GLYNN WALDEN ON THE ROLLOUT. Page 3

ıllıdıdıd

NEWSWATCH

Martin, Senators Spar Over Ownership

WASHINGTON FCC Chairman Kevin Martin hopes to convince his colleagues to pass relaxations to media ownership rules by year-end, including a repeal of the rule that prohibits one entity from owning both a newspaper and a TV or radio station in the same market.

The chairman hopes to allow for public comments on changes to the ownership rules through October and November, with a vote from the commission at its last public meeting of the year on Dec. 18.

Sens. Byron Dorgan, D-N.D., and Trent Lott, R-Miss., said, "The FCC is in for a huge battle" if it tries to relax the media ownership rules. "This is not in the best interest of the country," said Dorgan during a Senate hearing in October.

Senator and presidential hopeful Barack Obama, D-Ill. called on the chairman to take a closer look at the consequences of changing media ownership rules, as did Rep. John Dingell, D-Mich.

But an FCC spokesperson told Bloomberg, "This process was begun 18 months ago and has included more hearings, more independent studies, longer and more comment periods, and more input from the public than any other commission proceeding."

CEA Projects $48.1 B in Q4 Sales

ARLINGTON, Va. According an annual industry study of consumer electronics holiday spending, the top wish list items for adults this season are computers, peace and happiness, big-screen TV, clothes and money.

Consumer electronics will generate $48 billion in fourth quarter sales, according to the Consumer Electronics Association.

Big-screen TV moved up to third place from 11th the year before. The wish list from teens remains clothes, MP3 player, video games, computers and cell phones.

"While overall holiday spending will increase, we found consumers are cutting back on decorations, home purchases and travel, but not gifts, especially electronics. The average CE gift giver will spend $358 on those gifts this season," said CEA Economist Shawn DuBravac.

CEA forecasts $22.1 billion will be spent on holiday CE gifts, which represents 46 percent of total fourth quarter revenue for consumer electronics. Total fourth quarter sales will reach $48.1 billion, a 7 percent increase from $44.8 billion in 2006.

FCC Considers LPFM Order

WASHINGTON Speaking before the House Committee on Small Business in October, Chairman Martin said the agency is considering an order that would guarantee low-power FM stations will "have reasonable access to limited radio spectrum."

He said commission is providing opportunity for small businesses in radio with the advent of the LPFM service.

An FCC spokesman confirmed during a legal session at the fall NAB Radio Show that the agency is holding up some major modification applications for full-service FMs if the changes would result in taking lower-power stations off the air. This is notable because LPFMs are licensed as secondary services.

See NEWSWATCH, page 5 ▶

Index

NEWS

AM Towers Fingered as Cancer Cause	1
Is AM Skywave Finished?	1
Newswatch	2
Glynn Walden on HD-R's Progress	3
From the Editor	4

HD RADIO NEWS

'The IBOC Handbook' Cracked Open	10
HD Radio Scoreboard	11
HD Radio Alliance Signs Up for Year 3	14

FEATURES

Workbench: Eliminate Pesky Peromyscus Leucopus	18
You've Got Mail — Lots and Lots of Mail	20
'The Mutt & Jeff of Radiotrons'	22
Radio History Has a Storefront Home	24

STUDIO SESSIONS

TLF300: Audio Over IP in Small Package	26
Sound Forge 9.0 Addresses Two-Track Limit	28

BUYER'S GUIDE

WPR Monitors Network With Goldeneagle HD	32
RDL SourceFlex Monitors the 'Home Office'	34
Burk Enables 'Unified' System for Va. Cluster	36
M2.2R: KPBS' Main Mod Monitor	38
WVIJ Monitors ZX2000 With Web Remote	38

OPINION

Commit to 'Staggering' Potential of 3G	44
Merger Ad Nauseum	46
Reader's Forum	44–46

World Radio History

NEWS MAKER

Glynn Walden on HD-R's Progress

'Father of IBOC' Gives His Views On the Rollout and Other Technologies

"Convenience of the HD Radio is paramount to the listener," Glynn Walden says.

In light of the rollout of HD Radio and the FCC's historic vote this year to finalize, for the most part, its authorization of the new digital radio technology, Radio World sought the perspective of CBS Radio's senior vice president for engineering.

Known by industry insiders as the "father of IBOC," Walden was one of the engineers working early on the technology, even as it first began as "Project Acorn," a joint effort of Westinghouse, CBS Radio and Gannett.

He was a co-founder of USA Digital Radio to help pioneer the transition of IBOC from the lab to the marketplace. Radio World reported on his efforts and those of USADR and its successor Ibiquity Digital.

Walden, now back at CBS Radio as senior vice president for engineering, was honored in 2004 with NAB's Radio Engineering Achievement Award for his hand in designing the Ibiquity HD Radio system.

The veteran of 33 years in engineering is still heavily involved with HD Radio. CBS, not surprisingly, is one of the early adopters of the technology it helped spawn as well as a member of the HD Digital Radio Alliance.

Walden answered questions from Radio World News Editor/Washington Bureau Chief Leslie Stimson in an e-mail interview.

***RW:** What are your duties now? What's a typical day for you?*

Walden: I am the senior vice president of engineering. My day typically starts in my New York City office around 7:15 a.m. where I try to catch up on e-mails and especially deal with those issues requiring a more thoughtful response. As the day moves on I spend a lot of time with the regional engineers on the larger projects and other CBS management as necessary.

***RW:** You were at Ibiquity Digital for a number of years; can you clarify your role with the company now?*

Walden: CBS Radio is committed to developing a digital pipe to its audiences and HD Radio offers the most flexible and lowest-cost way to make that happen.

While I no longer have any official connection with Ibiquity, I interface frequently with the company as the CBS technical liaison in the rollout of digital radio. In addition, I have many friends working at Ibiquity.

***RW:** How do you think the IBOC rollout is going, both at CBS and in general?*

Walden: Well, the rollout of digital radio on the transmission [side] is pretty much where I expected it to be at this point. It started later than I predicted, however the uptake was faster once it started.

On the receiver side, I am impressed with the number of products available; however, the penetration is less than I expected.

***RW:** How much further will the rollout have gone in a year and what major landmarks do you hope can be achieved?*

Walden: I expect HD Radio and its abilities to deliver digital services to be incorporated into more devices. Convenience of the HD Radio is paramount to the listener.

In order to meet the expectations of our listeners, the appliance used to deliver HD Radio will have to offer the features, conveniences and connectivity found in today's digital devices. A 1/8-inch phone jack is no longer a suitable I/O device; the HD Radio will need the connectivity of a USB jack and the convenience of an iPod.

***RW:** Speaking of iPod, what are your thoughts about the iTunes tagging announcement?*

Walden: CBS Radio is excited about the capability of the HD Radio system to connect with our listeners and engage in e-commerce. iTunes tagging and other yet-to-be-introduced features of the HD Radio system will benefit radio in its transition to digital broadcasting.

***RW:** What practical IBOC implementation issues are developing as more stations go IBOC; and what are the issues likely to arise as more AMs go digital at night?*

Walden: When I worked at Ibiquity I was fortunate enough to have had significant resources to study the impact of the digital conversion on AM and FM analog operations. Those studies were very conservative and real-world interference issues were always less than the studies predicted.

That same conservative approach was used in the Ibiquity AM studies. Those studies do not say that no interference will occur, as interference, at times, will occur outside the areas where the station derives listeners and revenue.

Glynn Walden

Hobbyist and skywave listening will be diminished at times; however, the studies have shown on a statistical basis there is a small percentage of analog listeners impacted with AM HD Radio operating at night.

I hope that time will show the conservative predictions used in the Ibiquity studies are correct as AM radio needs continued nighttime authorization to get AM HD Radios in service and allow us to move beyond analog and experience the benefits of an AM digital service: improved coverage ... less interference ... and the ability to deliver enhanced services and quality that is acceptable to the audience that is rapidly growing into our demographic areas without any knowledge of AM radio.

***RW:** Describe the HD Radio implementation at CBS.*

Walden: CBS is in the process of upgrading all of its studios, STL links and transmission facilities to digital. I am pleased with the progress to date and am encouraged of the support we receive in our process of digitizing our stations.

***RW:** What are CBS Radio's technical goals in the coming year?*

Walden: CBS has converted a large number of its stations to digital. As we look to 2008 there are a number of markets where the HD Radio conversion has not taken place due to tower limitations, building size or other infrastructure issues.

See WALDEN, page 5 ▶

BSW
Lowest Prices and Largest Inventory on EVERYTHING For Broadcast
BSWUSA.COM 800-426-8434

30,451 products in stock at press time!

With Burk, You're Always In Control!

Burk ARC Plus Remote Site Control
BURK
- Full-time, multi-site control via TCP/IP
- Up to 256 channels of metering, status & control
- Bright, easy-to-read display and interface

ARCPLUS Single unit List $2,995.00

Call BSW For Lowest Price: 800-426-8434

Cambridge Soundworks HD Radio
- Cambridge HD Radio with quality FM and AM antennas for superb sound
- Desktop model has alarms and headphone out
- Handy wireless remote control included
- You gotta get one for your office!!

820HD

LowestPrice only $299.99!

Cost-effective Remote Control!

Broadcast Tools 8-Channel Transmitter Site Control with Web or Dial-Up Access
- 8 high-resolution analog channels
- Simple telco hybrid with send and caller balanced audio I/O
- Browser-based event function program scheduler and alarm logger

WVRC-8 List $1,059.00

Call BSW For Lowest Price: 800-426-8434

DaySequerra HD Radio Tuners
DaySequerra
- Precision HD tuners (<S.0dBf in FM) deliver incredible accurate monitoring of analog and HD Radio AM and FM signals
- Low-jitter D/A and Class A biased balanced audio outputs
- Model M4.2R adds an Ethernet port as well as Remote Dashboard software for full remote control plus alarms and e-mail notification

M4-0X HD Radio tuner List $1,595.00
M4.2R HD Radio tuner w/ software, Ethernet List $2,795.00

Call BSW For Lowest Price: 800-426-8434

BSW
Broadcast Supply Worldwide

Same Day Shipping
BSW stocks a huge warehouse in Ohio for faster delivery to you. Stock items ship the same day. Just order by 7:00 PM Eastern Time.

Experienced Sales Staff
BSW's sales professionals have decades of real-world broadcast and recording experience to offer expert help with your purchase.

World Radio History

Rational Discussion or Luddite Rants?

"Just taking a run-through of the latest Radio World issue, Oct. 10, and what do I find at the back of the mag? Yet another anti-HD Radio rant by yet another AM Luddite."

This is a letter from an industry engineer that I thought you'd want to see; I offered to publish it over his name but he declined. However his points are important to share, so I do so here without identifying him.

This was from a prominent, major-market engineer, a person I like and respect and a man whose name you'd recognize, though he's not someone who contributes regularly to RW or who has been quoted on this topic before.

"Paul, our AM has been running HD Radio for more than a year and you know what? I haven't gotten a single call about us causing the world to come to an end as we know it on the AM band. Not a *single* call.

"Hell Paul, I got more calls when I put my FM on the air with HD Radio (one) than when I fired up the AM. And you know what? We turned on HD Radio at night on the AM and again received *zero* calls about us destroying nighttime AM reception with HD Radio.

"Where is the hue and cry that, according to this person, I should be hearing because I am killing all AM reception for hundreds of miles with my HD Radio AM nighttime signal? Real-world experience broadcasting HD Radio AM both during the day and at night has shown me that we have *zero problems* with it," he continued in his e-mail.

"Really Paul, these anti-HD Radio AM folks have no experience with any aspect of broadcasting AM HD Radio and yet you continue to give them a national platform for their misguided and irrational raving. Does this make any sense? Is this providing a valuable service to the industry to let these ignorant folks loose to spew this stuff?

"And no I am not interested in debating these folks. These anti-HD Radio AM folks are completely incapable of any rational discussion on this topic. All you have to do to understand this is read their spewing to understand that they operate under the 'Don't confuse me with the facts, my mind is made up' motive.

"To them, all of us HD Radio broadcasters have 'sold out' and you would have a better chance of resolving the Middle East conflict than getting the anti-HD Radio AM group to have a rational discussion about it in light of those of us who actually broadcast it every single day with no complaints.

'You would have a better chance of resolving the Middle East conflict than getting the anti-HD Radio AM group to have a rational discussion about it.'

"Paul, it's way past the time to let all of those folks who have no life other than to complain about AM HD Radio on the AM band to go back to their anti-HD Radio blogs, sip AM DX Kool-Aid, long for the return of wide-band AM, keep their candles lit under the picture of Leonard Kahn and make tin foil hats.

"I for one have had enough of them 'gracing' the back page of what I consider to be one of the best books in the industry."

★ ★ ★

Here's how I replied to the above e-mail:

"Thanks for taking the time to write about this topic of how we cover viewpoints about HD Radio. It's a valid point of discussion.

"My policy is and has always been that it's not up to me to start deciding that certain viewpoints are no longer relevant.

"Barring slander or downright misstatement of facts, I pretty much let people who care about the U.S. radio industry speak their minds in the opinion section of RW. Sometimes that can be unpleasant.

"When it comes to HD Radio, the views that we publish are, unfortunately, not held by just a few folks. And the fact that at least one big radio broadcast group recently turned off its AM IBOC at night, at least temporarily, citing problems, suggests to me that RW is not 'out on the fringe' by covering this topic. (Which of course is not the same as RW endorsing the anti-IBOC views.)

"Interestingly, HD opponents have in the past criticized RW — not for giving them space, but for giving HD Radio a lot of what they consider 'positive' coverage.

"And I'll say this also: If RW's allowance of space to those views seems out of whack, perhaps HD Radio needs more of its fans to speak up on its behalf.

"Having said all of that, however, I'm most proud that RW publishes letters that criticize us; and I would like permission to print your e-mail as a letter too. May we?"

I welcome your own thoughts on this discussion to *radioworld@imaspub.com.*

★ ★ ★

On a separate but related note, I share the following excerpt from the newsletter of the engineering department of Crawford Broadcasting, written by its DOE Cris Alexander, who also contributes to Radio World:

"My position on the AM night digital issue has all along been one of cautious optimism," Cris writes. "I never expected the massive amounts of interference that some were predicting because science simply does not support that hypothesis. But I would be naïve to think there would be *no* resulting interference. ...

"What have folks been hearing out in the real world since the night of the 'IBOCalypse'? All of the observations sent me thus far agree with my own, namely that the digital sidebands from the few stations currently transmitting in the digital mode at night are having no real impact on adjacent-channel stations.

"Here in Colorado, I have listened carefully to some of the Class A stations that boom in here at night that are transmitting digital signals," he continued.

From the Editor

Paul J. McLane

"You can, for the most part, forget about skywave digital service. At least in this part of the world, it ain't happening. You might get the PAD scroll or just the station name/call sign, but no decoded digital audio.

"I have also listened carefully to stations on channels adjacent to these digital Class As. While in some cases I can hear a slight 'hiss' way down there in the atmospheric noise, in no case have I observed the adjacency's signal degraded in any way by the Class A's digital signal. Reports from around the company are saying the same thing.

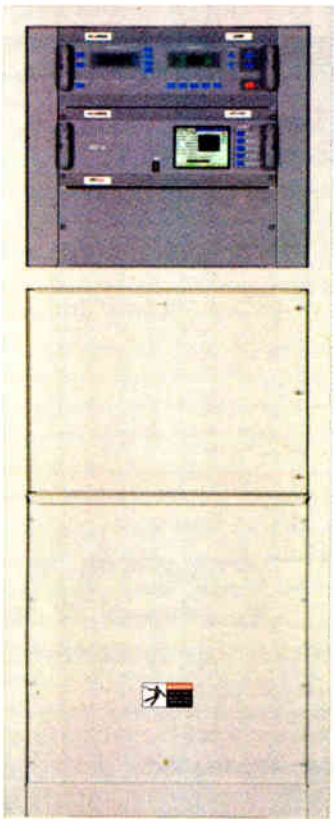
"Admittedly this is a small sample, but I believe it is representative of what we will see across the board as night digital operation proliferates."

Alexander also observed that "both KLZ and KLTT in Denver produce excellent night coverage with their digital signals. In my after-dark travels around Denver metro, I have not so far driven out of the digital coverage. I am hearing similar reports from other markets as well. And finally, we have had zero interference complaints to date from our digital night signals. I really didn't expect any.

"So, is this the beginning of the end of all AM night coverage? Based on what I have seen so far, absolutely not. But we mustn't assume that no problems so far mean no problems will occur in the future.

"Going forward, we will have to be ready and willing to make adjustments as specific situations demand. That's clearly what the FCC has in mind. All the rhetoric aside, I would say we're off to a good start."

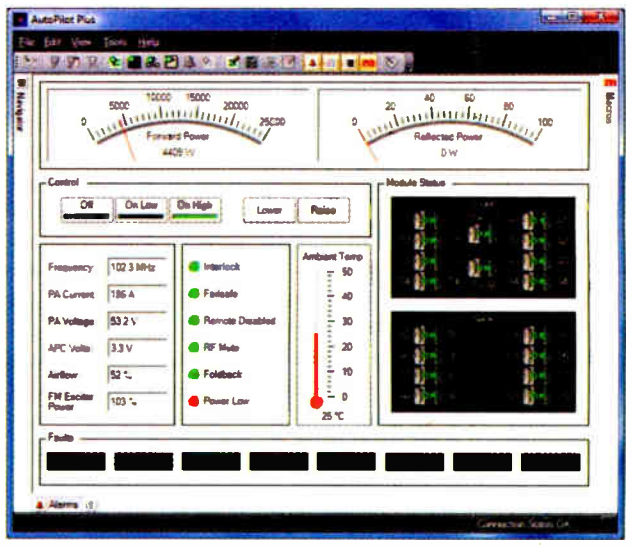
Cris Alexander and I think alike.



More control. Less wiring.

The Burk PlusConnect™ for Harris Z transmitters brings more than 400 remote monitoring and control parameters onboard the ARC Plus. Enjoy powerful remote control with *no parallel wiring*.

- **400 parameters for total monitoring and control**
- **Easy connection to the transmitter - one serial cable is all it takes**
- **All the power of the ARC Plus, including IP-based control with dial-up connectivity**



ARCPlus

Also Available...
...GSC3000 interfaces for the **Nautel V5, Nautel V10,** and **Acrodyne Quantum** series of transmitters. Contact Burk Technology to learn more.

800-255-8090
SALES@BURK.COM
WWW.BURK.COM
BURK TECHNOLOGY

World Radio History

Newswatch

▶ Continued from page 2

Meanwhile, NAB President/CEO David Rehr sent a letter to Senate Commerce, Science and Transportation Committee Chairman Daniel Inouye, D-Hawaii, expressing concerns about legislation that would exempt LPFMs from third-adjacent-channel protection requirements.

Rehr said again that the NAB does not oppose licensing of LPFMs but rather interference.

"Third-adjacent protection exists for a reason: to guard against interference and to protect our lifeline service to communities. A broad, blanket policy change is harmful and unnecessary."

Some 815 LPFMs were on the air as of Sept. 20, according to the FCC.

LPFM advocates feel they have a better chance in Congress this year to expand the service over NAB's interference objections than in the recent past. A Senate bill that would allow more LPFM stations moved in October out of the Commerce Committee to the floor. A similar bill is in the House. No vote is scheduled.

News Roundup

NCEs: The FCC capped at 10 the number of applications one organization could file for new stations and major changes in the reserved band (Channels 201–220) window, which was open briefly in October. (The agency also extended the window by a day due to problems with its electronic filing system.) Anticipating pent-up demand and wanting to prevent spectrum hoarding, the commission said if an applicant went over the cap, the agency would process only the first 10 applications filed.

HD RADIO manufacturing capacity in Asia has doubled in a year due to receiver demand, Ibiquity Digital says, with several new modules and components available to support advanced features such as iTunes tagging. About 60 companies are licensed and certified to manufacture HD Radio modules, components, receivers and tuners. Ibiquity is offering a Reference Kit, available to licensees of Apple Made-for-iPod and Ibiquity, that includes hardware and software needed to commercialize HD Radio receivers that support iTunes tagging.

LG Innotek is offering an HD-R module that supports conditional access, store and replay, and iTunes tagging capabilities; Samsung EM is offering a module that the company says offers a quick path to market for product manufacturers.

IRVING D. LAW Jr., CEO and founder of BSW, died at his home in Tacoma, Wash. He was 88. The company called Law "our friend, mentor and leader" in its announcement and posted a memorial and biography written by BSW President Tim Schwieger on its Web site. Law had been a sales rep for Scudder/Best Foods; he began selling IGM Automation Systems in the 1960s. Broadcast Supply West, as it was first known, was founded in 1973 as a telephone/mail order supply business.

CERVON: Broadcast Electronics is saluting retired president Larry Cervon with a plaque at its plant in Quincy, Ill.; and it arranged a ceremony there to honor Cervon and mark the 30th anniversary of the company's move from Maryland. Cervon was president from 1976 to 1991; according to a company bio, he took over when BE was a small manufacturer of tape cartridge machines. He moved BE to Quincy in 1977 in order to take advantage of the area's skilled labor pool after Motorola vacated a factory.

CPB has opened another grant round for HD conversion. The deadline to file applications is Nov. 23. This round will total $7 million; stations that receive such grants need to raise matching funds. See *www.cpb.org/grants/grant.php?id=110.*

GENERAL MOTORS has made XM Satellite Radio a standard feature on 2008 Buicks, Hummers and Saabs. The radios come with a free three-month trial. XM is now standard across many of the vehicles in the Saturn, Chevrolet, GMC and Pontiac lineups. GM says Cadillac was the first auto brand to offer XM, as a factory-installed option in 2001 and later as a standard feature. XM is available on about 50 '08 GM vehicles. GM has produced more than 6 million vehicles with XM.

ARBITRON and Radio One came to terms on a five-year contract for ratings services in 16 markets. The deal is notable because of past concerns among minority broadcasters about representation of blacks on PPM panels. Radio One CEO Alfred C. Liggins III commended Arbitron for addressing those concerns. The deal includes PPM ratings services in 15 markets and continuation of diary-based ratings in one market.

NAB asked the FCC to defer action on the satellite merger. The trade group wants to review documents it expects to be released through a Freedom of Information Act request. The association said it hopes to "supplement the record with certain documents relating to the serious apparent wrongdoing by XM and Sirius 'executive and senior-level employees' regarding the operation of FM modulators/transmitters and/or terrestrial repeaters." The satellite companies called NAB's allegations unfounded.

NEW LEADER: The Broadcasters Foundation confirmed a transition period as it begins a search to replace its president, Gordon Hastings. Chairman Philip J. Lombardo will head the search committee, of which Hastings will be a member; Hastings will reestablish the management firm he ran until becoming leader of the foundation in 1994. His firm will contract with the foundation to market the Golden Mike Award, Celebrity Golf Tournament and the Offshore Fishing and Family Weekend.

Walden

▶ Continued from page 3

In 2008 we expect to get some of these more difficult HD conversions completed.

[As of August, RW's HD Radio Scoreboard showed CBS Radio had converted 70 percent of its 140 or so stations.]

***RW:** I'd like your perspective about digital technologies that compete with radio — some now and others in the future — what new media and bigger data pipes, iPods and WiFi, for example, mean for digital radio. Any comments on other technologies as well?*

Walden: Bandwidth is not infinite; Shannon's law has still limited wireless mobile systems to approximately 2 bits/Hz. Small cell sizes spreads available bandwidth across a larger user base, however as the bandwidth increases so do the applications, so there will always be an appetite for more spectrum than is available.

No matter how that bandwidth is used, CBS wants our content available on any appliance that our listeners are using, cell phones, iPods, WiFi radios etc.

***RW:** ... and on competing digital technologies, such as Eureka-147 and Digital Radio Mondiale, and the newer FMeXtra?*

Walden: Leslie, in North America, Eureka-147 and Digital Radio Mondiale are really not competitors. Eureka-147 is a good technology and it works well at VHF-UHF frequencies such as was implemented in England. Those frequencies were not available to U.S. broadcasters leaving S-Band for the U.S. and L-Band for Canada.

Westinghouse, CBS, and Gannett's USA Digital Radio determined that operation of the Eureka-147 system operating at those higher frequencies is not financially viable for an advertising-supported broadcast model. Without access to the VHF-UHF spectrum the U.S. broadcasters developed IBOC to deliver digital within their existing beachfront spectrum.

Digital Radio Mondiale is a technology that works; however, it is not viable for North American broadcasters as it has no analog-to-digital transition plan. [DRM is an all-digital system.] The HD Radio systems allow broadcasters to deliver a digital pipe while continuing to serve its existing analog listeners. Remember the genius of the HD Radio system is the transition plan, analog-hybrid to all-digital.

FMeXtra is a short-term analog broadcasting technology, a system tied to the past with no transition to the future.

***RW:** Engineers' jobs have changed so much as technology changes. Do you think younger engineers coming up through station ranks will be prepared for radio's future needs? How do you find new engineers for CBS?*

Walden: The future of engineering lies in the computer side of our business.

Leslie, CBS has a lot of exciting young engineers, most coming from an IT background, and they are adding on to their skill sets support for our RF systems. I am not worried as long as we continue to bring in new talent, mentor them, provide educational opportunities and teach them the love of broadcasting that exists in the engineering community.

The new ASI6585 gives you the best combination of IP connectivity and DSP-based processing:

ONBOARD AUDIO ACCELERATOR. We rev up your sound two ways: The powerful integrated DSP gives you realtime processing, without bogging down your PC. And our powerful *Built for Broadcast* technologies like MRX multi-rate mixing, TSX time-shifting, and MP3 compression speed up your workflow.

SURROUND SOUND BUILT IN. Enjoy tommorrow's sound today. Record, play and mix up to 8 channel streams.

LIVEWIRE AUDIO-OVER-IP. Route 16 channels of 24bit digital audio over your Ethernet network with unprecedented control and flexibility.

PICK YOUR DRIVER. Whatever driver you need, we've got you covered. Windows WAVE, WDM or ASIO. XP and Vista. Even Linux ALSA!

To learn more, ask your automation VAR, or call +1-302-324-5333.

BUILT FOR BROADCAST www.audioscience.com AUDIOSCIENCE Sound Engineering Sonic Excellence

World Radio History

Skywave

▶ Continued from page 1

most radio listeners is a pair of ears.

For receiving equipment I picked a Sangean CCRadio plus with digital tuning and a GE Superradio III (operated in narrow-band mode) — receivers that serious AM listeners might be using. Neither was connected to an outside antenna, and listening took place in the basement of two homes that I own.

My primary residence is in Alexandria, Va. The home is clad in aluminum siding and is about a mile from an AM station. There were fluorescent lighting fixtures, an X-10 carrier current remote control system and two computers in operation during most of the AM listening. A 14.4 kV power line passes the house, and there are three 230 kV high-tension lines two blocks away.

My country home is about 50 miles southwest of Washington. It's set in the woods, but is a modern house with its own X-10 control system and numerous standard and compact fluorescents. A 7.2 KV feeder passes the house, and there's a 500 kV cross-country transmission line less than a mile away.

Photo by James O'Neal

The Sangean radio is tuned to WHAS, Louisville, Ky., at 840 kHz. Alongside is one of the author's Otari MTR-10 audio recorders used to record 'before/after' audio and a rack-mounted Tascam LA-40 unbalanced/balanced audio converter to feed audio from the radios to the Otari.

IBOC-free listening

These conditions are representative of what AM radio signals have to overcome to reach listeners today.

Prior to Sept. 14, the first night the FCC authorized AMs to leave their IBOC transmitters on all night, I logged and recorded signals from more than 50 stations. Although late summer is not the best time for AM reception, I managed to pull down most of the familiar nightimers. These ranged from WGR in Buffalo, N.Y., at 550 kHz all the way up to WQEW in New York City on 1560 kHz.

Stations were received from as far south as WWL, New Orleans; WHO, Des Moines to the west; CHWO, Toronto to the north; and WBZ, Boston to the east. If I couldn't comfortably listen to a station, it wasn't logged.

Virtually all stations were common to my two receive sites. The one holdout was WTWP, formerly WTOP, in Washington at 1500 kHz. However, this station has poor Northern Virginia nighttime coverage.

Nothing spectacular was observed in three nights of IBOC-free listening.

On the Friday night that AM nighttime broadcasting was supposed to drastically change, my wife and I drove to our country place for some additional DXing.

En route I switched the van's radio from Sirius Satellite Radio to AM to see if hash was all that was left, but I was rewarded with clear reception of CHWO's regular Friday night music offering.

The rainy weather and stop-and-go traffic didn't allow much experimentation, but I observed that WOR, New York was indeed running IBOC and so was WABC in that same city.

WOR handily took down WLW in Cincinnati on 700 kHz and WGN, Chicago at 720 kHz. WABC in New York on 770 kHz made it impossible to listen to adjacents WJR, Detroit at 760 kHz or WBBM, Chicago at 780 kHz.

After reaching our weekend home, I resumed DXing and observed that the only serious damage to nighttime regulars seemed to be what was noted in the en-route listening experience.

Noise floor

With the Sangean and GE radios I could null out some adjacent-channel interference by orienting the sets to favor the Detroit, Cincinnati and Chicago stations. When properly "aimed," I was able to hear the previously covered-up stations with only minor digital noise.

WOR has always been subject to some serious nighttime fading here and WLW and WGN were completely clear of digital hash during the deep WOR fades. But that is as expected. I don't own an IBOC-capable receiver, but would have to believe that neither digital nor analog WOR could be received during such fades. (This is borne out by others reporting that the best skywave IBOC lock duration is usually measured in seconds, up to less than a minute.)

As listening conditions were not that great, I gave up around 1 a.m. A front pushed through overnight and cleared out on Sept. 15. Chasing AM signals was a bit better that evening.

I heard WOR and WABC and what they were doing to their first-adjacents. I was able to null out most of the hash.

As "atmospherics" were substantially diminished, I confirmed what I thought I'd perceived the night before: the noise floor on both stations had increased from that observed in pre-IBOC nights.

With WOR, I believe that was due in part to the self-interfering nature of AM IBOC aided by a contribution from adjacent WLW. I'm not sure that WABC had much help in this respect, as it was whacking 780 WBBM worse than WBBM was clobbering it.

I noted several other implementers, including WTAM, Cleveland on 1100 kHz. Normally WBT, Charlotte, N.C. on 1110 kHz, delivers a gangbuster nighttime signal here, but now WBT was being peppered by IBOC hash. As Charlotte is at nearly a right angle from Cleveland here, I was able to null out most of the trash.

Unfortunately this didn't work for WBAL, Baltimore at 1090 kHz. WBAL goes N-S directional at night and doesn't put much of a signal in here. WTIC in Hartford, Conn., on 1080 kHz is running IBOC 24/7, hammering WBAL from both sides. The station was previously audible, but now was not.

WLAC, Nashville, Tenn., at 1510 kHz; WWKB, Buffalo, N.Y., at 1520 kHz; and WCKY, Cincinnati at 1530 kHz were in the clear. WTWP, Washington on 1500 kHz was not running IBOC.

For grins, I checked into WQEW, New York at 1560 kHz to see if nighttime IBOC had done any damage to Radio Disney. No such luck! It was unscathed.

Skywave is variable

For several months WHAS, Louisville, Ky., at 840 kHz, has run a nighttime ID proclaiming that it was broadcasting in HD. Now they were really pushing out the additional nighttime spectrum baggage.

WCCO, Minneapolis at 830 kHz was much weaker, and with both stations close to the same compass heading, WCCO was not really listenable.

Chicago's WLS on 890 kHz is running IBOC. This was evidenced by a definitely noisier WCBS, New York at 880 kHz.

New Orleans's WWL at 870 kHz really blasted in here (probably second only to Boston's WBZ) and didn't seem to be much affected by the IBOC blitz.

Listening to WJR as I wrote this, at about 10:30 p.m. on Sept. 17, the fourth night of skywave IBOC, I was somewhat amazed at the will-o'-the-wisp nature of the beast. On Sept, 16, WJR, Detroit was getting clobbered by WABC, New York, but the next night, even without too much nulling exercise, the Detroit signal was fairly clear. Ditto WBBM, Chicago. It was WABC that was suffering.

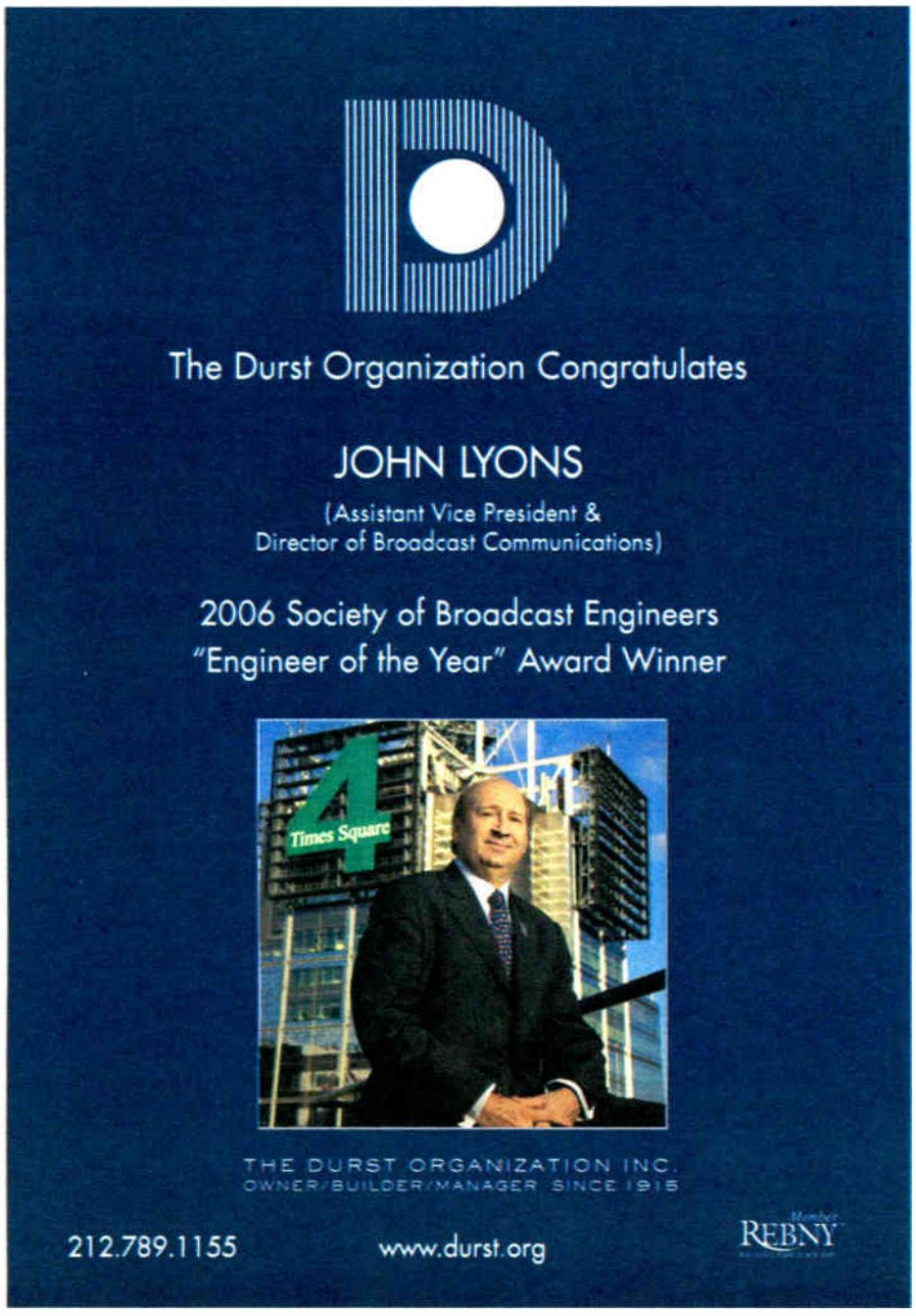
Of course, due to nighttime medium wave fading nature, there are no absolutes.

So what's the verdict? Did nighttime IBOC kill skywave broadcasting?

I have to say that it's still inconclusive. As I listened Sept. 17, I really didn't hear *that* much interference. True, WBAL was gone and WBT was being peppered, but at home I can null out WTAM. On the other hand, this isn't possible with a car radio.

O'Neal is technology editor of RW's sister publication TV Technology.

RW welcomes other points of view and readers' field observations about digital radio. Write to Lstimson@imaspub.com.



World Radio History

Impossible Remote?
Nah, You've Got ACCESS.

Meet Another Real-World Super Hero...

Broadcasting a live Phoenix radio program from out to sea would be challenging for even the most seasoned veterans. Not for Attorney and Certified Financial Planner® (and world traveler) Keith DeGreen. Keith is shown here using the Comrex ACCESS Portable as he and his ship, The Global Adventure, approach Koror Harbor In The Republic of Palau—450 miles east of the Philippines and 7,200 miles from Phoenix!

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

Contact Comrex today and find out how ACCESS can make you become a Real-World Super Hero—wherever you are!

Keith has been broadcasting his radio program, a unique mix of personal finance, economics, politics and real-life "extreme broadcasting" adventure for 19 years. Listen live 8—11AM Sunday mornings AZ time on NewsTalk 550, KFYI, or catch Keith's archived shows, and enjoy the amazing videos, photos and blogs of his open-ended 'round-the-world journey at his website, www.theglobaladventure.com.

Keith DeGreen says: "Whether I'm a thousand miles out to sea, visiting unusual ports of call or exploring remote inland places, my Comrex ACCESS Portable empowers me to project a broadcast-quality signal back home at anytime from virtually anywhere."

ACCESS

Put Comrex On The Line.

COMREX

Toll Free: 800-237-1776 • www.comrex.com • e-mail: info@comrex.com
19 Pine Road, Devens, MA 01434 USA • Tel: 978-784-1776 • Fax: 978-784-1717

World Radio History

Cancer

▶ Continued from page 1

magnetic fields surrounding AM transmission sites throughout that country and used a mathematical model to estimate residents' exposure to radiation.

The study, published in the American Journal of Epidemiology, concluded that children who lived within two kilometers (a little over a mile) of an AM radio transmitter were twice as likely to develop lymphatic leukemia when compared to children who lived more than 20 kilometers, roughly 12.4 miles, from similar transmission sites.

What does it mean?

In the study, Dr. Mina Ha of Dankook University College of Medicine in Cheonan, South Korea, said her research team's conclusions suggest a possible carcinogenic effect of energy from AM radio towers. She also said more research is needed to confirm the findings and "figure out the biological mechanisms at work."

Dr. Ha declined to comment for this story.

Skeptics of biological studies see them as "limited in scope" and influenced by "coincidence" with little scientific validity.

"I've followed these types of biological effects literature for 40 years and this is one crazy paper," said Rick Tell, president of Richard Tell & Associates Inc., a consulting firm that specializes in RF safety. "It is so out there it really doesn't mean anything.

"This is an epidemiological study and there are uses for it in biology; but the researchers looked at such weak fields, a volt per meter or less, that this is hard to believe. They make their statistical evaluations and conclusions, but these are really not plausible biologically."

The study, "Radio-Frequency Radiation Exposure from AM Radio Transmitters and Childhood Leukemia and Brain Cancer," looked at patients younger than 15 — selected from hospitals —who were suffering from leukemia and brain cancer. A prediction program using geographic information systems was used to estimate radiofrequency radiation (RFR) exposure from 21 AM station transmission sites with power of 20 kW or more.

Dr. Mina Ha said the research suggests a possible carcinogenic effect of energy from AM radio towers. She says more work is needed to confirm and 'figure out the biological mechanisms at work.'

Tell, who worked for the Environmental Protection Agency for more than 20 years, said he believes the mainstream science community wouldn't accept the study.

"I believe there is an obvious confounding matter involved in this. There is likely something else going on in the vicinity to make the numbers the way they are."

Robert Cleveland, who retired this year after 27 years at the FCC as a lead physical scientist, worked to set RF exposure guidelines in this country.

"I'm not an epidemiologist and have no opinion on the merits of the procedures and data the researchers used," Cleveland said.

"However, the results of this study didn't strike me as a very strong association or link between RFR and cancer. The data looks scattered to me. There are lots of questions to be answered about this study."

The researchers admit "exposure levels used for the study might not be equivalent" to real exposures, Cleveland said, and they also "question the biological connection" in their own paper.

"The levels of electric field exposure they used were very low. The highest levels were two volts per meter. Well, you can find those kinds of levels in your house from sources like wireless devices and 60 Hz sources."

Epidemiology really "never proves anything conclusively," said Richard Strickland, president of RF Safety Solutions, an RF safety-consulting firm, who is an RW contributor. "It can point you in a direction. Sometimes there is smoke there and sometimes not."

Strickland doesn't believe the AM broadcast industry in this country has much to worry about as a result of the latest study.

"This certainly will not affect the way we train or teach RF safety," Strickland added.

Linda Erdreich, Ph.D., senior managing scientist with Exponent, specializing in environmental epidemiology and health risk assessment, said the South Korean study showed "internal inconsistency" that is a symbolic red flag for "there's nothing there" to support the conclusions.

Doesn't buy it

"I don't buy the fact that there is an increased risk for cancer from RF from the evidence in this study," Erdreich said. "We've had dozens of epidemiology studies into radiofrequency energy with many contradictions. There is certainly nothing conclusive about this study. However, there was some improvement in exposure assessment over some of the previous studies."

Erdreich pointed to the large sample number as lending support to the study. Researchers analyzed 1,928 leukemia patients, 956 brain cancer patients and 3,082 "controls" across South Korea. Controls were a group of children who do not have leukemia, used as a reference population for comparison.

"A large number is important in epidemiology studies because small numbers can be affected by large fluctuations. This study was so large that we didn't have the problem of trying to distinguish it from chance," Erdreich said.

Still, the South Korean researchers' results were not supportive of the idea there is a risk related to radiofrequency exposure, she said.

"These types of studies have to be taken in context with other studies, but this study does not show that cases with the highest levels of RF exposure has more cases of cancer than controls."

Ed Mantiply, a physical scientist with the FCC, said, "The FCC is not a health or safety agency and does not evaluate biological literature on RF exposure. The EPA is the proper agency to comment on biological environmental RF sources such as broadcast."

A spokesman for the EPA would not comment on the South Korean study.

Another person familiar with RF exposure guidelines in the United States said he was surprised the study was even published considering the low risk ratios quoted in the research material.

"The risk ratios are very small. In the evaluation of risk many epidemiologists consider at risk ratios of two or three very small. This study has risk ratios of about two," the source said. "It's a very long stretch to say this study is showing a significant link between exposure to AM radiofrequency radiation and cancer of any form."

There is likely something else going on in the vicinity to make the numbers the way they are.

— Rick Tell

Researchers reported that the odds ratio for all types of leukemia was 2.15 among children who resided within 2 km of the nearest AM radio transmitter as compared to those who resided more that 20 km from an AM radio transmitter.

"In other words, an odds ration of 2.15 is interpreted to mean that in this study, children with leukemia were twice as likely to have resided within 2 km of the nearest AM antenna than the children without the disease. However, twice as likely is theoretical and assumes a perfect study, which no study is," Erdreich said.

Write to RW

Send e-mail to radioworld@imaspub.com with "Letter to the Editor" in the subject field; fax to (703) 820-3245; or mail to Reader's Forum, Radio World, 5827 Columbia Pike, Third Floor, Falls Church, VA 22041.

World Radio History

WORLD LEADER IN TALKSHOW SYSTEMS

ONE-X-SIX

The perfect multi-line talkshow system for use with up to six phone lines.

TWOx12

Make fast-paced production and high quality conferencing a snap with this 12 line on-air phone system.

SERIES 2101

The world's only talkshow system especially designed to meet the challenges of integrating large connected broadcast plants.

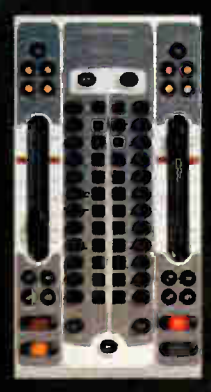
Introducing Nx12!

Our most flexible standalone talkshow system...ever. This self-contained 12 line system includes 4 hybrids and is offered with Livewire Audio-over-IP and either analog or AES inputs/outputs. Call for availability.

CONTROL AS YOU LIKE IT

DESKTOP DIRECTOR

Sophisticated, yet easy-to-use, control stations that make fast-paced production a snap.



CONSOLE DIRECTOR

Console + turret mounted accessory controllers put control right at the talent's fingertips. Axia Element users get even tighter integration.

CALL CONTROLLER

Simplified and cost effective option for call screening and on-air control.

ASSISTANT PRODUCER

This talkshow management system completes your Telos multi-line talkshow system with easy-to-use client/server call screener software that provides vital real-time link between producers and talent.

Telos
ALDIO | NETWORKS

www.Telos-Systems.com

© 2007 TLS Corp. Telos, Axia, One-x-Six, TWOx12, Series 2101, Nx12, Call Controller, Desktop Director, Assistant Producer, Console Director, Livewire and Element TM TLS Corp. All rights reserved.

World Radio History

HD Radio News

Radio World — Covering Radio's Digital Transition — November 21, 2007

The Alliance Renews
Page 14

BOOK REVIEW

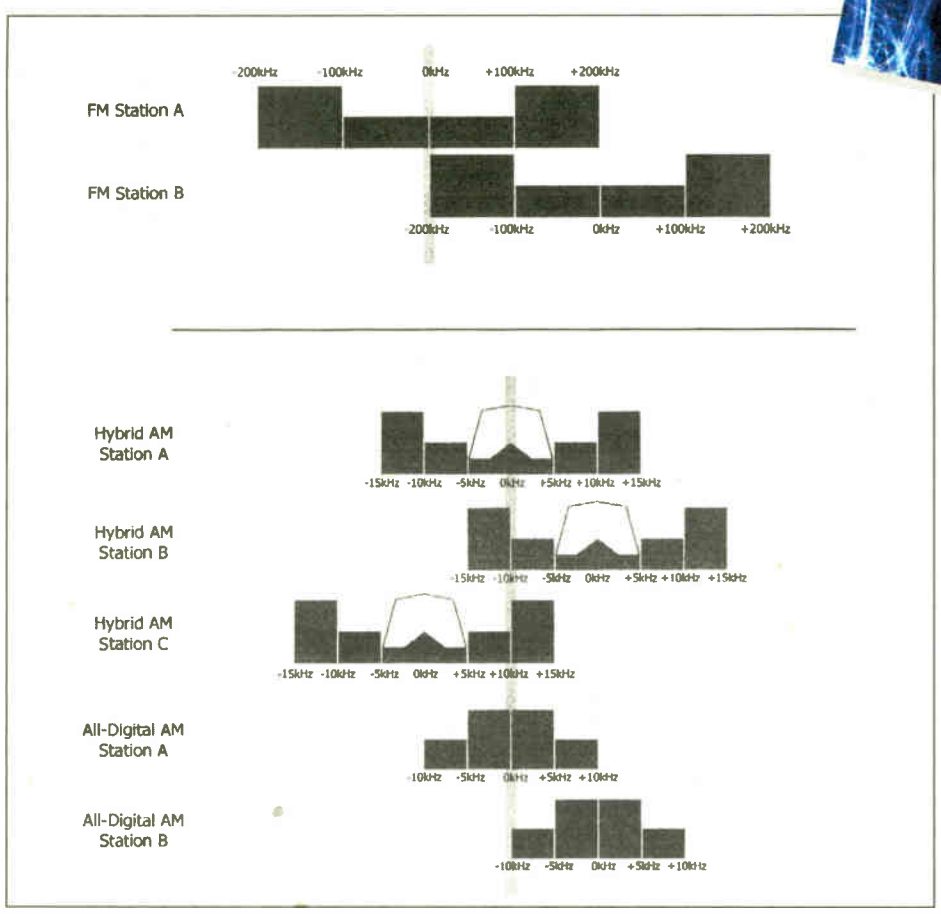
'The IBOC Handbook' Cracked Open

From History to Current Implementations, Maxson Offers a Comprehensive, Dynamic Read

by Thomas R. McGinley

The recent FCC adoption of IBOC as the U.S. digital radio broadcast standard is a pivotal event in the history of broadcasting. From its inception in the early 1990s, the broadcast trade press has followed closely and reported on the development and rollout of this rather complicated technology and the implementation of it called HD Radio.

Anyone interested in how IBOC actually works at a more technical engineering level has been hard-pressed to find much published documentation on the subject, other than white papers published by the technology developer itself. That challenge has now been solved in splendid fashion by David Maxson and the release of "The IBOC Handbook."



Spectral Interlace of IBOC Signals. From 'The IBOC Handbook.'

For 20 years, Maxson served commercial classical station WCRB(FM) in Boston and was its vice president and director of engineering. At the time, Charles River Broadcasting owned the station; it changed hands from Greater Media to Nassau Broadcasting in 2006.

Maxson formed Broadcast Signal Labs, a precision frequency measurement and signal analysis service, with longtime friend and fellow engineer Rick Levy in 1982. He began to focus more on digital broadcasting projects in 1995 and has participated as a key member in National Radio Systems Committee standard-setting proceedings since 1998.

David Layer, NAB Science & Technology director of advanced engineering, is the book's technical editor; Focal Press published it in association with NAB.

A comprehensive view

"The IBOC Handbook" was written to provide a comprehensive look at IBOC from the inside out.

The first two chapters lay down the building blocks and establish a clear context of how IBOC evolved and took its place as the industry's digital broadcast platform choice for radio.

Every component of IBOC's service feature set is explained, including Main Program Service (MPS), Supplemental Program Service (SPS), Station Information Service (SIS) and Advanced Data Services (ADS) with future data enhancements.

Maxson traces the rise of IBOC through its various stages: Project Acorn, USADR, the formation of Ibiquity Digital and the long and arduous testing on pioneering stations. He documents the role of the NRSC, managing the process by which the necessary protocols and specifications were defined and fine-tuned so that a standard eventually could be adopted for both the FM and the AM broadcast services.

Competing digital technologies including Eureka-147, DRM, CAM-D, DVB-T/H, FMeXtra and the satellite radio services are discussed in significant detail. This sheds valuable light on the big-picture context within which IBOC has emerged as the chosen standard.

The standards-setting process often is misunderstood by many in our industry, especially by those who have never participated. As an active member of the NRSC, Maxson is able to paint a clear picture of the rigorous NRSC regimen.

In his second chapter, "The Path to the IBOC Standard," Maxson recounts the chronology of NRSC activities, including DAB subcommittee and working group meetings beginning in 1998. The objec-

See HANDBOOK, page 12 ▶

Title: "The IBOC Handbook: Understanding HD Radio Technology"
Author: David P. Maxson
Publisher: NAB/Focal Press
ISBN: 9780240808444
Price: The book retails for $89.95 and was available used $42.79 from Amazon.com through *www.ibocbook.com*. It's available from the NAB Store at a member price of $79.95.

New Analog Radio Modulation Monitor – HD Radio® Ready

M2A Features

- Analog FM Modulation Monitor with upgrade path to HD Radio
- Accurate off-air monitoring of audio level and carrier modulation
- Measures FM pilot & subcarrier injection and incidental AM noise
- Includes RBDS decoder with display and alarm for loss of RBDS data
- Includes alarms for audio peak, audio program, RF carrier and RBDS
- Optional AM off-air measurement including C-QuAM AM Stereo
- Optional Ethernet remote control with logging, alarms and 100 scanning presets

DaySequerra
www.daysequerra.com
DaySequerra • West Berlin, NJ 08091
sales@dayseqerra.com • 856-719-9900
©2007 ATI Group Inc.

World Radio History

Highly efficient transmitters.
Forward-looking design.
Enhanced support.

For nearly five decades, BE has helped you get the most out of your equipment investment by giving you the best possible return on your money and time.

Whether converting to HD Radio or purchasing a new analog rig, let BE show you how we can help add profits and subtract headaches.

Total Radio. Guaranteed.

Broadcast Electronics Inc
Tel: (217) 224-9600
www.bdcast.com
bdcast@bdcast.com

Sponsored by Broadcast Electronics

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-October. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

STATUS OF ROLLOUT AT GROUPS 26-50

	$ Rank	# Stns.	Licensed	On Air	Multicasting
Inner City Bcstg	26	17	0%	0%	0%
Multicultural Bcstg	27	42	12%	2%	0%
Lotus Comm Corp	28	25	16%	8%	8%
NextMedia Group	29	42	10%	10%	2%
Sandusky Radio	30	10	40%	40%	20%
Nassau Bcstg Ptrs LP	31	52	2%	2%	2%
Wilks Bcst Gp LLC	32	18	6%	6%	6%
Tribune Company	33	1	100%	100%	0%
Renda Bcstg Corp	34	25	12%	0%	0%
Pamal Broadcasting	35	35	0%	0%	0%
Gap Bcstg	36	60	2%	0%	0%
Buckley Bcstg Corp	37	20	20%	15%	10%
Border Media Ptnrs	38	28	4%	4%	0%
Service Bcstg Group	39	3	0%	0%	0%
Millennium Radio Gr	40	12	17%	17%	0%
Midwest Comm Inc	41	42	5%	5%	0%
South Central Comm	42	11	9%	9%	0%
Max Media LLC	43	37	0%	0%	0%
UNO Radio Group	44	14	29%	7%	0%
WEAZ-FM Radio Inc	45	1	100%	100%	7%
Curtis Media Group	46	19	0%	0%	0%
Hearst-Argyle	47	2	50%	50%	50%
Main Line Bcstg	48	19	16%	0%	0%
Hall Communications	49	21	5%	0%	0%
Fisher Comm Inc	50	3	0%	0%	0%

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

Market Penetration, United States

Total stations: 13,939

The HD Radio Bottom Line

	Total Licensed	On the Air	FMs Multicasting
	2,001	1,510	743
Last Month:	1,976	1,494	724
Last Year:	1,530	1,015	427

World Radio History

Handbook

▶ Continued from page 10

tives and goals established at official meetings are documented along with their follow-up results.

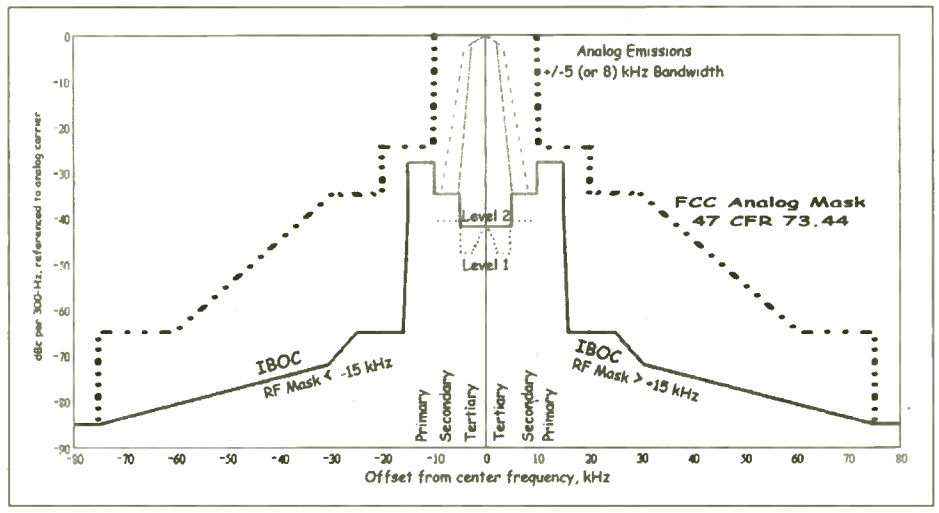
Key issues that confronted the NRSC during the standards-setting process included FM subcarrier compatibility, the codec crisis of PAC vs. HDC, multicasting and "Tomorrow Radio," competing surround sound proposals, and the thorny problem of AM nighttime performance. The book offers Maxson's insider view of how each was handled.

The dynamics of how digital communications systems actually work are heavily grounded in "protocol stacks," the ordered implementation of software-driven rules by which the various layers of computer networking processes communicate. Maxson offers a plain language guide in his introduction:

"As one progresses from the information input at the top of the stack to the radio signal that comes out the bottom of the stack, the processing tasks require different types of engineering." The eight chapters in Section 2 are devoted to the NRSC-5 IBOC protocol stack in exquisite detail.

Readers with a basic understanding of digital transmission theory will be able to navigate through this section more rapidly than those who are less technically inclined.

Keeping track of all the acronyms can make one's head hurt, but Maxson does a good job of relating technical definitions and concepts in understandable language and metaphors. Following the journey of PDUs (Protocol Data Units) as the packaged carriers of digital information through each layer of NRSC-5 becomes fascinating.



Comparison of FCC/NRSC-2 Mask and Hybrid AM IBOC Mask

Data, data, data

The NRSC-5 core standard was adopted by the NRSC in April of 2005 and focuses on how any developer would assemble the standardized IBOC digital signal for transmission.

All computer-based communications systems use protocol stacks derived from the legacy OSI (Open Systems Interconnection) model. The Handbook details and illustrates the overall system blocks and layers of the NRSC-5 OSI in Chapter 3.

Another chapter breaks down and describes the top transport layer of NRSC-5, Program Services and PSD or Program Service Data. The audio codec processing and main error protection techniques using Reed-Solomon coding and CRC checks also are explained in this chapter.

Chapter 5 tackles Channel Multiplexing, the last portion of transport layer 2 in the stack. Here, the role of Logical Channels within the RF channel of multiple subcarriers as well as the OFDM modulation scheme are explained and illustrated. That sets the stage for audio transport layer 1 where the vitally important component pieces of digital encoding including scrambling, folding in data, convolutional coding, matrix filling, puncturing, and interleaving are fully covered.

Maxson does a good job of relating technical definitions and concepts in understandable language and metaphors.

The next phase of generating the IBOC signal unfolds in "Populating the OFDM Waveform With Information." The block diagrams, illustrations and discussion detail the structure of layer 1 including frame and block characteristics, the critical functions of symbols, latency, AM and FM time diversity, time synch, system control processing and differential encoding.

At the end of this chapter, the book summarizes the various Service Modes available in both AM and FM IBOC, which offer shared uses for different data payloads in the Logical Channels of the OFDM subcarriers.

Two chapters present analysis of the physical layers of the FM and the AM OFDM carriers. The primary, secondary and tertiary subcarrier maps are detailed along with a revealing discussion about symbol values, matrices and constellations.

Maxson offers mathematical analysis of the OFDM modulation vectors for advanced readers. While the equations are there to be dissected, the explanations of the concepts they represent are also valuable for those who glaze over when looking at algebra and calculus problems.

Transmission System Specifications are examined in Chapter 9. Timing issues and diversity delay alignment techniques are discussed.

Special emphasis is devoted in this chapter to spectral emission limits and the NRSC masks for both AM and FM. Valuable tips on how to fine-tune the IBOC transmission system to achieve mask compliance are presented.

Maxson completes his top-to-bottom analysis of the IBOC protocol stack in Chapters 10 and 11 with a detailed breakdown of the SIS Data (Station Information Service) and Advanced Data Services. ADS is the arena where future data applications will be developed and threshed out in the marketplace.

AM nighttime tests

Maxson also outlines Use Cases, mapping of potential classes of future data applications that may appear in ADS, including results of the Impulse Radio study on this topic.

The third section of the book covers the part of IBOC that station engineers must face directly: implementation.

One chapter examines AM considerations, focusing on the demands IBOC places on the AM transmission chain, including transmitter output bandwidth, antenna load Hermitian symmetry, impedance bandwidth and antenna pattern bandwidth performance. Maxson draws from the resources of various consulting engineers to offer tips on how to measure and optimize load conditions to maximize performance.

Another chapter concludes with a discussion about AM IBOC nighttime operations, including a review of the rigorous tests Ibiquity performed to ensure compatibility with analog operations during skywave. With the recent rocky start of the full-time AM HD Radio rollout, it would behoove those with reservations about the issue of compatibility to take a close look at this section.

The considerations involving implementation of FM IBOC systems in Chapter 13 examine the various methods of launching and combining the digital and analog signals. Issues involving multiplexers as well as combined and/or separate antennas are covered.

Engineers who have installed or are planning to install FM IBOC are familiar with these choices and concerns. However there is a wealth of valuable additional information in this chapter that will benefit station engineers charged with maintaining optimized performance.

"The IBOC Handbook" completes its daunting mission of telling the consummate IBOC story with a chapter covering real-world transmission and reception issues. Maxson lays out the needs of a typical IBOC station transmission chain and interconnection requirements including audio processing, level matching, STL, Exgine topology, Importer and Exporter, plus network IP and security issues.

See HANDBOOK, page 14 ▶

Radio World's HD Radio Scoreboard is published in alternating issues. Selected data is from BIAfn's MEDIA Access Pro™; the scoreboard also uses information supplied by sources including iBiquity Digital Corp., the HD Digital Radio Alliance and RW's own research.

BIA fn Financial network

MEDIA ACCESS PRO

www.bia.com

World Radio History

You're looking at a complete audio-over-IP routing system.

(Just add Cisco.)

Administer this • The beauty of the Web is that you can get information anywhere. Same thing with Axia: you can set up and **administer an entire building full of Axia equipment** – audio nodes, consoles, virtual routers, whatever – from your own comfy office chair. All you need is a standard Web browser (PC or Mac, we like 'em both). Put an Internet gateway in your Axia network and you can even tweak stuff remotely, from home or anywhere there's a Net connection. Hey, isn't it time for a Mochachino?

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

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

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

Put that in your pipe • How many discrete wires can a CAT-6 cable replace? Well, a T-3 data link has 44.7 Mbps of throughput. But Axia networks' Gigabit Ethernet links give 1000 Mbps of throughput between studios — more than 22 times the capacity of a T-3; enough for 250 stereo channels per link — the equivalent of a **500-pair bundle on one skinny piece of CAT-6**. Use media converters and optical fiber for even higher signal density. Think that might save a little coin in a multi-studio build-out?

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

Very logical, Captain • Routing logic with audio used to be as hard as performing the Vulcan Mind Meld. But Axia makes it simple, converting machine logic to data and pairing it with audio streams. So **logic follows audio throughout the facility** on Axia's switched Ethernet backbone. Eight assignable GPI/GPO logic ports, each with five opto-isolated inputs/outputs, are built into every Element power supply, so you can control on-air lights, monitor mutes, CD players, DAT decks, profanity delays, etc. Got more than eight audio devices? Add a GPIO node like this one wherever you've got gear.

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

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

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

Push to play • Axia Router Selector Nodes are **really advanced selector and monitor panels** that you can put anyplace you need access to audio streams. Like newsrooms, dubbing stations, or even the station's TOC, so you can monitor any of the thousands of audio streams on your network at a moment's notice. The LCD screen scrolls through a list of available streams; the eight Fast Access keys let you store and recall the streams you use most. There's even an input, for convenient connection of an analog or AES device. Sweet.

Brains in the box • The typical radio jock cares for studio equipment about the same as a five year old cares for a puppy: haphazardly, if at all. That's why we **took the CPU out** of our Element modular console and put it in here, with the power supply and GPIO ports. That means a greatly reduced chance of being taken off the air by a Coke spilled into the board. Because we know that you have better things to do on a Sunday night than trying to dehumidify circuit boards with a hair dryer.

Quick Connect • Axia I/O is presented on RJ-45 and adheres to the StudioHub+ standard. A couple of clicks and you're done.

You got to have friends • Delivery system providers like ENCO, Prophet BSI, BE, iMediaTouch, DAVID Systems and more all have products that **work directly** with Axia networks. So do hardware makers like AudioScience, International Datacasting, 25/Seven, Telos and Omnia. Check out the whole list at AxiaAudio.com/partners.

AXIA
A TELOS COMPANY

AxiaAudio.com

© 2007 TLS Corp. Axia, Element, PathfinderPC, Status Symbols, Zephyr, Omnia TM TLS Corp., all other TM's property of their respective owners. Objects in advertisement are closer than they appear.

World Radio History

HD Radio Alliance Signs Up for Year 3

Digital Radio Advocacy Group Says It Is Moving Forward With 'Monetizing' HD2 Channels

by Leslie Stimson

ORLANDO, Fla. The HD Digital Radio Alliance has loosened restrictions on members' HD2 channels for 2008 to allow some advertisements and ease the format selection process.

Proponents hope the changes will turn around the generally lackluster promotion of multicasts to date and entice stations to talk up and expend more effort on HD2s.

Participating stations will be allowed to air limited sponsor mentions per hour, similar to underwriting announcements on noncommercial stations.

Although at the spring NAB convention there had been discussion about not allowing spots on multicast channels, when IBOC rules were released in May the commission refrained from imposing a ban, stating instead it "strongly encouraged" stations to use the spectrum for public affairs programs and formats that serve minorities, underserved populations and non-English-speaking listeners.

Stations that multicast but are not members of the alliance are free to air any content they wish.

Easing up on the voluntary "no ad" restriction for HD2s is something alliance stations had sought. The premise of keeping channels commercial-free was to entice the public to sample the channels and buy HD Radios, assuming stations programmed the extra offering creatively.

Easing up on the voluntary 'no ad' restriction for HD2s is something alliance stations had sought.

In its announcement, the alliance quoted CBS Radio President/CEO Dan Mason as saying the ability to monetize HD2 content through relationships with local advertisers is key to driving consumers to HD Radio.

Also starting now, stations can promote their own HD2s in a portion of alliance ad time that had been devoted to the organization's spots.

The alliance announced the changes in October as it re-chartered itself for a third year. Its members include Beasley, Bonneville, CBS, Citadel/ABC Radio, Clear Channel, Emmis, Entercom, Greater Media and independently-owned WBEB(FM), Philadelphia.

See ALLIANCE, page 16 ▶

What's
Google™
doing with
radio automation?

Google has been redeveloping SS32 and Maestro from the ground up. Our new system can be summed up in just three words...

Progressive. Flexible. Sound.

We're breaking new ground with automation technology.
Don't get left behind.

800-726-8877

Visit www.google.com/radioautomation to find out more.

© Copyright 2007. All rights reserved. Google and Google logos are registered trademarks of Google Inc.

Handbook

▶ Continued from page 12

The closing section of the final chapter offers IBOC coverage observations based on charted data collected by the NRSC and more recently by NPR Labs.

Readers will conclude that in general, the first generation of consumer IBOC receivers do not achieve the early projections made by the 2001 NRSC tests concerning the limits of reliable IBOC coverage. Maxson does indicate that receivers should improve as the rollout continues.

An Appendix by Dave Wilson, director of technology and standards for the Consumer Electronics Association, offers a comprehensive overview of IBOC digital radio receiver fundamentals.

This is the best published resource on virtually everything you'd want to know about IBOC receivers I've encountered. The back of the book includes a useful glossary including those pesky acronyms engineers will find handy.

Maxson completed the book in June, one month after the FCC released the text of its "official" IBOC authorization, which was adopted in March. Full on-air implementation of the standard commenced on Sept. 14.

As a working engineer maintaining a cluster of FM IBOC stations, I found the book an engaging, though at times challenging, read.

I am left with the overall impression that while the data offerings of IBOC in the form of Ibiquity's HD Radio are flexible and scalable to accommodate new products and opportunities, the standard will not be easily modified to "fix" perceived fundamental problems with this technology going forward.

Also, Maxson does not discuss criticism of the technology to any extent. Throughout, he tacitly accepts the prevailing conclusions of the NRSC committee and Ibiquity's attitude about interference caused by IBOC operations, especially AM IBOC: that primary coverage contours are still protected and "bonus coverage" beyond that enjoyed by many stations, including skywave, just isn't all that important anymore.

But engineers who have not investigated the design fundamentals of the IBOC system beyond equipment installation and performance concerns should greatly benefit by acquiring their copy of the IBOC Handbook. It will prove to be an invaluable resource.

McGinley is DOE/MIS CBS Radio Seattle and RW technical adviser.

World Radio History

Feature packed.

(Kind of like our ads.)

Go (con)figure • The folks at MPR say they really love being able to configure and administer an entire building full of consoles and routing equipment from the comfort of their own offices. Put an Internet gateway in your Axia network and you can even log into Element (or any other part of an Axia system) remotely from home, where there's plenty of Cheetos and Pepsi. Great for handling those 6 P.M. Sunday "help me!" phone calls from the new weekend jock.

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.

Perfect timing • You can't have too much time. That's why Element's control display contains **four different chronometers**: a digital time-of-day readout that you can slave to an NTP (Network Time Protocol) server, an elapsed-time event timer, an adjustable count-down timer... and there's also that big, honkin' analog clock in the center of the screen (Big Ben chimes not included).

Screen play • Use any display screen you choose, to suit your space and décor. 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 want to bet he bought his monitors on sale?)

Lovely Rita • LED program meters? How 1990's. SVGA display has lots of room for timers, meters, annunciators and more — enough to show meters for all four main buses at once. Reboot to 5.1 surround mode and the light show is even cooler, with surround audio and associated stereo mixes all going at once.

Memory enhancer • We know how forgetful jocks can be. That's why 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**. Profiles are easy to make, too: just have talent set up the board the way they like it, then capture their preferences with a single click for later use. (Hey, make *them* do some work for a change.)

Black velvet • Some things **just feel right**. Like our premium, silky-smooth conductive plastic faders and aircraft quality switches. We build Element consoles with the most durable, reliable components in the industry — then we add special touches, like custom-molded plastic bezels that protect on/off switches from accidental activation and impact. Because we know how rough jocks can be on equipment. And nothing's more embarrassing than a sudden case of *broadcastus interruptus*.

Split decision • No, you're not seeing double: Element gives you the choice of single-frame or split-frame configurations of **up to 40 faders.** Perfect for complicated talk or morning shows where the producer wants his own mini-mixer, or to give talent space for copy, newspapers and such. Solomon would be proud.

Swap meet • Element modules hot-swap easily. In fact, the **entire console** hot-swaps — unplug it and audio keeps going; an external Studio Engine does all the mixing.

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. Sweeeet.

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

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

Missing features • Did we forget something? Program these **custom button panels** with any macro you want, from recorder start/stop to one-touch activation of complex routing and scene changes using PathfinderPC™ software. You could probably even program one to start the coffee machine (black, no sugar, thanks).

Great Phones • 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 really clicks with the Telos Series 2101, TWOx12, and new NX-12 that connects four hybrids plus control with a **single Ethernet cable.** StatusSymbols™ (cool little information icons) tell talent at a glance whether a line is in use, busy, pre-screened, locked on air, etc. Even dial out with the built-in keypad.

The Busy Box for jocks • Element comes standard with a lot of cool production room goodies you'd pay extra for with other consoles, like per-fader EQ, aux sends and returns and custom voice processing by Omnia™ enabling you to 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. 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.)

Mix-plus • If constructing a complicated mix-minus on the-fly brings a big grin to your face, you're excused. But if you're like us, you'll love the fact that Element does mix-minus **automagically.** Forget using all your buses for a four-person call-in, or scrambling to set up last-minute interviews. When you put remote codecs or phone calls on air, Element figures out who should hear what and gives it to 'em - as many custom mix-minuses as you have faders.

AXIA
A TELOS COMPANY

AxiaAudio.com

Shown: 16-position split-frame Element, nicely equipped, $12,558.00 US MSRP. Not shown but available: 4-, 8-, 12-, 16-, 24- and 28-position Element. Dual exhaust and whitewalls optional at extra cost.
© 2006-2007 TLS Corp. Axia, Element, PathfinderPC, Status Symbols, Omnia TM TLS Corp., all other TMs property of their respective owners.

Element

World Radio History

Alliance

▶ Continued from page 14

Member stations committed 2008 ad time that the alliance values at $230 million. The time runs across all dayparts and ads are not pre-emptible, according to President/CEO Peter Ferrara.

Alliance officials say that in 2008, more focus will be on local stations broadcasting in HD-R, giving them back 20 percent of the ad time to promote multicast channels, local partnerships and events. The alliance is working out content for its 2008 ads, but Ferrara said spots will focus more on stations and HD Radio, less on national retailers and specific hardware.

Formats

Another way stations will be able to derive revenue from HD2 is by naming channels after partners, like "The Ford Channel," for example. Ferrara said the alliance would like to see stations approach local Ford dealerships and, as part of a sponsorship, require the dealers to play the HD2 channel in stores and use HD-R "hang tags" in cars. Ford is the first of the "Big Three" U.S. automakers to include HD Radios across most product lines, beginning with its 2008 models.

Program consultants critical of HD Radio have said stations don't promote multicasts and associated Web sites for fear of losing main channel listening to the HD2s, which are not yet accounted for in ratings. Stations also have been reluctant to spend money on promotion if they can't make money on the new channels, they say.

Some radio owners support HD-R but have shied from joining the alliance because they didn't like the organization's HD2 format selection process. Now those rules are easing.

To flip or introduce an HD2 format in the past, a member needed alliance approval; that's no longer the case. However, under the new rules, a new format still must not exist already in the market on main or HD2 channels. It's not clear how or whether this will be enforced.

Critics say that to date, the system for multicast program selection hasn't worked to differentiate HD2s from existing formats or to entice consumers to buy radios.

Ferrara said the alliance is talking to additional broadcasters about joining and "many of them are" but he did not name them.

Auto standard?

Meanwhile, Ferrara believes other large carmakers will follow the recent example of Ford and add HD Radio as an option.

IBOC proponents would prefer HD-R to be offered standard rather than as an option. However, "We've lost sight of the fact that FM took 10 years" to become standard after starting essentially as a bolt-on to AM radios, he told RW.

He thinks HD-R can cut that timeline in half and predicted that by model year 2012, HD Radio will be optional in every car and standard in most. Skeptics, though, say when FM radio came on the scene, radio wasn't facing competition from iPods, sat radio or WiMax in the car; they ask whether five years is too long, and note that Ibiquity announced an "official launch" of IBOC in spring of 2002. The first commercial station began broadcasting HD Radio in 2003. Kenwood debuted the first car receiver in late 2003 and others followed in early 2004.

Refreshed

Ibiquity also revamped its retail sales Web site, *www.hdradiouniversity.com*. The site is designed to inform retail salespeople about HD Radio in an "informative and fun way," according to Ibiquity. Chalk Media, which works with Best Buy, Samsung and other organizations, worked on the project.

The redesign was needed because the technology has advanced and the number of products increased since 2006. There are more than 50 HD Radio SKUs or "Stock Keeping Units" — unique product numbers — on the market, available from 7,000 storefronts and online, a spokeswoman said.

Benefits touted to salespeople are the course will result in higher sales, higher referrals and fewer returns.

Asked whether retailers will mandate that employees look at the site, Ibiquity said it was hard to tell; each retailer implements training differently, the company said.

World Radio History

OMNIA ONE: Small Box. Big Attitude.

Omnia
A Telos Company

OmniaAudio.com

Omnia, ONE are registered trademarks of TLS Corp. ©2007. All Rights Reserved.

World Radio History

Eliminate Pesky *Peromyscus Leucopus*

by John Bisset

In addition to handling special project work, Matt Lightner, principal of Lightner Electronics, gets called in to stations for troubleshooting and maintenance. Visit his Web site at *www.lightner-electronics.com.*

Recently, Matt was asked to identify a problem inside an AM antenna tuning unit. There, he discovered the station was running on "mice" power.

Peromyscus leucopus is the white-footed mouse, which seems to love nesting in phasors and tuning networks. These cute varmints can wreak havoc in any station setting.

Matt suggests sealing all holes and ensuring that the phasor or ATU doors fit securely. Mice can gain entry through openings as narrow as 1/2-inch!

This is the time of year when rodents will seek warm, dry shelter. A few precautions will keep them out of your facility.

At a recent BE-sponsored transmitter workshop, we discussed protecting facilities against snakes and rodents. A liberal sprinkling of moth balls was suggested.

This idea was expanded upon at the recent Wisconsin Broadcast Clinic. Their evening nuts-and-bolts session is always worth the time; everyone learns something. This year, Shively's Bob Surette moderated the panel. He kept the discussion flowing with a variety of topics.

One tip was using copper "wool" — the equivalent of steel wool, but made of copper — to seal larger entry ports in racks, transmitters and phasor gear.

A recent problem is that copper wool has gotten awfully expensive, as with any copper product. One engineer suggested substituting stainless steel wool found at your local Dollar Store. The stainless steel wool pads are cheap and won't rust, so they are ideal for plugging holes.

Stuff them in the cracks and openings to keep rodents and snakes out. It was pointed out that rodents will chew through RTV or expanding foam, but they leave the copper or stainless steel wool alone.

For information on the Wisconsin Broadcast Clinic, bookmark this site for next year: *www.wi-broadcasters.org.* Click on the Broadcasters Clinic Program.

★ ★ ★

Allen Branch sends a note about solving a dead tower beacon problem and saving his client the cost of a tower crew.

His clients reported the failure but were warned by the FAA they had 15 days to fix the problem.

Allen decided to start his investigation on the ground first. The client had no idea where the beacon flasher was, and Allen eventually found it: one of those SSAC black "cubes." Allen noted discolored lugs where the wires connected to the SSAC block. It turns out the lugs were loose.

Allen removed and cleaned the lugs, tightened them with pliers and pressed them back onto the flasher cube. Problem solved.

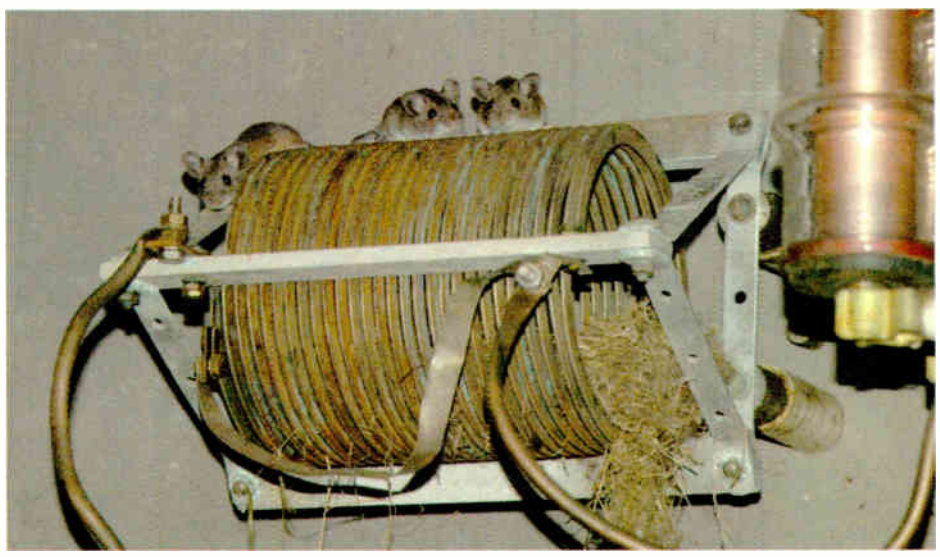


Fig. 1: A Coil Condo is an attractive home to *Peromyscus leucopus.*

Fig. 2: As a replacement for copper wool, use less expensive stainless steel wool to plug holes.

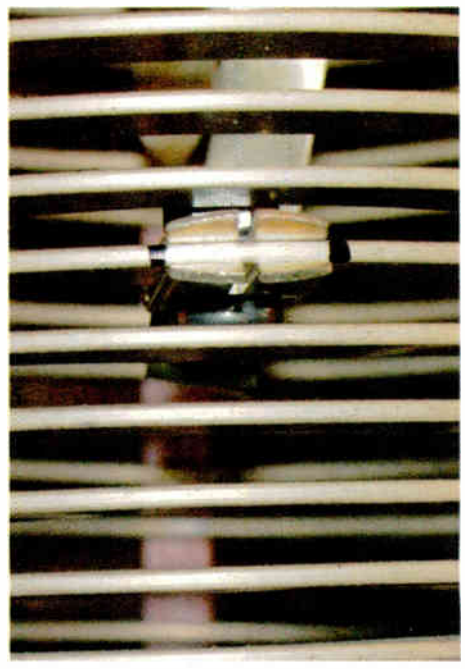


Fig. 3: Note coil clip locations with a permanent marker.

Keep connections tight. This is a great maintenance tip that applies to everything from the transmitter to the AC electric boxes.

Allen Branch is with Alleo, a contract engineering firm, and can be reached at *alleo21@yahoo.com.*

★ ★ ★

See SHARPIES, page 19 ▶

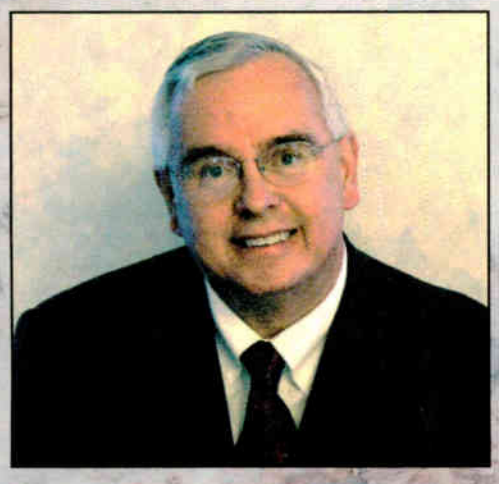
CONGRATULATIONS TO

JOHN BISSET

SBE EDUCATOR OF THE YEAR

Engineer Extraordinaire

Lifelong Mentor, Friend & Advisor to our Industry



NEW WORLD RADIO GROUP

WUST—Washintgon
WNWR—Philadelphia
WBIS—Baltimore/Annapolis
WAGE—Leesburg, Virginia

World Radio History

Sharpies

▶ Continued from page 18

Paul Sagi writes to *Workbench* from the other side of the world — he's based in Kuala Lumpur — and always includes tips that can be used anywhere.

Recently, Paul had to open a Studer CD player to change out the laser. The player had countersunk allen-key-head screws on the rear that needed to removed.

As Paul attempted to remove the screws he found they were jammed and would not budge. Putting a wrench on the allen key merely twisted it. It looked as though the hex hole was going to get damaged if he persisted.

Paul took a small, sharply pointed center punch, and put the point against the screw head at the 9 o'clock position. He tapped the punch with a hammer to drive it towards the 7 o'clock position.

A couple of sharp taps loosened the screw enough that the allen key could be used. The fine-tipped center punch did not deform the hex hole.

Paul notes that these screws are used on the front of many pieces of rack-mounted equipment. He cautions that the punch you use should be very sharply pointed or you might find it leaving the screw and scratching the front panel of expensive equipment.

It goes without saying not to use this method on screws that hold glass or plastic panels.

Paul Sagi can be reached at *pksagi92@gmail.com.*

★ ★ ★

At a recent SBE Ennes Workshop, I discussed the use of fine-tipped Sharpie brand permanent markers to identify the location of coil clips or rollers on variable coils. See Fig. 3. The rationale is that if the clip falls off, it's an easy job to push it back where it belongs.

Bill Weeks of Wolftron has been tuning up a new AM site for WGNY(AM) and found the marker suggestion helpful. He took the idea a step further by color-coding the marker settings.

Sharpie permanent markers come in a variety of colors; Bill found this "color coding" useful in identifying coil clip positions for different parameters as the array was tuned.

He adds that after the tune-up is complete, nail polish remover does a fabulous job of removing the multiple "permanent" marks from the coil windings. And like the Sharpies, nail polish remover is easy to find — even at odd hours — at a 24-hour drug store or 7-Eleven.

Bill Weeks has documented the construction of the new array at WGNY with lots of pictures. The project includes a counterpoise ground system, designed by Clarence Beverage of Communications Technology. (*www.commtechrf.com*). Look for an article in the pages of RW when the site is completed.

Bill Weeks can be reached at *bill@wolftron.com.*

John Bisset, the SBE Educator of the Year, has worked as a chief engineer and contract engineer for 38 years. He is the northeast regional sales manager for Broadcast Electronics. 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.*

WHO'S BUYING WHAT?

So, Tell Me Clarice ...

In the Warner Bros. movie "The Brave One," Jodie Foster portrays a New York radio host on fictitious public station WNKW who turns vigilante.

Foster, past winner of two Academy Awards, is shown training in a WOR(AM) studio with Dan Braverman, president of Radio Systems, which was contracted to build two working radio studios on a sound stage in Brooklyn.

Set director Lydia Marks ("The Devil Wears Prada") hired Radio Systems to consult on and provide gear for the sets. Equipment included Radio Systems Millenium consoles as well as equipment from Telos Systems, Burk and Dalet. "Loads of vintage gear just being retired from the CBS Radio cluster in Baltimore was also loaned by engineer Ken Cardosa," Braverman said.

Radio Systems subsequently was contracted for a second movie project, supporting Uma Thurman as yet another talk host in "The Accidental Husband."

Total Radio. Guaranteed.

No appointment necessary.

BE is always there for you.

Innovative technologies are only part of BE's story.

With the values of a company founded in 1959 and the responsiveness of a startup, BE has been rolling out new products, adding staff and expanding our factory to continue to earn your confidence.

Our mission-critical solutions for analog and HD Radio go the distance for you with unparalleled customer service and product reliability. BE products—AudioVAULT, The Radio Experience, Big Pipe, the FXi FM+HD Radio exciter and more—offer stations a competitive edge for greater listenership and revenue.

That's Total Radio. Guaranteed.

Broadcast Electronics, Inc • 4100 North 24th Street, Quincy, Illinois 62305
Telephone (217) 224-9600 • bdcast@bdcast.com • www.bdcast.com

Broadcast Electronics, the BE logo and AudioVAULT are registered trademarks. The Radio Experience, Big Pipe and Total Radio are trademarks, and "We're broadcasting" is a service mark of Broadcast Electronics Inc. HD Radio is a trademark of iBiquity Digital Corporation.

World Radio History

RADIO IT MANAGEMENT

You've Got Mail — Lots and Lots of Mail

The Spam Plague May Never Go Away But These Tips May Help Fight the Symptoms

by Larry Foltran

Spam. The mere utterance of the word can turn a computer user's stomach in an instant.

No, I'm not talking about canned meat, although that might bring about the same reaction in many people. The fact is that e-mail spam is a nuisance and the one thing on which the majority of the world's e-mail-using population can agree unanimously.

Recent statistics show 90 billion spam messages are sent per day. Yes, that's billion with a "B," and that's per day with a "holy cow."

Statistics also show that 89 percent of e-mail messages received are spam e-mails. Just one look at one day's worth of messages in my inbox and I can easily attest to that.

Spam messages advertise a variety of products and services, some innocent, others not so innocent, anything from prescription drugs to mortgages; software products to dating sites.

People must obviously be responding to these calls to action, making spamming profitable. In fact, estimates show approximately 8 percent of spam targets have opened their wallets to purchase the advertised items. Although 8 percent may not seem like a large percentage, it's more than enough to keep spammers in business.

Filtering

In response to this digital plague, the CANSPAM Act — for "Controlling the Assault of Non-Solicited Pornography and Marketing" — was signed into law in 2003. Although it did little to stop or even slow the volume of spam, it did put in place some requirements for these e-mails.

One is the "opt out" link that is required in all spam messages. In reality, clicking on this link only confirms your e-mail address as valid to the spammers and opens the flood gates to more messages. My personal suggestion is to simply delete the message.

Other requirements set in place include clear labeling of adult-oriented messages, legitimate "from" addresses and a valid subject line. Spam messages that do not comply with these requirements are considered illegal — but only in the United States. The U.S. does lead the world in spam messages sent, but this law does little to bridle the messages sent from China, Russia and other countries.

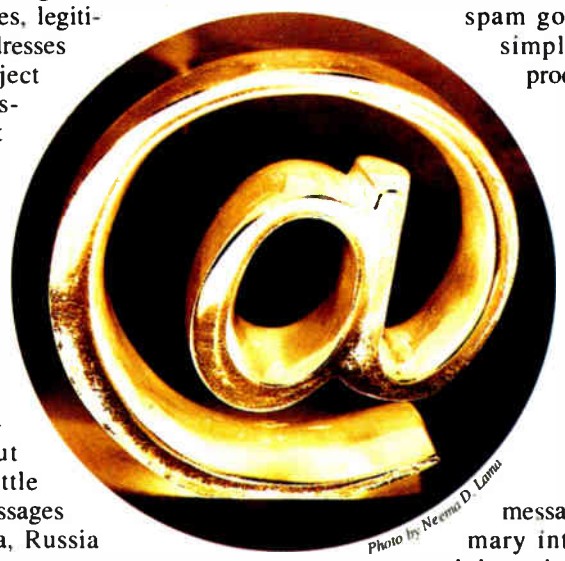


Photo by Neema D. Lanu

Ultimately, the responsibility of filtering or blocking these messages comes down to the individual e-mail user. With a variety of hardware- and software-based products available on the market, it comes down to personal preference and the each product's effectiveness.

I personally use a software filter that moves all spam messages to a specific folder to be deleted later. There are other options that filter out the messages before it even reaches your e-mail client.

Arms race

Fighting spam has become a virtual arms race. As spam-fighting software gets "smarter," the spammers use new ways of getting their messages through our defenses.

Last year, spammers realized that they could get through text filters by using graphics instead. Spammers have also become creative in their spelling of related products or keywords. As an example, the word e-mail can be typed as "emall," "em@il," "e-maile" or a variety of other ways to get through filters set in place.

On the more sinister side, spam goes further than simply advertising a product.

Many spam messages have the primary intent of tricking recipients into providing e-mail account passwords, bank account information or other sensitive data. These "phishing" schemes (yes, spelled with a ph) have become quite advanced in their methods.

A relative of mine recently acted on a message she received informing that her e-mail account may have been compromised. The message provided a link where she entered her account username and password to confirm she was the proper user. Within hours of that message, she received another message, this time from the actual ISP. It stated that her e-mail account had been shut down because it was being used to send spam. Yes, it happens that quickly.

Within the last month or so of this writing, spammers have been using several new methods to ensnare their victims. Whether they are PDF files featuring advertisements, online greeting cards containing a virus or a membership welcome message with a phishing link, all e-mail users should be very careful when determining what is legitimate and what isn't.

One common rule is to consider any unexpected attachment, especially when received from an unknown address, as potentially virus-laden spam. I recently had to perform digital surgery on a laptop at the station after an online greeting card was opened. In my opinion, 30 seconds of warm and fuzzy accompanied by a quick laugh are not worth the hours you could potentially spend trying to get rid of a computer bug.

Thirty seconds of warm and fuzzy accompanied by a quick laugh are not worth the hours you could potentially spend trying to get rid of a computer bug.

Any e-mails you receive from your credit card company or PayPal that ask you to log in through a link provided in the message should be considered suspicious. If there is a problem with your account, it is safer to either call or log in through their actual site than to use the link provided.

Keep in mind that the vast majority of legitimate credit card and PayPal-related messages will include your full name in the greeting and not simply "user" or your e-mail address.

The chain

The key is to prevent spammers from getting your e-mail address in the first place. This is an extremely difficult task, especially considering the different methods that are used.

One method I have found that works to keep new spam to a minimum is getting rid of the chain e-mails. Many people enjoy forwarding chain e-mails to friends and family. They simply hit the "forward" button, add a long string of e-mail addresses and off it goes. Take a look at all of the e-mail addresses contained in these messages the next time you receive one. The message may have been forwarded a dozen times before reaching you. Spammers love seeing these messages in their inbox.

A better way is to add all of the contacts in the BCC list or blind copy. The recipients will appear as "undisclosed recipients," keeping everyone's e-mail addresses under wraps.

Unless something drastic is done in the near future, I believe spam messages are here to stay and will only increase in frequency. Unless e-mail users globally decide to not support the spammers and stop making purchases linked to these messages, we will continue to see mail servers clogged with spam.

Of course, one person's spam is the other 8 percent's ticket to a "great online deal."

The author is corporate Web site and information technology coordinator for Crawford Broadcasting. This article appeared in the company's newsletter The Local Oscillator.

All I Want For Christmas Is A Balsys Studio!

BALSYS

The Balsys Companies provide a full range of services:

- Studio Conceptual Layout featuring optimum workflow and flexibility
- Custom Furniture design and fabrication
- Equipment Specification & Procurement
- Project Coordination
- System Prewiring, Test, & Documentation
- On-Site Installation & Training

The Balsys Companies
930 Carter Road #228 - 234
Winter Garden, FL 34787
Tel: 407-656-3719 • Fax: 407-656-5474
www.Balsys.com • Sales@Balsys.com

World Radio History

ONE

Harris — The ONE choice for end-to-end radio solutions.

ZX™ Series

FM tri-mode transmitters featuring multiple PA modules and power supplies for maximum redundancy. When used with the FlexStar™ HDx Exciter, the ZX™ Series can operate in either digital only or FM/FM-HD. ZX transmitters are available from 500 W to 3500 W.

FlexStar™

HDx Exciter brings HD Radio™ and analog audio to a new level. Featuring real-time adaptive correction for increased power and efficiency and the latest iBiquity platform in HD Radio™ —Exgine—HDx Exciter unlocks new revenue streams.

Destiny™ 3DX-50

Highly efficient, medium-wave transmitter, and the latest in the DX™ family of world-class digital AM transmitters. Fully compatible with HD Radio and DRM. Harris AM transmitters are available from 1 kW to 2 MW.

PR&E NetWave™

Modular, network-enabled, high-performance radio broadcast console packed with features that are perfect for small to medium studios. Share all your studio resources throughout the facility with the Harris™ VistaMax™ audio management system.

HD Radio is a trademark of iBiquity Digital Corporation.

From AM/FM and HD Radio™ and DRM transmission to program audio transport to consoles to broadcast studios — Harris offers you the best products and systems in the business backed by outstanding customer service.

For more information visit www.broadcast.harris.com/radio, call +1 800 622 0022 or broadcastsales@harris.com.

Harris is the ONE company delivering interoperable workflow solutions across the entire broadcast delivery chain with a single, integrated approach.

Business Operations • Media Management • Newsrooms & Editing • Core Processing • Channel Release • Media Transport • **TRANSMISSION**

HARRIS® *assuredcommunications®* *www.harris.com*

Broadcast • Government Systems • RF Comm • Microwave

World Radio History

MARKET PLACE

CDR882: Extended, Simultaneous Recording Of 2+ Discs

HHB debuted the CDR882 DualBurn professional audio CD recorder, compatible with CD-R media both low and high speed up to 52X, including HHB's recently released CDR80HS 2X-52X disc.

The CDR882 supports extended recording time across two or more discs, as well as simultaneous recording of two discs, high-speed duplication and disc management. The company promotes full 24-bit A/D and D/A converters with noise-shaped dither onto CD, a quartz crystal-derived internal clock and audiophile-grade analog circuitry.

The CDR882 weighs in at 14.7 pounds, and uses IDE CD-R drives mounted in a steel 2U rack-mounting chassis.

Connectivity includes balanced XLR analog inputs and outputs, unbalanced phono analog I/O, balanced XLR AES/EBU digital I/O, coaxial and optical S/PDIF digital I/O, external word clock input, RS-232 remote control and parallel control interface. The sample rate converter accepts digital signals from 32 to 96 kHz, and the CDR882 ships with an infrared remote control.

For more information, contact HHB's North American distributor, Sennheiser, at (860) 434-9190 or visit www.hhb.co.uk.

'The Mutt & Jeff of Radiotrons'

Reader Dave Burns shares this photo from RCA Broadcast News in 1931.

The caption reads, "George Gray, engineer at WEAF, and Raymond Guy, engineer of NBC, display the Mutt and Jeff of Radiotrons." (Mutt and Jeff were characters in a long-running and pioneering comic strip. One was short, the other tall.)

Radiotron was an RCA trade name for various tubes including transmitter and home receiver models. Burns writes, "The big one is a Radiotron 898, exactly as used in the WLW half-million-watt facility, starting in 1934 ... The price for this part was $1,650 each."

RW contributor James O'Neal expands on the topic: "The WLW 500,000 amplifier — it was not sold as a complete transmitter, and 'amplifier' was the description on the RCA nameplate — consisted of three RF amplifier cubicles, two audio modulator cubicles and a HV rectifier cubicle.

"Each of the three RF amplifier cubicles was built around four of the UV-862s. The amplifier was designed so that the inputs to all RF cubicles were paralleled together and the outputs were series connected. This allowed a problematic RF amplifier section to be 'isolated' while the other two (or even one) fed the antenna.

"In the strictest sense there were no 'spares,' as the machine was designed for all three cubicles to be online in order to deliver 500,000 watts.

"The complete system was constructed around 20 of the UV-862 100 kW tubes. These were DC filament tubes and required a couple of 3,000 amp motor generators down in the station's basement to supply filament power. Within a year or so, a replacement tube was being produced, the UV-898, I believe. It had the same general characteristics as the UV-862, but could operate with either DC or AC on the filament. In fact, it was designed to operate with a three-phase AC filament supply.

"WLW retrofitted the 500,000 W transmitter to use the new tubes and eliminated the need for the motor generators. One of the start-up check list items for the transmitter involved the use of welder's goggles to inspect the three filament strands to ensure that all were lit. They were that bright."

HD Radio Pure Digital. Clear Radio.

The Best Just Got Better

BELAR FMHD-1

With our new software update release now does even more including:

- *ANALOG READINGS* of Total, Pilot, Left, Right, L+R and L-R Modulation.
- *VARIABLE ANALOG COMPOSITE FILTER BW* for improved Analog readings in the presence of HD
- *ANALOG / DIGITAL AUDIO POLARITY CHECKING* with real-time on screen indicator
- *REMOTE ACCESS* with integrated LAN/WAN Ethernet connection and Wizard for Windows software
- *EASY POWER MEASURMENTS* with Drop Down Windows on the Spectrum Analyzer Screen.

Analog Readings Screen

Time Alignment Screen with Polarity Indicator

BELAR "When accuracy counts, count on Belar"

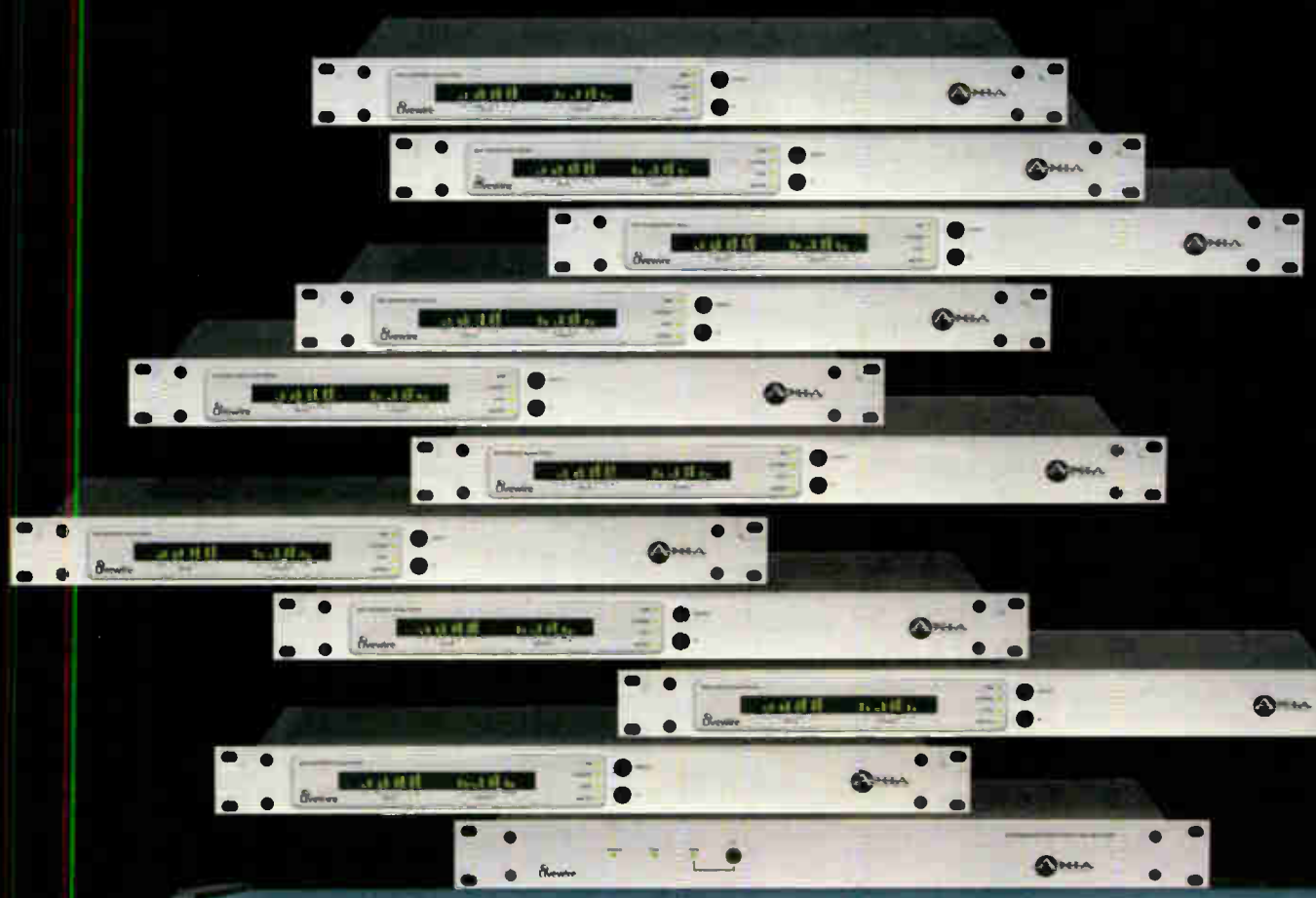
Belar Electronics Laboratory, Inc. P.O. Box 76 Devon, Pa 19333 U.S.A.
(610) 687-5550 - E-mail: sales@belar.com - Website: webmaster@belar.com

World Radio History

Try Livewire on Us!

Livewire® IP networking is now available integrated with our Millenium Digital consoles. You can wire and mix your studio sources locally and economically, while accessing facility-wide sources via the Livewire network. Scale-up your system anytime by adding more consoles, Axia nodes and software – all connected via a standard Ethernet network.

It's the best of both worlds - Livewire IP networking and Millenium Digital consoles!



Millenium Livewire consoles feature 6 channels with LCD displays and rotary encoders for full access to all networked audio selections. Local channels provide inputs for studio analog and digital, mic thru line level sources.

Connect your Millenium / Livewire system in minutes with StudioHub+ — the plug-and-play wiring solution.

radio SYSTEMS

601 Heron Drive • Logam Township, NJ 08085 • Phone: 856-467-8000 • Fax: 856-467-3044 • www.radiosystems.com

Livewire is a registered trademark of TLS Corp. Studio Hub+ ia a registered trademark of Radio Systems, Inc.

World Radio History

ROOTS OF RADIO

Radio History Has a Storefront Home

Visit the Titanic's Radio Room and More at the American Museum of Radio and Electricity

by James Careless

Today, right now, you can wander into the Titanic's Marconi radio room.

The display at the American Museum of Radio and Electricity in Bellingham, Wash., is a replica, showing the doomed ship's broadcast center, where the first S.O.S. signals sent during a real emergency were tapped out. The radio room was manned by 25-year-old John (Jack) G. Phillips, who drowned, and 21-year-old Harold Bride, who survived. Both stayed at their posts until the last possible moments.

"All of the Marconi shipboard radio rooms were identical," says Frank Ordway, AMRE's executive director. "As a result, the working equipment that you see in our exhibit is the same as was used on the Titanic."

What goes around comes around. When movie director James Cameron was diving on the wreck of the Titanic, looking into the real radio room, "He called us from his bathyscaphe to tell us what he was seeing," says Ordway.

The radio room is one of many historical exhibits at the AMRE, which is housed in a former retail location not far from Seattle. Stop by its storefront home and you'll find some astounding electrical artifacts dating to the 17th century.

Unintentional museum

Ironically, the extensive collection of documents and electrical/radio hardware in the AMRE started as a hobby for local resident Jonathan Winter. He loved tinkering with old radios so he started to collect them — lots of them.

By 1985, Winter decided to share his collection with the public through a small storefront shop, which he almost jokingly dubbed the Bellingham Antique Radio Museum. To his surprise, people came out in force to inspect his old radios.

As a result, the museum had to keep moving to larger premises. Eventually, it was granted nonprofit status by the IRS in 1998, at which time there were more than 800 radios in its collection.

In 1995, Microsoft executive and fellow collector John Jenkins got involved. By 2001, he helped it move into its current large quarters and added his inventory of 17th and 18th century electrical instruments and documents.

It was then that the name American Museum of Radio and Electricity came into being. Today, AMRE has gone from a hobbyist's storeroom to a full-fledged institution with executive director, professional staff and KMRE, an on-premises radio station. Winter is president and curator.

The museum has 12,500 visitors a year and operates on a budget of $275,000, which comes in part from donations, memberships, grants and station underwriting.

What to see

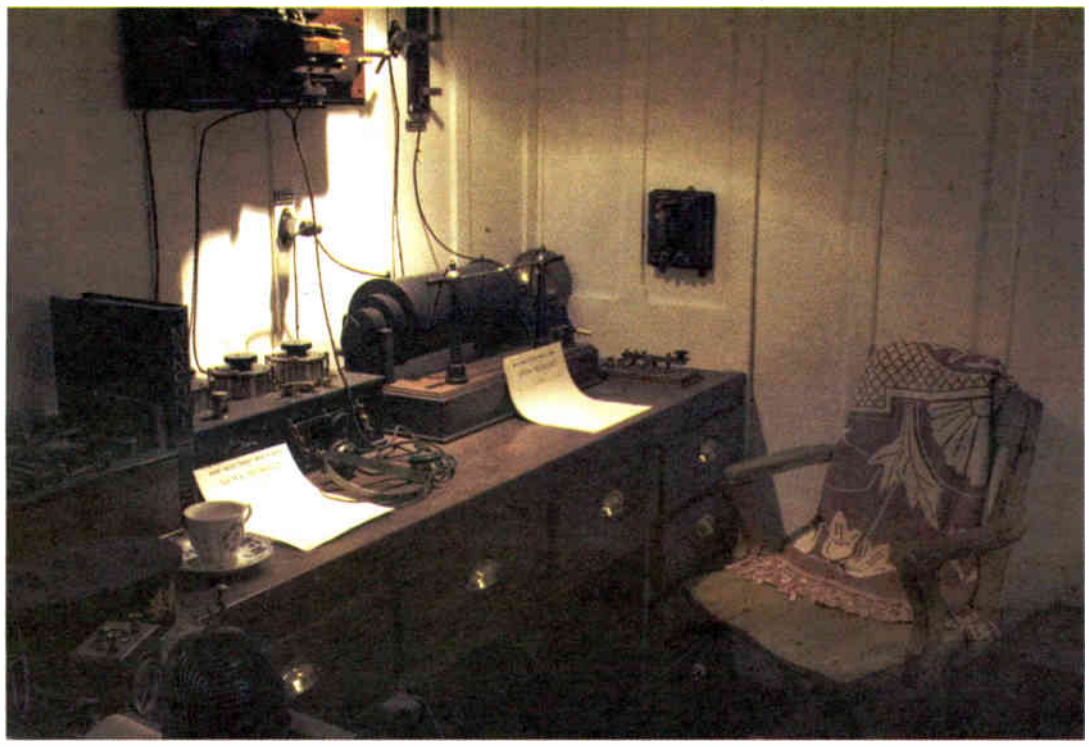
In its Dawn of the Electrical Age exhibit, you can see scientific devices from the 1600s and 1700s in a setting akin to a laboratory from those long-ago days.

"This is the kind of place that Benjamin Franklin worked in," says Ordway. Outside the room, a diorama shows the countryside with Franklin's famous kite and key in the sky; push a button and you'll hear the story of Ben's kite experiment accompanied by thunder and flashes of lightning.

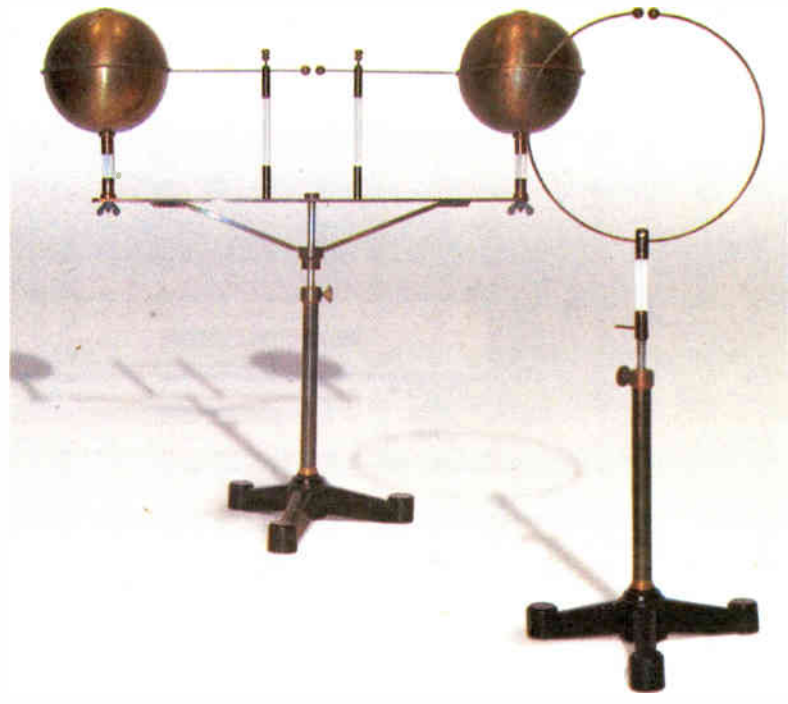
A recent addition is the Static Electricity Learning Center, with interactive exhibits aimed at younger audiences as well as adults. Visitors can stop at learning stations to operate modern versions of instruments and artifacts and generate sparks of static electricity. Franklin's Bells, Leyden jars, electroscopes and other devices are shown.

Other rooms display an extensive rare collection of 1920s European radios, the only known surviving example of the 1909 Collins Wireless Telephone — a 100-year-old cell phone, albeit not pocket-sized — and the 1929 Theremin electronic instrument. Its creepy tones were heard in Hitchcock's film "Spellbound," the sci-fi classic "The Day the Earth Stood Still" and the Beach Boys song "Good

See MUSEUM, page 25 ▶



The museum features a full-size diorama that reproduces the radio room on the Titanic, outfitted as on the ship's only voyage. Its last 'Marconigram' was transmitted at 12:17 a.m. on April 15, 1912. The rare Marconi set is authentic.



Hertz Resonator and Detector, circa 1890s, the first test device to prove Maxwell's theorem about the existence of radio waves. Heinrich Hertz confirmed that these phenomena were indeed waves, they traveled at the speed of light and that the waves could be reflected, refracted and polarized. He was also able to calculate their wavelength and frequency.

We want people to experience and learn about the electrical and radio inventions that changes the world.

— Frank Ordway

Announcer's Consoles for Live Events

Radio, television, production, or stadium announce. Whatever the application, the Model 200 series of announcer's consoles provide consistently excellent performance.

Now Shipping the Model 233

With six models to choose from, everything on your "wish list" can easily be handled. And while each unit provides a unique mix of features, all share a common core: great audio quality, a simple user interface, and reliable operation.

To see which Model 200 series product is right for your application, give us a call or visit www.studio-tech.com.

STUDIO TECHNOLOGIES INC.

Skokie, IL USA | Ph 847-676-9177 | www.studio-tech.com

World Radio History

Museum

▶ Continued from page 24

Vibrations."

You can even play the Theremin.

For radio buffs, the AMRE's 1930s Living Room not only transports you back to radio's golden days but lets you hear them through a tunable 1936 Zenith. You can twist the dialing knob to hear the Lone Ranger, Shadow and Green Hornet.

Nearby, the AMRE offers a room of 1920s Atwater Kent "breadboard" radios. These were the basic, low-budget receivers that introduced America to the marvels of wireless.

"People used to buy the components from Atwater Kent, then assemble them at home on breadboards," Ordway says. "The company [then] decided to do the assembly in-house, and sell completed sets."

The museum has a large collection of restored and functioning Atwater Kent radios. This one is vintage 1923.

These are just some of the highlights of the museum, many of which are accessible for hands-on use. "We want people to experience old-time radio, as well as see and hear," Ordway said. "This is why we try to make our exhibits as interactive as possible."

The museum is also home to KMRE(LP), which airs locally on 102.3 FM and online at *www.shoutcast.com*. KMRE provides a mix of local programming and vintage radio shows.

"We already have a modern production studio, and we are now framing in a second one that will be designed as a 1930s facility complete with authentic equipment," says Alena Feeney-Adam, the station's general manager. Currently, KRME runs automated.

The next time you are in Washington State, bypass Microsoft's Redmond campus in favor of the joys of old-time radio in Bellingham.

A Classic Philco 20 from 1932.

A ship cone speaker by Tower Mfg. Corp., 1925. 'An example of the wonderful designs that were available during this competitive time when you had to buy a separate speaker to listen to your radio,' says Frank Ordway. 'The Tower Adventurer, Pirate Ship and Castle Cone were favorites then and are highly prized today.'

If You Go

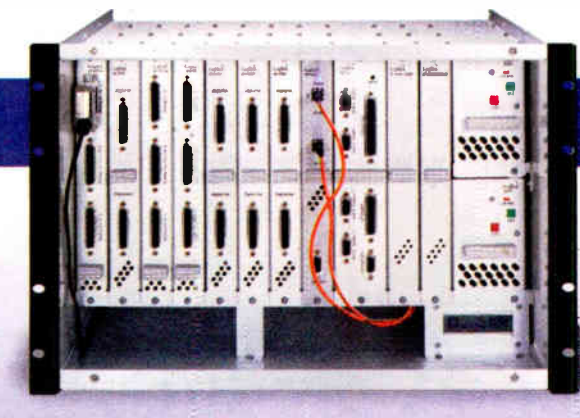
What: American Museum of Radio and Electricity

Where: 1312 Bay St., Bellingham, Wash.

When: Wednesdays through Saturdays, 11 a.m. to 4 p.m. and by appointment. Admission is $5 for adults and $2 for children 12 and under.

How: (360) 738-3886 or *www.amre.us*. Visit the Web site for information about the collections, school programs, workshops and school group tours.

$96^2 < \#20K$



The new math of audio routing

With Logitek, you don't have to spend a fortune to move audio signals around your facility. Our Audio Engine router does it all—X-Y routing, mixing, gain control, EQ, compression, limiting—for a great price.

Learn more about the Audio Engine and Logitek's line of console control surfaces at www.logitekaudio.com.

Logitek
Console Router Systems

Logitek Electronic Systems, Inc.
713.664.4470
info@logitekaudio.com
5622 Edgemoor • Houston, TX 77081
1.800.231.5870
www.logitekaudio.com

© 2006 Logitek Electronic Systems, Inc.

World Radio History

Studio Sessions

Product Guide Inside

Radio World — Resource for Radio On-Air, Production and Recording — November 21, 2007

PRODUCT EVALUATION

TLF300: Audio Over IP in Small Package

Rarey Likes This Small But Powerful Codec for Its Ease of Use and Multiple Simultaneous Connections

by Rich Rarey

I was intrigued when a pair of Tieline Commander G3 field codecs arrived at my office.

I had heard that audio over IP was The Next Big Thing but hadn't touched any actual field devices; and I imagined that sending audio over the public Internet was just begging for trouble. I was just sure that any broadcast-quality connection would die miserably when enough people consumed all the bandwidth by surfing and downloading YouTube videos exactly at the moment of the broadcast.

It was with this expectation that I plugged one Tieline Commander G3 into an outside-the-firewall spigot at work, pressed the WIZ button to guide me through a static IP setup and plugged a stereo audio source into the rear XLRs. I carried the other Tieline home in my briefcase.

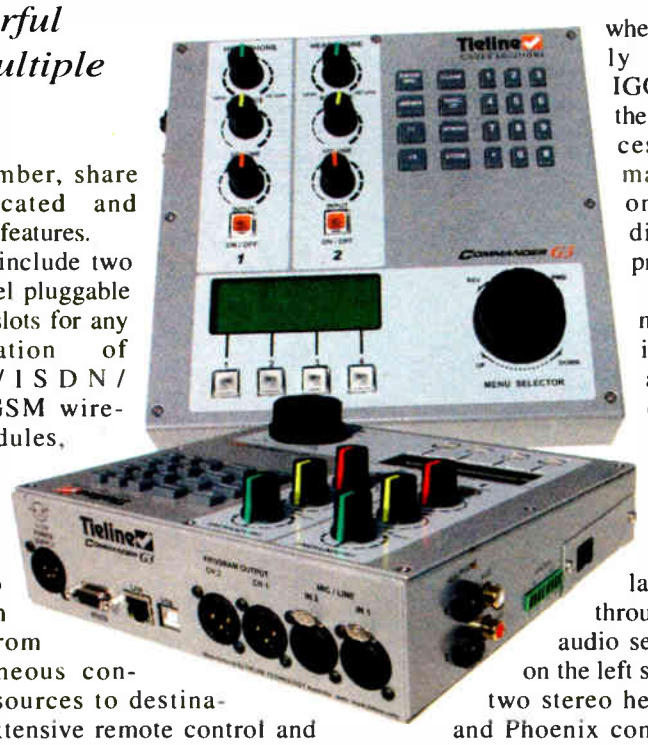
Once at home, I bid the family a cheery hello, plugged the Tieline into a Verizon FiOS [high-speed Internet] spigot, and "dialed" the Tieline at work.

Almost immediately, the connection framed at 128 kilobits MP2 stereo. "Naw," I thought, "It can't be this easy." So I disconnected and ratcheted up the bit rate to 384 kilobits. The two Tielines connected and framed again, quickly and easily.

I thought this must really be The Next Big Thing.

Controls

The Tieline Commander G3 series of codecs, of which the TLF300 field codec is a member, share sophisticated and complex features.



They include two side-panel pluggable module slots for any combination of X.21/ISDN/POTS/GSM wireless modules, with an integral 11 x 6 audio router to switch audio from simultaneous connected sources to destinations; extensive remote control and softkey/GPI programming capability; a number of popular, robust coding algorithms from MP2 to a raw linear stream; and, of most interest here, integral audio over IP.

The whole package is in a small enclosure measuring 8.56 x 8.58 x 2.95 inches — and it doesn't even need a cooling fan. The external 12VDC power supply plugs into a four-pin XLR on the rear panel.

The TLF300 controls on the sloping front are straightforward and easy to understand. Each mixer section of the two-channel mixer has an on/off key, rotary level control and a headphone level and send/return audio balance control.

The codec's "Intelligent Gain Control" can be enabled to operate like a limiter to manage levels exceeding +14 dBu. The input channel's on/off button flashes when IGC is actually working. The IGC stage is after the 24 bit A/D processing, and is managed by the onboard 32 bit digital signal processor.

An additional, monaural auxiliary line input and output is exposed on RCA connectors on the left side. The auxiliary input level is controllable remotely or through the Tieline's audio setup menu. Also on the left side panel are the two stereo headphone jacks, and Phoenix connectors for the two CMOS solid-state relay inputs and outputs. Each relay's action is configurable by the included Tieline Toolbox software.

Adjacent to the front-panel mixer section is a telephone keypad, with dedicated keys for Hangup, Clear, Enter-Dial, Memory, Store and Soft Keys F1 and F2. An amply-sized backlit LCD screen above four soft keys displays menus and status and virtual level metering. My favorite control is a comfortably large "soft" menu selector knob with a press-to-accept button action.

On the rear are the two analog outputs and two line/mic inputs, individually configurable from the audio menu, or by the Tieline Toolbox software. Phantom power also can be enabled on both input XLR connectors.

Product Capsule:
Tieline Commander TLF300 Field Codec

Thumbs Up

- ✓ Small, compact
- ✓ Extremely flexible
- ✓ Multiple, simultaneous connections
- ✓ Internal audio routing matrix
- ✓ Pretty, "photo-virtual" remote control software included
- ✓ Comprehensive configuration software, the Tieline Toolbox, included
- ✓ Firmware upgrades easily made
- ✓ Well-written manual
- ✓ Two can remotely control each other, including audio gain

Thumbs Down

- ✓ Some features programmed only by Toolbox software
- ✓ Some features available at additional charge
- ✓ For configuring complicated tasks, its complexity requires thoughtful setup

PRICE: Commander field unit with wired IP and POTS: $3,025

CONTACT: *Tieline at (317) 845-8000 or visit* www.tieline.com.

While the Tieline TLF300's features are numerous and control could be complicated, Tieline has included a starting set of configuration profiles that serve nicely for most of the manual tasks.

In those cases where the user wants to make the TLF300 even easier — "automatic," if you will — up to 98 configuration profiles can be created, edited and saved, such that a user need only apply power and be guided to the desired configuration by prompts from the display.

The TLF300 will, with the press of a soft key, recall a complete snapshot that includes phone numbers, input settings, audio routing, ISDN setup, function buttons, talkback operation and other necessary settings. All of this is easily programmed using the Tieline Toolbox software, and the snapshots can be saved to your local computer for safekeeping.

There are more than 20 factory audio matrix routing configurations provided,

See TIELINE, page 31 ▶

Our focus is always on our #1 product:
Radio Automation for Terrestrial & Internet Delivery

↗ Dynamic On-Air screen layout - simple transition from your old system to software that is truly-state of the art

↗ 5th Generation Radio Automation with the latest advances in Audio-over-IP, RDS and Internet streaming

↗ Simple, Revolutionary, Steadfast with unparalleled support for our products

iMediaTouch
TOLL FREE 888-665-0501
Web. www.imediatouch.com
Email. sales@imediatouch.com

Download a demo at www.imediatouch

imt technologies | Radio Automation | Digital Logging | Internet Radio | Revenue Solutions | HD Radio

SCMS

Service and Pricing you can Count On!

orban crl

1967
First Orban product sold to customer: a stereo synthesizer sold to WOR-FM, New York.

1972
Bob Orban's first of 24 patents issues (U.S. #3,670,106, "Stereo Synthesizer").

June 2007 *
SCMS acquires assets of Major Broadcast Equipment Supplier

2005
Orban Optimod 8500 Third Generation of Digital Processing is released and takes audio processing to a new level of industry setting standard.

1975
OPTIMOD 8000 audio processor introduced for the new FM format. Bob Orban and partner, John Delantoni, set up Orban Associates as a privately held company.

2003
OPTIMOD-FM 8300 is introduced at NAB in Las Vegas. OPTIMOD-PC ships. World's first audio PCI Sound Card with Optimod-class DSP for broadcast signal processing.

2007*
Orban begins shipping the new Optimod 6300 high-quality, multipurpose stereo audio processor for digital radio, digital television, netcasts, STL protection, satellite uplink protection, and digital mastering.
Orban also introduces the all-digital 9300 Optimod-AM audio processor for monophonic AM shortwave, medium wave and long wave broadcasts.

Orban Optimod 6300

Three Processors in One:

1. A no-compromise processing chain for digital transmission and media
2. A studio AGC (with peak limiting for STL protection)
3. A talent headphone processor

1976
SCMS founded by Bob Cauthen

2000
Orban Optimod 8400 Second Generation of Digital Processing is released to immediate great reviews and becomes the new industry standard.

Orban Inc. is purchased by CRL from Harman International.

1978
OPTIMOD-AM 9000A offers AM stations a more "FM-like" sound quality and reduced interference.
In modified form, the receiver equalizer and low-pass filter ideas form the basis for the NRSC-1 standard issued in 1987.

1996
First low-priced, all digital processor for FM introduced, OPTIMOD-FM 2200.
The DSE 7000FX introduced with new DSP engine offering on-board effects like reverb, equalization and compression.

1983
OPTIMOD-TV Model 8182A introduced. Adds Hilbert-Transform clippers and a CBS Loudness Controller to the original 8180A.

1991
Orban leads the transition to digital with the first successful DSP-based FM audio processor, OPTIMOD-FM 8200.
Thousands on air around the world.

1987
Orban's first product using micro-processor technology is introduced. The 787A Programmable Mic Processor incorporates equalization, compression, and de-essing in a digitally-controlled analog signal path.

Here for the Long Haul!

* Go to http://www.orban.com/about/timeline/ for a full look at Orbans timeline

Mid-South: **1-877-391-2650** Bob Mayben
Central: **1-731-695-1714** Bernie O'Brien
West Coast: **1-866-673-9267** Doug Tharp
Mid-West: **1-513-899-3036** Mary Schnelle
South-Atlantic: **1-770-632-1295** Art White
North-East: **1-315-623-7655** Jim Peck
South-West: **1-210-775-2725** John Lackness
North Central: **1-513-376-8600** Pam Leffler
Pro Audio: **1-877-640-8205** Ric Goldstein
Latin America: **1-760- 650-1427** Lily Massari

***Contact* SCMS**
at any of its offices
to discuss your needs
1-800-438-6040
Bob, Ernie, Matt, Mike or Andy
HQ in Pineville, NC

SCMS INC.
YOU KNOW WE KNOW RADIO!
www.SCMSinc.com

❖ Go to http://www.scmsinc.com/07022007.htm

World Radio History

PRODUCT EVALUATION

Sound Forge 9.0 Addresses Two-Track Limit

Digital Production Suite Promises What You Need to 'Quickly Get From Raw Audio to Finished Master'

by Read G. Burgan

In the 1990s, Sound Forge was one of the first PC-based digital audio editors. Like the once-ubiquitous tape recorder, it became a familiar and welcome part of our broadcast world.

From the beginning, SF has been a two-track audio editor. With SF 9.0, Sony has addressed the two-track limitation. However, instead of adding multi-track editing to SF, it has opted for something in between, which Sony calls "multi-channel" editing.

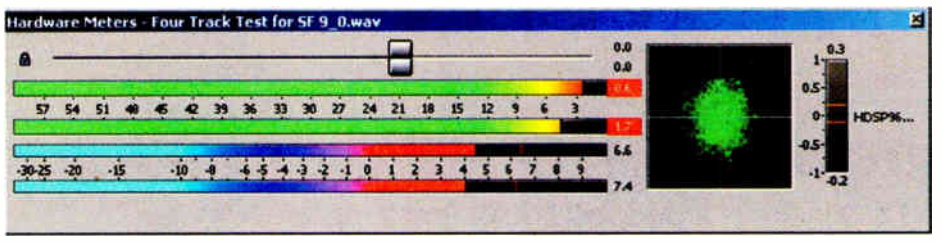
Multi-track and multi-channel are *not* the same.

Sony's multi-channel editing has some of the features of multi-track editing but lacks some of the more crucial ones. The primary application is for surround sound recording and playback and for court recording and transcription services. That makes it a good candidate for radio stations looking to include surround sound in their HD Radio broadcasting.

SF's record interface has been redesigned to permit recording of up to 32 channels.

Users can apply individual DirectX and VST plug-ins to any combination of multi-channels — with some notable exceptions. Some plug-ins can be applied to more than two channels while others cannot. About the only way of determining this is by trial and error.

However, it is *not* possible to access the individual volume or other automatable envelopes per individual channel in the multi-channel editing mode. For example, you can change the volume for an entire individual channel, but you cannot raise or lower it incrementally along the time line.



Sound Forge 9.0 Hardware Meters

While this limits the usefulness of the multi-channel format, it is consistent with the intent of the program to provide a platform for surround sound applications. And it is possible to drag an individual channel to a single mono or stereo file, make changes there to the automation envelopes and then paste it back to its original track in the multi-channel editor.

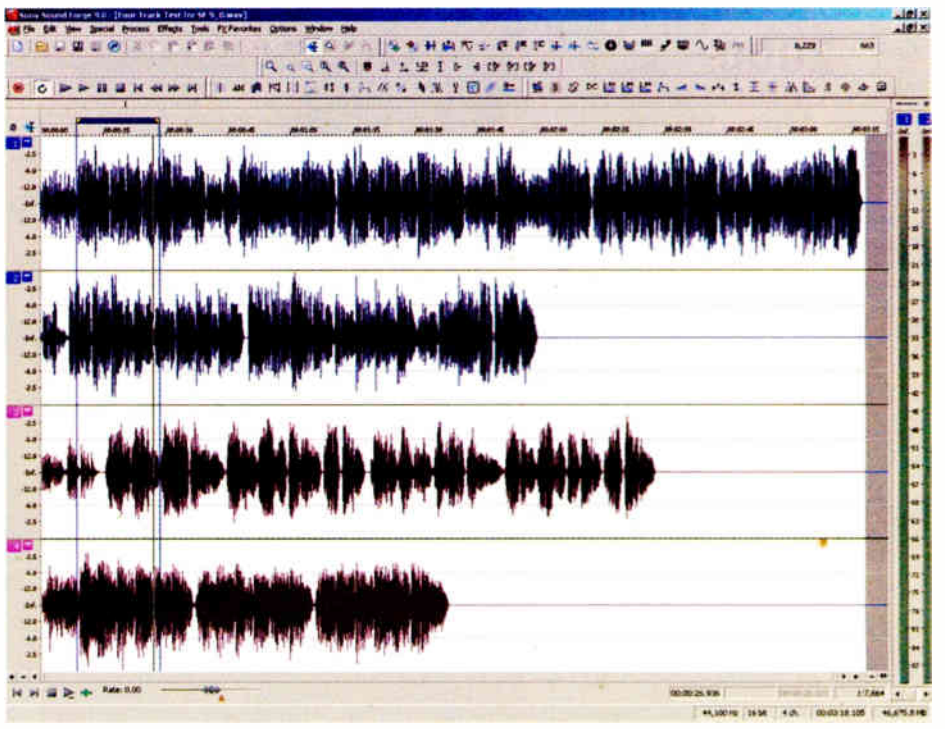
Nor is it possible to "slide" the individual tracks along the time line in relation to each other. Each channel in the SF 9.0's multi-track editor is fixed firmly in place. It cannot be moved.

The inability to alter the individual automation envelopes of each channel and the inability to individually slide channels around in relation to each other limit the use of this software in a traditional multi-track manner. Sony is open about this. Thus if you need true multi-track editing, you would be better served by choosing an editor that is designed specifically to support multi-track editing such as Sony's Vegas or Adobe Audition 2.0.

Sony has modified the Channel Converter located in the Process Menu to accommodate the mix down from multi-channel to two-track stereo or mono.

One of the new features of SF 9.0 is the addition of a "wet/dry mix" option. This is an additional box that can be opened when using a DirectX or VST plug-in.

If you have used reverb plug-ins, you are probably familiar with the feature; most reverb software includes the ability to mix the original unprocessed sound with the sound after it has been processed by the reverb. Essentially Sony has applied this concept to virtually all of the plug-ins used by SF 9.0.



SF 9 Multi-channel Display

It allows for a much improved tweaking of the sound in ways that weren't possible before. The feature is not available in the Plug-In Chainer and I hope that Sony will consider making the feature operational in that mode in the next version of SF.

SF 9.0 has added "hardware meters." The hardware meters window includes not only traditional VU meters that can be adjusted in various ways, but also controls for adjusting the output level of the individual channels and a phase scope and mono compatibility meter.

The phase scope can display the signal in one of four ways: 1. Lissajous-XY Plot; 2. Lissajous-Rotated; 3. Polar-Linear Plot; and 4. Polar-Circular Plot. The mono compatibility meter indicates whether or not phase cancellations between channels might cause phasing problems when down mixing to mono.

What I especially like is the totality of

See SONY, page 30 ▶

Product Capsule:

Sony Creative Software Sound Forge 9.0 Digital Audio Editing Software

Thumbs Up

- ✓ Multi-channel editing up to 32 channels
- ✓ Includes Noise Reduction 2.0, CD Architect 5.0 and iZotope Mastering Plug-Ins
- ✓ New Hardware Meters include mono monitoring
- ✓ Compatible with Windows Vista operating system

Thumbs Down

- ✓ Multi-channel editing not as flexible as true multi-tracking editing software
- ✓ Lacks tools for editing in the frequency domain
- ✓ Some occasional instability that causes the program to crash

PRICE: Packaged: $319.96
Downloaded: $299.96
Upgrade From Previous Version: $149.95

CONTACT: *Sony Creative Software at (608) 204-7680 or visit* www.sonycreativesoftware.com.

STATION/STUDIO SERVICES

ATTENTION PROVIDERS!

Promote your services to **Radio World's** readers. Reach Radio Station owners/managers and engineers with your message.

For information on affordable advertising call Claudia at 1-703-998-7600, ext. 154.

World Radio History

Broadcast Software

1-888-274-8721
www.bsiusa.com

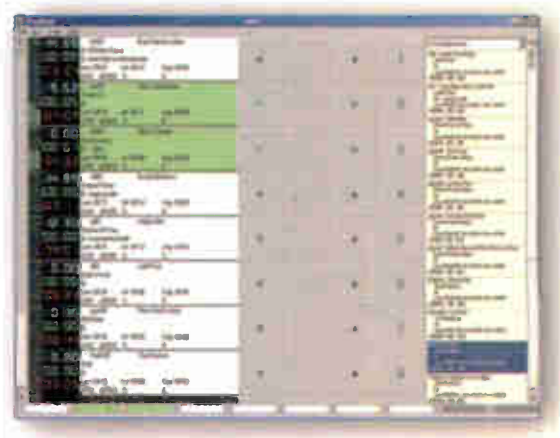
Radio Automation

Simian - radio automation and digital playout system.

Instant Audio

Stinger - Instant Access to 288 'rapid-fire' audio files.

Digital Cart Player



WaveCart - the original on-screen cart machine replacement.

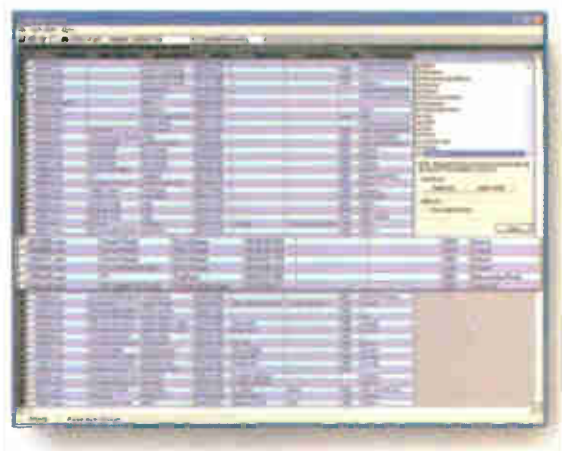
Audio Logging

SkimmerPlus - skimming and audio logging with web playback.

Complete Systems

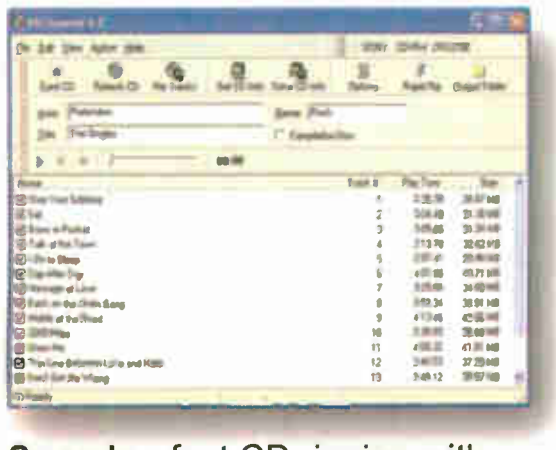
Systems - fully configured with hardware, software and music.

Music Library



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

CD Ripping



Speedy - fast CD ripping with automatic file tagging.

Sound Cards

AudioScience - professional sound cards built for broadcast.

Remote Control

Trigger & Relay Kits - for GPI/O and satellite operation.

Broadcast Software International
503 E. 11th Avenue
Eugene, Oregon 97401 USA
Direct: 541-338-8588
Fax: 541-338-8656
www.bsiusa.com sales@bsiusa.com

BSI

World Radio History

Sony

▶ Continued from page 28

information that the Hardware Meter window provides when all three of the functions (VU meter, phase scope and mono compatibility meter) are selected. This provides an easy means of keeping track of important information when you are working with multi-channel material.

Sony has updated the SF 9.0 Spectrum Analysis window to include an individual display window for as many multi-channels as you are using. Spectrum analysis can be a valuable means of evaluating your sound and of locating problems that may need attention.

However, my opinion is that Sony lags behind in the area of spectrum analysis support. Adobe Audition added spectrum analysis editing tools as early as version 1.5 and improved them in version 2.0, which has been out for more than a year. SF 9.0 has no tools for editing in the spectrum analysis mode.

Restoration software

SF 9.0 includes a "Mastering Effects Bundle" licensed from iZotope Inc. The plug-ins are based on the iZotope Ozone 3 package and include Multiband Compressor; Mastering EQ; Mastering Reverb; and IRC Limiter.

iZotope has a reputation for producing quality software plug-ins that are easy to use with excellent sound quality based on 64 bit internal processing. The four plug-ins included in SF 9.0 continue that tradition. My personal favorite is the Multiband Compressor, which enables you to control the dynamic range of the audio over four user-selectable frequency bands. Because the plug-in includes plenty of presets, I found I could use it without a long learning curve

I like the iZotope mastering bundle and expect to use it in the digital audio work I do. The only downside is that because of licensing restrictions with iZotope, the bundle shows up only in SF 9.0. I would like to be able to use the plug-ins with other audio editors I use but can't because of this limitation. Sony says that it plans to make the bundle accessible in its other Sony Creative Software products when new versions are released.

SF 9.0 includes CD Architect 5.0. Back in the '90s, Sonic Foundry introduced CD Architect to handle the tasks associated with producing and burning audio CDs from WAV files. From the beginning, CD Architect has been held in high regard by audio professionals.

CD Architect 5.0 remains unchanged from its initial release back in 2003, but so have audio CDs.

For the first time, Sony is including its Noise Reduction 2.0 digital audio restoration package with every purchase of SF 9.0. I have used NR 2.0 since it was released in 1999. At the time it provided remarkable quality in a package of plug-ins that removed both pops and clicks and broadband noise.

I still have a high regard for NR 2.0 and continue to use it in my work along with newer products. At the same time, eight years is a long time to continue a product without an update. Those of us who have been using NR 2.0 are waiting for Sony to come up with an update or a totally new noise reduction package.

If you don't already have noise reduction software, the Sony NR 2.0 bundle is a good bargain: an excellent high-quality restoration package that can produce good-sounding results.

Read Burgan is a former public radio station manager specializing in digital audio restoration. E-mail him at rgb@chartermi.net.

Able to leap tall buildings?

No distance or line-of-sight restriction makes **Starlink SL9003T1** the ideal choice for STL/TSL and intercity links.

Starlink T1's bidirectional high capacity significantly reduces communications costs compared to discrete audio, telephone and data circuits.

And **Starlink's** uncompressed digital audio will stand out above your competition.

STL over any distance or terrain...
...Moseley Starlink T1

- HD Radio™ and Multicasting
- Transmitter remote control
- RBDS data
- Telephone extension
- IP-based equipment control
- Internet and e-mail connection

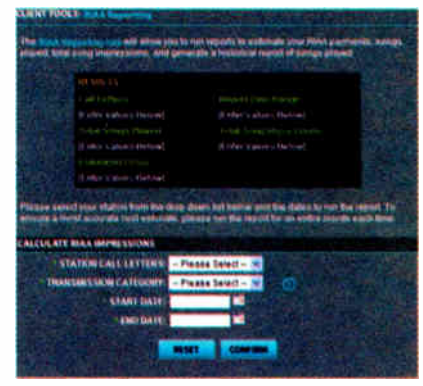
Call the digital STL experts today.
Dave Chancey 805.968.9621
Bill Gould 978.373.6303
www.moseleysb.com

Moseley

PRODUCT GUIDE

Liquid Compass Has Royalty Reporting Tool

Forget "aggregate tuning hour." Are you ready for those new per-performance RIAA royalty reporting requirements? The beginning of 2008 is right around the corner.



Users select from drop-down information such as call letters and date range.

Streaming provider Liquid Compass has released a royalty reporting tool that automates the reports.

RIAA Reporter generates a monthly and quarterly report in spreadsheet format that performs the calculations for you: what was played, how often and the total number of listeners. Clients need only to log on to the Liquid Compass Client Control Center and select from pre-populated drop-down information such as call letters and date range.

The program automatically calculates the station's fee and provides it in a form acceptable to SoundExhange, the performance rights organization designated by the U.S. Copyright Office to collect and distribute digital performance royalties to artists and copyright owners.

For more information, contact Liquid Compass at (303) 839-9401 or visit www.liquidcompass.net.

World Radio History

Tieline

▶ Continued from page 26

and they provide the usual routing between mic, headphone, encoder and decoder, as well as the arcane routings such as those that route the phone module audio to other destinations for use as a talkback or cue.

There are too many factor routing configurations to discuss here; each Tieline can hold up to 160 routing configurations. For an additional fee, Tieline can enable the Matrix Editor for users to create and save their own unique routing configurations.

Take two

We had occasion to use the TLF300 on two remote broadcasts.

The first was for transmitting a music concert in New York City back to NPR, where the audio was passed to the NPR Digital Media Division for Web streaming.

The concert venue had exactly two POTS lines into the building (voice and fax, nowhere near the sound board) and no possibility for ISDN installation. It did, however, have high speed "public" Internet access.

Ignoring the POTS lines, we decided to ship up a TLF300 a few days before the gig and check the quality of Internet service. The producer decided that if the Tieline couldn't make and hold a connection — the only hope for getting live audio out of the venue — the gig would not be streamed live.

I pre-configured the TLF300, quickly setting up the IP connection for DHCP from the front panel, guessing that regardless of the Internet service provider, the connection would flow through the ISP's router that would assign the Tieline an IP address and handle the data routing to the outside world.

I selected a modest bit rate with a robust algorithm — 128 kilobits MP2, J-Stereo as the coding algorithm — realizing the resulting audio would be further bit-rate reduced for Web streaming. I selected the factory profile "ManDflt Stereo," which instantly configured the Tieline's inputs and outputs for stereo. The two front-panel inputs become left and right IN, with stereo audio feeding the headphones and the stereo balanced outputs, as well as to the IP destination.

Because the remote site was assigned an arbitrary IP address through DHCP, the remote site had to "call" our rack-mounted Tieline TLR300B2, which uses a static IP address. All it had to do was turn the menu selector to highlight "IP," touch the keypad to enter NPR's Tieline IP address and press the menu selector to "dial" the IP.

The test went well, and on the night of the concert, the Tieline connected and stayed connected throughout. The producer was thrilled.

The second broadcast test was for the afternoon talk program's live remote from Fairbanks, Alaska. Again, ISDN was simply not available, but Switched-56 service was, and we had to scrounge for the ancient equipment to use for the live broadcast remote.

It was almost as an afterthought that we included a TLF300 in the site survey kit, in the event that sufficient Internet bandwidth was available. We were pleasantly surprised that the Tieline had no problem holding a connection during the site survey, and included it in the remote equipment pool.

On the broadcast day, we were able to get one of the two Switched-56 lines to frame after much fussing, but the TLF300 connected easily to our rack-mounted TLR300B2 at 128 kilobits, MP2, J-Stereo. A numerical "signal strength" value on the display showed numbers ranging from 79 to 95, where 99 is the highest "strength." The lower the number, the more likely a connection will experience dropouts or audible artifacts.

We compared the incoming audio arrival times of the Switched-56 and the Tieline (in quality, the Tieline was far superior), and noticed at first the Tieline lead the Switched-56 by some milliseconds, and over time the Tieline lagged behind the Switched-56.

This brought home the realization that the public Internet is not a guaranteed bit stream like a 64 kilobit ISDN channel; some IP packets will take longer to arrive than others, and there is a penalty if you try to run your intense laptop Web applications on the same Internet connection the Tieline uses.

We heard this during the broadcast as the Tieline had moments of slightly "watery" artifacts, and in an informal conversation with the technical director after the broadcast, she mentioned several remote production staff were remotely logged into NPR on the same hub, so they could write scripts and manage the call screener.

The latency, however, was low enough to still be "interactive," as the phone calls were mixed into the program in Washington, but heard by the host in Alaska. When the remote Switched-56 codec's output went dead during the broadcast, the Tieline was the only path to get backfeed audio to the site.

In using the Tieline TLF300, it is apparent that we have barely exploited its features in our daily broadcast tasks; this review is but a bare outline of its many capabilities and operation. For those wishing to move audio from one remote place to another by any number of means, and the task at hand requires easy of use or simultaneous connections to a single codec, the Tieline Commander TLF300 is a fine investment.

The list price for a Commander field unit with wired IP and POTS is $3,025, with a final discounted price from dealers less than $3,000.

Additionally, Tieline recently debuted an algorithm for lossy IP networks called MusicPlus, which delivers 20 kHz stereo audio as low as 96 kbps with a 20 millisecond algorithmic encode delay.

Rich Rarey is the master control supervisor for National Public Radio.

World Radio History

USER REPORT

WPR Monitors Network With Goldeneagle HD

by Pete Kingslien
Field Projects Manager
Wisconsin Educational Communications Board

MADISON, Wis. HD Radio technology provides Wisconsin Public Radio additional opportunities to reach listeners with multiple program services, and in areas of the state where a second frequency cannot be obtained, adding a program service through an HD2 channel is an attractive alternative.

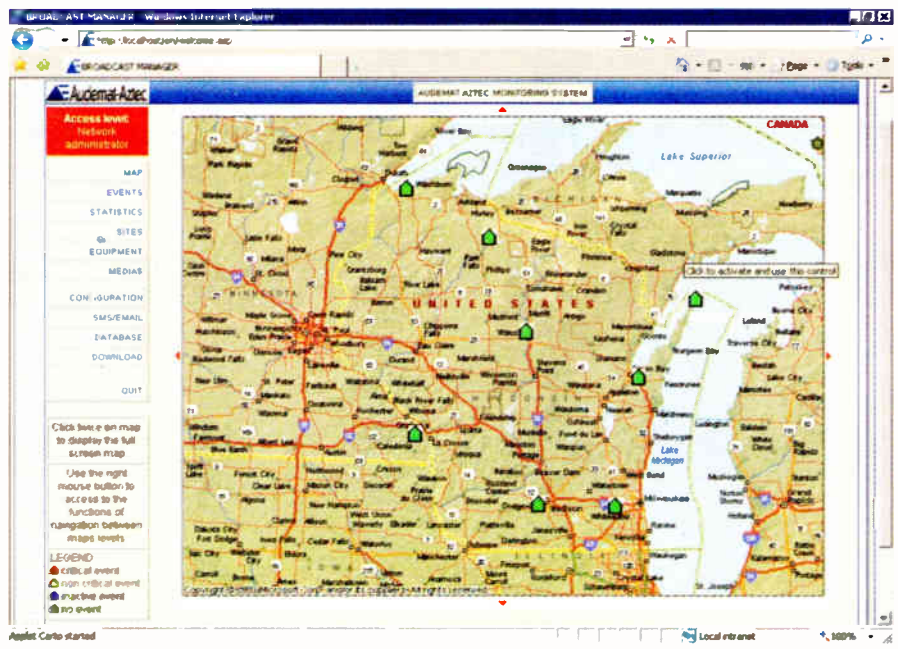
WPR currently offers Ideas Network and NPR News and Classical Network statewide, as well as a third all-classical music format in areas of HD service where this specialty format is requested.

Monitoring a state network of 23 FM and two AM stations is challenging enough, and the most recent phase of our HD Radio build-outs added seven HD Radio installations, four of which now carry an HD2 channel. Add to that six more HD Radio upgrades by early 2008, and one can appreciate the difficulty of the monitoring situation presented to the staff at the Wisconsin Educational Communications Board's new Operations Center in Madison.

Many of these services cannot be heard from Madison, and we often had to rely on listeners to inform us of outages, which could not be monitored at our Operations Center. On a particular weekend when HD2 had shut down in the Milwaukee market, only the repeated calls from classical music listeners made us aware of the outage.

Obviously there had to be a more professional way to monitor these signals.

Coincidentally, the Educational Communications Board was in the process of upgrading our FM monitoring across the network when we happened across the **Audemat-Aztec** Goldeneagle HD at NAB2007.



Kingslien likes Goldeneagle HD's Broadcast Manager, which lets WPR remotely monitor all of its Goldeneagle units from Madison.

A convincing hands-on demonstration of this device led us to purchase and take delivery of eight Goldeneagle HDs, supplied by Broadcasters General Store. But in our mind the killer app for these units is Audemat's Broadcast Manager package, consisting of a PC server and software that enables us to remotely monitor all of the Goldeneagle units from Madison.

Good visuals

We already had the connectivity available, as our programming is delivered by common carrier DS3 and T1 circuits, which also gives us limited bandwidth to provide Internet and e-mail to out-of-state staff and several private Ethernet links for control and monitoring of our remote sites.

We now have the ability to display a Wisconsin map at our operations center showing the status of our radio station's Goldeneagles. A green icon indicates that all transmitters and programs are functioning normally, while any loss of an analog signal, HD1 or HD2 shows up on the map as a red blinking alarm.

In addition to this visual display, we installed a relay output card in the Goldeneagles to give us contact closures to our remote monitoring system. This will audibly and visually alert our operators of problems and tell us which service is impaired.

These alarms can be programmed easily through the Goldeneagle HD software and also can alert field technicians by e-mail, pager or SMS messages. A unique and intuitive graphic scripting program makes complex signaling configurations easy to accomplish.

Look and listen

As a stand-alone product, the Goldeneagle HD is a complete FM monitor capable of monitoring all analog, HD Radio and RDS parameters.

Alarm limits can be placed on these parameters, and by installing a relay card these alarms show up locally and also are reported to any remote control system. With the centralized network management package everything can be seen at one staffed location.

The Goldeneagles also monitor all parameters in real time, such as total modulation, L+R, L-R, left channel, right channel, pilot, RDS and SCA subcarriers, and can maintain a database of these parameters over time for analysis of problems and overall quality monitoring. They also can record audio streams for playback later and send streaming audio to connected PCs.

The market scan function lets users listen to and look at other stations in your market, while the spectrum analyzer option makes it easy to check for mask compliance and also allows for time alignment of your analog and HD1 streams. The Goldeneagle HD is a one-box solution for monitoring compliance on analog and HD radio stations.

Part of our purchasing package included training on the Goldeneagle HD and on the network management system.

Tony Peterle of Audemat-Aztec's Miami office enjoyed the beautiful Wisconsin fall weather while acclimating our technicians to the systems many features. We learned how to monitor HD Radio quality, HD Radio digital acquisition and digital SNR using the Goldeneagle HD, and how to bring all this data to our central monitoring location using the network management package.

For more information, including pricing, contact Audemat-Aztec at (305) 249-3110 or visit www.audemat-aztec.com.

OMNIRAX BROADCAST FURNITURE *The Engineer's Choice!*

WHAT PEOPLE ARE SAYING ABOUT OMNIRAX...

"Within a short amount of time Omnirax was able to come up with a beautiful concept for our new studios."

"The Omnirax design makes these studios incredible for talent and operators on both sides of the console."

"Our furniture from you not only fit into our budget and timeline, it was very well constructed and looked beautiful. I expect to be outfitting many more facilities with Omnirax..."

"I was impressed with the exceptional care given packaging for shipment. A few very large and potentially fragile components made it cross-country completely unscathed"

"I wholeheartedly recommend Omnirax to everyone."

P. O. Box 1792 Sausalito, CA 94966 800.332.3393 415.332.3392 FAX 415.332.2607
www.omnirax.com info@omnirax.com

World Radio History

MUSICAM USA

The World Leader in IP Codecs

Introducing our next generation of IP Audio Codecs

featuring

Suprima

IP DUAL AUDIO CODEC

- **Includes LAN, ISDN U & S/T, and X.21 interfaces standard**
- **Auto backup to ISDN from IP or X.21**
- **Built-in Web server for control and monitor from remote locations**
- **Includes SIP protocol over IP, MPEG2, MPEG3, MP2/4 AAC, apt-X, G.722, G.711 & PCM**
- **Portable and Decoder Only versions also available**

SupriMAX

MULTIPLE IP CODEC

- **Up to 14 full-featured IP codecs housed in one unit**
- **Each module is hot-swappable**
- **Ideal for multicast applications**
- **Redundant Power Supplies**
- **Comes fully loaded with every available algorithm included**
- **Monitor large systems with SNMP management**

Visit our website to view the MUSICAM USA Product Portfolio and contact MUSICAM USA, the IP technology leader, for more information about how easily our products can help you master the "audio over IP" direction for your station(s). We are already shipping products to major groups and small stations alike. Check our references and let's go!

CCS

MUSICAM USA

670 North Beers Street, Bldg. #4
Holmdel, NJ 07733 USA
phone: 732-739-5600 - fax: 732-739-1818
email: sales@musicamusa.com
web: www.musicamusa.com

World Radio History

USER REPORT

RDL SourceFlex Monitors the 'Home Office'

Lincoln Financial Media Uses the System for Multi-Channel Monitoring in a Facility's Restroom

by Gary Nakashima
Assistant Chief Engineer
Lincoln Financial Media of Colorado

DENVER When building new studios in a new building or, in our case, space completely remodeled for our purposes, one of those things that must be considered is monitoring in the less-than-obvious places. I'm speaking of a necessary but not so glamorous place: the bathroom.

Five Lincoln Financial stations are co-located in our Denver market studios. We had planned to use the old method of using a multi-pole switch, amplifier and speaker in each monitor location.

This requires having an AC outlet installed near the amplifier, which of course brings up another set of problems: Where do you put an amplifier in a bathroom? Do you have the feed at a fixed level or do you install some kind of level control? Pulling in a pair for each station — in our case five stations — and of course wiring up the multi-pole switch makes for considerable labor for each monitor location.

SourceFlex In Situ

We started to look around for an easier method and found the **RDL** SourceFlex distributed audio system.

Meet the system

The SourceFlex SAS-8I is the audio input chassis for the SourceFlex System that accepts eight balanced or unbalanced sources. While we don't use it in this application, it also has a separate paging input and closure contacts. The unit is programmable for the maximum number of sources so that unused channels don't appear at the listening stations. In our case we set that to five.

The SAS-8I, our rack-mounted "head end," can handle four listening stations without additional hardware. These are connected with six-conductor cable. Conductor size is determined by the length of the connection. Our connections were less than 125 feet, so our cable choice was Cat-5 twisted pair.

This cable is inexpensive and even the plenum versions are available readily. There is a provision to set maximum listening level at each station at the SAS-8I and it provides the protection of an auto-resetting fuse that protects the power feed to each listening station.

Our selection for listening station was the SAS-RC8 room control station. The device mounts inside a standard two-gang electrical box. The SAS-RC8 has a line-level balanced output and is often used to allow for source and level selection for a large room with an external amplifier. The appearance of the unit is several steps above what can be produced in most station's shop facilities.

The SAS-RC8 also has an 8 ohm speaker output, so no external amplifier was required for this application. We just ran wiring to a wall-mounted speaker and completed the setup. Each room control panel has a source select button and a level control.

Operation of the unit is intuitive. If you do want to drive an external amplifier the module supports that as well.

With the flexibility of the system we could easily add additional modules for areas such as jock prep areas, break rooms or any other area where we might need a multi-channel audio monitoring station.

There is a good selection of listening stations to match the intended location. The SAS-TC8 is similar to the SAS-RC8 we used. The SAS-TC8, though, incorporates a speaker into its wall-mount design. The SAS-SM8A is designed for a tabletop mount. (This is the style of listening station found in many sports bars.) For headphone monitoring, there is the SAS-HC8, the listening station popular for gyms and exercise facilities.

Expansion beyond the original four listening stations also is easy. The SAS-8C adds eight listening stations of any style to the system. The SAS-82 adds listening stations two at a time. Both of these are supplied with a ribbon cable that loops back to the SAS-8I to make use of the sources fed to that unit. There is virtually no limit to the total number of listening stations in a single system.

In a complex, state-of-the-art facility, the RDL SourceFlex was a handy plug-and-play solution. It made for a fast and simple installation of a number of user-friendly monitors throughout our new facility.

For more information, including pricing, contact Radio Design Labs at (800) 281-2683 or visit www.rdl.net.

TECH UPDATES

NTI's Digirator Syncs to A/V Signals

After expanding its line of handheld audio test instruments this summer with the MR-PRO analog audio generator, **NTI** also has introduced a digital domain audio generator: the DR2 Digirator.

The DR2 produces common audio test signals with sampling frequencies up to 192 kHz and resolution up to 24 bit. It features a multi-format sync input, allowing the instrument to be synchronized to video and audio signals.

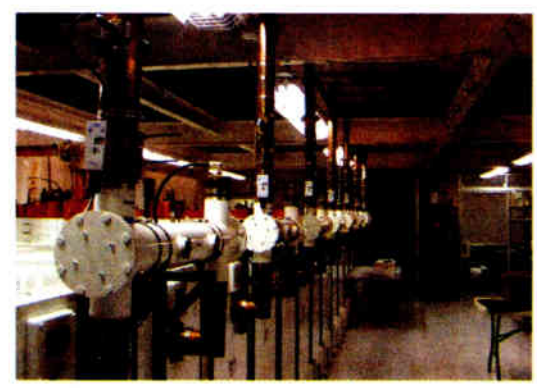
In addition to standard two-channel digital audio, the DR2 can source a comprehensive set of surround signals including Dolby D, D+, E, Pro Logic II, DTS and DTS-HR, making it suitable for multi-channel audio applications.

Also included are additional functions for the measurement of transparency and signal latency; and a signal transparency check function that, for example, allows a Dolby E user to check if an AES3 digital signal path will be transparent to a Dolby E program signal.

The DR2 supports AES3, S/PDIF, TOSLink and ADAT outputs with a suite audio test signals. WAV file playback functionality allows the user to transfer their own customized test signals from the PC to the DR2.

For more information, including pricing, contact NTI Americas at (503)684-7050 or visit www.ntiam.com.

Richland Towers Uses ANT to Monitor Tenants



ANT131 probes monitor power feeds on an eight-channel combiner inside a Richland Towers site in Texas.

Richland Towers is a multi-tenant tower company that provides transmission facilities for broadcast systems, including master DTV and FM antenna intallations and combiner systems.

ANT said Richland uses its products to monitor its tenants' transmission power levels in the combiner and antenna main feeders.

Probes enable Richland to remotely monitor site RF functions such as forward and reverse power levels to assure that stations do not exceed maximum power levels, and that master antenna VSWR levels are not exceeded during extreme weather icing conditions.

The ANT products used by Richland for remote-site monitoring provide the ability to monitor each station's power levels at the entry point to the combiners and then the total combined power out.

These probes also are installed to monitor the transmission line feeders to the antennas.

For more information, visit www.antgroup.it.

Product Showcase

Model RFC-1/B Remote Facilites Controller
- control transmiter from any telephone
- 8-64 channels of telemetry and control
- programmable control by date and time
- optional printer and modem adapters
- programmable telemetry alarms
- integrated rack panel

Sine Systems, INC
615.228.3500
more information: www.sinesystems.com

World Radio History

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 connectivity 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

BW BROADCAST

World Radio History

USER REPORT

Burk Enables 'Unified' System for Va. Cluster

Sinclair Telecable Modernizes Norfolk Stations' Remote Control With Burk ARC Plus/ARC-16

by Dave Morgan
Director of Engineering and AM Operations
Sinclair Telecable-Norfolk

NORFOLK, Va. At the Sinclair Telecable station group in Norfolk, Va. — WNIS(AM), WTAR(AM), WPYA(FM), WROX(FM) and WNRJ(FM) — a modern, unified remote control system has been on our wish list for a number of years, and we have finally begun the process of retiring or upgrading our aging stand-alone systems.

We have four transmitter sites for five stations; all are at least a half-hour drive from our downtown studio site, making reliable and easy-to-use remote control, monitoring and diagnostic capability even more important. After evaluating a number of systems, we decided to employ the **Burk Technology** ARC Plus/ARC-16 platforms.

Familiar territory

We were familiar with the ARC-16, having owned and operated two ARC-16SA units with Enhanced Speech Interface (ESI) dialup access. The ability of the ARC Plus to connect with our existing ARC-16 units will allow us to create a unified system while keeping replacement costs down. We could even upgrade the existing ARC-16s to current standards for a reasonable price.

What we liked about the ARC Plus system is that it can be used with both IP and dial-up telephone access. The ESI option provides a phone jack for telephone control, and can be programmed for selective alarm dial-out, allowing varying tiers of alarm notification.

Because of the ESI capabilities, we were able to buy our first ARC Plus ahead of IP service availability at the WNIS/WNRJ transmitter site. This allowed a timely replacement of our 24-year-old Delta Electronics RCS-1V system.

ARC-16 ESI users will find comfortable familiarity with the ARC Plus ESI, as well as a number of improvements, including a greatly expanded voice vocabulary and the ability to use macros without an outboard computer.

Dave Morgan operates the Burk ARC Plus remote control.

In fact, none of the basic operation of the ARC Plus system requires a dedicated computer, unlike systems that use a computer and software to connect to the I/O panels. Computers have a way of crashing, but Burk units have been rock-solid for us over the years.

At the studio, we will use AutoPilot Plus software for controlling, monitoring and logging our sites, while Burk's AutoLoad Plus software eases configuration and calibration. Both applications are user-friendly, which is an absolute necessity for modern-day station control operators who are not technically-inclined (but only key engineering personnel will use AutoLoad Plus).

Burk does not charge annual maintenance fees, and routine firmware and software updates are free.

The front-panel display on the Plus is a huge improvement over that of the ARC-16, and I really like the larger Raise/Lower buttons, which also are programmable for each function with integral LCD lettering and backlighting.

To the extent that our extremely busy and stretched schedule allows, we are gradually adding control, status and metering capabilities beyond the bare necessities. Connecting and configuring the ARC Plus is the easy part; the hard part is finding the time to get to the site and run cables for new capabilities.

One helpful feature of the ARC Plus system's Integrated Command Relay Unit (ICRU) is the ability to program the duration of relay operations, even to fully latching. The ICRU, IIU and ARC Plus main unit include useful front-panel status indicators.

We also have found Burk's optional AFD-1 Arc and Flame Detector to be so sensitive that it can see a lighter's flame or even the arcing inside an electric drill from several feet away. This adds important fire detection capability, which should make our insurance company a bit happier.

Plans

We have only scratched the surface of the ARC Plus's capabilities, but we are paving the way for the day when we finally get IP service at the WNIS/WNRJ site. The Plus will connect with a computer at the studio control point that will run AutoPilot Plus full-time, and also will link serially (via IP) with the two ARC-16 sites.

A second ARC Plus eventually will be added at the remaining site to complete the system. I have already designed a control screen using the Custom Views feature of AutoPilot Plus; the dangers with this software are that it is fun and can be addictive if you're at all creative.

At the recent NAB Radio Show in Charlotte, N.C., Burk's Anita Russell and Steve Dinkel showed us important new innovations, which we plan to adopt. One is the PlusConnect interface unit, which connects directly to the Harris Z series of FM transmitters, yielding much more monitoring capability for the transmitter we use for WNRJ.

We also liked the new connectivity with Web-enabled PDA phones, such as BlackBerry or Treo. While Burk's ESI works well using "good old" DTMF tones via telephone, once we get an IP connection at the ARC Plus site, control and monitoring through a PDA device promises to be significantly faster and more user-friendly.

The folks in Burk's tech support department have been patient and helpful when we have leaned on them for help. Turnaround of our ARC-16 units sent back to the factory for "Good as New" upgrades has been fast. Sales support from our dealer, Mike Phelps at SCMS, has been outstanding.

We're satisfied with the early performance of the ARC Plus, and we look forward to using its full range of capabilities for our sites when our implementation process is complete.

The ARC Plus lists for $2,995.

For more information, including pricing, contact Burk Technology at (800) 736-9165 or visit www.burk.com.

TECH UPDATES

Nautel Has Web-Based Monitoring for Its Transmitters

Nautel introduced NxLink, a remote Web-based monitoring and control system for the company's transmitters.

It uses IP access to provide remote monitoring and control of the Nautel V Series FM and XR Series AM transmitters. Users can access the NxLink via Internet-enabled computers or with IP-ready smartphone devices for flexibility, according to the company.

Highlights include remote access to alarm/information logs; configurable e-mail reporting of critical alarms; and the ability to save or e-mail equipment status for later review.

NxLink can be purchased with Nautel transmitters, or it can be added to existing installations. Supported equipment includes V Series transmitters, including combining systems; XR Series transmitters; and Vector Series transmitters. NxLink software can be upgraded over the LAN using a Web browser or FTP connection or with a direct serial connection to the device.

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

WVRC Controls Site Via Web, Voice

The **Broadcast Tools** WVRC-8 and WVRC-4 offer Web-based and/or recordable voice response dialup transmitter site control.

Both units furnish a browser-based, 100-event function program scheduler and event alarm logger. The user may select from four e-mail recipients and a sound effect to play when an out-of-tolerance alarm is generated.

The WVRC-8 has eight high-resolution analog (telemetry) channels, while each of the eight optically isolated status channels may be configured for 5 to 24 VDC wet or dry (contact closures) status monitoring. The eight control channels have a mix of SPST and SPDT one-amp relays for each raise/on and lower/off function. These relays may be latched, unlatched or momentarily closed.

The WVRC-4 offers four high-resolution analog (telemetry) channels, while each of the four optically isolated status channels may be configured for the same 5 to 24 VDC wet or dry (contact closures) status monitoring. The four control channels have independent SPDT one-amp relays for each raise/on and lower/off function. These relays also may be latched, unlatched or momentarily closed.

The WVRC-8 and the WRVC-4 offer default recorded messages in English, and the user can record words and phrases in other languages.

Highlights include a stereo silence sensor with aural monitoring, front-panel microphone for remote aural site monitoring, Telco hybrid with send and caller balanced audio I/O, front-panel LED indicators for most operational activities and surge-protected power supply.

For more information, contact Broadcast Tools at (360) 854-9559 or visit www.broadcasttools.com.

World Radio History

Products & Services SHOWCASE

SONIFEX
Manufacturers of Audio Broadcast Equipment

SONIFEX Redbox

7.1 ACTIVE MONITOR MATCHING UNIT

Redbox RB-UL4
Quad Stereo Unbalanced to Balanced Converter

- Converts 8 x RCA unbalanced inputs to 8 x XLR balanced outputs.
- 1U rack unit can be surface mounted.
- Ideal for balancing domestic outputs for surround sound applications.

INDEPENDENT AUDIO
T: 207 773 2424
E: info@independentaudio.com
www.independentaudio.com

Visit our website for details:
www.sonifex.co.uk

USE THE COUPON BELOW AND SAVE 10% ON YOUR NEXT ORDER!

Freeland Products, Inc.
Rebuilder of Quality Tubes Since 1940

www.freelandproducts.com
75412 Highway 25, Covington, LA 70435
800-624-7626 * 985-893-1243 * Fax 985-892-7323
E-mail freeland-inc.com@freeland-inc.com

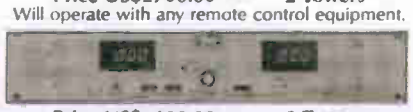
Are you looking for ways to cut your engineering budget, while maintaining the highest quality for your station?
We offer a great warranty, quick service and technical support for our customers 24/7. We can bank your rebuilt tube too, until you need it, just ask.
We have a LARGE stock of commonly used tubes ready to ship. If you're in a hurry we can ship from stock.
Call 800-624-7626 for more information!

Take 10% off the cost of your next Rebuilt Transmitter Tube.
~Coupon copies are not VALID~
This original coupon MUST accompany the used tube when sending for rebuild.
Radio World

DIGITAL ANTENNA MONITORS

In-Stock-Available for Immediate Delivery

Price US$2700.00 2 Towers
Will operate with any remote control equipment.



Price US$2100.00 2 Towers
For AM directionals with studio located at transmitter site.

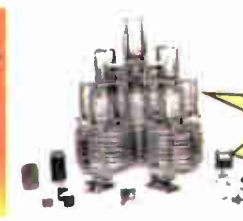
These monitors are state-of-the-art instruments of unequalled accuracy (.5% or better on ratio and .5° or better on phase) and stability. With typical modulation the true ratio readout of these monitors is a factor of 10 more stable than instruments that measure normalized amplitude, and their phase readouts are rock solid. Phase sign is automatic, no extra operation. In addition to the analog DC outputs for remote control the Model CMR has a multiplexed BCD digital output which can be used to drive the Remote Indicator Model CMR-1. RF inputs have dual protection. Gas discharge tubes across the sample line terminations plus relay protectio

GORMAN REDLICH MFG. CO.
257 W. Union St. Athens, Ohio 45701
Phone 740-593-3150 · FAX 740-592-3898
www.gorman-redlich.com/jim@gorman-redlich.com

Directional Antenna Systems

Diplexer/Triplexer Systems

High-Power Antenna Tuning Units



RF Components

IBOC PHASE ROTATORS AVAILABLE!

Factory Dealer For:

AM Antenna Solutions
Reach Farther, Sound Better!

LBA is your trusted supplier for IBOC-ready AM antenna systems. For over 40 years we have been designing and manufacturing reliable *Directional Antenna Systems, ATU's, Multiplexers, Combiners, Cellular/PCS Colocation Isolators, and RF Components* for all power levels.

Choose an LBA system and join thousands of satisfied broadcasters in the US and worldwide!

LBA can also design, manage, install and finance your complete RF project. Please call us for a free technical consultation!

LBA Technology, Inc.
3400 Tupper Drive, Greenville, NC 27834
252-757-0279 Fax: 252-752-9155
www.LBAGroup.com jbrown@LBAGroup.com
SINCE 1963

The NEW MiniMAC Remote Control

Smaller than the MAC, but just as smart!

SCMS

t. 1.800.438.6040 | f. 1.704.889.4540
www.scmsinc.com

davicom

t. 1.418.682.3380 | f. 1.418.682.8996
www.davicom.com

Do Unattended Live Remotes

DR-10 Dial Up Controller & Remote Broadcast Interface

- The DR-10 is a Dial-Up remote control with telephone audio input and output for remote broadcasting.
- If your automation works with satellite networks, you can use the DR-10's relay outputs to fire commercials, liners, etc. Save $$ with no staff needed at the studio!
- Use the DPDT relays to insert the phone audio directly into the program path when necessary, especially for emergencies or to bypass your automation sysytem.
- When used with our Silencer Option, the DR-10 is the **ONLY** product available that completely removes DTMF control tones from the audio path for clean remotes.

Get the DR-10 & start saving money now!
www.circuitwerkes.com

CircuitWerkes, Inc. - 352-335-6555

World Radio History

USER REPORT

M2.2R: KPBS' Main Mod Monitor

by Rocky Curless
Chief Engineer
KPBS(FM)

SAN DIEGO KPBS(FM) was an early adopter of HD Radio, serving both San Diego and the Imperial Valley with two full-power transmitters. We ordered two **DaySequerra** M2 modulation monitors for our first HD Radio install in San Diego, then the M2.2R for our second install in Calexico. I rely on them as our main off-air modulation monitor because of their dependability, performance and features.

Where the M2s do an outstanding job of monitoring our HD broadcasts, the M2.2R gives us tools to know even more about our broadcasts and comes standard with features that used to be optional.

DaySequerra's M2.2R has everything I need in a professional HD Radio modulation monitor: remote operation, analog and AES audio (both active in HD and FM), split mode for time alignment, RF signal level bar graph meter, display for PAD information and RBDS.

Quality control

The M2.2R measures analog pilot and SCA injection levels and incidental AM noise accurately in the presence of our HD signal, something that my older, non-HD-aware monitor cannot do. The vacuum florescent display shows me scrolling PAD or RBDS data. Like the M2, the M2.2R holds 20 AM and 20 FM presets, so I can monitor other stations quickly. When receiving stations off-air, the M2.2R is sensitive while remaining selective.

As an NPR affiliate and a good steward of quality audio, we have found our DaySequerra monitors to provide perfect HD audio. We depend on the M2 and the M2.2R to give us a transparent view backward into our transmission chain so we can set our processing properly. In addition to giving us analog and AES digital outputs, the M2.2R keeps the AES output alive, even when we tune to non-HD stations.

We really like the M2.2R's alarm system, which DaySequerra calls "PLM," for Performance Loss Monitor. The unit has six dry, floating relays that we can program to operate when our RF carrier or program audio level drops or disappears, or if we lose OFDM lock, multicast capability or delay bit. DaySequerra lets us alarm our PAD or RBDS data, so I don't have to keep glancing at my car radio to make sure the automation is working.

The M2.2R comes standard with an Ethernet port for remote control and DaySequerra's Remote Dashboard program. From my office, I can log into the monitor and confirm that my signal is present. I can see and log my PAD data, and the software can send me e-mail when an alarm condition occurs.

I do like DaySequerra's approach to split mode. It puts the left analog signal on the left VU meter and the left digital signal on the right VU meter. A/D level balancing is easy, but the real fun is time alignment. The meters are peak-reading, so it's easy to see when the blend alignment is right.

The M2.2R retails for $5,995.

For more information, contact DaySequerra at (856) 719-9900 or visit www.daysequerra.com.

WVIJ Monitors ZX2000 With Web Remote

by Dan Kolenda
Pastor, Calvary Assembly of God
General Manager/Chief Engineer
WVIJ(FM)

PORT CHARLOTTE, Fla. WVIJ(FM) is a Christian educational radio station associated with the Calvary Assembly of God and Port Charlotte Christian School. Owned by the non-profit Port Charlotte Educational Broadcasting Foundation, the station reaches Charlotte County and most of Desoto County, as well as parts of Lee County and Sarasota County, in southwest Florida.

The FCC recently awarded the station a power increase from 680 watts to 1.9 kW, vastly improving the signal quality in its fringe areas.

The power increase also required a transmitter upgrade. We opted for a **Harris** ZX2000 transmitter after considering a less expensive analog transmitter, mainly for its clear upgrade path to digital through a simple exciter swap and some other minor adjustments. The ZX2000 also is notable for its remote monitoring capability through the Harris Web Remote system.

Web Remote is an IP-based optional module integrated into the transmitter that offers a modern approach to maintaining the health of the transmission system. While the system is available in a 1 RU version, the ZX transmitters are designed to accept the modular version — essentially a computer-based card that is inserted into a built-in slot.

Both versions have plenty of auxiliary inputs for monitoring external equipment in the transmitter room, though for now we use it strictly for monitoring the transmitter and other critical measurements related to the facility, such as building temperature. Web Remote is officially responsible for monitoring the health of two broadcast streams, as the ZX2000 transmits programming for both its main analog channel and a foreign language service on its subcarrier frequency.

You've got mail

The e-mail alerts pinpointing specific service issues with the transmitter are what caught my attention initially. The station also uses an older Gentner remote monitoring system that still provides excellent readings and event logging but is not as time- or energy-efficient.

Speed, however, is a major advantage with an IP-based system. Instead of dialing into the Burk system by telephone, Web Remote is accessible via a basic Internet connection. I simply log onto a computer, open a browser and type in the IP address assigned to my Web Remote. The ZX2000 meters and diagnostics are ready to view, with the ability to send commands to the transmitter at the click of a mouse.

Web Remote also logs parameters including what time any control functions have been activated, such as raise or lower power or transmitter on/off.

The station's Web Remote system is set up as an intranet-based system so I can log into the system through multiple computers, plus the BlackBerry that is glued to my hip. This allows for immediate response to e-mail alerts; and Web Remote acts as an online portal to fix the majority of these issues quickly with little effort, such as turning off the transmitter remotely due to extreme temperatures that present a potential failure risk if we have a building air conditioner malfunction.

Similarly, the transmitter can be reduced to half-power during strong storms to conserve energy when power failures are rampant if operating on an under-rated generator. Powerful storms are common in Florida, and the ability to reduce transmitter power over IP will at least delay, if not eliminate, a trip to the transmitter site. The power level can be raised back to normal remotely once the threat has passed.

Kolenda and WVIJ's ZX2000

Web Remote lists for $1,299. It comes in two versions: the module that plugs into a ZX model transmitter, or a 1 RU standalone that connects to a transmitter.

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

TECH UPDATES

RFC-1/B: Auto Pattern Changes, Readings

Sine Systems' model RFC-1/B remote facilities controller is a transmitter remote control system that can be accessed through a standard telephone or wireless/cellular phone. Telemetry readings are reported with a male human voice.

The basic system consists of an RFC-1/B and an RP-8 relay panel that provides eight channels of telemetry and raise/lower control. Eight relay panels can be connected for a maximum of 64 channels. The RFC-1/B can be programmed to perform automatic power/pattern changes and log readings. It also can be programmed to alert station personnel during an alarm condition. For telephone line and telemetry signal surge protection, the company suggests the SP-8 surge protector.

In partnership with Innovative Broadcast Services (IBS), Sine Systems says it will release new data retrieval and control options for the RFC-1 in the coming months. The system will combine newly designed hardware accessories with a specially tooled version of IBS' The Hawk site control software.

For more information, contact Sine Systems in Nashville at (615) 228-3500 or visit www.sinesystems.com.

Sicon-8 Adds Software, Web Server

CircuitWerkes has new control software for its Sicon-8 dial-up remote control with speech capability.

Sicontroller Main Screen

Sicontroller gives the user control of the Sicon-8's programming and daily operation. Multi-site capability lets users control several sites from one computer. The free software includes a firmware updater, allowing users to add features to their Sicon-8 hardware in the field.

A scripting tool automates complex tasks from within the software, and can be used for managing items like power changes or backup transmitter operations where status and meter values must be read and used as part of a decision process.

The Sicon-8 includes a Web server that can be accessed by a Java-enabled browser or by the Sicontroller software.

The system's I/O, including eight channels of relay, are featured on the main board. Metering, status and control connections are on de-pluggable screw terminals. The hardware is expandable to 32 channels by adding up to three additional SX-8 expander chassis.

For more information, contact CircuitWerkes at (352) 335-6555 or visit www.broadcastboxes.com.

World Radio History

The Best of Both Worlds

Bridging the gap between Analog and Digital.

ADMS 44.22 Analog/AES Digital Matrix Switcher

The ADMS 44.22 is a four input stereo AES and four input stereo analog matrix switcher with two independent stereo analog and AES outputs in a 1-RU profile. Each input is equipped with a three band EQ, five types of filters and a leveler function. Any or all of the inputs may be mixed, faded, dimmed to either or both output pairs. Additional features include; selectable stereo PPM meters; headphone amplifier; powered monitor output; 16 x 16 GPIO port and RS-232 port (USB and/or Ethernet optional).

USA Proud

BROADCAST® tools

support@broadcasttools.com
www.broadcasttools.com

INNOVATIVE PROBLEM SOLVING TOOLS FOR BROADCAST

World Radio History

TECH UPDATES

RF Scout Monitors VSWR, Detects Problems

The **Dielectric** RF Scout monitors RF transmission system VSWR and forward power and detects VSWR problems as they develop. In many cases this will allow the transmitter operator to detect and remedy transmission system contributors to elevated VSWR before they affect operations, according to the company.

The RF Scout monitoring system comprises a rack-mountable unit with two power sensors and their associated cables, along with a dual directional coupler with factory pre-set coupling values consistent with the forward power level. The coupler sections are designed for the various line sizes available.

The unit continuously monitors forward and reflected power and uses a 40 MHz single-board microprocessor with non-volatile RAM capacity to calculate true VSWR. The system displays the values and can hold up to a year's worth of data and alarm events. In addition, the system also can be configured to monitor transmission line pressure and temperature.

The RF Scout starts at $3,350 and varies depending on line size and options.

For more information, contact Dielectric at (207) 655-8100 or visit www.dielectric.com.

Belar FMHD-1 Adds Remote Control Interface

Belar says its FMHD-1 digital FM HD monitor/analyzer has expanded capability and a remote control interface with its latest software update.

The software release is shipping, and adds the ability to monitor analog total, pilot, left, right, L+R and L-R modulation; active monitoring and indication of digital to analog polarity alignment; and an improved spectrum screen that allows numeric display of portions of the spectrum (upper/lower/total side band, analog and ratio of the digital sideband to analog).

Additionally, the software can be remotely updated, monitored and operated through the Belar Wizard for Windows software package.

This update also is available for free for previously purchased FMHD-1 units.

For more information, contact Belar at (610) 687-5550 or visit www.belar.com.

CMR Has Auto Phase Sign Indicator

Gorman-Redlich says its Model CMR antenna monitor offers an automatic phase sign indicator with no extra operation for accurate log or remote readings. An optional repeater-controller is available for hardwire remote control and readout via multi-conductor cable at distances up to 1,500 feet.

Non-reference and reference amplitudes are separately measured and divided electronically to give an accurate digital reading — and an equally accurate DC voltage for remote readings — that does not vary with carrier level and is stable under conditions of asymmetric modulation, according to the company.

Amplitude or true ratio may be selected for measurement with a front-panel switch. An optional common point terminal is provided for measuring common point amplitude.

Additional highlights include dual surge protection. Gas discharge tubes across the sample line terminations, and a relay that drops out when the monitor is not being interrogated and disconnects the sample lines from electronics, protect against sample line surges.

For more information, contact Gorman-Redlich at (740) 593-3150 or visit www.gorman-redlich.com.

MAC v5.10 Adds Support for Super/MiniMAC

Davicom has released Version 5.10 firmware for its MAC monitoring and control units, adding features such as SuperMAC and MiniMAC2 support.

SuperMAC support is scalable remote monitoring and control. Input/output capacity can be adapted to current and future needs by networking up to four MAC units. This gives a "super-capacity" of up to 64 metering inputs, 128 status inputs, 128 physical relays, 512 virtual relays and 512 virtual logic gates, according to the company. The SuperMAC is seen as a single MAC unit.

The MiniMAC2 is now available. It includes audio detection on metering inputs, 16 status inputs and eight relays. It operates with the same MacComm software as the MAC2 and Super MAC units.

Additionally, Davicom added features such as support for dynamic DNS servers; support for DHCP network environments; the ability to send test e-mails and trace their progress to help diagnose problems with Internet service provider mail servers; and support for Base 10 logarithm operators to allow conversion of meter readings to dB. It said customers had requested these features.

For more information, including pricing, contact Davicom at (877) 282-3380 or visit www.davicom.com.

Products & Services
SHOWCASE

Ultra Slim - 30W, 50W, 100W
Exciter/Transmitters
New Features on the LEX Series Include:
BEXT
- Built-in Stereo Generator with Very High Separation and Fast Audio Clipper
- Up to Seven Frequencies, Power Levels, and Program Presets (remote controllable): Ideal Back Up for Multiple Stations
- Rear Panel Connection for Direct DC Battery Back Up with Auto Switch Over and Built-in Charger
- Built-in, Front Panel User Programmable FSK ID Keyer for Auto ID of Translators

619 239 8462 www.bext.com bext@bext.com

RECEIVERS

OUTSTANDING specifications and pricing on professional quality receivers for EAS, monitoring and translators.

The AFC3 is a three receiver rack mount that is configured to your EAS or monitoring specific application. Each receiver has internal frequency selection (PLL) switches, front panel controls and indicators, and rear panel connections.

Price: Approximately $1300 (depending on receiver choice)

Select three receivers from our FM or FM/SCA, NOAA Weather, Public Service and/or AM Monitor/Receivers. All receivers are PLL (synthesized) designs using the latest state of the art components and are available as stand alone receivers as well as in AFC3 combinations.

DAYTON INDUSTRIAL CORPORATION
2237 Industrial Blvd., Sarasota, FL 34234 Tel. (941) 351-4454
Email: SCARadio@aol.com WebSite: www.DaytonIndustrial.com
Quality Receivers Designed and Manufactured in the USA since 1980

World Radio History

BROADCAST Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

ACOUSTICS

WANT TO SELL

AcousticsFirst™
Toll-Free Number 888-765-2900
Full product line for sound control & noise elimination.
www.acousticsfirst.com

AMPLIFIERS

AudioClassics.com Buy - Sells - Trades- Repairs New, Used & Vintage - McIntosh, Marantz, Klipsch, Tannoy, JBL and other US made audio equipment. 800-321-2834

WANT TO BUY

Collector wants to buy old vintage speaker & amplifier, McIntosh, Marantz, Electro Voice, Jensen, Altec, Tannoy, Fisher, Dynaco, Cash- pick up 773-339-9035

ANTENNAS/ TOWERS/CABLES

AM Ground Systems
Reliable, On-time Installation
Quality Workmanship
Ground System Evaluation
and Repair
www.amgroundsystems.com
1-877-766-2999

FCC COMPLIANCE
TOWER SIGNS
AM & FM Tower Signs
ASR-Tower Registration
Standard & Custom signs
Guy Wire Protectors - Ant. Tags
ANTENNA ID PRODUCTS
antennaID@msn.com
Free Catalog
610-458-8418
www.antennaID.com

WANT TO SELL

ERI 10-bay High Power Rototiller, center fed antenna on 105.3. Just removed from tower, on the ground ready for pick-up. Excellent Condition. Make offer. todd@94k-rock.com 231-843-0941, ext.11

Two Wil-Burt Company Antennas - $7,000 each. For information, call Tempesst Allen 318-730-1558 or 318-264-9033. Will negotiate the price.

www.radioworld.com

AUDIO PROCESSING (INCLUDES ON-AIR)

WANT TO SELL

ARTS Model 416 DA. Will let go for $75.00 plus S7H. Please e-mail mraley@bbnradio.org for pictures and information.

Symetric A-220 Stereo Amplifier - $115.00 "as is" email mraley@bbnradio.org for a picture or Mike at (704) 523-5555

AUTOMATION EQUIPMENT

WANT TO SELL

Now available, radio automation for the Linux operating system. Schedule music, voice track, create shells, auto or announcer assist mode, set intro and ending cues, hit the vocal every time with your voice tracks, execute exact time events, join networks, and more. The software is free, there is a small duplication fee. For more info call 406.665.1832.

CAREERS

Where can I find... a job? an engineer?
SBE
RESUMEBank
JobsONLINE
(317) 846-9000
Go to Career Services at www.sbe.org

COMPLETE FACILITIES

WANT TO SELL

NEW OR USED COMPLETE PACKAGES
STUDIO/STL/TRANSMITTER /ANTENNA OR ANY COMBINATION OF ABOVE.
-LEASE OPTIONS-
-EMERGENCY RENTALS-
-REMOTE BROADCAST RENTALS-
SCMS, Inc. (800) 438-6040
"You Know We Know Radio"

CONSOLES/MIXERS

WANT TO SELL

BE Mono Spotmaster - 8 channel $300.00. Call Carl Haynes 601-573-2445

Harris Executive Stereo 10 Channel Console $500.00. Call Carl Haynes 601-573-2445

PROMOTE YOUR BUSINESS!
ADVERTISE!

LIMITERS/AUDIO PROCESSING

WANT TO BUY

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST - 214 738-7873 or sixtiesradio@yahoo.com

MICROPHONES

WANT TO BUY

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 214 738-7873 or sixtiesradio@yahoo.com

MISCELLANEOUS

WANT TO SELL

ROTRON BLOWERS AND PLATE BLOCKERS, new & rebuilt for Elcom, Harris, CCA, CSI, McMartin. Goodrich Ent. 11435 Manderson St. Omaha, NE 68164 402 493 1886 FAX 402 493 6821

Energy-Onix 1000 amp only makes 600watts for sale "as is" $1100.00 plus s&h. E-mail MRaley@bbnradio.org for pictures.

Five (5) Sensaphone 1100 Alarm and remote monitoring units. $75.00 each plus S&H. E-mail mraley@bbnradio.org or call (704) 523-5555 for information

McMartin MS-25B Amplifier - $15.00. e-mail mraley@bbnradio.org for information

Seven (7) bulk demagnetizers and Four (4) wand demagnetizers. Sell for $10.00 each. E-mail mraley@bbnradio.org

HV TRNSFS AND CHOKES for AEL 10 and 10 KW – XMTRS W. C. Florian 312-633-9700

WANT TO BUY

Collector want to buy: old vintage pro gears, compressor/limiter, microphone, mixing consoles, amplifiers, mic preamps, speakers, turntables, EQ working or not, working transformers (UTC Western Electric), Fairchild, Western Electric, Langevin, RCA, Gates, Urei, Altec, Pultec, Collins. Cash - pick up 773-339-9035

Equipment Wanted: old, obsolete, or unused signal processing, recording, and playback equipment. Limiters, preamps, EQ, mixing desks, microphones, tape machines (cassette and reel), etc. **Donations gladly accepted;** asking prices considered. 443-854-0725 or ajkivi@gmail.com.

I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR, KSFX, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc... Feel free to call me at 415-383-6216 or you can email me at ronwtamm@yahoo.com.

Transmitter Bandpass filter – Power Rating at 5 KW or more – Freq 101.9 FM – Call John at 928-425-7186 or email bill@gila1019.com but must place" **for John"** in the subj line.

DONATIONS NEEDED

Non-profit, Low Power community radios stations need Equipment- All Volunteer Stations . Will offer tax deduction letter. You determine donation value. We will pay shipping. Equipment shared between three Wisconsin stations. Looking for Mics, Mixers, field equipment, etc. You name it. Email: Dan@WIECradio.org

MONITORS

WANT TO SELL

Five (5) Belar RF amplifiers good condition will let go "as is" for $185.00 each. Please contact mraley@bbnradio.org or call (704) 523-5555 for pictures or information

We have 16 Gentner VRC 2000 remote control units. Fail safe device not included just the remote control unit. Will sell "as is" for $300.00 each plus s&h. Please contact Mike at mraley@bbnradio.org for a picture or more information.

REMOTE & MICROWAVE

WANT TO SELL

WE RENT FOR LESS
Blueboxes
Zephyrs
POTS Codecs
RF/Audio Gear
FM Exciters
FM Power Amps
STL's
Test Equipment
If we don't have it, we will get it!
SCMS, INC. (800) 438-6040
"You Know We Know Radio"

SATELLITE EQUIPMENT

WANT TO SELL

Wegener satellite receiver OR 96 – One Zephrus 304 – Best offer - Call Carl Haynes 601-573-2445

STATIONS

WANT TO SELL

AM Radio Station For Sale -10 KW - Covers SE Wyoming And All Of Northern Colorado - $2.5 Million Dollars - Info: 720-979-9682

NEW FM CP's for Western college towns. Class C1 KRKV covers Lamar to La Junta, Colorado. Class C3 KVAR reaches from Chadron to Gordon, Nebraska, includes tower site. Asking $250K each or $450K for both. Contact Richard at 256-497-4502 or rwdabney@yahoo.com.

VSoft
The Leader in Broadcast Engineering Software
Winner of the 2007 "Cool Stuff" Award!

Professional Software packages for FCC applications and predicting coverage.
- Create stunning "real-world" coverage maps and interference studies using Longley-Rice, PTP, FCC, ITU-R P.1546-1, and Okamura/Hata with Probe 3™
- Search for FM channels under spacings and contour to contour protection using FMCommander™
- Prepare AM skywave and groundwave allocation studies and map FCC contours with AM-Pro 2™
- Plot STL paths over 3D terrain with Terrain-3D™
Quality custom mapping and FCC engineering consulting available.
www.v-soft.com (800)743-3684

www.radiostationsforsale.net
AM CP in Providence RI @ 1M
AM-FM-Weekly PA @ 1.75M
AMwFM Translator NH @ 500K
FM Class A CP in PA @ 250K
FM Class C-3 in ME... @ 595K
FM Translator in ME ... @ 35K
Inquiries 781-848-4201 anytime Or e-mail salesgroup@beld.net

FOR SALE: 10 kw AM between Nashville and Knoxville. Futher upgrade possible. 931-265-4945 or e-mail flightdeckradio@yahoo.com.

STUDIO ACCESSORIES/ SUPPORT

WANT TO SELL

Audio Arts Model PS 6040 power supplies (Audio Arts R-60). Will let go for $200.00. Please contact mraley@bbnradio.org or call (704) 523-5555 for information.

Four (4) Audio Arts R-60 manuals for $20.00 each (price includes shipping). E-mail mraley@bbnradio.org or call (704) 523-5555 for more information.

LPB Blue 5c consoles – We've got about ten of them in good condition. We will let them go "as is" for $500.00 each plus S&H. Contact Mike Raley at (704) 523-5555 or e-mail mraley@bbnradio.org for pictures.

TAPES/CARTS/ REELS/CDs

WANT TO BUY

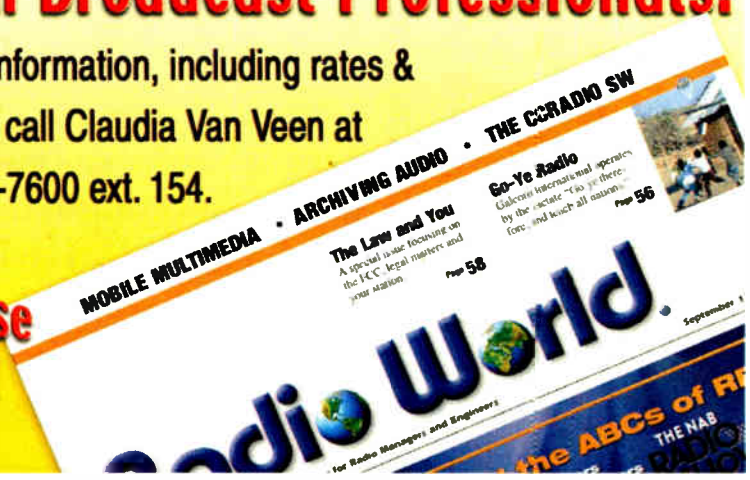
Large or small collections of 16" transcriptions or 12" transcriptions, not commercial LPs. Bill Cook, 719-687-6357.

V-DISCs – 12 in. 78 RPM discs. Bill Cook, 719-687-6357

TEST-METERING-MONITORING

WANT TO SELL

Test Equipment: 1. Spectrum analyzer 2. FM Field Strength Meter 3. Analog Bird Thruline wattmeter w/ slugs - Call John at 928-425-7186 or email bill@gila1019.com but must place" **for John"** in the subj line.

Reach Broadcast Professionals!
For more information, including rates & deadlines, call Claudia Van Veen at 1-703-998-7600 ext. 154.
Advertise today!


World Radio History

Consultants

Consulting Communications Engineers
EMC Test Lab
• FCC Applications and Field Engineering
• Frequency Searches and Coordination
• AM-FM-CATV-ITFS-LPTV
• EMC Test Lab-FCC and European (IEC)
OWL ENGINEERING, INC.
E-mail: info@owleng.com **651-784-7445** Fax (651) 784-7841
5844 Hamline Ave. N., Shoreview, MN 55126 *Member AFCCE*

The Coverage Map Store
REALcoverage.com
High Performance Engineering for Maximum Coverage

Structural Analysis
ERI
Electronics Research, Inc.
7777 Gardner Road
Chandler, IN 47610
(812) 925-6000
www.ERIinc.com
REGISTERED PROFESSIONAL ENGINEERS STRUCTURAL ANALYSIS TOWER REINFORCING ERI Incorporated 1943

COMMUNICATIONS TECHNOLOGIES, INC
RADIO FREQUENCY/BROADCAST ENGINEERING CONSULTANTS
- AM, FM, TV coverage & Upgrades
- Broadcast transmission facility design
- FCC applications preparation - construction permit and license engineering

Clarence M. Beverage • Laura M. Mizrahi
P.O. Box 1130 Tel: (856)985-0077
Marlton, NJ 08053 Fax: (856)985-8124
www.commtechrf.com

Buying used equipment?
Selling used equipment?
YOU'RE IN THE RIGHT PLACE!
Radio World
Broadcast Equipment Exchange
For more information, call Claudia Van Veen at 703.998.7600, ext. 154. or cvanveen@imaspub.com

DISTRIBUTOR DIRECTORY
The following distributors serving the broadcast industry would be glad to help you with any of your requirements.

CORNELL-DUBILIER MICA CAPACITORS
FROM STOCK
JENNINGS VACUUM CAPACITORS
FROM STOCK
JENNINGS VACUUM RELAYS
SURCOM ASSOCIATES
2215 Faraday Ave., Suite A
Carlsbad, California 92008
(760) 438-4420 Fax: (760) 438-4759
e-mail: link@surcom.com web: www.surcom.com

Doug Vernier
Telecommunication Consultants
Broadcast Engineering Consulting
AM/FM/TV/LPTV/DTV
Custom mapping service
Frequency searches
Propagation prediction
FCC application preparation
VSoft Communications Software for your PC
(800) 743-3684
www.v-soft.com

IEM Mullaney Engineering, Inc. Member AFCCE
Serving Broadcasters Since 1948
9049 Shady Grove Court
Gaithersburg, MD 20877
(301) 921-0115
Fax (301) 590-9757
mullaney@mullengr.com

FASTER... MORE ACCURATE RADIO COVERAGE
- Real Time 3-D Displays
- Interference calculations
- Cost effective mapping
- Fully integrated databases
- Used by the FCC
- Latest standards built-in

RADIO SOFT
Visit us on the web at www.radiosoft.com
101 Demorest Sq., #E, Demorest GA -706-754-2725

SCMS INC. "Call me for your studio equipment needs"
YOU KNOW WE KNOW RADIO!
John Lackness
Sales
210-775-2725
P.O. Box 932 • Cibolo, TX 78108
johnl@scmsinc.com
BROADCAST EQUIPMENT SALES AND RENTALS

GRAHAM BROCK, INC.
BROADCAST TECHNICAL CONSULTANTS
Full Service From Allocation to Operation AM/FM/TV/AUX Services; Field Work: Antenna and Facilities Design
Over 45 years engineering and consulting experience
912-638-8028
202-393-5133
www.grahambrock.com

Without advertising a terrible thing happens...
NOTHING...
For information contact Claudia Van Veen at 703-998-7600 ext. 154 or cvanveen@imaspub.com

TRANSMITTERS/EXCITERS/TRANSLATORS

TRANSCOM CORPORATION
Serving the Broadcast Industry Since 1978
Transmitters and Broadcast Equipment for Radio & Television

Used FM Transmitters

1 KW	2007	Crown FM1000A (new)
1 KW	2007	Crown FM1000E (new)
1 KW	2007	Crown FM2000E (new)
7+ KW *Digital*	2005	Harris Z16 HDS IBOC
7+ KW *Digital*	2002	Harris Z16 IBOC
10 KW	2001	Henry 10,000D-95
20 KW	1985	Harris FM20K
20 KW	1989	QEI FMQ 2C,000B
25 KW	1995	Harris HT25
25 KW	1990	Continental 816R-3B
25 KW	1989	Continental 816R-3B
35 KW	1987	Harris FM35K
50 KW	1982	Harris Combiner w/auto exciter-

Used AM Transmitters

5 KW	1982	Harris MW5A
5 KW	1987	Harris MW5B
5 KW	1988	Harris SX5A-single phase
10 KW	1985	Continental 316F
50 KW	1985	Continental 317C2

Exciters
Used 2004 Harris DIGIT 2nd Generation "New" 20w & 30W Synthesized exciters

New TV Transmitters- Analog and Digital
OMB & Technalogix
VHF and UHF (10 W to 10 KW) TV Antennas TV STL

Used Misc. Equipment
Altronics 20KW Air Cooled Load
Denon 720R cassette NEW
Sola Voltage Reg. 60hz 1 KVA s-phase

Please visit our website, fmamtv.com, for the most current listings.

800-441-8454 • 215-938-7304 • FAX: +1-215-938-7361
www.fmamtv.com • E-mail: transcom@fmamtv.com
RETUNING & TESTING AVAILABLE • CALL US FOR A QUOTE!

Looking to Buy or Sell Used Equipment?
Look no further, you're in the right place!
Radio World
Broadcast Equipment Exchange
Call today for current rates and deadlines!
703-998-7600, ext. 154

World Radio History

ECONCO NEW TUBE

NEW

ECONCO NEW TUBES

New tubes are now manufactured by *ECONCO* at our award winning facility in Woodland California! Of course, we continue our 34 year tradition of high quality power tube rebuilding.

TEL: 800-532-6626
INTL: +1-530-662-7553
FAX: +1-530-666-7760
www.econco.com
SE HABLA ESPAÑOL

ECONCO NEW TUBE

TRANSMITTERS/ EXCITERS/ TRANSLATORS

WANT TO SELL

OFF THE AIR?
Emergency Back-up Rentals
FM Exciters - STLs -
FM Pwr Amps - Antennas -
Studio & Test Equipment
SCMS Inc (800) 438-6040
"You Know We Know Radio"

CCA AM 10,000 D – Call John KQSS 928-425-7186 between 10 & 6 PM Pacific Time.

BE FX30, 30 watt exciter – 8 years in use $1000/obo – Pat Lopeman 231-845-9666 or patrick@wmom.fm

FM Translator at 104.5 – Manchester, KY Call Joey Kesler 606-843-9999

Motorola Two Way transmitter (855.8375) Model C551 0107A removed from service due to breach of lease agreement (company went bankrupt). Cannot find much information but if you are interested please send an e-mail to mraley@bbnradio.org

Used Harris Gates MW-f (5k day 1k night transmitter serial 90939). $1000.00 plus buyer responsible for removal. mraley@bbnradio.org for pictures.

Used QEI FMQ 10000 in fair condition. This is a three phase transmitter with a bad IPA and combiner that will make about 95% power with QEI 600w amplifier. Willing to let this 12 year old transmitter go for $3095.00 but buyer must arrange pick up and shipping from Charlotte, NC. Contact Mike Raley at (704) 523-5555 or e-mail mraley@bbnradio.org for more information. Serial number is ST10KW054.

Continental 10 kW 3-phase transmitter- FM 90.5 type 816R-1A available. Taken out of service Feb 1, 2007. Extra tubes and some spare parts. Exciter not included. Contact Vernon H. Baker WPAR FM 540-961-2377 or vbaker@vtacs.com

Two AM MW-10 Transmitter, One On 1030, In WV- One On 1040, In NC - Assemble One From 2.Keep Remainder For Spare Parts. Make Offer. Contact Vernon H. Baker WPAR FM 540-961-2377 or vbaker@vtacs.com

WANT TO BUY

67 kHz (SCA Channel 1) Used or repairable (with manuals if available) – call John 517-316-5307

AM Phasors, Phasor Parts, Phase Monitors, Rf Switches, AM Transmitters. Continental Communications 314-664-4497, Contcomm@Sbcglobal.Net

www.radioworld.com www.radioworld.com

TUBES & COMPONENTS

POWER Eimac YOU CAN TRUST
ISO 9001 Certified
The Choice of Successful Broadcasters Since 1934

NEW POWER TUBES
Triodes
Tetrodes
Pentodes
NEW SOCKETS & REPLACEMENT PARTS
Worldwide Availability
Made in U.S.A.
CALL 800-414-8823
Int'l (650) 592-1221
Fax (650) 592-9988
Visit our Web Site at
www.eimac.com
CPI Communications & Power Industries

D And C Electronics
An International
Distributor of RF Components
Tubes
NEW & REBUILT
TRANSMITTERS, STUDIO EQUIPMENT, STLS, ANTENNAS,
RADIO DATA SYSTEM (FOR CAR RADIO DISPLAY)
EXCITERS-TRANSMITTERS, TRANSLATORS, MIXERS-CONSOLES, RADIO LINK
RPU, MOSFETS, VACUUM CAPACITORS, SOCKETS
Eimac CPI Communications & Power Industries Pro-Tek®
SVETLANA EEV BROADCASTING USA DISTRIBUTOR
BEST PRICES To Order: FROM OUR STOCK
1-800-881-2374
Outside U.S. (352) 592-7800
Se Habla Español
P.O. Box 6409
Spring Hill, FL 34611
BEST SERVICE
352-592-7800
Fax 352-596-4884
Website: www.dandcelectronics.com

RF PARTS™ CO.
Se Habla Español We Export
EIMAC • TAYLOR • SVETLANA
New & Rebuilt Tubes - Same Day Shipping
Motorola • Toshiba • SGS • Thomson & Mitsubishi Semiconductors
800-737-2787 760-744-0700
rfp@rfparts.com www.rfparts.com

FOR THE BEST PRICE
& 24 Hr service on transmitting tubes & sockets/parts, new & rebuilt call Goodrich Ent. at
402-493-1886 day or night,
www.goodrichenterprises.com.

WANT TO SELL

3CX3000A7 Econco tested – "Good" $300 – Pat Lopeman 231-845-9666 or patrick@wmom.fm

Buying Or Selling Used Equipment?
You're in the right place!

EMPLOYMENT

HELP WANTED

MORRIS

MORRIS COMMUNICATIONS COMPANY,
owner of KGNC-AM and KGNC-FM in Amarillo, TX
has an opening for a **Radio Chief Engineer.**

We're looking for a radio veteran with at least 5 years experience as a Chief Engineer. You should have experience with high power FM, directional AM, and hard disk automation, ideally Maestro. You will need extensive experience with computers and networking. Additionally, you will be focused on compliance, leadership, maintenance and projects. We have high standards for our products and we don't cut corners. We need you to be able to fix something permanently, quickly and economically. We'll give you all the resources you need to get the job done. SBE Certification preferred. In return for your dedication and hard work, you'll be paid a great salary, outstanding benefits, and a 401(K) program the company will pay into.

E-mail your resume to jay.white@morris.com.
Morris Communications Company, LLC is an Equal Opportunity Employer.

CHIEF ENGINEER - CITADEL BROADCASTING - DETROIT Applicant must be detail oriented, proficient in electronics, studio maintenance, knowledge of HD radio infrastructure, IT technology and DADpro32 digital delivery systems, high power AM Transmitter operations and combined FM antenna systems. Experience in directional antenna systems is preferred. Job includes overseeing technical and operational aspects of remote broadcasts, building maintenance, operating and capital budget management. Position is responsible for ensuring full operational capacity, audio quality and operating legally within the FCC parameters. On-call 24/7. 10+ years experience preferred. EOE.Resumes to: HR Dept, WJR/WDVD/WORQ, 3011 W. Grand Boulevard Ste 800, Detroit, MI 48202

POSITIONS WANTED

Extremely knowledgeable and articulate racing writer/talk show host Adam Amick is available for shows, correspondent, features, etc. Check out www.bleacherreport.com or www.rubbinsracingshow.com for samples. Call 214-384-5812 or email: adam@rubbinsracingshow.com

C.E. position wanted: Experienced with computers, transmitters, H.D. transmitters, automations, digital studios. Robert King, Call: (915) 581-2979.

Dedicated to my work, with great personality. Extremely detail oriented, respectful. Experience: broadcasting, voice work, board-operator, digital, cool edit, basic engineering and maintenance. Robert 469-254-8535; rob@r-o-b.tv.

Multi-talented, life experienced with exceptional wit looking to broaden current radio broadcasting field. General talk with unique twists. Detailed/impeccable time management. Mike sfarmer@netzero.net; 972-351-2977

Very young, hip and energetic! Versatile with good on-air presence and technical abilities. Out going and energetic, plus witty personality! Contact: Aven Polk 817-846-1838; aven30@hotmail.com

Solid behind the scenes/producing & technology/cool edit. Thinks on feet, creative writing, reliable/dependable. Works well with little or no supervision. Dan Wilson. 817-305-6227 danwilson07@yahoo.com

Very smooth voice, with quality production skills. Extremely personable, gets along with everyone! Thorough show prep, and follow through. Methodical, organized and dependable. Marvin 817-684-0191; muhammadmarvin@hotmail.com

Are you a small market station needing a good nuts & bolts engineer in the LA area? I will make your station shine! CET, fully FCC Licensed. Available for Full/Part-time/Contract work. Available immediately. Mitchell Rakoff, 917-324-8466 mitchellrakoff@yahoo.com

ADVERTISE YOUR EMPLOYMENT AD ON OUR WEB SITE FOR ONLY $2 PER WORD!
www.radioworld.com

Looking for a good deal?
You've come to the right place.
To advertise call Claudia VanVeen at 703-998-7600 ext. 154 or cvanveen@imaspub.com

World Radio History

GUEST COMMENTARY

Commit to 'Staggering' Potential of 3G

The Web Can Be More Than a Promotional Tool; Why Isn't Radio More Eager to Expand Its Platform?

by John Schaab

Three years ago, the hot buzzword in media was "convergence." This referred not only to the assault of unending media from the cable and phone companies but also the convergence of mobile technology.

While the promised convergence has taken place to an extent, it certainly hasn't expanded the platform for broadcast radio. This is puzzling because IP radio, even over a 3G network, can deliver world-class audio better than most iPod downloads or even IBOC feeds.

So why hasn't broadcast radio, the largest audio content provider in the United States, taken advantage of the opportunity to expand its platform? This also is puzzling, especially regarding the potential of the new mobile 3G market.

According to the major carriers expanding their 3G networks, the 3G phones are flying off the shelf, far outselling HD Radios. Seventy percent of all the new cars being sold in 2007 have auxiliary audio input capability, including everyday Fords, Chevys, Dodges, Hondas and Toyotas. Internet radio listenership in the work environment has skyrocketed, so the ability of audiences to continue to listen to their favorite stations while commuting home should be a given.

Why aren't people listening to their favorite broadcast stations on their mobile phones? Is this unique to broadcast radio or IP radio overall? Will the iPhone change that?

On the surface all the pieces are in place. It should be happening but it isn't, the primary reason being poor audio quality. With regard to 3G mobile streaming, there is a total lack of promotion on the part of the carriers and the streamers themselves.

Add a social phenomenon that is unique to the United States and things start to get clearer.

The quality

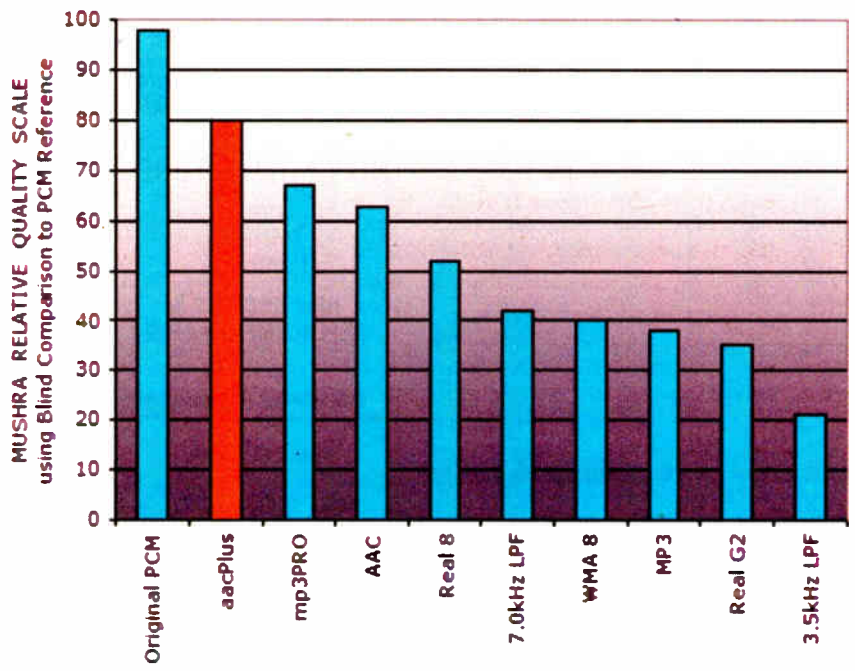
Quality is important as more and more people get online and take advantage of the variety available on the Internet.

In radio, there is a strong correlation between high audience numbers and audio quality. Radio broadcasters in particular seem to be concerned about a potential audience's ability to hear the station with a dialup modem, whereas Internet-only stations typically will provide a choice. If they don't, they will opt for higher bandwidth, more efficient codecs or a combination of both to provide a fairly high-quality sound.

While some of the major groups have posted significant numbers for their Web streams, one has to look at the number of stations being streamed and then compare those numbers to successful IP-only stations that typically offer no more than five or 10 channels, not including custom playlist services.

Major-market broadcast group CEOs announce they have an Internet strategy, yet their streaming audio quality is just awful. How can one have a strategy that doesn't have a viable product? Savvy broadcasters use their audio stream to further promote their overall product.

Codec Comparison Test Results for 48kbps Stereo
Source: European Broadcasting Union Report #BPN049



This phenomenon seems limited to radio broadcasters who evidently do not want their streams to compete with their broadcast signal. The strategy of most broadcasters is to use a codec that reaches the most players, especially in the office environment where downloaded players or plug-ins may not be allowed.

Then they make sure that they can reach dialup clients as well, so they cut the combined audio and data bit rate to 40 kbps or less, which adds "phasey" artifacts while compromising audio bandwidth and stereo imaging. Some stations even stream in mono! And I haven't even addressed the crummy ad insertion and sound effects that go along with some of these "strategies."

This sounds bad on PC speakers and worse on cell phones. I've talked to engineers at some broadcast groups who are committed to quality and who don't like what they are putting out, but corporate strategy is to minimize cost while bringing in residual revenue, using the stream as a promotional tool for the station instead of making it a viable product that can generate self-supporting revenue.

I am not promoting any type of codec here because they all sound great if operated at their "sweet spot." Instead, this is about quality, plain and simple, because broadcasters are competing against netcasts and podcasts that sound very good.

These originate not just from Internet-only streamers but also from podcasters that target millions of iPods and other portable media players. Broadcasters are not promoting their stations by sounding bad. The revenue will never do more than "cover cost."

If broadcasters are to maximize their investment as content providers, they are going to have to think differently, taking full advantage of the audio quality the Internet can provide. In doing so, they also cross-promote the station's other transmission platforms. As long as a station's strategy is based on minimizing costs, the full potential of the Internet as a revenue platform will be minimized too.

In fact, many people who listen to Internet radio are passionate about it. They don't use dialup; they use broadband. These days, people without broadband aren't interested in streaming or they'd have more than a dialup. People who listen to the Internet don't mind getting the player that will get them the quality stations they want. Listeners not using Windows Media can overcome port 80 issues.

With WiFi, WiMax, 3G, IP and more, Internet radio can deliver what HD Radio promises, but with millions of receivers already on the market. Internet radio is radio with no geographic limits — radio that can be taken anywhere there is Internet service. For many small- and medium-market broadcasters who are balking at the HD fees, Internet radio could be seen as an HD alternative as long as it delivers HD or better quality.

The carriers

Phone carriers don't want netcasters to stream. The carriers want their customers to buy content at a premium and at the carriers' convenience, so podcasts or downloads are what it is all about. That is where carriers want the business and that is where they point the promotion.

The reason is simple: bandwidth. Downloads can go at any speed. They can be time-shifted to low usage times. Live streams are a different story.

The real mind-boggler is this: The streams and live content that carriers promote not only sound horrible but use some of the most inefficient codecs on the market today. The balance sheet says they can only justify the content if it is spread over many phones. Instead of the lack of quality perceived by the listener and the impact that the codec's efficiency will have on the entire network, the compromises of the past drive the technology.

Again, the potential for quality is there; it is just not being addressed. Content of all sorts just isn't making it (except porn, of course). The recent failure of both ESPN and Amp'd, both content-rich MVNOs, highlight the surprising lack of interest in content on 3G phones.

Surprising also is that this is really limited to the United States, which points to the real problem regarding 3G media services — all of them, not just live streaming.

The politicians

Sure, why not? It seems to be a good time to point the blame for just about everything on the politicians.

The United States is virtually the only developed country that still allows cell phone use, even texting, while driving. People are too busy using their phones for photos, texting and calls to be using them for entertainment. That is what they have their iPods for, and if they plug their 3G phones into the car it will mean they have to unplug their iPods. Unless the user knows some really good stations, the iPod is going to win the quality war.

See 3G, page 45 ▶

◆READER'S FORUM◆

Embrace Diversity

Kudos to Radio World for the article "Gay Radio Gets a Coming Out" (July 18). I was saddened, however, to read Bill Bauer's editorial hate mail regarding people with different sexual orientations from what he deems to be the "right" one (*Reader's Forum*, Sept. 12).

The world is full of diversity and it is my hope that we can all strive to make room for variations without the need to condemn others because they are different.

Todd Cory
Mt. Shasta, Calif.

Joe Lasmane

I very much enjoyed Joe Lasmane's article, "Hazmat-What's That?" in the Oct. 10 issue. Not only was it funny and well-written, but it brought up some interesting thoughts regarding everything we use today, from cleaning supplies to food we put in our bodies, and the long-term effects.

I'm a young guy — 23 years old — so I don't have experience with the substances that Joe spoke about, but it nonetheless was a great read.

Ben Runnels
Bennington, Vt.

Funniest damn article I've read in years. I want to buy Joe Lasmane's book when it comes out. I'm going to have a hard time getting anything done today 'cause I can't stop laughing.

Dave Breithaupt
Syracuse, N.Y.

World Radio History

3G

▶ Continued from page 44

So the bottom line is that the same carriers who are dumping a bunch of money into content that isn't selling also are dumping a bunch of money into lobbyists to help make sure the idiot in back of you in the Hummer has to right to text whomever, whenever. Of course this means they don't buy content.

That being said, we now have the promise of a phone scheme that is based on content first and the phone second: the Apple iPhone.

John Schaab and Orban VP of Product Development Greg Ogonowski

The iPhone

While the iPhone will undoubtedly change the picture with regard to mobile content, it is not the revolution that many had hoped it would be. The iPhone's dependence on a dated 2.5G network was a concern at first. However, one realizes when looking at the actual capabilities of the phone that like the rest of the mobile industry, this model is based on podcasts or downloads. Unlike the 3G phones that allow streaming, the iPhone does not.

This is about quality, plain and simple, because broadcasters are competing against netcasts and podcasts that sound very good.

So on the surface, it appears that the iPhone will not supply the kick needed by streamers wanting to take advantage of what should be a great market and platform. In reality, the iPhone may still provide the necessary push because it has spurred competitive products from the traditional phone manufacturers and competing carriers. That competitive product will be based on 3G and that does include streaming, so there is hope.

Conclusions

Broadcast radio, for the most part, has never really understood the Internet. Instead of using the platform as an extension of the programming, radio broadcasters use it to promote their primary delivery platform. The difference between the two is the difference between delivering a high-quality product to the end-user, regardless of medium, vs. attempting to get people to listen to the broadcast station by playing an inferior product over the Internet. This is akin to promoting steak by serving Spam.

If a group's "Internet strategy" is based only on minimizing cost, this strategy cannot compete with the Internet broadcasters who are serious about their audio. Competition always will defeat those who don't compete. If you are streaming, compare your product to the Internet-only stations that you're competing against. They will start taking broadcasters' ad dollars away only if broadcasters let them.

Check out some of the "better" stations, including iTunes.com, Tuner2.com and Shoutcast.com. If you've got a true 3G phone go to *http://m.tuner2.com*. There are a lot of places to look, but take the time and compare your stream to others. Dispassionately evaluate the content and audio quality of your station's streams. Are you delivering a product that people want to hear?

It is logical for radio to take advantage of the additional platforms that the Internet provides. The Internet is nothing more than a means for broadcasters to extend their presence, keeping listeners who are on the move or on the road.

There are no additional fees for quality. Depending on which codec used, improving quality may not even require more bandwidth, unless of course people actually start listening to you because you sound "good." At that point, you might even be able to get some real ad dollars and not just leftover auction revenue. It's there for the taking, but only if you've really got a quality product outside your primary platform. Sadly, most broadcasters don't.

Broadcasters have to understand that the Internet is much more than a promotional vehicle. The potential that the 3G network holds, even without carrier support, is staggering. All it will take is a commitment by the broadcasters to the technology.

Broadcasters are spending a good deal of money promoting HD. Why not hedge the investment by promoting the additional platforms that are available to your listeners? Unlike HD's inability to compete with satellite radio in the new car market, 3G holds the potential of actually allowing a station to start cashing in on both the primary and supplemental channels that have been developed.

Increased use of hands-free technology and auxiliary audio/data I/Os in automobiles will continue to simplify the use of the multi-media handsets that are continually emerging. With the proper promotion, listeners can be made aware of how to listen to your content everywhere and will actually want to.

No matter what happens with the iPhone, CRB or just about anything else IP-related, the Internet is here to stay and so are those who want to deliver live media. If you want to be in those offices and on those phones, and get the ad dollars that will be associated with those streams, you need a quality product that goes well beyond programming.

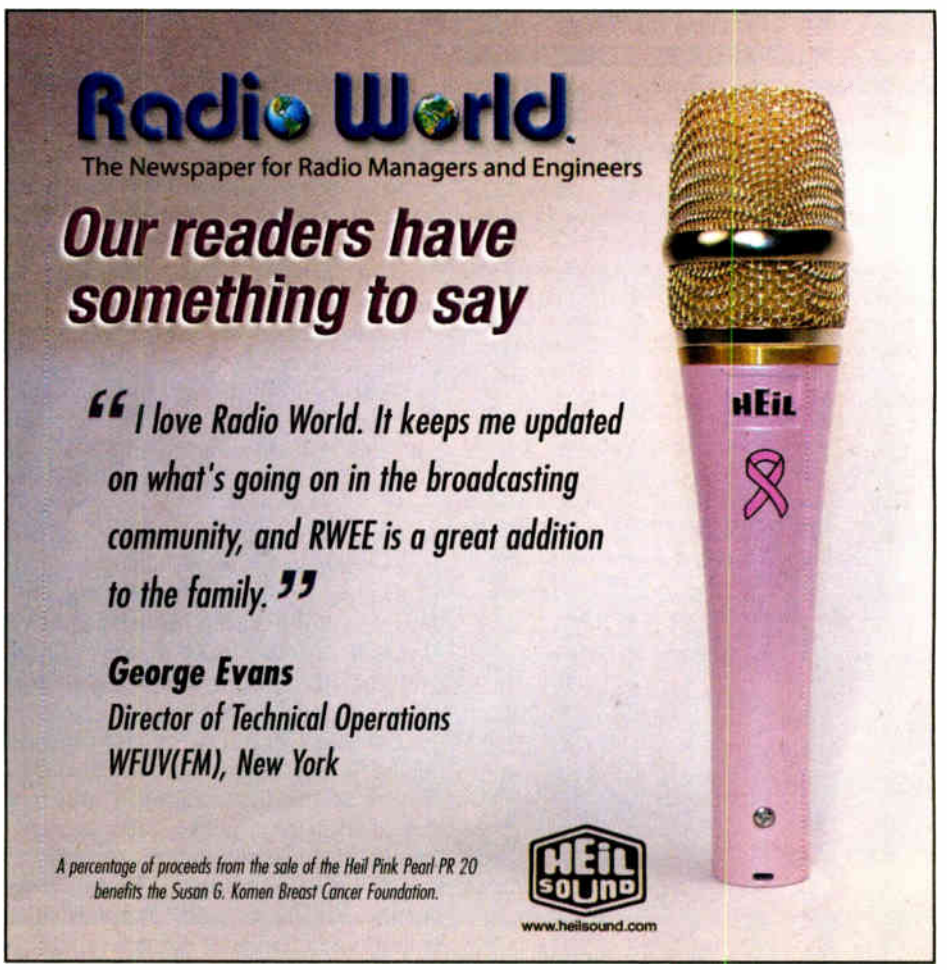
John Schaab is PC products manager for Orban Optimized Audio.

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

Advertiser Index

This listing is provided for the convenience of our readers.
Radio World assumes no liability for inaccuracy.

PAGE	ADVERTISER	WEB SITE URL
31	AEQ, SA	www.aeqbroadcast.com
12	Audemat-Aztec Inc - USA	www.audemat-aztec.com
5	AudioScience Inc.	www.audioscience.com
13	Axia - A Telos Company	www.axiaaudio.com
15	Axia - A Telos Company	www.axiaaudio.com
20	Balsys Technology Group	www.balsys.com
22	Belar Electronics Laboratory Inc.	www.belar.com
40	Bext, Inc.	www.bext.com
19	Broadcast Electronics	www.bdcast.com
11	Broadcast Electronics	www.bdcast.com
39	Broadcast Tools, Inc.	www.broadcasttools.com
29	BSI - Broadcast Software Intl	www.bsiusa.com
3	BSW - Bdct Supply Worldwide	www.bswusa.com
4	Burk Technology	www.burk.com
35	BW Broadcast	www.bwbroadcast.com
37	Circuit Werkes	www.circuitwerkes.com
7	Comrex Corporation	www.comrex.com
1	Continental Electronics Corp.	www.contelec.com
37	Davicom, a Div. of Comlab	www.davicom.com
10	DaySequerra/ATI	www.daysequerra.com
40	Dayton Industrial Corp	www.daytonindustrial.com
37	Freeland Products, Inc.	www.freelandproducts.com
14	Google Inc.	www.google.com/ads/asaudio
37	Gorman Redlich Mfg	www.gorman-redlich.com
28	Grace Broadcast Sales	www.gracebroadcast.com
21	Harris Corporation	www.broadcast.harris.com
16	Kintronic Labs Inc	www.kintronic.com
37	LBA Technology, Inc.	www.lbagroup.com
25	Logitek	www.logitekaudio.com
30	Moseley Associates	www.moseleysb.com
33	Musicam - USA	www.musicamusa.com
18	New World Radio	www.newworldradio.com
17	Omnia - A Telos Company	www.omniaaudio.com
32	Omnirax	www.omnirax.com
26	OMT Technologies/Media Touch	www.omt.net
27	Orban CRL	www.orban.com/about/timeline
23	Radio Systems Inc	www.radiosystems.com
27	SCMS	www.scmsinc.com
37	SCMS	www.scmsinc.com
34	Sine Systems	www.sinesystems.com
37	Sonifex Ltd.	www.sonifex.co.uk
8	STUDER/Harman Pro N.A.	www.studer.ch
24	Studio Technologies	www.studio-tech.com
9	Telos Systems - TLS Corp.	www.telos-systems.com
6	The Durst Organization Inc.	www.durst.org
47	Vorsis	www.vorsis.com
48	Vorsis	www.vorsis.com
2	Wheatstone Corporation	www.wheatstone.com



World Radio History

Radio World

Vol. 31, No. 29 November 21, 2007

Telephone: (703) 998-7600
Business Fax: (703) 998-2966
Editorial Fax: (703) 820-3245
E-mail: radioworld@imaspub.com
Web site: www.radioworld.com

Next Issue of Radio World December 5, 2007
Next issue of Engineering Extra December 12, 2007

For address changes and subscription renewal, please visit www.radioworld.com and click on "Subscribe to RW." To submit letters or story proposals, to request writer's guidelines, or for other editorial matters, e-mail the editor at radioworld@imaspub.com.

—EDITORIAL STAFF—

Paul J. McLane	ext. 117	*Editor in Chief, U.S.*
Leslie Stimson	ext. 129	*News Editor/Wash. Bureau Chief*
Kelly Brooks	ext. 136	*Associate Editor, RW & Production Editor, RWEE*
Thomas R. McGinley	—	*Technical Adviser*
Michael LeClair	—	*Technical Editor, RWEE*
John Bisset	—	*Contributing Editor*
Skip Pizzi	—	*Contributing Editor*
Marguerite Clark	—	*Editor (International), Milan*
Rogelio Ocampo	ext. 121	*Latin America Editor in Chief*
Karina Gerardi	ext. 137	*Latin America Editor*
Brett Moss	ext. 143	*Managing Editor (International)*
Brian Smith	ext. 140	*Managing Editor, Web*
Peter Finch	—	*Editorial Assistant, Milan*

—EDITORIAL CONTRIBUTORS—

W.C. Alexander, Steve Callahan, James Careless, Harry Cole, Mark Durenberger, Charles Fitch, Ty Ford, Scott Fybush, Harold Hallikainen, Craig Johnston, Paul Kaminski, Peter King, Mark Lapidus, Daniel Mansergh, Sharon Rae Pettigrew, Carl Lindemann, Ted Nahil, Tom Osenkowsky, Ken R., Rich Rarey, Tom Ray, Randy Stine, Richard Strickland, James G. Withers, Tom Vernon.

—ADMINISTRATION & PRODUCTION—

John Casey ..... *Publisher*
T. Carter Ross ..... *Editorial Director*
Davis White ..... *Production Director*
Karen Lee ..... *Production Publication Coordinator*
Lori Behr ..... *Ad Traffic Manager*
Kwentin Keenan ..... *Circulation Manager*

—CORPORATE—

NewBay Media LLC

Steve Palm ..... President and CEO
Paul Mastronardi ..... Chief Financial Officer
Jack Liedke ..... Controller
Nancy Gregson ..... Marketing Director
Denise Robbins ..... Group Circulation Director
Joe Ferrick ..... Vice President of Web Development

Market Groups

Carmel King ..... Executive Vice President, Video/Broadcast Group
Eric Trabb ..... Vice President / Sales Director, Video/Broadcast Group
Adam Goldstein ..... Vice President, Group Publishing Director Pro Audio & Systems Division
John Pledger ..... Vice President, Group Publishing Director Music Player Network
Jo-Ann McDevitt ..... Publisher, Technology & Learning

—ADVERTISING SALES REPRESENTATIVES—

US East & Latin America: John Casey 330-342-8361
Fax: 330-342-8362 e-mail: jcasey@imaspub.com
US West & Canada: Dale Tucker 916-721-3410
Fax: 916-729-0810 e-mail: dtucker@imaspub.com
Classified & Product Showcase: Claudia Van Veen 703-998-7600 x154
Fax: 703-671-7409 e-mail: cvanveen@imaspub.com
Europe, Africa, Middle East: Raffaella Calabrese +39-02-7030-0310
Fax: +39-02-7030-0211 e-mail: rcalabrese.imaspub@tin.it
Japan: Eiji Yoshikawa +81-3-3327-5759
Fax: +81-3-3322-7933 e-mail: callems@world.odn.ne.jp
Asia-Pacific: Wengong Wang +86-755-5785161
Fax: +86-755-5785160 e-mail: wwg@imaschina.com

Radio World Founded by Stevan B. Dana

Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by NewBay Media, LLC, 5827 Columbia Pike, Third Floor, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church, VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 282, Lowell, MA 01853. REPRINTS: For reprints call or write Caroline Freeland, 5827 Columbia Pike, Third Floor, Falls Church, VA 22041; (703) 998-7600; Fax: (703) 671-7409,
Copyright 2007 by NewBay Media, LLC. All rights reserved.

—Printed in the USA—

NewBay Media

Merger Ad Nauseum

A merger of the nation's only two subscription radio companies is a bad idea.

We've made this point but we feel compelled to reiterate it in the wake of wearisome arguments between the camps as well as endless prognostications by financial analysts as to the likelihood of regulatory approval. (At this writing, neither the FCC nor Justice Department have ruled, although anecdotal reports indicate those bodies may be leaning in favor.)

Admittedly it's diverting to watch broadcasters, XM and Sirius fling snark at each other and express through their press releases how shocked they are — simply SHOCKED — at the arguments and tactics used by the opposing camp.

"The NAB will stop at nothing to block the merger and stronger competition for terrestrial radio, including resorting to misrepresentation," the merger advocates charge.

"XM and Sirius have spent upwards of $20 million trying to bamboozle the Beltway into believing that a monopoly is good for consumers," says NAB.

Fun!

What's troubling is how many people think this decision should boil down to whether satellite services compete with traditional broadcast.

It's ridiculous to argue that traditional and satellite radio don't compete. These are sibling media that do compete for listenership.

But broadcasters shouldn't accept combat on this particular field of battle; it's the wrong argument. Broadcasters do compete with satellite; satellite and radio compete with iPods; iPods with cellphones with Internet in the car with new media ad nauseum. It's not possible to define these as utterly separate markets.

The argument here should be one of fairness. Any form of media regulation must ultimately involve arbitrary decisions; but when such regulation is deemed necessary, we must follow it to its reasonable outcome. If we accept the regulation to begin with, we must accept its consequences.

The valuable satellite spectrum was auctioned by the FCC, which decided that two, and only two, companies could use it. Those companies enjoyed protection against competition for years while they labored to start up; their niche continues to be protected against new entrants by FCC fiat.

XM and Sirius accepted the spectrum on that basis and promised to use it to advance new services — despite the opposition of existing media companies as well as the pleas of other hopeful new satellite applicants. And the two companies have used the spectrum well, to their great credit.

But they now apparently can't continue to operate under those assumptions — or, if they can, they don't want to. So they seek to change the ground rules under which they were granted this precious access while protected from direct competition, arguing that the competitive media landscape has changed dramatically since 1997.

(Well if the competitive marketplace has changed in 10 years, it has certainly changed in the century since good ol' radio has been around. By that argument, we can now do away with all radio merger restrictions. Total free markets!)

Seriously, though: Would the FCC and DOJ have approved a one-company satellite radio monopoly a decade ago? Certainly not. Would regulators have approved a *two*-company satellite service if they had known the two would merge within a decade? We feel confident the answer is no.

These answers suggest to us a proper outcome. Reject the merger; lacking that, delay the merger while erasing restrictions on competition to the newly merged entity.

We're fans of satellite. We argued in favor of the service when it was proposed; it's indisputable that these aggressive program competitors have forced traditional radio to start to rethink its business models. Often we find ourselves slapping our foreheads at the latest announcement from programmers at Sirius or XM, asking ourselves "Why didn't broadcasters think of that?"

But we find no compelling reason to change the assumptions established by regulators when the services were approved. And we reject the argument that combining the country's only two paid satellite radio services will result in better service to consumers. That, too, is ridiculous on its face. Monopolies within protected industries degrade, they do not improve, benefits to consumers. If the merger is approved, we predict higher prices and fewer program choices. Satellite's many fans will regret the decision in a few short years.

— RW

◆READER'S FORUM◆

iTunes Tagging

I'm very excited about iTunes "tagging" ("HD Radio, Meet the iPod," Oct. 10) for a number of reasons.

First, it's good for radio.

Right now, we have the opportunity to propel radio into the heart of new technology devices that are favored by consumers; to bridge a decades-old gap between music sales and radio airplay. The day when a radio station plays and promotes music, only to compel the listener to go buy the music "somewhere else," are over.

With radio participating with iTunes, listeners "tag" the song on supporting devices and are directed to the station's Web site to buy the song, as they listen to it!

I'm also excited to see so many working so hard to make this happen quickly.

Having turned on the first stations to employ tagging in Seattle and San Francisco, I was lucky to see a different side of HD Radio product development that few people see.

During the software development phase, I met "teams" of dedicated developers at Ibiquity, names I had never heard. But these people were amazingly dedicated to seeing this successfully turn on [as demonstrated by] countless e-mails and phone calls, at times of day totally in defiance of the time zones they originated from.

At times, over the weekends, I had stacks of inquiries, asking me to "Please let me know how it goes," as if a baby were arriving.

It's exciting to be sitting in Cupertino, Calif., at Apple headquarters, where every employee you're introduced to "gets it," and you are instantaneously thrust into creating products you know will be an elegant advancement related to your life's work: radio.

With tagging, we are truly improving the radio experience, utilizing all the tools available to us today. Existing technologies like RDS also will play a role in enabling devices with tagging capabilities. Slower-speed data streams like RDS can easily transport the modest data necessary to enable tagging, and with RT+ encoding of the text intended to be displayed to the end user, the device can specifically parse out artist and title (plus other data) and dedicate their device's user interface for an elegant layout, as opposed to the traditional generic crawl of RDS text.

While the wide implementation of RDS and super-inexpensive chipsets will propel tagging in the analog realm, it is only the opening act for the possibilities future HD Radios will offer us. Blazing-fast DSPs are coming to produce products possessing two HD Radio tuners: one for the audio you hear, and the other for incoming data at rates of speed far faster than RDS.

You don't have to be a rocket scientist to imagine the instant benefits when a new consumer device has an internal FM radio (with tagging data), *and* WiFi connectivity. Hear the song, tag it and download it — all while sitting at your favorite coffee shop.

Allen Hartle
Founder, CTO
Jump2go
Pebble Beach, Calif.

Michelet 'Gets It'

Paul, thank you for running John Michelet's article, "Train Your Advertisers Too" (Sept. 26).

I first discovered John's informative book, "Advertising ... Industry in Peril," more than a year ago. I found it to be an excellent book. In fact, I bought about 20 copies and gave them out to selected clients as gifts. I pretty well know which of my advertisers "get it," and sure enough, the ones I chose read it, loved it and learned from it. In addition, they saw it as our station doing one more thing to help them.

Again, thanks for sharing such valuable information, and for all you do.

Craig Baker
Eatonton, Ga.

World Radio History

QUESTION:

Would you process all these different voices the exact same way? ***Of COURSE Not!***

The new **VORSIS M-1 Digital Microphone Processor** is individually designed for ALL of your on-air talent at truly affordable prices. Only with the VORSIS M-1 do you get individual presets, fully adjustable compression and expansion, multi-band EQ (either pre or post dynamics), high and low pass filters, de-esser, and built-in phantom power. And all of it available via our easy-access graphic interface. **The M-1 Digital Mic Processor** — *a new level in voice management.*

REDEFINING Digital Audio Processing

VORSIS®

copyright © 2007 by Wheatstone Corporation

tel 252-638-7000 / www.vorsis.com

World Radio History

Condition your Signal

with the New Vorsis® HD-P3

What Is It?

A four-band parametric equalizer feeding a three-band limiter with adjustable crossover points, AGC and selectable filters for FM, AM or streaming audio formats. The HD-P3 includes a variable de-esser, an expander and dual digital outputs (one with user selectable HD latency FM delay), plus high pass, low pass and notch filters, *and* a signal de-correlator to optimize bass content. All this controlled by an ethernet protocol computer interface that lets you run one or many HD-P3s from your office or internet based locations.

What It's For:

Processing for your new HD signal, improving your existing FM or AM signal chain, preprocessing streaming audio-over-internet, a standalone HD processor or a realtime DJ monitor feed—and finally—a KILLER studio production tool.

What's It Like?

"PERFORMANCE WITH OVERDRIVE"

VORSIS® It's What's Next in Processing

a division of Wheatstone

Copyright © 2007 by Wheatstone Corporation

World Radio History