audience

by Vincent Nowicki

Jack Quinn and Nick Olguin's guest commentary on the Broadcasting Board of Governors ("Don't Close Shortwaves, Improve Them," Feb. 1) is out of step with the realities of today's sophisticated audience and the strategic media markets for U.S. international broadcasting.

The BBG is keenly aware of the value of shortwave in distinct markets such as some parts of Africa and parts of Asia. Shortwave sustained international broadcasting throughout the Cold War and still makes a significant mark today in the global war on terror.

Vincent Nowicki

However, nostalgia for Cold War methods does not get the job done in the new millennium. We need only look at a few recent events to vividly illustrate that point.

Old meets new

In September 2007, Burma's junta cracked down on the demonstrations led by Buddhist monks. BBG doubled Voice of America and Radio Free Asia (RFA) Burmese broadcasts in shortwave and medium wave. At the same time, daily Web traffic to VOA's site increased by 186 percent and remains 95 percent above pre-crisis levels. There were real-time exchanges of video and sound from eyewitnesses' cell phones and handheld devices.

Here, old and new technologies were blended with great effect. The Web supports a dynamic interactive with our audience, allowing us to get news and then share it with remarkable immediacy. The Board's FY 2009 budget request reflects the need to invest in these transformative technologies while sustaining the proven broadcast facilities as appropriate.

In November 2007, the Pakistani government shut down all independent media inside Pakistan including VOA's TV programs on local channels. We expanded VOA Urdu-language broadcasts from five to 12-1/2 hours daily using primarily medium wave.

Research tells us that in Pakistan, after TV, FM is the dominant medium followed by AM. Shortwave is the least popular by a wide margin, with only 8 percent ownership. Notably, there is a sharp rise in mobile phone ownership and along with it, FM radio access. In this hostile climate the solution requires determination and creativity but clearly not shortwave.

In Russia we face an even more complex challenge. The Committee to Protect Journalists described in August 2007 that: "In the run-up to parliamentary and presidential elections ... Russian authorities have consolidated their control on the influential broadcast media." The CPJ described restrictive media laws, pressure, intimidation and imprisonment of journalists. Specifically, "14 journalist murders committed since President Vladimir Putin took office in 2000 remain unsolved."

BBG access to domestic radio and TV outlets has dropped, due to Russian government pressures, from 97 in 2005 to 19 today. However, only 2 percent of Russians use shortwave radio on a weekly basis, and AM usage is similarly low at just 5 percent weekly, while weekly Internet use stands at 15 percent. The Internet and other new media have become the default delivery options. Transforming our programming and shifting technical resources to reach both the policy-influencing elite and the "digital generation" is our immediate test.

The BBG has its eyes wide open as it directs U.S. international broadcasting. It faces a challenging assignment, but U.S. taxpayers can trust that we are doing our homework.

Effective distribution

Our strategic approach, including network realignments and expanding our broadcasting platforms in places like the Middle East, has been pivotal to increasing our audience.

It is true that we closed our transmitting stations in Playa de Pals, Spain, in 2001 and Kavala, Greece, in 2006. However, surplus equipment from such shifts is economically and effectively redeployed at other BBG facilities on a regular basis.

In general, the shortwave broadcasting mission European-based stations have capably served for more than half a century has shifted eastward to Asia.

Our engineers successfully added more than 50 FM transmitters to our inventory over the past several years. Most operate 24 hours a day, seven days a week. In 2007, the BBG transmitted more total hours of radio than any previous year in the last decade. In addition we operate four local television transmitters in Iraq to broadcast one of three 24-hour streams of our Arabic news and information channel, Alhurra.

Since 2002 VOA's television production has grown significantly and its worldwide TV audience has quadrupled with television programming in 25 of its 45 languages. Collectively, this new broadcasting has boosted the BBG's global audience levels from 100 million to 155 million in the past six years.

The single greatest challenge we face is to ensure effective distribution. Too many of the countries to which the BBG broadcasts try to jam our direct broadcasts, limit or prohibit local distribution via affiliates, enforce laws that restrict broadcast content and block our Internet sites.

We broadcast in 60 languages to more than 80 countries. Our global network of more than 60 transmitting facilities includes about 175 transmitters and 400 antennas with a combined power capability of more than 38 million watts. To track the effectiveness of and drive continuous improvements in our broadcasts, the BBG spends $9 million a year on market and audience research.

The BBG has its eyes wide open as it directs U.S. international broadcasting. Using the correct media mix — be it Internet, TV, AM, FM or shortwave radio — preferred by the audience, and not simply grasping on to old approaches, is the only way we can reach today's worldwide audience.

This is a challenging assignment, but U.S. taxpayers can trust that we are doing our homework.

Vincent Nowicki is the director of the engineering and technical operations at the International Broadcasting Bureau. IBB provides the engineering and technical operations for BBG broadcasters.

◆READER'S FORUM◆

Quinn, Olguin E-Mails

Jack Quinn's and Nick Olguin's e-mail addresses were omitted from their commentary "Don't Close Shortwaves, Improve Them" (Feb. 1). Jack Quinn can be reached at *w6mz@verizon.net*; Nick Olguin can be reached at *kc3fz@netzero.com*.

Privatization Not The Answer

The commentary "Don't Close Shortwaves, Improve Them" (Feb. 1) by Jack Quinn and Nick Olguin starts promisingly enough but ends with a non-sequitur.

The arguments the authors make against the actions of the Broadcasting Board of Governors are all on the mark. Remarkably, though, they fail to mention the threatened closing of the Morocco transmitter site (scheduled for this month) or the closure of the Delano, Calif., transmitter site in January.

Also they focus narrowly on Russia. It is not just Russia we need to reach. The lack of shortwave broadcasts also threatens our ability to reach people in the Middle East, Indonesia, Pakistan, China, Iran, etc.

The BBG's biggest blunder is its belief that television broadcasting can replace shortwave broadcasts. Because of its vulnerability to interdiction, television is not capable of replacing the penetrating power of shortwave radio broadcasts.

In the penultimate paragraph Quinn and Olguin present a false premise and reach a false conclusion. In fact, privatization of government services often ends up costing the taxpayers of this country more money and the services are less efficient.

The authors also fail to acknowledge the Voice of America's essential role in World War II and the Cold War. The VOA is a federal agency and it was able to fulfill its mission despite the fact that it is required to comply with civil service regulations and bargain with unionized employees. As a matter of fact, it was the federal employee unions who alone had warned about the BBG's poor decisions from the start.

The decision to eliminate shortwave radio broadcasts rests solely with the BBG and privatization is not the answer.

Tim Shamble
President
American Federation of Government Employees Local 1812
Washington

'Digital Tipping Point'

Paul, your interview with Mark Zoradi was very interesting ("In Movies as in Radio, Content Reigns," Feb. 13). In your interview, did he venture any prognostications concerning the following:

- What percentage of Disney's content will be exhibited in "digital theatres" at the end of the next five years? U.S.? Foreign?
- How much more of Disney's investment dollar is being allocated to digital distribution technology, i.e. new codecs, new formats, over-the-air, DVD, satellite, cable/FiOS, STREAM, store/live, wireless, etc.?
- And how long will Disney decide to stay in the exponentially growing and costly digital technology business rather than focusing on content?

Mark is so right that "content is king." What a great legacy of success he has left behind — and he continues to forge.

My questions are focused on the economics of distributing video content, and there is no question that exponentially rapid changes in digital technology are driving the video and audio content industries into another world — one that perhaps Disney and others in the big 6/10 may be uncomfortable in, and are scratching their heads on how to best handle.

I suspect the "digital tipping point" cited by Mark is indeed a paradigm shift in content distribution that for any industry would give pause. Could the "content king" be taking a new "money trail [path]" in the near future?

David Barnes Still
Rosemont, Pa.

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NewBay Media

Don't Rush Off Just Yet

Apple Takes a Bite Out of the NAB Show

We view with disappointment the decision by a couple of high-profile companies not to exhibit at the NAB Show this year.

Apple announced that it will not have a booth. As reported by our sister publication TV Technology, speculation about such a move had increased after Avid Technology, an Apple competitor, dropped out.

Neither of these companies will leave a particularly big hole on the radio side of the show but the development is discouraging for those who believe in the importance of a vibrant broadcast equipment marketplace — and who worry that other companies might also choose to pull back on in-person outreach, degrading an important, centralized educational opportunity for broadcasters.

It's true that any responsible company must consider expenses and weigh costs of reaching customers through all of the methods available. It's true that conventions in general are likely to experience more such pressures as companies find alternate means of introducing their products. This is to the good.

Also, without doubt the cost of exhibiting at the NAB is substantial. Exhibitors have long carried a great deal of the convention's burden on their backs.

However consider how a reporter for the Las-Vegas Review Journal wrote about the Apple decision: "Company leaders no longer view packing bags and hauling a delegation to Las Vegas to exhibit at the trade show as a cost-effective way to promote the company."

Here's the danger of simply writing off what the in-person convention experience can offer. Conventions aren't about hauling and packing. They're about the value of in-person meeting. There is nothing to replace the experience of seeing and touching a product or the personal contact one can start to build there.

Engineers and other managers seeking to outfit expensive broadcast facilities must make decisions involving hundreds of thousands of dollars in capital; the NAB floor remains a critical way for attendees to gain vital perspectives before spending that money — not to mention the fact that a healthy exhibit floor does help cover the costs of a robust track of sessions.

RW's parent company has a business relationship with the NAB for the show Dailies and other projects, so you need to take these comments with that in mind. But we'd feel this way regardless. (You could even argue that pulling out of shows would leave more marketing money for print ads.)

Ironically, it was just a few months ago that Apple grabbed radio's attention with word that it would enable tagging for iTunes on certain new HD Radio receivers. So we had hoped to see more of the company on the radio side. If that seems unlikely, consider that not long ago Google would have been seen as an odd duck on the radio floor; now it's an important presence there.

Web sites and virtual malls should complement, not replace convention outreach. We hope manufacturers pause before they are tempted to dismiss the in-person experience entirely and seek to supplant it with less personal, cheaper alternatives. And we hope NAB will redouble its own efforts to keep exhibitors and assist them in restraining costs.

— RW

◆READER'S FORUM◆

For the Good Of the Public

As the local volunteer frequency coordinator in Los Angeles since the late 1970s, I am offended by Mario Hieb's guest commentary, "Why Does the SBE Subsidize the NFL?" (Jan. 2). Could this be because after the Olympics, Mario thought he could make a living in frequency coordination?

Frequency coordination has been done on a volunteer basis for the last 30 years. We have all seen first-hand how expensive, and how poorly, paid coordination has worked since the FCC mandated that we must use a private (i.e., commercial) company instead of the local volunteer frequency coordinator for fixed links.

There are now a lot of links installed without licenses, or modified without a license modification, because small stations cannot afford the absurdly high cost of the coordination services, which added no value whatsoever over those same coordination services provided by volunteers. And count up the amount of dismissed applications since October 2003 when the new rules went into effect. Commercial coordination has, so far, been a disaster.

Maybe the GDCs enjoy going to the games. Maybe they believe that they are not being paid insufficiently, as Mario asserts. Maybe they, like SBE, SCFCC and NCFCC, view the work as volunteer work; something that benefits broadcasters generally and the common good.

Mario cites doctors and lawyers who are paid as professionals. Not always, Mario. Some doctors and lawyers, the more ethical ones, donate their time to help society generally. The law profession calls it "pro bono publico"(for the good of the public).

It would be nice if the other sports leagues were as interested in frequency coordination as the NFL is now. It wasn't always this way; the NFL was not a good neighbor in spectrum use. The NFL saw the light, but not from the beginning; the GDC program was borne from the need to protect broadcasters, which the volunteers did.

The fact that the games benefit from the work of the GDC volunteers does not make them the indentured servants of the NFL. They are what they have always been: spectrum managers. It is just as much for the common good (the viewers and the broadcast stakeholders) as for the NFL.

The SCFCC has always worked with all eligible entities to provide access to the spectrum. We provide our services at no charge to any user. We have been paid for special events and this goes into the SCFCC general fund to keep the committee going. But make no mistake: SCFCC does this for the good of the broadcasting industry.

It is OK to be a volunteer, Mario. The NFL isn't offering the GDC's value for services. It is, at most, offering a tip for good volunteer service for the benefit of all. And that is a good thing.

Howard Fine
Los Angeles

Dorrough Electronics

I'd like to recognize what I consider outstanding customer service from a broadcast equipment manufacturer.

I've been involved in broadcasting since my teens, thanks to the local community FM station I was part of in the '70s. This would pave the way for my employment at several AM and FM stations in the capacity of engineering.

In my career, I have discovered that some equipment vendors take a dim view to servicing beaten-up equipment, usually hoping that the customer will pony up to purchase a replacement unit instead. Sometimes the customer just doesn't have that luxury for a variety of reasons.

I'm building up an on-campus AM and leaky coax FM station for a high school in the district where I'm employed as a computer and electronics technician. In the process of acquiring equipment, I procured a couple of older audio meters manufactured by Dorrough Electronics.

Having used and installed Dorrough products for more than three decades, I was aware of the quality of its products. While I felt these units had seen better days, my query to Dorrough was answered quickly by Mike Dorrough's wife, Kay.

Kay was extremely helpful and asked me to send them in for service. It was wonderful to see a company that takes a conscious effort to keep its customer's needs in mind regarding factory service. In spite of the meters' condition, I was thrilled to receive the units back — not only looking great but also operating wonderfully.

In a day where people question the products and support provided by many manufacturers I just want to let the engineering community know that Dorrough is a cut above in customer support and satisfaction.

Bill DeFelice
Freelance Broadcast Engineer
Electronics Technologist
Norwalk Connecticut Public Schools
Norwalk, Conn.

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