

Lost Radio Programs

Brian Turner explores the deeper recesses of radio's treasure vault.

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Multicast on the Air

The list is growing fast. Who's multicasting in what formats?

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Radio World

\$2.50

The Newspaper for Radio Managers and Engineers

March 15, 2006

INSIDE

OPINION

▼ Comments on the future and other hot topics from Jeffrey Hugabone, Rick Perotta, Ken R. Deutsch, Tom Hartnett, Gary Keener and more.



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NEWS & HD RADIO

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Also: Reviews of 25-Seven's ATM and Digigram's PCX HR.

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E-mail:
radioworld@imaspub.com

Citadel Gets the Mouse House

Acquisition of ABC Radio Assets to Create New No. 3 Owner on Revenue List

by Randy J. Stine

NEW YORK Barring opposition from government antitrust officials or the FCC, Citadel Broadcasting's \$2.7 billion acquisition of ABC Radio will create the nation's third-largest radio group (ranked by revenue), one capable of competing on a better footing with broadcasting giants such as Clear Channel and CBS Radio, analysts say.

The merger is a complex cash and stock transaction that will create a new Citadel subsidiary. It will include 22 ABC Radio stations and the ABC Radio Networks, according to participants. ABC Radio Networks has 4,500 affiliates and is home to big talent names like Paul Harvey, Sean Hannity and Tom Joyner.

Citadel officials declined to comment further about specifics of the deal or what they intend to do with the ABC Radio stations and network. Citadel CEO Farid Suleman will continue in that role with the new entity. Participants expect the sale to close by the end of the year.

The big deal gives Citadel an additional 14 FM and eight AM stations, all in the top 16 Arbitron markets. Citadel's existing stable of stations are mostly in market numbers 50 to 150. Its largest market had been Salt Lake City, Utah, ranked 31. The newly combined company, to be named Citadel Communications, will be comprised of 177 FMs and 66 AMs and have an estimated \$1 billion in revenue.

ESPN Radio and Radio Disney were not included in the transaction, the participants said.

Citadel, headquartered in Las Vegas, was founded in 1984 with Larry Wilson as CEO. Investment firm Forstmann Little

See DEAL, page 3 ►

MULTICASTING

Special Report from Radio World Newspaper

HD Radio
Expands
The Dial

A special report
on multicasting
accompanies this
issue of Radio World.

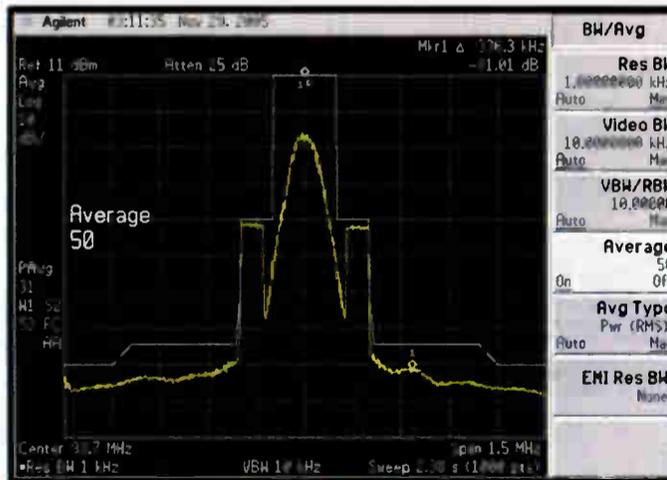
NEWS MAKER

For Broadcasters, Ferrara Is HD Radio's New Point Man

ORLANDO, Fla. Peter Ferrara has done nearly every job in radio, including jocking, sales and management. Now he holds a job that didn't exist a few months ago. The 54-year-old is point man for the HD Digital Radio Alliance, a group comprising 12 members, mostly large radio group owners, working in concert to promote digital radio.

Ferrara is logging frequent flier miles as he meets with receiver manufacturers, retailers and automakers to let these factions know broadcasters are serious about promoting HD Radio to

See FERRARA, page 6 ►



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HD2 Work Covered by AFTRA

by Leslie Stimson

Labor on multicast channels at Clear Channel's unionized stations are covered under an agreement with the American Federation of Television and Radio Artists that the union believes is precedent-setting.

While the broadcaster receives discounted wage rates for work to produce HD2 channels for now, both sides have agreed to revisit the issue should multicasting take off. The union says it has been assured that all programming work on multicasting at Clear Channel's unionized stations will be covered under the agreement and with basic

working conditions met.

That's the gist of language referring to multicasting under the agreement that covers roughly 30 to 35 of Clear Channel's 1,200 stations. Only union stations are included.

A union official believes the contract is the first of more to come and says other radio groups are interested in crafting similar deals.

Meanwhile, the union is looking to the future and the impact on members of other technologies besides digital radio. It said it is working on contract language that could be used no matter how content is delivered.

"Technology is changing in radio,"

said AFTRA General Counsel and Legislative Director Tom Carpenter.

"I think a lot of radio owners are trying to figure out what their business plan would be, taking into account podcasting, multicasting, the Web, etc."

The AFTRA-Clear Channel Radio deal was reached last summer. Carpenter told Radio World other group owners have been asking questions about the union deal.

HD2 covered

The agreement states that on-air labor for the HD2 channels is covered by AFTRA's contract with Clear Channel Radio and sets a baseline for

other stations multicasting their digital signal, in the union's eyes.

"This is a national agreement, dealing with a technical issue. We think it makes sense as a policy issue to deal with these issues in a common way," said Carpenter.

"To the extent it represents a new business venture for our employers we want them to do it in a way that is profitable, but also to make sure our members' interests are taken into account also."

AFTRA sees multicasting as having the potential to create more radio employment opportunities in the future.

Yet the union is aware that broadcasters are asking employees to repurpose content into several products; it wants to ensure union members are compensated fairly.

"Now, after an airshift, it's 'Can you update a blog for us, or podcast?' It creates added value for the company and creates a workload issue for the employee," said Carpenter.

Clear Channel approached the union last summer and indicated it wanted a national contract to cover multicasting, Carpenter said.

Conceivably, a station could sell four times the revenue, depending on how many digital channels it produced, he estimates.

"We said to them if they would commit to making sure it would be done with a union contract and with basic working conditions, they could have a discount wage rate for the supplemental streams."

Market size counts

The amounts paid to air talent vary by market size and the agreement gives the radio group "a little latitude" on voice-tracking; Carpenter said this approach makes sense because multicasting is in its infancy.

See AFTRA, page 3



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Deal

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& Co., led by Wall Street financier Ted Forstmann, acquired it in 2001.

The Walt Disney Company acquired Capital Cities/ABC in 1996. The company's programming offices are in Burbank, Calif.

'Upper echelon'

"This moves Citadel into the upper echelon of broadcast groups. They have strong financial backing and a strong financial commitment to the medium. Citadel is a very well run group," said Mark Fratrick, vice president of BIA Financial Network Inc.

Fratrick said it appears Citadel beat out Entercom for the Disney radio assets by simply being the highest bidder.

"The \$2.7 billion is a very healthy number. It's obvious prices are down from four of five years ago. However, it's still a big dollar amount, even if they are large-market stations," Fratrick said.

One thing the new Citadel has in its favor is CEO Farid Suleman's big market experience while COO of Infinity, which is now CBS Radio, analysts said. Suleman also gained valuable radio network experience at Westwood One.

Suleman "is experienced and familiar with competing in larger markets," said Bishop Cheen, analyst with Wachovia Capital Markets, covering the media and entertainment sector. "I'm sure he's learned a lot about running properties in smaller markets at Citadel the past several years. Therefore, if there is anyone out there who do well in both worlds, he seems very well qualified."

Cheen says Citadel's combination of large and small markets should position the broadcaster to possibly outperform the market once the economy improves.

The group "has more firepower now. They'll be the third force in radio, trailing only Clear Channel and CBS Radio.

| BIA Rank | Owner | Revenue (\$ 000) | Stations | Markets |
|----------|-------------------------------|------------------|----------|---------|
| 1 | Clear Channel | 3561925 | 1185 | 192 |
| 2 | Infinity Broadcasting | 2207500 | 178 | 41 |
| 3 | Cumulus | 578100 | 335 | |
| 4 | Entercom | 486025 | 103 | 21 |
| 5 | Cox Radio Inc | 485600 | 78 | 19 |
| 6 | ABC/Disney | 454750 | 72 | 43 |
| 7 | Citadel Broadcasting Corp | 412457 | 224 | 50 |
| 8 | Radio One Inc | 378400 | 69 | 22 |
| 9 | Univision Communications Inc | 351600 | 73 | 22 |
| 10 | Emmis Communications | 308275 | 24 | 8 |
| 11 | Bonneville International Corp | 245450 | 38 | 7 |
| 12 | Salem Communications | 205950 | 106 | 40 |
| 13 | Greater Media Inc | 185500 | 19 | 6 |
| 14 | Spanish Broadcasting System | 157100 | 20 | 6 |
| 15 | Jefferson-Pilot | 153100 | 17 | 5 |
| 16 | Saga Communications Inc | 134550 | 87 | 15 |
| 17 | Beasley Broadcast Group | 127300 | 42 | 10 |
| 18 | Entravision Holdings LLC | 96325 | 52 | 20 |
| 19 | Regent Communications, Inc | 87975 | 74 | 14 |
| 20 | Journal Communications Inc | 82925 | 37 | 8 |

The top 20 radio groups, ranked by revenue, as of December 2004, the latest BIA figures available. This shows the marketplace prior to the ABC sale.

Once radio finds some market traction, Citadel should be strategically positioned to perform well," Cheen said.

Jim Boyle, Wall Street analyst and former managing director of Wachovia Capital Markets, said he expects integration to go smoothly with limited friction.

"Sometimes there is a major culture clash in these deals. However, I don't expect that to happen even with the difference in market sizes. Citadel has brought in some major market experience. I think they have a good mix of people in place," Boyle said.

Boyle specifically mentioned Citadel COO Judy Ellis, former manager of Emmis' New York station cluster.

However, some analysts still question the synergies created by the newly formed group.

"There remain some unanswered questions surrounding this transaction. ABC and Citadel differ quite significantly in cluster size, which could make it difficult for them to realize cost savings across the platform," said Marci Ryvicker, Wachovia Securities analyst.

Ryvicker also wondered whether the deal could mark the beginnings of an exit strategy for Citadel's majority owner, Forstmann Little & Co. The investment firm owns approximately 67 percent of Citadel and took the broadcaster public in 2003.

The Citadel/ABC Radio merger follows closely the Cumulus Media acquisition of Susquehanna for \$1.2 billion last fall. Despite those two high-profile deals, media brokers expect the transactions market to remain flat the remainder of 2006.

"These two deals are prominent, but I don't expect them to be a harbinger of things to come," said Dick Blackburn, president of media brokerage firm Blackburn & Company Inc. "It's very difficult to find these kinds of assets anymore. So many properties are just parked in groups that will not be sold anytime soon."

Serafin Bros. President Glenn Serafin said, "I don't see much happening between the top 15 radio companies. We are still in a period of moderation, but the smart money still sees opportunities in today's environment. The market is cautious, still, but improving."

Univision Radio could be the next big group sold, media brokers predicted. The broadcaster's parent corporation recently acknowledged its board of directors is exploring a possible sale of the radio division's 69 radio stations.

AFTRA

► Continued from page 2
"If people do a voice-tracked shift in addition to their regular air-shift, there's a fee that attaches to that," said Carpenter. The fee is higher for those on the main channel than for voicing a supplemental channel. "At a minimum, people are going to get paid" for supplemental channel work, he said.

Most of its contracts with the broadcaster restrict the use of voice-tracking to weekends and overnights for the analog and main digital channel, said Carpenter.

The union and Clear Channel plan to meet regularly to see how the multicasting business plan changes, he said. If multicasting takes off and brings in additional revenue, the company understands AFTRA will come back to them to ask to raise the wages for HD2 work.

For now, Clear Channel air talent get a few thousand dollars per year to

voice-track a multicast channel, Carpenter said. The arrangements are similar to multicast agreements being reached with television broadcasters.

"This is a great agreement for both sides," said Andy Levin, executive vice president and chief legal officer for Clear Channel Radio. "Our focus is to put on new and original programming on all of our digital channels. At the same time, it gives us some flexibility in repurposing the best of the best for our listeners while making sure union employees are fairly compensated."

Levin did not answer a question about how multicasting would be handled at non-union stations, however when the company announced its multicast formats earlier in the year, President/CEO John Hogan said the broadcaster had access to various in-house resources to handle multicasting duties.

Meanwhile the union is looking at questions of contract language for new technologies. Most of its contracts include language that relates to the Internet; AFTRA has been treating podcast work as Internet-related in its agreements with broadcasters. The union is exploring how it might treat content broadcast over cell phones for the future, said Carpenter.

AFTRA has several hundred radio and TV stations under contract.

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New Channels Raise New Questions

When Radio World devoted early editorial coverage to the research project called Tomorrow Radio, and when we later honored NPR's Mike Starling with our Excellence in Engineering Award, we did so in appreciation of the impact that the creation of new FM program channels might have on our industry.

Not everyone in the industry was eager to see those channels come online; others were more optimistic but doubted that the channels could be made to perform adequately to satisfy consumers.

Now several big radio groups are behind the idea in a coordinated way; and soon we'll start to learn if our expectations were realistic.

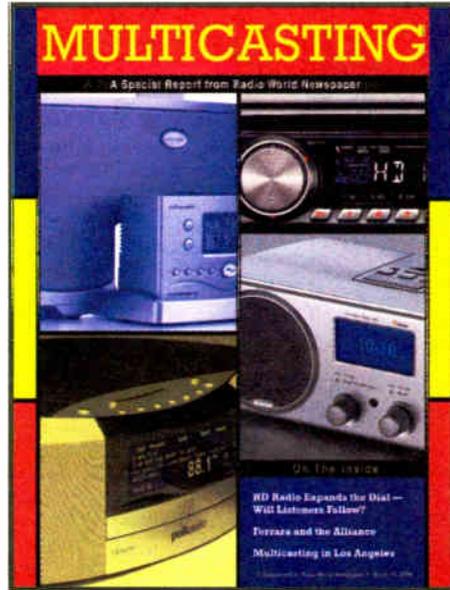
However, I feel safe in predicting that the radio buzz at the approaching NAB convention certainly will center in large part around the presence and promise of these new channels, or what we now call multicasting.

Accompanying this issue of Radio World you'll find a special 16-page supplement about multicasting, intended for managers and programmers as well as technical readers, many of whom are just starting to appreciate what this new tool might mean for them.

Appropriately, we hear from the head of the new HD Digital Radio Alliance, Peter Ferrara, in a two-part interview by Leslie Stimson that also occupies part of this issue of RW. We talk to the head programmer at Clear Channel's cluster in Los Angeles, where multicast channels have been put on the air; and Skip Pizzi provides an overview of how we got here and what might come next. The supplement's advertising sponsors tell us about their new products intended or suitable for multicasting.

Isn't it also interesting to speculate about what might happen with these new channels? Think of the implications.

If the addition of Docket 8090 stations in the 1980s helped to dilute the FM dial's offerings and caused radio owners to struggle — as many people argued — what will be the impact of hundreds or thousands of multicast channels? Or does



it not matter because the number of owners doesn't change?

If AM IBOC struggles while FM IBOC, driven by multicast, zooms to success, what will be the effect on the landscape of AM vs. FM?

If corporate radio types have been criticized for unimaginative and bland programming, will they suddenly turn into programming geniuses given new program chains? What impact might the extra channels have on radio labor?

How long will it take before multicast channels are populated by commercials? Will radio reading services find a welcome mat on HD2 channels? Might there ever come a day when multicast channels could be set up as subscription services? Might radio's frequent critics find a way to treat multicast channels as "open" space on the spectrum that could be harnessed by new licensees rather than existing ones?

What will the FCC ultimately decide about IBOC and multicasting?

Most of these questions can't be answered now. One thing's for sure, though; multicasting won't take off unless consumers can hear it. Thus it's also appropriate that the cover of the special report features not one but four HD Radio receivers that are multicast-capable.

They are manufactured, clockwise from upper left, by Radiosophy, JVC, Boston Acoustics and Polk Audio.

What's your experience with multicasting to date? How do you think it will play out? Tell me at radioworld@imaspub.com.

From time to time a listener or colleague may ask you to recommend a radio they can keep for emergencies, something not subject to failure should their electricity go out.

Buc Fitch reviewed two such models. His 2002 review of the Freeplay Plus and Grundig FR-200 can be found at www.rwonline.com. Go to the Product Evaluation tab on the left, then scroll down to March 12, 2003 and Jan. 2, 2002. The author now adds, "You might point out the plethora of uses that can be made of the FreePlay wind-up generators for charging cell phones and scanners."

Another golden oldie that popped up lately from the RW archives was Bruce Bartlett's column providing the definition of common sound terms like "brittle," "etched," "sharp," "transparent" and "warm." A reader remembered the column and asked for help finding it. You can read that helpful list on our site; go to the Reference Room tab, click on 2002 and search or scroll down to "Glossary of Sound Quality Terms," Nov. 20.

New on our site are recent articles in Bill Eldridge's series on IT Service Management. The fourth part in his multi-part series is coming up soon in print; meanwhile I recommend the first three articles to you. See the IT Service Management link.

Those articles reside on our Web site along with lots of useful information and back stories; spend some time browsing.

William O'Shaughnessy, president of Whitney Radio in New York, does not tolerate certain phrases on his station. According to a memo sent to trade media,

From the Editor



Paul J. McLane

"O'Shaughnessy has posted a sign in all WVOX and WRTN studios in Westchester that the following utterances are verboten on Whitney Radio until further notice."

They are: "Make it happen! Be proactive! Absolutely! Sounds like a plan! Gettin' it done! 24/7! Doin' what it takes! Change the paradigm! Think outside the box! The whole nine yards! Maximizing assets! Multi-tasking! A new metric! Been there, done that! He's a player!"

O'Shaughnessy thinks "absolutely" will be the hardest to kill off. I salute Bill and only wonder how he limited himself to such a short list.

Al Peterson writes that he came across a great new word on urbandictionary.com, namely BITGOD. Unexpectedly, it has nothing to do with digital technology; it's from the acronym for "Back In The Good Old Days."

The definition, as posted by Jeff Angus of Seattle, is "someone who yearns for the way things were 'Back In The Good Old Days' and automatically assumes that way on which they imprinted was the-way-it-should-be. BITGODs are not always incorrect in that belief, but they are autonomic about it and haven't thought it through."

For example: "Radio BITGODs think radio will never be as good as it was back in 1939 (or 1964 or 1972 or 1995 or whenever)." Al says the term is "perfect for radio dinosaurs who refuse to move ahead with the times." 🌐

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NEWS WATCH

Univision for Sale

LOS ANGELES Univision Communications Inc., which has radio holdings among its media assets, put itself up for sale. Univision says its board has decided to begin a process to explore strategic alternatives to enhance shareholder value; a sale, merger or recapitalization are among the options.

Univision Communications Inc. considers itself the largest Spanish-language media company in the country with TV, cable, radio holdings as well as Internet and music label divisions. Univision Radio has 69 radio stations in 16 U.S. markets and four in Puerto Rico.

UBS Investment Bank is advising the company.

VOA Programming Threatened

WASHINGTON Under budget cuts proposed by the Broadcasting Board of Governors, Voice of America would see drastic reductions in resources not related to bringing the U.S. message to the Middle East or fighting terrorism. If Congress passes its proposed fiscal year 2007 budget as is, VOA would shift more funding into TV news, which is more expensive to produce than radio news, and reduce its shortwave offerings.

The BBG had to make what it termed "painful choices" to balance its budget, and proposed the elimination of English-language program "VOA News Now," which relies on shortwave transmission.

Research shows "millions more are benefiting from Internet programming," according to the BBG in explaining why it would continue the English news mostly over the Internet. It would continue to offer English news to Africa and Special English, broadcast via shortwave for those learning the language.

The proposed 2007 budget for international U.S. broadcasting is nearly \$672 million, a 4.3 percent rise from the previous year that is targeted to the war on terror and new technology, said the BBG.

Also targeted for elimination are broadcasts in Croatian, Turkish, Thai, Greek and Georgian. VOA radio broadcasts in Albanian, Bosnian, Macedonian, Serbian, Russian and Hindi would end while television programming in these languages would continue.

Radio Free Europe/Radio Liberty will continue radio programming in Russian and Georgian while eliminating radio programming in Macedonian.

For fiscal 2007, the proposal calls for a 13 percent increase for Middle East Broadcasting Networks and a 5.3 percent increase for VOA.

Spectrum Fees in FCC Budget

WASHINGTON The FCC wants to make the most of scarce spectrum resources and kept that goal in mind when drafting its fiscal 2007 budget proposal, part of the package submitted by President Bush to Congress.

Total proposed FCC funding is \$302.5 million, a 4 percent rise from last year's \$289.8 million.

The agency would make the bulk of its money through regulatory fees; a proposed spectrum user fee is included in for stations that didn't get their licenses at auction.

"The explosion of new digital services has placed huge new demands on this traditionally scarce resource, and allocating its private-sector use has always been one of the FCC's fundamental responsibilities," states the agency in its budget proposal.

The FCC wants more money to help fund its laboratory functions, such as \$1.1 million for 12 vehicles containing direction-finding equipment so the Enforcement Bureau can bust pirates and other unlawful spectrum users.

The commission has used these vehicles to resolve interference to police, fire department and emergency medical response communications systems. In response to Hurricane Katrina, for example, the FCC used them to resolve interference affecting the communications systems of disaster relief personnel.

The agency wants to replace its fleet of aging vehicles and also update the direction-finding gear.

The commission also seeks \$700,000 to automate frequency coordination between the FCC and the National Telecommunications and Information Administration as well as frequency assignment requests that are referred from the commission's bureaus, such as WTB, IB, and EB; and reviewing frequency assignment requests that are submitted to NTIA from other federal agencies such as DOD, FAA, and NASA.

Now, this coordination function is all manual. The proposed OET Frequency Assignment Coordination System would automate cross agency frequency coordination and speed it up and make it easier to track the processes, said the FCC.

DG Systems to Fight Delisting

IRVING, Texas Digital media distribution company DG Systems, parent of StarGuide, said it received a staff determination letter from Nasdaq saying DG's stock will be de-listed because it is under \$1.00.

The supplier said "such letters are standard procedure when a company does not meet the minimum closing bid price requirement" and that it intends to appeal.

DG Systems is awaiting stockholder approval meanwhile for a proposed merger with FastChannel Network Inc. It also wants shareholders to allow a one-for-10 share reverse stock split that it thinks would result in DG Systems regaining compliance with Nasdaq minimum price rules.

Feingold Seeks Payola Hearing

WASHINGTON Sen. Russ Feingold, D-Wis. has asked Commerce Committee Chairman Ted Stevens, R-Alaska, and

co-chair Sen. Daniel Inouye, D-Hawaii, to schedule a hearing on payola.

In a letter, Feingold said New York State Attorney General Eliot Spitzer, the FCC commissioners and music, radio and concert industry representatives should be invited to testify.

Although the topic is likely to be discussed as part of several hearings the committee plans to hold in preparation for the rewrite of the Telecommunications Act, Feingold believes the topic deserves special attention. He authored the "Radio and Concert Disclosure and Competition Act of 2005" last year to "attack this problem," he wrote.

Also, Associated Press reported that Spitzer said he has subpoenaed nine radio companies in his investigation of major artists and songs that he claims got air time because of payoffs by recording companies. The companies that have received subpoenas include Clear Channel, CBS Radio, Citadel, Cox, Cumulus, Pamal Broadcasting, Entercom, Emmis and ABC.

While not addressing the request specifically, Chairman Ted Stevens said in response to queries by reporters that not every one of the 164 bills before the committee would receive a hearing and priority would go the 95 measures introduced by committee members, Reuters reported; Feingold is not a member of the committee.

News Roundup

RADIO REVENUE in 2005 was flat, according to the Radio Advertising Bureau, compared to the year before. The fourth quarter acted as a drag on the year. U.S. commercial radio revenue, including non-spot dollars, totaled \$21.4 billion.

RAB said local sales grew 1 percent, national dollars fell 2 percent, network revenue dropped 2.6 percent and non-spot dollars decreased by 1 percent in the year.

By comparison, 2004 was up 2 percent over the year prior.

ATA AUDIO is now the North American distributor for the Prodys product line. Prodys is a Spanish company founded in 1995 that makes audio and video compression and communication products.

AUCTION 62 for FM construction permits closed after 13 bidding days and 61 rounds. A total of 163 permits were awarded for roughly \$70 million gross bids and the commission held back eight CPs. The net bids amounted to just over \$54 million from 96 bidders.

MIKE MULLEN joins NAB as director of government relations. Mullen comes from the office of Rep. Mike Doyle, D-Pa., where he was senior legislative assistant since early 2004.

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Ferrara

► Continued from page 1
move product, while, at the same time, urging manufacturers and automakers to put digital radios in front of consumers more quickly.

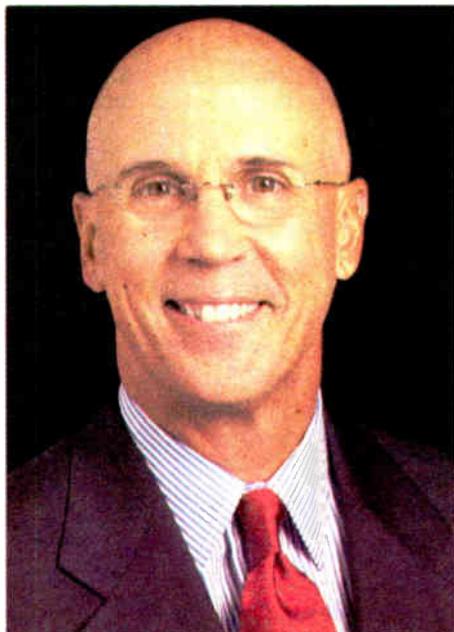
The formation of the alliance, he believes, "underscores all of those companies, and all of those companies CEOs, who have said, 'This is important, we have to work on this together.'" The alternative? "If they don't, it will either take a lot longer or it will end up like AM stereo and quadraphonic, and never get off the ground."

News Editor/Washington Bureau Chief Leslie Stimson spoke with Ferrara on one of the rare days when he was in his Orlando office. Portions of the interview also appear in the Multicasting supplement included with this issue of Radio World.

RW: What are your impressions of how things are going for the alliance, what's working or not.

Ferrara: Actually, things are going very well.... I think we've covered a lot of ground in a short period of time. I guess the only thing that has been a little bit of a surprise to me is how slow the consumer electronic world moves.

Coming from a business where, if we go to bed at night, and we say, 'We don't



Peter Ferrara

like oldies and tomorrow we want to be classic rock, we wake up and we're classic rock. It just doesn't work that way in the CE world. So I'm having to not only learn that, but having to learn how to work it.

We really need to push what would be their normal time line along faster. That's part of what the alliance was set up to do.

RW: I've been told it takes some three years to get on the design platform of a

new vehicle. When can we expect to see a domestic automaker carry HD Radios and what has to happen for that to occur?

Ferrara: There's a lot of pieces on the automotive side. You have the engineering side of it alone. Then you've got the design phase — how's it going to fit in the dash and what's it going to connect to and what parts are going to be used and all that.

Then you've got the production scheduling, actually getting it begin to be produced and then you finally have end product. It takes more time than I think any of us really understand, but we're well on our way and I think there's going to be some pretty exciting announcements coming over the next six months....

RW: Do they have concerns or questions?

Ferrara: I don't think they have concerns other than ... it's an added cost to install it in their cars. So they either have to figure out a way to lower the cost and offer it as standard equipment, which of course, is what we want them to do, or they have to be willing to pass along the added cost to the consumer in making it an option — which is fine, but we would prefer not to see it.

We want to see HD Radio as standard equipment just like an AM/FM radio is standard equipment. It's just a matter of getting it on that engineering, design and production schedule in a way that's going

to get them there.

RW: Terrestrial radio's business plan for how HD-R is rolling out auto receivers is different from how the satellite companies did it. They gave the automakers incentives to help with R&D costs of the radios. Is the alliance doing that at all?

Ferrara: The satellite guys (XM Satellite Radio) went into General Motors and wrote them a check for \$400 million and gave them a big chunk of

'We want to see HD Radio as standard equipment, just like an AM/FM radio is standard equipment.'

their company. We're not going to do that and we don't need to do that.

Here's one of the fundamental differences in terms of what the alliance and what HD Radio brings to the table for the automakers.... (W)e actually have the ability to sell cars. The automotive industry, if it's not *the*, it's one of the largest categories of our business.

See FERRARA, page 8 ►



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Ferrara Started in Radio as a Terrapin

Peter Ferrara caught the radio bug while attending the University of Maryland. As a freshman, he was a bio sciences major. He intended to be a teacher.

Then he began working — or as he puts it, "goofing off" — at WMUC, then an AM carrier current station. He had a newscast and a Saturday night oldies all-request show and was hooked, changing his major to communications.

The alliance job is not only fun, he said, but also a good fit.

"I really enjoy the challenge of fixing things and building things; it's kind of what I do," said Ferrara. "I think I have a pretty good strategic and analytic sense. I like thinking through the 'how' of a business plan or the 'how' of getting something done. But what I really love is working with people and helping them find ways to be successful. I learned a long time ago that I don't have all the answers."

Ferrara is a former senior vice president at Clear Channel Radio who had management oversight of more than 400 stations. He was most recently the vice president of special projects providing guidance on new initiatives and strategic projects.

Previously, he was an equity partner and chief operating officer of Granum Communications, vice president and chief operating officer of U.S. Radio, executive vice president of the National Radio Broadcasters Association and a general manager for Metroplex Communications and EZ Communications.

He co-created the Pro-Rate Yield Management system for pricing radio inventory. In the 1980s, he felt there had to be a better way to manage and price radio inventory to maximize yield. "At the time, everybody was just kind of doing grid cards," he said.

Pro-rate started as an internal company program that Ferrara wrote in partnership with Bob Hughes at U.S. Radio. As it developed into a viable tool, RCS bought the program and offered it for sale, he said.

Earlier, while a sales manager at WGAY(FM) and WRC(AM) in Washington, Ferrara had become interested in quantifying shared listening and selling against it.

"What I realized is that while every radio station had listeners, we shared a lot of them. Some stations shared more than others," said Ferrara.

Cume duplication at that time, he said, was a separate calculated number and not really reflected in Arbitron ratings.

"My idea was to not only show the calculated number, but show each station on a grid basis, indexed against the other stations in an entire market. So at a glance, you could see and advertisers could see and could be sold, either the value of duplication, on being able to increase frequency, or the value of *not* buying certain stations to minimize duplication."

The idea of the Cume Duplication model was born; Arbitron liked it and used it in its reports — and still does, he said.

Ferrara lives in Orlando with his wife of 34 years.

— Leslie Stimson

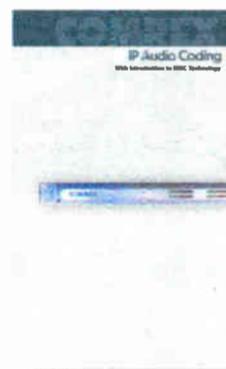


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World Radio History

COMREX

Ferrara

► Continued from page 6

RW: Some stations that haven't joined the alliance have said to me they find the amount of money necessary to contribute an impediment, referring to the \$200+ million, mostly in ad inventory for 2006, contributed by charter members. Others like the goals of the alliance but don't want to have work with other members on selecting their multicast formats. Is the alliance thinking about having another form of membership?

Ferrara: First of all, money has never been an issue. The cost to join the alliance is very proportional to the number of stations that an owner has and to

the market size. Everybody is treated on a proportional basis. I've never had one person say, "I don't want to join because I think it's too much money."

The real issue is whether or not they buy into the concept that we as an industry are better off being unified in our efforts for the betterment of radio. If they see the world and the future of radio only through their respective company eyes or only through the next couple of years, they're not likely to support our efforts. And we understand that. Everybody certainly has the right and the choice to do what they want to do. But we really think that this is not about specific company success, this is about radio industry success.

RW: What about the people who say some of the formats being offered on mul-

ticast are also being offered on satellite radio?

Ferrara: Last time I looked, satellite radio combined, both companies, had less than 10 million people. We service 240 million people, so I don't get the fixation on satellite radio. Satellite radio is a very small, niche business. They wish they could reach as many people as we do.

To that point, I think that the press has really been fixated on satellite. And the reality is, is that first of all, HD as a technology, has been in development for a number of years so it precludes any of that.

But the biggest thing I'm more worried about the 40 million iPods and the ubiquitous cell phone and the Internet as a competitor to terrestrial radio, and the opportunity to take time with our media away. Satellite's just kind of one more thing that's in the mix.

RW: Some receiver manufacturers have jumped into the HD Radio space, others are waiting to see how it fits in with the rest of their product lines. Are you seeing some hesitation?

Ferrara: There are a lot of manufacturers out there and they are making some amazing products, but for those yet to get into the game, it really has more to do with finding price points that they feel they can offer to the largest and broadest possible market segment to grab market share. The latest move by Boston Acoustics to go from \$499 to \$299 is a huge move and the alliance is going to aggressively promote that radio to consumers and help Boston Acoustics for making that move.

But for these other people I think that they've been both kind of waiting to see whether or not the broadcast industry was going to be committed to this technology and really get behind it in a big way. That's exactly what the alliance is setting out to do.

RW: The alliance nudged B.A. on that?

Ferrara: Of course. Boston Acoustics has made a conscious decision to move on that price point because they believe that by seeding the market and by getting in the game in a way they are and have, that they have the opportunity to really begin to become the... category leader.... We're arm in arm with them on that move.

The real issue is whether or not they buy into the concept that we as an industry are better off being unified in our efforts for the betterment of radio.'



Thomas Ray
VP, Director of Engineering
WOR, Buckley Broadcasting
New York

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We're going to promote it on the air, we're going to promote it on *HDRadio.com*.... We're going to sell a lot of Boston Acoustics radios. I just hope they can make enough of them fast enough, because I know we'll deliver the results.

RW: I have engineers telling me they still don't have their Receptor HDs.

Ferrara: And if that motivates the Panasonics and the Sonys to get in the game in a big way, then great. That's working, too.

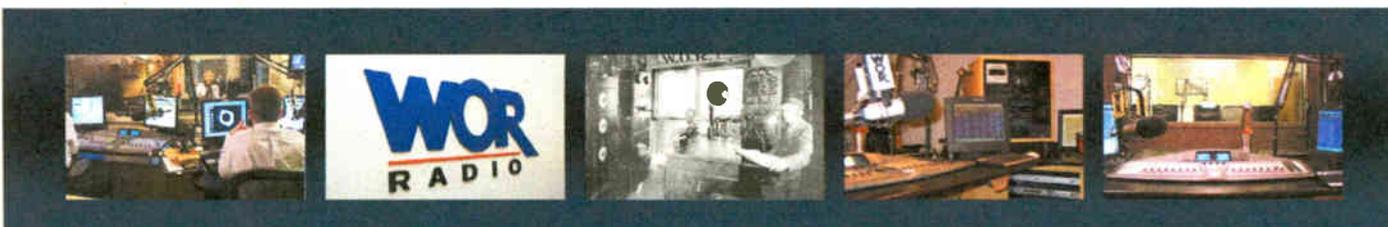
RW: What's the magic price point that the alliance would like to see radios sell for?

Ferrara: What I've learned is that at \$199 we go from selling hundreds of thousands of radios to selling millions of radios. We're close....

We're now \$100 off that magic number. As the costs of the technology come down, as the chip costs come down, as the tuner and power management costs come down and the manufacturing costs come down, because there's more demand there, the price will come down. But to answer your question, I think when we get to \$199, we've really made some significant headway.

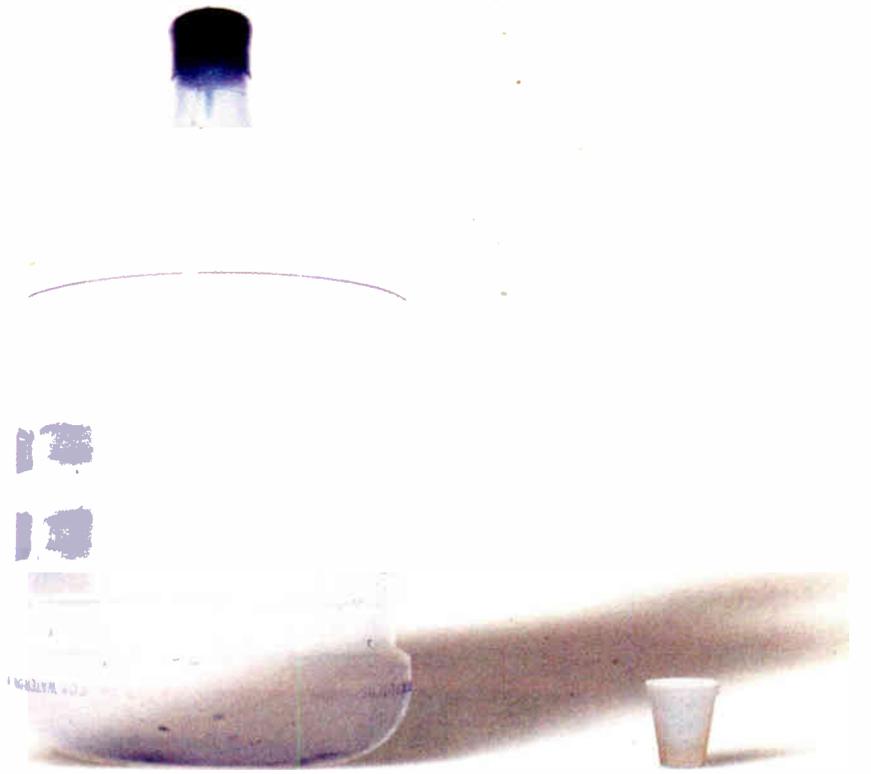
This is part of what we're doing.

See FERRARA, page 21 ►



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DIGITAL NEWS

Digital Radio Goes Globe-Trekking

DRM DATA: New Digital Radio Mondiale data can be found at www.drm.org.

DRM is a digital radio system for shortwave, medium-wave/AM and long-wave. In 2005, the DRM Consortium voted to extend the system to the broadcasting bands up to 120 MHz. The design, development and testing phases of DRM's extension, which are being conducted by the DRM Consortium, is expected to be completed by 2007-09.

The new table of DRM Use Possibilities, written by DRM Technical

Committee Chairman Donald Messer, outlines ways DRM and DRM/analog simulcast options can be used.

DRM SPAIN: DRM's new Spanish coalition has 16 members, including Continental Electronics.

MEXICO: The first Mexican member has joined the DRM Consortium. La Red Mexico joined in December. The consortium now has about 90 members from 31 countries.

FORUM PRESIDENT: Dr. Young Kyun Kim of Samsung Electronics is the new vice president of the World DAB Forum, the group that promotes Eureka-147 digital audio broadcasting.

Kim was elected by the WorldDAB membership, which decided to expand

the board now that more countries are using DAB and its standards are being applied to multimedia broadcasting in addition to traditional audio transmissions. Kim joins World DAB Forum President Quentin Howard of commercial DAB broadcaster Digital One and Vice President Leif Lonsmann of Denmark's public broadcaster, DR.

At Samsung Electronics, Kim is senior vice president Global Standards and Research Telecommunication Network Business. The Asia Pacific region is a growing market for Eureka-147, now used in about 40 countries according to the World DAB Forum, which adds that the core Eureka147 standard has expanded into a family of DAB standards that now include other multimedia applications and features, including Digital Mobile Broadcasting. Because these share the

same core standard, infrastructure and receiver technology can co-exist.

SALES OF DAB: Sales of Eureka-147 digital radios showed growth trends in 2005, according to the World DAB Forum. While the U.K. continues to lead, other countries are following a similar pattern. The U.K. saw sales of 483,500 digital radios over Christmas 2005, contributing to a cumulative total of 2.7 million sets in homes. About 1.4 million DAB radios were sold in the U.K. in 2005; the latest Rajar listening figures show that 11.1 percent of the population now live in DAB households.

Denmark has recorded cumulative sales of 143,000 DAB receivers up to the end of November 2005. Sales figures for the month of December are expected to be released at the beginning of April. In Norway, where public broadcaster NRK has set an analog switch-off target of 2014, approximately 51,000 digital radios were sold in 2005.

By year-end December 2005, more than 110,000 DMB-enabled receivers had been sold in Korea and mobile operators have ordered another 30,000 from manufacturers. Sales are expected to top 2 million by the end of 2006.

Singapore saw sales of digital radios rise to 10,000 units in 2005. In 2006, broadcasters in Singapore will continue to campaign on behalf of DAB listening, with digital road shows and on-air advertising.

Cuts Loom For Pubcasters

WASHINGTON Public broadcasting faces deep cuts in the 2007 budget for the Corporation for Public Broadcasting as proposed by the Bush administration — reductions that could affect digital conversion funding and eliminate the Public Telecommunications Facilities Program, a funding source for stations converting to digital and, more recently, those recovering from Hurricanes Katrina and Rita.

The administration wants to rescind \$53.5 million from the \$400 million already appropriated by Congress for fiscal 2007 and cut \$50 million from the \$400 million appropriated for 2008. The budget proposal includes no advance appropriation for 2009 and no additional funding in 2007 for digital conversion or television interconnection, though CPB said it could use a portion of its 2007 regular appropriation for these purposes.

If enacted, these 2007 funding levels would represent a 24.7 percent reduction from CPB's 2006 funding, a cut the organization said would be felt in all of its programs, including station Community Service Grants, funding each station gets if it meets minimum qualifications.

President/CEO Patricia de Stacy Harrison said CPB is "very disappointed" at the recommended funding levels.

Last year, the administration requested that CPB's already-enacted \$400 million in 2006 be cut to \$390 million, with no additional funds for digital conversion or interconnection. After much lobbying by public broadcasting, Congress decided to fund CPB in 2006 at \$396 million, with \$30 million for digital and \$35 million for interconnection, for a total of \$461 million.

In February CPB asked Congress for a \$430 million advance appropriation for 2009 and \$40 million for digital conversion.



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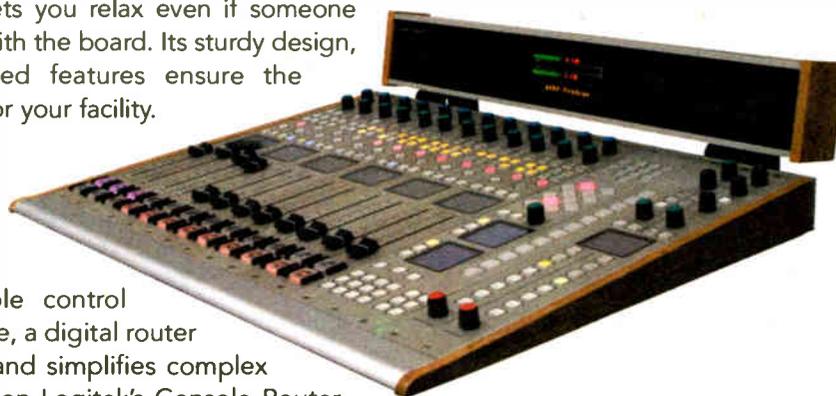
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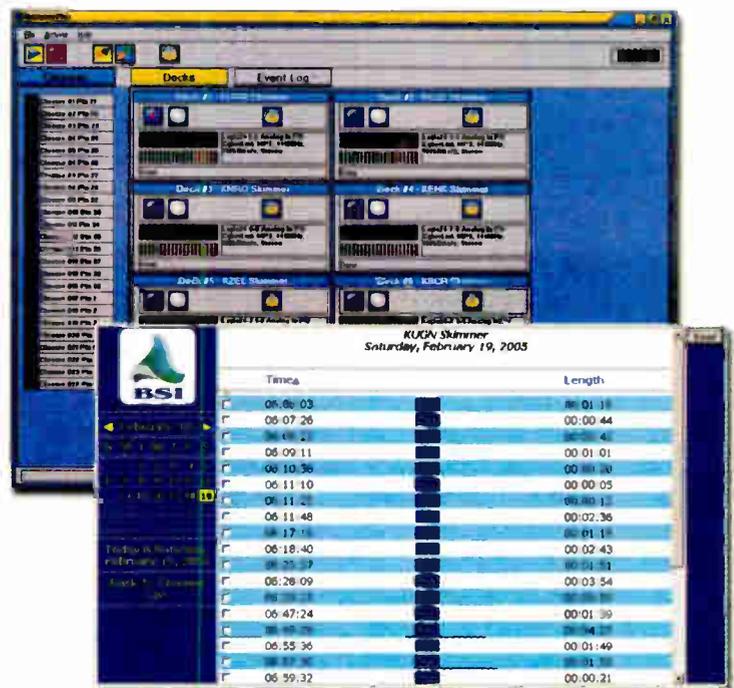
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Chasing Ghosts: WFMU Airchecks

by Ken R.

Radio is ephemeral. The sound waves we receive each day race off into the cosmos where the audio events, songs and human emotions they carry bounce around the Milky Way and presumably are lost forever.

Most of our audio culture has vanished because no one thought it important enough to capture via archival tape or disk. These recordings of what we hear on the radio are known as airchecks, and a small cadre of fans, Web sites and now one radio station, celebrate and preserve them.

WFMU(FM) is an anomaly. It's a large listener-sponsored entity formerly associated with Upsala College in East Orange, N.J. It was purchased in 1994 when the school closed. In 1998 the station was moved to Jersey City and remains independent and freeform. It was voted the "Best Radio Station" four years in a row by Rolling Stone.

"We had been discussing the idea of digging up some classic WFMU-related archives from DJs of the past," said Music and Program Director Brian Turner. "And the idea morphed into an overall spotlight on lost radio programs."

Thus was born "Archives for Aircheck," a one-hour program heard weekly during



Brian Turner

Williams and Liz Berg contribute show ideas and put in time editing the clips that air. Listeners including Tom Smith and J.C. Kaelin have contributed program concepts and tapes. Past shows are posted on the station's Web site.

Eclectic airchecks

One week you might hear the panic of Sept. 11, 2001 as newscasters scrambled

focus on how that station advanced the cause of black music and human rights.

Other programs have focused on classic top-40 jingles, a live call to a cop killer who was holding a hostage at a 7-11 store, and hillbilly tunes from "The National Barn Dance," an early country music show originally aired on WLS(AM), Chicago.

And on it goes, with a curious lack of consistency, part of the show's charm.

Turner was first captivated with airchecks when he heard a most unusual cassette from WFMU, even before he joined the station.

"I once heard this tape given out as a premium. It featured an Eskimo janitor who took over the airwaves of a striking CBC station, smoked weed on mic and sang along with a Rolling Stones song in his native Inuit language," said Turner.

"That struck me as an incredible thing you don't normally hear on other programs that highlight radio history. Hence, when we talked about starting up this show the summer of 2002, I thought a particular focus should be less of the dry historical archival stuff and more on the eccentric personalities and out-of-the-norm moments of radio history.

"Once we aired a tape of a U.K. pirate DJ at sea who was broadcasting live when his ship was boarded and set on fire."

Inspiration in many places

A lot of sounds find their way to WFMU, but Turner is picky about what is right for this show.

"I get a lot of wartime speeches and oldies DJs, but I try to avoid that kind of material," he said. "The same with 'bloopers.' I prefer a show to build an atmosphere of its own and we try not to doctor it up with too much production to preserve the element of how it sounded when it aired.

"It's a real process of discovery for me."

"Archive for Aircheck" shows are

Brian Turner's Favorite Shows

Bob Lassiter, a Florida Talk Host — "He was a real outpost of intellect and free-thinking, doing constant battle on the air with some of the most fundamentalist and right-wing listeners in the state."

A WFMU 1990s broadcast featuring the rock band Yo La Tengo — "It was on a show here called 'The Music Faucet,' and the band was accompanied via telephone by singer-songwriter Daniel Johnston, a unique and off-kilter primitive singer-songwriter who was then living in West Virginia."

Murray Saul — "This guy is a real old-school motor mouth freak from Cleveland and he was frothing at the mouth, improvising and cursing his boss and demanding everyone 'get down.' It was indescribable."

Paris Hilton — "We ran all of her personal podcasts to promote a movie. It was some of the most insipid yet 'Warholian' stuff of the season, as she blabbed about nothing, was heard eating with her friends and bitching about how bored she was."

Old-Time Soul/Funk DJs — "These include Frankie Crocker, Sonny Hopson and others. We occasionally run some ragged gospel shouters like Reverend Lester Knox and some vintage material from WWOZ(FM), New Orleans."

Once, we aired a tape of a U.K. pirate DJ at sea who was broadcasting live when his ship was boarded and set on fire.

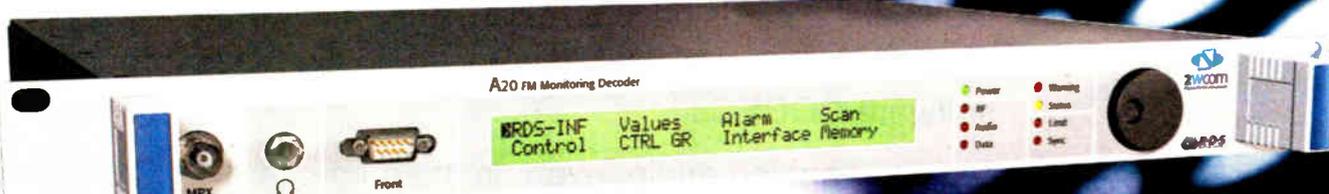
— Brian Turner

the summer on WFMU. A number of people including Evan Funk Davies, Ken Freedman, Rex Doane, Dave the Spazz, Michael Pool, Debbie Daughtry, Scott

to make sense of the terrorist attacks and resulting chaos. The following week the history of Memphis soul station WDIA(AM) might be featured, with a

available at <http://wfmufm.org/playlists/AC>, complete with show descriptions. And if you want to delve more deeply into traditional radio airchecks, try www.reelradio.com, www.californiaaircheck.com or www.theaircheckfactory.com.

Ken R. is a former radio personality with lots of airchecks of himself, for which he says there is very little demand. 🌐



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MARKET PLACE

Satcom, Axia Sign Networking Agreement

Satcom Resources and Axia Audio have signed a business relationship deal. Satcom is an integrator and distributor of VSAT and conventional satellite communications networks; its chief technology officer is Bill Sepmeier. Axia makes switched Ethernet digital audio networking systems and is part of the Telos/Omnia/Axia group of companies.

Satcom is integrating the Axia Audio line into its online catalog.

In the announcement, Sepmeier stated: "The beauty of our product lines' blend is that program material never leaves the IP format, and can be used in real time throughout a worldwide consolidated broadcast operation, no matter where that operation reaches."

Axia President Michael said the deal lets users extend their networks across continents, using the satellite connectivity solutions available from Satcom.

For information contact Axia in Ohio at (216) 241-7225 or visit www.axiaaudio.com; or Satcom in Colorado at (970) 748-3094 or www.satcomresources.com.

“Everything is bigger in Texas. Except equipment budgets.”

“I’d gotten the green light to build new studios for our South Texas radio cluster. We wanted the ability to put any of our stations



on air from any studio, so we started investigating networked audio.

“Also, management said we might add more stations to the cluster, so I needed a system that could be easily and affordably expanded later on.



“We looked at several systems. Some did what we wanted, but were very complex and required us to buy their expensive routing mainframe, whether we were building lots of studios or only a couple. That was completely outside our price range.



“Then we looked at Axia. They showed us how an IP-Audio system would let us share audio sources, switch air studios quickly, even customize console settings for individual jocks. And Axia cost *about half* what some companies wanted us to spend.

“Of course we were a little skeptical — how often is the least expensive solution actually the best?

“Then we learned that Axia’s Ethernet backbone scales, like a computer network. All we’d have to do to grow is connect



more nodes and surfaces, maybe add another Ethernet switch. We didn’t have to commit to buying equipment for all of our studios at once.

“So we built one studio using Axia, and *it worked great*. Went together fast and smooth. A few



wrinkles during installation were ironed out by Axia support right away. Those guys were amazing. It was like their entire team was there to make sure I was happy.

“We liked Axia so much we installed a second studio. Then a third. Then a whole second cluster.



My colleagues are so impressed with how well Axia works, they want it in their stations, too!”

— Jorge Garza, Univision Radio, McAllen, Texas



www.AxiaAudio.com

Solving the Digital Music Puzzle

Disagreement Continues on How Best to Address The Digital Music Mess, With IBOC at Ground Zero

by Skip Pizzi

Everyone agrees that the music recording industry has traveled a rocky path into the digital domain. Beyond that, however, concurrence is scarce.

Some feel that this is largely the industry's own fault for ignoring earlier warnings, and releasing unprotected digital content on CDs for over two decades. Others say that blame is misplaced, and at least some of the industry's reduction in sales is due to other, non-digital ills. Still others claim that the evidence RIAA cites for decreased sales is misleading, resulting from creative accounting rather than real losses.

Even if you put faith in the RIAA's claim that digital technologies have reduced record sales, the spin-variations on the same data by different industry sectors are fascinating. For example, industry pundits claim that the music industry's "business model is broken," while the RIAA present it as a case of "market failure" and legalists cite a "lack of parity" in current copyright law.

This is important for more than just its rhetorical diversity. Such variety in char-

acterization inevitably will lead to widely divergent proposals for solutions, and that's just what is taking shape right now regarding digital radio's relationship to the music business.

Damage control

As it has done with the emergence of other new technologies, the RIAA is taking the opportunity of IBOC's deployment — some would say belatedly — to call for new regulatory relief.

In its current pleadings, the RIAA sets the table by citing that the United States is the only developed country in which free-to-air (FTA) radio airplay does not generate performance royalty payments to recording artists and publishers. (Only *composers* are paid for airplay of their songs in the U.S., with no musicians or music publishers receiving compensation for the airing of *recordings* of those songs.)

Of course, this specific exemption for American FTA radio broadcasters has historical tradition dating to 1971 (when sound recordings were first received copyright protection under U.S. law), and is based on the thinking — agreed to by

record companies at the time — that radio airplay leads to increased record sales. Thus a quid-pro-quo "barter" relationship that benefits both parties without exchange of funds was established.

In the intervening years some variations have been introduced due to technological changes. Today, a three-tiered arrangement has been established for electronic distribution of copyrighted music, which can be generally characterized as follows:

Exempt: As in the FTA radio example above, no compensation is paid to copyright owners, and the content is used by broadcasters under compulsory license.

Ephemeral (or "non-interactive digital"): Compensation is paid by service providers for use of copyrighted content in real-time transmissions under statutory license. This applies to satellite and Internet radio in the U.S. today. (Other limitations to usage may also apply under this license, such as the number of consecutive selections allowed from a particular album or artist, and prohibitions/limitations on recording.)

Transactional (or "interactive digital"): A higher level of compensation is paid, based on bilateral negotiations, for the purchase of an electronic copy of copyrighted content. This applies today

The Big Picture

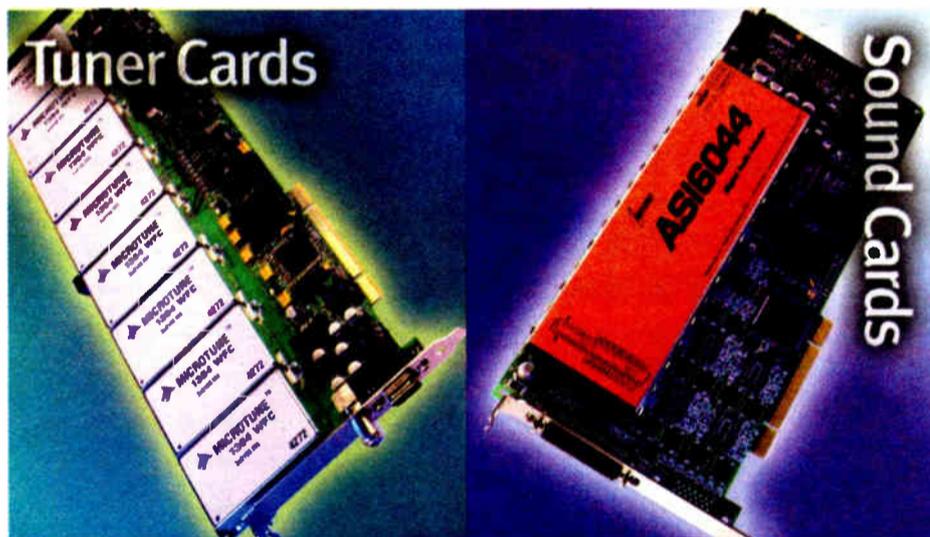


by Skip Pizzi

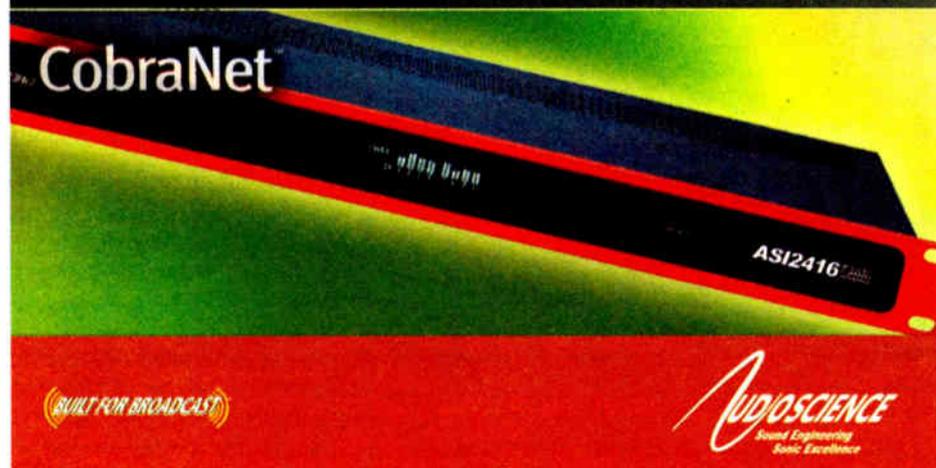
Today the RIAA fears that with IBOC — along with some recently released satellite radio devices — such airplay could instead *thwart* retail music sales (including the nascent legitimate download business), if it provided consumers with a new ability to easily capture music from the broadcast stream. In this case, the basis of earlier agreements will have been violated and a new music-licensing scheme for radio broadcasters will be required, the RIAA asserts.

Forks in the road

Among the diverse views toward a solution is an approach that proposes changing U.S. copyright law to include a levy for FTA performance royalties, and a possible increase in music-licensing fees for satellite and Internet radio. The



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The RIAA fears that IBOC airplay could thwart retail music sales, including the nascent legitimate download business.

to music download services. Other rules covering extended usage beyond the device that the music is downloaded to may also apply under these licenses (e.g., whether or how many copies can be made to CD-R, portable devices, etc.)

Broadcasters have assumed that IBOC digital radio would fall under the first category above, but the RIAA is asking for it to be considered differently. How this will be resolved is the subject of much current debate, and will be critical to the eventual resolution of the IBOC content-protection discussions becoming known in legislative and regulatory circles as the "audio flag" (see *The Big Picture* column in our March 1 issue).

A different business

Another premise of the RIAA recent arguments describes the different relationships between radio and television broadcasters and their respective content providers. Consider that in the television world, content owners receive the bulk of their revenue from the purchase of broadcast rights by TV broadcasters. Any compensation from the sale, rental or download of recordings of this content is secondary.

In contrast, as noted above, record companies do not receive compensation for the broadcast of their works on U.S. radio, under the assumption that the increased record sales resulting from such free airplay will alone produce a viable income stream.

RIAA feels likelihood of success along this path is low, given strong opposition anticipated from broadcasters.

Instead, the RIAA proposes an arrangement that would keep IBOC, satellite and Internet radio broadcasts essentially ephemeral by regulation, using the audio flag and its enforcement rules to limit recording devices' capabilities and prevent redistribution of broadcast content via the Internet, removable media or other devices.

Ideally, the RIAA would like these rules also to include limits on searching and automated copying, so that individual songs cannot be separated from surrounding content without obtaining the appropriate, higher-level (i.e., "interactive" or transactional) license.

To enable these limitations the RIAA proposes the use of random time offsets between audio content and its associated metadata, and a requirement that recording devices make all radio recordings in no shorter than 30-minute increments, which could not be subsequently edited. These rules would prevent consumers from permanently saving the content in a broadcast stream as discrete song files — at least via any simple or automated method. (See our Feb. 1 column.)

A further divergence of opinion exists over whether the broadcast, music and consumer electronics industries might generate their own voluntary accords on such matters, or whether government involvement is necessary.

See PUZZLE, page 16 ►

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Rehr: Newspaper Rule 'Anachronistic'

The following is from a letter dated Feb. 8 from NAB President David Rehr to FCC Chairman Kevin Martin. Rehr said that as the FCC approaches its next review of broadcast ownership rules, NAB "wants to emphasize the importance of reforming these broadcast-only restrictions that impair local broadcasters' ability to compete in a digital, multichannel marketplace."

Rehr argued that the "complete prohibition on newspaper/broadcast cross-ownership is anachronistic." An excerpt:

NAB fully supports your calls for reforming the outmoded cross-ownership prohibitions. As you have correctly noted, unlike every other one of the broadcast ownership restrictions, the newspaper/broadcast cross-ownership ban remains unchanged since its adoption in the 1970s.

In 2004, moreover, the Third Circuit Court of Appeals — while overturning the Commission's specific new cross-ownership limits — did uphold the Commission's decision not to retain the complete prohibition on newspaper/broadcast cross-ownership. In doing so, the Court agreed that newspaper/broadcast combinations can promote localism and that newer media, including cable and the Internet, do contribute to diversity in local markets.

Unfortunately, the FCC's decision repealing the cross-ownership prohibition never became effective due to the Court's overturning of the new numerical cross-ownership limits, so broadcasters still remain subject to a ban the Commission has already found unwarranted. NAB hopes to work with you in reforming the cross-ownership rule so as to find the appropriate and judicially sustainable balance between localism, diversity and competition.

NAB believes that the Commission correctly concluded in its last ownership review that the complete prohibition on

newspaper/broadcast combinations was no longer justified. The cross-ownership prohibition has inhibited the development of new innovative media services, especially digital and on-line services that have features of both the electronic and print media.

The ban also precluded struggling newspaper and broadcast entities, including those in medium and small markets, from joining together to improve, or at least maintain, existing local news operations.

After all, broadcast television is not the only traditional medium facing significant financial pressures in the digital environment. Numerous reports have documented continuing and serious declines in newspaper circulation, reductions in newspaper revenues, and cuts in jobs at even major market newspapers. A number of studies have shown consistent declines in newspaper readership, especially among younger consumers who frequently use other media (especially the Internet) to obtain news and information.

Several studies have further indicated that television stations co-owned with daily newspapers excel in providing certain types of programming, including local news and other locally oriented programming.

Like the television duopoly rule, the cross-ownership restriction inhibits broadcasters from competing vigorously with their multichannel competitors in local markets.

For example, the cross-ownership rule prohibits the owner of a single radio station from having an attributable interest

in a daily newspaper in the same market, while a cable system operator with a dominant position in the local multichannel video programming distribution market faces no restriction in acquiring a daily newspaper in the same market.

Similarly, a cable system operator — who controls the distribution of dozens or even hundreds of video programming channels, as well as an essential pathway into consumers' homes — can acquire a broadcast television station in the same



Photo by Bob Kovacs

market, unlike the owner of a single broadcast television station who cannot acquire a second broadcast channel in most markets.

Certainly in the current digital, multichannel marketplace, local broadcasters are unable to dominate either the advertising market or the marketplace of ideas. Thus, maintaining broadcast-only local ownership rules in their current form can no longer be justified.

Rehr also discussed reform of the television duopoly rule, reform that he said is "urgently needed."

Comment on this or any article. E-mail radioworld@imaspub.com.

Puzzle

► Continued from page 14

Then there is the entire matter of how the audio flag would work — assuming it were agreed to by the industry (or mandated by government action).

This would necessitate a lengthy process that included decisions on how to insert the flag in the IBOC stream in a backward-compatible, standardized and interoperable fashion; what rules, content protection systems and/or other enforcement technologies would be accepted for use on flagged content; and how such acceptability would be determined (criteria, process, robustness level, liability in case of failure/hacks, governing body, etc.).

This also assumes that Congress will grant the FCC jurisdiction to manage such "downstream-of-the-tuner" technologies, which as of this writing it has

Broadcasters should recall that they may have more than one dog in this hunt.

not yet done, and which has kept the DTV broadcast flag off the books even after its completion of the abovementioned requirements over the course of several years.

Thus many elements would need working out before an audio flag system could be put in place. Other solutions might take less time and result in more favorable and flexible conditions, but they would require parties that are currently far apart in their positions to come to quick consensus.

Finally, broadcasters should recall that they may have more than one dog in this hunt.

Radio operations already inhabit distribution modes beyond FTA broadcasting, and therefore operate under multiple corresponding licensing regimes for the same content. To wit, many radio operators also stream their on-air and/or other programming on the Internet, and some even offer paid downloads of songs aired (e.g., WMMR's Digital Music Store or the XM+Napster service).

Some have claimed that the audio flag process is just RIAA's attempt to leverage radio broadcasters' investment in new technology to the music industry's advantage. Others feel it is an appropriate, proactive response to another potential threat to the music industry's survival.

Whatever your view, it would be wise to keep a broad and careful watch on this important, ongoing debate. It may affect your future business on numerous levels, and if the private sector doesn't produce an acceptable solution, the U.S. government may provide one for it.

Skip Pizzi is contributing editor of Radio World.



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GUEST COMMENTARY

Ferrite Devices Offer Extra Isolation

Isolation Considerations in Dual-Transmitter FM IBOC Systems

by Robert P. Russell

The author is president of Advanced Ferrite Technology Inc., Rockville, Md., a manufacturer of high-power RF ferrite devices.

Broadcasters need to think about signal isolation considerations in their FM IBOC implementations.

FM analog transmitters have restrictions on the maximum output voltage

protected by VSWR monitoring, with auto fold back to maintain reverse power at a safe level. This active-loop transmitter protection method is the accepted norm and ferrite isolators are not used in conventional FM analog systems.

IBOC dual-transmitter systems

For IBOC operation a digital transmitter is added adjacent to the existing FM analog transmitter. The two signals are combined, centered on the same carrier

current trend favors dual antennas. The digital transmitter can either have digital-only output, or be a combination transmitter that outputs both digital and FM analog signals together on the same carrier.

The presence of two adjacent transmitters in an IBOC station introduces a cross-talk problem, caused by leakage across the combiner. For any combiner method, there will be finite isolation and the transmitters will leak small amounts of unwanted reverse power into each other, as shown in Fig. 1.

Although both transmitters will be

modulation), out-of-band emission (OBE), regeneration, spectral growth and other signal quality deviations.

Isolation requirements

The IBOC literature reports a range of combiner isolation values. Interleaved antennas have demonstrated 43 dB isolation; other examples range from 34.5 dB to 50 dB isolation.

A good coupler has 35 dB isolation into matched loads, which is unlikely to be achieved in practice. For dual-antenna combining, 36 dB is currently regarded as an achievable isolation.

Whether the antenna isolation values are sufficient could be the subject of ongoing testing and evaluation. The

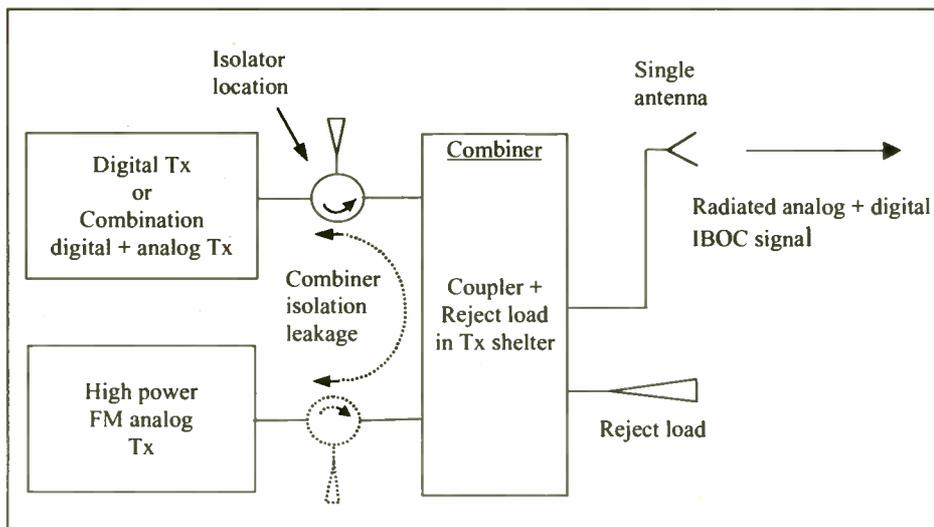


Fig. 1: Schematic for dual-transmitter IBOC system using coupler combiner

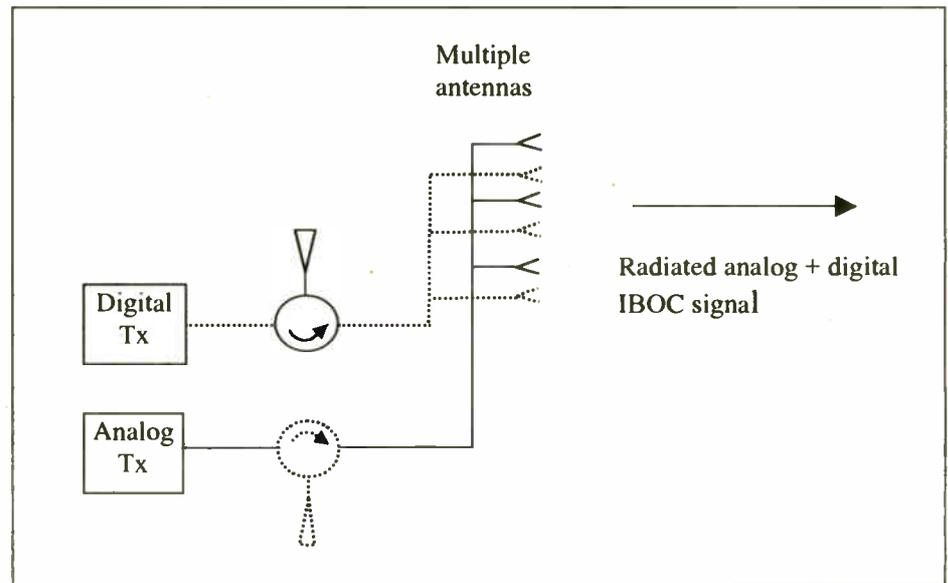


Fig. 2: Schematic for dual-transmitter IBOC system using antenna coupling

Standing Wave Ratio. Tube transmitters are quite robust, typically tolerating a VSWR of 2.0, with automatic reduction in output power. Solid-state transmitters are more restrictive, with tolerable VSWR typically in the range 1.3 to 1.5, with special cases as low as 1.1.

Analog FM transmitters are usually

rier frequency and radiated together.

Figs. 1 and 2 depict the basic dual-transmitter IBOC schematics. Combining can be done either using a coupler in the transmitter shelter, or by near-field antenna coupling on the tower.

Both methods are shown. Although both methods have been deployed, the

exposed to reverse leakage signals, the digital transmitter is the most vulnerable to cross-talk problems. This is because it typically has the lower TPO and must maintain high linearity to meet the FCC IBOC mask requirements. Analog/digital interference in the digital transmitter may cause problems with IM (inter-

FCC emission mask is likely to be revised to implement the more restrictive limits recommended by Ibiqity and the National Radio Systems Committee.

The combiner isolation requirement varies with the transmitter TPO levels and the combiner methodology. The

See ISOLATION, page 20

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Radio World's HD Radio™ Scoreboard

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HD2 Digital Radio Formats Now On the Air

Albuquerque (Market 70)
KABQ Hispanic Oldies
KBGI Country Variety
KBZU Christian Rock
KDRF Raggeton
KKOB Top 10s-All Formats
KMGH Oldies
KPEK Triple A
KRST Future Country
KSYU New Hip Hop
KTEG Classic Alternative
KZRR Deep Tracks & Live Rock

Atlanta (Market 11)
MBZY New Alternative
MKLS Triple A
WLTH Oldies
WNNX Adult Alternative
WVEE Neo-Soul/Urban AC
WVVA Regional Mexican
WVVA Hispanic AC
WVWQ All 90s
WZGC Deep Classic Hits

Baltimore, MD (Market 20)
WBFS True Alternative
WLTF Older Softer AC
WPOC Future Country
WQSR Sports Radio
WSMJ Traditional Jazz
WVMX Top 40/CHR

Birmingham, AL (Market 57)
WBXB Classic Country
WENN Smooth Jazz
WHJJ Oldies
WGEN New Hip Hop
WRAX MOR/Soft AC
WUHT Old School Hip Hop
WYSF Country Variety
WZRR Deep Tracks & Live Rock

Boston (Market 9)
MAAF Live Rock
WBCN Indie & Ultra-New Rock
WBMX All 80s
WBSX Coffeehouse/Folk
WJMN Classic Hip-Hop
WKLK Classic Country
WHLJ Smooth Jazz
WMLK Rhythmic AC
WOPS 50s/60s Pre-B Oldies
WROR Comedy
WYKK Classical
WYKS Dedicated Artists
WZLX Deep Tracks Classic Rock

Chicago (Market 3)
WBBM Dance
WCKG News
WDRV Deep Tracks
WGCI Old School Hip Hop
WILV Love Songs
WJMK Greatest Hits 60s & 70s

WKOX Punk Young Alternative
WKSC Kiss Dos
WLIT Disco
WLUP Loop Loud (extreme hard)
WNUA Traditional Jazz
WTMX All 80s
WUSN Chicago's Future Country
WVAZ Gospel
WXRT XRT New Music

Cincinnati (Market 27)
WAGZ Extreme Rock & Hip Hop
WEBN New Alternative
WGRR All 80s
WKFS Classic Hip Hop
WKRQ My HD
WROJ All 90s
WOFX Triple A
WRRM Adult Hits
WUBE Future Country
WVMX Urban Variety
WYGY All New Music

Dallas-Ft. Worth (Market 5)
KDBN New Adult Hits
KDFE New Alternative
KDMX Free Mix
KEGL Hispanic SAC Maria
KHKS Kiss Espanol
KJJK MY HD (all requests)
KLLI Hispanic Talk
KLUV All Beatles
KOAI Traditional Jazz
KPLX New CHR
KVLK Chick Rock
KZPS Americana

Dayton, OH (Market 56)
WDFK Deep Tracks and Live Rock
WDSJ All New Alternative
WLOT Artist Channel
WMMX ULW 2-In-Depth News
WTUE Oldies 70s & 80s
WXEG Christian AC

Detroit (Market 10)
WCSX Deep Trax
WDTM Live Rock
WJLB Classic Hip Hop
WKQI New CHR
WKRK Re-News
WMLC More Magic
WNYD Gospel
WNYC Love Songs/Ballads
WOMC History of Rock & Roll
WRFV RIFF2
WVMV Traditional Jazz
WYCD Future Country

El Paso, TX (Market 76)
KHEY KHEY-AM simulcast
KPRR Active Rock
KTSN KTSN-AM simulcast

Hartford, CT (Market 50)
WHCN Deep Tracks & Live Rock
WKSS Pride (Gay)
WPHH Classic Hip Hop
WRCN Jazz
WTIC News Talk Sports
WVYZ Classic Country
WZMX Hispanic Raggeton

Houston (Market 7)
KFNC Classic Hits
KHJZ Traditional Jazz
KHMV New CHR
KILT Future Country
KIOL Indie & New Rock
KKRM Adult Alternative AAA
KLOL La Preciosa
KODA AC Love Songs
KRBE Classic Alternative
KTBY Free Buzz

Indianapolis (Market 41)
WFBO Deep Tracks & Live Rock
WFHS Oldies
WISG Christian Rock
WJJK My HD
WLHK Americana
WNOU Dance
WNTB Blues
WRXZ Classic Alternative
WYXB Disco
WZPL Comedy

Los Angeles (Market 2)
KBIG Disco
KCBS Variety CHR
KHHT Jam Oldies
KIIS Kiss Espanol
KLOS Fusion Hispanic/Anglo Rock
KLSX Female Talk
KOST Lite Classics
KPUR Power Dos
KROQ RQ Extreme/Active
KRTH Pre-Beatles Oldies
KTUV Classic Jazz
KYSR All 80s Hits
KZLA Adult Alternative

McAllen-Brownsville, TX (Market 60)
KBFM Spanish Hits
KHXX Classic Rock
KQXX Classic Country
KTEX Classic Country

Memphis (Market 48)
KJMS Smooth Jazz
WEGR Deep Tracks
WGXK Country Variety
WHAL Hispanic
WHRK Classic Hip Hop
WMBZ Comedy HD2-Fox News HD3
WMC Adult Hits Variety
WMPV Metal Rock
WMPW Oldies

WRBO Urban Life Talk
WRVR Blues
WXXY Christian Rock

Miami (Market 12)
WBGD Triple A
WHYI New CHR
WKIS Outlaw Country
WLVE Classical
WMEG Adult Standards
WMTB Urban Variety Oldies
WPOW Dance

New York (Market 1)
WAXQ Deep Cuts Classic Rock
WGBS Oldies
WHT ZNew Top 40
WKTU Country
WLTW Lite Classics
WNEW News
WQCD Chill-Electronic AC
WQNT Hip Hop Gold
WRKS Gospel
WUPR Power Espanol
WXRK New Rock

Philadelphia (Market 6)
WBEB 80s Channel
WBEN Rhythmic AC/Classic Dance
WDSX R&B Love Songs
WIOQ Hispanic CHR
WJZZ Traditional Jazz
WMLK Classic Deep tracks
WMMR Live rock
WGLL All 70s
WRDW Club Dance
WNSI Easy Standards/MOR
WUSL Xtreme Hip Hop
WXTU Future Country
WYSP Alternative

Portland, OR (Market 24)
KGON Live Rock
KIJZ Traditional Jazz
KINK Vintage Progressive Rock
KCCW Rhythmic AC
KCRZ Indie Rock
KLTH 60s Oldies
KNRK Deep Tracks
KRSK HD2 Comedy/HD3 News
KUFO New Rock
KUPL Classic Country
KVNX 80s Dance
KWJZ Blues
KYCH Urban AC

San Francisco (Market 4)
KDFC Classical Deep Tracks
KFOG New Rock
KPRC Country
KIOI 80s Hits
KISQ Romantica
KITS All New Music
KKSJ Traditional Jazz

KLLC Chill (downtempo
Electronica)
KMEL Urban-xtreme hip hop
KOIT 50s 60s oldies
KSAN CHR
KYLD Wild Hispanic
KZBR Disco

San Jose, CA (Market 33)
KCNL Tropical
KFFG CHR
KSSO Hispanic Hits
KUFY Deep Tracks

Seattle-Tacoma (Market 14)
KBKS New CHR
KBSG Blues
KFNC Urban AC
KISW Live Rock
KJAO Progressive Talk
KJR All 80s
KNPS Future Country
KRTT HD2 Comedy/HD3 News
KNBQ Progressive Talk
KNDD International hits
KQZB Urban AC
KUBE Extreme Hip Hop
KZOK Deep Cuts Classic Rock

Springfield, MA (Market 80)
WHYN New CHR
WMAX Country Variety
WPKX Americana

Tulsa (Market 64)
KIZS Spanish Hits
KNOD Rock Variety-
Everything rock
KQLL 60s, 50s
KTBT Urban "Beat"

Washington (Market 8)
WAWW Adult Alternative
WASH AC Ballads and Love Songs
WBIG Oldies 50s & 60s
WGMS Classical Deep Tracks
WIHT New CHR
WJFK Female Talk
WJLZ Hispanic Reggeton
WJZO Classic Country
WPGC Gospel
WVDC New Rock
WVZZ Viva La Voce

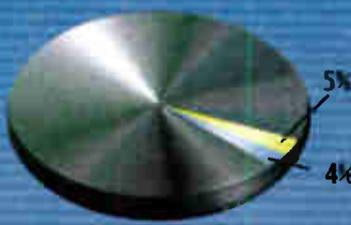
Wichita, KS (Market 94)
KDGS Deep Tracks
KEYN Blues
KFBZ Live Rock
KFN Comedy HD 2/CNBC-HD3
KRBB Smooth Jazz
KTRH Rock Variety
KZCH Dance
KZSN Classic Country

The HD Radio Bottom Line



Market Penetration United States

13,599 AM & FM Stations (excludes LPFMs)



Number of FM Stations Multicasting:



Isolation

► Continued from page 18

most severe case is in a 10 dB coupler combiner, with a low-power digital-only TPO and an analog TPO on the order of 11 times higher.

Less severe is in split-level combining (SLC) schemes using a combination digital + analog transmitter and where the two transmitter TPO levels are more similar. Somewhat reduced combiner isolation may be tolerable for SLC.

Efficacy and stability

It appears that IBOC combiner isolation values in the range 30–40 dB are currently achievable, but unknown is whether this is sufficient to meet the proposed FCC mask requirement for IBOC digital transmitters. It would be prudent to mitigate this uncertainty by supplementing the combiner isolation.

This mitigation can be provided by the addition of a ferrite isolator at the digital transmitter output, located as

The FCC emission mask is likely to be revised to implement the more restrictive limits recommended by Ibiqity and the National Radio Systems Committee.

shown in Figs. 1 and 2. This would provide a further ≥ 22 dB of isolation, which would increase the total isolation to > 50 dB.

Another consideration is the long-term stability of the combiner isolation. An IBOC combiner/antenna system may be adjusted at site commissioning for

optimum isolation, but thereafter may degrade with time.

Possible reasons include thermal aging, corrosion, antenna contamination and mechanical shifts on the feed line and tower. Temporary degradation may be caused by antenna snow/icing and wind gusts.

An isolation degradation of only 3 dB will double the analog leakage power into the digital transmitter, 4.8 dB will triple it and 6 dB will quadruple it. A ferrite isolator would provide an additional ≥ 22 dB to protect against such degradations. As a passive component inside the transmitter shelter, the isolator will maintain stable isolation.

Ferrite Isolators

The microwave/radio ferrite components industry has matured, with ferrite devices available from 25 MHz through millimeter frequencies. High-power ferrite circulators are available in the 88–108 MHz band.

The three-port structure is a symmetrical ferrite junction in dual ground plane stripline. The external connections are in coaxial line.

Most ferrite devices we provide to antenna companies, systems companies and transmitter vendors,

offer these benefits: additional isolation and low insertion loss, reliable, distortion-free isolation and de-coupling.

The ferrite disks are in a high DC magnetic field, provided by external permanent magnets. The magnetic field is set for operation above ferromagnetic resonance, which provides low loss and ensures linear behavior at high power.

In isolator applications, the side port of the circulator is terminated in a load, as shown in Fig. 3.

The transmitter signal circulates with low loss to the output port. Reverse power at the output circulates to the load.

Transmitter protection is provided by the circulator isolation. The side port can be monitored to verify reverse power level.

The circulator center conductor has DC connection to ground, which further protects the transmitter against transients on the feed line such as lightning surges. This type of above-resonance

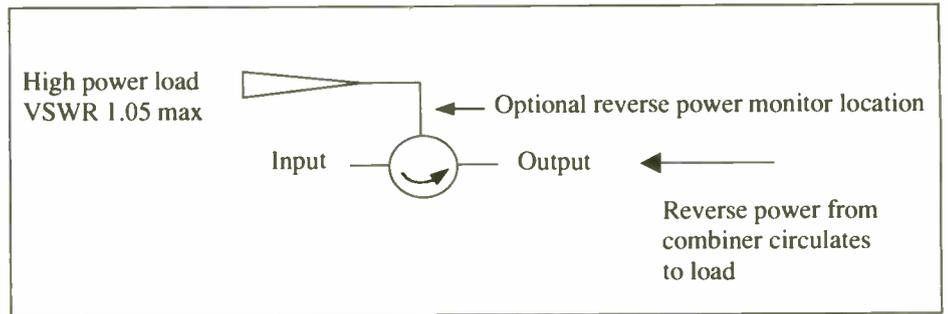


Fig. 3: Three-port junction circulator used as isolator

circulator is proven not to exhibit IM or spurious emission effects in IBOC digital transmitters.

Typical performance is 0.15 dB loss, 1.1 VSWR and 25 dB isolation. Isolation performance is sensitive to the circulator ferrite and magnet temperature at the design operating RF power

load, which is provided and installed by the user. A 1.05 VSWR load in worst phase may reduce isolation to 22 dB

For proper circulator design power rating, it is essential to specify the site forward and reverse power conditions and also feed line pressurization and site altitude. The design power capability, in

For any combiner method, there will be finite isolation and the transmitters will leak small amounts of unwanted reverse power into each other.

level. Typically, it takes about 30 minutes for the isolation to stabilize under the station forward and reverse power conditions.

Thereafter, for constant transmitter TPO, moderate changes in reverse power from the IBOC combiner will not significantly degrade circulator isolation. A mechanical adjustment is factory-set to optimize circulator isolation and thereafter, if necessary at commissioning, can be readjusted under the actual station operating power conditions. Factory high-power certification of isolation is done using actual FM transmitters at power levels that replicate the station conditions.

Circulator cooling is natural convection air.

Connectors are 7/8-inch EIA or 3-1/8-inch EIA, depending on the power level. Actual site isolation depends on the VSWR and phasing of the side port

terms of voltage stressing, is at the peaks of the voltage standing wave at the circulator output.

Simultaneously, the thermal/cooling design must consider the worst possible heating conditions in the ferrite junction region. The side port load must be properly rated for the maximum expected reverse power exposure.

Circulators are available for the power levels currently in use for digital only and combination digital + analog transmitters. Also available is a high-power circulator at 40 kW forward, suitable for protection of analog transmitters, when leakage from the digital transmitter is degrading the analog signal.

This is the location shown dotted in Figs. 1 and 2. Circulators are factory-tuned to the station frequency and certified by actual high-power testing.

RW welcomes other points of view at radioworld@imaspub.com.

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Ferrara

► Continued from page 8

We're trying to partner with receiver manufacturers, with retailers, with automakers to encourage them to do this in a big way. Concurrent with that, we've also are in the process of cutting a deal with Crutchfield as the primary retail distributor for the B.A. radio and for other HD Radios. They're going to carry a product line of seven HD Radios. And we're going to promote them as well. ...

RW: Are the stations going to also mention that when they promote HD Radio on the air?

Ferrara: Not specifically, but what our marketing and promotion is going to be doing (slated to start Feb. 20), in the initial first round of messaging we're going to be promoting the Boston Acoustics radio.

But we're really going to be promoting the features and benefits of HD Radio, the consumer choices. We're going to be talking about HD Radio.com and HDRadio.com is going to become the center point by which we can funnel everything through.

It's a consumer-centric site. It's designed so that the consumer can go to one place and say "Here's where I can learn about it, here's what's in it for me, here's where I can buy one. If I've got any questions, here's who I can contact."

'HD Radio will be the largest radio advertiser on the radio in 2006.'

RW: Why is cooperation among alliance members not considered anti-competitive behavior? It seems that stations are cooperating in a way on the multicast channels that they wouldn't agree to on their main channels.

Ferrara: Precisely. It has nothing to do with the main channels. It has everything to do about coordinating the formats on the new HD2 channels, where there is currently little or no audience.

From an anti-competitive standpoint, if the industry didn't work together, in a cohesive manner, with consistent messaging, and providing the consumer the benefit of new and unique choices, diverse choices, the technology either will take a long time to emerge or may not happen at all.

So at some point now, once we have established some significant receiver set penetration, once we have some measurable audience on the HD2 channels the alliance members will independently decide, "Okay, now I want to monetize that," and the alliance will cease to exist.

RW: You've decided that already?

Ferrara: We have to. The alliance might be able to go forward as a marketing arm, but as far as coordinating formats and those sorts of things, we won't once we're satisfied that we've actually made some measurable mark in set penetration and in audience delivery. No more

than we could do that now with our main channels....

RW: Maybe it will exist as a promotional vehicle?

Ferrara: Correct. One of my sound bites has been, "It's kind of heard to have restraint of trade when there is no trade."

RW: How are disputes over multicast formats for example, handled within the alliance?

Ferrara: I can't share with you the details of it but I can tell you that basically, all of the member companies submit multiple format ideas for the HD2 channels by market. Then, through a selection process, each station, it's not done by company, but station by station, has the opportunity to select from that list.

The list is extensive. In other words, if there's 10 HD2 channels in the market,

the list is at least 15 formats long. So there are plenty of choices.

RW: You've alluded to a big promotional campaign in the first 28 markets.

Ferrara: Think of it in terms of the largest radio advertiser that's out there. Two hundred million dollars, it's more than \$200 million actually, is more than Home Depot spends on the radio, (more than) Geico or General Motors spend in a year. I'd say we're putting our money where our mouth is.

RW: Is the \$200 million enough?

Ferrara: HD Radio will be the largest radio advertiser on the radio in 2006.

RW: You might ask companies to pony up more?

Ferrara: I think we wait and see how it goes and how it works' but suffice it to

say if we need to do more, we can and we will....

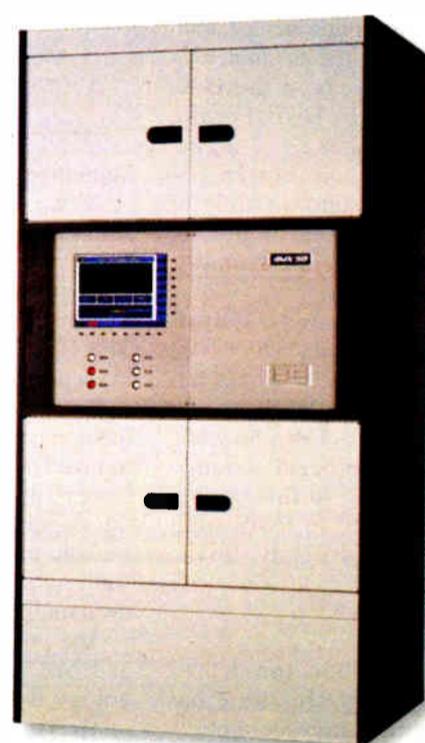
RW: Now what?

Ferrara: We really do need to beat the drum. We really do need to sell this through. The more information and the more people understand it, what the alliance is doing and why it's here, then the faster this is going to happen. That, at the end of the day, is kind of what it's all about.

I've joked with a few people... somebody said, "How will you know when you've been successful managing the alliance?" And I said, "When I don't need to have a job anymore." When the alliance ceases to exist and I go on to whatever the next thing is, that's the real benchmark of success. Because that means that we've gotten to a point where it matters. ●

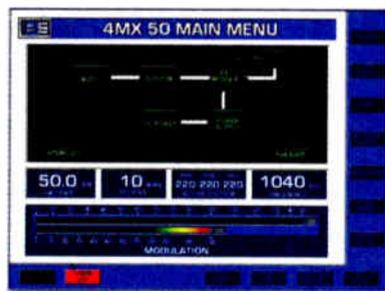


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DMB Set for Take Off in Korea

by Patricia Lee

SEOUL, South Korea The transition from analog AM/FM to digital mobile broadcasting in Korea has benefited from willing broadcasters, favorable government policy, the necessary network and device capability and consumer demand, according to experts. South Korea is spearheading digital mobile broadcasting at home and abroad.

Industry research estimates that the Korean DMB market could be worth more than \$800 million by the end of the decade.

Regulatory bodies such as the Korean Broadcasting Commission and Korea Electronics Technology Institute have worked to bring DMB to fruition.

Digital Mobile Broadcasting — consisting of digital TV images, and digital audio broadcast to a mobile device such as a phone — is expected to launch to consumers later this year in the U.K. according to the World DAB Forum, which promotes the Eureka-147 digital radio technology. The core Eureka-147 standard has expanded into a family of DAB standards that now include other multimedia applications and features, including DMB.

Germany will operate two DMB trials, according to the forum, which also says in China, Samsung Electronics has agreed to supply 500,000 DMB phones to two Chinese mobile TV operators. Both companies plan to begin commercial DMB broadcasting in this spring. Other countries involved in DMB trials include the Netherlands, Italy, Spain, France and Mexico.

Next generation

Since October 2003, the Korea Electronics Technology Institute has been developing reception technology for next-generation Eureka-147/Digital Radio Mondiale broadcasting. The project is targeted for completion in



DMB uses Eureka-147 DAB-based technology to deliver video, images, audio and text to portable receivers, including mobile phones such as this Samsung SCH-B360.

September 2008.

Along with the DMB project, KETI also is managing a separate project, a DMB receiver development center, working with Samsung, Korea Broadcasting Systems, LG Philips and other partners. The DMB receiver development center has a projected five-year lifespan.

But government policies and equipment capabilities alone are not sufficient to take DMB to new heights without consumer support. Increasingly, consumers are cognizant of the content they might be able to receive via a portable device, such as a mobile telephone or PDA or even on in-car audiovisual systems.

The possibilities are varied, especially as DMB, like the Eureka-147 DAB technology it builds upon, will be available on terrestrial and satellite platforms.

Surveys conducted in South Korea revealed that the diversity of handset and content appropriate for mobile

applications would influence consumer demand, according to DMB proponents.

"This also implies that content providers in Korea are the most influential player, followed closely by handset vendors," said Park Jun-Seon, director of the KBC technology policy bureau.

The motivation for Korea to have its own standard, Terrestrial-DMB (T-DMB), came about as it was considering moving from analog to digital audio, said Park. While the ATSC standard was adopted for digital television in Korea, there was a problem with mobile signal reception.

"At the same time, we were also reviewing (Eureka-147) DAB and we found that with modifications we could use DAB for video," he added.

High-quality video, audio and data services for T-DMB are provided using MPEG-4 video compression and AAC-BSAC for audio. The frequency band-

width for each broadcaster is 1.54 MHz and 1.152 kilobits per second of data can be transmitted, thus allowing condensed video and audio data transmission through multiplexing.

Consumers watch television or listen to radio or data broadcasting using personal or automobile handsets when outdoors or on the move using Satellite-DMB (S-DMB). In areas where satellite signals cannot be received or are blocked, gap-fillers will be used to provide service.

Retransmission

About 200,000 to 250,000 people subscribe to S-DMB; each is paying around 10,000 won, or approximately \$10.25 per month, for the service.

Proponents hope to reach 4 million subscribers by year-end 2006.

Retransmitting the S-DMB signals remains a concern, according to Park.

TU Media, a consortium formed by SK Telecom that provides mobile TV content, mobile multimedia services and digital audio for S-DMB, is working with national broadcasters such as KBS, MBS and Seoul Broadcasting Systems to retransmit content via satellite. While TU Media also develops its own content, it hopes to offer better material with the support of traditional broadcasters.

Meanwhile, T-DMB, which has been operating as a test service since March 2004, is set to launch commercial operations in December 2006.

The launch has been delayed though due to issues concerning the subterranean transmission network in shadow

T-DMB services will initially start in Seoul, but will expand to cover the nation.

regions and areas with poor reception.

"Although gap fillers could be used to allow signals to be received and rebroadcast in shadow regions, the question lies in who would be paying for the installation of gap fillers," said Park Yong-Suk, a researcher at the KETI DxB Communication Convergence Research Center.

The issues, however, may soon be resolved as both terminal product companies and broadcasting operators intend to share their expenses, according to Park Jun-Seon of the KBC.

Six broadcasters, KBS, MBC, SBS, YTN, KMMB and Korea DMB, have licenses to offer T-DMB service and collectively, they will provide six video and 25 audio services.

However the Korean government has restricted the number of services that broadcasters can offer. "Each broadcaster will offer two out of three (audio, video or data) services to prevent certain broadcasters from becoming a monopoly," said Park Jun-Seon of the KBC.

T-DMB services will initially start in Seoul, but will expand to cover the nation.

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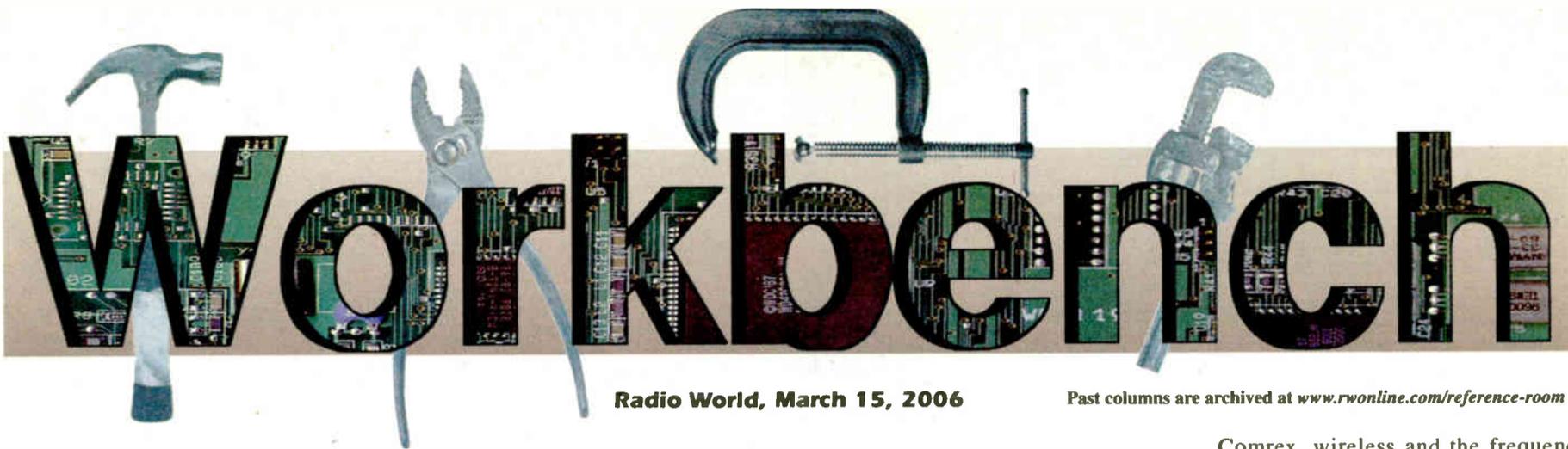
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Radio World, March 15, 2006

Past columns are archived at www.rwonline.com/reference-room

Make a Case for Organized Remotes

by John Bisset

Spring, at most stations, brings the start of another remote season. Engineers in warmer climes haven't even had a winter break like the rest of us.

In preparation for what will be a good nine months of moneymaking for your station, it's time to get organized.

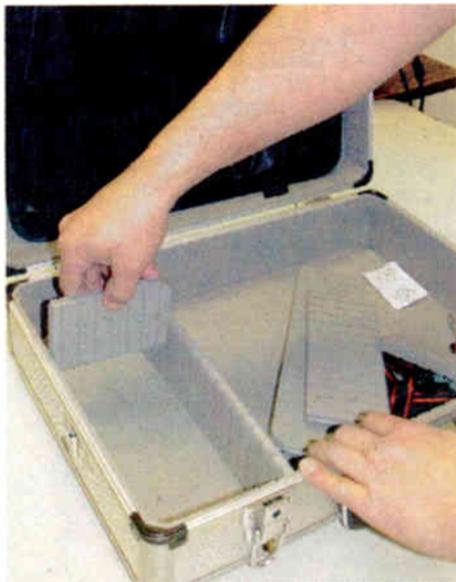


Fig. 1: A \$20 Husky case, complete with dividers.

Where to start? Get rid of the cardboard boxes or corrugated postal mail containers that hold your remote gear. A floppy cardboard box sends the wrong impression to the client. Further, a mish-mash of wires and AC cables makes set-up a nightmare.

Lamar Smith is market engineer for Entercom's Scranton, Pa., cluster. He and five other engineers keep transmitters, studios, IT and remotes running smoothly. His engineers are known for coming

up with unique, cost-effective solutions to everyday problems. Their solution for remotes is a case in point.

Engineer Bob Drazba loves Home Depot, where there's always something cost-effective that solves a problem around the stations. Home Depot is where he found a neat little tool case, shown in Fig. 1. For \$19.95, Bob realized he had a solution to the cardboard boxes.

It's amazing what 20 bucks will get you these days: a sturdy plastic-and-metal-trimmed case, with a tool pouch, dividers and even a webbed shoulder sling. The case is versatile, too.

The dividers can be used in the basic case to hold a wireless microphone system, as seen in Fig. 2. Note that Bob has color-coded the wireless systems with colored electrical tape. No questions about which microphone belongs to which receiver. Bob has carried the color-coding to the case itself; the orange wireless goes into the orange case. Hey, anyone can figure this out!

There's even enough room for spare batteries in these Husky cases.

Bob took the storage idea a step further, cutting out foam inserts for specific pieces of equipment, like the Comrex in Fig. 3. You can buy the foam from a packaging, hobby or office supply store and customize it for your equipment. Bob's thinking is that if everything has its place, in most cases it returns as it left.

Simplifying things for staff will make your life easier, too. Color-coding — even the input pots on the Comrex — means fewer foul-ups on live radio.

It doesn't take a lot of time to implement a plan like this; and the payoff is time saved for you. Wouldn't it be nice at the next manager's meeting to have programming and promotions compliment you instead of carping about missing

cables when they set up a remote?

Bob and Lamar told me that under the old method of remote equipment organization, it sometimes took them a couple of days to organize equipment and cables for a remote. Digging through several cardboard boxes was the norm. This led to frustration, since during the warmer months, the engineers were handling up to three remotes per station over a weekend.

Now, thanks to these cases, they can take a quick look inside to assure everything is in its place, and they're off to the site. Fig. 4 shows a few of the cases lined up and ready to go.

In addition to the colored electrical tape bands, mark the bottom lip of each case. Bob has also used a P-Touch Labeler to identify each case — RPU,

Comrex, wireless and the frequencies used.

Thanks to the Entercom Scranton team for sharing their ideas.

If you run into trouble getting the \$20 expenditure past your manager — yes, there are managers who would question the expense — ask if he thinks the client would pay more for a remote at which the engineer showed up with a cardboard box held together with duct tape, or a remote run out of shiny, well-organized cases. If he's sharp, he'll get the idea (or he may tell you to get some new cardboard boxes).

★ ★ ★

I have received comments about the solenoid breaker reset scheme described in the Feb. 1 *Workbench*; I'll share them in a future column.

Brian Brachel's response, though, See TROUBLESHOOTING, page 26 ▶



Fig. 2: A full wireless microphone system fits in this standard case.

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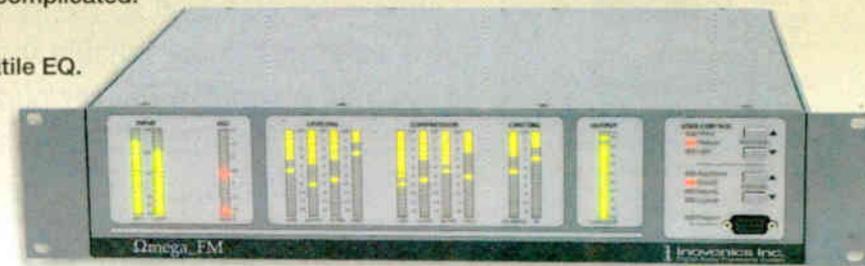
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USER REPORT

WZPL Uses Tieline G3 for Remote

by Mike Rabey
Chief Engineer
Entercom Indianapolis

This story was to appear in the Feb. 15 Buyer's Guide on portable audio and newsgathering.

INDIANAPOLIS Getting remote broadcast audio from the remote site to the studio usually employs one of three well-known routes. RPU transmitters can provide good audio or wretched audio, depending on the terrain and the level of RF pollution in your market. POTS codecs are handy, if somewhat fidelity-challenged. ISDN links sound great if you can afford the line charges and have two weeks of lead time.

So I was intrigued by the opportunity to test-drive the new Tieline Audio Over IP option for its G3 codec. Now that high-speed Internet is available at most businesses, the concept of achieving a high-quality stereo audio path from a remote site has become feasible. Free 128 kbps stereo audio is an attractive idea. The Tieline G3 already has the RG45 connector and associated circuitry in place, so only the software needs to be updated to implement this new capability.

Net gains

Obviously, this type of service requires high-speed Internet service; dial-up installations need not apply.



Mike Rabey with the Tieline G3

Also, at least one of the ends needs to have a public IP address. This will require a dedicated static IP address, not the dynamic address used by most broadband providers. This is where your IT specialist or ISP provider will have to get involved. Here at Entercom

Indianapolis, IT Manager Gill Rudolph performed a NAT (network address translation) on an address on our local network, creating an address the Tieline could call home.

After the trial units were dropped off by Tieline GM Kevin Webb, the first order of business was to set them up on the bench for testing. The two codecs were connected back-to-back with a crossover cable, and stereo audio was fed into one unit. The output from the other unit was monitored with a high-quality amp and speakers. After first connecting to each other, the units started off at a 9.6 kbps data rate, which sounded marginal. However, as I manually stepped up the data rate, audio quality quickly improved. At 24 kbps, the Tielines switched into stereo mode, and I continued to increase the data rate until it reached 128 kbps. At this point, the audio quality was truly remarkable.

Careful listening was required to differentiate the output from the source material. Tieline offers the choice of proprietary algorithms: "voice" for use at low data rates, and "music" for better quality audio at higher rates. For 2006 Tieline will also offer AAC Plus, Layer 2 and G.722.

Tieline offers the choice of TCP (Transfer Control Protocol) or UDP (Universal Datagram Protocol). Everybody is familiar with TCP/IP from transferring files over the Web. TCP/IP provides robust data transfer via a system of handshaking and double-checking of each data packet. This is great for data integrity, but the overhead and bandwidth requirements slow down audio transfer substantially.

UDP/IP is more like a "mass mailing" protocol: there's no handshaking, no data checking, the sending end just spews out the bits, and hopes the other end gets

Troubleshooting

► Continued from page 24

offered very good tips on what's really causing the trouble. He is the chief of WKHQ(FM) in Charlevoix, Mich. The station serves the Traverse City market, where there's great fishing and other sports.



Fig. 3: The foam cutout holds WILK(AM)'s Comrex.

While Brian applauds the engineer's design of a solenoid-resettable breaker, he adds that with the same or less effort, the engineer could have found the actual reason that the circuit breaker was tripping.

Brian had a similar issue with a Continental 816-R4 a few years back. He would experience plate breaker shutoffs for no apparent reason every month or so.

Brian investigated the breaker and noted that it was 90 amps, as installed by the factory. The breaker was original equipment.

One day Brian decided to figure out what was going on. He measured the current through the breaker with an RMS ammeter. At 100 percent transmitter power output, the transmitter was drawing 88 amps through that 90 amp breaker! This of course was the issue, and here's why: When the building got warmer, the breaker would de-rate and would trip.

Brian's next call was to Continental, who told him that there should be a 100 amp breaker in that circuit, if he was drawing 88 amps. They sent a 100 amp version that would fit. The result: not one trip since.

With this resolution, Brian offers several suggestions. First, if the building is hot, cool it off. Remember that everything gets de-rated in heat. That includes line fuses as well as circuit breakers. Heat could eventually

cause other breakdowns as well.

Second, make sure all three-phase connections are tight. If they are loose, they will create heat, which will propagate through the assembly and create the same result in the breaker before eventually burning the connections.

Third, when you suspect a faulty breaker, measure the current with a calibrated clamp-on ammeter. RMS



Fig. 4: Color-coded remote cases are ready to go. Sure looks professional, doesn't it?

ammeters will measure the AC circuit accurately. Make sure the phases are all in balance — close to equal current draw on each phase leg. This measurement will tell you a lot about the circuit's operation. It could be a wrong value breaker installed, as was Brian's case, but it could also be a power supply problem or a heating issue.

Ammeters are just as important as a high voltage probe and a good voltmeter. For broadcast and contract engineers, at a minimum, these three pieces of test gear are mandatory.

Finally, chronic tripping usually indicates a problem. Spend your valuable troubleshooting time trying to find the root cause. Band-Aids eventually will fail and you will be back to square one. Thanks, Brian, for these great troubleshooting tips.

Brian Brachel can be reached at brian@106khq.com.

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is 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.

Free 128 kbps stereo audio is an attractive idea ... Careful listening was required to differentiate the output from the source material.

them all. It may sound slap-dash, but for rapid audio transfer it's actually quite reliable, especially with the FEC (forward error correction) that Tieline builds into the software. Unfortunately, our firewall wouldn't pass UDP, so we used TCP for all testing. It worked quite well, notwithstanding a fairly noticeable delay from end to end.

It was time to put the G3 system to the test with a live remote broadcast of WZPL's "Smiley Morning Show" from a local comedy club on the Friday morning before Christmas day. The manager of the club informed me that they had SBC DSL Internet service, and invited me to test the connection two days before the broadcast date. I went to the site, plugged the Tieline into their Ethernet switch, and it promptly connected to the studio unit. I listened to the backfeed in flawless stereo.

Finally, it was show time. I had set the pan-pots on the mixer to spread the mics across the stereo soundstage. This gave the live reading an "open" sound that was quite pleasant. Surprisingly, a large crowd had assembled at the comedy club at 6 a.m. to watch the show, and their laughter and applause at the antics of the morning zoo made the broadcast even more enjoyable. The Tieline dumped the connection once, possibly when the office manager arrived at work and connected her computer to the Internet. Luckily, it happened during a commercial break, and the Tieline auto-reconnect feature kicked in before the live segment resumed. All in all, the remote was a spectacular success, thanks to the flawless sound that the Tieline G3 provided over the public network.

For more information, contact Tieline in Indiana at (888) 211-6989 or visit www.tieline.com.

MARKET PLACE

Prophet Systems, Radio Systems Sign Wiring Deal

Prophet Systems Innovations and Radio Systems Inc. signed a deal under which Prophet will provide Radio Systems' StudioHub+ connectivity as a factory value-added option for its installations.

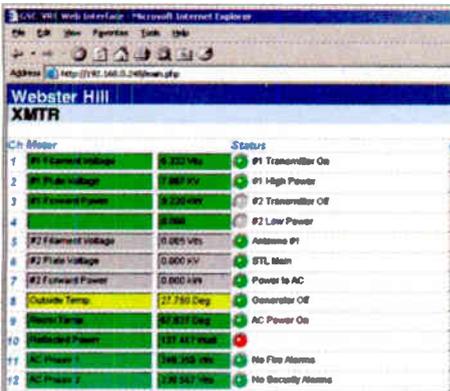
Prophet makes NexGen and 101 PC-based audio storage and playback equipment. StudioHub+ is an integration platform that provides plug-and-play wiring solutions via CAT-5 cable assemblies and break-out boxes.

The deal was announced by Tim Gieschen and Dan Braverman, presidents of Prophet and Radio Systems respectively.

Contact Prophet Systems in Nebraska at (308) 284-3007 or www.prophetsys.com; contact Radio Systems in New Jersey at (856) 467-8000 or www.radiosystems.com.

Burk Updates Web Interface Firmware; Takes Trade-ins

Burk Technology said firmware version 2.0 is shipping with its Web Interface products, which complement the GSC3000, VRC2500 and ARC-16 facility control systems.



General Manager Anita Russell said the firmware provides faster performance and better connection quality. It replaces earlier versions and began shipping in production units in December.

Customers with existing units who have not yet received a free upgrade can e-mail support@burk.com for information.

The GSC/VRC Web Interface and the ARC-16 Web Interface provide Web-based access to remote site conditions. They also allow operators to use system software over TCP/IP, reducing dependency on serial connections.

Separately, the company announced a \$500 trade-in allowance when broadcasters trade in a Moseley MRC-series remote control and purchase a new GSC3000 broadcast facility remote system. The sale is through Burk dealers and expires at the end of June.

For information contact the company in Massachusetts at (800) 736-9165 or www.burk.com.

Advertisement for SYSTEMS STORE.com, an online source for technical tools and supplies, listing various brands like Gepico, Krone, Neutrik, and Switchcraft.

ENCO Teams With Wicks, Powergold to Offer StreamLine

ENCO Systems says it is working with Powergold Music Scheduling Software and Wicks Broadcast Solutions to produce an integrated radio management and automation system.

The product is called Streamline; it combines Powergold Music Scheduling and Wick's Visual Traffic with ENCO's DAD radio automation software.

StreamLine, which ENCO calls an "agent" that watches the applications, integrates DAD's Library, Import, Export and Playlist functions with Visual Traffic spot entry and log management. Powergold's music scheduler drives and updates DAD playlists. ENCO says StreamLine frees broadcasters from managing multiple discreet applications and interfaces.

For information contact ENCO Systems at (800) ENCOSYS or visit www.enco.com.



Large advertisement for ANT remote control systems. It features a central image of a server rack with a funnel-shaped graphic containing the text 'WE CONNECT THEM ALL!' and the ANT logo. The ad lists 'INTERFACING' features like virtual connectivity and RS485 connections, and 'HARDWARE FEATURES' like modular construction and backup power. It also shows various control room software screens and contact information for NAB 2006.

Studio Sessions

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March 15, 2006

PRODUCT EVALUATION

PCX HR: Big Audio, Small Package

Sound Cards Offer DSP Monitoring, Breakout Box, Small Size, Enabling Easy Integration With PCs

by Carl Lindemann

Digigram's PCX HR (for "High Resolution") series opens a new era for broadcast production systems.

The PCX882HR has an 8x8 analog I/O alongside an 8x8 digital I/O; its sister model, the PCX881HR, is 8x8 digital I/O only. The demo unit I tested came with the BOB8 breakout box, and was used in concert with the WinRadio v2.6 automation software.

The card's small form factor, less than seven inches long, resolves integration issues had by the old full-length cards and will work with most any available PCI slot.

The card's converters are full-bore 24-bit/192 kHz capable. The hardware converters provide sample rate conversion for each channel so a vast mix-and-match can take place, simultaneously recording different sample rates/frequencies, saving the need to standardize in-house. The card's 66 MHz/64-bit Universal PCI interface has enormous bandwidth capacity.

The optional BOB8 breakout box is a 2U rack unit with two rows of Neutrik XLR connectors. The eight mono analog inputs are on the left side over the eight mono outputs. The four stereo AES/EBU inputs are on the left side over the matching stereo outputs. A word clock I/O, video sync input and SMPTE/LTC (Linear Time Code) input take up the far right side. Not enough I/O? Slap in a companion board/box to double the capacity.

The manual for the PCX882HR was fairly skimpy at 26 pages. Digigram generally does excellent development work to create utilities, and the focus here is exclusively on the various controls in the OS.

Digigram's communications manager

at the time of my review Frank Seidel explains, "The concise paper-based documentation is [due to] the fact that the card has a very long life. During this lifetime, software updates occur frequently, which can be better reflected by a computer Help file that can be more easily updated."

The bottom line on the setup is that it is likely to take more time in the typical installation to plug cables into the BOB8 breakout box than to set up the computer. A quick text of the audio quality in Sound Forge showed it to be more than adequate, near 100 dB S/N ratio.

Revving up the DSPs

Operation of the WinRadio package with minimal hardware was fine even



In any case, popping the card in and getting the drivers installed was a simple matter.

Launching the HR Runtime driver package managed the installation with a variety of drivers (Digigram np Runtime, WDM DirectSound, Wave, ASIO) depending on the application. Checking the diagnostic utilities confirmed that everything installed seamlessly. From there, the WinRadio v2.6 application software also went in without any issue. In fact, things were up-and-running with ease.

Whatever tweaking is necessary comes from adjusting levels on the channels through the software providing analog and digital gain up to a scorching +24 dBu.

when layering in loads of effects taxing the DSP power and not the computer's CPU.

This reflected the leap in DSP power over the previous generation PCX882v2. The older card used the Motorola DSP56303 chip operating at 80 MHz and the PCX882HR ups the ante to a Motorola DSP56321 operating at 240 MHz. That threefold gain in clock speed translates into a like increase in streaming capacity.

According to Digigram, the older card can mix three MP3 256 Kbps 48 kHz stereo streams simultaneously, while the HR series upgrade handles 12. Similarly, the 16 MPEG2, 256 Kbps 48 kHz stereo streams for the four physical outputs of

Product Guide



Inside

Product Capsule: Digigram PCX882HR Professional Audio Card

Thumbs Up

- ✓ Ample DSP processing power
- ✓ Broad range of drivers
- ✓ Easy to integrate into standard PCs

Thumbs Down

- ✓ No printed documentation for utilities

PRICE: \$390

CONTACT: Contact Digigram in Virginia at (703) 875-9100 or visit www.digigram.com.

the legacy card multiply to 68 stereo streams. The Digigram Control Center utility monitors the DSP's usage to maintain a comfortable reserve of processing capacity (10 percent is recommended) to remain glitch-free.

Again, lack of printed documentation for this utility left me wondering what the advantages might be for the various settings available. Help lies in a Help file — but it would help more to commit this to ink and paper.

Digigram's HR series marks a new phase in the digital audio/computer production revolution. Not long ago, hardware capability was the limiting factor. Systems with the PCX882HR integrated into it will likely remain viable and vibrant for the foreseeable future. Putting in a second card can double these capabilities so you have a scalable solution able to take on the audio engineering needs of a considerable broadcast operation.

Carl Lindemann is a frequent contributor to Radio World.

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Students Run High-School Station

WSTB Teaches Future Broadcasters About Regulations, Budgets and Disaster Management

by Ken R.

"I offer direction and set policy, but the students are empowered to run the station," said Bob Long, general manager of WSTB(FM), a high-school radio station in Streetsboro, Ohio.

"That's how they learn." Long, one of a handful of adults associated with the station, believes many teachers are "control freaks."

"I maintain that if you give the students room, they'll do something wonderful," he said. "I trust them, and they know they are trusted. We treat the station as a business and the students take a lot of pride in it."

Students into broadcasters

Long worked for several commercial stations in Ohio in the 1970s and wanted to combine his love of teaching with his radio career. When WSTB advertised an opening for a general manager in 1981, he was delighted to get the job and has remained there 24 years.

The Class A, 680-watt station's frequency is 88.9 MHz; it went on the air in March of 1972. The format is modern rock/alternative; WSTB is nicknamed "AlterNation."



Senior Robbie McVay handles the Friday 'All-Request Show' from 3-6 p.m. He also is production manager.

The station is automated overnight. There are live kids there Monday-Friday from 7:30 a.m. until 6 p.m. On Sundays there are live adults playing oldies all day. The station is on the air 24 hours a day, 7 days a week, 365 days a year, but automated except during the above hours.

The station's chief engineer, William Weisinger, is a paid contractor who comes in several times a week and probably ends up spending up to 30 hours at the station some weeks, Long says.

Long's course, Broadcasting I, can be taken in the sophomore, junior or senior year, yet a student still has to qualify to get on the air at WSTB — and this involves more than just getting good grades and showing up for class.

"There are a maximum of 20 positions, and we have about 60 or 70 people a year who take the course, so we can be selective," said Long. "Our decision is based on whether that person can be

trusted, because there is no direct adult supervision here part of the day while I'm teaching. We have to choose people who can mix well together, who are energized and aren't going to screw around on or off the air."

Has Long ever regretted allowing anyone on the air?

"No, not really," he said. "I've occasionally had to remove someone for dereliction of duty, or in one case had to demote an administrator back down to a DJ — but nothing heinous. It's not just

my judgment selecting these people, as my student staff is also involved."

The decision as to who gets to work at the station is not entirely Long's. He has an administrative staff of about eight students, all of whom are unpaid. This group meets once a month.

"It's a benevolent dictatorship," Long said, in which sometimes he is overruled by the group.

"If I didn't take their suggestions seriously, they would wonder why there were here."

Curriculum: beyond the basics

Long believes students need to know radio's history to understand its current

state. One project the classes enjoy is performing an old-fashioned live radio drama as a classroom exercise. "They write the script and create all the sound effects," he said.

To evoke a more contemporary sound on the air, students learn voice tracking on Simian software from BSI. "The learning curve on that is hours, not days," he said.

Also in the curriculum: FCC regulations, understanding Arbitron ratings, demographics and basic marketing. Long challenges students with a project called "Make Your Own Radio Station" in which they must design an imaginary station for a real market based on the conditions in that city.

"I give them equipment catalogs and they have to 'purchase' the right stuff

See WSTB, page 32 ▶



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RADIO UP NEXT

What Comes After ISDN?

Here's What Telcos, Codec Manufacturers Have to Say About the Replacement of ISDN by IP Audio

by Tom Vernon

Beginning around 1995, Integrated Services Digital Network revolutionized remote broadcast technology by enabling affordable, high-quality stereo dial-up connections. How quickly things change.

Recently, there have been indications that telcos are becoming reluctant to install and support ISDN circuits. The service is being displaced by faster,

cheaper and simpler broadband services such as xDSL and cable modems. IP audio is the buzzword. Satellite and wireless technologies also are being touted as potential replacements.

How much longer will ISDN be around, and what comes next?

Industry feedback

Kevin Webb, general manager of Tieline America, said customer feedback

suggests a shift away from ISDN is well under way.

"Our customers tell us it is getting more difficult to get ISDN lines installed, and in some cases requests are turned down," he said. "It also is getting harder to get tech support from the phone company for ISDN circuits." He said the advantages of newer technologies also are a driving force.

David Lin, director of sales and marketing at Musicam USA, still sees strong

the phone company."

he urges customers to hold on to ISDN circuits as long as possible, saying their great asset is the guaranteed quality of service, something that is not easy to obtain with Internet-based technologies.

Proceed with caution

The ISDN crunch is being felt in the Big Apple. Tom Ray, corporate director of engineering for Buckley Broadcasting/WOR(AM) in New York and a contributor to Radio World, said real problems began about six months ago, when it became difficult to get new lines installed.

"We were told by Verizon that banks

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'Into Tomorrow With Dave Graveline' was broadcast from the Consumer Electronics Show. The three-hour remote used the Comrex Access codec connected to the Internet. A dial-up line was used for backup but was not needed during the broadcast. Graveline is at right, Technical Director Chris Graveline at left.

demand from customers for ISDN. "About 95 percent of our customers depend on ISDN for remotes," he said. "We're seeing an increase in the use of IP audio for permanent connections, but the technology will have to become more reliable in order for on-demand service to grow."

He said that in developing nations such as China, the telcos are bypassing ISDN altogether and installing newer technologies.

Rolf Taylor, product manager of telephony at Telos Systems, sees a similar decline in Europe.

"ISDN isn't going away anytime soon, but getting circuits overseas will become harder, slower and more expensive as time goes on," Taylor said.

At Comrex Corp., Vice President of Development Kris Bobo said research for new product development is directed towards IP audio gear.

"With techniques such as forward error correction and dynamic delay scaling, we've made great strides in getting the technology to perform well over the public Internet." She anticipates a day when POTS codecs no longer work because IP audio circuits will be more cost-effective for the telcos to maintain.

Bobo echoes comments by others about declining service, adding that the problem seems to be worse on the East Coast.

"ISDN has gone through a complete cycle. About 10 years ago, many telco salespeople didn't even know what ISDN was," she said. "Then things got better. Now we're back to having to explain it to

and broadcasters were the only users of ISDN service, and that ISDN would not be part of Verizon's upgrades to central offices," he said. Verizon added that there would be a 60-day minimum wait for new service.

Getting good tech support on existing ISDN circuits has become more difficult. Ray cited an incident when lines at WOR were being dropped repeatedly. The problem eventually was fixed but only after much debate among the many Verizon technicians who were involved.

While many stations seem to be having difficulties with ISDN, Jim Smith, media relations representative for Verizon, said that ISDN continues to be a viable service for his company and there are no plans to discontinue it.

While there seems to be an evolution towards IP audio via the Internet for remotes, Taylor of Telos urges users to proceed with caution.

"Over-provisioning bandwidth is not the same thing as guaranteed quality of service," he said. "An Internet connection may work well for a day, a week or a month, and then not work. Broadcasters need to understand that risk."

Making the switch

Webb of Tieline said broadcasters need to take certain steps before jumping into IP audio remotes.

First, make sure the studio connection has a permanent IP address. These are available from a reputable ISP or professional IT organization.

Next, perform the Network Address Translation between the public Internet

See AFTER ISDN, page 31 ▶

After ISDN

► Continued from page 30

and the station's LAN. Following installation of the NAT, the studio codec can be connected. If the station has a DHCP-enabled network, the codec will be assigned a private extension number. The station's public IP address will then be routed to this private IP address through the NAT configuration.

Make sure there is a dedicated IP connection for the remote codec, or shape the network with a Virtual Private Network. Set aside a pipeline for the incoming call to be routed to the IP codec, so the IP audio is not molested by other traffic on the station's LAN.

Engineers who are setting up remotes with IP audio may need to acquire additional skills and training. Taylor elaborated: "Having general IP skills is a given. Beyond that, understanding port forwarding is important, especially if you're operating behind a firewall." He said users should understand firewall and router technology.

"Become familiar with basic protocol

analysis software," he said, "although in some instances these tools are built into the codec." Taylor recommends Ethereal, an analysis program available for free download at www.ethereal.com.

Alternatives, options

While DSL is one logical choice to replace ISDN, other technologies are available or about to come online.

Satellite terminals are an option. The combination of high hardware costs and connect charges have limited their use in the past to disaster areas or developing nations where there are no alternatives.

More recently, hardware costs have fallen, and connect charges for BGAN service averages about \$2.10 per minute. A typical setup would involve making a connection from the codec's high-speed data port to the satellite terminal. Some

satellite terminals have a direct ISDN interface.

As "hotspots" are becoming more common in bookstores, coffee shops, airports and public places, WiFi is an attractive medium for remotes, and pioneers with this service report good success. Access in many locations is free, others have a subscription model averaging \$6-\$10, depending on the plan. Connections are usually stable, with delays ranging from 100-200 mS, not much different than a POTS codec.

While WiFi remotes must be confined to hotspots, the upcoming WiMAX service is expected to cover a radius of 30 miles, although initial test results haven't been quite this good (see sidebar).

New technologies may expand the potential for satellite remotes. Connexion by Boeing has developed

antennas and equipment that enable high-speed airborne Internet access to commercial aircraft. Recent tests with Comrex Broadcast Reliable Internet Codec technology have verified the ability to broadcast IP audio from planes in flight. Signals are transmitted from the plane to an earth station via a Ku-band satellite.

Inmarsat's new Broadband Global Area Network (BGAN) also may be adopted for broadcast remotes. The mobile service provides both voice and broadband data simultaneously on a global basis. Guaranteed data rates are available on demand.

Tom Vernon is a frequent contributor to Radio World.

What's ahead for ISDN and for radio remotes? Comment on this or any article to radioworld@imaspub.com.

Are You Ready for WiMAX?

In the not-too-distant future, Worldwide Interoperability for Microwave Access, or WiMAX, may become an important technology for broadcast remotes. Similar in principles of operation to WiFi, WiMAX operates over greater distances, at higher speeds and with a greater number of users.

While WiFi can transmit at speeds up to 54 Mbps, proponents expect WiMAX to go as fast as 70 Mbps and cover a radius of 30 miles, although preliminary tests haven't achieved these results. Unlike WiFi, line of sight is not needed between users and the base station. The original WiMAX IEEE 802.16 standard describes the service operating in the 10 to 66 GHz band, but 802.16a added the 2 to 11 GHz range.

Steps have been taken to get WiMAX rolling. Intel has announced plans to make Centrino laptop processors WiMAX-capable in the next two to three years. It is expected that virtually all laptop computers will be ready for WiMAX by 2008. Intel also disclosed plans to invest an undisclosed sum in wireless broadband pioneer Clearwire, which owns large chunks of the wireless spectrum across the U.S., and is providing services to Jacksonville, Fla., Eugene, Ore., and Anchorage, Alaska.

Other Wireless Internet Service Providers (WISPs) are delivering WiMAX. TowerStream serves cities such as Los Angeles, New York, Chicago, Boston, San Francisco and Providence, R.I. AirBand is serving 28 U.S. markets including Baltimore, Dallas, Houston and Philadelphia. The Chinese cities Dalian and Chengdu are building pre-WiMAX networks that will be upgradeable when certification testing is complete.

Industry experts describe WiMAX as a disruptive technology for broadband providers such as cable and DSL companies.

— Tom Vernon

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WSTB

► Continued from page 29
from a budget we give them," said Long. "They also select a format and design the graphic logo."

Money matters

Streetsboro High School pays the phone and electric bills as well as Long's salary, but not much else. Long said the budget comes largely from pledge drives, which in the recent past have raised \$25,000 to \$30,000.

"If we have a major expense — like when we switched to automation or needed a new tower — they paid for that," Long said, referring to the school district. "But the daily operations are covered by on-air fund drives, which the students handle. They make the pitches, man the phones, collect the cash and send out the premiums."

Arbitron says the station has 30,000 listeners, so Long figures the \$30,000 the station raised in its 2004 fundraiser works out to about \$1 a year for every weekly listener.

The station obtains Arbitron ratings from the Radio Research Consortium,

which sells ratings to non-commercial entities like WSTB. Long said the station pays for the ratings for several reasons.

"It's nice to know who is listening because for example, you can tell your morning guy that he has [between] 8,000

"there just aren't a lot of jobs out there anymore since consolidation. The state of commercial radio is less than pleasant. Entry-level deejay jobs are gone, so we put a lot of people into related fields," such as IT, promotions, management and

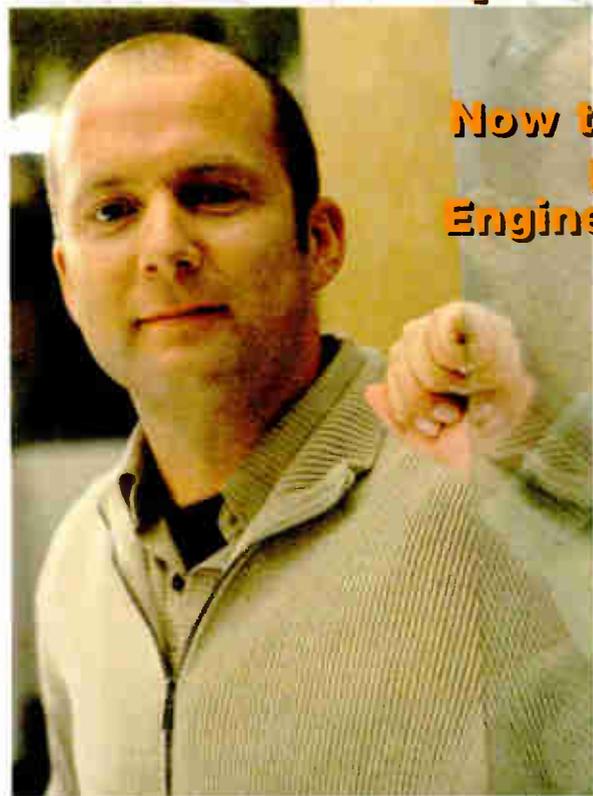


Sophomore Ben Claussen, a student member of SBE, is the station technologist and works with former student Dan Kuznicki on the station's Web site. Here he does work at WSTB's computer rack.



Senior Bruce Pucci is music director. He is shown on air doing his Friday morning show.

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and 9,000 each week. It pumps up his professionalism.

"Secondly, it's a research tool. It tells us what demographics to pitch our fundraising to and at which times. It also told us that our audience skewed younger at night, so we changed our music to appeal to the 16-22-year-old. Thirdly, I use Arbitron in class to teach rating interpretation."

Long said in the past, high school and college stations tended to act as mini-broadcast schools that tried to place grads in the real world of broadcasting. But

marketing.

Engineering and technical training are not included in that list because he doesn't teach RF matters. "I combine it with IT," he said, adding much of today's equipment is computer-based and so he focuses on that.

At least one student may opt to pursue a career in broadcast engineering. Sophomore Ben Claussen serves as the station's broadcast technologist and is a student member of SBE.

"We're also teaching disaster manage-
See WSTB, page 34 ►

WSTB Behind the Scenes

Here's a look at the equipment it takes to keep WSTB running smoothly:

Engineering Rack

Marti STL-20C Transmitter
Aphex 320A Compellor
Optimod 8100 (primary processor)
Inovonics DAVID (aux processor)
Inovonics 530 Modulation Monitor
Carver PSB-11 Tuner (Studio Air Feeds)
Sine Systems RAK-1/RP-8 Remote Control
CRL SCA 300A
WWES Relay Controller
Tohtsu Remote 800-watt RF Relay
WWES AC Relay Box
Bext LEX 25 (primary aux site exciter)
QEI 675 (secondary aux site exciter)
Henry 1000D (primary 1 kW FM aux site amplifier)
Silicon Valley 10/1000 (secondary FM aux site amplifier)
ATI DA416
Rolls RA63S Distribution Amplifier
APC 1500 UPS

MCR

Dynamax MX8L Audio Console
Three Gemini CDX 601 CD Decks
Sage ENDEC with two McMartin FMR-1 FM tuners and a NOAA receiver fed from a three-element 162 MHz yagi
Pace Landmaster VHF (RPU) Transceiver
WWES AC Remote Relay Box (tally light control)

Henry Engineering StereoSwitch Box (for emergency air feed transfer to production)
Audio Technica ATH-M40 Headphones
Audio Technica ATH-M30 Headphones
Two Audio Technica AT3060 Mics on O.C. White Boom
Tascam PA-20 mk II Amplifier
Two JBL 4208 Speakers
WWES Custom Intercom

Prod 1

Dynamax MX8L Audio Console
Three Marantz PMD320 CD Decks
Audiometrics DA 16000.b
Tascam PA-20 mk II
WWES AC Remote Relay Box
Audio Technica AT2020 Mic
Audio Technica ATM25 Mic
Two 5-inch Sony Mini 2-way Speakers

Prod 2

Dynamax MX8R Audio Console

Main Transmitter Site

Marti SR-20 STL Receiver
Bext LEX 30 Exciter
Silicon Valley 10/1000 RF Amplifier
Sine Systems RAK-1/RP-8 Remote Control
Jampro JMPC-2R Antenna (shared w/ WKSU(FM), Kent State)

Off-Site (GM residence)

WWES Silence Sensor Receiver

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WSTB

► Continued from page 32 ment," Long said. While Streetsboro doesn't have a designated EAS station, nearby Akron and Cleveland do.

"Our station is working with the city and we will shortly become the designated local center of communications in times of disasters such as blizzards, tornadoes or even chemical spills. We have a standing invitation to city government officials to walk in or call us with information and we'll put them on the air anytime.

"We met again last week with city council," he said. "They are going to put out a booklet this summer telling the community that they should tune to 88.9 in case of emergency because we have proven ourselves. They even gave us \$30,000 to move our transmitter to expand our coverage area."

Listeners say the station sounds professional and it has a slick Web site, designed by former student Dan Kuznicki. Key student personnel update their own sections of the site such as local events and the music playlist.

"Listeners tell us that WSTB doesn't sound like a high-school station," said Long. "We try to compete with the commercial stations."

What's become of Long's graduates? He has a former student serving as afternoon drive DJ on WQMX(FM) in Akron, who also serves as the station's assistant music director.

A former student is now regional vice president of distribution for the Game Show Network in New York. He started his career at WSTB. "As I was sitting in his office overlooking Central Park recently, I thought it was a real warm moment."

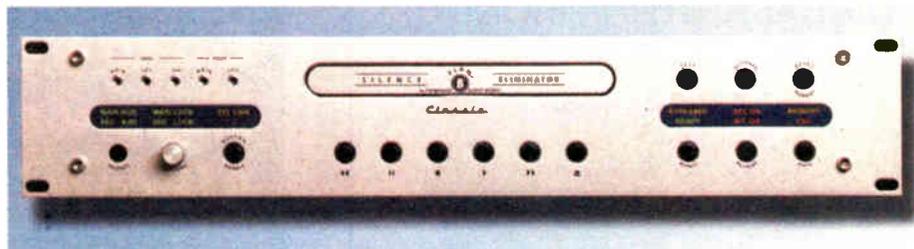
Visit WSTB at www.rock889.com.

Ken R. is a frequent contributor to Radio World, and was a broadcaster before disco was big. Contact him at ken@ken.com.

PRODUCT GUIDE

Danagger Offers 'Classic' Option for Plan B Users

Danagger Audio Works debuted a midrange model of the Plan B dead air prevention device with special features for network repeater applications. The Plan B Classic accepts an external closure to inject local audio from the system's internal DVD drive or Compact Flash card and automatically rejoins after a break.



Like other Plan B models, the Classic also will detect digital or analog program feed failures and provide continuous replacement audio while notifying station personnel via voice remote control.

External closures also can trigger automatic notification, which the company says makes the unit suitable for remote control for installations like repeaters. Each unit can have a separate ID number to identify which network site is reporting a problem. Users also can call the Plan B Classic to monitor program and backup audio, manipulate relays, monitor status inputs or make emergency phone-to-air announcements.

A monitor amplifier with stereo speakers and a headphone jack are included in the Plan B Classic's 2U aluminum rack-mount chassis.

A "Plus" option allows backup audio to be injected from an alternate external digital or analog program source, like a secondary STL or off air receiver. This option can be ordered separately and installed by the user. The company says all Plan B models now use interchangeable modules, allowing a Classic to be upgraded to the IP-equipped Plan B Deluxe at a later time.

The Plan B Classic has begun shipping and is available through broadcast equipment distributors listed at the company's Web site.

For more information, contact Danagger Audio Works in Canada at (888) 892-8346 or visit www.danagger.com.

ATA Audio's Kronos Supports Four E1/T1 Links

The Kronos E1/T1 Multiplexer system from ATA Audio allows transportation of voice channels, high-quality audio and data across 2.048 Mbps or 1544 Mbps structured links (E1 or T1 circuits), using time division multiplexing. It supports up to four E1 or T1 links.



Time slots can be dropped/inserted across any of the connected T1 circuits. Audio coding options are J41, J42, J57, ISO MPEG 1/2 Layer II, ISO MPEG 1/2 Layer III, G711 and G722.

It is implemented using a modular construction on backplane architecture in a 19-inch rack. Four racks may be cascaded together.

Features include the option of redundant AC or DC power supply, hot swapping of modules and local or remote control and configuration through RS-232 or LAN interface.

The Audio Encoder module supports analog or digital inputs.

For more information, contact ATA Audio in New Jersey at (973) 659-0555 or visit www.ataaudio.com.

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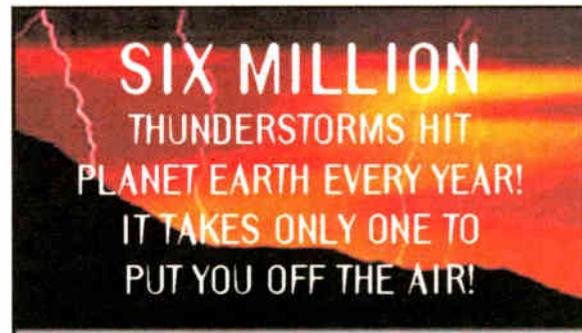
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PRODUCT EVALUATION

ATM: Not Just a Squeeze Box

25-Seven's Unit 'Pauses' Broadcasts, Eases Joins, Allows On-The-Fly Compression Changes

by Thomas R. Ray, III

When I was asked to review the Audio Time Manager by 25-Seven Systems Inc. I thought, "Well, this is great. Something to time-squeeze programming to slide in another commercial or two; and something we wouldn't use at WOR." I was wrong.

Geoff Steadman, president of 25-Seven Systems, changed my mind.

"I suppose you could use it for that purpose," he said, "but that's not how it is intended to be used."

The 25-Seven Audio Time Manager is a 2 RU digital box. The front is laid out logically, with the common controls such as record, hold and play on the right. Toward the center and left are an LCD screen for manipulating the ATM through its various menus; five soft keys near the LCD screen to allow menu selections; and a set of four arrow buttons to move through and around various menus.

The back contains XLR connectors for analog audio input and output, and XLR connectors for AES or SPDIF signals, something that is very nice. Analog reference levels can be adjusted easily through the menus. The back also has a DB-25 connector for GPIOs (eight general-purpose inputs and eight outputs), RS-232 data for remote control of the ATM, and an Ethernet jack for software updating, synchronization of time and secure remote control through an internal Web server.

One of a station's big fears is losing a commercial break during network programming if normal programming is interrupted. The ATM can start recording at the moment of interruption, and will 'record' any closures received from the network.

Installation is fairly straightforward. Stereo audio connections are obvious, as is the connection if you use a digital signal. Once the unit is in the rack, it is simple to configure the networking parameters and NTP time-server parameters. If you do not have an Internet connection available, you can set the time of day easily on a menu screen. And you do need to set up the time of day.

'We interrupt this program ...'

So what are the uses for the ATM?

Perhaps your station carries baseball games. Nothing frustrates a listener more than having the right fielder going back for the game-winning catch, only to hear that the play-by-play has been interrupted by an EAS alert or a network news bulletin.

The ATM can put the ball game into "pause" mode, much like the TiVo does for your favorite television program. Say the guy is at the plate ready to swing, but your EAS box takes air for a thunderstorm alert. You can have the ATM sense a closure that the EAS is on the air, and it will start

recording. When the EAS system releases, it will start playing back the game exactly from the point where it was interrupted. The ATM will then speed up the play-by-play until you are back in real time.

A better use for the ATM would be if a network talk program were interrupted. One of a station's big fears is losing a commercial break during network programming if normal programming is interrupted. The ATM can be triggered to start recording at the moment of interruption, and through its GPI port, also will "record" any closures received from the network.

You can define the functions of various GPIs and GPOs easily using the front-panel menus. Once the interruption has

ceased, the ATM will proceed to play back the interrupted program from the point of interruption and, if a break cue were received while you were away, trigger your automation system to fire the break at the right time in the program. I think that is a cool feature.

The time compression used by 25-Seven is very good. There is no pitch shifting, even at its maximum speed up

rate of 20 percent.

You would need to experiment to determine the maximum speed you wish to play back your audio. While the pitch of the voice remains accurate at 20 percent, the playback does sound like the person is talking awfully fast. If your audience knows the speech patterns of your announcers, they may find this annoying. The ATM sounds good and the speed difference is hard to pick up at 5-10 percent shift.

You may be wondering why we need to set the time of day, and why we would want to lock it to an NTP time standard. The reason is that the ATM's time compression ratio is adjustable on the fly. Let's say you had a program interruption five minutes before the end of a program that lasts 40 seconds. When the ATM begins playing back, it will tell you on its display the time the system will be back in real time.

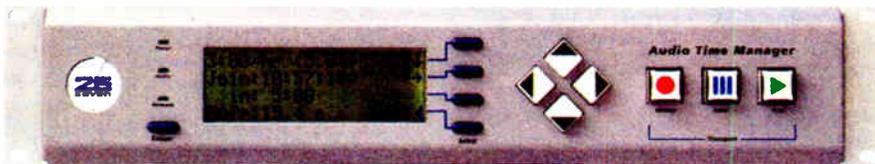
Let's assume you need to hit network news on top of the hour. You can, on the fly, adjust the time compression rate so

ATM will come back to real time exactly at the top of the hour. And you can see this calculation directly on the display. No math or time calculations required: the ATM does it all. This is another cool feature.

Yet another use for the ATM would be to provide a local introduction of something like a presidential news conference. We all know these things never start on time, and it usually sounds sloppy when you do join, usually clipping or stomping on the first couple of words. Using the ATM, you could start recording at precisely the moment the president starts speaking, while setting up the scene for your listeners, and then begin playback. A perfect join.

Cut the cord

The embedded Web page is easy to use. This provides full functionality on a Web browser in the studio if your ATM is in the



Product Capsule: 25-Seven Systems Audio Time Manager

Thumbs Up

- ✓ Menus are easy to navigate, understand
- ✓ On-the-fly time compression changes
- ✓ Embedded web page
- ✓ GPIO capabilities
- ✓ Inclusion of AES, S/PDIF audio I/O

Thumbs Down

- ✓ External power supply

PRICE: \$7,950

CONTACT: 25-Seven Systems in Boston
at (888) 257-2578
or visit www.25-seven.com.

installing an ATM simply may not be able to afford it.

Overall, I found the ATM to be a tool that is well thought out, with many uses for practical programming problems in a radio facility. The menus are set up well and are easy to navigate and understand, the "normal" controls on the front panel are simple to use, and the ability to change the time compression on the fly is a great idea.

The inclusion of AES or S/PDIF audio ins and outs is something more manufacturers need to consider. The abilities of the GPIOs and the ATM's ability to record and spit out network break closures blow me away. And it's nice to see the unit can be controlled via browser, as more and more manufacturers are providing this feature.

If you are looking for a way to make programming interruptions or joins easier and neater on your air, the 25-Seven Audio Time Manager should be strongly considered.

Tom Ray is vice president/corporate director of engineering for Buckley Broadcasting/WOR Radio in New York and a frequent contributor to Radio World.

rack room. This is a great feature to prevent running multi-wire cable between rooms.

If, however, you like using remotely mounted buttons to control the ATM's main functions, you can map these to the GPIOs. There does not appear to be much the 25-Seven folks have left out.

What don't I like about the ATM? For a unit the size of the ATM, I find it disconcerting that it connects through an external power supply whose pin plug can accidentally be pulled out of the back of the unit. I prefer the "normal" power cords you find on most devices, as these tend to stay put and don't clutter up the equipment rack with yet another wall wart or external power supply box.

I also find the list price of \$7,950 steep. Granted, the ATM is a powerful box with many good features. But smaller radio stations that could really benefit from

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Buyer's Guide

Tech Updates



Radio World

Digital Audio Production

March 15, 2006

USER REPORT

VoxPro 4.0 Edits Bits In Short Windows

by Larry Lomax
Crista Broadcasting, Seattle

SEATTLE VoxPro is manufactured by Audion Labs and distributed through a number of dealers. When I moved from Sandusky to Crista Broadcasting in 1997, VoxPro was on my "must have" list. It changed the way I did radio.

Now I host and produce the Spirit Music Countdown on KCMS(FM) in Seattle and handle a variety of operational functions for sister stations KCIS (AM) and KWPZ(FM). For editing phone bits and creating daily station promos VoxPro is utilized in all dayparts, but especially our morning show with Scott and Sam.

VoxPro was created in the early 1990s, the brainchild of Seattle radio morning talent Charlie Brown. For those of us who remember using razor blades and splicing tape, Charlie was looking for a faster way to record and edit phone bits. VoxPro migrated from its original Apple-based system to Windows a few years ago, and it has some new embellishments with the release of version 4.0.

Quick

I got my first taste of VoxPro at Seattle's KLSY(FM), where Delilah was hosting an evening love songs show. In more recent years I have visited a number of times with Delilah and her producer Janey, and their fingers absolutely fly on Vox Pro prepping phone bits for her nationally syndicated show. Martha Hadley, host of the newly syndicated "Sharing Life Together," has been using Vox Pro for several years on her nightly interactive show with listeners.

The primary strength of this tool is the ease and speed to record, edit and playback for live radio. If I am running a contest going into a song or spot break, I can make pretty quick work of getting it edited to air in a matter of seconds.

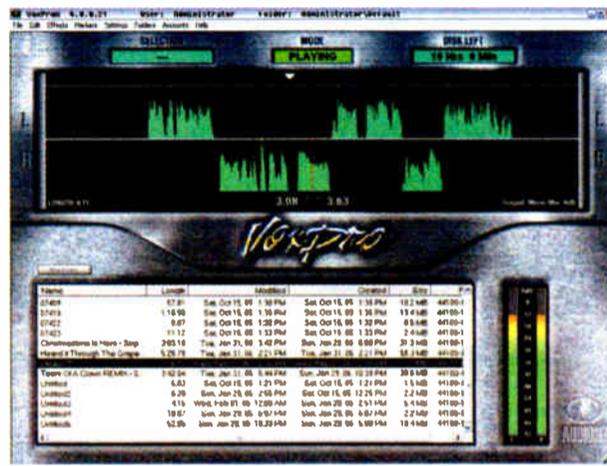
Most programmers would agree that you never want to waste the listener's time, so the ability to edit quickly to the gist of an incoming call is invaluable.

After you have created and aired a bit, you can mix down the two channels to WAV, WMA or MPEG for archiving or posting bits on the Web. The VoxPro is a more appropriate choice than standard WAV editors for phone bits and fast turnaround of audio in the control room. Aside from taping listener calls, I have found it useful for recording remote breaks, in-studio interviews and audio feeds from network sources or TV. I can see it as a great tool for a radio news operation.

While you are in the midst of editing one bit, you can start recording a new call instantly. If it turns out you don't want to keep the call while you are recording, you can hit cancel and it's gone; you are back to the bit you were editing. Each call gets time-stamped and can be renamed at any point, and can be filed into specified folders.

If I am doing a contest or listener poll, I can string a number of calls together using the insert record function at any point within an already recorded track. I can also cut and paste within that track so I can end the bit with the best bit.

Another invaluable tool is the "voice slip" feature. Since audio from talent and caller are on two discrete tracks, you can time shift the audio apart when both parties are speaking simultaneously. It's a way to rescue



VoxPro 4.0 Screenshot

a call that otherwise may not be useable. You can also mute either channel to clean up any unwanted background sound.

Audion offers a nice control panel that will perform most functions with ease, although I find myself comfortable just using the keyboard. You do need the control panel to utilize the hot keys that you can link for instant playback to any specific cut. Each user has their own log in, so they see their own files, and can organize their own folder structure. This also prevents one talent from deleting another's work. However the administrator can view usage of each user, and suggest any digital housekeeping that may be in order.

New features for 4.0

If you don't already have a compressor/limiter on your phone hybrid, you can utilize the AGC function to help assure you have usable audio levels. Presuming you already are running processing on your microphone, I would not run the added AGC on that channel.

As you are recording or during playback, you can add markers to access reference points quickly when editing, especially useful for long-form recording. You can label each marker point easily and delete them as needed.

VoxPro can also monitor a folder on the network and automatically import new files in a variety of codecs. That function may be helpful for a talent and producer working together or dropping in sound bites. Some of the other effects available may be used somewhat infrequently, but they lend themselves to your own creativity. Change pitch and tempo, echo, flange, chorus, distortion and several presets for reverb. There's also a CD ripper built in.

One thing I'd like to see is more mouse functionality in editing. At present you have the ability to select an area of the waveform with the left mouse button. It would be helpful when editing to have a right button menu available with options to delete the selected region, create a new file of the selected region or trim off the unselected area.

As a tool to help talent perform better on the air, VoxPro works well for me. It has become my "Swiss army knife" for the past decade.

For more information, contact Audion Labs in Washington state at (206) 842-5202, or visit www.audionlabs.com.

USER REPORT

Maine Public Radio Rides The Burli Wave

by John Bradford
Systems Technician
Maine Public Broadcasting Network

BANGOR, Maine In 1999, the radio service of the Maine Public Broadcasting Network sought the means to streamline newsroom workflow and content delivery without compromising content quality or network resources.

By incorporating the components a newsroom would need into one program, Burli Software created a package that allows our news staff to do practically all of their work in one program. A reporter can boot up a workstation, open Burli and use nothing else.

Using off-the-shelf hardware with current versions of Windows, integrating Burli into our network was not a difficult task. Setting up the data server involved the



MPBN 'Morning Edition' Host Irwin Gatz uses the Burli system.

installation of the Burli program and modifying some global settings and behaviors to meet our needs. Some of the configuration involved simple settings such as a system-wide PCM default sample rate to the more complex job of setting up users and groups to provide data security. Additionally, because MPBN makes full use of the archiving, assignment and contacts features, MySQL was easily installed and configured on this machine.

Capture

For capturing various information services, a dedicated machine was set up. The only additional hardware installed is a modem for capturing incoming faxes, a phone hybrid to allow reporters to record directly into Burli from remote locations and a Sound Blaster card for timed capturing of analog audio off satellite.

Maine Public Broadcasting also depends on both the AP wire service and the NPR DACS messaging system. Burli supports ingestion of these and practically any wire service in the world.

Capturing the general newsroom e-mail and various RSS feeds is also handled through this machine. All captured content is sent to the data server where it becomes immediately available for use at each Burli workstation.

Workstation setups were easy: Run the install; point each workstation to the server; make some local configu-

See BURLI, page 38



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World Radio History

USER REPORT

USB Match Plus Replaces Sound Cards

by Dave Kephart
Owner/Operator, KSR
Technical Director,
MGK Communications

THOUSAND OAKS, Calif. KSR is a production facility for a number of nationally syndicated music-based weekly radio shows, as well as occasional commercial voice-over work and related post-production.

I have been a user of other Henry Engineering products over the years, and their consistent quality and durability led to the acquisition of the new USB Match Plus for my critical studio work. I have not been disappointed.

The USB Match Plus is a professional bi-directional stereo audio codec and monitor. In simple terms, it is an external A/D and D/A converter that replaces a traditional computer sound card.

The unit connects to any PC using USB interface, and provides line-level analog inputs and outputs on XLR connectors. The front panel has controls for Record and Play levels, and a six-LED peak-reading digital level meter that is switchable to monitor either input or output. There is also a high-quality headphone amp (it follows the meter select), with a level control.

No installation software

The unit supports 32, 44.1 and 48 kHz sampling rates, and sports 16-bit Delta-Sigma A/D-D/A converters. The Match Plus is powered by its USB connection. My studio is set up to take full advantage of computer-based mixing and editing using two audio computer systems. I installed the USB Match Plus on my primary workstation, on which I record my



Kephart works in production with USB Match Plus.

voice tracks and transfers from other sources.

The USB Match Plus performed flawlessly from the moment I set it up. The USB connection makes for a quick installation. No software is needed; my system recognized it immediately and it fired up without a hitch.

The front-panel level adjustments made it easy to calibrate inputs and outputs to the rest of my equipment, and the level meters are not only handy but appear to be very accurate. They indicate peak level, referenced to absolute "digital full tilt." You always know exactly how close you are to the digital clipping point.

The unit also has a Speaker output for amplified computer speakers, which I

found useful. Some of the projects I produce end up as Web audio presentations or as MP3 files intended to be downloaded and listened to on the end user's computer. The ability to listen to material on typical consumer computer speakers is a bonus, especially when it comes to adjusting low-frequency content.

The Speaker output can be muted by connecting the Mute jack to an external switch or relay. It's a nice feature that'll be appreciated by broadcast studio users.

I am pleased with the sound quality of the USB Match Plus. I do a lot of critical monitoring of detailed and often low-level material, and that's where the unit's sound quality really shines through.

It is during these low-level passages

and fades that one might encounter digital artifacts (sometimes referred to as "zipper noise") in a lesser unit. Not so with the USB Match Plus. Even with headphones cranked, I was unable to detect the slightest anomaly, even at extremely low levels on difficult program material. And at normal listening levels the sound quality is superb.

I generally monitor and mix using dedicated near-field monitors, and it is important to me to have a system that is flat across the board. The USB Match Plus has a smooth, open sound with a solid low end and precise high end. No frequency hype, and none of that digital graininess in percussion or artificial sibilance on voice tracks. The headphone jack is not just a frill; it's an audiophile-quality amp that can be used for critical evaluation of your audio.

Most of my projects are for broadcast, distributed on CD. I therefore produce everything at 16-bit/44.1 kHz. Prior to using the USB Match Plus, I had used different sound cards including another external unit, several of which were capable of 24 bit 96 kHz audio. Since I live and work in the real world, I rarely, if ever, use those capabilities.

After extensive listening tests of a variety of critical material, including some side-by-side comparisons, I would have to say that the sound quality of the USB Match Plus is superior even to other sound cards I've used that were considerably more costly. The sound quality, convenient features, quality and durability that I've come to expect from Henry products over the years add up to a home run for the USB Match Plus.

A "lite" version called USB Matchbox is also available. It offers the same audio performance, minus the level meter and headphone output features.

For more information, contact Henry Engineering in California at (626) 355-3656 or visit www.henryengineering.com.

Burli

► Continued from page 36

ration changes and the reporter is up and running. At the beginning of 2006, Burli released the latest official version. Updating the workstations to new versions of Burli is a snap. Simply copy the new version to the Burli root directory on the server and restart Burli at each workstation. The program automatically recognizes the new version and copies to the local workstation.

While the Burli user interface does take some time for most folks to get used to, the learning curve is not steep.

The program displays three panels from which the reporter can access information or audio and to work on news stories. Available to all users in the upper panel is the In-Queue, which acts as the central repository for incoming items such as wire copy, faxes, e-mail, captured audio feeds and locally created audio and scripts. Simply clicking on a slug from the lists displays the content whether it is text, a fax or an audio waveform.

Also available in the upper panel are tabs to offer filtered In-Queue content (also quickly accessible from the left panel's filter tree), network scripts, a powerful multi-track editor and even an integrated Web browser. All of the upper panel content resides on the server except for the multi-track audio and, obviously, Web

content. Almost any In-Queue item can be utilized in working stories by copying text into a script or pulling audio into the lower panel, where it can be edited or incorporated into a script.

News prep

The lower panel is where the user will conduct much of the work involved in preparing news items. Recorded audio — from within Burli or from the field — appears here, and the reporter can edit audio non-destructively. At MPBN, we use solid-state recorders in the field, so the reporter simply opens the audio file in Burli and it's ready to edit and use in

their stories.

Burli also incorporates a rather powerful multi-track editor, giving the user the ability to layer voice tracks, actualities, ambient sound and other audio elements which, especially for long-form news, are absolutely essential. The final mix can then be inserted into a script for a full-length news show.

Newscast and show scripts reside on the network and are created and edited from the lower panel. A reporter can monitor the timing of a story, make edits that are available network-wide and insert actualities or complete audio components into the proper point within the script. Then, for

the actual newscast, the announcer can bring up the script and display it in a prompter mode. This allows for scrolling of the copy with audio clip links at their proper location for easy firing.

Burli is a simple yet complex program that gives producers and reporters the necessary tools in one interface. While it is impossible to cover all of the features and potential configurations, Burli's expert staff not only helped to customize the system for each us, but they also provided some of the best technical support available.

For more information, contact Burli Software in Vancouver at (604) 684-3140, or visit www.burli.com.

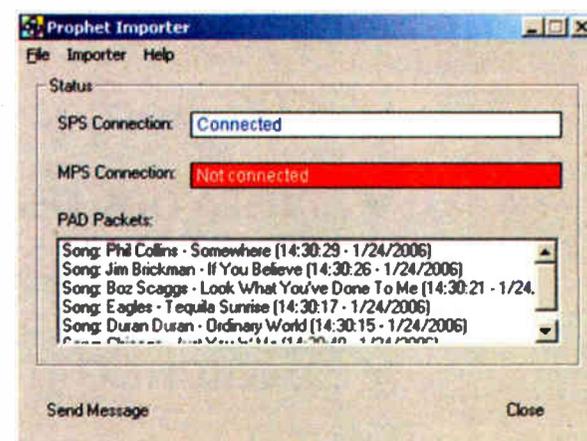
TECH UPDATE

Prophet Combines Tasks With HD Importer

Prophet Systems Innovations has added HD to its line of NexGen modules. The HD Radio Importer interfaces with its automation system, and can also function as a stand-alone converter. The module combines audio playback, library management and editing.

The Importer uses one audio input and requires no audio outputs. Prophet says its system allows a single box to feed the HD signal and have enough channels left over for editing. The company also says that its system, like others, requires several applications which need to start in a set order, but the HD Radio Importer has managed configuration settings which allows the process to take place by clicking one icon.

For more information, contact Prophet Systems in Nebraska at, (877) 774-1047 or visit www.prophetsys.com.



TECH UPDATES

Adobe Upgrades Audition to 2.0

Adobe Systems Inc. continues to expand the capabilities of Audition, the audio editing software originally developed as Cool Edit.

The new Audition 2.0, it says, features a low-latency mixing engine that allows instant audio feedback. The engine allows record parameters to be made in real time. Punch-ins can be made on the fly to any number of audio tracks. Eight tracks can be recorded simultaneously.

Audition 2.0 has a revamped mixer panel that displays all settings and allows up to 16 sends per channel. Effects are displayed on the mixer channels, a change from previous versions. More than 50 effects are available to shape audio according to the producer's needs. The multitrack display will be more familiar to users of previous versions.

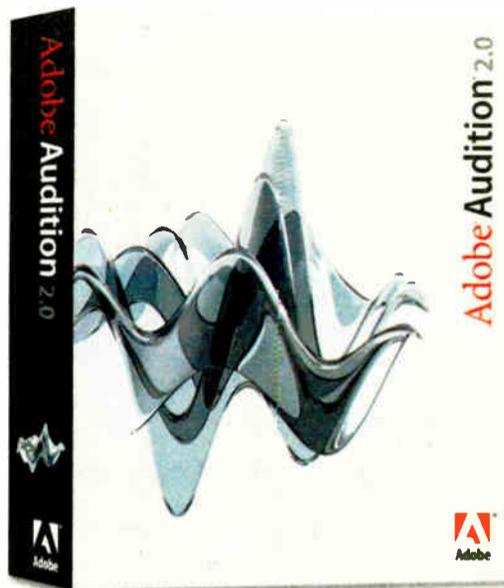
The workspace of Audition 2.0 is customizable, and preferred environments can be saved for later use. The software supports common video formats and can synch up clips to sound files in the multitrack view. For more advanced video support, Adobe's After Effects and Premiere Pro integrate with Audition and can be purchased as a package.

Finding audio with in a WAV display is aided by two styles of scrubbing. Tape editors will be familiar with the old, "rocking the reels" style of back and forth scrub to find a precise sound. Shuttle scrubbing is available for rapid search of an audio file.

For audio that needs repair, the Lasso tool is provided to isolate sounds within the Spectral Frequency Display. Producers can isolate sounds with a free-form Lasso, or they can use the marquee tool, which provides a rectangular isolation.

Audition 2.0 features a file management system. Adobe Bridge allows users to view media files in a group, and offers audio and video previewing before opening for edit. Audition 2.0 is available as a stand-alone editing product, as part of a digital audio and video editing suite, or as an upgrade from a previous version of Audition.

For more information, contact Adobe in New York at (800) 833-6687 or visit www.adobe.com.



OMT Expands Production Capabilities

A WAV and MPEG recorder will be added to the production module of the iMediaTouch audio asset system when OMT Technologies unveils release 2.6 at the NAB2006 convention in Las Vegas in April. Users can edit and record cuts in a manner typically done with third-party production software.

The software uses a non-proprietary design and can run on generic PC equipment with standard audio cards. Common audio files can be transferred into the production module, and CD ripping is offered. Bit and sampling rate of files and CD audio can be adjusted up or down as the transfer occurs. Files can be moved from iMediaTouch to other editors or players for preview, edit or playback.



The production module also offers multiple levels of security, which OMT says makes it ideal for student and volunteer-run radio stations. The software allows system administrators to put password protection on certain levels of production, such as deleting audio cuts. Novice users can complete production tasks without inadvertently altering an audio database.

Multiple edit windows and time manipulation are available with the new release of the production module, as well as more editing tools. The tools function and display in a similar manner to popular stand-alone editors to reduce the learning curve, the company says.

For more information, contact OMT in Winnipeg at (800) 665-0501, or visit www.imediatouch.com.

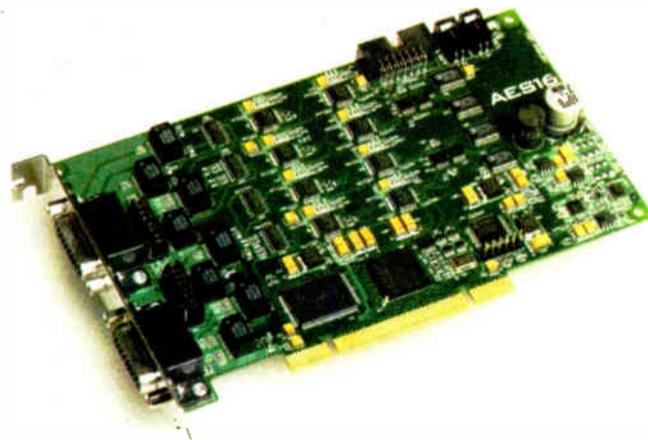
Lynx Offers 16 Channels of Digital Playback

The AES16 from Lynx Studio Technology is a half-size PCI card that supplies 16 channels of 24-bit AES/EBU digital audio with a sampling rate up to 192 kHz. The card comes with a 32-channel mixing program that allows hardware parameters to be set and monitored visually. Master levels are set with the software, and different mixing scenarios can be saved. Drivers and sources can be checked and adjusted using the software interface.

Each card allows two more AES16 cards to be connected. Up to four cards can be combined for a total of 64 inputs and outputs. Formats can be converted on the fly with no audio degradation. Lynx says the cards feature a proprietary technology that allows the cards to find clock info in severely degraded signals that usually accompany long cable lengths and other noise sources.

There are two models of the card, the AES16 and the AES16-XLR. The XLR model comes with two fan-out cables to connect from the card to standard AES/EBU cables. The XLR connectors are color-coded for ease of identification and connection.

For more information, contact Lynx in California at (949) 515-8265, or visit www.lynxstudio.com.



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TECH UPDATES

Sony Releases Acid Pro 6

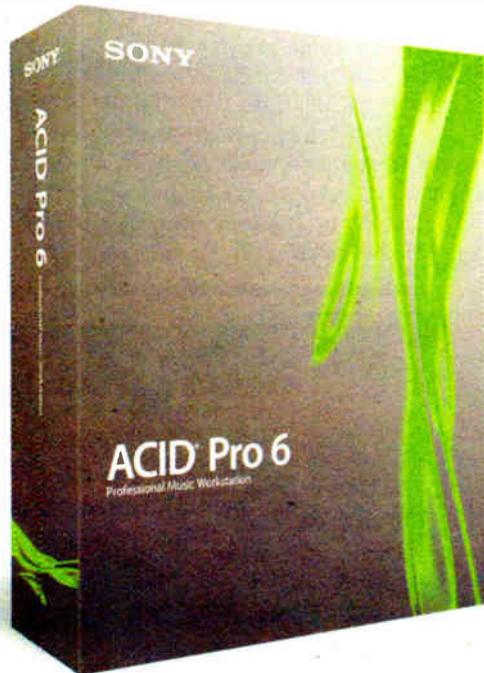
Sony Media Software has released Acid Pro 6, an upgrade to its loop-based music creation software package. The version adds a multi-track recording and MIDI sequencing platform. Sony says these additions make Acid Pro 6 a full-featured professional digital audio and MIDI workstation.

Multi-track features include unlimited audio tracks, on the fly punch-ins, 5.1 surround sound and approximately 20 effects. The software allows for hands-on mixing using external control devices. This includes support for Mackie Control Universal, and user-customized mapping for five generic control surfaces. Audio tracks can be teamed with a video scoring track that accepts AVI, MOV and WMV files.

Musical production tools include drum map editing, which allows users to create drum map templates, and inline MIDI editing. MIDI notes can be edited for position, pitch and controller information on the main multi-track interface. Sony Media Software provides Net space for producers to self-publish their tracks at ACIDplanet.com.

In conjunction with the launch of Acid Pro 6, Sony Media Software introduced a two-CD set of loops and samples useable with the program. The samples are based on the music of bassist Tony Franklin. The collection is "Tony Franklin: Not Just Another Pretty Bass."

For more information, contact Sony Media Software in Madison at, (800) 577-6642 or visit www.sonymediasoftware.com.



Digigram Cards Support Surround

Digigram's VX1222HR and VX 1221HR have the ability to play two simultaneous surround sound signals, while recording the audio.

Each card takes up one PCI slot, but can output six stereo channels. The VX1221HR has two digital inputs and 12 outputs, while the VX 1222HR has both digital and analog I/Os.

The cards can convert sampling rates to conform to the internal clock. An output for Word Clock is available. Other cards can be connected to the VX series with a companion board connector. Sampling rates up to 192 kHz are available.

Digigram says the cards have the ability to send audio for three different playlists to consoles, along with audio for commercials, jingles and cue monitoring. Connections to the card are made through a 62-pin port. A breakout cable is optional.

For more information, call Digigram in Virginia at (703) 875-9100, or visit www.digigram.com.



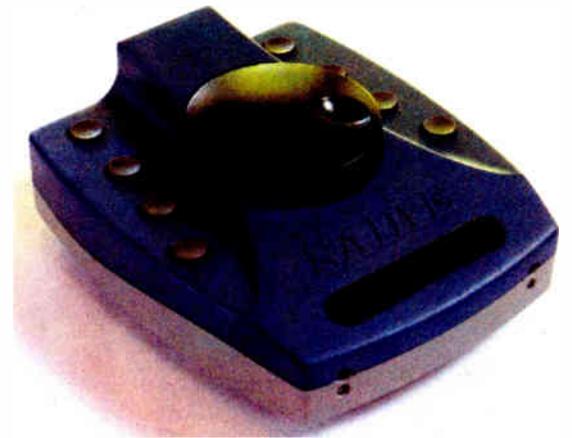
Sneaker Net Moves SADiE BB2

While most digital production is now passed around complex networking systems, SADiE is touting the old ways of editing: take your project with you. It offers the BB2 series of portable digital production devices, which allows eight-track editing with the basic tools that producers use in a studio or field recording situation.

The unit can connect to a desk or laptop PC using Windows XP and USB2.0 connections, and can fit in a coat pocket. The BB2 has analog and S/PDIF inputs and outputs, as well as a dedicated microphone input and headphone jack. The BB2-J adds a shuttle wheel to search through audio files. SADiE says the BB2-J's ergonomic is designed to abate repetitive strain injuries exacerbated by use of a mouse in recurrent editing operations.

The BB2 series of portable digital editing devices is compatible with SADiE's more complex Series 5 audio asset management systems. Projects can migrate from the BB2 to the Series 5 for advanced editing and playback. The BB2-J can be upgraded to run SADiE V5 production software, which includes mixer routing and processing as well as CD burning.

For more information, contact SADiE in Tennessee at (615) 327-1140 or visit www.sadie.com.



AudioScience Develops CobraNet Products

AudioScience continued expansion of its CobraNet digital audio network system with the ASI2416 modular interface. The IRU hub can deliver up to 32 channels of analog or AES/EBU audio I/O and up to 64 relay-based GPIO outputs and 64 opto-isolated inputs. CobraNet functions in an Ethernet environment for delivery and editing of digital audio.

Each module has a unique interchangeable connector portion that may be configured with a pluggable terminal block or a standard 50-pin Centronics connector interface compatible with AudioScience's sound cards.

Current modules include the ASI1401 Analog Module with four stereo balanced inputs and outputs, the ASI1402 AES/EBU Module with 4 AES/EBU inputs and outputs and the ASI1403 GPIO Module with 16 relay outputs and 16 opto-isolated inputs.

The base unit of the ASI2416 offers 16 channels of CobraNet I/O and is based on a Texas Instruments 32-bit digital signal processor that performs switching, mixing and tone decoding. Cirrus Logic's CS18101 processor performs Ethernet navigation.

AudioScience provides free, downloadable software with the ASI2416 for audio routing between CobraNet compliant devices from any manufacturer.

For more information, contact AudioScience in Delaware at (302) 324-5333 or visit www.audioscience.com.



ASI2416 Modular CobraNet Interface With ASI6416 CobraNet Sound Card

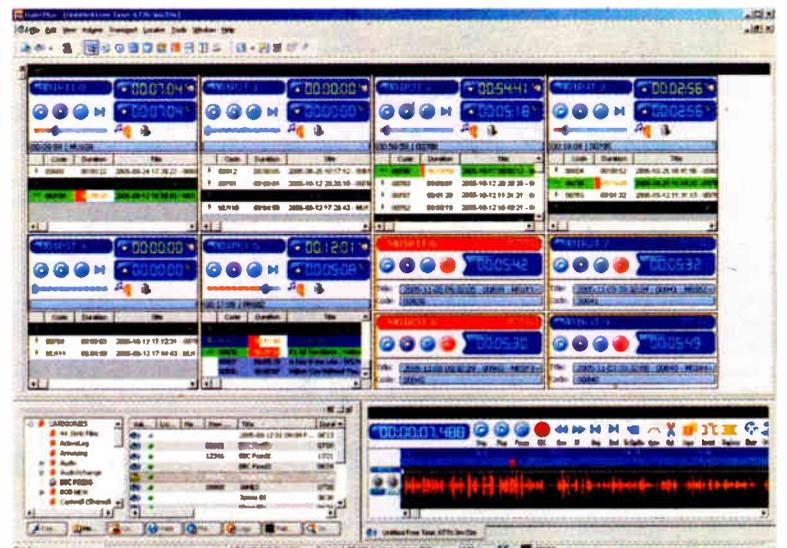
Dalet Introduces Audio Engine, Recorder

The P3000 player/recorder has been added to Dalet's lineup of products for its DaletPlus Radio Suite. Dalet says the new system was designed for large-scale automation projects. The P3000 provides 16 simultaneous stereo channels from one server. Single events can be edited and saved under multiple titles and function in a system Dalet calls "Containers". After editing, the event can call all of the titles up for automation use.

There is a separate user interface for both the player and recorder, as well as editing and event screens. Stations using the Radio Suite for news production can access and edit scripts with News Edit, an application similar to Microsoft's Word Pad. Available disk time is displayed on the Program Manager line.

Powering the P3000 functions is the new DaletPlus audio engine. The new engine allows producers to mix a project that uses different sampling rates, and encoding. The audio engine is designed for low latency playback, allowing users to hear an accurate mix as they record. It uses an Intel processor and supports industry-standard audio boards with MME drivers. The DaletPlus audio engine is designed for use by multiple brands of sound cards based on an Intel processor.

For more information, contact Dalet in New York at, (212) 825-3322 or visit www.dalet.com.



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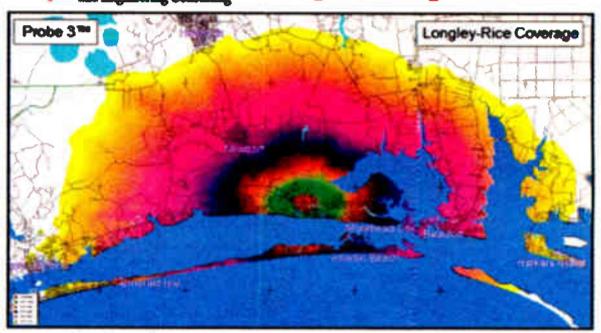
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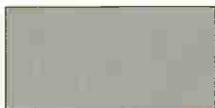


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◆ READER'S FORUM ◆

Spotlighting Young Engineers

I really enjoyed the article on young engineers (Feb. 1). Not sure I agree that young engineers are aplenty; if you go look at the average age at an SBE meeting, it is hard to find a radio or TV chief under 50.

I felt I was a member of a tiny group of younger engineers when I became chief of WTIC(AM-FM) in January 1998. At that time I was 24 and to my knowledge the youngest chief in the company, and was told probably the youngest CE of a 50 kW heritage clear AM in the country.

Luckily, I had some great mentors and was welcomed by the SBE chapter — not discounted because of my age.



Now that I'm pushing 33 and starting to move into the next phase of my life and career, I realize the value to business in the energy and enthusiasm that comes with youth. In other words, I see myself slowing down a bit.

Spotlighting young engineers is great on many levels. It is inspirational to younger engineers and encourages more articles. It has never been more imperative that we seasoned engineers offer encouragement and remain available to answer questions or help out in a pinch. Self-confidence is an essential component in building a young engineer's career and keeping him or her from becoming discouraged and leaving the field.

We must take seriously the challenge of growing the next generation of competent broadcast engineers.

Jeffrey R Hugabone
CBS Radio Hartford
Chief Engineer
WTIC(AM/FM)
Farmington, Conn.

Royer and the Source Book

Recently I received my copy of Radio World and was pleased to see a product release for one of our latest products, the Royer R-122V vacuum tube ribbon microphone. Thank you for including us in your newspaper.

The issue was accompanied with the latest release of the Radio World Source Book & Directory, which is always a handy resource to find manufacturers. However, when I thumbed through the resource directory to check to see if our information was correct, as we recently

moved to larger facilities, our company was not listed.

I'd like to let readers know we haven't vanished! We are still handcrafting fine ribbon microphones here in Burbank at this address: Royer Labs, 2711 Empire Ave., Burbank, Calif., 91504.

Rick Perotta
Royer Labs
Burbank, Calif.

RW welcomes corrections or clarifications for our 2007 Source Book & Directory. E-mail us at radioworld@imaspub.com.

The Pirates May Have a Point

I heard about yet another pirate station hitting the air, this one in San Diego. Even though "Free Radio 96.9" was shut down by the commission in July, it is back with even a stronger signal, according to NBC(TV) in that city.

**The pirates are
breaking the law,
no question. But
listen to what they
are saying.**

Two thoughts occur to me. I'm writing here as an RW reader, not an RW contributor.

The first is that many pirates simply don't care about the FCC laws that keep broadcasters from eating each other's lunch as they do in other countries. I have read that some of these unlicensed broadcasters rationalize their flaunting of the rules with bogus logic such as "free speech is what we're all about," or "it's not fair that six companies own all the radio stations."

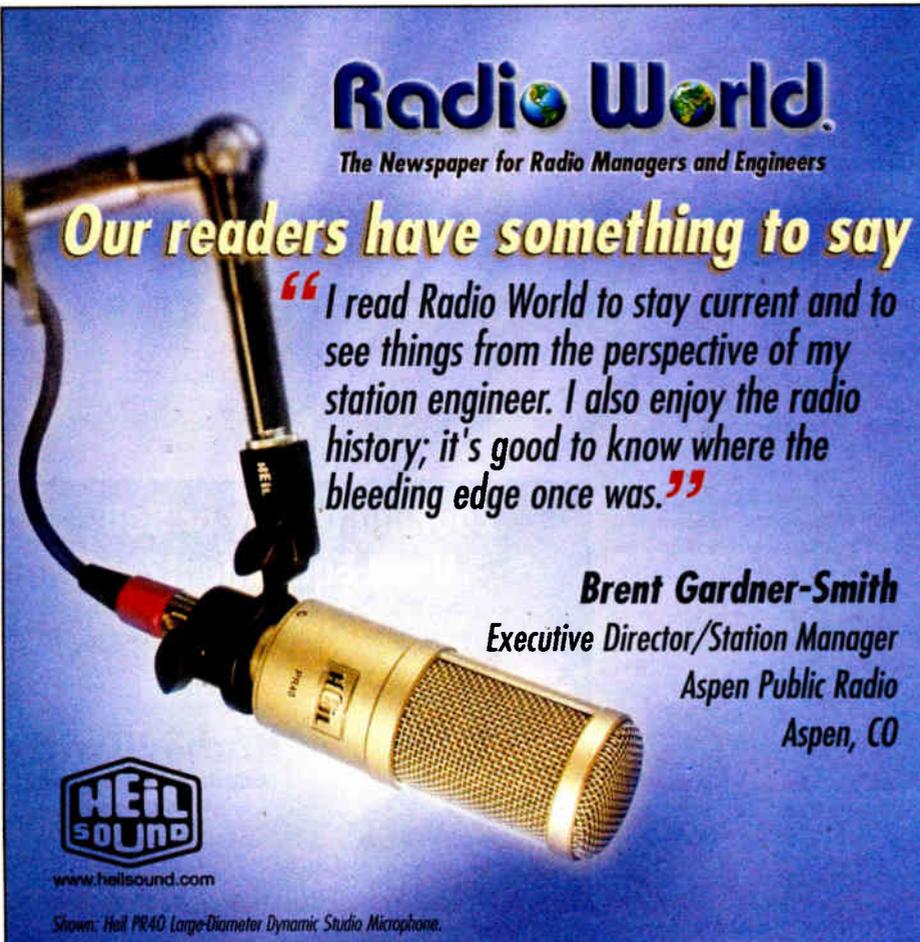
The second thought is that while the pirates are wrong to do what they are doing, they still have a point.

In the mid-1960s in the United Kingdom, the BBC held a radio monopoly. Programming was boring and citizens wanted more choices. A crop of pirate operators sprung up, broadcasting from open waters three miles off the coast, a plan they thought would give them some protection. They were all eventually shut down, but their message was heard and gradually the BBC allowed more voices to be heard on the dial.

The success of satellite and Internet radio shows that a certain segment of the population is not satisfied with terrestrial radio. So much so that they are willing to pay \$12.95 a month for satellite programming even though dozens of channels of traditional AM and FM are available at no cost.

The pirates are breaking the law, no question. But listen to what they are saying. The message should not be ignored.

Ken R. Deutsch
Toledo, Ohio



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GUEST COMMENTARY

Life After ISDN: What's Next?

Hartnett Says Comrex BRIC Technology Offers Stability, Low Latency; Uses Little Network Bandwidth

by Tom Hartnett

Sometimes it seems that radio broadcasters are second-class citizens when it comes to getting the tools they need from the phone company for remote broadcasts. This wasn't always the case.

Telephone companies used to have an entire division dedicated to serving broadcasters — but those were the days of monopoly and tight regulation, and telcos were forced into serving broadcasters by the regulators.

for a good portion of their broadcasts.

ISDN has become so ubiquitous and reliable that radio talent can telecommute and easily “hit the road” for broadcasts from virtually anywhere.

But while ISDN was gaining steam, so were competing technologies. Modem technology quickly advanced to deliver speeds that rivaled ISDN, and DSL and other Internet access technologies matured to the point of stealing the majority of Internet users.

In recent years, ISDN has been left

across it is another thing entirely.

Audio on the Net

On the Internet, reliability and stability have a direct relationship with delay, which is the bane of remote broadcasters. And the only way to stabilize a network with a varying packet delay (like the Internet) is to create a decoder buffer to smooth out the network jitter.

It might be argued that in this day of HD Radio delay will be less important, but there is often still the need to have interactive chat over the remote broadcast link, especially in live news environments or programming with listener call-ins.

The science behind putting audio on the Internet is pretty well defined. Several methods and products exist that will compress audio, wrap it into an IP packet, then shoot it to another address for decoding. But these products have proved lacking for use of the wild of the Internet, especially in a challenging network environment.

Comrex has been looking at the problem for several years and has come up with a solution.

We've coined our technology BRIC, for Broadcast Reliable Internet Codec. It's designed to make the Internet rival previous solutions in terms of reliability and delay, while still providing ease of use for those who don't know the difference between DHCP and DNS.

The stability and low-latency aspects of BRIC come from combining advanced compression algorithms with intelligent

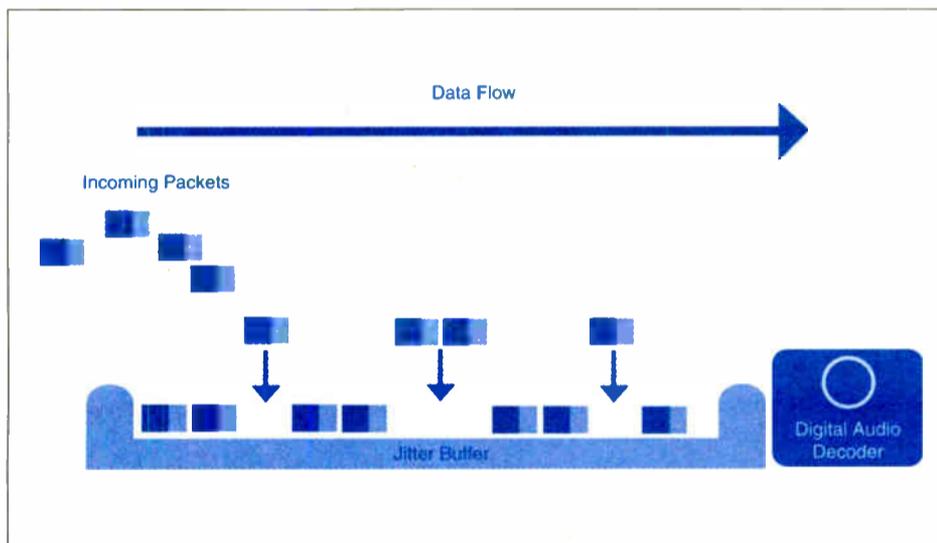


Tom Hartnett

usable as it is to be reliable. BRIC has features that allow quick setup and connection to a range of networks, and a special feature — BRIC TS — allows for “buddy list-style” point-and-click connections, along with transversal of network devices that would prevent peer-to-peer connections otherwise.

The road beyond ISDN clearly leads in the direction of Internet-based solutions, and BRIC technology makes it reliable and useable.

The one thing that has struck me since introducing BRIC at NAB2005 is how many interesting applications we've found to “spec out.” So far we've tested from



Part of the magic of BRIC is in how the decoder jitter buffer is managed, minimizing delay and maximizing stability.

Installing dedicated broadcast loops for remotes was never a money-making proposition for telcos, and indeed once they were able to price them closer to their true cost, they quickly fell out of favor with broadcasters in the 1980s.

Coincidentally, this had quite a beneficial effect on Comrex, which happened to be providing one of the few alternatives to broadcast loops at the time, the multi-line frequency extender.

But this conversion ended the days when broadcasters could tell the telcos to jump and the telcos would ask, “How high?” From that point on we've been relegated to piggybacking onto whatever circuits were in demand by larger industries. Luckily, the next technology to come around was a perfect fit for broadcasters — ISDN.

'An orphan technology'

Although ISDN boasts a stack of technical standards several feet thick, the concept is pretty simple. Because all the internal telco trunks had already been converted to digital, this digital access could simply be extended to the customer.

In the 1980s the digital rate of a voice call (64 kbps) seemed like a blazingly fast speed compared to the 2.4 kbps modems of the day. Designers envisioned a digital network that integrated services, allowing voice and data calls to interoperate smoothly.

It was serendipity that DSP compression science was progressing to the point where quite reasonable audio could be transferred around the data rates offered by ISDN, and Comrex, among many other companies, was there to answer the call. Many stations invested in ISDN equipment, and several began to rely on ISDN

with only two killer apps: broadcasters and video conferencing. And video conferences are migrating quickly over to the Internet, leaving us lowly broadcasters as the only users of what is becoming an orphan technology.

Telcos are finding it is in their best interest to limit the locations where ISDN can be installed, or sun-setting its availability altogether. ISDN also is becoming harder to support, as new staff isn't so well trained or experienced with it. What's a broadcaster to do?

Comrex has enjoyed a lot of success in delivering POTS codecs as an alternative to ISDN, but these have their own their long-term concerns. This is because telcos are again transitioning their trunks, this time from T1 style circuit-switched networks to Voice-over-IP technology.

I believe this transition will not only hasten the demise of ISDN, but also will make it increasingly difficult to place POTS codec calls in the future, especially long-distance.

So again we find ourselves searching for a way to do remote broadcasts over a low-cost, readily available medium. Currently, this is Internet access-delivered in the form of DSL or cable modem, which is quickly becoming as ubiquitous as phone lines.

Additionally, with wide deployment of Wi-Fi and 3G wireless data services, the Internet offers the possibility of enabling many new applications that couldn't be envisioned in the wired world.

So while change is inevitable, and even desirable from a wireless standpoint, there remains the issue of reliability. Transferring data across the Internet may seem reliable from a Web surfer's point of view, but moving real-time audio

ISDN has been left with only two killer apps; and with video conferences migrating to the Internet, broadcasters are the only users of what is becoming an orphan technology.

buffer management. Translation: BRIC uses little network bandwidth, and constantly and silently makes automatic adjustments to its buffers to maintain the sweet spot between reliability and delay.

We borrow from some of the advanced work going on in the VoIP world that has made applications like Skype and Vonage so successful.

But these days it's as important to be

coffee shops with Wi-Fi, on a variety of low-cost and portable satellite channels, boats, aircraft and networks where older solutions just weren't feasible.

My hope is that the this transition will make remotes easier and cheaper, while at the same time making broadcasts more fun and interesting for listeners.

Tom Hartnett is the vice president of engineering for Comrex.

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◆ READER'S FORUM ◆



2011: Radio in Five Years

Paul McLane wrote about past predictions for radio and invited us to look ahead five more years ("They Looked Beyond Y2K," Jan. 18).

Despite regulatory delays and setbacks, FM broadcast will be well on the way to becoming totally digital and multi-channel in the larger (50+) markets by 2011, with datacasting becoming a larger part of the mix.

In the smaller markets, HD adoption will still be confined to hybrid simulcasts of the analog channel, with few additional channels or services, due to implementation costs. HD receiver penetration will be in the 5 percent range in those major markets, but making progress. Multichannel content will be what drives receiver purchases — or not.

WiMax will become a factor in audio broadcasting via both Palm and laptop implementations, but look for in-dash auto receivers incorporating analog and digital

AM and FM, satellite and WiMax to begin appearing in shows.

The power of WiMax will change a lot of scenarios. WiMax will, of necessity, be mostly an urban development. Look for a very few progressive broadcasters to hook up to WiMax early in the game, many of which may be non-comms. The capture of WiMax broadcasts, as in Podcasts, will be an important developmental issue. Broadcasters will begin to recognize WiMax as a competitor/replacement for traditional terrestrial broadcast due to its access to mobile platforms.

In the more distant future, being a "local" broadcaster will be defined more by how easily your site can be captured on the Web by a group in a certain area than by how "local" your content actually is, whether you have a broadcast station or not.

AM will continue to languish technically, with little incentive to migrate to digital. Due to the potential for serious (primarily) nighttime interference, regulators will still be struggling with their role. At this point, regulation will have declined to make a decision and allowed a sort of "defined chaos," with individual inter-

Are You a Masochist?

It was with great interest that I read an annual "state of the profession" report in a recent issue of Electronic Design magazine.

The results were as I expected. Salaries in the field of broadcast engineering were only 60 to 80 percent of the average for electronic design engineers.

Of particular interest though was a section that asked, "Would you recommend engineering as a profession to a young person?" Several respondents voiced the familiar concerns: deadlines, long hours, lack of continuing education, little fun, competitive pressures from here and abroad. Yet I was struck by a resonant response from Chester F. Page, chief engineer of EEW Inc., a gentleman about my age and seniority in his own field. It captures my feeling about radio engineering today:

"Anyone (contemplating being an engineer) who isn't already spending most of his or her time building stuff, and trying to get it to work by the time he or she starts thinking about careers, probably isn't an engineer in the first place," Page wrote. "Anyone who really is, in that sense, already an engineer probably won't find any other career as personally satisfying, however much more prestige (and income) might go with it."

"To those considering making a career of building stuff, I would say only this: If you wish to remain continuously employed, you will need to plan your career as deliberately and carefully as you would plan any other system that must survive in the real world. And while planning, you might perhaps also plan for occasional moments away from building stuff, for family, etc."

In radio, the pool of technocrats has been thinning as a direct function of consolidation and deregulation. By anyone's definition the engineer count has reached an all-time low. Compounding this, the mean age is probably higher even than that of construction workers, which is 43.

Retirement and death will drain the technical expertise from radio, expertise that only a lifetime in the business can produce. Where will competent replacements come from? Do we want to send them off on a path of career oblivion? With all the knowledge we have to share, would we entice our children into this field to learn from us?

Cinema is my second passion — I write film criticism and history under a pseudonym, and I'm probably the only broadcast engineer in the country who dreams in Panavision — and it strikes me that radio engineers and actors share a space on the frustration plane.

A leading man in the 1920s and '30s, one of the handful to make the transition from silents to sound, was Richard Dix. His son Robert, also an actor, often is asked, "Do you think I should be an actor?" He replies, "No. If you have to ask me, you're not confident enough to get out there and get in the mix."

It's a tough life.

Like actors, we radio engineers are here because there is no other profession for us. Love and the masochism function simultaneously, like synchronous carriers.

But to our children and others who express an interest or think they might want to try on the hair suit of broadcast engineering, it might be fun — and only fair — to give them the old western movie one-liner.

Turn back before it's too late.

Charles S. Fitch
Avon, Conn.

Being a 'local' broadcaster will be defined more by how easily your site can be captured on the Web by a group in a certain area than by how 'local' your content actually is.

ference issues handled case-by-case. Thus AM implementation will be crippled by previous regulatory decisions, but will still happen as receiver penetration driven by FM continues.

As with FM multicasts, content creation will be important to success on the AM band. Traditional "dead-ender" formats will continue in analog until killed by regulation or ratings.

Due to the existence of so many competitive program streams, traditional commercial terrestrial broadcasting will continue to see its share of the economic pie decreased, to the detriment of the now-existing business plans of major broadcast entities. The result will be a continuing sloughing off of non-productive properties — primarily AM but not only — to smaller entities, many of which will be non-profit.

New frequencies for terrestrial broadcast will be virtually impossible to locate, even in sparsely populated areas, due to previously existing congestion and recent filing windows. But would-be noncommercial broadcasters will find they can land a terrestrial signal if they happen to be in the right place at the right time, and aren't afraid to work the situation.

Gary O. Keener
San Antonio, Texas

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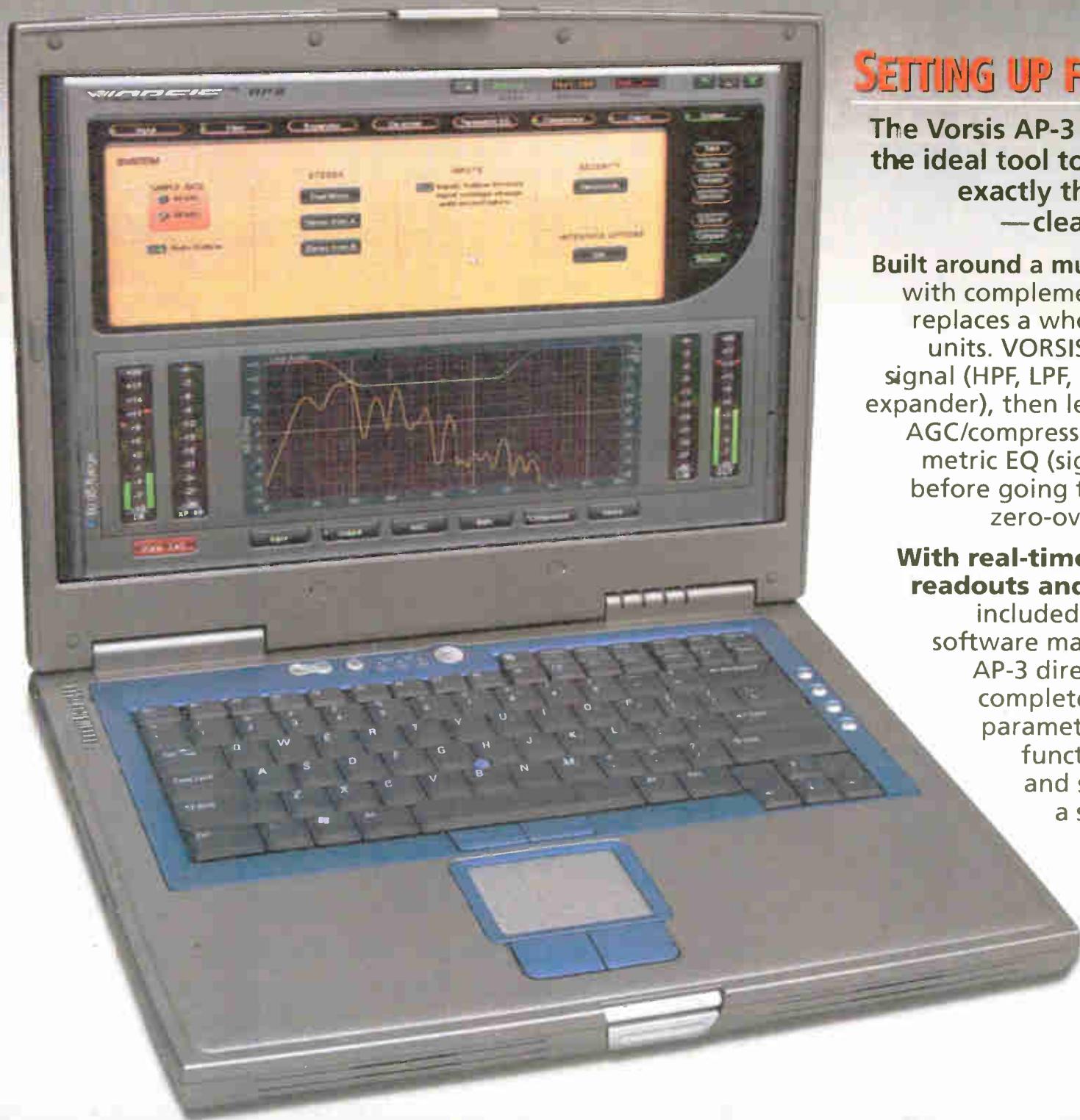
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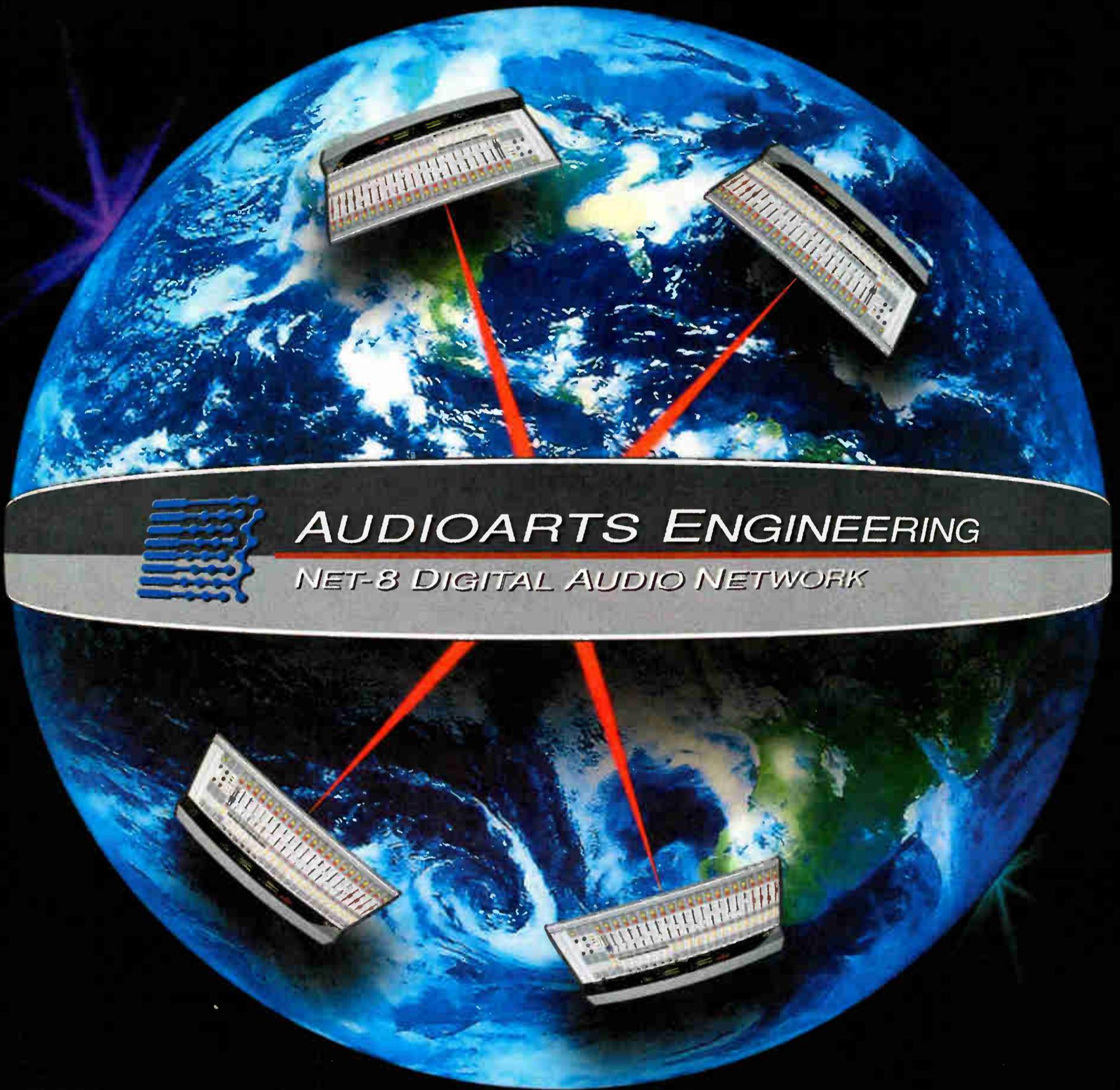
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