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A Year to Remember

It was one for the books in U.S. radio. Skip Pizzi recounts the highlights.

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Something in the Air

Antennas, STLs, transmission support and lots more.



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December 19, 2007

INSIDE

NEWS & HD RADIO

▼ A longtime owner/engineer expresses his doubts about HD Radio.

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▼ Europeans consider an HD Radio roadmap.



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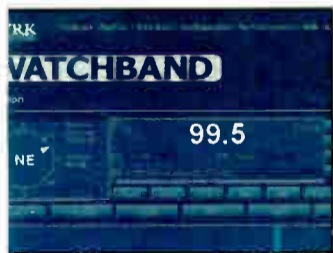
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ie FCC should pay heed to a rare ace of cross-industry accord.

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Look for your **RW 2008 Source Book & Directory**. Free for subscribers, arriving next month.

A Card for All Seasons



Wisconsin Broadcasters Launch an ID Card Program for Essential Personnel in Emergencies

Page **4**

SoCal Fires Help Radio Refine Prep

Backup Plans & the Web Help Get Word Out

by **Randy J. Stine**

SAN DIEGO Radio stations across Southern California say they learned valuable lessons from October's wildfires, lessons that will help them when they go into fire coverage mode again.

With the threat of wildfires across California at an all-time high, according to local fire officials, the chances are pretty good that radio broadcasters will again be asked to play a crucial role in disseminating lifesaving information.

Staying on the air with that information during mandatory evacuations while protecting employees and facilities is challenging, some broadcasters say.

The SoCal wildfires, which destroyed thousands of homes and burned more than a half-million acres in several counties, wreaked havoc with the emergency operation plans for many radio stations. A few stations broke format to simulcast audio of local TV affiliates. Other radio stations were forced to take improvisation to a

See FIRE, page 3 ►

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FCC Intends to Expand LPFM Service

Low-Power Rules Strengthened, Service Favored in Some Cases Over Full-Service Stations, Translators

by Leslie Stimson

WASHINGTON Full-service FM broadcasters seeking to increase power in order to reach a more populated market or to apply for a translator will soon feel the effects of new rules governing low-power FM stations.

The new rules — passed in a late-night, sparsely attended vote in late November — and further questions the agency raised suggest a fundamental policy change toward LPFMs and how their relationship with full-service broadcast-

ers could be regulated in the future.

The FCC urged Congress to ease interference restrictions and said it hoped to take further action on LPFM within six months.

At least one legal expert believes future FM city-of-license changes will now need to protect LPFMs.

Another attorney believes a new interim short-spacing waiver policy — one that protects LPFMs threatened with interference or going dark due to applications by full-service stations to increase power or move to larger markets — will

extend beyond those cases and result in more LPFMs on the air.

FCC-proposed changes to allocation spacings also could result in many more LPFMs on the air, these experts believe. Further, the commission said it intends to hold another filing window for LPFMs.

The FCC said it has made all these changes to “strengthen and promote the long-term viability of the LPFM service, and the localism and diversity goals that this service is intended to advance.”

Commissioner Michael Copps called LPFMs “a breath of fresh air” and described them as truly local stations. He congratulated proponents “who have worked so hard and accomplished so much

in an environment that has been far less friendly towards them than it should have been,” an apparent reference to full-service broadcasters and NAB in particular.

The trade group has said it opposes not the service itself but the interference

The FCC urged Congress to ease interference restrictions and also said it hoped to take further action on LPFM within six months.

LPFMs could cause. Reacting to the vote, NAB stated it looked forward to reviewing the specifics but it was pleased the FCC had clarified that LPFMs need to be locally-owned with locally-originated programming and are limited to one owner per station.

Third-adjacent protections

Bills are pending in Congress that, if passed, would repeal third-adjacent-channel protections for full-service stations to allow more LPFMs to squeeze into the band.

FCC Audio Division Chief Peter Doyle said that while the agency can't repeal that protection, the commission is urging Congress to do so and seeks public comment on this point.

NAB believes third-adjacent protections are “critically important” to protect

See LPFM, page 24 ▶



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Fire

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new level, including one case of a commercial broadcaster turning over its frequency to a public broadcaster that lost power.

Leon Messenie, director of engineering and IT for non-commercial KPBS(FM) in San Diego, said the station lost telephone communications and power at its Mt. San Miguel transmitter site early on. Within hours KPBS was broadcasting its all-news coverage via Lincoln Financial's KBZT(FM) at 94.9 MHz.

The arrangement lasted approximately 24 hours before KPBS engineers built a backup transmitter site at the station's studios using an existing microwave STL tower.

History helped

Other radio stations worked shorthanded as employees were forced from their homes because of mandatory evacuations. Broadcast engineers scrambled to fuel generators and find audio chain alternatives to keep their stations on the air.

Previous wildfires, specifically the Cedar Creek fire in 2004, have taught many San Diego-area radio broadcasters that emergency preparedness is the only way to care for equipment and ensure



Photo by: Dave Somers, WBSTC

Fire behind Mt. San Miguel

While his two stations suffered no physical damage or lost airtime, McGowan did have a major engineering concern come to light during emergency preparation. A recently acquired, used generator running at the transmitter site was determined to be inadequate.

"We decided to connect [the generator] to the new transfer switch, part of our HD upgrade and install completed in September, when we discovered the old generator doesn't provide the necessary neutral connection we need for our transfer switch and to meet code," McGowan said.

KHTS(AM) in Santa Clarita, Calif., served as that fire-ravaged area's "emergency voice," according to owner Carl Goldman.

"Since we are the only local radio station, we have great relationships with first responders in our area. You really need to have pre-established relationships

in at the transmitter site. After that we had wall-to-wall coverage four straight days," Goldman said.

During that time KHTS increased the content on its Web site and assigned a full-time employee to constantly update its fire coverage, Goldman said. In fact, the station had to go to a backup server to handle the additional Internet traffic.

"At any one time we had over 1,500 people on our Web site looking for fire information," Goldman said. Typically, Goldman said, the station's site may have several thousand visitors per day.

On the Web, too

Robert Hughes, co-owner of Compass Radio's KPRI(FM) in San Diego, said a large portion of the station's listening area, particularly northern San Diego County, was burned. The station studios were affected by smoke, soot and ash, and fire came to within a mile of its transmitter site.

"Even though the studio itself was locked up tight, the equipment had a fine layer of dust on it," Hughes said. "Based on the experience, one suggestion might be to find a light cloth to cover consoles and mixing boards."

Hughes said the station's staff would review its emergency plan and refine it with what came to light during these



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employee the safety.

"Having an emergency plan is crucial, and testing the plan often is, too. I maintain and keep with me a folder with all remote control assignments, electrical circuit data, communications data and just about everything you would ever need if you are not at your desk," said Eric Schecter, director of engineering for Lincoln Financial Media's cluster in San Diego.

Schecter maintains a "defensible space" near remote sites by clearing brush regularly several hundred feet from any buildings. Fire did reach within 50 feet of an old wooden house where the KSOQ(FM) transmitter is located on St. San Miguel.

"We were lucky to have an irrigated lawn between the fire and the KSOQ building," Schecter added.

Lee McGowan, director of engineering for CBS Radio's KYXY(FM) and KSCF(FM) in San Diego, recommends radio stations have an emergency strategy, similar to his facility's 38-page disaster recovery contingency plan, updated annually.

"Each station manager is given a copy to keep at home as well as work. Part of the plan is a call list with important contact phone numbers. Engineers should always have an RF STL to back up their landline T1."



Photo by: Rockley Curless, KPBS(FM)

Many stations lost telephone communications in the San Diego fires.

with local emergency public information officers and have an internal plan set up for your staff," Goldman said.

KHTS became "all emergency, all the time," according to Goldman.

"We missed about 15 minutes of air when our backup generator failed to kick

wildfires.

"One thing we'll be looking at is how we can more widely distribute the ability to operate, program and control the station from multiple remote locations. Given computers and cell phones this should be easier than ever before."

Hughes said because of the fires the station has asked the FCC to expedite a request to move its main transmitter site to Mt. Soledad in La Jolla, Calif., from a more fire-prone site near Lake San Marcos.

"As with previous wildfires, the operability of the San Marcos site was threatened by this wildfire," Hughes said.

Cleaning the abrasive soot from equipment and vehicles also presents its challenges, local observers said.

"We will need to go into high-voltage cabinets at our sites to wipe off soot and vacuum out the fine ash that may have worked its way in," said Lincoln Financial's Schecter. "The last thing you want is a conductive path for high voltage to arc. As well, we will rinse out air conditioners and clean the coils."

KPBS appeared to be the hardest hit, but missed little airtime because of the KBZT arrangement. No one else contacted for this article reported being off the air for an extended time.

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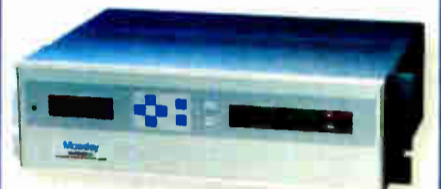
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A Crisis Is a Good Time to Be Carded

Wisconsin Program Is a Model of How Engineers, Management and Law Enforcement Can Work Together

Imagine you're the chief of a station in Madison, Wis. It's summertime, peak tornado season, and a vicious twister has just torn through part of your community, taking lives, damaging buildings and knocking you off the air. Another nasty cloud form reportedly is brewing.

You jump into your vehicle and rush toward the transmitter site to assess the damage and to get your station back up so it can report on the next threat and pass along the instructions of emergency responders to the public.

But a mile from the site, you are stopped at a roadblock by a state police officer who tells you that the area hit by the twister is now closed to everyone until all storms have past. You protest that you are a radio engineer rushing to get your station back on the air.

"Everyone means *everyone*," the trooper replies, resting his hand on his holster as he leans into your car window. The look on his face suggests he'd be happy to see you test his statement.

You're stuck. You can do nothing to reach the tower site and get your station back on the air to do its job serving the local interest, convenience and necessity. Or can you?

Aid to judgment

If you work in Wisconsin and your station takes part in its new Broadcaster Emergency Personnel ID Card Program, you can show the officer a laminated card that identifies you as essential broadcast personnel who may be allowed to proceed to your facility.

The card bears the endorsement of the state's Department of Justice Division of Criminal Investigation and a toll-free number the officer can call to verify.

The program is a byproduct of lessons learned after Hurricane Katrina and a model for cooperation among broadcasters, engineers and law enforcement.

It was conceived when Michelle

Vetterkind, president of the Wisconsin Broadcasters Association, and Gary Timm, a broadcast engineer for Journal Broadcast Group and the state's EAS chair, attended an "EAS summit" meeting held by the National Alliance of State Broadcasters Associations.

Vetterkind and Timm heard colleagues from Mississippi and Louisiana talk about how difficult it had been for engineers to get to transmitter sites after Katrina. Vetterkind, Timm and WBA Vice President Linda Baun decided to act to avoid a similar problem in Wisconsin by proposing the ID program.

The cards do not guarantee passage: if an officer deems the situation life-threatening

with more pending.

"We're very fortunate in that we have a fantastic relationship with our Department of Justice," Vetterkind told me. "This has been a roadblock in many other states, but for us it wasn't. We went to them and they asked, 'How can we help?' Not only did we get their approval, but they're laminating the cards."

A radio or TV station must apply for a card and the general manager must sign the request, which is sent to the WBA and Justice officials for approval. The wallet card arrives in four to six weeks and bears the engineer's photo, station name and title; on the back it carries a Justice Department explanation and the toll-free verification number.

Justice educates law enforcement agencies about the card, prints them and maintains the phone line. The broadcast association maintains the database of IDs

From the Editor



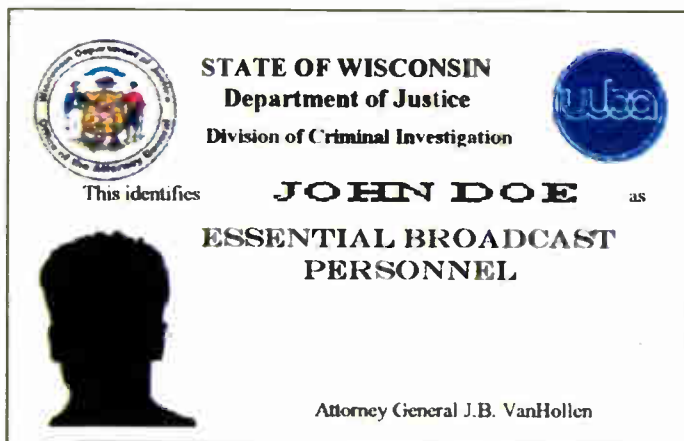
Paul J. McLane

have to carry multiple cards. "You need to be able to verify you've gone through the proper procedure," Vetterkind said.

I asked Linda Baun if she has any advice to others who may wish to set up such a program.

"Communicate, communicate, communicate," she replied.

"The message is we are all in this



The bearer of this card has been granted authority to proceed to broadcast facilities in times of natural disaster to facilitate repairs or perform necessary maintenance on equipment used to communicate with the public. If a law enforcement official finds that conditions at the time of requested admittance risk the loss of life, serious injury or property damage, access may be denied.

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302

ing or unsafe, passage may still be denied. But the card can help immensely in a situation where a well-intended officer must make a quick decision under stress about who is and isn't qualified to pass. The IDs also ease access to Local Emergency Operation Centers should EOC officials ask for broadcast personnel help.

Trust but verify

Launched in February, the program has attracted the participation of 41 broadcast organizations, some with multiple stations. Approximately 112 engineers in Wisconsin now carry the card,

and shares it with DOJ for its reference in answering the line.

Baun said the approval process is stringent, not at all a rubber stamp.

The card is not intended for journalists trying to work around authorities; nor is it issued to station general managers. (A few have tried. GMs don't generally like to be told that they are "nonessential personnel," but we're talking about emergencies here.)

Cards do not expire but must be renewed every two years, and when a person leaves a station's employ, the GM must collect the card. Contract engineers must apply through each station and may

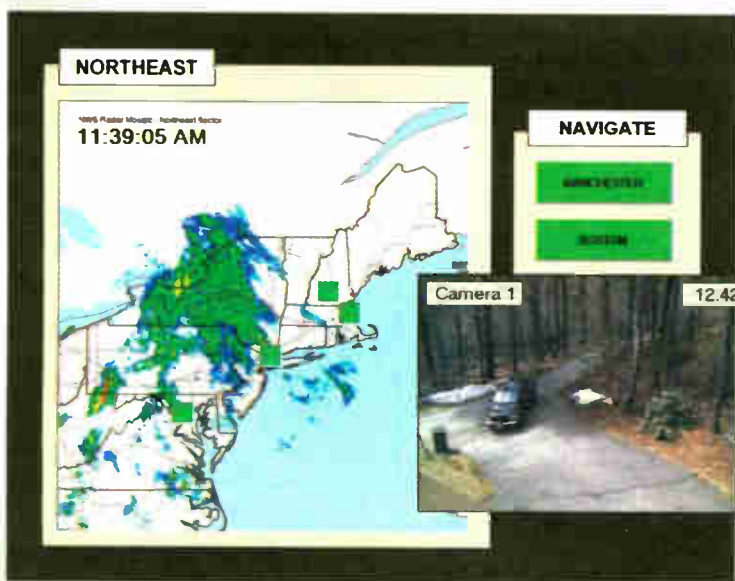
together. We want to have the 'plan' in place so chaos doesn't ensue during an emergency situation. Open dialogue, a great attitude and turning the 'what if' into 'this is the plan' is not a simple task; but the plan itself must be simple, because in times of catastrophe, keeping it simple is crucial."

Talk it up

As the spouse of a broadcast engineer, Baun knows that technical people may be intimidated by the idea of trying to launch such a program.

See ID CARD, page 5 ▶

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GUEST COMMENTARY

Let's Have a Reality Check on IBOC

Owner/Engineer Says HD-R Is Never Going to Work

by Larry Langford

As an owner/engineer who has been around this crazy business since the '60s, I think I can offer some insight into all this IBOC talk.

At first glance it seemed Ibiqity did everything right. They pulled together several teams to design the digital scheme and got major broadcasters to get behind it.

Ibiqity then designed a perpetual income machine with user fees. But suddenly it became loud and clear, like an old 10-bell bulletin on a teletype machine: *For AM it's not working.*

Yes, I can hear the supporters say, "Sure it works. We just have to work out the bugs and give it time to catch on." And they are so quick to point out how long it took FM to really catch on.

To use that as a benchmark is not only dumb, it's stupid.

FM benchmark 'stupid'

FM did not take off until people demanded and got it in their cars as standard (read: "no extra cost") equipment.

Do you really think FM would have caught on if the carmakers had to pay a fee for every radio they built? Come on, wake up, people.

What if adding FM reduced coverage of AM? Or degraded the audio? Do you really think owners would have tolerated degraded AM while they waited for FM to "catch on"?

Some of the biggest companies in the business are behind AM IBOC and yet even *their* people are saying it's not working.



Larry Langford

The interference to adjacent stations is serious, especially for small stations near 50 kW operations, and Ibiqity would have us tolerate additional hiss from our own IBOC carrier.

I have done some extensive listening in the service area of my WGTO (910 kHz, 1 kW).

WLS (890 kHz, 50 kW) is about 85 miles away to the west. WOKY in Milwaukee (920 kHz, 5 kW) is about the same distance away but more north. Both are running IBOC with both stations putting hash deep into my protected contour at 905 kHz (890 + 15 kHz = 905 kHz, and 920 - 15 kHz = 905 kHz.)

I can testify that my coverage has indeed suffered. The hiss from WLS and

WOKY is *clearly* audible in most car radios all the way to my 2 mV/m contour.

The IBOC hash has taken out an entire market for me that was in the 1 to 2 mV/m contour along the resort shore of Lake Michigan.

Those who support AM IBOC say that

Ibiqity will work out the kinks and have a solution. Who are they kidding? If it's the digital carrier that is causing the hiss on the analog signal, there is no way to "fix" that. Reducing the digital power will make lock and range problems even worse.

Oh yes I forgot, we are being told that analog radios need to be narrowed more. How will you replace all those radios that get the hiss now?

What about the telephone-quality audio that results from even more narrowing? I know we are told that most AM radios have little response over 4 kHz, but they do have *some* response over 4 kHz and in an honest A/B comparison, there is noticeable change in perceived quality when you tighten the high pass of the transmitter down to a sharp cutoff at 5 kHz from 10 kHz.

Telephone-quality

Let's not forget, the human ear is better than any audio meter in detecting quality changes. The ear is also very sensitive to sounds like hiss.

In case you have not heard it, that hiss sounds just like your main carrier has suddenly become weak and the noise is from the radio front end. Most people think your power has dropped.

That is just what we small AM stations *don't* need: a perception of weak carrier.

Here is the biggest joke of all of this
See LANGFORD, page 6 ▶

ID Card

▶ Continued from page 4

She advises that you gather interest from colleagues and identify a broadcast leader in your area who can carry the idea to law enforcement. "It's not about who gets the credit or the politics, it's for the good of your community," she said.

with agencies from both counties.

Local SBE chapters and others should take note of this smart program. For information see www.wi-broadcasters.org, under Emergency Planning.

An FCC panel after Katrina supported the idea of a national standard for credentialing telecom repair workers; broadcast workers also could be included in such a standard. Until then, though, states are wise to act on their own.

The cards do not guarantee passage but can help immensely in a situation where a well-intended officer must make a quick decision under stress about who is and isn't qualified to pass.

"Develop that relationship with your Department of Justice," Vetterkind added, or with the appropriate agency in your state, perhaps the state police or emergency planning department.

WBA also recommends that, once you have your card, you meet with local or county law enforcement to be sure those agencies are aware of the program. That's particularly important if your transmitter is in a different county than the studio; in that case, you should meet

A few other jurisdictions reportedly have adopted similar programs, including New Jersey, South Carolina and New York City. Wisconsin, meanwhile, may never suffer a hurricane such as Katrina; but it is squarely in tornado country, and we can easily imagine it being hit by a pandemic or hazmat train wreck.

Next time something unforeseen happens in these areas, radio engineers will be better prepared to respond where they are needed most. ●

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► Continued from page 5

mess. IBOC supporters say we can now play music again and sound like FM, right? But in the meantime we have to narrow the analog so that the music over the vast majority of radios in use sounds worse than before. Remember why so many AMs switched to talk in the first place?

And we are supposed to pay an annual fee for the privilege of shooting ourselves in the foot?

Ibiquity is asking me to:

- Pay about \$25,000 for an installed IBOC exciter, and then who knows how much the fees will rise in later years;

- Spend a small fortune to have my 20-year-old directional "optimized" for perfectly symmetrical sidebands and broad-enough response;

- Degrade my listener base by adding nasty hiss to my own signal at a time when I am already fighting a multitude of other noise sources;

- Degrade my own audio bandwidth to 5 kHz or less to allow the digital carrier to work; and

- Wait for 10 years for car radios to become popular while paying a fee each year.

It is just me, or do they take us for fools?

In my earlier article on IBOC reception (RW, Aug. 2, 2006), I noted that FM IBOC does not sound that much better than properly processed analog in the

great majority of listening situations, but on the other hand, it does no harm.

The same cannot be said for AM IBOC. I have listened to local Chicago stations when IBOC was first permitted to go on at night. It was not pretty. Even in the city, holding lock was hard.

The radio would slip back and forth from analog to digital every couple of minutes. AM 1000, WMVP (WCFL for us old guys) has never been able to make it work on their three-tower DA. My sources tell me they have spent millions on a rebuild.

Will Ibiquity give me *my* money back if my DA cannot be made to pass it? The only winners in this IBOC deal are the big companies that will make out on the FM HD2 and HD3. For us little AM guys it's just another nail in the coffin.

I can only hope that Detroit will take a

hard stand on Ibiquity license fees. Maybe the Ibiquity beancounters never figured out that without IBOC as standard dashboard equipment, you can forget it.

If they expect me to pay an annual fee while screwing up my own sound for the analog listeners that are going to be the main audience for years to come, they have completely lost their minds.

A Chicago radio engineer who was one of my mentors said it best: "IBOC FM is junk science. AM IBOC is science fiction." Any AM small-station owner who buys into this is asking for complaints, headaches and severe disappointment.

I now think I know why the FCC never adopted the NRSC 10 kHz receiver standard as a mandate to manufacturers. The folks at Ibiquity knew that the wider NRSC radio would make the eventual rollout of AM HD even harder.

Fringe reception

So they probably lobbied against the wide-band standard. Now that AM IBOC is here, corporate engineers for some of the big companies that support IBOC are leading the call for severe narrow-banding. Hmm, I think I smell a rat, again. These were some of the same people that said NRSC wideband would be the savior of AM providing FM like sound.

Do you realize the NRSC standard would have given us radios with an audio pass of about 7.5 kHz?

If it's the digital carrier that is causing the hiss on the analog signal, there is no way to 'fix' that.

Sure, we could have used a narrow switch for fringe reception, but for the most part, the NRSC standard would have given us radios that would have sounded great in areas where most local AM listening occurs. And the NRSC radios would have been delay-free.

Don't tell me wide-band cannot sound good. It's all in the receiver.

The stock Ford Crown Victoria radio for model year 2001 is a beautiful example of "FM-like" AM audio from stations that are still transmitting NRSC audio. And let's not forget the GE SuperRadio. It is still in production and sounds great at levels over 2 millivolts.

We expected that you can't mix IBOC and wideband, but it is now clear that even normal AM bandwidth is too wide. So now we must really squeeze it down and that will hurt analog badly.

You think the NAB move to put AM stations on FM translators is independent of trouble with AM IBOC? You think the call for even sharper cutoff AM receivers is independent of the trouble with IBOC AM? It is time to stop CPR and "call it." The AM IBOC patient is dead.

The author is president and chief engineer of Langford Broadcast LLC, licensee of WGTO(AM), Cassopolis, Mich. and WDOV(AM), Dowagiac, Mich. Reach him at larrylangford@aol.com.

Radio World welcomes other points of view to radioworld@imaspub.com.

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Mike O'Shea, Chief Engineer
WUSF, Tampa Florida

"When we started shopping for new consoles at WUSF, my first step was to ask my peers what they thought. I posted a question on Pubtech saying I was thinking about switching to a routing system console, and asked for recommendations. The majority of responses led us to Logitek.

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World Radio History

Arbitron Delays PPM Adoption

NEW YORK The radio industry's long-debated move to electronically collected ratings data hit a snag in November.

Arbitron said it will delay commercialization of its Portable People Meter radio ratings service in nine markets while issues of sample size — including improved compliance among minority youth — are worked out between the research firm and commercial broadcast customers.

Broadcast customers have said sample sizes with PPM are too small, while the National Association of Black Owned Broadcasters has said minorities are under-represented with PPM.

Arbitron has acknowledged its sample size dipped over the summer, as RW has reported, but continued to defend the accuracy of its audience estimates.

Observers said the decision to delay PPM implementation in other major markets is "huge" and reflects the power of Arbitron's large commercial broadcast group customers.

Radio station Arbitron ratings are used by ad agencies and advertisers to make their decisions in buying ad time.

New York, Nassau-Suffolk and Middlesex-Somerset-Union will be delayed by nine months; broadcasters in those markets previously were due to go

Market	New schedule	Former schedule
New York	September 2008	December 2007
Nassau-Suffolk	September 2008	December 2007
Middlesex-Somerset-Union	September 2008	December 2007
Los Angeles	September 2008	March 2008
Riverside	September 2008	March 2008
Chicago	September 2008	March 2008
San Francisco	September 2008	June 2008
San Jose	September 2008	June 2008
Dallas	December 2008	September 2008

Revised PPM Rollout Schedule:
First Survey Month of 'Currency' PPM Data for Buy/Sell Transactions

"live" with PPM this month.

Other markets in which Arbitron has slowed its implementation schedule are Los Angeles, Riverside and Chicago, which will see a six-month delay, and San Francisco, San Jose and Dallas, which are seeing a three-month adjustment.

Diary service will be extended in these nine markets, the company said, while it works with customers, the Media Rating Council, other organizations and community groups on the research and business issues related to the PPM implementation. Arbitron had received harsh words from several broadcast groups in the

months before the announcement.

Feedback from these groups led the company to conclude that the industry would be better served if the firm delayed further commercialization and addressed

their issues, stated Chairman, President/CEO Steve Morris.

The ratings firm said it has several initiatives in the pipeline for implementation in the first quarter of 2008 that it believes will improve the performance of PPM samples.

"We also plan to use the additional time to work closely with community leaders to review the workings of the Portable People Meter service and to gather their insights as to how we might improve compliance among persons 18-34, including ethnic young adults, across the diverse communities of New York, Los Angeles, Chicago and subsequent markets," stated Morris.

The decision does not affect PPM services in Houston and Philadelphia. Arbitron also intends to introduce PPM service in Atlanta, Detroit, Washington and in subsequent markets, as originally scheduled.

As a result of its decision, Arbitron lowered its forecast for earnings per share for 2007 and '08.

Leslie Stimson

NEWS WATCH

NAB to FCC: Regulate HD-R Sparingly

WASHINGTON NAB is urging the FCC to apply additional rules to IBOC lightly, particularly for subscription services delivered via multi-cast channels.

In reply comments to the commission, NAB said, "Most commenters rejected limitations on the amount of subscription services that may be offered, finding such regulation unnecessary to the preservation of free, over-the-air digital radio."

Beyond the baseline requirement that broadcasters offer one free digital programming service comparable to or better in audio quality than their current service, stations "should be free to allocate remaining bandwidth in response to consumer demand and changing marketplace conditions," the trade group stated.

NAB agrees with Cox Radio that the penetration level for IBOC receivers with conditional access capability will not support a subscription service for some time and so it would be "unreasonable" for the agency to establish spectrum caps now. In addition, a spectrum fee "would create a disincentive that would almost certainly doom the technology before a market can develop," said NAB.

The Benton Foundation urged new public interest requirements for digital radio, but this would "throw the commission back to an outdated era of heavy-handed and unnecessary regulation," NAB argued.

Public Radio Gains Listeners

OLNEY, Md. Public radio reaches nearly 28 million people old enough to fill out an Arbitron diary in a given week. Pubcasters reached 27.9 million

persons age 12+ in an average week or 11.1 percent of the U.S. population.

That's according to the Radio Research Consortium, which analyzes audience data for stations receiving funds from the Corporation for Public Broadcasting.

After three years of decline, public radio's Average Quarter Hour Persons audience grew 3 percent in the Spring 2007 survey. The AQH rise means public radio captures 5 percent of radio listening.

RRC based the figures on the Arbitron Nationwide.

BBG Will Close Morocco Station

WASHINGTON Officials with the Broadcasting Board of Governors said broadcasts from the Morocco Transmitting Station will cease in March.

No programs will be affected; other facilities will pick up those services. The government expects to vacate the facility by the end of 2008 and return it to the Moroccan government. "The rising cost of operating the Morocco station prompted this decision," said Letitia King, chief of media relations for the International Broadcasting Bureau. Officials expect to save \$3 million to \$4 million a year.

The facility includes 2,000 acres with 80,000 square feet of buildings and 10 high-power (500 kW) short-wave transmitters. It carries U.S. government broadcasts from Voice of America, Radio Free Europe/Radio Liberty and Radio Farda. There are 56 government employees, including four U.S. citizens and 52 local employees; a memo to staff stated that employees who lose their jobs will receive severance compensation.

U.S. international broadcasting in Morocco started in 1949 with the Tangier Relay Station. The current facility is 18 miles southwest of Tangier and began broadcasting in 1993.



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World Radio History

MW Oven Tester Evaluates WAP Operation

by John Bisset

Ed Dulaney is the market engineer for Crawford Broadcasting's Denver cluster. He writes that for several months he's had some old 2.4 GHz Wireless Access Points (WAPs) lying around in storage. From all outside indications they seemed to be functioning perfectly.

When plugged in, Ed saw the "blinking lights" on the front and was able to log into the Web interfaces with a computer connected to the Ethernet port. However, no matter which way he set up the wireless configuration, he couldn't see the access points with a WiFi card in his PC. It just seemed that the units weren't radiating any RF.

Being an industrious sort, Ed decided to see if he could measure the RF output of the units with a "Microwave Leakage Detector." These are the units sold by almost every department store — RadioShack too — and are used to check a microwave oven for excess radiation.

Since microwave ovens operate at 2.45 GHz, Ed figured that these detectors would be able to pick up the 2.4 GHz signals from his WAPs. Sure enough, when he put one of them next to a working antenna, it read the approximate power density of the access point.

Seen in Fig. 1, the D-Link wireless access point is radiating 2.40 milliwatts per cubic centimeter, proving that the device is indeed putting out a signal.

Ed found that the levels will bounce around wildly, as a wireless access point utilizes spread-spectrum modulation. Readings varied between 0.1 and 3.1 mW on the Microwave Leakage Meter.

He tested the units in storage, and found some that never gave any reading, proving without a doubt that the RF section was toasted!

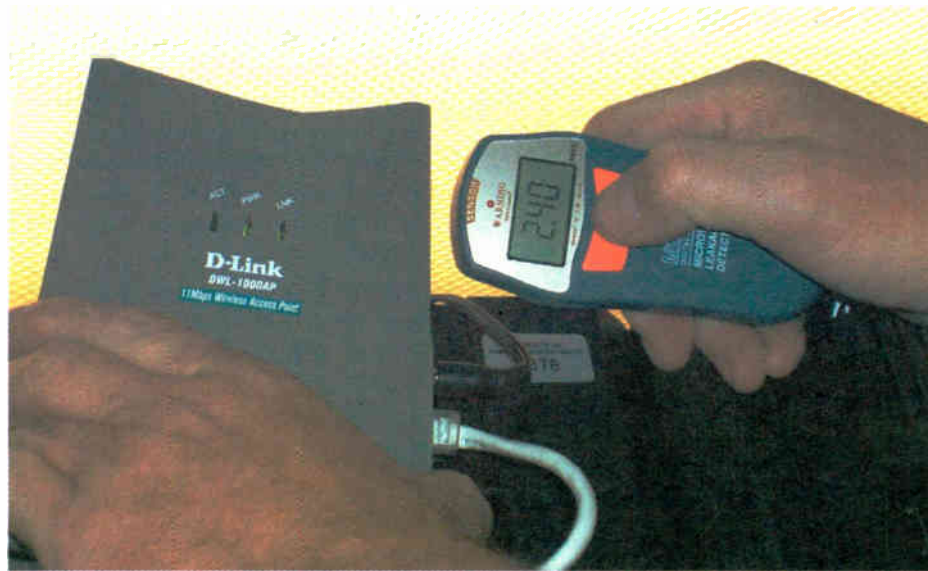


Fig. 1: Using a microwave oven leakage detector to verify wireless access operation.

Sure, you could drag out the spectrum analyzer and check the levels that way. But for \$20 at your local department store you can have a portable WAP tester.

Ed Dulaney can be reached at edulaney@crawfordbroadcasting.com.

Jim Swartos owns the tallest communications tower in northwest Washington state.

The last time he had to call in a NOTAM on a tower lighting issue, he was on hold for over three hours. While waiting, he was thinking, "There must be some serious storm problems over a large part of the country!"

When he finally got through (it was after midnight and thus the next day) the person taking his call said, "No, we haven't been that busy, the phone system

must have a glitch in it. I'll tell tech support to take a look at it."

What this really meant was Jim was on "Ignore" for that time period. Needless to say, Jim feels that this recent consolidation (using Lockheed Martin) has a few issues to be ironed out.

Jim further advises anyone who calls and is placed on hold for more than a few minutes, to hang up and call again.

Swartos can be reached at jtowersnw@hotmail.com.

Adapting studios to existing buildings isn't always the easiest job. Especially where long halls are involved, dampening the hall noise can be a problem.

Joe Jarjoara, chief engineer for Qantum Communications of Cape Cod, Mass., sent in an effective sound lock seen in Fig. 2.

His first step was adding a second door See SLING, page 11 ▶



Fig. 2: A carpet strip helps deaden hall noise in this simple sound lock.

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Sling

► Continued from page 10 to make the sound lock. Joe obtained additional deadening by adding the carpeted strip inside the frame of the two doors, as pictured. Not fancy, not costly and it works.

Joe Jarjoara can be reached at avcraftsmen@aol.com.

★ ★ ★

Energy Transformation Systems builds a variety of problem solutions supporting data, voice and multimedia.

The California company has introduced a product called InstaSnake that consists of two small boxes with four XLR microphone inputs and a shielded RJ-45 jack on one box, and corresponding outputs on the other.

You can find out more about the product by heading to the company's Web site; see www.etslan.com/audio.htm.

The InstaSnake is a passive unit so you do not need power. The device accepts mic, line, analog or digital audio and supports phantom power. The interconnect between the two boxes is Cat-5 cable.

In-house testing using a low-Z Shure microphone showed that Cat-5 could be used to distances of nearly 2,000 feet with no diminution in the quality of

sound. The advantage, especially for remotes, is that you can get four channels of analog or digital audio signal from one place to another on *one* run of Cat-5 or better cable

★ ★ ★

Engineers who maintain mountaintop transmitter sites are familiar with the Phasemaster.

In places where it's costly to run three-phase electric service, the rotary phase converter generates three-phase AC out of single phase. Usually very reliable, they sometimes need to be moved or replaced



Fig. 3: A sling added to the engine hoist keeps the Phasemaster from tipping as it's moved.

the device can be damaged as it's lifted. Seen in Fig. 3, Bill's solution was to

when larger capacity is needed. That's when you find out how heavy these devices are!

Nassau Broadcasting Maine Market Engineer Bill Ryall had to swap out and move Phasemasters at one of his sites last summer. Not only are the devices heavy, but their physical construction makes them awkward to move.

Although there are two motor eye hooks, when lifted from these hooks the Phasemaster tips back toward the rear terminal box. If you're not careful,

build some lifting slings to use in conjunction with his engine hoist. The hooks fit into the eyes, and the rear bracket holds the terminal box level, preventing the Phasemaster from tipping.

This setup will allow one person to easily pick up and move a Phasemaster single-handed, though I don't recommend that. Have a partner at hand.

Bill can be reached at bryall@nassaubroadcasting.com.

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 recently 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.

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MARKET PLACE

BIAfn Improves AppTracker, Flag

BIAfn Dataworld enhanced its AppTrackers and Flag services.

The offerings support the efforts of media companies and legal counsels to monitor FCC actions, "whether for themselves or as a means to watch competitors."

The company said AppTracker also now can send detailed status reports to mobile applications, such as BlackBerry, Treo and iPhone.

It monitors new applications under review at the FCC in real time, enabling users to know about developments in construction permits, license assignments, transfers of control and consummated agreements.

The service monitors the FCC delivers decisions and actions based on application number, market areas, owner and licensee names, call signs and e-mail addresses. The user can choose various notification intervals and targeted dates.

Flag notifies subscribers of activity at the commission that affects any monitored points and is marketed as an "early warning alert system" on decisions affecting that specific area. It evaluates AM, FM, TV and LPTV/Translator; it also notifies of CATV, BCST, AUX, EBS/BRS and wireless cable. It checks spacing criteria and educational proposals near commercial operations. It can monitor states, distances out to 60 miles or specific FCC release types or release items, and initiate an alert to subscribers when an FCC release mentions a station's call letters or flagged geographic site.

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2007, A Year to Remember

It Was One for the Books in the U.S. Radio Environment; We Recount Some Highlights

The arbitrary boundary of the calendar year provides us with an almost obligatory opportunity to reminisce on the recent past, and look ahead to the near future, on an annual basis.

Far be it for us to avoid this tradition, particularly for 2007, which turned out to be a relatively eventful year for the radio industry.

Probably topping the list was the release of long-anticipated "final rules" for IBOC, with the FCC's Second Report and Order on DAB, adopted in March (although not effective until Sept. 15).

Among other things, this made it possible for broadcasters to begin FM IBOC multicasting and Extended Hybrid operation without permission or notice. It also allowed AM IBOC broadcasting at night — a topic that has subsequently proven quite controversial, resulting in numerous complaints, the formation of an anti-IBOC coalition, and one radio group's (Citadel's) at least temporary cessation of AM IBOC operation. This debate will undoubtedly continue in 2008.

There were other, more positive IBOC-related movements in the industry during 2007, which you may recall from their in-depth coverage on these pages, and which will likely reappear in more real form in 2008.

These include the RadioGuard conditional access (CA) system developed for HD Radio by NDS and Ibiqity, and the first IBOC receiver chipsets suitable for portable applications. In addition, several industry announcements in 2007 showed promise for the beginnings of a realistic IBOC datacasting business in 2008.

It's one thing to steal listeners, but something else when advertising revenue is also poached.

The NRSC did its share of work in the IBOC standardization arena this year, with the release of an informational document on surround sound broadcasting, (the product of an NRSC Working Group that I co-chaired with Steve Fluker, and edited by David Layer of NAB), as well as updates of its AM bandwidth and

pre/de-emphasis (NRSC-1-A) and emission mask (NRSC-2-A) standards (to better accommodate IBOC-AM).

It also issued its first "Guidelines" documents delineating recommendations or best practices — one on analog AM bandwidth options (G-100), and another on the harmonization of data between RBDS and IBOC-PSD (G-200).

Less noticed but still important in 2007 was the FCC's move toward "digital EAS," with the provisional mandating of the Common Alerting Protocol (CAP) as a new, XML-based method of distributing alert messages among EAS participants.

Meanwhile, NAB introduced its FASTROAD (Flexible Advanced Services for Television and Radio on All Devices) program, a multi-million dollar fund directed toward research, development and incubation of new services that will allow broadcasters' services to propagate or evolve smoothly into next-gen consumer media systems and the behaviors they engender.

The first fruits of this project may appear in 2008, and they are apparently intended to push the industry beyond its current state, which some might correspondingly describe as the SLOWBOAT (Still Losing Opportunities While Broadcasters' Old Attitudes Triumph) approach.

The other PPM

One of the most impactful introduc-

The Big Picture



Photo: Gary Hayes, BBC

by Skip Pizzi

tions of 2007 may turn out to be Arbitron's Personal People Meter (PPM, not to be confused with the Peak Program Meter used by audio engineers for audio level display).

The system leverages the same aural masking techniques used by audio compression algorithms to embed audio signatures inaudibly into broadcast content; these are later extracted from recordings made by portable devices worn by selected listeners, thereby indicating their actual radio listening on a given day.

The increased accuracy of listening data caused by the transition from diaries to PPMs for the estimation of audience is likely to have a major effect on the business of radio broadcasting, particularly in the short to mid-term.

Moving from diaries to the PPM literally overnight in any given market is a

See 2007, page 14 ►

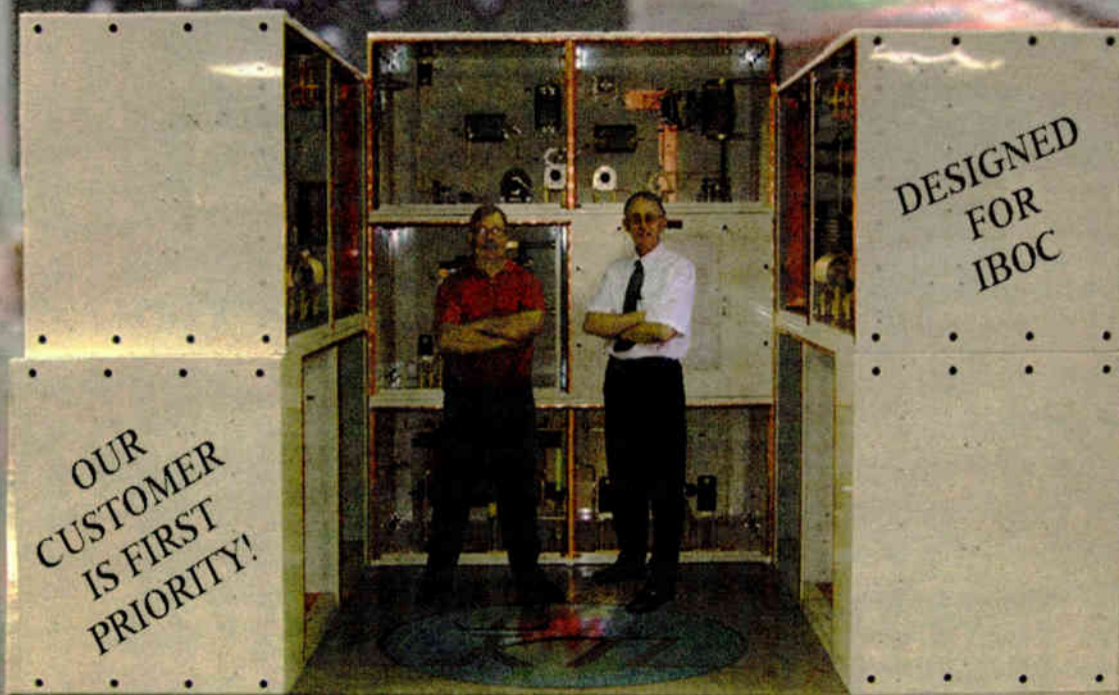
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World Radio History

2007

► Continued from page 12

huge step, though — not unlike exchanging a magnifying glass for an electron microscope — so it will certainly take some getting used to by the industry. This process will be interesting to observe in the coming years.

Lord of the Blings

This year's title for "Subject on Which Most Rhetoric Was Spewed" undoubtedly goes to radio broadcast performance royalties for music recordings. It's hard to imagine this issue not winning the same prize next year, as well.

In 2007, most of the discussion focused on Internet radio, due to the periodic (~5 year) review of royalty rates that concluded this year for the period 2006–2010, with substantial increases set by the new Copyright Royalty Board (in its first major action since it was formed by the U.S. Copyright Office).

The decision is still in effective abeyance as the industry continues to discuss its finer points and seek relief, both in Congress and in bilateral discussions with SoundExchange, the royalty collection agency. This process will very likely continue into — and perhaps throughout — 2008.

In CRB Part 2, the board concluded its hearings in October on a similar review of the royalties assessed on satellite radio.

At press time, the new rates for that sector were expected to be announced imminently. When they are, it is possible that another reactive firestorm may be ignited (due to another substantial rate hike that is anticipated by many observers), although the far smaller universe of players involved in satellite radio may keep this iteration from burning as long and hard as in the Internet radio case.

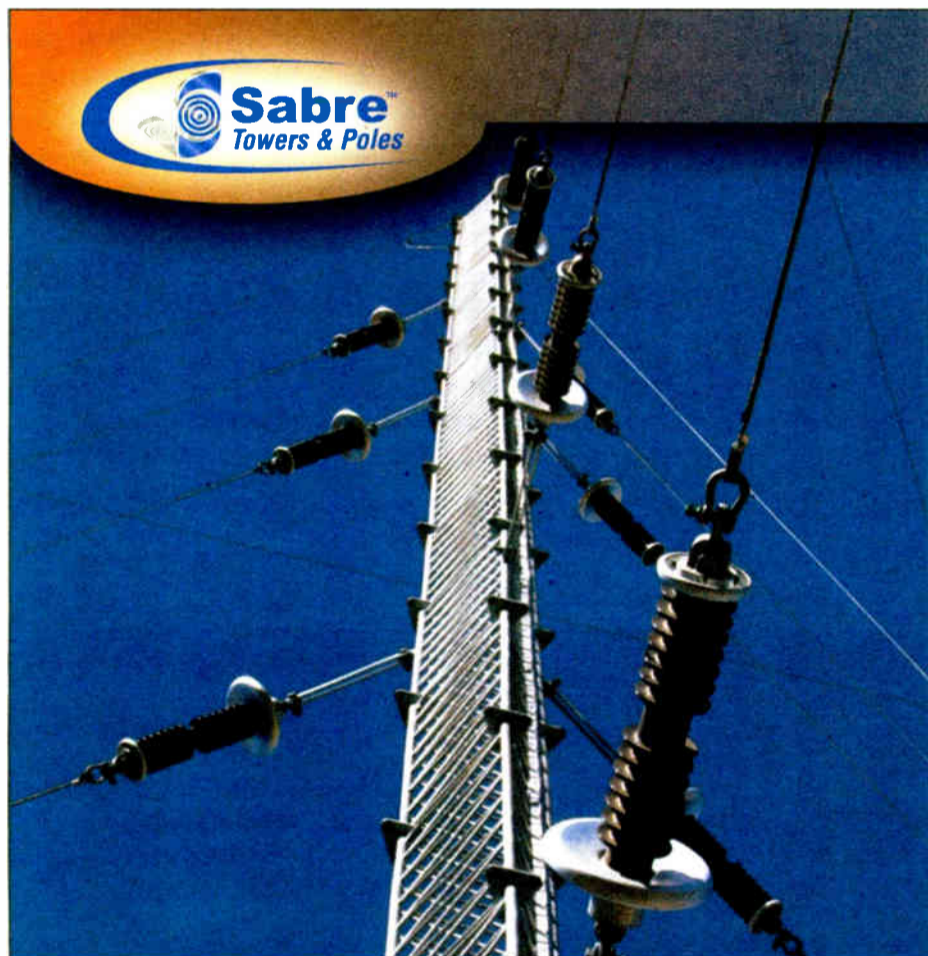
But the third part of this epic trilogy could be the real blockbuster: The possible assessment of such royalties on terrestrial radio broadcasting — for the first time. Of course the reaction to this would be nothing short of cataclysmic, and the preparatory rumblings already have begun.

Interestingly, existing law essentially prevents such a change from being unilaterally instituted by the CRB, so it literally requires an act of Congress to do so.

The first proposal for such legislation has been drafted recently by Rep. Howard Berman, D-Calif., chairman of the House Judiciary Committee's Subcommittee on Courts, the Internet and Intellectual Property, a measure that has already become generally known as "the Berman Bill."

Should the bill make it into law, it could ultimately lead to new royalties on over-the-air radio broadcasters set by the CRB. Most observers believe a full progression to that end is unlikely, particularly given the strong broadcasting lobby. Yet others have noted that NAB appears more vulnerable than it has been historically, due

OUT	IN
Diaries	PPMs (well, sort of)
AES3	IP audio
PAD	PSD
Field-recording media that move	Solid-state field-recording media
Streaming your air signal	Separate on-air and on-line services
ISDN	EV-DO Rev A
MP3	HE-AAC
DAB	DAB+
XLR	RJ-45
Canadian DAB	Canadian IBOC
Convergence	Mobile Convergence
SAME	CAP
Angst over the CRB	Angst over the Berman Bill
AM Skywave listening	AM IBOC
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its still-new leadership, and its concurrent concern with other critical issues, such as media ownership, the ongoing digital TV transition and mobile competition.

Note also that even if such royalties are never assessed on local radio, that industry could still feel an impact from the CRB's actions via other venues. A direct impact comes from the increased costs on radio broadcasters' own Internet streams, of course, but there could be an even more important indirect effect.

Perhaps the scariest new movement of the year was the movement away from DRM-protected music downloads.

Consider that the CRB's imposition of higher costs of operations on Web- and satcasters could cause them to move (or move further) toward an advertising-based business model, and some of the revenue thereby attracted could reduce advertising dollars that might otherwise have been spent on local radio broadcast stations.

It's one thing to steal listeners, but it's something else again when advertising revenue is also poached by new competitors. The problem is compounded by the fact there is almost no limit to the number of new entrants that can compete this way other than natural market forces (in other words, there is no scarcity of spectrum or licensing requirement for online competitors).

Increasingly, too, the entire Internet (fueled by its search engines' success) is drawing more advertising revenues away

from traditional media in general. In a PPM world, any such movement — even a small one — could be detected and reported, potentially causing a snowball effect that accelerates the rate of such shifts.

Not a happy scenario for traditional radio, and one that might cause broadcasters to hasten their own exploration of and movement to online alternative services in the next year.

Brother, can you paradigm?

Perhaps the scariest new movement of the year was one that we've only seen the beginnings of in 2007, but which may eventually have substantial impact on the radio business.

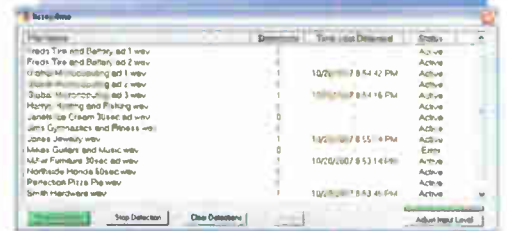
This was the movement away from DRM-protected music downloads, which is but one part of the entire music industry's struggle to find a proper business process for the connected entertainment environment. What it specifically implies for radio, however, is that online music stores and subscription services may also ultimately move to an advertising-based business model.

Couple this with the above-mentioned possible transition of Internet radio toward ad support, and it could produce significant erosion of both broadcast-radio listenership *and* advertising revenues to all of these new media sites.

On the other hand, there are other models that the music industry may move toward other than an ad-supported one, and several of those also made their debut in 2007. Most notable was Radiohead's pay-what-you-like download (or buy the CD with some extras) experiment, the ultimate outcome of which is still in question.

Finally, no year-in-review article is complete without a "What's In and What's Out" list, which we present above for your review, along with our best wishes for you and your business in 2008!

Skip Pizzi is contributing editor of Radio World.



Studio Sessions

Radio World

Resource for Radio On-Air, Production and Recording

December 19, 2007

PRODUCT EVALUATION

Aphex HeadPod 454 Spanks Bottom End

Small, Hefty Headphone Box Is Equally Comfortable With Lows and Highs; Monitors at Modest Levels

by Doug McLeod

The radio industry isn't generally seen as a market for audiophile headphones.

The advent of CD and DAT media didn't move the market, particularly, because no matter how clean the source material was, listeners still received it in processed analog. But now that all-digital audio paths are a reality — and with HD Radio creating a larger footprint — some radio people might be looking for better quality to monitor all that superior sound.

Unfortunately, no matter how good the headphones are, they must be driven by an amplifier, and few units on the market provide truly audiophile reproduction. It's a problem Aphex Systems can relate to.

Although the company made its name with processing gear for studio and

broadcast use — such as the Dominator II, Compellor and its flagship Aural Exciter line, as well as the Model 230 Master Voice Channel and the Model 2020 MkIII Broadcast Audio Processor — it has recently added other products.

Now in its catalog are D/A and A/D converters, a -10 to +4 level converter and the Anaconda bidirectional digital snake, which debuted at the 2006 AES Show.

Aphex is now in the headphone amplifier/splitter business, too, because the company found it hard to show off its processing gear with available headphone gear.

"Whenever we went to demo at trade shows, no matter what amplifiers we hauled around, we couldn't get the quality we needed to properly demonstrate our products," said Marvin Caesar, Aphex president and co-founder.

"So we created a circuit for our own use, just so we would have something good enough to monitor our processing products with. We started getting requests to put that circuit in a product that customers could buy."

Functional real estate

That circuit became the Aphex HeadPod 454 professional high-output headphone box. It's a rugged and functional device: a mighty midget that sounds great.

Straight out of the box, I saw that the HeadPod 454 is a serious piece of gear. Hefty for its size, the unit weighs in at 16 ounces for a box that's smaller than a lot of digital field recorders (5.5 inches wide x 1.9 inches height x 4.5 inches deep), and is encased in metal. Not a plastic surface to be found. That alone makes it a standout product.

Layout is simple and functional: five

Product Capsule: Aphex HeadPod 454

Thumbs Up

- ✓ Clean sound, even at low frequencies and high volumes
- ✓ Excellent power without crosstalk or other noise
- ✓ Rugged construction, compact design
- ✓ High quality at lower volume cuts down on listener fatigue

Thumbs Down

- ✓ No way to mix or balance the left and right inputs
- ✓ No battery power/was not designed for remotes

PRICE: \$249 MSRP

CONTACT: Aphex Systems at 818-767-2929 or visit www.aphex.com.

See HEADPOD, page 18 ►

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World Radio History

You think we have a lot to say? You should hear our clients.

When we asked our clients which Element features they liked best — well, you see the results. And this is the *edited* version. (Good thing we bought two pages.)

Go (con)figure • The folks at MPR say they really love being able to configure their Elements and keep tabs on their entire Axia network using standard Web browsers. You can set up and administer an entire building full of consoles from the comfort of your own office (where there's plenty of Cheetos and Pepsi). Put an Internet gateway in your Axia network and you can even log into Element remotely, from home or anywhere else there's a Net connection. Great for handling those 6 P.M. Sunday "help me!" phone calls from the new weekend jock.

Screen play • Element lets you use any display screen you choose, to suit your space and decor. Get a space-saving 12" LCD, or go for a big 21" monster. (This is Dave Ramsey's favorite Element feature, by the way. Anyone wanna bet he bought his monitors on sale?) Hook up a VGA projector and make a Meter Wall!

Perfect timing • You can't have too much time. That's why Element's control display contains **four different chronometers** to help keep talent in sync: a digital time-of-day readout that you can slave to an NTP (Network Time Protocol) server, an elapsed-time event timer, a countdown timer talent can set for any interval they choose... and there's also that big, honkin' analog clock right in the center of the screen (Big Ben chimes not included). We wanted to make it even bigger, but our screen designers charge us by the pixel.

Where's Waldo? • Hide and seek is a pretty fun game. But not when you're in a hurry, and definitely not when you're on the air. So every Element fader comes with a big, **bold** 10-character LED display right above it to show talent, at a glance, exactly what source is assigned to that fader. If it's music from a digital playout system provided by one of our partners, the display can even show the title or artist of the song that's active. Talent tells us that these displays are at the perfect angle for either sit down or stand-up studios.

Black velvet • What's 100 mm. long, silky smooth, goes up and down all day and **lasts forever?** Our super-quality conductive plastic faders, of course. (You have a filthy mind, mister. Shame on you.) We sourced the most durable, reliable, premium faders and switches for Element. And we added extra touches, like the custom-molded plastic bezels that protect on/off switches from accidental activation and impact. Because we know how rough jocks can be on equipment — some of us were (jocks, not rough). And because we also know there's nothing more embarrassing than a sudden case of *broadcastus interruptus*.

Audio cards • Well, um, there actually aren't any. Not in Element, or anywhere else in an Axia network. Why not? Think about this: your production guy spends hours crafting exciting, finely-tuned bits of broadcast magic, only to filter them through a card sitting in a noisy, RF-filled PC. It's like washing a wedding dress in the Hudson River. Not only that, broadcast audio cards are expensive. And they only work in *PCI slots* — how many of those are you sitting on, now PC's? The **Axia IP-Audio Driver** installs on any Windows PC to send and receive pure digital audio right through the PC's Ethernet port — no sound card required. You get better, cleaner PC audio that's sharable right to the network. And you save tons of cash on sound cards, and on the audio inputs you would have needed for that PC card audio — well, that's almost as big a savings as you can get. (You've been kidding, right?)

Options • Clients say they love Element's uncluttered workspace. We kept it clean by placing an "Options" key over each fader to give instant access to all the advanced goodies. It makes customizing settings easier than selling fudge cake to Dom DeLuise.

Great Phones • We wanted the phones on Element to work like an extension of the board — they themselves. Unfortunately, talent objected to having Ethernet ports implanted in their skulls, so we came up with the next best thing. With Element, jocks never have to take their eyes or hands off the board to use the phones. Element works with any phone system, but it really clicks with the Telos Series 2101, TWOx12, or the new NX-12, which connects four hybrids plus control with a single *Ethernet cable*. Status Symbols™ show cool little information about your phone at a glance whether a line is in use, busy, or otherwise. (That's not all, though. This call will end the phone system from the board using the integrated keypad.)

Who are these guys? • Why buy a console from Axia? Element was designed by Mike Dosch and his team of ex-PR&E renegades (who know a bit about consoles). And Axia is a division of Telos, the DSP experts.

Fried Chicken • Conductive Aluminum Baffle™ is connected to a 40-kilovolt "Mange Superior™" that can be activated with a SPICE device for all your favorite electrocutes for the 110 to save the birds a little "poultry handling."





« "We couldn't find a better way to monitor, so we invented it! And for broadcasting, we have low latency routing where you can monitor today and... Thanks MRP!"



« These coffee grinds are really great! But they're built a little better coffee. We use good switches to generate our tracks. Guess how many they've built!



« At Axia, "millions" is just down the road. As in "million dollars." So, it's maintenance. "Millions" depends. Is your life worth more to you or your job?



« "SoundCloud" is a great idea. But if you're in the car, you can't be in the traffic light out of control. We have a lot of people from our broadcast. MRP... please.

Meter reader • LED program meters? How very 1990s. Element's SVGA display has lots of room for timers, meters, annunciators (there's a five-dollar word) and more — enough to show meters for all four main buses at once. Reboot the console to 5.1 surround mode and the light show is even cooler. Any more bling and those fast, furious types'll want it for their dashboards.

Status Symbols • There are those icons again. (We're in love with icons. It's the Telos way.) These Status Symbols alert talent to phone lines ringing, mix minuses minusing, talkback channels talking, etc. They can even display fader numbers, like you see here. Just one more way Element makes it easy for talent to do a fast, clean show.

How many? • How many engineers does it take to change these light bulbs? None... they're LEDs.

Swap meet • Element modules are easy to hot swap. Remove two screws and a cable or two, and they're out. In fact, you can hot-swap the **entire console** — unplug it and the audio keeps going, because mixing is done in an external Studio Engine.

Can I play with your knobs? • Twist 'em, push 'em, make 'em click. Element comes standard with some pretty powerful production features, like per fader EQ, voice processing and aux sends and returns. Context sensitive SoftKnobs let production gurus easily tweak these settings, while simultaneously satisfying their tactile fixations. (Don't worry: for on-air use, you can turn off access to all that EQ stuff.)

Memory enhancer • We know how forgetful jocks can be, so Element remembers their favorite settings for them. Element's Show Profiles are like a "snapshot" that saves sources, voice processing settings, monitor assignments and more for instant recall. Have talent set up the board the way they like it, then capture their preferences with a single click for later use. They make them do some work for a change.

Stage hook • This button activates the emergency ejector seat. OK, not really. It's the Record Mode key, when you press it, Element is instantly ready to record off air phone bits, interviews with guest callers, or remote talent drop-ins. One button press starts your record device, configures an off air mix minus and sends a split feed (host on one side, guest on the other) to the record bus. Like nearly everything about Element, Record Mode is completely configurable — its behavior can even be customized for individual jocks. Sweetest.

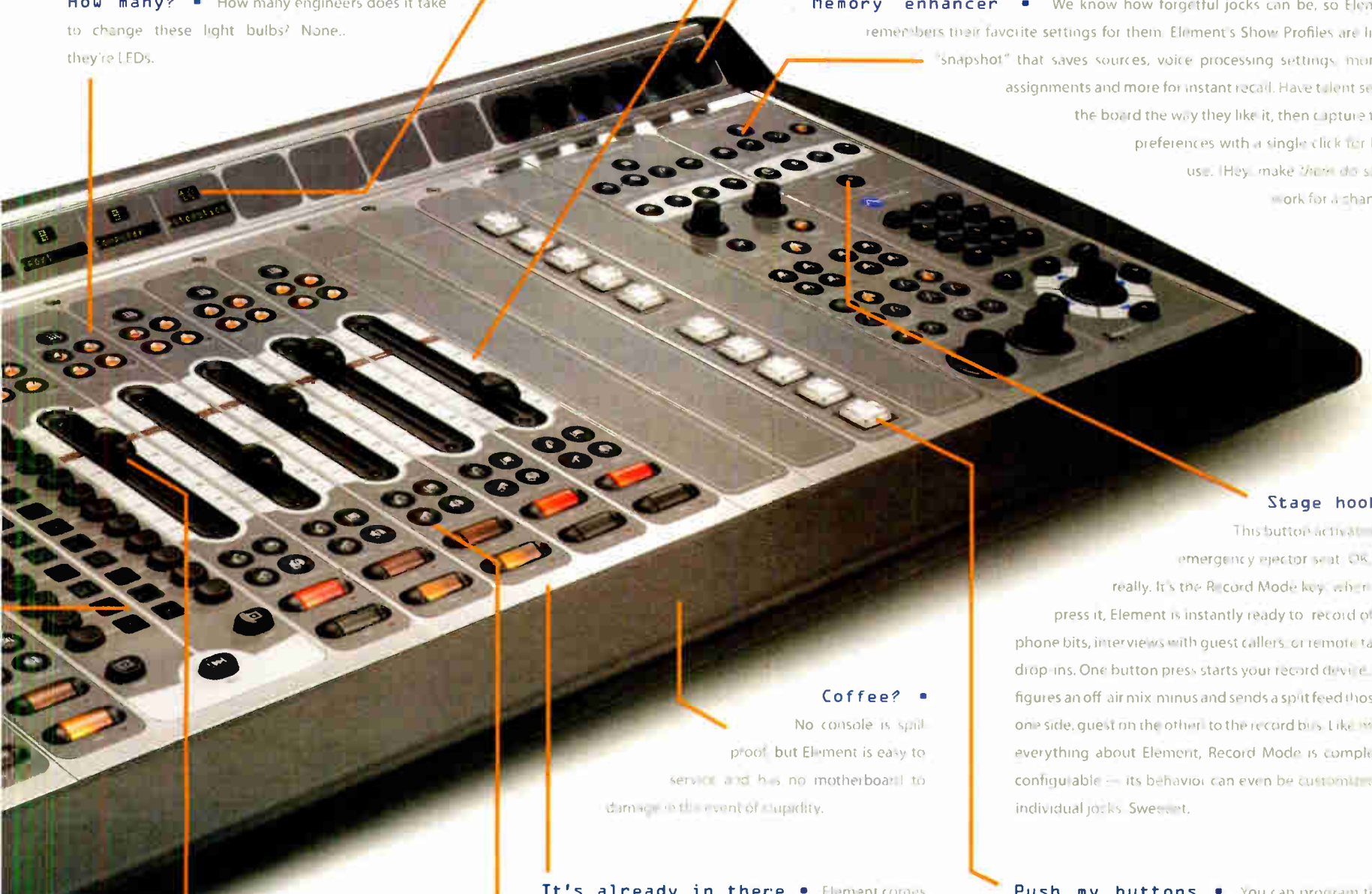
Coffee? • No console is spill-proof, but Element is easy to service and has no motherboard to damage in the event of stupidity.

It's already in there • Element comes standard with a lot of cool goodies you'd pay extra for with other consoles. Like just-in-time voice processing by Omnia™ that lets you quickly build and capture compression, noise gating and de-essing combinations for each and every jock that load automatically when they recall their personal Show Profiles. (There's even a secret "Big Balls" setting that makes wimpy interns sound like team leaders. A fifth of Chivas to the first guy who finds it.)

Talk to me • Need some zilla-on-air time with your talent? Talk to Studio guests, remote talent, phone callers — talk back to anyone just by pushing a button.

Push my buttons • You can program these custom button panels with any macro you want, from recorder start/stop to one-touch activation of complex routing switches and scene changes using PathfinderPC™ software. You can probably even program one to start the coffee machine (black, no sugar, thank you!).

Mixmaster • Does the thought of constructing a complicated mix minus on the fly bring a big grin to your face? If so, you're excused (Masochism 101 is down the hall). But if you hate building mix minuses manually as much as we do, you'll love the fact that Element does them for you. No more using all your buses for a few people while no more scrambling to set up clean feeds for last-minute interviews. When you put remote coders on phone calls, Element **automagically** figures out who should hear what and gives it to you — as many distinct mix minuses as you have faders.



www.AxiaAudio.com

HeadPod

► Continued from page 15

knobs on the top — one master and four individual level controls — and four headphone jacks on the front. The back is just as straightforward. Feed the box either with a stereo TRS signal or individual left and right balanced signals, all on 1/4-inch tip-sleeve (TS) or tip-ring-sleeve (TRS) user-supplied cables. A switch selects between the stereo and individual inputs. There's also a jack for the wall-wart AC supply.

Aphex has not neglected the bottom of the case. Where most manufacturers leave this blank, Aphex has screen-printed the specs, a graph showing maximum power output to the headphone jacks (expressed in ohms) and graphics showing the TRS and TS configurations for the input and output jacks. These days more non-technical people are being called on to connect things, so this is a helpful touch.

The HeadPod 454 is not only built for rugged simplicity, it's a muscular audio device. In fact, the manufacturer has printed a warning right on the top of the case: "Caution: Turn down volume before plugging in."

Yes, we're all familiar with the disclaimers that lawyers insist upon to avoid lawsuits ("Caution: Do not touch hot part of iron with hand.") But this is serious. The 454 packs a tremendous wallop.

Okay, so it's rugged and loud, both prime considerations for a headphone distribution amp. But how does the

HeadPod 454 perform with high-test audio?

This box sounds wonderful. Most headphone amps add something unwanted to the audio: hiss, distortion or crosstalk. We're all used to it and, frankly, if you're just listening to amped-up announcers and 20,000 wackos in a basketball arena, then who cares? The announcers are wearing sportscaster headsets. Volume rules. A \$40 headphone amp might be just fine.

But for more discerning listeners with quality headphones, what works for remotes can be a major annoyance. If you're monitoring jazz, classical or any digital music, distortion and hiss are unthinkable. For talk, too, it's clarity that counts. Listener fatigue is something headphone makers addressed long before the amplifier folks.

With the HeadPod 454, critical monitoring can take place without having to crank the levels. The nuances of your audio source come out cleanly at modest levels, so you can listen longer and more comfortably.

How low can it go?

And then there's the low end. That's where lots of headphones and headphone

amplifiers go off the rails.

"We recognized that even good headphones have problems with the bottom end. You don't get a true response," Caesar said. "If you listen to something that's been mixed entirely through headphones, you almost always find that it's

Clarity," Aug. 3, 2005) and knew that I could count on high-end, surround-sound type reproduction of any kind of music.

What I wasn't prepared for was that clean low end referred to earlier. Caesar said this was the first thing a lot of trade show listeners noticed too, "the fact that they could finally hear the bottom end the way it's supposed to sound. Even with great headphones, that wasn't possible before." It's possible now.

This incredible sound comes at a price, naturally. The \$249 MSRP might seem steep if you're used to \$39 headphone amps. But the pure quality and evident ruggedness make the HeadPod 454 a strong value in lots of ways. Mixes and program monitoring take a decided leap forward. And as I mentioned, this baby is rugged. You're going to have it around for a long time.

At first look, the HeadPod 454 seems ideal for remotes as well as studio work. The construction and handy size are

ideal. But, according to Caesar, the 454 isn't designed for remotes, and while I would be tempted anyway, field use could be problematic due to the power supply. It's a basic jack-in-the-back wall wart. Those little connectors are notoriously easy to disconnect accidentally in the field unless you tape them on and the unit does not have a battery option.

Another issue, and my only real complaint, is that you can't mix or fade the left and right inputs, either the stereo or the independent left and right inputs. If you need different levels or balances from your inputs, such as for program return or cueing, you'll have to bring them in from their own mono sources.

The Aphex HeadPod 454 fills a much-needed void in a world of end-to-end digital radio. It's a strong performer and comes in such a convenient size that I can imagine engineers and even announcers, who insist on using their own headphones, carrying a HeadPod from shift to shift and station to station.

Doug McLeod is a long-time major league play-by-play announcer. He also voices commercials from his studio in Scottsdale, Ariz.



bottom-heavy."

Published specs for the HeadPod 454 claim a frequency response of 10 Hz – 120 kHz, a breathtaking spectrum of sound. Total harmonic distortion plus noise is rated at <.001 percent at 100 mW into 25 ohms. Crosstalk is –80 at 1 kHz, –70 at 10 kHz. That makes what can be a very loud sound come out clean and clear.

I used the HeadPod 454 in my studio. At Caesar's suggestion, I connected it straight into the regular headphone jack of my Mackie 1402VLZ Pro mixer. Mackie has always provided a clean and robust signal at the headphone jack, good enough to use for program output in a pinch. What the HeadPod 454 did was improve on what I had always thought of as a clean signal.

Listening through my Sony MDR-7506 headphones, the difference was obvious. It was crisp, clear and, unfortunately, brought out a couple of annoying room sounds I hadn't noticed before.

Later, I tried a pair of Ultrasonics Proline headphones and the improvement was astonishing. I had previously reviewed an Ultrasonics headset for Radio World ("S-Logic Enables Audio Depth,

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PRODUCT GUIDE

50 kW Software Listens for Ads, Music

The Listen4me program from Fifty Thousand Watt Software listens for ads, music, jingles and promos from any source, including radio, TV or Internet streaming. Users give it a sound file sample of a recording they want to listen for.

Listen4me listens to the sample recording to "learn" what it sounds like, then listens to the audio stream to detect plays of the recording. It keeps a log of occurrences of detected recordings, including recording name, date and time. The log file can be imported into a spreadsheet.

The program also saves a sound file copy of the detected recording for later review and verification, and keeps a snippet of the preceding sound so users can determine what was playing right before the detected recording. It listens for up to 20 recordings at once.

Listen4me runs under Windows. A free functional 30-day trial is available for download from the company's Web site.

For more information, visit www.50kws.com.

File Name	Detections	Time Last Detected	Status
Fred's Tea and Bakery ad 1.wav	0		Active
Fred's Tea and Bakery ad 2.wav	0		Active
Global Microcomputing ad 1.wav	1	10/20/2007 8:54:42 PM	Active
Global Microcomputing ad 2.wav	0		Active
Global Microcomputing ad 3.wav	1	10/20/2007 8:54:16 PM	Active
Henry's Hunting and Fishing.wav	0		Active
Javelis Ice Cream 30sec ad.wav	0		Active
James Gymnastics and Fitness.wav	0		Active
James Jewelry.wav	1	10/20/2007 8:55:14 PM	Active
Millie Custom and Music.wav	0		Error
Miller Funeral 30sec ad.wav	0	10/20/2007 8:53:14 PM	Active
Norfolk Honda 60sec.wav	0		Active
Perfection Pizza Pie.wav	0		Active
Smith Hardware.wav	1	10/20/2007 8:53:45 PM	Active

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World Radio History

PRODUCT EVALUATION

Watchband to Capture Hearts of Engineers

Burk's Remote AM/FM/RDS Receiver Displays Projected, Actual Signal Strengths, FCC Station Info

by Stephen M. Poole

Imagine a PC radio coupled with a streaming Web server that can be programmed to keep an eye on every station in your market, and you'll get an idea of what the Burk Watchband is capable of. But that's just a start.

The receiver is an outboard, computer-controlled AM/FM unit with RDS. Software is provided to set up a streaming Web server and control interface accessible through any Web browser. Listen to any station as a live stream, or schedule to record selected stations and listen later.

The Watchband system also records RDS data: monitor a competitor's playlist, record your own playlist for reporting purposes or provide logging of RDS text for advertisers.

An engineer will find a lot to love. The Web interface graphically displays the relative signal strengths of all stations in a market. Have Watchband monitor signal strength and e-mail an alarm if anything falls outside of the limits you've defined. It can similarly monitor audio levels and phase problems and let you know if something is out of whack.

But here's the really neat thing: It will query an FCC database to display call letters, location and licensee's name. Watchband also uses that data to calculate the expected signal strengths of each station, and displays them graphically along with the actual received value. Nice.

You might ask, why a separate computer? After all, many pro audio devices nowadays have a Web server built in. The reason is simple: Watchband is designed to be the ultimate skimmer, and you'll doubtless be recording audio and playlists. A small, built-in Web server wouldn't have enough storage to make it worthwhile. Plus, a true enterprise-class server will better handle multiple users. I think Burk chose wisely in this case.

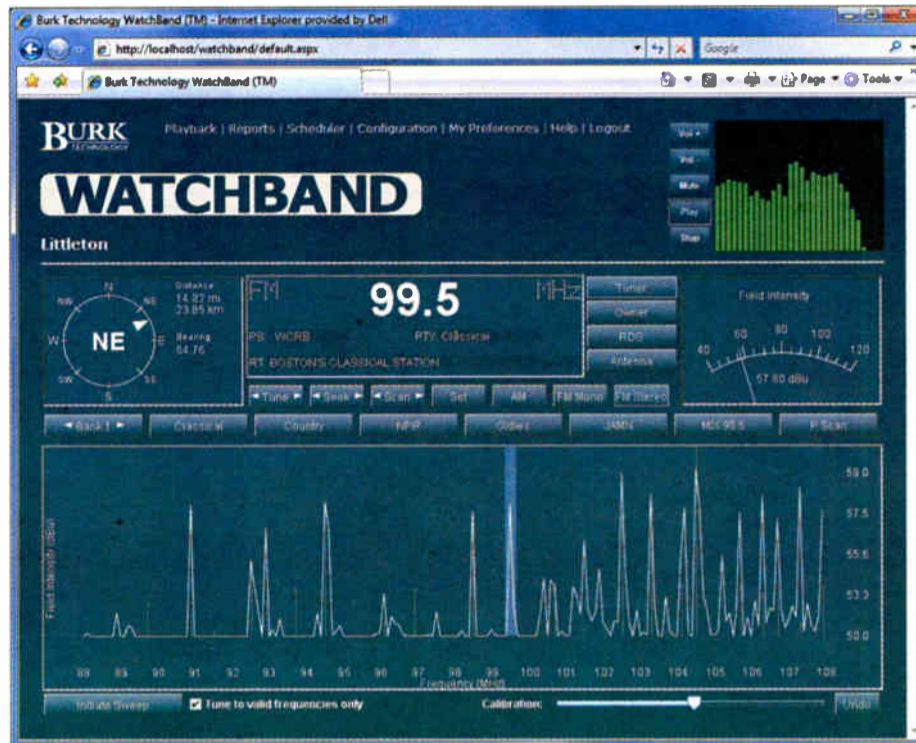
Installation and setup

The Watchband receiver unit is about the size of a small book. For our tests, we just set it on top of the server PC.

On the back are connections for the wall-wart power supply, a standard DB-9 RS-232 port, a 1/8-inch mini jack for audio out and an F-type antenna input. Connecting it to the PC with the provided cables is a simple matter; we had that done in less than a minute.

Burk supplies a whip antenna to get you up and running as quickly as possible, but it strongly recommends a good

external antenna for the best performance. The same antenna input is used for AM and FM, so you probably want one that works well for both. If you like,



Burk sells a companion antenna designed for dual-band use.

The requirements for the dedicated computer are modest; you probably have an older PC that'll fit the bill in your "bones and clones" closet.

Burk recommends Windows XP, Vista or Server 2003 running on a 1 GHz processor, with 1 gigabyte of memory and 100 megabytes of available hard drive space for the Web server and control software. More disk space will be wanted, of course, as Watchband creates files for later retrieval.

The server computer also will need a network connection with Internet access, an audio card and a standard RS-232 serial port. If your PC only has USB, buy and install one of those USB to DB-9 adapters. You'll need it.

Most of the actual setup involves installing and configuring the software on the dedicated Windows PC, and that's when I called in my intrepid assistant Todd Dixon. Burk provides step-by-step instructions for the software, which must be installed in the specified order: Microsoft Internet Information Server (IIS, the Web server) first, then the Windows Media Encoder (for streaming audio) and finally, the Watchband control

server. Necessary software is provided on the supplied CD.

Once Todd had installed everything, we hit our first snag: the system refused to boot.

After some head-scratching, we booted in safe mode and removed the Novell client

from our test machine. That solved the problem. Because of our experience, I personally recommend a bare-bones Windows XP platform with the latest patches and updates. If your PC is an older one, wipe the hard drive and reinstall Windows while you wait for the Watchband to arrive. Don't put any software on there that isn't essential.

A personal note: The Watchband system itself is reasonably secure. All access is password-protected, and you will set up a list that specifies what each user can and cannot do. But while Burk's instructions are generally excellent, they focus on the Watchband system itself. It's assumed you already know how to keep a Windows server PC secured and properly patched.

Therefore, the usual warnings about exposing a server to others apply to this thing too. In particular, don't open Watchband up to the Internet unless you understand the risks and know what you're doing.

Using Watchband

Once you have everything set up and running, simply use your Web browser to access the Watchband server. Burk recommends Microsoft Internet Explorer, but Mozilla Firefox works just as well.

On your initial log-in, you'll be asked to register the software with Burk. Tell it where you are; you can easily retrieve your latitude and longitude with the link provided on the setup screen.

During our configuration, we ran into one other head-scratcher: the displayed signal strengths were severely clipped to about 1/3 height. After some digging, we found the setting to change this. Why it wasn't set correctly on initial install, I don't know, but it was easily fixed.

The RDS display was ugly at first; it took a while for the data to settle down. When I mentioned this to Nathan Burk, he suggested it might be the fact that we were using the little whip antenna instead of a good outdoor unit, which makes sense.

Product Capsule:

**Burk Technology
Watchband Remote
AM/FM/RDS Receiver**

Thumbs Up

- ✓ Scheduled recording and logging of all stations in your market
- ✓ Easy-to-use interface, accessible from any good Web browser
- ✓ Displays RDS data, along with FCC info for the station being monitored
- ✓ User-defined e-mail alerts and alarms
- ✓ Displays projected and actual signal strengths for all stations
- ✓ Excellent price/performance ratio

Thumbs Down

- ✓ No HD: Watchband is analog AM and FM only
- ✓ Requires an old-style RS-232 port, not the now-ubiquitous USB

PRICE: \$1,495

CONTACT: Burk Technology at (978) 486-0086 or visit www.burk.com.

It also takes some time (we had to wait overnight) for Watchband to finish retrieving the FCC database info. Once it does, you'll begin to see the station data and projected signal strengths, as mentioned.

Tuning to a particular station can be done with the Tune and Seek buttons on the virtual receiver display, though I preferred the geekier method — simply click on the signal strength "spike" in the display and Watchband immediately switches to that station. By moving the mouse pointer over the signal strength display, each frequency and the basic info for that station also were displayed in a little pop-up. Very nice.

Now for the skimming and logging. We scheduled test recordings, both audio and RDS data, for several stations and the system worked flawlessly. One point that may not be immediately obvious, though, is that a single Watchband receiver can only tune a single station at any given time. In other words, if someone changes the currently tuned station, everyone who might be logged in and listening to the stream will hear the newly selected station.

In a similar vein, if Watchband is recording a station, the user can't tune to a different one until it's finished. Power users who really need the ability to record one station while monitoring another can add a second Watchband receiver.

This thing really impressed me as I ran it through its paces. I was testing it on a local area network, so I set it for the maximum bit rate, and the streaming audio sounded great. The receiver has good sensitivity; I was able to pick up all but the weakest stations in the market using the supplied whip antenna.

I'd like to see Burk add two things to this system: USB instead of RS-232, and HD-R capability. First, few PCs come with DB-9 ports anymore; we had to scrounge up an older computer for our test. Plus, the Watchband could be USB-powered, eliminating the wall wart. Second, companies like ours that are really pushing and promoting HD want to see it in every receiver we buy. It would really be nice if we could compare the phase/timing and relative levels of the analog vs. HD audio too.

But that wouldn't stop me from buying the Watchband. All in all, at a suggested list of \$1,495, it represents a terrific value.

Stephen M. Poole is chief engineer, Crawford Broadcasting, Birmingham, Ala.

Product Showcase



Model RFC-1/B Remote Facilities Controller

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HD Radio News

Radio World

Covering Radio's Digital Transition

December 19, 2007

Europeans Consider HD-R Roadmap

by Michael Hedges

LUCERNE, Switzerland Mounting interest in Europe for HD Radio is encouraging the technology's supporters.

The formation of the European HD Radio Alliance and growing participation in strategy roundtables show that interest is leading to digital strategies and HD-R could spread to several European countries within months, proponents believe.

The largest public broadcaster in the country, SSR-SRG, is using Eureka-147 digital radio technology. The broadcaster has financed two DAB multiplexes that carry its channels exclusively. A third multiplex using DAB+ has been proposed, but not constructed.

IBOC supporters believe the HD-R system would be attractive to private Swiss commercial stations with service areas that fall out of the norm for Eureka "pod" coverage, in which every station has the same power level and coverage area. Eureka would not be as efficient or economical a choice for stations with smaller coverage areas, IBOC proponents have said.

More than 200 broadcasters attended a two-day HD Radio conference, held here in October to chart steps forward.

Organized by Markus Ruoss, a European digital broadcaster and technical consultant, and supported by Ibiquty Digital, the Swiss broadcast association VSP, and BAKOM, the Swiss media regulator, "HD Radio Days" offered testing results meant to resolve questions about IBOC capacities and viabilities in Europe such as tighter channel spacing, mountainous terrain and different spectral occupancy.

The 100 kHz Swiss channel spacing is tighter than in most countries and because spectral occupancy changes

with IBOC as the system injects digital energy into the sidebands, Europeans have worried about protecting adjacent channels from potential interference.

The testing took place in Switzerland, much of it in the Lucerne area, a city in eastern Switzerland surrounded by a

Ruoss, is to make "98 percent" of radio listeners happy. "Real-world listeners," he said, "listen to music and content in a real-world environment, not decibels or kilocycles."

According to Ruoss, most technical arguments meant to demonstrate that

receivers are "very different."

For a variety of technical, geographic and jurisdictional reasons, FM radio coverage in Europe requires many transmitters, translators and repeaters.

For example, according to Ruoss, Radio Sunshine will require three to four transmission sites for 80 percent coverage and eight to 12 sites for 98 percent digital coverage. The current analog coverage of the station requires 15 transmitters.

For testing indoor reception and interference, Ruoss selected two sites: one on the fringe of the Radio Sunshine coverage area, about 7.5 miles from the primary transmitter site, and the other in the Lucerne city center.

Radio Sunshine used an on-air promotion to recruit test subjects.

Digital robustness

From this testing phase, Ruoss concluded that where FM analog reception is good, HD Radio is also good. "DAB [Eureka-147] faces the same limitations as FM and HD-R," he said. But he also said that FM reception deep inside buildings is "not as good as we think."

Cars of Radio Sunshine listeners were equipped with JVC or Visteon Jump receivers, with test subjects encouraged to drive around central Switzerland.

Ruoss said all of the HD Radio testers were "enthusiastic" about digital robustness. "Everybody likes HD Radio's ease of use."

A separate test, using a specially-equipped BMW automobile, took place on a Swiss Air Force base runway to attack an often-heard complaint that it is not possible to receive HD Radio in a car traveling faster than 100 miles per hour. At 140 mph, according to Ruoss, HD-R reception was "just fine."

Hans-Ulrich Rohrbach, consultant to the Swiss regulatory body, presented lab test results that compared HD Radio-induced interference levels in a variety of receivers. The main focus

See EUROPE, page 25 ▶



Jurg Bachmann, Konrad Volanthen of OFCOM and Markus Ruoss and Perry Priestley of Ibiquty.

lake and ringed by mountains. Lucerne is where Ruoss established an HD Radio platform with the station he owns, Radio Sunshine.

NRJ Group station Energy Zürich contributed technical assistance in the testing, providing content for the HD2 48-kilobits-per-second digital channel.

Ruoss introduced his test results by reminding the audience that the analog FM systems in use for decades are still "very good" overall.

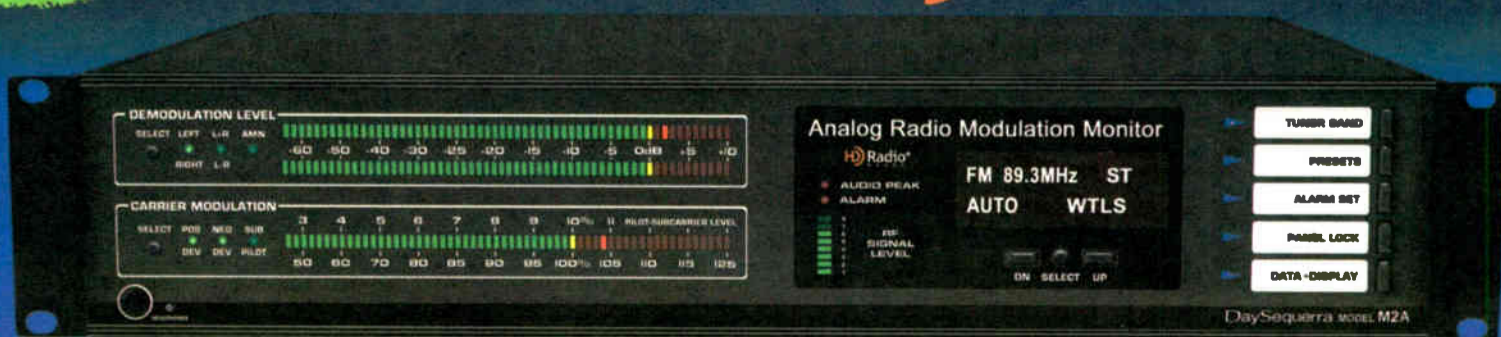
The objective for HD Radio, said

HD Radio does not work in Europe have either turned out to be wrong, solvable by operational introduction or not relevant for the commercial radio listener.

The remaining technical issue seems to be "+/- 200 kHz interferers in the fringe and overspill area of actual FM networks," said Ruoss.

The basis for the testing environments was determining acceptable interference levels with current FM receivers. Referring to the receiver study conducted by BAKOM, Ruoss said that FM

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Radio World's HD Radio™ Scoreboard

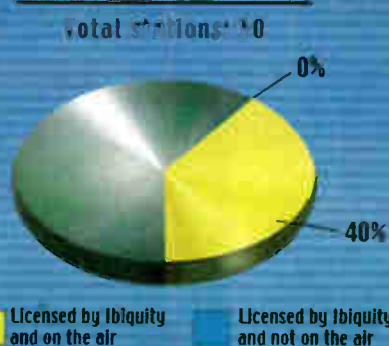
The HD Radio Scoreboard is compiled by Radio World using information supplied by iBiquity Digital Corp., the HD Digital Radio Alliance, BIA Financial Network and other sources. Data reflect best information as of mid-November. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

TOP 25 MULTICAST FORMATS

Country	66	Rhythm/Blues	16
Rock	47	AC	15
Classical	39	Christian Contemporary	14
Alternative	33	News	14
Classic Rock	30	NPR	13
Oldies	29	80s Hits	12
Smooth Jazz	27	Dance	12
AAA	24	Classic Hits	11
CHR	23	Spanish	10
Hip Hop	21	Urban AC	10
News/Talk	20	Top 40	9
Comedy	19	Variety	9
Jazz	16		

Source: Data above is from BIA Financial Network's data service MEDIA Access Pro™ and also includes iBiquity information. Visit www.bia.com

HD Radio at Sandusky



The HD Radio Bottom Line

	Total Licensed	On the Air	FMs Multicasting
Current	2,027	1,525	765
Last Month:	2,001	1,510	743
Last Year:	1,579	1,052	482

World Radio History

Personalized Radio For RRS Under Way

NPR Labs, IAAIS Are Developing 'Radio Anytime' Capability for Visually-Impaired Listeners

WASHINGTON NPR Labs and the IAAIS are working on a way for the visually impaired to listen to their radio reading service when and where they want to.

The intent is to make it easier for the visually impaired to hear their radio content when they want to, rather than having to listen in real time.

Think of it like TiVo for radio reading services, says NPR Labs Research Associate Kyle Evans, who pitched the project and is spearheading the three-year effort.

Technology Officer Mike Starling, also executive director of NPR Labs.

Using a special software program, individual stories in the audio would be "marked" so the receiver could recognize the beginning and end points. Audio to text software would "translate" enough of the piece so the receiver could know when the user pushes a button to gather all "dog" stories, for example, and buffer them for later listening.

Those stories would be aggregated, and the user could decide later which ones to listen to, said Evans. Users

The intent is to make it easier for the visually impaired to hear their radio when they want to, rather than having to listen in real time.

The National Institute on Disability and Rehabilitation Research, a subset of the Department of Education, in November awarded NPR Labs a grant to develop the personalized audio information service for RRS listeners. NPR is providing additional resources directed toward the project in order to meet the timeline and deliver promised prototypes.

The idea involves the metadata in the HD Radio audio stream. Since the data portion of each stream is not "fully populated," there's enough overhead in the IBOC data stream to handle this use. This data activity could be part of a multicast channel of the audio information service, said NPR Vice President/Chief

would set up a profile using a computer interface, he believes.

The project is in the beginning stages, though some software would be needed, probably in the HD-R importer, to handle the speech to text translation, he said. NPR Labs is working with stations to determine how to implement the necessary software.

In a world in which we're deluged with information, visually impaired listeners are challenged in trying to keep up with news, Evans said. "A device like this could speed up the amount of content they could process."

— Leslie Stimson

LPFM

► Continued from page 2
listeners. "The idea that hundreds, if not thousands, of additional LPFMs can be shoehorned into an overcrowded radio dial without causing considerable interference simply defies the laws of physics," stated NAB Executive Vice President Dennis Wharton.

Martin singled out both Prometheus Radio Project members on their "success" as well as former Chairman Bill Kennard, who initiated the LPFM service seven years ago.

Pete Tridish, founder of Prometheus, commended the agency for moving toward what he called "better engineering methods" for finding channels for LPFMs.

Specifics of the commission action were not published immediately. However, the commission voted to allow the sale of an LPFM from one non-profit to another with certain conditions and to cap ownership to one LPFM per licensee. The idea here is to keep LPFM ownership local and true to the original non-profit intent of the service.

Full-service to pay?

The commission voted to treat alterations in an LPFM's board of directors as minor ownership changes that the agency can approve quickly; and it spelled out that repeated, automated programming does not meet the local program origination requirement.

Although the vote to pass the new rules was 5-0, Chairman Kevin Martin voted with the Democrats and not his own party colleagues on two key issues that favor LPFM rather than existing broadcasters. The other GOP members voted for the item overall, but dissented in part to the rules.

First, the FCC established an interim policy for considering short-spacing waivers and a displacement policy for LPFMs.

Proponents wanted to extend the length of LPFM construction permits

beyond 18 months. While not approving a blanket increase, the commission gave the Media Bureau permission to grant extensions.

As we reported in September, the FCC has identified about 40 LPFMs "at risk for displacement," Doyle said, due to recently adopted rules to streamline city of license modifications for full-service FMs.

The FCC also "tentatively" concluded that full-service stations must provide technical and financial assistance to LPFMs when a full-service station's "facility proposal" would cause interference to an LPFM.

In cases where no other technical remedies can be found to minimize or eliminate interference to an LPFM, the FCC "would favor those LPFMs" that have regularly provided eight hours a day of local programming over an application for a full-power station move-in, Doyle said.

At least one legal observer said future FM city-of-license changes will need to protect LPFMs as a result.

GOP Commissioners Deborah Tate and Robert McDowell objected to the waiver policy, which the FCC had rejected in 2005; McDowell called it a "radical departure from prior commission precedent made without sufficient public notice."

"Clearly, the 2005 commission recognized and upheld our long-standing policy to treat full-power stations as primary to secondary services such as LPFM and FM translators," he said.

Tate said she could find no justification for a policy shift, noting that "low-power FM licensees provide a great service to their communities, but they accept their license knowing that they are a secondary service."

Wharton said NAB shared those concerns and hoped to work with the commission to find a solution that works for all

Compromises, concerns

The second key area in which Martin sided with Democrats was the decision to cap the number of applications still pending from the 2003 FM translator filing window to 10 proposals per applicant. Tate and McDowell said this was too low.

McDowell said the 10 cap was even lower than what LPFM advocates had proposed. Tate preferred "a more measured approach, rather than an 80 percent cut, from 50 to 10."

Doyle said some entities filed for hundreds, and even thousands, of translators.

The cap preserves opportunities for new LPFMs, said Martin. LPFM advocates care about the cap because they have sought priority over translators in regards to frequency allocations.

Other areas on which the commission seeks comment in its Further Notice of Proposed Rulemaking are whether to retain the co-equal status of LPFMs and FM translators or give LPFMs priority, and whether to use contour-based rather than distance separation methodology.



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NEWS WATCH

Time to Re-visit Channel 6 Protection?

WASHINGTON Engineering Consultant Jack Mullaney says given the February 2009 deadline for the television transition to digital, it's time for the FCC to drop radio's protections for TV Channel 6 and re-purpose that spectrum to the FM band.

In a filing to the FCC for MB Docket 87-268, "Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service," Mullaney says adding 82 to 88 MHz to the bottom of the FM band would ease overcrowding.

Because only eight digital allotments are proposed for Channel 6, Mullaney believes, based upon this "extreme underutilization of TV 6, the commission could also consider a shared use of the channel but limit the sharing to just those full-service digital TV allotments currently under consideration."

Many of the recently filed NCE applications for radio allocations either ignored Channel 6 protection or curtailed their proposed power levels to protect those analog channels, he said. The thousands of applications filed in the recent window, as well as more than 14,000 applications filed in the 2003 FM translator window, demonstrate pent-up demand for FM spectrum, he argues.

One allocation for a TV channel could be used for up to 30 FM radio stations. Such additions could go a long way towards easing short-spacing conditions on the FM band, he states.

"The assumptions that Channels 2-6 are technically equal to the remaining Channels 7-51 have proved not to be totally accurate," Mullaney wrote in the filing.

"We believe the problems associated with impulse noise and greater difficulty in compensating for signal cancellations are some of the major reasons why there are only 38 potential [TV] digital allotments under consideration while there are currently 302 analog full-service analog allotments."

News Roundup

INTERNET usage could outstrip network capacity in North America and worldwide in a couple of years. Nemertes Research says Internet access infrastructure, specifically in North America, "will cease to be adequate for supporting demand within the next three to five years." Users could increasingly encounter Internet "brownouts" or interruptions to their applications they use online, the authors predict.

DIGITAL RADIO PRIMER: The World Broadcasting Unions, a coordinating body for associations that represent broadcasting networks, has developed a "Digital Radio Guide" that explores digital radio technologies and options. The text covers DRM, DAB, ISDB-TSB, HD Radio, digital satellite radio broadcasting and Internet radio.

Europe

► Continued from page 22
was on modern receivers, measured with HD Radio signals compared to FM signals.

Receivers used in the testing were categorized first by FM reception characteristics. Receivers ranged from "micros" and car radios to "vintage 1980s" home stereo FM tuners and HD Radio receivers.

Driving tests

Measurement of reception interference was against ITU standards. Car radios and HD-R receivers showed the best performance.

According to Rohrbach, the car radios

performed well because they are built for the most adverse conditions. "Modern car receivers showed far less noise than expected," he said.

Paradigm shifts

Micro hi-fi receivers, perhaps characterized as cheap and old, showed the weakest performance. The 1980s home stereo tuner had problems with an HD-R signal as host and was unable to lock onto the HD-R signal.

"Results," said Rohrbach, "show a large variation among receivers tested." BAKOM is proposing further testing on up-to-date car receivers.

VSP President Jürg Bachmann, recently elected chair of the European HD Radio Alliance and, until recently, managing director of Radio Energy Zürich, addressed other realities of HD

Radio implementation in Europe.

According to Bachmann and most other speakers and conference participants, HD-R will arrive in Europe within months, not decades.

One of the paradigm shifts is the relationship between HD Radio and DAB, said Bachmann. Local private sector broadcasters are drawn to HD-R for cost advantages while public broadcaster SSR-SRG has invested in the exclusivity of DAB and DAB+ for its regional channels, he said. SwissCom Broadcast has a virtual monopoly as analog transmission system provider.

The HD Radio advantage for European broadcasters, said Bachmann, is accessibility. "It is a tested technology, which does not have to be developed from the beginning, only adapted for Europe." ●

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Radio World

Antennas, STL, Power Protection and Transmission Support

December 19, 2007

USER REPORT

FMVee: Spirit of (Clear Channel) St. Louis

Dielectric Antenna and Combiner System Enables Digital Broadcast From 10-Station Facility

by Christian Vang
Chief Engineer
Clear Channel St. Louis

ST. LOUIS As chief engineer for Clear Channel here in St. Louis, a large part of my role understandably is dedicated to ensuring that the equipment we use will broadcast high-quality radio signals reliably.

Currently, we are broadcasting four of our radio stations from leased space on a local tower site. When it came time for maintenance on the site's multi-station combiner, the tower owner consulted with us and many of the other tower users, and ultimately decided to use this as an opportunity to upgrade the entire system with support for HD Radio.

Dielectric's FMVee top-mount antenna and multi-station combiner were

selected as the heart of the new transmission system.

With Dielectric equipment already on site, the FMVee offered a solution that not only was simpler and less expensive to implement, it also had the capacity to support the mixture of Class B and Class C stations that use the system. Dielectric's equipment is robust and runs efficiently and safely at the high power levels we need to transmit 10 stations from a single system.

Mixed signals

Installing the FMVee, which covers the full 88-108 MHz FM band, had the added benefit of allowing all users to implement HD Radio quickly and more cost effectively than other methods.

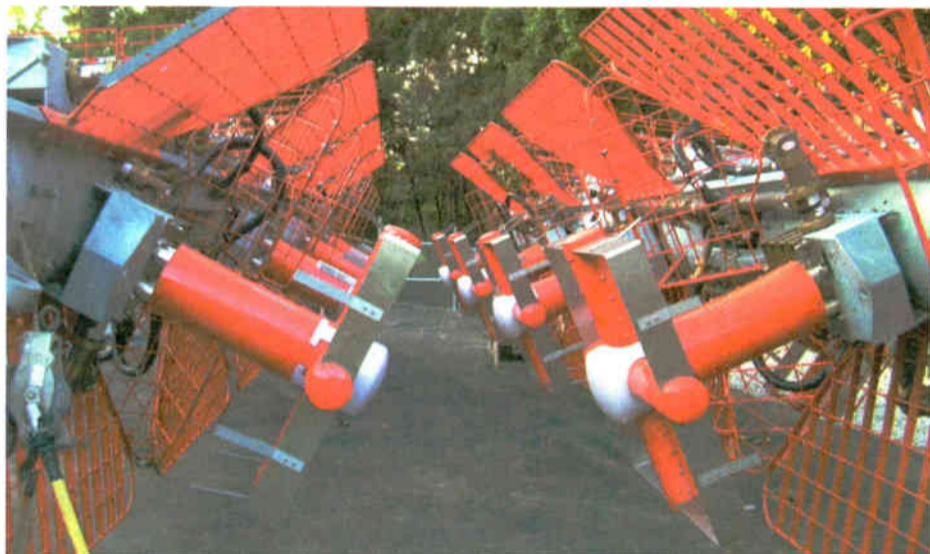
The HD signals from each station are combined in the same system as the ana-

log FM signals — thereby eliminating the need for 10 dB high-power combiners, reject loads and expensive low-level transmitter designs. It allowed us to continue to use our existing analog transmitter and simply add a low-power HD transmitter to the system. We've been broadcasting in

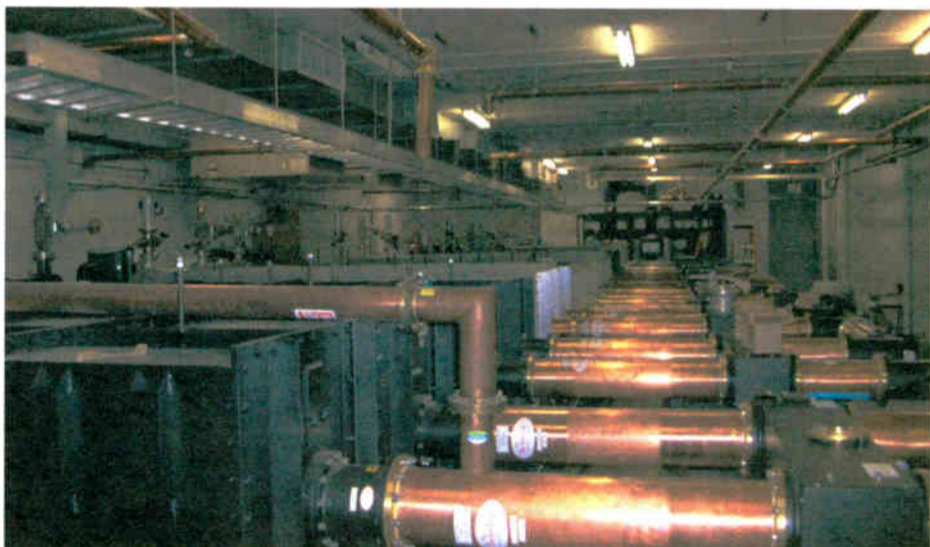
pole, making it much more resistant to icing than our previous equipment.

Because of the FMVee's circularly polarized design, we have benefited from a noticeably improved reception since the installation of the new antenna. We're getting calls from listeners, especially those in fringe areas, who previously could not get our stations and now are receiving the broadcasts loud and clear.

One of the features we have most



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The combiner after reconfiguration for 10 Class C FM signals.

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HD since October 2006 and are enjoying the opportunity to develop new channels of content and new data streams.

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One of the problems we experienced with the previous antenna was susceptibility to Missouri's occasionally harsh winter weather. We were pleased to see this problem virtually disappear with the new antenna installation. The FMVee's feed system resides entirely within the

appreciated is the inclusion of an RF switching system prior to the antenna. Because the antenna is constructed in two halves, we are able to use the switching system to operate our stations on either the entire antenna or just a portion of it at the touch of a button. This unique feature will allow us to keep our stations on-air at half-power should we need to correct an error or repair damage on another portion of the antenna.

With the FMVee and Dielectric multi-station combiner, we seem to have found the best of many worlds. Not only are we reaching more listeners, more reliably than ever before, we've also cost effectively tapped into the new market of HD Radio.

For more information, including pricing, contact Dielectric at (207) 655-8152 or visit www.dielectric.com.



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USER REPORT

TFC2K: 'Beefy,' Broadband And Unbothered

Bext Stainless-Steel Antenna Offers Durability And Ease of Broadband Design

by **Wayne Johnson**
Owner/GM
Media Logic

STERLING, Colo. Our company, Media Logic, operates four radio stations in northeastern Colorado.

When it came time to build our new 50 kW FM station in Sterling, we had no hesitation and went with Bext equipment.

KSRX(FM) is now happily on the air as 97.5 BOB FM. In addition to the FM transmitter, Bext provided us with the necessary FM high-power antenna and three sets of STLs. Bext also worked with us beforehand with the configuration and gave us useful information to make certain choices, such as the right transmitter/antenna gain combination to reach our 50 kW ERP, and the most cost-



Wayne Johnson tweaks the Bext STL at KSRX.

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effective way to resolve our multiple-hop STL set up.

The antenna we selected is the Bext 8-bay model TFC2K. This is a broadband, beefy, stainless-steel circularly polarized model.

We liked the fact that it is broadband because we felt that something broadband is not likely to go out of tune. Tuned antennas may go slightly out of tune over time, or tend to be more affected by metal items around them. Also, the effect of ice on a broadband antenna is less severe than on a tuned antenna, an important consideration for a transmitter site like ours.

Last but not least, a broadband antenna would allow us, should we ever wish to do so, to combine two or more stations into the same antenna, using FM combiners, for which Bext is known.

Also, the stainless steel material used sounded to us as probably the most durable metal for something exposed to the harsh elements at that site. The installation was straightforward, and we liked the rugged brackets that came with each antenna bay.

Once in place and after power was applied, the performance of the antenna was good. No reflected power, which was impressive for a broadband antenna, and very good and consistent signal coverage overall.

To bring our content to the site, we needed one set of STLs, and two more sets of STLs to go from our studio to this same site and, through a second hop, reach another site for another one of our stations that is not in line of sight with our studio. We accomplished all of this with three Bext LD STLs.

Two STL transmitters were installed at the studio; two STL receivers at the main site; one more STL transmitter at the main site pointing to the second site; and finally, an STL receiver at the second site.

The STL installation also was simple and straightforward. The Bext STLs are programmable on the front panel, so all we had to do was dial in our frequency.

The STLs immediately locked onto the programmed frequency and quietly started doing their job. None of them seemed to be bothered in any way by the presence of other STLs at the same locations. The audio quality is excellent for all of them, certainly a factor especially for a multiple-hop STL like ours, where there was no audio degradation despite going through more than one hop.

For more information, including pricing, contact Bext at (800) 500-5769 or visit www.bext.com.

USER REPORT

Entercom Picks Moseley for HD Rollout

STLs Carry Ethernet, Audio to Transmitter Site For 'Confusing,' Six-Direction Network

by **Lamar Smith**
Director of Engineering
Entercom Wilkes-Barre/Scranton

WILKES-BARRE, Pa. When it was time to plan my HD Radio projects in Wilkes-Barre, there were many things I had to consider. My choice of Moseley broadcast equipment wasn't a difficult decision, but planning the exact equipment I was going to use was a different story. I have several situations that affect my STL paths, and each one had to be evaluated to determine the best scenario.

My STL network is truly a confusing mess. I've once described it as the spokes from a bicycle wheel. I have an STL pointing in every direction possible from our studio building — six directions, to be exact. The thing that makes it more complicated is that I not only have 950 MHz systems, I also have a wireless T1 system as well.

As I planned my HD Radio rollout, I also needed to carry an Ethernet connection to the transmitter site. I found the Lanlink the perfect fit for this application. Working with Bill Gould and Dave Chancey at Moseley made everything easy.

I have an STL pointing in every direction possible from our studio building.

My plan for my HD Radio rollout forced me to STL my entire primary programming audio as well as my HD2 audio to the transmitter site. The Starlink 9003Q was the right choice for the 950 MHz operations. I selected the Starlink 9003T1 for my wireless T1 system.

The Starlink 9003Q can be set up to carry four analog channels or two AES/EBU stereo channels with ease. One feature I found helpful is that I could put right and left analog audio on the transmitter and pull it off the receiver as AES/EBU stereo on the other side. This was nice considering I still have a few analog studios and the need for an A-to-D converter was not necessary.

The Starlink 9003T1 was the obvious choice for my wireless T1 system. I have a Stratex 4/T1 link in place to one of my transmitter sites. I've had this link in service for four years prior to my HD Radio rollout. I had a Starlink 9003T1 on the link carrying primary audio to the transmitter site, but I needed to add a second path of audio for my HD2.

Gould said "no problem." He was right.

What we did was add an encoder card to the studio side and a decoder card to the transmitter site side. We used one of the extra T1s on my Stratex link to create the unidirectional link for my HD2 audio.

My other two T1s were used by a second Starlink 9003T1 that carried pro-

gramming for another station co-located at site. This second Starlink replaced an existing 950 MHz STL link. I reused the antennas and placed a Lanlink on them to carry my data to the site for the two stations.

Lanlink was a great choice for my data to the transmitter sites in my HD Radio rollout. It is a spread-spectrum system that works in the 900 MHz unlicensed band so it interfaces easily with existing 950 MHz STL systems without adding any antennas or requiring any tower

work. I planned and installed my HD Radio network to include Internet, PAD Data and equipment control capabilities for all my sites.

Remember how I said my STL systems look like the spokes of a wheel? I have three Lanlinks, all working on the same tower, pointing in three different directions without interference. Each system is addressed with a different name association and the spread-spectrum system does all the work to keep them from interfering with each other.

For more information, including pricing, contact Moseley at (805) 968-9621 or visit www.moseleysb.com.



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USER REPORT

Kintronic Load Braves Elements for HAARP

Company Develops 50 Ohm Load Design With Sealed Architecture to Withstand Extreme Weather in Alaska

by **Steve Floyd**
Chief RF Engineer
HAARP Research Station

GAKONA, Alaska The HAARP Research Station was completed in June of 2007 and is a U.S. government-funded, world-class ionospheric research facility used to further advance our knowledge of the physical and electrical properties of the earth's ionosphere.

This HF transmitting system consists of 180 HF transmitters, each with an RF output of 20 kW, operating in authorized bands from 2.8 to 10 MHz, providing a combined total input RF power to the 180 element antenna array of 3600 kW, and generating an electronically steerable antenna beam with an ERP approaching 96 dBW (4 gigawatts)!

The antenna array consists of 180 individual towers with each tower supporting two sets of crossed dipoles, one dipole pair for low-band (2.8 to 8.1 MHz) operation, and the other dipole pair spaced lower on the tower for high-band (7 to 10 MHz) operation.

There are a total of 360 low-band dipoles and 360 high-band dipoles. The antenna system is a 12 x 15 close-spaced planar array, with the close tower and dipole spacing driven by antenna pattern performance in the high band up to 10 MHz.

An undesired effect in this closely spaced antenna array is the mutual coupling of RF energy to each individual dipole antenna from neighboring dipoles that will create an even mode RF current on the dipole antenna.

This even mode RF current has the same polarity on each dipole side, thus it cannot radiate, and must be controlled to eliminate potentially catastrophic RF voltage or current peaks from occurring in the antenna matching units, and also to eliminate RF current on the antenna support tower.

The fixed tuned antenna matching units, designed at BAE Systems-AT Division in Washington, provides a reject output port for this even mode energy at each dipole feed point. What we needed was a 50 ohm load that could handle up to 3 kW of RF energy, with a low VSWR, and be maintenance-free for a 30-year lifetime in the outside Alaska environment, where temperatures routinely range from -65 Fahrenheit to +90 Fahrenheit every year.

With high wind, rain and lots of snow and ice, this is a terrible environment for any antenna system component to withstand.

Practice makes perfect

After contacting many vendors in the broadcast antenna component area, only two companies responded with proposals.

Kintronic Labs, under the direction of Tom King, provided the most technically credible response.

The company was challenged to provide the 50 ohm load design with a completely sealed architecture to withstand the extreme weather environment. Tom and his principal engineer, Larry Arnold, arrived at our Washington office with a technically sound proposal for a sealed load design. After review by our technical staff we sent them back to the draw-

ing board to both reduce cost and pursue a field-serviceable design using a surface-mount resistor technology.

Graciously, Tom and Larry accepted our direction and went off to try this new design approach. Several months later, they returned to our Washington office with not only a surface-mount component design and supporting thermal analysis, but with a first prototype providing real measured RF and thermal test data.

We were thrilled. However, after many internal debates our technical staff decided that this new design would not be sufficiently low in cost and rugged enough for our liking.

We sent Kintronic back to the drawing board again. The direction this time was to use the snap-in clip-mounted ceramic core power resistors found in many indoor load applications. The snap-in clip mounting would provide for the anticipated thermal expansion of the ceramic tubular resistors and prevent resistor component cracking from the expected thermal shock during winter operation.

Again, Tom and Larry started over and produced a new load design using the snap-in low inductance ceramic core power resistors.

We approved the design and instructed Kintronic to complete the final production design. After completing the new load design and constructing a pre-production model, thoroughly tested by Larry Arnold, we were done.

Not so fast

However, the HAARP program manager suddenly realized the contract required RF antenna connections in the HAARP antenna system be welded, soldered or bolted, and contain no dissimilar metal electrical connection junctions. No clip-in components were allowed.

Kintronic was again sent back to the drawing board. Most vendors would have simply said "no thanks" to a potential customer at this point, especially as funding had yet to be provided to Kintronic to support its pursuit of this business opportunity, and there was no guarantee Kintronic would win our business.

Starting over

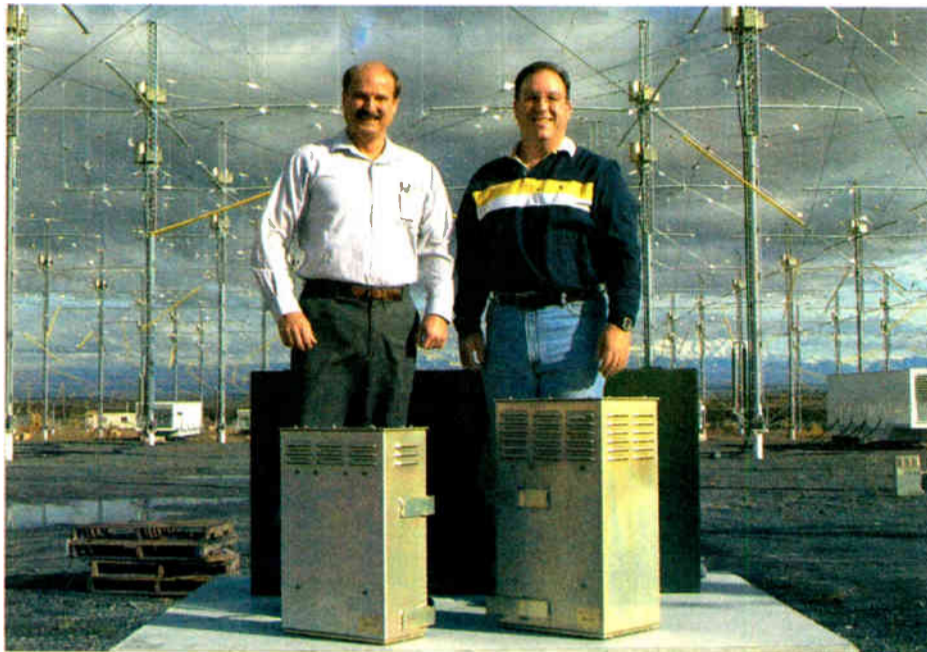
King, Arnold and the Kintronic design team did not give up. They simply started over and with clever innovation used a high-quality, low-inductance, wire-wound, ceramic core, screw-mounted, resistor product, configured in quantity to provide a very low VSWR with no additional tuning components.

Arnold, unfazed by our technical team's indecision, obtained custom value resistor samples, rented a temperature chamber and high-power excitation equipment, then proceeded to thoroughly test the new design, specifically the thermal shock survivability.

Given that the resistors were now bolted into place without the clip mount to provide for thermal expansion, the concern was that thermal expansion would cause cracking and failure of the resistor components, especially when applying maximum rated RF power after the outdoor mounted loads have been sitting at

subzero temperatures to -65 F.

Larry ran many temperature shock tests and demonstrated the robustness of the company's design. Kintronic Labs had actually achieved an affordable, rugged, convection-cooled load design that would satisfy all specifications.



Larry Arnold and Steve Floyd stand with the Kintronic loads under the HAARP antenna array.

Thankfully, limited funding was now provided to Kintronic Labs and two production prototypes were built to be installed in Alaska at the HAARP facility for real-life testing through a winter period.

Success? Not yet.

After tower installation, the even mode loads were deemed "too large" and, you guessed it, back to the drawing board for Kintronic Labs.

Fortunately Larry Arnold kept tempers in check at the Kintronic factory and the load design was greatly reduced in size. New prototypes using the rugged wire-wound ceramic core resistors were constructed and tested, and yet another set were then sent to Alaska for test and evaluation, all in several months time.

Tom King, Larry Arnold and the staff at Kintronic Labs came up with a winning design that exceeded our expecta-

tions. We tested their final compact 2.5 kW design at more than four times the rated power (10 kW), applying tremendous thermal shock, and no problems were observed. We were finally ready for production.

But testing in the HAARP antenna array provided new measured data that showed the required even mode load rating for the high-band dipoles was actually only 1 kW, not the 2.5 kW required for

the low-band dipoles. We asked Tom King and Larry Arnold to develop a 1 kW load version, much smaller and cheaper of course, for the high-band application.

After providing new production prototypes with test data, the smaller high-band load design was tested and approved. Ultimately, an order for 720 loads, plus 20 spares, was placed with Kintronic Labs. Production went smoothly and stayed on schedule; Larry Arnold was sent to the HAARP facility in Alaska to oversee the installation and to train our staff on the repair and test procedures for these serviceable and rugged loads.

With 720 even mode loads installed since the summer of 2005, we have not had any Kintronic loads fail in the HAARP system to date.

For more information, contact Kintronic Labs at (423) 878-3141 or visit www.kintronic.com.

TECH UPDATE

Tele-Link III Is Ethernet STL

The Tele-Link III Internet STL from Energy-Onix is a Linux-based digital audio system designed to be used with a conventional broadband Ethernet connection to achieve a high-fidelity stereo-audio link between the studio and transmitter sites of a radio station.

The basic system consists of two terminals, each of which contains an encoder and decoder.

The combination of using 44.1 kHz sampling rates together with the codec MP3 or Ogg Vorbis audio formats yields a frequency response of 20 Hz to 17.5 kHz, a signal-to-noise ratio better than 95 dB and a distortion of less than 0.005 percent, according to the company.

Both encoder audio inputs, as well as decoder outputs, are balanced, 600 ohm XLR terminations.

Highlights include variable bit compression of 16 to 128 kbps; program delay of 1-1/2 seconds; and an LCD display of static IP and operating bandwidth.

The Tele-Link III costs \$2,495 for one-way; \$2,995 for duplex.

For more information, contact Energy-Onix at (518) 758-1690 or visit www.energy-onix.com.



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USER REPORT

Harris Provides 320-Mile STL for KLDE

Intraplex NetXpress Audio-Over-IP Platform Bridges Distance Between Secondary Studio, Transmitter

by **Danny Ray Boyer**
President
Central Communications
and Electronics Inc.

ELDORADO, Texas Central Communications and Electronics Inc. recently provided engineering and construction services for KLDE(FM).

One of the first challenges we faced when KLDE's Class A license was granted was how to bridge the 320-mile span between the station's remote secondary studio and its transmitter site. T1 service was a possibility, but the overall re-occurring expense was prohibitive. Further investigation suggested that audio over IP would be more cost-effective.

Central Communications and Electronics has been selling and servicing two-way radio and microwave equipment, as well as aviation communications equipment, in the Dallas-Ft. Worth area for more than 35 years. We have been a long-time user of Harris Intraplex products for these applications and have several Harris legacy T1 links in service, with applications including TSL and STL

audio for broadcast customers and two-way radio systems.

We also use Intraplex SynchroCast systems to synchronize "simulcast" two-way radio systems. Our largest simulcast system has four remote transmitter sites and 10 remote receive sites.



Our history with Intraplex led us back to Harris for a radio broadcast STL solution for KLDE. After deciding against T1, we opted to install a Harris Intraplex NetXpress audio-over-IP platform to link the two locations.

The first step to establishing the NetXpress audio-over-IP connection was

setting up the pipeline between the two sites.

Verizon FiOS service was installed at the secondary studio, delivering Ethernet over a fiber connection at 15 Mbps downstream and 2 Mbps upstream. Verizon Business Class DSL provided 3 Mbps downstream and 768 kbps upstream at the transmission facility.

The NetXpress STL link features Harris compressed audio modules delivering a 15 kHz stereo pair to KLDE's

transmitter. A TSL connection is used for confidence monitoring and returning an off-air feed of the program audio back to the studio. Currently this is a 7.5 kHz service, owing to limitations on upload speed with the DSL connection. In addition to these basic services, program data travels through the NetXpress connection

for RBDS receiver display.

We also employed VF-25 voice modules to send four channels of voice grade (300-3,400 kHz) audio to and from the transmitter. At KLDE, these are used to send LPI, LP2 and National Oceanic and Atmospheric Administration audio from the transmitter site to the EAS decoder at the secondary studio.

KLDE uses Intraplex RS-232 modules as a backup to control its Supervisory Control and Data Acquisition system, which is used for remote control of KLDE's 3 kW main and 1 kW auxiliary FM transmitters. SCADA runs on a rack-mount Modicon Process Logic Controller (PLC) with plug-in modules for different telemetry and control functions. The best way to think of SCADA is a broadcast remote control system on steroids.

In addition to the transmitters, the RS-232 connectivity provides backup remote control of the station's Belar Wizard modulation monitor and Omnia on-air audio processors.

Another great feature of NetXpress is the centralized monitoring and control capability that comes with the package. Sitting at my desktop, I can look at all the modules plugged into KLDE's studio and transmitter frames, and control and monitor them as needed. The system can be controlled from a Web browser or SNMP network manager.

For more information, including pricing, contact Harris Broadcast Communications at (513) 459-3400 or visit www.broadcast.harris.com.

TECH UPDATES

WorldNet Oslo Delivers 14 Channels of Audio Over IP

The WorldNet Oslo from APT is a modular platform offering various plug-in cards for transport, audio and aux data.

The WorldNet Oslo sits at the main studio and delivers from a single stereo pair to 14 fully duplex channels of audio over IP lines. A T1 transport system also is available. In situations when the broadcaster needs to deliver several channels to a transmitter or another studio, a second WorldNet Oslo can be located at this site.

The WorldNet Oslo offers linear and Enhanced apt-X coding options. Linear is suitable for applications where there are no restrictions on bandwidth; Enhanced apt-X delivers the same audio quality with under 2 ms delay at a fraction of the data rate. Other options include MPEG L2, J.57 and J.41 companding.

Features include four channels of audio per plug-in module, up to seven audio modules per unit and a choice of more than 20 audio modules. Each WorldNet Oslo has the capacity of up to 28 mono channels/14 stereo pairs. DSP-based architecture, hot-swappable modules, passive backplane and failsafe options including redundant PSUs and automatic back-up switching round out additional highlights.

For more information, contact APT at (800) 955-APT-X (2789) or visit www.aptx.com.



Superior Electric Adds to Din Mount TVSS Series

Superior Electric debuted DIN2R and DIN3, part of its Din Mount Transient Voltage Surge Suppressor series.

The DIN2R and DIN3 series offer 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 use MOV technology, while the N-G models use gas tube technology. All models incorporate an internal thermal disconnect system 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 to ease installation and maintenance.

The DIN3 models can be connected in parallel or "in-line" with the load. Connected "in-line," they provide 50A maximum continuous operating current protection. Models are available with surge current capacities of 70 kA, 100 kA or 165 kA.

For more information contact Superior Electric at (860) 507-2025 or visit www.superiorelectric.com.



DIN2R features a replaceable plug-in surge protection module and fixed base to ease installation and maintenance.

Fanfare TRO Replaces Demod, Remod at Translator

Fanfare says its FP-TRO receiver/translator for HD Radio and analog eliminates the necessity for demodulation and remodulation at a translator.

Instead, the "TRO" converts the modulated carrier internally from one frequency in the FM broadcast band to any other frequency within the band.

TRO is capable of translating cleanly, to the next adjacent, without any visible (scope) or aural interference, according to the company. To complete the installation, a linearized PA system is required.

As such, a TRO-equipped translator does not demodulate the signal and therefore



does not impinge on any intellectual property for which licensing may be required, the company says.

Fanfare also offers high-gain directional FM antennas for concentration on stations in a specific direction, and minimizing reception from stations in other directions; vertical omnidirectional antennas for reception of FM stations in all directions; a mobile version of the FM-2G-type antenna; and antenna accessories to optimize installation such as lead-in cable, connectors, rotators and switches.

For more information, including pricing, contact Fanfare at (866) 26-TUNER (268-8637) or visit www.fanfarefm.com.



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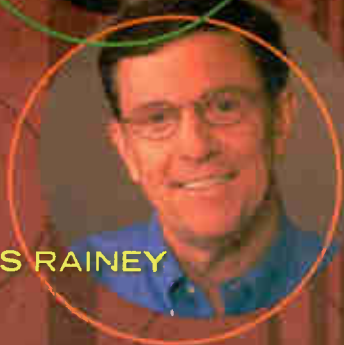
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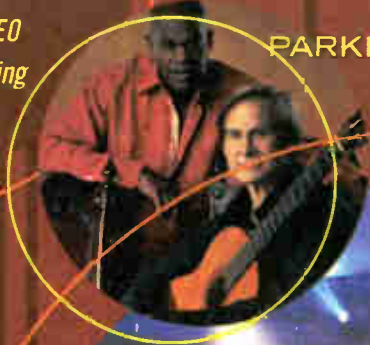
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— Dick Jenkins, CEO
EMF Broadcasting

I look forward to NRB each year as it is a fantastic opportunity to rub shoulders with people who are also involved in the ministry of media. It's a worthwhile investment of my time and energy to be educated by and to fellowship with the people who are leading the way in this arena of ministry.

— Mark Zschech, Hillsong Church

What makes going to NRB so worthwhile is interacting with other decision makers. My peers are there and I am always amazed how much I can immediately get done to advance this radio ministry by attending NRB.

— Tim McDermott, President/General Manager, KSBJ



USER REPORT

Crown Supplies 'All-Weather' Tx for Spirit

by Jeff Orr
 Owner, Engineer
 Communicorr Broadcast
 Engineering

COLUMBUS, Ohio When Spirit Communications Inc./WUFM began looking to build out its translator construction permits granted in the 2003 translator window, one of the most critical components needed were the transmitters.

As its consulting/contracting engineer, I was tasked with designing these sites for a quick and cost-efficient buildout.

While cost is a critical component, reliability is equally vital. The translators

Crown Broadcast/IREC is a name with which I was familiar. I have experience with the company and have always been pleased with the performance, value and quality of its equipment.

As part of the translator projects, I have had an opportunity to make use of its line of low-power excitors/PAs. We have used Crown FM30, FM100 and FM250 (now FM30, FM150 and FM300) in various sites, depending on the necessary TPO.

While these items are some of the more expensive options on the market, their use is standard for my consulting firm. When a station's image is based simply on what people hear, what good is that station if it is silent due to a broken part that only

saved a few dollars originally?

The FM line of transmitters from Crown serves as a one-box solution for translators. They can be fitted with an internal high-quality receiver card, frequency shift keying for automatic identification, stereo generator and internal Omnia audio processing.

In addition, they can be operated from AC or DC power, a real benefit in some remote sites.

The performance of the GoRX3 receiver card was proven to us recently. On one of our mountaintop sites, we had a first-channel adjacent neighbor move to the same site about 50 yards away. We already had a directional antenna receiv-

ing the signal 45+ miles away; we thought we'd be lost in noise for sure.

However, even with the new first-channel adjacent to our receive frequency, the Crown unit continued to receive high-quality audio with minor "muddiness." We are still proceeding with a slightly more directional antenna, but we have decided to delay ordering a filter. With the GoRX3 card in the transmitter, we believe we will still produce high-quality audio.

Crown units have an ALC circuit protecting against increases in VSWR, temperature and power variances. Additionally, SWR and power control are available for remote control, and the frequency can be set from the front panel.

For more information, contact Crown Broadcast/IREC at (866) 262-8972 or visit www.crownbroadcast.com.



are as close as 30 miles to as far as 2,000 miles away. They are housed in air-conditioned transmitter buildings on mountaintops as well as outdoor enclosures in corn fields. Spirit needed a transmitter that would be reliable in all weather.

While one particular transmitter vendor stood out in my mind, Spirit requested I visit others during the NAB show in Las Vegas. Going booth to booth and seeing many quality transmitters, I was confident in giving my advice regarding a manufacturer.

TECH UPDATE

Shively: Systems Based on 'Real' Antennas

When Yagi antenna systems are to be used for full facility directional operation, the FCC requires a formal pattern range test and a certification of the patterns test.

Shively says its engineers build systems "based on real antennas, measured on real towers," which comply with the FCC rules for directional antenna systems.

Shively Labs says every coverage pattern it replicates is developed on one of its two test ranges, and it never relies upon computer modeling. This allows the company to incorporate the details of the tower, transmission lines and other adjacent antennas accurately into the final design.

For more information, contact Shively Labs at 888-SHIVELY (744-8359) or visit www.shively.com.

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USER REPORT

ERI Selected for Charlotte's 'LaTremenda'

by Lowell Homburger
Partner
Abernat, Roxben & Boggs

CHARLOTTE, N.C. When Norberto Sanchez, CEO of one of the nation's newest Latino radio groups, Norsan Group, came to us and told us he needed an FM station to cover Charlotte, N.C., one of America's hottest radio markets, we knew it wouldn't be easy.

Charlotte's FM dial is loaded with out-of-market stations that have had their towers moved as close as possible, with some cities of license as far away as 70 miles. With Class Cs, it's not that hard to do. But the best frequencies have all been used; Sanchez's request was more speculation than hope.

Knowing we had a dynamic entrepreneur who needed to have an FM for his company's survival was all the incentive

our crew needed, and within five months we had located an "A" licensed to Pageland, S.C., 60 miles from the center of Charlotte, whose signal at that time was so bad it couldn't be heard much more than 10 miles from the city of license. It wasn't even a "blip" on the Charlotte radio radar.

We called in one of our co-venture partners, Bob Burnham, and asked his opinion. He said it would be a big stretch, especially if we wanted to keep the application at the FCC simple. The freeze was still on (2005) for changing city of license, and besides that, even if we could, in this instance it would not have worked. The frequency was the only public AM, FM or TV station



Stu Albert of Albert Engineering Services attaches the rigid transmission line to the coax switches at the new Norsan tower site.

licensed to Pageland. The status could not be changed.

Best laid plans

Bob laid out the game plan: Seek good PE advice; be certain we could even put a tower where the PE suggested; and then get involved in a hands-on way to meet the new Historical Preservation and Wildlife regulations regarding new towers.

We chose to use Seattle's Hatfield & Dawson, where we found Erik Swanson, a capable engineer who took the time to research and get us what we needed.

Once we found the footprint where the new tower could go yet still maintain city grade over Pageland, our crew found a decent site with good elevation that "fit" as far as the FAA was concerned.

The application was filed and the long wait for the CP began. During this time, we learned that Norsan's prime Charlotte competition was about to launch a new FM, and the pressure was on to get our new tower up, new equipment in and testing over as quickly as possible.

It became clear that our client was serious about expediency, but we also were serious about not compromising quality, so I brought in Tim Neese of Multitech Consulting in Swannanoa, N.C., to handle design and equipment needs. We later

used Stu Albert of Albert Engineering Services in Charlotte to help put the finishing touches on the actual hookup.

I was lucky to have the resources of three experienced, knowledgeable and talented engineers working together to get the station up and running without any deviation from our goal to provide Norsan with a state-of-the-art, major-market facility.

We set about to get equipment lists ready and, once the CP was issued in the spring of 2007, within a week we were working on the project and clearing land, putting in roads and getting the site prepped.

It is our policy to always set forth a three-vendor bid, and we did for everything, except the antenna. Having been in this business for 40 years, I feel there is no better antenna than ERI. Everybody I have known with an FM station that exceeded their stated coverage uses ERI antennas. It's unscientific, I realize, but you can't beat real-world experience.

With this new FM tower site and the sheer importance of having coverage to a population area that lies between 18 and 40 miles from the 500 foot tower, I knew I couldn't take a chance, so insisted on ERI.

A call put me in touch with David White, who made some good suggestions and followed the progress of our order for a four-bay LPX 4E-HW (four bays, half-wave-spaced, specified by Erik at Hatfield and Dawson to give better distance coverage).

Burnham traveled to the ERI test range in Chandler, Ind., to meet with ERI techs and find a good optimization pattern, which was accomplished with a 48 inch tower facing.

The antenna was delivered on time, and we didn't disappoint our client, who now is operating Charlotte's newest Latino Radio station, WGSP(FM) 102.3, "LaTremenda," still licensed to Pageland, S.C.

The signal exceeded every expectation of normal coverage we had; not only is the center of Charlotte coverage superb, but calls come in from 75 to 85 miles away.

For more information, including pricing, contact Electronics Research Inc. at (877) ERI-LINE (374-5463) or visit www.eriinc.com.

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1-703-998-7600, ext. 154 or email cvanveen@imaspub.com.

TECH UPDATE

Suprema Suitable as Primary Link, ISDN Backup

Musicam USA's Suprema is suitable for STLs because of its standard available interfaces. It can be used as a primary link via IP, ISDN or dedicated data lines (X.21). By utilizing the included GPIO interface, the Suprema also can be used as an automatic STL backup of the primary link. For an "all-in-one" solution, the company suggests Suprema be used as a primary link over IP or X.21, with an automatic backup to ISDN.

The unit's Web server eases controlling and monitoring of the Suprema. Log in from any Internet Explorer browser, and control and monitor Suprema's functions from anywhere. It supports SNMP protocol, so it can be integrated into existing systems easily. There also is an option to send e-mail upon failure.

Suprema contains algorithms such as the latest MPEG 2 Advanced Audio Coding, aacPlus and uncompressed linear audio and near-zero delay. AES/EBU input and output also is standard.

For more information, contact Musicam USA in New Jersey at (732) 739-5600 or visit www.musicamusa.com.



DSPXtreme AUDIO PROCESSOR

Extreme PROCESSING

The DSPXtreme is the newest addition to BW Broadcast's DSPX range of audio processors and we've included a few new features you wouldn't normally expect in an audio processor.



The first thing you will notice is the 2RU form factor which now includes two colour screens - one of which is touch sensitive. As well as looking great, the touch screen removes the need for jogwheels, joysticks and buttons allowing you to navigate, setup and control the DSPXtreme with a touch of your finger.

Behind the stylish front panel you'll find we've included more of the features that have made the DSPX range of processors among the best in the world. If you don't need all the features, no problem, the DSPXtreme is available in four different versions with tailored hardware and programming features: FM, AM, CD, HD

For quality FM stereo broadcasting, the DSPXtreme-FM includes the world class stereo encoder found in the DSPX and DSPXtra. As well as the standard processing features you'd expect in a top-line processor, the DSPXtreme-FM has dual

output paths allowing HD and FM services to be processed simultaneously without compromise. Simulcasting of FM and HD service is not a problem using the diversity delay feature.

With 6-Bands of audio limiting, distortion controlled clipping and look-ahead limiting you will have everything you need at your fingertips to create your own distinct sound for broadcasting or audio production.

Remote configuration and monitoring is simple with numerous connectiv-

ity options. These include an Ethernet port for LAN or WAN access, an RS232 serial port and an 802.11 (WIFI) Wireless interface. If you don't require a full user interface a remote trigger port is available that allows preset selection through contact closures.

You want more? No problem. The DSPXtreme has a flexible 'flash' upgradeable architecture which means that as we continue to make enhancements and add features, you can continue to reap the rewards. You can simply download the upgrades from our website.

www.bwbroadcast.com

World Radio History



USER REPORT

WFYL Taps Barix for Long-Distance STL

AM Station Integrates a Platform for IP Transport From Boston to Pennsylvania — Nearly 400 Miles

by Dana Puopolo
Consulting Engineer
WFYL(AM)

WEST NORRITON, Pa. The road to putting a station on the air always has its share of speed bumps. It can take years to finally turn on the transmitter from the time the FCC construction permit is granted.

Langer Broadcasting, owner of WFYL (AM) in the Philadelphia market, experienced this reality for nearly a decade.

The station, at 1180 kHz, is likely the last new call letter station on the crowded Philadelphia market dial. The daytime station, which airs local programming plus network feeds from Framingham (Boston), Mass., took nearly nine years to hit the airwaves from the time it received its FCC CP.

After years of zoning hassles and tower location scouting, city officials from West Norriton, Pa., proposed a municipal golf course as a potential tower site. The station's studio, transmission facility and tower are now located on the Jeffersonville Golf Course in West Norriton; the station went on the air late last year.

The reliance on National Radio Network feeds for about half of WFYL's programming initially seemed to require a satellite dish. We soon discovered that approval might take months and began looking at alternatives.

Going the distance

I had been familiar with Barix and its Instreamer and Exstreamer IP audio units, as Langer Broadcasting's Pittsburgh station was using them successfully for fractional TI STL service between its downtown studio and the transmitter.

After research and testing, we opted to integrate a Barix STL platform for IP transport from Framingham to West Norriton — nearly 400 miles.

Verizon DSL service was installed at both points to ensure that the audio remained within the same network over that distance. The dedicated network stream minimizes potential data packet loss during transport.

The Framingham location is a 24/7 manned operation, featuring two live radio stations, production studios and the network origination facility for the National Radio Network. A Barix

Instreamer device accepts the program feed from Framingham's automation system, encodes the audio and streams it over the private Verizon network to the WFYL transmitter located at the Jeffersonville Golf Course. There, a Barix Exstreamer device receives and decodes the signal in preparation for delivery to the transmitter.

The transmitter building is an old irrigation pump house that housed a central watering system for the golf course for nearly 70 years. The watering system was replaced with a series of remote irrigation wells in 2000, and the pump house was stripped of everything but the wiring. With AC power intact, it made for an excellent transmission facility.

On golden pond

The Exstreamer is at the transmitter site, which is situated on the edge of an irrigation pond. The fairway between the golf buildings eliminated the possibility of digging a trench to run wire for audio and telephone. The Verizon DSL service terminates inside the Golf Pro Shop, located in the Administration and Clubhouse building, adjacent to the golf course itself. A Q Bridge wireless Internet Bridge serves as the "last mile" connection to the transmitter, providing a cost-effective solution to a difficult challenge.

The Barix Instreamer, a bargain at \$395, also provides MP3 or MPEG-2 streaming; we use the latter, which provides exceptional audio quality. The WFYL mono audio stream is set at 128 kbps, a near CD-quality audio that trumps Starguide satellite and FM audio quality. WFYL has received calls complimenting us on our on-air sound.

WFYL also employs Barix Instreamers and Exstreamers for EAS; while the Instreamer at Framingham transports program audio to WFYL, another Instreamer transports live feeds from two Philadelphia market stations back to Framingham.

FM tuners for Philadelphia stations WHYI and WMGK are located at the WFYL studio site. When EAS alerts are activated at either station, the WFYL tuners pick them up and stream them to Framingham, where, if necessary, the EAS encoder routes the tones back to the WFYL transmitter. This strategy has proven far more reliable than contact closures at the transmitter controlling an EAS unit located there.

The long-distance Barix STL application has proven extremely reliable and cost-effective, saving well more than \$10,000 compared to a fixed 900 MHz hardwired STL system. The Barix platform also inter-operates well with other equipment such as the Q Bridge last-mile solution.

For more information, including pricing, contact Barix at (866) 815-0866 or visit www.barix.com.

TECH UPDATES

Marti STLs Updated For Longer Hops

Marti STLs attain a flat frequency response up to 20 kHz with less than 0.2 percent distortion.

They offer square wave response, user-selectable audio processing, low-pass and band-pass, front-panel test functions and automatic switching capability. The company says its STL line has been updated to improve performance over today's longer hops, as transmitter sites move further away from studios in big and small markets.



Range was increased by as much as double their previous capability. Marti, a subsidiary of Broadcast Electronics, says a frequency-synthesized power amplifier design enables its STL-20C composite and STL-20M single-channel systems to increase output power to 20 watts.

The Marti STL line also is easier to tune and runs cooler than previous generations, and has additional frequency options, which the company deems important as the lessening availability of frequencies trickles down to smaller markets.

The Marti STL-20C composite system and the STL-20M single-channel system operate on 150, 230, 250, 330, 450 and 950 MHz frequency bands.

The Marti STL-20C composite system also is frequency agile, and no RF tuning is required. Marti STLs are wideband, up to 50 Hz, and the STL-20M mono transmitter is equipped with a wideband amplifier that allows for front-panel adjustment of transmitter power output.

A basic Marti STL system starts at \$4,350.

For more information, contact (217) 224-9600 or visit www.martielelectronics.com.

CAMI: Mount Translator On Existing 'Hot' Tower

LBA Technology debuted its CAMI series of broadband medium-power isolators for AM towers.

CAMI isolation systems permit other antennas to be mounted on "hot" AM towers, providing a way to mount the translator antenna on existing AM towers without major changes to the transmitting system.

The systems are targeted to isolate single auxiliary broadcast coaxial cables for STLs, FM translators and low-power FM. One CAMI fits all of these applications. CAMI systems also have the advantage of passing AC or DC current to tower-top amplifiers, and are more resistant to weather and lightning, according to the company.

CAMI isolator systems are now shipping.

For more information, including pricing, contact LBA Technology at (800) 522-4464 or visit www.lbagroup.com.



Nautel Reliable HD Transport Used at BE, Harris Sites

Last spring, Nautel introduced its Reliable HD Transport to address potential on-air audio dropouts caused by lost packets in HD Radio studio-to-transmitter transport. Nautel says this solution is now being used by customers at BE and Harris sites.

Generation 3 HD Radio systems allow the Exporter to be located at the studio, which

requires transfer of HD data across an STL to the transmitter. The Ibiqity protocol used to transfer data between an exporter and exciter is called E2X.

"Streaming data across an STL is not a trivial exercise and it is even more difficult when it has to be done over a LAN," said Nautel Marketing Manager John Whyte. The company says it recognized the potential for data integrity problems and developed the Reliable HD Transport Protocol, which encapsulates E2X with improvements for detecting and recovering data loss.

Nautel also offers 1U rack-mount Reliable Transport Interface Units to support BE and Harris installations. One unit is required at the studio and the other at the transmitter site. This solution has helped customers isolate operational problems that were thought to be STL/E2X-related because the units eliminated the lost data and showed that the fault was elsewhere in the system, according to the company.

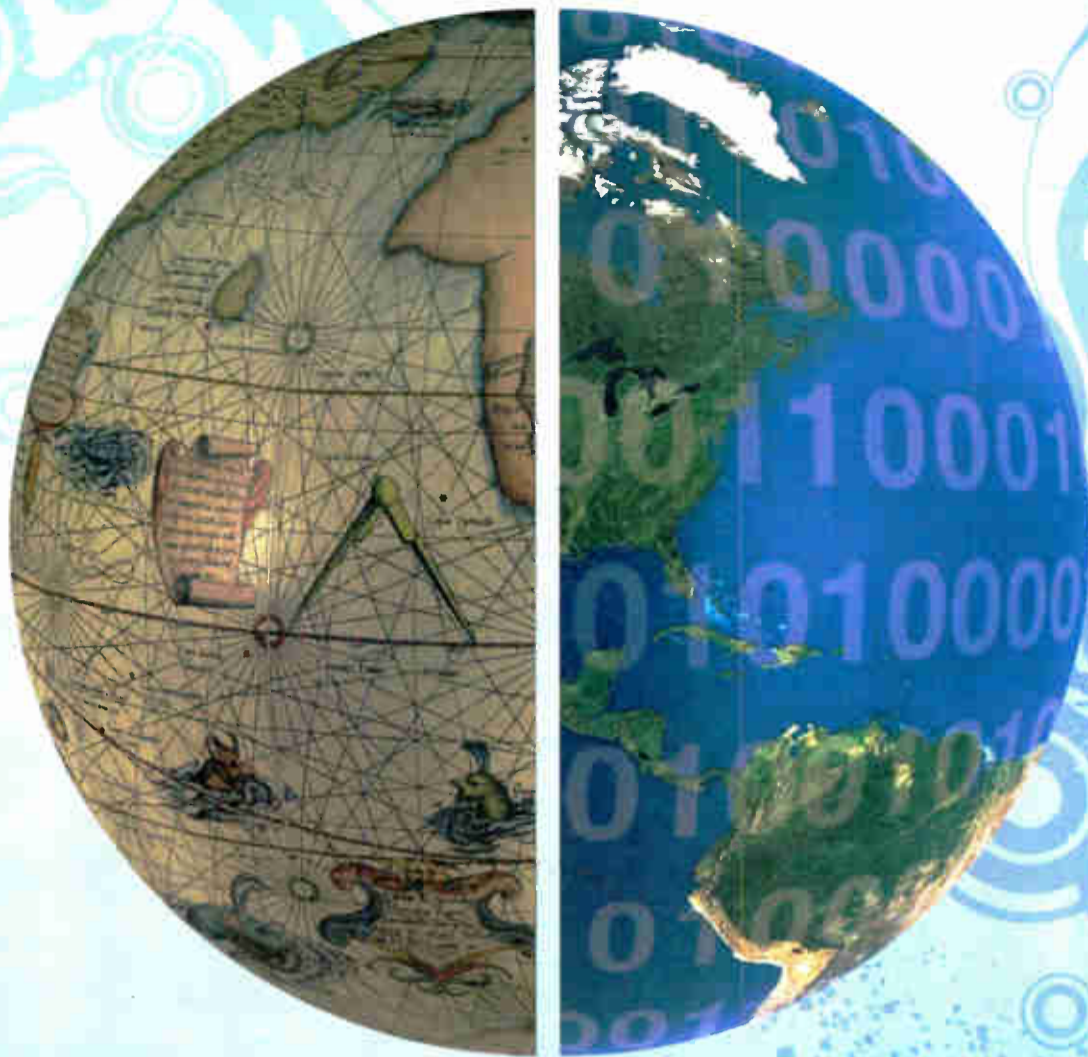
For more information, including pricing, contact Nautel at (902) 823-3900 or visit www.nautel.com.



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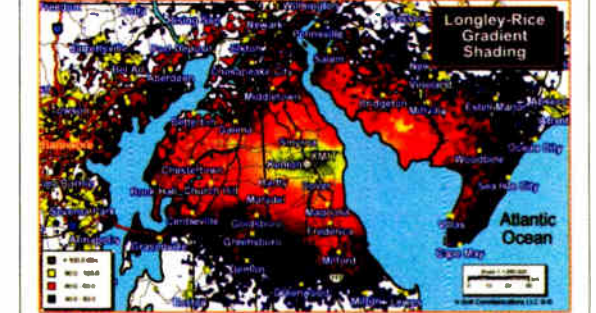
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GUEST COMMENTARY

Wisconsin LPFM Pays It Forward

WIEC Stays True to Its Mission and Makes Equipment Donation to Startup LPFM in Ohio

by Dan Drumm

A few months ago I received a response from a classified ad that our non-profit organization had placed in Radio World. The result was an equipment donation valued at more than \$18,000.

WIEC(LP) in Eau Claire, Wis., has the bare minimum of equipment needed to stay on the air. Without even a small mixer to act as a station console, we get by with a used computer and a \$6 headset mic to broadcast to our community. As a caretaker of this low-power FM radio station, I am keenly aware of the need for philanthropy to help keep LPFM stations on the air.

Like most community LPFMs, we are all-volunteer run. Underwriting and lis-

WCRX is currently re-broadcasting a forum event where citizens questioned the eight Bexley mayoral candidates. This forum recording is being re-broadcast three times a week until the election.

Weiland was enthusiastic about his newborn community station, but at the same time, skeptical of the equipment offer. After a short period of disbelief, he was convinced the offer was no scam and there was indeed plenty of valuable equipment available for WCRX, from a broadcast console and satellite equipment to the Orban compressor/limiter their volunteer engineer had requested only days earlier.

With lightning speed, Ron King and Kurt Weiland connected, documented and completed the logistics of transferring ownership of the equipment to WCRX.

I felt that WCRX was a good candidate for the donation because of its public service mission and innovative approach to programming.

tener donations pay for necessary used equipment as we try to bootstrap our stations into viable, self-supporting assets for our communities.

Enter Ron King of RKP International Corp. who recently sold his station, WRKP(FM) in Moundsville, W.Va. King had more than \$18,000 in equipment without a home and some capital gains to offset. When his equipment offer arrived at WIEC, I could hardly believe my eyes. This was the result of our classified ad!

After a few weeks of sorting through the details and trying to work out transportation issues, it became clear that WIEC would not be able to take advantage of King's generosity. We were disappointed, but because our non-profit mission includes helping other community radio stations, we looked for a struggling station in the area that might be able to benefit from King's donation.

Suspended disbelief

I was able to locate a startup LPFM station in Bexley, Ohio, about 150 miles from the equipment. The station is WCRX(LP), operated by Bexley Public Radio Foundation. I felt that WCRX was a good candidate for the donation because of its public service mission and innovative approach to programming.

When I spoke with Kurt Weiland, treasurer of WCRX, he impressed me with the novel directions the foundation was taking community radio as he described each of their shows.

"We also have monthly 'culture dispatches' from former residents who now live in Colorado, Alaska, West Virginia and New Hampshire," where, he said, "correspondents compare life, politics and culture in their old and new communities."


Seeing the broadcast community come together in a generous, reliable and effective way is reassuring.

RKP International received a tax deduction, and Bexley Public Radio Foundation's WCRX gained much-needed equipment for its LPFM. Bexley passed along King's remote mixer and a pair of broadcast quality headsets to our station in Wisconsin.

King said, "Those pieces of equipment have a lot of history [in] high school football and even professional indoor arena football." (WIEC will treat the equipment with care and put our \$6 headset on the shelf.)

This was a win-win-win situation, but the real winners here are our communities, through both philanthropy and volunteer public service.

I want to remind Radio World readers that even much smaller donations can make a big difference to tiny non-profit stations. I want to thank Ron King of RKP International for generously giving to struggling, non-profit community radio stations. I also want to thank Radio World for making it all possible with a classified ad.

Dan Drumm is treasurer, Eau Claire Broadcasting Corp., and WIEC(LP) "technical geek." 

Write to RW



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GUEST COMMENTARY

Hey, AM HD-R Critics: Got a Better Idea?

Naysayers Should Offer a Cost-Effective, Feasible Alternative or Put a Cork in It

by Stephen Poole

As a market chief engineer who has installed HD-R systems on two AMs and three FMs, I'd like to throw in my own two cents' worth. In particular, I want to address the negative comments that have been made about AM HD-R in this magazine. The following are my own opinions and observations, not necessarily those of my employer.

My biggest complaint about the complainers — i.e., those who want to dismiss AM HD-R — is that they propose no real, *feasible and realistic* alternative. You get the impression that these naysayers want to keep AM as it is, in spite of its many problems and the precipitous decline in listenership in recent decades.

Okay, suppose they get their way: If the decline continues, the day will come when the manufacturers just stop building AM radios due to lack of demand. What will they do then?

Then there are those who want to wail about might-have-beens and maybes: "If only we'd stuck with C-Quam!" (No data services, 10 kHz bandwidth and far more subject to interference than HD-R.)

Others argue that the FCC should give each AM station owner an FM, or something equally unlikely, given the shortage of spectrum availability. They are astonished that Ibiqity has the temerity to ask for licensing fees for a system that took it years, and countless man-hours, to make work.

My personal favorite? Those who grumble about imagined conspiracies and

assume that "industry leaders" (whoever they are) actually "want AM to die."

Folks, our company, Clear Channel, Citadel and a bunch of others have heavily invested in AM. You don't buy zillions of dollars worth of property and then hope it precipitously loses its value! That's just insane.

Just the facts, please

Now let's establish some objective facts. AM competition doesn't just come from other broadcasters nowadays; it also comes from the Web, satellites and other providers. Further, these new sources of entertainment aren't going away. The future will bring even more competition, not less.

Even worse, the generation coming up now is all-digital. Surveys show that the majority of the under-35 crowd has little interest in FM, and couldn't care less about AM. The younger ones prefer to get their music from iTunes, and the older ones use CDs and satellite. If they listen to "radio" at all, it'll be a Web stream.

What does this mean? The currently available audience is getting older, and broadcasters are fighting over a steadily-shrinking pie. We've got to do something revolutionary to get listeners back, to win these young people who will be the listeners of tomorrow and to ensure the future of radio in general.

But the solution must be (a) technically feasible and (b) cost-effective. It has to be *realistic and do-able*. We have to ask: What can do with AM *as it exists, in band, on channel?*

Digital has many advantages over analog; the biggest is a signal that would be unusable for analog will work fine with digital. It is far more resistant to interference. If you don't believe me, look at the Eb/No figures on your satellite receivers; I've gotten clear audio on mine with numbers as low as 4.5 dB. The same principle applies here.

We've got to do something revolutionary to get listeners back, to win these young people who will be the listeners of tomorrow and to ensure the future of radio in general.

I said that because some have justly complained about the initial crop of HD-R receivers. It's true; the first generation wasn't very impressive. But the newest, second-generation radios are already an order of magnitude better, and this can be further improved. Speaking as an engineer and programmer, if you have a known data set and know where to find it, you can work magic pulling that data out of even the worst noise and interference.

Do you realize what this means? Nighttime AM is a real possibility with HD-R! You daytimers out there with less than 100 watts of nighttime power should be all over HD!

Monster hash

Now for the one that generates the most hysteria: interference.

I have been amazed at the comments in this newspaper from people who think that HD-R "violates" or exceeds the NRSC mask specified in the FCC rules. No, it does not! This is a key feature of the Ibiqity system and it helps explain why it took so long to develop. It must be compatible with existing receivers and it has to fit into the current emission mask(s). It is, and it does.

I'll now state another objective fact for you: It would be possible for me to build a perfectly legal AM transmitter that caused *more* interference than HD-R.

Where did anyone get the idea that the NRSC mask is some sort of panacea for objectionable interference? There are old AM tube transmitters out there with bargain NRSC add-ons that, when driven with heavy processing, are emitting more junk outside of their primary channels than my HD-R transmitters. (I've heard them and you probably have, too.)

The AM NRSC standard, with its 75 usec pre-emphasis out to 10 kHz, means I am broadcasting material to either side of my carrier that directly walks on my adjacent-channel neighbors. Now, it's true that AM HD-R then adds additional emissions out to 15 kHz to either side of the carrier, but these are at a very low level.

Once again, I would argue that I have heard stations here in Birmingham, Ala., that put out more junk at these frequencies than my HD transmitters do. Why is no one complaining about them?

A better question is: What are the HD-R naysayers actually proposing? Do they think we should forcibly limit AM to 10 kHz (or even worse, 5 kHz) and be done? If we do, it's just going to die, anyway.

I choose to improve AM, and HD-R represents the best compromise that will allow us to use robust, error-corrected digital delivery with a full 15 kHz audio bandwidth, and all *within* the current NRSC mask. It works. We're using it here and every day we get comments from new listeners who have purchased a receiver, and they all say the same thing: "Wow!"

I'll finish on a personal note. The HD-R naysayers also apparently think that people like me are mindless kids who are simply dazzled by anything digital. We just want HD because it's "shiny and cool" or something equally silly. Please. I've been in this business since the mid-'70s and I assure you, I ain't easy to "dazzle."

I haven't known the president of our company, Don Crawford, or our DOE Cris Alexander to jump blindly onto bandwagons, either. We made a conscious, informed decision to switch to HD-R on our FMs and AMs after a lot of very careful consideration.

The bottom line is that, until the naysayers can propose a real, feasible, doable and cost-effective alternative to help AM grow and survive in an increasingly competitive (and increasingly digital!) marketplace. I'm finding myself increasingly uninterested in what they have to say.

Stephen Poole is market chief engineer for Crawford Broadcasting Co., Birmingham, Ala.

◆ READER'S FORUM ◆

Internet Radio

Skip, I really enjoyed your article on the current state of royalty battles and what's really happening here ("Substitute Teaching for the Digital Age," Oct. 10).

Many of us have known for a long time that the current Internet radio battle

playing. We sell lots of CDs via Amazon.com through our site, and the clicks almost always come from the now-playing pages.

Secondly, by playing more than one track from a CD, you give the listener the chance to hear more of a CD before purchasing it, rather than limiting them to only one song, which they may fear is the only good track. The album-oriented

matter how good you make it, the true music fan who buys CDs and digital tracks will always need variety.

We might soon be adding track links to iTunes to buy through there, as well as the album through Amazon or whatever. The fact that an artist can gain both immediate, whole CD — or as you call it, the bundle — and single sales increases total sales opportunities. These options negate the bundle argument as the whole reason for this battle.

A greater reason is that the labels that control the recording industry's lobbying efforts are not happy with the amount of revenue going to the "long tail" of the industry. The diversity of music on satellite and Internet radio is what is feared here along with the diversification of the pipeline to consumers. Not the lack of CD bundle. More of our sales (by a significant percentage) go to indie bands than major label artists. I'm sure many other stations could speak similarly.

This is about an industry that can't adapt and has chosen to direct its efforts to protecting their no-longer-sustainable business model rather than evolving with the times.

Derek Grimme
Station Manager
Creamy Radio
Pheonix

Internet radio offers more promotional opportunities for music sales than any other medium.

is only part of a grander war. I would like to take issue about one aspect of your article, however.

Internet radio, much more than traditional radio, truly offers more promotional opportunities for music sales than any other medium. This is accomplished through the very format being online and offering more interactivity such as online playlists, "Buy Now" buttons and artist links. All of this right in front of a listener while the song is

nature of many Internet radio stations encourages whole CD sales rather than single sales from terrestrial radio singles. If that were not the case, record shops wouldn't have whole CDs in their headphone listen stations.

This type of structure provides greater promotional value to an artist, not the opposite. As you stated, radio is something structured for a listener (outside of custom programmable services, which I feel are a different class) and no

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A Refreshing Harmony

Now that all comments to the FCC's Second FNPRM on DAB have been collected, the record is fairly clear: There is overwhelming support for the FCC to place a minimum of additional regulation, and to levy no fees, on advanced IBOC services, thereby allowing the market for these services develop unencumbered.

Agreement on this point came from practically all sides, including NAB, Ibiquity, Clear Channel, NPR and Microsoft, as well as from many smaller companies, including many state broadcasting associations. Having such leading representatives of commercial radio, non-commercial radio and the tech industries all agree on anything is unusual today (it's certainly not the case in the DTV environment at the moment), so it's a message that should not be ignored.

There were dissenting views, mostly from consumer advocates and religious groups. We support their basic premise that the traditional public interest responsibilities of broadcasters should be maintained in IBOC services, but with due respect for these groups' well-intentioned motives, their attempt to achieve a greater public good is not necessarily well served by some of their positions in this proceeding.

Adding layers of bureaucracy, inflexibility or cost to the development of advanced IBOC services will simply result in broadcasters choosing to not go there, and the promise of IBOC will remain incompletely fulfilled. This won't benefit anyone — neither broadcasters nor consumers — so those

who support the imposition of burdensome additional mandates here are ultimately self-defeating. There are other, better-suited venues and methods for these groups to achieve those goals.

One important exception to these proposals for added regulation came from representatives of the visually impaired community, who called for some minimum reservation for their services in IBOC (without specifying much beyond that request), an idea we endorse in principle. Others commented that some additional advanced EAS service regulations for IBOC might be warranted, to which we also agree.

Otherwise, however, we believe that in general, the comments of the broadcast and tech industries on this matter make good sense, and we concur that a light regulatory approach will serve to stimulate developments that may ultimately provide valuable new services for U.S. consumers. As NPR sums it up nicely in its reply comments, "Particularly as stations undertake the expense of converting their facilities to digital operation and developing new services, now is not the time to impose new regulatory obligations and costs."

The FCC should pay heed to this rare instance of cross-industry accord, and allow advanced IBOC services to be developed without undue additional regulation. The marketplace will then provide its own ample review of the results.

— RW

◆ READER'S FORUM ◆

Takes Me Back

I enjoyed Buc Fitch's article "The General Electric Phasitron FM Transmitter" (Oct. 24). It brought back memories of my first job in electronics working for Sylvania TV in Batavia, N.Y., in the '60s.

I was hired as a test equipment engineer under John Diehl, W2QWS. My first assignment was to convert the 10 watt FM GE Phasitron transmitter for use in alignment of the sound section of TV set PC boards. The frequency was 41.25 MHz and the deviation was 25 kcs (okay, 25 khc nowadays). We used a 7360 beam-switching mixer tube to down-convert the FM band signal to 41.25, and took the signal from the 6V6 doubler stage. The 815 was removed. A 6146 was added to amplify the 41.25 MHz for use in the production line alignment positions. So if an old GE rig turns up in this configuration, it probably came from the Sylvania TV plant.

Dick Pache, HRI/K2LCT
 Tegucigalpa, Honduras

Just wanted to drop you a line and let you know how much I enjoy Buc Fitch's pieces at Radio World Online. I just discovered these Milestones articles, and they do bring back memories. His "occasional," as the boys at The New Yorker would call them, would make a great anthology.

I graduated from Baltimore City College High School in June of 1959, and after school would hang out at the studios of WBJC(FM) and do an occasional show, or in the transmitter room down the hall. I was a member of the BCC Amateur Radio Club, such as it was, and thought seriously about a career in broadcasting.

One memorable afternoon I remember with chagrin. I accidentally put the station off the air when I leaned against the transmitter rack and brushed up against a red "emergency off" button on the old GE

250 watter. Mr. Arnold, our electronics shop teacher, was not a happy camper after that faux pas, nor were our handful of listeners.

You have a wonderful publication. Keep up the great work.

Ned Rubin
 Baltimore

I cannot resist of responding to your Phasitron article.

I worked, while getting Bachelors and Masters degrees, at Syracuse University at what I was told was the first low-power educational FM station licensed in 1947, WAER.

I was there from 1957-62. By then the power was raised to 1 kW and I assisted in moving the transmitter while at school to a new location, and with help of a higher-gain antenna we raised ERP to 3 kW. We even ran this Phasitron transmitter with dial-up remote after the move.

Syracuse radio and TV stations were always test beds for GE broadcast equipment. As I recall, GE was selling TV aural transmitters with stereo exciters to radio stations when FM stereo hit in the early '60s. An FM I also worked at in Syracuse was a test facility for this system (WSYR).

Not only fond memories of working and really learning all phases (pun intended) of radio and subsequently TV broadcasting, but a chance to earn a little spending money also, as we were paid to do production engineering at 75 cents an hour. If we pulled a transmitter shift we received \$1/hour at the college station

because that required a license (a pocket card I still carry in my wallet 50 years later that does not have an expiration date!).

While not directly in broadcast, I am directly involved in the industry, as I've been in TV/radio/Internet production for a major advertising agency for the past 40 years. I get involved in the technical aspects of the business as well as the business and creative parts of production, and of course have interests in the product distribution to our audiences. I have designed/built a couple of in-house analog production studios along the way for demo/casting work, etc.

What I learned about "networking" in radio and TV has been directly translatable to computers, which has been a real plus moving to the digital world.

You are absolutely right about getting an audience for FM in those days. After leaving Syracuse I worked for an FM station in Rochester, N.Y., for a short period of time. To sell a sponsor, you had to give him an FM radio so he could hear his message. (I heard of the saying back then "that if you bought an AM, the seller would throw in the FM for free!")

We all know how FM grew. It is the program material that will get the audience every time. I

strongly believe, as has been cited many times in your publication, that technology for technology's sake alone will never hold an audience. Provide a potential audience what they want and you will get the audience.

Alan Lapidus
 Los Angeles



A couple of final output tubes from the GE Phasitron Alan Lapidus has kept all these years: 'Great paperweights and a lot of great memories.'

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